

COMMITTEE ON FINANCIAL AFFAIRS

September 27, 2018

9:15 – 10:30 a.m.

Blow Memorial Hall – Room 201

James A. Hixon, Chair

Mirza Baig, Vice Chair

- I. Introductory Remarks - Mr. Hixon
- II. Approval of Minutes - April 20, 2018
- III. Report from Senior Vice President for Finance and Administration Samuel E. Jones and Vice President for Finance and Chief Financial Officer Amy S. Sebring
 - A. 2018-2024 Six-Year Plan Update. **Resolution 17**.
 - B. 2018-2024 Revised Six-Year Plan Narrative. *(Pre-Read)*
 - C. FY20 Operating and Capital Budget Amendments. **Resolution 18**.
 - D. 2018-2019 Operating Budget Summary. Enclosure F.
 - E. Statement of Endowment Funds - June 30, 2018. Enclosure G.
 - F. Corporate Resolution to Transact Business and Confirm Authorized Business Agents for the College of William and Mary. **Resolution 19**.
- IV. Report from Virginia Institute of Marine Science Dean John T. Wells
 - A. 2018-2024 Six-Year Plan Update. **Resolution 20**.
 - B. 2018-2024 Revised Six-Year Plan Narrative. *(Pre-Read)*
 - C. FY20 Operating and Capital Budget Amendments. **Resolution 21**.
 - D. 2018-2019 Operating Budget Summary. Enclosure H.
 - E. Federal Budget Update.
- V. Investments Subcommittee Report – Mr. Baig
- VI. Closed Session (if necessary)
- VII. Discussion
- VIII. Adjourn

MINUTES
Committee on Financial Affairs
April 20, 2018
Board Room – Blow Memorial Hall

Attendees: Committee members H. Thomas Watkins, Chair; James A. Hixon, Vice Chair; S. Douglas Bunch; Anne Leigh Kerr; Christopher M. Little; Brian P. Woolfolk; faculty committee representative Eric D. Chason. Board members present: Sue H. Gerdelman; Lisa E. Roday; Karen Kennedy Schultz; William H. Payne; staff liaison Terry Fassanella. Others in attendance: President W. Taylor Reveley; Provost Michael R. Halleran; Virginia M. Ambler; Henry R. Broaddus; Dean Davison M. Douglas; Samantha Huge; Kent B. Erdahl; Michael J. Fox; Samuel E. Jones; Matthew T. Lambert; Jeremy P. Martin; Amy S. Sebring; Richard Bland College President Debbie Sydow; Virginia Institute of Marine Science Dean and Director John T. Wells; and other College and VIMS staff.

Chair Thomas Watkins convened the meeting at 9:04 a.m. Recognizing that a quorum was present, Mr. Watkins requested a motion to approve the minutes of the February 9, 2018 meeting. Motion was made by Mr. Dixon, seconded by Mr. Little, and approved by voice vote of the Committee.

Senior Vice President for Finance and Administration, Samuel E. Jones opened the presentation with an overview of the University's Budget Process. Mr. Jones proceeded by providing a summary of the 2018 General Assembly proposed budget actions for FY 2019. The General Assembly convened a Special Session on April 11 to finalize the 2018-2020 Biennial budget. As of this meeting, the State budget had not been finalized. Despite that, Mr. Jones review the university's FY 2019 spending priorities, which included mandatory expenditures; high priority restorations and maintenance of effort; and expansion of current programs and new initiatives.

Chief Financial Officer, Amy Sebring, presented the incremental increases in the need-based financial aid under the Promise. Ms. Sebring noted that \$2.3 million in incremental funding was originally budgeted for FY 2018, but that actual expenditures are projected to be \$5.8 million for FY 2018, leaving a \$3.5 million shortfall to be covered with one-time actions. For FY 2019, a total of \$7.5 million in incremental funding is projected to cover \$3.5 million overage in FY 2018 and to meet projected needs for FY 2019, consistent with the the Board's goal of reaching a more socially and economically diverse student body.

In addition to need-based financial aid, Mr. Jones presented the FY 2019 operating expenditure priorities, including mandatory expenses to annualize FY 2018 salary actions and the university share of projected increases for employee health insurance in FY 2019.. The proposed budget also included a potential 2% bonus for operational and classified staff, but will likely be reallocated pending General Assembly action as the action was eliminated from the House budget. Potential alternative uses for these funds include market-based salary adjustments, need-based financial initiatives, and incoming Presidential initiatives. FY 2019 expenditure priorities create an incremental increase of \$12,011,600, with a projected incremental revenue increase of \$11,535,000, creating a \$479,600 shortfall prior to reallocation. The reallocation of \$1,712,000 creates a surplus of \$1,232,400 available for program expansion and new initiatives such as the RBC Promise Scholars, campus security, and additional staff in high priority areas. The proposed FY 2019 budget does not include a salary increase for faculty and staff.

Ms. Sebring presented the auxiliary budget. The main drivers of the budget include annualization of FY 2018 salary actions, anticipated increases in health insurance increase, debt service, indirect cost recoveries, and contractual obligations. Seventy-five percent of the proposed FY 2019 auxiliary budget is comprised of housing, food services, and athletics.

An overview of Resolution 24 reveals the William & Mary FY 2018-19 Operating Budget Proposal. The total operating budget reflects anticipated revenue of \$412,393,582 million and expenditures of \$410,655,285 million.

Ms. Sebring presented to the Committee the proposed tuition and fees for FY 2019. The Board of Visitors approved Resolution 18, Continuation: William & Mary Promise; which sets the FY 2019 tuition for new in-state undergraduates at \$17,434, guaranteed for four years. Tuition for in-state undergraduates admitted in prior years remains flat based as William & Mary continues its commitment under the Promise. Total cost (tuition, fees, room and board) for in-state undergraduates ranges from \$32,180 to \$35,636, depending on class. Out-of- state undergraduate tuition will increase by \$2,039 (3.5%) to \$38,735, with a total cost of \$57,508. Tuition and fee increases for graduate and professional students range from \$324 to \$2,052.

Mr. Watkins requested a motion to approve **Resolution 24**, William & Mary FY 2018-19 Operating Budget Proposal and **Resolution 25**, FY 2018-19 Tuition and Fee Structure for Full- and Part-Time Students. Motion was made by Mr. Hixon, seconded by Mr. Little, and approved by voice vote of the Committee.

Ms. Sebring extended a warm welcome to guest, Scott Sandridge, Higher Education Budget and Policy Analyst with the Commonwealth of Virginia's Department of Planning and Budget.

Virginia Institute of Marine Science Dean/Director John Wells reviewed the proposed FY 2019 operating budget, highlighting funding priorities and challenges for VIMS. The projected FY 2019 operating budget revenue is \$50.3 million with expenditures at \$50.1 million. Mr. Watkins requested a motion to approve **Resolution 26**, FY2018-19 Operating Budget. Motion was made by Mr. Dixon, seconded by Ms. Kerr, and approved by voice vote of the Committee.

Investments Subcommittee Chair James Hixon reported the market value of the Board of Visitors' endowment was at \$85 million as of March 31, 2017, reflecting a performance rate of 6% FYTD. The Optimal Service Group has agreed to reduce its fees for accounts with values over \$50M. Using a sliding scale, up-to fifty million is 10 basis points; over fifty will be 7.5 and over \$100M will be 5.0 basis points.

There being no further business, the Committee on Financial Affairs adjourned at 10:04 a.m.

WILLIAM & MARY

2018-2024 SIX-YEAR PLAN UPDATE

WHEREAS, the College of William & Mary has a long tradition of providing an excellent liberal arts education to the citizens of the Commonwealth and the nation.

WHEREAS, the Governor's Commission on Higher Education has indicated "the Commonwealth's commitment . . . to having a distinctive 'public ivy' at William & Mary;"

WHEREAS, consistent with the requirement of the Higher Education Opportunity Act (the Act), William & Mary developed its 2018-24 Six-Year Plan rooted in this commitment, the goals set out in its Strategic Plan, and the objectives of the Act. This Six-Year Plan was approved by the Board of Visitors of the College of William & Mary in September, 2017.

WHEREAS, the Board of Visitors remains committed to the William & Mary Promise as a business model to enhance the quality of its education while improving predictability and affordability for in-state undergraduate students.

WHEREAS, the Commonwealth's planning process requires an update to the Six-Year Plan on an annual basis, incorporating the most recent funding actions by the Commonwealth and the most recent (FY 2019) operating budget approved by the Board of Visitors in April, 2018.

WHEREAS, the university has reviewed those expenditures necessary to support and enhance its instructional, research, student service, and administrative operations, prioritized those expenditures, and recommended funding through a combination of Commonwealth, College, and reallocated revenue.

WHEREAS, the university continues to evaluate opportunities to improve the effectiveness and efficiency of its academic/administrative programs and activities.

THEREFORE, BE IT RESOLVED, That upon recommendation of the President, the Board of Visitors of the College of William & Mary, approves William & Mary's Six-Year Plan Update to reflect the university's FY 2019 operating budget as approved by the Board in April, 2018.

BE IT FURTHER RESOLVED, That the Board of Visitors recognizes the incremental state support for operations appropriated by the Commonwealth for the 2018-2020 biennium and as a result, the update reduces the projected in-state undergraduate tuition increase for incoming students from 6.4% as contained in the original plan to 5.4% as contained herein. The Board will take formal action on in-state undergraduate tuition for FY 2020 at its November 2018 meeting.

**COLLEGE OF WILLIAM & MARY
SIX-YEAR PLAN (2018-20 through 2022-24):**

Part II NARRATIVE

William & Mary provides an outstanding education for Virginia students as the Commonwealth's "Distinctive Public Ivy" while expanding its global relevance, increasing interdisciplinary approach to research and education, and strengthening research capabilities. Going forward, the university intends to maintain and enhance an extraordinary form of education, offered by no other institution in the Commonwealth and few others in the country. In developing its six-year plan, the university strives to build on existing strengths, preserving an exceptional public educational experience while contributing to the Commonwealth's educational and economic development needs.

Each of the following sections provides a brief summary of key elements of William & Mary's six-year plan and related strategies as well as efforts to meet specified state policy goals.

A. INSTITUTIONAL MISSION

The William & Mary Mission Statement:

The College of William & Mary, a public university in Williamsburg, Virginia, is the second-oldest institution of higher learning in The United States. Established in 1693 by British royal charter, William & Mary is proud of its role as the alma mater of generations of American patriots, leaders and public servants. Now, in its fourth century, it continues this tradition of excellence by combining the best features of an undergraduate college with the opportunities offered by a modern research university. Its moderate size, dedicated faculty, and distinctive history give William & Mary a unique character among public institutions, and create a learning environment that fosters close interaction among students and teachers.

The university's predominantly residential undergraduate program provides a broad liberal education in a stimulating academic environment enhanced by a talented and diverse student body. This nationally acclaimed undergraduate program is integrated with selected graduate and professional programs in five faculties -- Arts and Sciences, Business, Education, Law, and Marine Science. Master's and doctoral programs in the humanities, the sciences, the social sciences, business, education, and law provide a wide variety of intellectual opportunities for students at both graduate and undergraduate levels.

At William & Mary, teaching, research, and public service are linked through programs designed to preserve, transmit, and expand knowledge. Effective teaching imparts knowledge and

encourages the intellectual development of both student and teacher. Quality research supports the educational program by introducing students to the challenge and excitement of original discovery, and is a source of the knowledge and understanding needed for a better society. The university recognizes its special responsibility to the citizens of Virginia through public and community service to the Commonwealth as well as to national and international communities. Teaching, research, and public service are all integral parts of the mission of William & Mary.

In fulfilling its mission, William & Mary adopts the following specific goals:

- to attract outstanding students from diverse backgrounds;
- to develop a diverse faculty which is nationally and internationally recognized for excellence in both teaching and research;
- to provide a challenging undergraduate program with a liberal arts and sciences curriculum that encourages creativity, independent thought, intellectual depth, breadth, and curiosity;
- to offer high quality graduate and professional programs that prepare students for intellectual, professional, and public leadership;
- to use the scholarship and skills of its faculty and students to further human knowledge and understanding, and to address specific problems confronting the Commonwealth of Virginia, the nation, and the world; and
- to instill in its students an appreciation for the human condition, a concern for the public well-being, and a life-long commitment to learning.

Note: There are no planned changes in the university's mission statement for the planning period FY18 through FY24.

B. 2018-2024 STRATEGIES

The following narratives support the various strategies included in the university's academic and financial plan.

Priority 1—William & Mary Promise (mitigate impact of tuition and fee increases on low- and middle-income students and their families, while continuing its “public ivy” education)

William & Mary continues to implement the “The William & Mary Promise,” which was approved by the Board of Visitors on April 19, 2013. The Promise created an operating model that provides vitally needed resources to secure the future of Virginia’s distinctive “public ivy” while markedly enhancing predictability, affordability and access for Virginia students. Intended to improve **predictability** in tuition through a four-year tuition guarantee, **affordability** by increasing the university’s investment in need-based financial aid and reduced assumptions about student use of loans, and **accessibility** by providing additional slots for in-state undergraduates, the Promise

and the six-year plan continue the university's investment in need-based student financial aid, increasing the availability of grant funds in lieu of loans, thereby reducing student debt.

Intended to support both low- and middle-income families, the definition of "middle income" used in the William & Mary Promise encompasses more than 70% of Virginia households and reflects the recommendation of the Higher Education Advisory Committee established under TJ21. As adopted by the General Assembly, TJ21 stressed the need to improve middle-income affordability and directed the Higher Education Advisory Committee to provide a definition of the target group. The Committee did so, defining "middle income" as extending to 400% of the federal "poverty" definition, or to roughly \$100,000 in annual income for a family of four with two children.

The results have been noteworthy. Since the William & Mary Promise was adopted in 2013, the average "net price" for Virginia families making less than \$75,000 has dropped more than 20 percent, and the university consistently ranks as having one of the lowest net price averages for in-state students among public institutions nationally. Among public universities in Virginia, the university offers among the lowest net price for in-state students from families with incomes of \$75,000 or less. Further, William & Mary is the only public university in Virginia that has replaced all loans with grants for in-state students with family incomes under \$40,000.

For the 2017-2018 academic year, the incoming class was notable. Not only was the Fall 2017 freshmen class the largest in William & Mary's history – with a total of 1,534 students – it included the largest number of in-state freshmen ever at 998 students. The Promise had a significant impact on the university's ability to attract in-state freshmen, with the university bringing in its most socio-economically diverse incoming class in history. In total, the combined in-state and out-of-state figures for Pell-eligible freshmen increased by 18.6% over the prior year, and when looking at all incoming students – both freshmen and transfers – the increase in Pell-eligible students was up over 20% for the year and up 30% over three years prior. In addition, the Fall 2017 incoming class included an 11% increase in first-generation college students over the prior year.

Recognizing the importance of ensuring that William & Mary remains an affordable option for low- and middle-income students, the university continues to balance the need for incremental financial aid with other priority initiatives given available revenues. Since inception of the Promise, William & Mary historically has increased its allocation of nongeneral funds to support need-based, in-state undergraduate financial aid between \$1.6 million and \$2.4 million. For FY18, the university increased need-based undergraduate aid by \$5.8 million or \$3.5 million more than originally budgeted. The incremental support was the result not only of the increased socio-economic diversity of the incoming class, but changes in the federal financial aid application process and calculations of need. The plan's increase for FY19 reflects an adjustment to base

funding to fully absorb FY18 actual costs as well as incremental funding of approximately \$4.0 million for new aid-eligible students this year. For FY20 and beyond, the university expects annual increases in financial aid as a result of the Promise to hover around \$4 million as William & Mary continues to recruit highly qualified, low- and middle-income Virginians.

Priority 2—Increase Faculty Salaries

In addition to promoting access and affordability, the Promise's financial model has allowed W&M to put significant resources into its faculty and staff. Prior to the Promise, average salaries for teaching and research faculty at William & Mary lagged behind its peer institutions by more than 20%. Since the inception of the Promise, the university has increased faculty salaries 4.4% per year on average, which has helped to close the gap. Given the progress W&M has made and the increased need for in-state, undergraduate financial aid in FY18 and FY19, the FY19 operating budget does not include salary increases, as shown in the updated six-year plan. The university anticipates a two-percent across-the-board increase for FY20 as directed by the 2018-2020 Appropriation Act.

Priority 3—Provide Competitive Staff Salaries

As with faculty, the Board of Visitors has emphasized the need to increase staff salaries to a competitive, market-based level since the inception of the Promise. Between FY13 and FY18, salaries for administrative and professional faculty and university (operational) staff have increased, on average, 3% with classified staff salaries increasing by an estimated 1.5% as authorized by the state. The revised six-year plan includes no salary increase for FY19, consistent with the Governor and General Assembly's actions for state employees. For FY20, the revised plan includes a 2% across-the-board increase for administrative and professional faculty and all (classified and operational) staff. The plan also anticipates an additional 2% merit increase for classified staff based on the 2018-2020 Appropriation Act.

Priority 4— New Undergraduate Curriculum

Funding provided in FY19 as part of this six-year plan will provide the last incremental increase to support the full adoption of the university's new curriculum. First adopted with the incoming class in the Fall 2015, the curriculum reflects William & Mary's new general education requirements, which continue its commitment to a liberal arts education while providing the skills necessary to succeed in the 21st-century workforce.

Priority 5— Degree Production in Data Science and Technology, Science and Engineering, Healthcare, and Education.

The 2018-2020 Appropriation Act provides \$1.2 million in state general fund (GF) support in FY20 to increase the production of degrees in high demand fields, including Engineering and Design. The Provost has begun working with the university's deans to ensure that, once available, these funds are used to leverage and enhance our existing programs to meet the degree targets

outlined in the Appropriation Act. In addition, the university will invest at least \$267,500 of institutional resources in FY20 to continue the planned expansion of its Engineering and Design Initiative – an essential component of degree production in these areas.

The Engineering and Design Initiative exposes students to the tools, programs, and methods used in traditional engineering and design degree programs and expects them to become familiar with “design thinking” so that they can work comfortably in design studios or entrepreneurial incubators across a broad array of industries. The programs are designed so that students can identify the essence of important problems, parse the tasks and workloads associated with solutions whether working alone or in teams, design those solutions using the latest computer-aided tools, and render those designs into working material objects using the latest methods, in labs, shops, studios, or maker-spaces around our campus.

Once relegated to the information technology field, “big data” has become increasingly important in a vast array of industries. The Data Sciences Minor, which was launched in Fall 2017, has already shown the level of student interest in these programs with 19 students declaring minors in the first year. The Engineering, Physics, and Applied Sciences curriculum— adopted as a track within the Physics major, effective in Fall 2018 – blends key elements of existing physics and applied sciences curricula with a focus on team-based, experiential problem-solving.

Although the targets set out in the Appropriation Act are ambitious given the short ramp-up time, William & Mary anticipates that these investments will result in more degrees being awarded in Data Science and Technology, Science and Engineering and Education. Further, the university continues to work on developing long-term, sustainable relationships with industry leaders who can partner with William & Mary in ways that will meaningfully accelerate programs in other key STEM areas essential to the growth of the Commonwealth’s economy.

Priority 6— Expand eLearning

The university has continued to expand both its online course offerings and programs. At the program level, the School of Business has been most aggressive with the launch of the Online Master of Business Administration (OMBA) in Fall 2015 and the planned online launch of the new master’s degree in Business Analytics (MSBA) in Fall 2018. In Summer 2017, the School of Business also started a hybrid program for undergraduate business minors that includes an online component. In addition, the School of Education has an existing online presence with its Executive Doctorate of Education (Ed.D.) program and in Spring 2018 started an online master’s program in counselling. Although not yet offering any degree programs, Arts and Sciences now offers a number of online summer term courses with enrollment in these programs having grown from a student headcount of 183 in Summer 2016 to 407 in Summer 2018 – an increase of 122%. Finally, in Spring 2018, the Law School established an online certificate in Military and Veterans Health, Policy and Advocacy. The university continues to explore new programs across all of its

academic units to the extent online delivery can meet student demand effectively. The six-year plan provides funding to expand our existing infrastructure, which will allow us to develop our online offerings more fully.

Priority 7 – RBC Promise Scholars

The RBC-W&M Promise Scholars program is a new initiative that will include the teaching of William & Mary courses at Richard Bland, scholarship funds, guaranteed housing, peer-to-peer support, and mentorship to high-achieving, low-income RBC students who have committed to transferring to William & Mary.

In spring 2018, Richard Bland College conducted a selective process to identify the first cohort of 10 honors-caliber, first-year, in-state students who are Pell grant recipients and committed to attending William & Mary. Beginning in Fall 2018, these students will be designated as RBC-W&M Promise Scholars who will be provisionally admitted to William & Mary for their third and fourth years, pending successful completion of an associate's degree and meeting minimum GPA requirements as per the existing articulation agreement.

Promise Scholars will receive a \$2,000 merit scholarship from William & Mary in their second year at Richard Bland and will be guaranteed housing designated for Promise Scholars. This community of peers will share their academic aspirations and accompany one another to Williamsburg for their upper-class years. Beginning in Fall 2019, Richard Bland also will begin awarding a new scholarship of the same amount to first-year students selected for the program.

William & Mary has selected two faculty members as inaugural Promise Fellows who will go to Petersburg to teach a general education course, giving Promise Scholars the opportunity to experience William & Mary classes while at Richard Bland. Beginning in the 2018-19 academic year, each faculty member will travel twice weekly to Richard Bland to teach William & Mary's signature COLL 100 and COLL 150 classes. These courses are required for all traditional William & Mary freshmen. Students in COLL 100 courses investigate the significant concepts, beliefs and creative visions, theories and discoveries that have shaped understanding of the world. They become more adept at presenting and defending ideas in ways that go beyond writing. Students in COLL 150 courses learn methods of scholarly research and practice and strengthen writing skills.

Once the scholars transfer to William & Mary, they will be guaranteed on-campus housing their junior year. Additionally, they will receive annual \$3,500 scholarships to offset student loans during their last two years. These scholarships will be in addition to any financial aid for which the students qualify, which will equate to a no-loan, all-grant financial aid package, enabling these students to finish their degrees at William & Mary without student debt.

Priority 8 – Improve Student Services

Recent and continuing enrollment growth, combined with William & Mary's focus on financial aid and enhancing the student experience have contributed to the need for additional resources to support the financial aid office and student affairs activities.

Priority 9 – Increase Academic Support

The Mason School of Business has instituted a number of new programs including the Online MBA and MSBA mentioned in eLearning above over the past couple of years. The enrollment at the Mason School continues to grow as these programs are still introducing new cohorts. This investment will provide additional academic support within the Mason School to help meet growing student demand.

Priority 10 – Creative Adaption Program

This plan continues to encourage and support creative adaptation across the academic enterprise using both incremental and reallocated funds. As the scale of projects increases additional investment may be required to fully implement pilot projects. A more detailed discussion of creative adaptation and projects recently supported follows in Section D – Evaluation of Prior Six-Year Plan.

Priority 11—Support Base Operations and Continue Business Innovation

Base Operations provides funding to support essential services in selected areas, including academic support, student services, administrative functions, and plant operations as well as incremental funding needed to support the nongeneral fund share of fringe benefit increases. Not reflected in the revised six-year plan is the new "surcharge" established as part of the 2018-2020 Appropriation Act for university employees hired on or after January 1, 2014 who are participating in the university's optional retirement plan (Item 464, Paragraph O). William & Mary is awaiting guidance from the Virginia Retirement System as to how this surcharge will be assessed, but based on preliminary discussions the impact is anticipated to be significant and on-going.

Given that many of the cost escalations in this area are unavoidable or outside of the university's control, William & Mary attempts, to the extent possible, to identify incremental new dollars through internal *reallocations* as part of on-going efforts to reprioritize existing dollars through Business Innovation. The Business Innovation project, launched as part of the William & Mary Promise and led by the Provost and the Vice President for Strategic Initiatives, develops and implements plans for more efficient business processes and revenue generating activities in order to reallocate dollars to support the university's highest priority needs. The university will continue to implement recommendations made by its outside consultant (organizational structure, business processes, and operating efficiencies) while identifying additional opportunities through an internal evaluation process.

Priority 12 - Whole of Government

In 2015, Virginia's Secretary of Veterans Affairs commissioned a report, "Growing the Military Mission in the Commonwealth of Virginia", which called for the creation of a "Whole of Government" Center of Excellence (COE) at William & Mary. The report envisioned this effort as the foundation of what could become the Harvard Kennedy School of the South, bringing a focus to issues particularly of interest to the military. The COE would bring to bear the best of William & Mary's academic efforts in public policy, law, business, and other areas and build on strong connection to the military and its facilities in the region. This effort, in part, would help the military recruit, retain and develop the next generation of military and civilian talent in defense of our nation. With support from the Secretary's office, the Hampton Roads Military and Federal Facilities Alliance (HRMFFA) and the reallocation of university funding, William & Mary has begun to implement the report's call to action. Faster than many predicted, William & Mary began an on-campus track in its Master of Public Policy (M.P.P.) program in Fall 2017. Enrollments were lower than anticipated, however, due largely to the program's two-year, full-time, on-campus curriculum. The 2018-2020 Appropriation Act includes funding in FY20 for W&M to develop the first-year curriculum online, which will reduce the on-campus requirements for the program to one year. Once implemented, W&M anticipates that the online, first-year curriculum will also increase interest for potential students in other M.P.P. tracks who cannot currently commit to a two-year, full-time, on-campus program.

Priority 13 - Counseling Veterans and Their Families:

The 2018-2020 Appropriation Act includes funding for William & Mary to develop a veterans and military concentration in its Master's in Counseling program at the School of Education and to create a certificate program for those already certified as counselors but who want to work specifically with military members, veterans and their families.

C. FINANCIAL AID

Continuing the university's commitment under the Promise (see narrative under Priority 1) to ensure that a William & Mary education remains affordable for low- and middle-income Virginia families, this six-year plan includes \$5.5 million in FY19 and a cumulative \$9.2 million in FY20 from institutional resources to support in-state, undergraduate, need-based financial aid.

D. EVALUATION OF PREVIOUS SIX-YEAR PLAN

To the extent that funds were available, the 2016-18 biennia saw implementation of six-year plans submitted under the TJ21 legislation. While many of the elements of those initial plans continue in this current submission, highlights of progress made on prior strategies include the following:

- **William & Mary Promise**— As described above, the “The William & Mary Promise” established an operating model that provides vitally needed resources to secure its future while markedly enhancing predictability, affordability and access for Virginia students. Elements of the Promise include:

- **Predictability through a Four-year Tuition Guarantee:** The Promise provides Virginia families with financial predictability through a commitment that tuition will remain constant through all four years of the students’ undergraduate study. Since its inception in Fall 2013, entering Virginia students and their families have known exactly what their tuition would be for all four years at William & Mary, with assurance that tuition would not rise year to year.
- **Affordability for Middle-Income Families:** As noted above, the Promise reduces “net tuition” paid by middle-income families, as defined by the state’s Higher Education Advisory Committee (HEAC). Based on FY15 data, average net price for families earning \$30,000 or less was \$4,046. For families earning between \$30,000 and \$48,000, average net price was \$4,997. For those earning between \$48,000 and \$75,000, average net price was \$10,982. Among families earning at least \$75,001 but less than \$110,000, average net price remained flat during this time period despite tuition increases implemented under the Promise.
- **Affordability by Reducing Debt for William & Mary Graduates:** The Promise reduces the loan burden for middle-income in-state undergraduate students who have demonstrated financial need. The William & Mary Promise lowers the maximum amount of loans required to meet full need for an in-state financial aid package by 36% (\$2,000 annually) for families with an income between \$40,000 and \$60,000, and by 18% (\$1,000 annually) for all other families with demonstrated financial need. Students from Virginia families with a household income of less than \$40,000 continue to receive financial aid that covers 100% of their need with grants. William & Mary is the only public university in Virginia to have replaced all loans with grants for in-state students with need whose families earn \$40,000 or less annually.

Overall, only 38% of William & Mary graduates carry debt, a percentage well below that of other public universities in Virginia or across the nation. They also borrow less than the state or national averages. And, William & Mary graduates pay back their student loans at far higher rates with less than 1% of William & Mary borrowers defaulting on their student loans.

- **Increased Accessibility for Virginia Students:** The Promise provided for 150 additional in-state undergraduate students to be enrolled at William & Mary over four years. The university's enrollment projections demonstrate that they have met this commitment. This growth is in addition to a previous 2011 commitment to increase overall undergraduate enrollment by 150 in-state undergraduate slots.
- **Faculty Salaries**—Supplementing bonus and base salary funding provided by the Commonwealth, the Board of Visitors authorized merit-based increases to base salary for faculty averaging 2% in FY13, 6% in FY14, 5.5% in FY15, 4.5% in FY16 and 3% in FY17. Although William & Mary lost some ground in the last year relative to peers, the collective actions have helped the university to continue moving towards the Commonwealth's 60th percentile goal (peer group based).
- **Undergraduate Enrollment Growth**—By Fall 2014, the university met its 2011 commitment to the Commonwealth to grow in-state undergraduate enrollment by 150 over four years. The university met its growth goals in the 2016-18 biennium, using funds dedicated to maintaining the quality of education while growing the student population to a sustainable size.
- **New Undergraduate Curriculum** — William & Mary's new general education College Curriculum (COLL) constitutes a continued commitment to the liberal arts mission of the College while providing the skills necessary to succeed in the 21st century workforce. The COLL curriculum integrates the study of substantive knowledge with inquiry-based learning and the opportunity to apply new knowledge actively through individual research projects conducted under faculty supervision. It spans all four years, with the first and fourth year tipped towards critical thinking and inquiry, while the second year favors subject-matter distribution and the third year expands global and cross-cultural knowledge and experience. It continues to emphasize writing and communication as it prepares graduates to become agile thinkers who can communicate persuasively and collaborate productively. William & Mary maintains required proficiency in digital literacy (to be fulfilled with an online course) and a foreign language and an added mathematics proficiency. The university committed significant resources over the biennia to support the faculty and resources needed to implement this new curriculum.
- **Engineering and Design Initiative** – As described above, the Engineering and Design Initiative is intended to bring tools, programs and methods traditionally employed in engineering and design programs to students in a way that allows them to analyze problems and develop solutions with the critical thinking skills inherent in a liberal arts education. William & Mary launched this initiative in FY17 with initial funding to stimulate activity across disciplines at William & Mary. The initial investment has helped to create

makerspaces for faculty and students to collaborate and share resources and knowledge and aided the establishment of a minor in Data Science and a major track within Physics in Engineering Physics and Applied Design. These spaces provide the tools needed to advance engineering and design-based projects.

- **eLearning Platform**—Using state and institutional funds, the university established a baseline eLearning platform supporting blended and online instruction especially in professional schools and graduate programs. William & Mary have also identified high-quality digital educational resources that can be used in courses and continue to explore opportunities to provide certificates, continuing education, and other online activities and programming.
- **Academic Program Initiatives and Improving Student Services**—Funding in these areas during the 2016-18 biennium helped to provide resources to support the academic mission of the university as well as improve the student experience. Specifically within student services, resources were directed to career services to address growing student demand. In addition, funding supported systems that have not kept up with demand due to limited resources.
- **Creative Adaptation Fund** – The university continues to set aside \$150, 000 annually to engage and unleash the creative energy in academic areas. The program encourages the development of innovative adaptations that improve the quality of educational programs either directly or indirectly by reducing costs or generating new revenues that can be reinvested in people and programs. This fund, designated for academic units, complements an on-going effort to improve university business practices through innovation and efficiency actions.

FY17 and FY18 projects include:

1. **Innovation Lab Summer Initiative**—Develops the content resources and implementation plan to offer a series of institutes and workshops in the Professional Development Center in the School of Education to equip K-12 school leaders with the tools and processes to foster innovation in teaching and learning. Offers multiple week-long, small group institutes and a larger conference format event. Based on similar institutes and other topics designed for K-12 participants. Developing these resources will allow the School to generate additional revenue.
2. **BUAD 443 - Entrepreneurial Ventures Redesign - Blended Learning**—This course fulfills a requirement for the undergraduate Bachelor of Business Administration

concentration in entrepreneurship and provides students with an introduction to the essential concepts in entrepreneurship. A course refresh was needed to build on the success of the in-person course format by pairing rigorous online content with rich in-person entrepreneurial ecosystem experiences. This effort allows W&M to expose the students to the growing entrepreneurial ecosystem, broaden the reach of course content by using an online format, expand exposure of entrepreneurship to non-business school students, and generate revenues through certificate programs open to audiences beyond the student population.

3. **Online Master's Degree Program in Counseling**—In collaboration with Everspring, our third-party partner in online programs, the counseling faculty in the School of Education will launch an online master's degree program with emphases in school counseling, marriage and family counseling, and clinical mental health counseling. The Creative Adaptation Fund will provide support for the development of the initial four courses of the program. There are few accredited online master's degree programs in counseling and this represents an opportunity to grow W&M's program.
4. **Well-Aligned Classes for a Well-Rounded Education in the Life Sciences and Computer Science**—This project seeks to provide an improved learning experience for students that scales with the large student populations seen in both disciplines. It also addresses the need for biology majors to be confident and competent in the application of computational methods and for computer science majors to learn how abstract computational methods apply to real-world challenges in the life sciences. eLearning techniques will be employed and carefully evaluated to provide a high-quality learning experience for courses that cater to hundreds of students each semester. Two new courses will be developed that introduce life science students to basic computer science and its power to solve a wide range of problems in biology and medicine. In addition, traditional wet lab exercises throughout the introductory biology curriculum will be replaced with a series of computer science exercises that address important issues in contemporary computational biology.
5. **Expanding Online Learning Modules for the Principles of Economics Course**—The Principles of Economics courses are large courses that are required for majors in Economics, Business, International Relations, and Public Policy. In 2012, Principles was redesigned by developing 17 online learning modules that substitute for lectures. The project was successful, but it is time to revise the modules, add new ones and write an instructor's manual to help others use the modules which will help meet high demand and allow enrollments to grow.

6. **Creation of a Dual-Purpose GIS Certificate Program to Support Expansion of the Center for Geospatial Analysis (CGA)**—Almost every arts and sciences discipline has been heavily influenced, if not wholly transformed, by the adoption of geospatial research and analysis techniques. Whether it be the politics of drawing congressional district boundaries or the geographical spread of dialects, folklore motifs, or invasive plant species, all employ similar techniques for gathering and analyzing spatially referenced information. This project focused on the development of a dual-purpose Geographic Information Systems (GIS) Certificate Program run by CGA. The program serves the needs of existing students by adding a GIS certificate option and by bringing post-baccalaureate students to campus for an intensive on-year program in GIS.
- **Fringe Benefits and State Funding Reduction**—The university allocated funds to support its share of significant increases in health insurance costs. While our original plan assumed some growth in fringe benefit costs, actual increases significantly exceeded estimates. At the same time, in FY18, the university is absorbing a 5% base reduction in state funding.
 - **Business Innovation**—A less publicized aspect of the William & Mary Promise was a commitment to improved efficiency and effectiveness across both academic and administrative units. The university continues to look for ways to reallocate funds through its business innovation efforts. William & Mary has a standing committee of senior leadership who look for opportunities across campus with an eye towards the best usage of our limited resources. Since FY14, the university has reallocated over \$4 million in recurring funds that have been redirected to support the highest priority needs. In addition to the \$4 million, the Provost asked deans to reallocate 5% of their budgets to higher priority items including salaries over this same time period.

E. TUITION RATE INCREASES

This original six-year plan included a 6.4% increase in tuition and mandatory E&G fees for incoming, in-state undergraduate students in FY19 and FY20 under the William & Mary Promise. As described above, under the Promise, in-state, undergraduate tuition is set for each cohort of incoming Virginia students and does not increase during their four years at William & Mary. Recognizing the incremental investment the state has planned for William & Mary in FY20, the university has updated the plan to reduce the proposed tuition increase for in-state students in FY20 to 5.4% over the current freshmen class. Given the four-year guarantee, this increase equates to less than a 1.4% annual increase if compounded over the four year time period. By lowering tuition, the university is able to leverage the state's additional support and reduce the impact on students and their families while still ensuring that the university has sufficient resources to make strategic investments in high priority programs like its Engineering & Design initiative and data science programs. As shown in the plan, the university plans to invest an

incremental \$267,500 in institutional resources along with the \$1.2 million provided by the state in general fund support to increase the production of degrees in high demand fields.

The proposed six-year plan also includes a 3.4% increase in tuition and mandatory E&G fees for out-of-state undergraduate students.

For graduate students, William & Mary has assumed a 4.4% increase for both in-state and out-of-state. In-state law student tuition assumes increases of 2.6% in FY19 and 2.3% in FY20, with out-of-state being 1.9% and 0.3% respectively.

The revised six-year plan also includes a 5.3% increase in mandatory non-E&G fees in FY19 and a 4.0% increase in FY20. Increases for graduate and law students range between 6.0% and 6.2% in FY19, with an expected increase of 4.0% for both student types in FY20. The FY19 increases were slightly higher than originally projected for the six-year plan due to debt service requirements for capital projects, including the opening of the new Integrated Wellness Center, limited increases in staffing for new programs or activities, contractual obligations, and increases in the indirect cost recovery rate to E&G programs. All proposed fee increases are consistent with the new provisions under Section 4-2.01 b) 8. after accounting for debt service, student health services, and required changes in compensation. Specific to the FY19 actions, the opening of the new Integrated Wellness Center in September has been accompanied not only with additional debt service which is supported by student fees, but also additional student health programming. In FY20, the proposed fee increase anticipates mandated salary and fringe benefit actions, debt service needs, and a full year of program support for new student health services.

As indicated above, current tuition and fees do not take into account the potential impact of the new "surcharge" established as part of the 2018-2020 Appropriation Act for university employees hired on or after January 1, 2014 who are participating in the university's optional retirement plan (Item 464, Paragraph O). W&M is in on-going discussions with the Virginia Retirement System and legislative staff to determine how this surcharge will be assessed. Implementation of that surcharge may impact future tuition and fee rates.

F. CONTRIBUTIONS TO ECONOMIC DEVELOPMENT

Employing more than 2,700 faculty and staff, and enrolling more than 8,500 students, William & Mary is a strong contributor to the state's economy. According to a recent Weldon-Cooper study conducted by the Virginia Business Higher Education Council (VBHEC), the total economic contribution resulting from William & Mary operations during FY15 was \$955 million in GDP and the total state revenue contribution was \$101 million. The university also contributes to economic development efforts through the following groups and organizations:

- University Based Economic Development officers (UBED)
- Virginia Economic Developers Association (VEDA)
- Greater Williamsburg Partnership
- Launchpad, Greater Williamsburg Regional Business Incubator
- Historic Triangle Collaborative (HTC)
- Southeastern Universities Research Association (SURA)

William & Mary often serves as a leader and convener of programs benefiting the region and state. Each year William & Mary students volunteer for more than 245,000 hours of service. Calculated at minimum wage that amounts to nearly \$2 million in contributed labor in areas of need, often financially distressed communities. William & Mary's School of Education offers graduate courses to provide in-depth training to teachers in preparation for serving as math specialists in K-5 schools. These school divisions are rural, have been cited for deficiencies in mathematics by the Virginia Department of Education, and are characterized as low socio-economic status areas. Further, as a university recognized as being military friendly, William & Mary not only encourages enrollment by veterans but also provides assistance to them through the Puller Veterans Benefits Clinic at the law school.

William & Mary's Mason School of Business is home to the Alan B. Miller Entrepreneurship Center. The Center exists to educate, inspire, and support individuals in developing the skills and mindset of an entrepreneur. In its Field Consultancy programs, elected teams composed of second-year MBA students, third-year law students, and undergraduates work as consultants charged with identifying, researching and proposing a solution for a real business problem faced by their client organization. Each project team works under the guidance of a faculty member and Executive Partners.

William & Mary graduates in the Class of 2017 are working in 58 different industries, including high tech/information technology, consulting, education, financial services, government, healthcare, law, technology and many others. Those not joining the workforce enrolled in 132 distinct graduate programs. Through them, the more than 100 Executives in Residence collaborating with the Mason School of Business, and 10,810 employers actively participating in Tribe Careers, William & Mary has a broad reach that makes it an active, engaged partner in improving the economy of the Commonwealth.

G. KEY CAPITAL OUTLAY PROJECTS

Over the last two years, the Governor and General Assembly have generously provided approval and funding for William & Mary's most pressing needs capital needs.

Recognizing existing authorizations, the Six-Year Plan as submitted including operating funds for the Fine & Performing Arts Complex (phases 1 & 2) and the West Utilities Plant. Planning is well underway for both of the projects and we expect them to be completed during the 2018-2020 biennium.

The university's Six-Year Capital Plan as approved by the Board of Visitors includes the following projects which will require operating support in the out-years:

- **Construct: Integrated Science Center 4** **\$74,916,000 GF**
Supports construction of a 124,000 GSF facility that will house Mathematics, Computational Science, Kinesiology, and Engineering and Design. The new facility will be located on the site of the recently demolished Millington Hall, adjacent and tied in to the Integrated Science Center, requiring the renovation of approximately 10,000 GSF. The 2016 General Assembly added the project to the Commonwealth's long-term capital plan, and authorized planning, using university funds if available.
- **Construct: Fine & Performing Arts Complex, Phase 3** **\$39,080,000 GF**
As noted above, the Commonwealth has previously provided funding support for Fine and Performing Arts (phases 1 & 2). This request supports phase 3 of the "Arts Quarter", which is the improvement of Andrews Hall for Fine Arts and Art History, and the construction of additional space to handle the industrial arts, such as sculpture.
- **Construct: Sadler Center, West Addition** **\$37,742,000 NGF**
Supports 76,000 GSF addition to the Sadler Center to house many of the Student Affairs functions currently housed in the old Campus Center. This addition is in accordance with the university's 2015 Campus Master Plan. Preplanning for this project has been completed and the project authorized by the 2018 General Assembly.

The Six-Year Capital Plan also includes two relatively small, high priority projects that would require funding and authorization from the Governor and General Assembly. Those projects include:

- **Construct: Population Lab** **\$8,484,000 GF**
Supports the demolition and reconstruction of a new animal laboratory to replace the heavily-used lab and aviary adjacent to the Tennis Center. The project will meet national standards, improving university standing for National Science Foundation grants. This facility supports primarily biology and psychology curriculum and research.

- Improve: Swem Library** **\$10,715,000 GF**
 Provides renovation of 26,000 GSF on the ground level of Swem Library in support of:
 - 1) the "Studio for Teaching and Research" including space for the Center for Liberal Arts;
 - 2) the Botetourt Gallery and theater; 3) a new home for "Content Services," including Digital Collections and Inter-Library Loans; and 4) Omohundro research space.

For the 2020-22 and 2022-24 biennia, the university has several major academic and student services buildings that are in need of repair or replacement. A brief description of those projects is included below:

- Renovate: Ewell Hall** **\$21,565,000 GF**
 The former home to Music, and the original Phi Beta Kappa Hall, much of Ewell will be vacated upon the completion of the new music facility (Fine Arts Phase 1) in summer of 2020. Preplanning to create a general classroom "swing-space" building would be an appropriate first step in design.
- Renovate: Adair Hall** **\$20,744,000 NGF**
 With the move of Kinesiology to ISC 4, Adair becomes a support facility for Rec Sports and Athletics, per the 2015 Campus Master Plan. This renovation will restore and rehabilitate the locker rooms, restore the main gym, and replace obsolete building systems with modern systems, including fire safety.
- Construct: Jamestown Place** **\$46,666,000 GF**
 Upon completion of the Sadler West Addition, and in accordance with the 2015 Campus Master Plan, a new facility or facilities, "Jamestown Place," will replace the dilapidated Campus Center, Atrium, and Trinkle Hall to create a new mixed use and administrative edge along Jamestown Road.
- Improve Kaplan Arena** **\$34,864,000 NGF**
 Supports total building systems renovation, fire safety and ADA compliance.
- Renovate: Dormitories** **\$14,900,000 NGF**
 Continues the university's third decade of investment in student residence hall improvements. Supports renovation projects for various dormitories, dependent on priority, urgency, and debt (fee) capacity. Next on the priority list are Green & Gold Village, and Botetourt Complex.

H. RESTRUCTURING

Since its implementation, restructuring has provided significant benefits to William & Mary, other Virginia institutions of higher education, and the Commonwealth. The university continues to support the goals of restructuring and encourage exploration of additional areas where operational flexibility can better serve both the institutions and the state.

With more than a decade of experience under restructuring, William & Mary has identified at least five key areas where additional flexibility would improve business operations and benefit both the institution and the Commonwealth.

- 1. Procurement.** Many of the procurement practices included within the management agreements pre-dated the state's small purchase charge program, which has significantly influenced how and what William & Mary is purchasing. Similarly, performance standards and expectations around spending patterns and practices are still predicated on best practices in the late 1990s and early 2000s, and no longer reflect current practice. Since that time, higher education institutions have become more sophisticated in managing their procurement spend and in identifying opportunities for strategic sourcing. Revisiting the assumptions, standards, and authorizations established under restructuring would be beneficial to ensuring that higher education institutions' procurement operations keep pace with industry best practices and that scarce resources are managed effectively. In addition, expanding the authority for all institutions – including Richard Bland College and other Tier I institutions – to use VASCUPP (Virginia Association of College and University Procurement Personnel) contracts without additional approval from the Department of General Services (DGS) would create additional efficiencies for those institutions as well as within DGS.
- 2. Employee Compensation.** The flexibility provided to William & Mary and other Tier III institutions to provide salary increases with institutional funds has been essential to the university's success over the last decade. William & Mary would welcome added flexibility to offer employees additional benefits options, including allowing both operational and classified employees the ability to participate in the university's optional retirement plan.
- 3. Enrollment Management.** State policy requires the university to maintain its ratio of in-state and out-of-state undergraduate students at current levels. Although William & Mary remains committed to serving Virginia students, the university would welcome the opportunity, as exists in many states, to increase the number of out-of-state students it serves **while ensuring that the number of in-state students served remains at or above current levels.** The state's requirement to maintain the current ratio between in-state

and out-of-state students restricts the university's ability to manage its enrollment based on market demands and programmatic needs.

4. **Tuition Management.** Given fluctuations in state funding and declining growth in overall state support over the last decade, it is essential to William & Mary's financial health that the Board of Visitors maintains the ability to set tuition and fees for its students. The Board of Visitors is uniquely positioned to understand the institution's operational model, financial needs, and market position relative to peer institutions both within and outside of the Commonwealth.
5. **Carryforward of E&G Funds.** The university's ability to carry forward E&G funds from year to year is essential given the uncertainties of state funding and the volatility of higher education markets. Institutions must be able to manage funds prudently without fear of penalty if they spend less than budgeted in a given year. With that assurance, institutions can more effectively manage and establish reasonable reserves to ensure they remain financially solvent during economic downturns and do not have to seek additional state support or burden students with additional costs to cover those gaps. New language included under Section 4-1.05c of the Appropriation Act recognizes the importance of this issue as universities seek to improve institutional planning and cost predictability for students and their families.

WILLIAM & MARY
FY20 OPERATING AND CAPITAL BUDGET AMENDMENTS

William & Mary has received guidance from the Governor's Office and the Virginia Department of Planning and Budget (DPB) related to the submission of operating and capital budget amendments to the 2018-2020 Appropriation Act.

As described in his September 14, 2018 memo to state agency heads and presidents of Virginia's public colleges and universities, Clark Mercer, Chief of Staff, notes that operating budget amendments for new general fund support in the 2018-20 biennium should reflect the Governor's priorities, which include "...strengthening the foundation of our economy through improved...workforce development."

Given the Governor's focus on workforce development and William & Mary's existing strengths in data science and business analytics, the university plans to submit the following operating budget amendment as described below:

RECRUIT ADDITIONAL FACULTY TO SUPPORT THE EXPANSION OF PROGRAMS IN DATA SCIENCE AND RELATED ANALYTICS FIELDS

Proposed Request:

<u>FY19</u>	<u>FY20</u>
\$ 0 GF	\$950,000 GF
0.0 FTE	5.0 FTE

The current Data Science Program at William & Mary provides students with the ability to minor in Data Sciences or to develop a self-designed interdisciplinary major with a focus in the area. Since its inception in Fall 2017, the Data Science Program has already seen significant success with 19 declared minors, and an additional 50 students have declared a self-designed major in Data Science or expressed an interest in doing so. Courses offered in the Data Science program are in high demand with all courses either filled to maximum capacity or over-enrolled each semester. Total numbers of students enrolled in Data Science courses were 190, 291 and 251 in Fall 2017, Spring 2018 and Fall 2018 semesters, respectively.

Over the next decade, the demand for data scientists will outstrip supply as an increasing number of industries move to apply the discipline and rigor of data analytics to solve complex economic and social problems. Building on existing educational and research strength in Data Science and Business Analytics, this request will support the recruitment of 5 additional faculty, a strategic cohort of hires that will permit the development of a major in Data Science with supplemental course offerings and certifications to expand the integration of data science across multiple disciplines.

Similarly, for capital projects, guidance from the Governor’s Office indicated that preference would be given for projects that directly support the Governor’s priorities and “maximize the benefit of the taxpayer dollars by running a smart, efficient, and responsive government.”

The university continues to put forward a request to renovate the ground level of Swem Library to improve the use of currently outdated and inefficient space. With the benefit of additional thinking around the convergence of the future of work, learning, and service, the renovation of Swem Library will provide much needed space to advance the use of technology to enhance teaching and learning. A short summary of the request is provided as follows:

**IMPROVE: SWEM LIBRARY TO ESTABLISH A
CENTER FOR TEACHING EXCELLENCE & LEARNING INNOVATION**

\$10,715,000 GF

Renovate approximately 27,680 GSF on the ground level of Swem Library to develop a new Teaching and Learning hub that will catalyze innovative teaching across the university, building upon William & Mary’s rich tradition and dedication to exceptional teaching and transformative learning experiences. The new space will be programmed to foster peer-to-peer collaborations across disciplines, scale up best practices, and support faculty in utilizing traditional and next-generation digital resources for improving teaching, enhancing learning outcomes, and advancing scholarship in these areas. In addition, the Center will serve as a university-wide incubator for online learning.

WHEREAS the Board of Visitors recognizes the Commonwealth’s interest in supporting workforce development, particularly in the areas of data science and analytics, and

WHEREAS the university has clearly established core expertise in these areas with strong student demand for expanded programs, and

WHEREAS the Board of Visitors recognizes the importance of ensuring that its facilities are utilized efficiently, effectively, and in a manner that supports the development of leading edge technologies and the use of technology in education and workforce development,

NOW THEREFORE, BE IT RESOLVED, That the Board of Visitors approves the administration’s proposed operating and capital budget amendments

NOW THEREFORE, BE IT FURTHER RESOLVED, That the Board of Visitors approves annotating the revised Six-Year Plan for 2018-2024 to reflect these high priority items.

September 26-28, 2018

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WILLIAM & MARY
2018-2019 OPERATING BUDGET SUMMARY

	2015-16 Actual	2016-17 Actual	Original 2017-18 Budget	2017-18 Actual	Variance	Approved 2018-19 Budget
CASH CARRYFORWARD	\$ 1,183,697	\$ 2,187,926	\$ -	\$ 2,193,394	\$ 2,193,394	\$ -
REVENUE						
General Funds						
Educational/General	\$ 41,620,263	\$ 44,144,181	\$ 43,182,499	\$ 43,641,218	\$ 458,719	\$ 44,080,417
Student Aid	4,127,011	4,377,227	4,519,259	4,443,597	(75,662)	4,460,902
Sponsored Programs	75,000	75,000	75,000	79,206	4,206	75,000
Nongeneral Funds						
Educational/General	138,684,861	148,115,132	154,190,384	157,995,553	3,805,169	161,336,164
Student Aid	27,153,194	32,911,115	35,598,771	34,950,696	(648,075)	40,523,539
Auxiliary Enterprise	105,643,193	108,670,263	110,617,916	110,863,811	245,895	115,341,533
Sponsored Programs	29,473,616	30,419,417	31,650,000	28,853,189	(2,796,811)	32,050,000
Private Funds	15,131,292	14,810,062	14,780,091	14,318,999	(461,092)	14,547,707
Total Revenue	\$ 361,908,430	\$ 383,522,397	\$ 394,613,920	\$ 395,146,269	\$ 532,349	\$ 412,415,262
EXPENDITURES						
Instruction	\$ 102,849,035	\$ 103,149,101	\$ 114,091,579	\$ 113,578,941	\$ (512,638)	\$ 118,404,242
Research	1,740,212	1,559,781	1,645,646	2,041,980	396,334	1,883,004
Public Service	16,280	23,931	22,304	26,888	4,584	28,054
Academic Support	29,033,769	31,129,236	31,391,342	31,446,309	54,967	32,503,748
Student Services	8,651,646	9,651,503	9,284,674	9,611,561	326,887	10,026,699
Institutional Support	30,117,672	33,490,687	33,134,922	34,478,436	1,343,514	33,225,829
Plant Operations	17,405,243	19,833,110	19,757,622	20,244,726	487,104	19,722,460
Student Aid	35,880,902	41,657,750	44,892,214	46,989,648	2,097,434	51,166,491
Auxiliary Enterprise	102,652,730	103,182,240	106,831,305	108,263,262	1,431,957	111,586,438
Sponsored Programs	29,548,616	30,494,417	31,725,000	28,932,395	(2,792,605)	32,125,000
Total Expenditures	\$ 357,896,105	\$ 374,171,756	\$ 392,776,608	\$ 395,614,146	\$ 2,837,538	\$ 410,671,965

**William & Mary
Education and General
2018-2019 Operating Budget Summary***

	<u>2015-16 Actual</u>	<u>2016-17 Actual</u>	<u>Original 2017-18 Budget</u>	<u>2017-18 Actual</u>	<u>Variance</u>	<u>Approved 2018-19 Budget</u>
CASH CARRYFORWARD	\$1,183,697	\$2,187,926	\$0	\$2,193,394	\$2,193,394	\$0
REVENUE:						
General Funds	\$41,620,263	\$44,144,181	\$43,182,499	\$43,641,218	\$458,719	\$44,080,417
Nongeneral Funds	138,684,861	148,115,132	154,190,384	157,995,553	3,805,169	161,336,164
Total Revenue	\$180,305,124	\$192,259,313	\$197,372,883	\$201,636,771	\$4,263,888	\$205,416,581
AVAILABLE FUNDS	\$181,488,821	\$194,447,239	\$197,372,883	\$203,830,165	\$6,457,282	\$205,416,581
EXPENDITURES:						
Instruction	\$101,054,820	\$101,650,630	\$112,872,320	\$112,321,749	(\$550,571)	\$117,315,735
Research	1,027,484	1,014,469	1,009,170	1,448,933	439,763	1,302,405
Public Service	10,198	8,031	8,021	6,597	(1,424)	8,021
Academic Support	27,937,440	30,028,551	30,297,231	30,556,368	259,137	31,236,244
Student Services	8,398,364	9,064,956	8,974,583	9,348,582	373,999	9,378,972
Institutional Support	23,908,092	28,092,532	24,686,554	26,571,999	1,885,445	26,911,426
Plant Operations	17,288,402	19,472,393	19,525,004	19,991,152	466,148	19,263,778
Total Expenditures	\$179,624,800	\$189,331,562	\$197,372,883	\$200,245,380	\$2,872,497	\$205,416,581

**The College of William and Mary
Student Financial Assistance**
2018-2019 Operating Budget Summary**

	<u>2015-16 Actual</u>	<u>2016-17 Actual</u>	<u>Original 2017-18 Budget</u>	<u>2017-18 Actual</u>	<u>Variance</u>	<u>Approved 2018-19 Budget</u>
REVENUE:						
General Funds	\$4,127,011	\$4,377,227	\$4,519,258	\$4,443,597	(\$75,661)	\$4,460,902
Nongeneral Funds	27,153,194	32,911,115	35,598,771	34,950,696	(648,075)	40,523,539
Auxiliary Enterprises	899,500	900,000	900,000	2,987,605	2,087,605	900,000
Total Revenue	\$32,179,705	\$38,188,342	\$41,018,029	\$42,381,898	\$1,363,869	\$45,884,441
EXPENDITURES:						
General Funds	\$32,179,705	\$38,188,342	\$41,018,029	\$42,381,898	\$1,363,869	\$45,884,441

* Excludes required transfers to the state

** Excludes student financial assistance support included in Board of Visitors private fund budget.

**William & Mary
Education and General
2018-2019 Operating Budget Summary**

	2015-2016 Actual	2016-2017 Actual	Original 2017-2018 Budget	2017-2018 Actual	Variance	Approved 2018-2019 Budget
CASH CARRYFORWARD	\$1,183,697	\$2,187,926	\$0	\$2,193,394	\$2,193,394	\$0
REVENUE						
General Funds	\$41,620,263	\$44,144,181	\$43,182,499	\$43,641,218	\$458,719	\$44,080,417
Nongeneral Funds	138,684,861	148,115,132	\$154,190,384	157,995,553	3,805,169	161,336,164
TOTAL REVENUE	\$180,305,124	\$192,259,313	\$197,372,883	\$201,636,771	\$4,263,888	\$205,416,581
AVAILABLE FUNDS	\$181,488,821	\$194,447,239	\$197,372,883	\$203,830,165	\$6,457,282	\$205,416,581
EXPENDITURES						
Instruction						
Personal Services	\$93,808,266	\$94,982,255	\$104,434,596	\$105,140,835	\$706,239	\$109,690,212
Non-Personal Services	7,246,554	6,668,375	8,437,724	7,180,914	(1,256,810)	7,625,523
TOTAL	\$101,054,820	\$101,650,630	\$112,872,320	\$112,321,749	(\$550,571)	\$117,315,735
Research						
Personal Services	\$966,445	\$977,537	\$936,272	\$1,361,957	\$425,685	\$1,225,275
Non-Personal Services	61,039	36,932	72,898	86,976	14,078	77,130
TOTAL	\$1,027,484	\$1,014,469	\$1,009,170	\$1,448,933	\$439,763	\$1,302,405

	2015-2016 <u>Actual</u>	2016-2017 <u>Actual</u>	Original 2017-2018 <u>Budget</u>	2017-2018 <u>Actual</u>	Variance	2018-2019 <u>Budget</u>
<u>Public Service</u>						
Personal Services	\$0	\$0	\$760	\$0	(\$760)	\$0
Non-Personal Services	10,198	8,031	7,261	6,597	(664)	8,021
TOTAL	\$10,198	\$8,031	\$8,021	\$6,597	(\$1,424)	\$8,021
<u>Academic Support</u>						
LIBRARIES:						
Personal Services	\$5,950,961	\$6,076,448	\$6,535,431	\$5,982,540	(\$552,891)	\$6,763,879
Non-Personal Services	4,914,637	5,333,158	5,085,528	4,933,281	(152,247)	4,840,354
TOTAL	\$10,865,598	\$11,409,606	\$11,620,959	\$10,915,821	(\$705,138)	\$11,604,233
OTHER ACAD. SUPPORT:						
Personal Services	\$14,182,840	\$14,771,666	\$15,107,366	\$16,140,103	\$1,032,737	\$16,653,110
Non-Personal Services	2,889,002	3,847,279	3,568,906	3,500,444	(68,462)	2,978,901
TOTAL	\$17,071,842	\$18,618,945	\$18,676,272	\$19,640,547	\$964,275	\$19,632,011
TOTAL ACADEMIC SUPPORT	\$27,937,440	\$30,028,551	\$30,297,231	\$30,556,368	\$259,137	\$31,236,244

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	2015-2016 <u>Actual</u>	2016-2017 <u>Actual</u>	Original 2017-2018 <u>Budget</u>	2017-2018 <u>Actual</u>	<u>Variance</u>	Approved 2018-2019 <u>Budget</u>
Student Services						
Personal Services	\$6,854,529	\$7,523,322	\$7,769,955	\$7,736,847	(\$33,108)	\$8,364,395
Non-Personal Services	1,543,835	1,541,634	1,204,628	1,611,735	407,107	1,014,577
TOTAL	\$8,398,364	\$9,064,956	\$8,974,583	\$9,348,582	\$373,999	\$9,378,972
Institutional Support						
Personal Services	\$19,495,463	\$21,722,030	\$20,160,393	\$20,391,388	\$230,995	\$20,721,798
Non-Personal Services	4,412,629	6,370,502	4,526,161	6,180,611	1,654,450	6,189,628
TOTAL	\$23,908,092	\$28,092,532	\$24,686,554	\$26,571,999	\$1,885,445	\$26,911,426
Plant Operations						
Personal Services	\$1,528,765	\$2,368,906	\$6,642,509	\$2,289,470	(\$4,353,039)	\$2,311,046
Non-Personal Services	15,759,637	17,103,487	12,882,495	17,701,682	4,819,187	16,952,732
TOTAL	\$17,288,402	\$19,472,393	\$19,525,004	\$19,991,152	\$466,148	\$19,263,778
E&G PROGRAM TOTAL	\$179,624,800	\$189,331,562	\$197,372,883	\$200,245,380	\$2,872,497	\$205,416,581

William & Mary
Auxiliary Enterprise
2018-2019 Operating Budget Summary

	2015-2016 <u>Actual</u>	2016-2017 <u>Actual</u>	Original 2017-2018 <u>Budget</u>	2017-2018 <u>Actual</u>	Variance	Approved 2018-2019 <u>Budget</u>
REVENUE						
Student Housing	\$32,932,608	\$33,163,843	\$33,929,952	\$33,565,069	\$ (364,883)	\$35,660,486
Food Service	21,129,517	22,397,220	22,097,500	22,969,332	871,832	22,870,000
Telecom/Network	3,627,660	3,531,857	3,754,475	3,709,789	(44,686)	3,769,748
Student Unions	3,073,557	3,161,410	3,138,200	3,237,348	99,148	3,198,550
Kaplan Arena	2,492,762	2,567,343	2,765,484	2,815,854	50,370	2,780,250
Athletics	24,485,028	26,026,771	26,729,433	27,203,961	474,528	28,134,777
Other	<u>17,902,061</u>	<u>17,821,819</u>	<u>18,202,872</u>	<u>17,362,458</u>	<u>(840,414)</u>	<u>18,927,722</u>
Total Revenue	\$105,643,193	\$108,670,263	\$110,617,916	\$110,863,811	\$245,895	\$115,341,533
EXPENDITURES						
Student Housing	\$31,525,355	\$31,497,226	\$33,929,952	\$33,569,512	(\$360,440)	\$35,546,236
Food Service	19,048,208	19,416,869	19,513,008	19,842,296	329,288	20,032,937
Telecom/Network	3,388,905	3,424,804	3,754,475	3,799,779	45,304	3,769,748
Student Unions	3,245,936	3,272,053	3,131,032	3,566,572	435,540	3,183,403
Kaplan Arena	2,369,203	2,535,190	2,765,484	2,363,290	(402,194)	2,780,250
Athletics	24,853,182	25,819,672	26,729,433	27,294,227	564,794	28,134,033
Other	<u>18,221,941</u>	<u>17,216,426</u>	<u>17,007,921</u>	<u>17,827,586</u>	<u>819,665</u>	<u>18,139,831</u>
Total Expenditures	\$102,652,730	\$103,182,240	\$106,831,305	\$108,263,262	\$1,431,957.00	\$111,586,438

College of William & Mary
Sponsored Programs
2018-2019 Operating Budget Summary

	2015-2016 <u>Actual</u>	2016-2017 <u>Actual</u>	Original 2017-2018 <u>Budget</u>	2017-2018 <u>Actual</u>	Variance	Approved 2018-2019 <u>Budget</u>
REVENUE						
General Fund	\$75,000	\$75,000	\$75,000	\$79,206	\$4,206	\$75,000
Nongeneral Fund	<u>29,473,616</u>	<u>30,419,417</u>	<u>31,650,000</u>	<u>28,853,189</u>	<u>(2,796,811)</u>	<u>32,050,000</u>
Total Revenue	\$29,548,616	\$30,494,417	\$31,725,000	\$ 28,932,395	(\$2,792,605)	\$32,125,000
EXPENDITURES						
	\$29,548,616	\$30,494,417	\$ 31,725,000	\$28,932,395	(\$2,792,605)	\$32,125,000

**THE COLLEGE OF WILLIAM & MARY
PRIVATE FUNDS BUDGET SUMMARY**

	2015-2016 Actual	2016-2017 Actual	Original 2017-2018 Budget	2017-2018 Actual	Variance	2018-2019 Approved Budget
REVENUE:						
Distributed Endowment Income	\$3,266,397	\$3,369,985	\$3,354,091	\$3,354,091	\$0	\$3,794,707
Administrative Overhead Allocation	300,000	300,000	300,000	300,000	0	300,000
Transfers from Other Sources	382,011	337,774	340,000	209,287	(130,713)	190,000
Earnings on Short-term Investments	320,921	347,099	320,000	760,273	440,273	450,000
Annual Gifts	8,523,859	9,241,402	9,400,000	7,404,184	(1,995,816)	8,900,000
Drawdown from BOV Quasi Endowment	1,350,000	500,000	500,000	500,000	0	500,000
Distribution from External Trusts	57,886	58,510	46,000	52,648	6,648	53,000
Proceeds on Sale of Land Parcel	0	0	0	771,072	771,072	0
Other Revenue	930,218	655,292	520,000	967,444	447,444	360,000
Revenue Reimbursements from CWMF	0	0	0	2,462,706	2,462,706	0
Total Revenue	\$15,131,292	\$14,810,062	\$14,780,091	\$16,781,705	\$2,001,614	\$14,547,707
EXPENDITURES:						
Instruction	\$1,794,215	\$1,498,472	\$1,219,259	\$1,257,192	(\$37,933)	\$1,088,507
Research	712,728	545,312	636,476	593,047	43,429	580,599
Public Service	6,082	15,900	14,283	20,291	(6,008)	20,033
Academic Support	1,096,330	1,100,685	1,094,111	889,941	204,170	1,267,504
Student Services	253,282	586,547	310,091	262,979	47,112	647,727
Institutional Support	6,209,580	5,398,155	8,448,368	7,906,437	541,931	6,314,403
Plant: Operations & Capital Improvements	116,841	360,717	232,618	253,574	(20,956)	458,682
Student Aid	3,701,197	3,469,408	3,874,185	4,607,750	(733,565)	5,282,050
Expenses supported by CWMF	0	0	0	2,462,706	(2,462,706)	0
Total Expenditures	\$13,890,255	\$12,975,196	\$15,829,391	\$18,253,917	(\$2,424,526)	\$15,659,505

* Proceeds on sale of land adjacent to Applied Research and Jefferson Lab

** Higher actual expenditures than original estimate in Undergraduate Scholarships

*** Various CWMF program expenditures paid by the College using local funds which were subsequently reimbursed by the Foundation

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**WILLIAM & MARY
STATEMENT OF ENDOWMENT FUNDS
June 30, 2018**

	MARKET VALUE	MARKET VALUE
	June 30, 2018	June 30, 2017
TRUE AND QUASI ENDOWMENT		
BOARD OF VISITORS:		
General Pool	\$84,783,698	\$81,525,787
Green Portfolio	601,034	516,834
Non-Pooled Assets	5,841,768	6,164,513
TOTAL BOARD OF VISITORS	<u>\$91,226,500</u>	<u>\$88,207,134</u>
COLLEGE OF WILLIAM & MARY FOUNDATION:		
Pooled Investments	\$436,146,255	\$396,597,548
Eminent Scholars	82,837,801	79,256,890
VA Assistance Program	50,597,192	47,593,474
Non-Pooled Assets	151,616,411	153,040,058
TOTAL COLLEGE OF W & M FOUNDATION	<u>\$721,197,659</u>	<u>\$676,487,970</u>
MARSHALL-WYTHE SCHOOL OF LAW FOUNDATION:		
General Pool	\$25,861,775	\$20,247,637
Eminent Scholars	13,803,881	12,919,783
VA Assistance Program	5,408,815	4,830,050
TOTAL M W SCHOOL OF LAW FOUNDATION	<u>\$45,074,471</u>	<u>\$37,997,470</u>
WILLIAM & MARY BUSINESS SCHOOL FOUNDATION:		
Pooled Investment	\$45,099,639	\$41,340,105
Other	2,352,115	1,788,423
TOTAL W&M BUSINESS SCHOOL FOUNDATION	<u>\$47,451,754</u>	<u>\$43,128,528</u>
VIRGINIA INSTITUTE OF MARINE SCIENCE FOUNDATION	<u>\$15,086,351</u>	<u>\$13,740,461</u>
MURRAY 1693 SCHOLARS FOUNDATION	<u>\$13,739,216</u>	<u>\$12,800,832</u>
MUSCARELLE MUSEUM OF ART FOUNDATION	<u>\$452,680</u>	<u>\$454,540</u>
OTHER SUPPORTING FOUNDATIONS	<u>\$1,315,041</u>	<u>\$1,263,757</u>
TOTAL TRUE AND QUASI ENDOWMENT	<u>\$935,543,672</u>	<u>\$874,080,692</u>

**STATEMENT OF ENDOWMENT FUNDS
NON-POOLED ENDOWMENT CORPUS AND
OTHER SUPPORTING FOUNDATIONS**

	BOV	CWMF	OTHER	6/30/18 TOTAL	6/30/17 TOTAL
SPECIFIC SECURITIES:					
Coin Collection (Payne)	280	0	0	280	280
EXTERNAL TRUSTS/FOUNDATION & OTHER NON-POOLED INVESTMENTS:					
Dorman Trust	0	446,154	0	446,154	421,813
Lettie Pate Evans Foundation	0	144,260,787	0	144,260,787	145,339,093
Schepmoes Trust	0	3,996,011	0	3,996,011	3,924,638
Dorman - Wren Preservation Acct.	0	844,027	0	844,027	768,238
Sumner Rand Foundation	0	0	1,315,041	1,315,041	1,263,757
REAL ESTATE:					
Student, Faculty and Administrative Buildings	549,009	10,612 *	0	559,621	885,272
Land	5,276,097	95,300	0	5,371,397	5,380,397
Life Tenancy	0	408,000	0	408,000	408,000
CWM Real Estate Foundation	0	1,350,000	0	1,350,000	1,350,000
MISC. GIFT RECEIVABLES:					
Year-end Cash Receivables	16,382	205,520	0	221,902	726,840
TOTALS	<u>\$5,841,768</u>	<u>\$151,616,411</u>	<u>\$1,315,041</u>	<u>\$158,773,220</u>	<u>\$160,468,328</u>

*Carrying value less accumulated depreciation

WILLIAM & MARY
CORPORATE RESOLUTION TO TRANSACT BUSINESS AND CONFIRM
AUTHORIZED BUSINESS AGENTS FOR THE COLLEGE OF WILLIAM & MARY

The *Bylaws* of the Board of Visitors of The College of William & Mary in Virginia clarify the power of certain officers of the College to transact business in the name of the University. At the September 28, 2018 meeting, the *Bylaws* were revised.

Article X, Section B.2. of the revised *Bylaws* states:

Concurrently with the President, the Senior Vice President for Finance and Administration has the authority to transact business in the name of the University, including: (1) the transfer, conversion, endorsement, sale, purchase, assignment, conveyance and delivery of any and all shares of stocks, bonds, debentures, notes, and subscriptions warrants, cash or equivalent assets, and evidence of indebtedness; (2) any and all contracts for the purchase of real estate and other property, or other securities or assets now or hereafter owned by the Board, or bearing any similar designation indicating ownership by the University; (3) agreements setting forth the terms for the acceptance of gifts to the University; (4) any and all contracts for the purchase or rental of professional services, supplies and equipment, including software and hardware; the design and construction of facilities; non-disclosure and confidentiality agreements; real estate and property leases or rental agreements; capital leases; acquisition or conveyance of any other type of property interest, including easements; equipment leases or fixed asset rental agreements; use of University facilities; and (5) any other agreements necessary to carry out and support the operations of the University, with the exception of those particular assignments made to the Provost. The sale of real property requires the approval of the Board and the Commonwealth of Virginia. The Senior Vice President for Finance and Administration has the authority to further delegate such authority; such delegation must be consistent with applicable law and regulations, and subject to guidelines for the exercise thereof.

BE IT RESOLVED, That the following statement of certification will accompany this resolution, requiring signature by the Secretary of the Board of Visitors attesting to its validity and correctness:

I, _____, Secretary of the Board of Visitors of The College of William & Mary in Virginia, do hereby certify that the foregoing is a true and correct copy of the Resolution approved by the Board of Visitors of said College at a duly constituted meeting held in the City of Williamsburg, Virginia, on the 28th day of September, 2018, at which a quorum was present and acting throughout, and that said resolution appears in the minutes of said meeting, and that the same has not been rescinded or modified and is now in full force and effect. I further certify that said organization is duly organized and existing, and has the power to take the action called for by the foregoing resolution. I further certify that Katherine A. Rowe is President and Samuel E. Jones is Senior Vice President for Finance and Administration of The College of William & Mary in Virginia.

Given under my hand and official seal of The College of William & Mary in Virginia on the ____ day of _____.

_____, Secretary

VIRGINIA INSTITUTE OF MARINE SCIENCE
SIX-YEAR PLAN UPDATE

WHEREAS, in response to the Commonwealth's direction that the Virginia Institute of Marine Science (VIMS) prepare a separate Six-Year Plan from the College of William & Mary; and

WHEREAS, consistent with the requirements of the Higher Education Opportunity Act of 2011 (the Act), VIMS developed its 2018-20 Six-Year Plan rooted in the goals set out in its Strategic Plan and the objectives of the Act; and

WHEREAS, this Six-Year Plan was approved by the Board of Visitors of the College of William and Mary in September 2017; and

WHEREAS, the Commonwealth's planning process requires an update to the Six-Year Plan on an annual basis, incorporating funding actions by the Commonwealth as reflected in the FY18 budget approved by each institution's Board of Visitors; and

WHEREAS, VIMS has identified those expenditures necessary to support its research, education, advisory service, and administrative operations, has prioritized those expenditures, and has recommended funding through primarily Commonwealth revenue;

THEREFORE, BE IT RESOLVED, that upon recommendation of the Dean and Director of VIMS and the President of the College, the Board of Visitors of the College of William & Mary approves VIMS' Six-Year Plan Update as outlined in the subsequent pages.

VIRGINIA INSTITUTE OF MARINE SCIENCE

2017 SIX-YEAR PLAN NARRATIVE**2018 Updates** (*italicized*)**A. INSTITUTIONAL MISSION**

The **Mission** of the Virginia Institute of Marine Science is to seek and broadly communicate knowledge in marine and coastal science to the Commonwealth of Virginia and the nation through research, education, and advisory service.

As a nationally and internationally recognized premier marine science institute, our overarching goals in the **VIMS Vision** are to (1) make seminal advances in understanding marine and coastal systems through research and discovery, (2) translate research findings into practical solutions to complex issues of societal importance, and (3) provide new generations of researchers, educators, problem solvers, and managers with a marine-science education of unsurpassed quality.

B. STRATEGIES

Increase Graduate Financial Aid. As one of the top producers of marine science graduate-level degrees in the nation, the William & Mary School of Marine Science at VIMS has awarded over 1,000 degrees since VIMS was founded over 75 years ago. Our graduate students provide essential capacity in support of VIMS research programs and advisory services mandated in the *Code of Virginia*. Our alumni successfully compete for jobs in academia, federal and state agencies, K-12 education, non-profits, and marine-related businesses within the private sector. Many have gone on to become leaders in areas such as aquaculture, fisheries management, storm surge modeling, water quality research, and environmental management and restoration approaches for coastal and estuarine environments. Despite the quality and success of the program, we are increasingly concerned that the high cost to our faculty of supporting research-focused graduate students is putting VIMS at a competitive disadvantage and limiting program enrollment below capacity. Increased state graduate financial aid of \$425,000 is vital to program stability and for increasing the competitiveness of VIMS' faculty in winning external grants and contracts by providing matching funds (also known as cost share). We have prioritized this request in order to reflect the very high value of the graduate program to VIMS, the Commonwealth, and the nation.

VIMS faces a challenge unknown at most of our peer institutions in Virginia and across the nation. Without an undergraduate marine science major, William & Mary is unable to provide the needed graduate student support that typically comes from teaching assistantships. This significantly disadvantages our institution relative to most of our peers that have greater need, and thus more opportunities, to engage graduate students in assisting with undergraduate courses. We also do not have the significant endowments of our peer private institutions. Therefore, the bulk of the financial aid provided to SMS students must be derived from competitive external grants and contracts to faculty. VIMS faculty currently provide more than \$2 of non-general funding from external grants and contracts for every \$1 of general funds used to provide tuition and assistantship support to graduate students. While the faculty will

continue to aggressively pursue competitive federal, state, and private grants and contracts to assist in meeting student financial needs, traditional fund sources are virtually saturated, and in many instances, are being reduced. The funding requested is sufficient to cover one year of tuition for an incoming class of 25 students. During this first year, students carry a heavy course load and are unable to contribute to grant-funded research in a meaningful way, and as such, faculty cannot justify expending grant funds on student financial aid. Without Virginia's financial commitment, VIMS will also be far less competitive for recruiting and retaining top-tier faculty who are attracted to VIMS, in part, because of the opportunity to work with talented graduate students.

Increase Base Operating Support. *This strategy has now been met. The General Assembly in their 2018 session provided VIMS with \$625,000 in each year of the biennium for operations and maintenance of new facilities coming online.*

Increase Base Operating Support. This request supports much needed core base operating funds at the Institute given that the normal formulas the state uses to assess and supply base operating support to higher education institutions do not readily apply to VIMS and, thus, disadvantages the Institute. Specifically this request includes vital support for 1) service contracts for high tech scientific equipment purchased through the Equipment Trust Fund, 2) inflationary increases in general operating expenses, and 3) support for personnel services in support units.

Utilize Advanced Modeling and Assessment Technologies for Chesapeake Bay Water Quality Improvement. *This strategy has now been met. The General Assembly in their 2018 session provided VIMS with \$893,753, starting in FY 2020, for water quality improvement work. The funding includes \$406,075 for on-going support, \$84,678 for debt service costs under the Master Equipment Leasing Program (MELP) associated with the modeling and assessment technologies, and \$403,000 for development of the State of the Elizabeth River Scorecard for pollution levels in the Elizabeth River.*

Utilize Advanced Modeling and Assessment Technologies for Chesapeake Bay Water Quality Improvement. The need to assess and verify the effectiveness of public fund expenditures to restore water quality in Chesapeake Bay is critically important. Historically, the Commonwealth was largely dependent upon the EPA Chesapeake Bay Program model and monitoring data to assess progress towards meeting Bay water quality goals. In recent years VIMS, in collaboration with DEQ, has employed more advanced water quality modeling and assessment technologies in Virginia's tributaries to support efforts by the state and local governments to meet water quality goals. The EPA has now recognized the value of the higher spatial and temporal resolution provided by these technologies and has indicated their willingness to allow states to adopt a more focused approach towards meeting and assessing water quality goals, potentially resulting in significant savings to local governments and the state. VIMS is uniquely positioned with its expertise, state-of-the-art modeling capabilities, advanced assessment technologies and mandated role as the scientific advisor to the Commonwealth on marine and coastal natural resource issues to provide this critical need. The

proposed program would build on these strengths to further develop and utilize models that more accurately represent conditions in Virginia waters and to couple these models with real-time water quality data to provide a comprehensive, high-resolution view of water quality that far exceeds the spatial extent, temporal coverage, and accuracy of the current monitoring program. Such information would furnish decision makers with the information necessary to make more informed decisions related to Bay restoration and TMDL (Total Maximum Daily Load) implementation.

Advanced water quality assessment can be most effectively achieved with a Commonwealth Chesapeake Bay Observing System comprised of a network of buoys that can remotely obtain water quality data and transmit it to a central location for analysis. This system would expand and integrate VIMS' current technologies to produce a unified, state-of-the-art system. The system would integrate water quality and weather to allow for near real-time responses in support of environmental management with public health and economic consequences, such as harmful algal blooms and fishery impacts, as well as statewide tidal water quality assessments. As an example, Virginia's rapidly growing oyster aquaculture industry would benefit greatly from an advanced water quality assessment and early warnings of harmful algal blooms.

Monitor Bay Grasses. Submerged bay grasses are a critical living resource in Chesapeake Bay that supports valuable fish and crab resources. Because bay grasses are dependent on good water quality they are being used as key indicators of water quality improvement in Chesapeake Bay by the Virginia Department of Environmental Quality. VIMS has conducted a bay-wide annual survey of bay grasses since 1987, with considerable support from EPA, NOAA and the state of Maryland. That support has declined in recent years as costs have risen. We are seeking to establish a stable funding base for maintaining the Virginia portion of this valuable survey.

The results of the annual survey are important to the Commonwealth for a number of reasons. (1) Bay grass acreage is embodied in Virginia's water quality standards; (2) the Virginia Secretary of Natural Resources must report annually to various Virginia House and Senate Committees on the status of bay grass abundance from the annual surveys (*Code of Virginia* §2.2-220); (3) bay grass acreage is an important component the blue crab fisheries management plan (*Code of Virginia* §28.2-203.1); (4) bay grass survey maps are used by the Virginia Marine Resources Commission in evaluating aquaculture lease applications; and (5) bay grass acreage is used as a metric for attainment of the restoration goals established by the Chesapeake Bay Program and its partners, including the Commonwealth of Virginia.

VIMS is uniquely qualified to provide this service, not only because of its experience in conducting the surveys, but because it has pioneered restoration techniques for bay grasses that are now used worldwide and is widely recognized for its scientific leadership in bay grass restoration.

Enhance Chesapeake Bay Environmental Technology. Natural economic benefits derived from the Chesapeake Bay are estimated to be valued at more than \$100 billion annually, with the Bay supporting many economically important fisheries, including blue crabs, striped bass, and oysters. The Bay waters also enhance coastal property values and support a vital tourist economy, including nature-based recreation industries. However, urbanization and increased fertilizer usage have led to excessive nutrient inputs entering the Bay, negatively affecting the health of the Bay ecosystem and the economic services it provides. For those economically invested in the Chesapeake Bay, there is an urgent need to implement the latest technology-based solutions to address major current and future environmental challenges, including: (1) hypoxia [“dead zones”], (2) water clarity, (3) acidification, and (4) Harmful Algae Blooms [HABs] and pathogens. These challenges facing the Bay are becoming increasingly critical each year, as temperatures rise, storms become more intense, and atmospheric carbon dioxide levels rise.

Fortunately, new technologies are making it feasible to use real-time data to produce short-term spatially extensive forecasts of hypoxia, water clarity, acidification metrics, and harmful algal blooms, resulting in improved decision support products for commercial and recreational anglers, watermen, beach managers, public health agencies, oyster hatcheries, and other shellfish growers. Addressing these Bay-wide challenges through forecasted information requires effective collaboration among business, education and government, and is only possible because of new technological advances in real-time data collection systems. Here we propose to leverage existing VIMS expertise in a novel *Chesapeake Bay Environmental Technology Initiative*, which will include: implementing state-of-the-art models that can ingest real-time Bay data, sensors that can collect and transmit data in real-time to improve forecast accuracy, and a new, targeted mobile platform that will improve stakeholder accessibility of this information. By promoting collaborative technological innovation among researchers, educators, entrepreneurs and government, this proposed initiative addresses multiple policy priorities of *GO Virginia*, including *Innovation, Invention, Improvement and Infrastructure*. In addition, information garnered from this initiative will address Governor McAuliffe’s policy priorities by allowing VIMS researchers to better understand how to “protect and improve the health of the Chesapeake Bay”, and better “prepare the Commonwealth for the effects of climate change”.

Boost Marine Aquaculture and Fisheries Health. Virginia is one of the nation’s leaders in the aquaculture production of bivalves, particularly oysters and clams. Improvements in disease resistance, genetics, and management have led to major advances in shellfish production in the state. Yet, outbreaks of disease continue to damage economically important and ecologically sensitive marine resources in the Commonwealth and nation. Examples of these diseases include dermo and MSX in oysters, *Hematodinium* in blue crabs, mycobacteriosis in striped bass, morbillivirus in dolphins, and wasting disease in sea stars, to name just a few.

The pathogens responsible for these outbreaks often are not well known, their risks to marine life and risk of spread remain understudied, and their full ecological impacts have been difficult

to assess. To meet the challenge of conserving and improving aquaculture and fisheries industries, we propose an initiative to provide science-based guidance on the development of improved techniques in aquaculture and disease management.

VIMS scientists have considerable expertise working with diseases of marine animals. We aim to leverage this expertise by augmenting training in aquaculture, identifying and liaising with key industry groups, serving as a clearinghouse for information to policy makers, establishing state and regional response protocols against diseases, and developing tools to enhance aquaculture production by mitigating the effects of disease outbreaks in our marine resources. Our goal is to build on existing and emerging aquaculture programs to augment fishery and aquaculture resources in the Commonwealth and Chesapeake Bay region.

Specifically, VIMS will:

- Enhance public outreach in aquaculture, environmental health, and marine animal health;
- Provide additional pathology services for industry and regulators;
- Establish surveillance protocols to facilitate identification, assessment, and prediction of emerging pathogens;
- Develop modeling tools to quantify epidemiological and ecological impacts of disease;
- Implement Response Planning Workshops to mitigate diseases in natural and cultured marine resources;
- Enhance technology transfer and training with the aquaculture industry; and
- Establish regular reporting to the VMRC and other agencies on status of new developments.

These objectives will build on VIMS' strengths in aquaculture and environmental sciences to provide cutting-edge science in support of efforts by resource managers, public health officials and industry to manage around marine diseases. Specific examples follow.

1. Shellfish aquaculture is a rapidly expanding economic sector that relies heavily on certification that seed shipped regionally and nationally is pathogen-free. We work closely with industry in this certification process, but the optimization and validation of newer molecular protocols is needed for rapid assessments, surveillance, and quality assurance. New advances in technology such as genetic manipulation, sample processing and automation, and sensor development will greatly facilitate this work.
2. Blue crab stocks fluctuate markedly due to fishing, predation, poor settlement, and disease; yet the latter (disease) remains understudied, even though several pathogens damage juvenile crabs in seasonal outbreaks.
3. Striped bass are susceptible to mycobacterial infections that show strong associations with increasing water temperature. The impact on fish populations has been difficult to quantify, but new modeling estimates indicate a significant increase in mortality due to this pathogen. The increased mortality from disease must now be factored into stock assessments and management plans for crabs and striped bass.

This strategy will provide guidance on the management and mitigation of existing and emerging disease threats to vital fishery and aquaculture resources in the Commonwealth and Chesapeake Bay region. The health of our marine resources is fundamental to the growth of local industries and to the revitalization of coastal communities that dependent upon them.

Establish a Molecular Core Facility. Rapidly advancing technology has led to a revolution in the realm of molecular biology and genomics, giving scientists much greater power to address complex problems in marine and estuarine systems. This revolution offers the opportunity for VIMS to improve its capabilities in fulfilling its advisory mission to the Commonwealth in the areas of fisheries and aquaculture, environmental health, and coastal ecology. Extremely large amounts of data can be generated in a relatively short period of time using this technology, offering unparalleled opportunities to create more sustainable environments, bolster regional economies, and protect human health.

Currently, VIMS researchers in within three different departments use molecular approaches to address important research questions related to resource management and public health issues in Virginia, including fisheries and aquaculture management, harmful algae blooms, and shellfish health and safety. Key pieces of heavily used shared equipment are scattered across campus and are rapidly becoming outdated. VIMS' ability to accommodate this research, which requires massively high-throughput sequencing, digital PCR, transcriptomics and single cell genomics, is limited by the absence of a centralized facility with support. *Now is the time for VIMS to establish a consolidated Marine and Aquaculture Molecular Core Facility.*

We are seeking to upgrade critical instruments and to add technical expertise in advanced bioinformatics analyses, and dedicated technical staff to operate and coordinate the use of specialized equipment, and to advise researchers on appropriate strategies and approaches to answer their research questions. Almost all top-tier marine research institutions, including Woods Hole Oceanographic Institute, Scripps Institution of Oceanography, Rosenstiel School at University of Miami, University of Rhode Island, University of Washington, and others, support these types of core facilities with state of the art equipment and technical expertise. VIMS needs this facility to remain competitive in the 21st Century and to provide the Commonwealth with state-of-the-art, science-based advice.

This initiative requests funds to consolidate, and update where necessary, existing equipment, thereby expanding VIMS' capacity for high-throughput sequencing, and staffing the facility with a technician and bioinformatician. Over the past five years, VIMS has leveraged its existing molecular genetics capabilities for over \$5 million dollars in extramural research funds. Enhancing our capabilities further would expand our capacity to leverage even more extramural money in support of our research, education and advisory missions.

Develop an Oyster Biosecurity Plan. The majority of cultivated oysters in the mid-Atlantic and increasing numbers elsewhere are triploid; that is, they contain an extra set of chromosomes rendering them sterile. In Virginia, triploid oysters account for approximately

90% of the oyster aquaculture production. These triploids are made by crossing tetraploid oysters, those that contain four sets of chromosomes, with diploid oysters, those that contain the normal two sets of chromosomes. VIMS is the major producer of tetraploid oysters, with other commercial companies currently developing the capacity for growing tetraploids also. While triploid oysters are reproductively sterile, tetraploids are fertile. Citing concerns about their reproductive capability, the state of South Carolina has recently taken steps to limit the deployment of tetraploid oysters in state waters. As the number of tetraploid oysters being held in Chesapeake Bay waters has increased, there is a critical need to evaluate the risks that these oysters may or may not pose to wild oyster stocks. The specific risk of concern is that, were a feral population of tetraploid oysters to become established in Virginia waters, tetraploid oysters might then be able to mate with native, wild diploid oysters resulting in some portion of the wild population being sterile triploids. VIMS' objective is to develop a biosecurity plan based on the scientific assessment of risks of holding tetraploid oysters in the Bay. We intend to assess the environmental concerns regarding the use and grow out of tetraploid oysters, for example, issues of health, reproduction, and population genetics, in order to inform a biosecurity plan. The ultimate goal is to assure that the use of these oysters in aquaculture is done in an environmentally responsible fashion and ultimately, make recommendations to the VMRC Commissioner for establishing guidelines for the use of tetraploid oysters in Virginia waters.

Accelerate Economic & Community Impacts from Coast & Marine Science and Technology. This proposed program leverages Virginia Sea Grant's (VASG) coastal community development funding (\$50,000 annually) and graduate research and workforce development fellowship program (\$40,000/year/fellow), VIMS' legacy services in economic impact analysis, Fisheries Resource Grant program and coastal and marine science and technologies, and partnerships with members of the VASG seven-university partnership (e.g., Virginia Tech Seafood Agriculture Research and Education Center and Office of Economic Development; William & Mary's Public Policy Program and Mason School of Business) to:

- Facilitate greater university-community and public-private partnerships that fast-track scientific discoveries and streamline the process of turning those discoveries into innovations that accelerate economic and community development in Virginia; and
- Meet pressing economic development analysis needs in coastal communities that inform local economic and community development decisions and planning.

This initiative contains three elements: 1) sector-specific Research & Development (R&D) plans; 2) collaborative public-private partnership-led graduate research and workforce development fellowships; and 3) economic impact analysis to support local and state economic and community development planning.

First, the program would establish partnerships with coastal and marine industries (e.g., aquaculture farms, hatcheries, seafood processors, coastal engineering and construction firms, marina, boat-building, etc.) and facilitate sector-specific R&D strategic plans to identify priority R&D needs that are currently limiting economic growth. Based upon the R&D

strategic plans, VASG, VIMS, and our academic partners will advance opportunities to seed-fund product and market development activities (e.g., NOAA Small Business Innovation Research, Virginia Research Investment Fund, Fisheries Resource Grant, Virginia's National Disaster Resilience Competition award). In collaboration with industry and academic partners, VASG would further leverage technical assistance from the Virginia Business Higher Education Council, GO Virginia, regional Economic Development Organizations, and other business incubators. For example, VASG has partnered on a grant with RISE, a non-profit organization establishing innovative resilience initiatives as part of the Virginia's HUD National Disaster Resilience Competition grant. RISE's mission is to test innovation and facilitate partnerships and collaboration in the resilience and coastal adaptation fields that lead to economic growth. RISE, in partnership with the global startup incubator 1776, will lead the Resilience Campus in Norfolk to enhance entrepreneurship skills and build highly scalable businesses. RISE has start-up seed funding available.

Second, new public-private partnerships will co-fund graduate research and workforce development fellowships working directly with the private sector and university advisors to advance coastal and marine science, innovations and new technologies. For example, VASG has partnered on grant proposals with five environmental engineering firms to co-fund graduate research fellows in resilience design and currently co-sponsors a summer resilience design fellow with Clark Nexsen, developing innovative flood and water management strategies, designs and technologies with market potential throughout Virginia, the nation and world. VASG is working with RISE to explore commercialization potential of these innovations.

Third, VASG and VIMS will provide economic impact analysis to local communities to inform economic and community development decisions and planning with the best available scientific information. These local and state community plans and policies are essential to enable commercialization from innovations. For example, VASG and VIMS are working closely with several new local and state-wide economic development programs, including GO Virginia, the Rural Coastal Virginia Community Enhancement Authority, and the Middle Peninsula Alliance Board.

Implement a post-graduate Commonwealth Coastal and Marine Fellowship program in collaboration with the Virginia Sea Grant (VASG) program that has been housed at VIMS since 2008. This proposed program would be modeled after the highly successful national Sea Grant Knauss Marine Policy Fellowship and similar state fellowship programs operated by state Sea Grant programs in Washington and California. The goal of the Commonwealth Coastal & Marine Policy Fellowship is to develop and support exceptional post-graduates by partnering them with an agency mentor where they receive on-the-job training, and hone their professional skills, while improving the stewardship of the Commonwealth's coastal and marine resources. The program increases the capacity of the host agencies by supporting fellows who are working on mission-relevant programs, and leveraging the knowledge and capacity of Virginia's academic institutions. The program enhances

retention of Virginia's best coastal and marine science graduates in careers within the Commonwealth.

Continue to operate as a year-round facility. As an independent state agency that is heavily involved in research and graduate education, VIMS also provides advisory service to the Commonwealth in the form of expert scientific advice on marine-related issues throughout Chesapeake Bay and the coastal ocean. All three of our missions, the graduate program, research and advisory programs, are heavily operational for the entire 12-month calendar year, and in fact, all of our faculty hold 12-month appointments. Field research is most active between April and October, but most other activities occur equally throughout the year. For example, throughout calendar year 2016, VIMS offered a total of 362 outreach programs reaching nearly 25,000 citizens. More than 50% of those programs were held on VIMS' main campus. These were in the form of campus tours, after hours lecture series, discovery labs, summer camps for children in grades 1-8, workshops, training programs, and more. VIMS always has been, and will continue to be, a year-round operation.

Virginia Research Investment Fund. VIMS submitted two Letters of Intent to the VRIF for consideration. The project summaries are as follows:

Expanding tetraploid technology for improved yields of oyster aquaculture in Chesapeake Bay

Virginia leads the east coast in aquaculture production of clams and, more recently, oysters. These developments have come from transfer of contemporary technologies from public institutions, such as, the Virginia Institute of Marine Science. In fact, VIMS has become a world leader in shellfish aquaculture technologies. One of those technologies has been a force in driving oyster aquaculture to the forefront: tetraploid technology. Tetraploid oysters are used by commercial hatcheries to produce sterile (spawnless) *triploid* oysters, which comprises >90% of farmed oysters in Virginia, and increasingly, east coast states. This technology is part of the IP portfolio of the Aquaculture Genetics and Breeding Technology Center at VIMS.

This proposed project will focus on expanding our mastery of tetraploid technology through several objectives:

- We will expand the development of tetraploid "lines" by developing new genetic material for release to industry.
- We will test this new material during this project through collaboration with several strategically located oyster farms, including one in Maryland where a new market for tetraploid technology is rapidly developing. Such expansion will benefit Virginia hatcheries.
- We will recruit and train a Tetraploid Technologist who will specialize in the practical breeding of tetraploid material for the benefit of commercial aquaculture. This position will be absorbed into operations at ABC after the grant period.
- Using the genetic materials at hand, we will continue our investigations into triploid mortality that have arisen in the last several years.

Commercialization of low-cost underwater sensor platform for animal-borne and 'crowd-sourced' environmental monitoring in the Chesapeake Bay and beyond.

Understanding the changes that our aquatic and marine environments are undergoing requires data collection, but we do not have sensors deployed in the majority of places due to high costs and logistical challenges. At the same time, our waters are continually plied by a variety of species that can carry electronic sensor tags, as well as by fishermen and other ocean users who could deploy them. Off-the-shelf electronic sensor tags have become reliable but are very costly and measure only a few variables. Fishermen are typically equipped with only thermometers, if anything, for environmental data collection.

We propose to commercialize the low-cost animal-borne sensor platform we have developed for shark behavior studies, and extend it to measure variables of interest for environmental monitoring and fisheries (e.g. dissolved oxygen, nutrient concentration). Several oxygen sensors are now available with long term stability (i.e. no short term drifts, frequent calibration not required). Pairing these stable oxygen sensors with our platform would enable tagged animals to function as autonomous vehicles, sampling the water column through their movements. In the Chesapeake Bay, additional oxygen measurements would be extremely valuable. The Bay suffers from eutrophication, which causes hypoxia, so there are episodes in which certain parts of the Bay's waters become degraded as fish and shellfish habitats, causing harm both to diverse wildlife and to Virginia's important fishery industry.

In addition to attaching the device to animals, it can be attached to a fishing pole for collection of vertical profile data. By pairing the device with the user's smartphone, the collected temperature, oxygen or other profile data could be uploaded to a server along with GPS coordinates, generating a large amount of new in situ measurement effort. This would become a 'crowd-sourced' oceanographic dataset with far greater spatial and temporal coverage than what could be accomplished by research cruises and other science platforms. Both NASA and NOAA presently have citizen science portals to accept crowd-sourced data. In conjunction with the hardware, we propose to provide the data analytics platform for interpretation of the sensor measurements by end users, immediately on their smartphones, as well as on the internet.

Our team has developed an inexpensive arduino-based accelerometer animal tag over the past two years and deployed it on captive sharks, so we have many of the building blocks in place. We have expertise in small low-power surface mount electronics development and microcontroller programming. We have substantial operational experience with animal tag application and recovery. We will provide a means to locate and recover the tag after timed release based on GPS and cellular uplinked location information.

This project will focus on commercialization and adaptation of our product to the target market. We anticipate that researchers, fishermen, boaters and other ocean users will be customers.

C. FINANCIAL AID – Not Applicable

D. EVALUATION OF PREVIOUS SIX-YEAR PLAN STRATEGIES

Graduate Financial Aid. VIMS faculty continue to aggressively pursue grant support from federal agencies and private donors, and recognize that meeting the need for graduate financial aid will require multiple sources of funds. For example, the VIMS administration made an internal reallocation of \$175,000 to graduate student support beginning in Fall 2013 and William & Mary's Provost allocated up a total of eighteen tuition waivers annually beginning in Fall 2014 for enrollment of top doctoral program students. In addition, the state awarded just under \$80,000 for Graduate Financial Aid beginning in FY17.

These efforts have reversed a trend of decreasing enrollment in our doctoral program from a low of 38 in Fall 2012 to 50 in Fall 2016. Additional state support is a critical element if we are to maintain our historic leadership in graduate education in marine science and take advantage of our strategic institutional goal of further increasing enrollment via a professional master's degree program.

Enhance Chesapeake Bay Water Quality Modeling and Monitoring. *This strategy has now been met. The General Assembly in their 2018 session provided VIMS with \$893,753, starting in FY 2020, for water quality improvement work. The funding includes \$406,075 for on-going support, \$84,678 for debt service costs under the Master Equipment Leasing Program (MELP) associated with the modeling and assessment technologies, and \$403,000 for development of the State of the Elizabeth River Scorecard for pollution levels in the Elizabeth River.*

Increase Base Operating Support. *This strategy has now been met. The General Assembly in their 2018 session provided VIMS with \$625 K in each year of the biennium for operations and maintenance of new facilities coming online.*

Management of Marine Diseases. VIMS has over \$467,000 in active grants during FY17 to conduct research related to understanding and managing marine diseases. The state support that we are now seeking is to more effectively put the knowledge that we gain through this research into use in monitoring and outreach programs to assist industry.

Monitoring Bay Grasses. VIMS obtained a small amount of one-time money during FY17 from the EPA to continue this monitoring program. However, these funds are not available in FY18 and the program has been forced to lay-off one person. Our current federal dollars are not sufficient to sustain this program at levels needed to provide DEQ and VMRC with up-to-date monitoring that they require for water quality standard evaluation and aquaculture permitting, respectively.

Develop and support new management and policy approaches at state and local government levels. The Commonwealth Center for Recurrent Flooding Resiliency, a joint partnership between VIMS, ODU, and W&M, provided partial support for this strategy centered around the topic of flooding.

Implement a Post-Graduate Commonwealth Coastal and Marine Fellowship Program.

With pilot funding from VIMS, VASG, the Virginia Environmental Endowment, and three state host agencies (VA Department of Environmental Quality, VA Department of Conservation and Recreation, and VA Marine Resource Commission), three Fellows were placed in 2017. Six outstanding candidates applied for the three available host positions. VASG conducted all recruitment and pre-screening, fiscal management, and Fellow oversight and technical assistance. The host agencies developed and oversee the Fellow's job tasks and activities, interviewed candidates, and serve as professional mentors for the 12-month duration of the Fellowship. While one-time seed funding was provided and minimal leveraged funding exists (e.g., \$10,000/year from VEE), long-term support is needed for the Commonwealth Coastal and Marine Fellowship program.

E. TUITION RATE INCREASES

Although the W&M School of Marine Science (SMS) resides at VIMS, we do not set the tuition and fees for the students in this graduate program. Those rates are set by the W&M Provost, Senior VP for Finance and Administration, with ultimate approval by the Board of Visitors. Unfortunately, the recent increases in graduate tuition and fees for marine science have negatively affected enrollment at the SMS. We aspire to have 120 students, yet our Fall 2016 headcount was 91. This is due to a combination of increasing tuition and fees and level, or even reduced, funding from external granting sources such as NOAA and NSF. The Director and Dean of VIMS has requested that W&M hold the SMS tuition and fees at current levels for fiscal years 2019 and 2020.

F. CONTRIBUTIONS TO ECONOMIC DEVELOPMENT**a. University-led or public private partnerships in real estate and/or community redevelopment**

VIMS has engaged in conversations over the last several years with Gloucester County's Economic Development Authority (EDA), a private developer, and W&M's Real Estate Foundation to explore the possibility of a mixed-use development contiguous to VIMS' Gloucester Point campus that would provide food, retail, and housing. VIMS does not have any auxiliary services, such as dormitories or food service. In fact, VIMS does not even have a campus center. While VIMS does not have the funds to put toward such a redevelopment, we do have approximately 450 faculty, staff, and students who would be very pleased to have these types of amenities contiguous to our campus with the majority willing to be patrons, if the price points are set favorably.

We learned from the EDA, in June 2018, that a prominent local restaurant owner was buying property within a short walking distance of VIMS for redevelopment into a restaurant, retail shops and, possibly, several apartments. The EDA has offered to bring VIMS into the conversation after the closing on the property so that we can convey our thoughts with regard to redevelopment.

Also in June, 2018, Gloucester County produced a video promoting economic development that featured in one segment its relationship with VIMS under the heading "where

inquiring minds come to learn.” VIMS is one of the county’s economic drivers and maintains a strong relationship with the Director of Economic Development, always with an eye towards mutually-beneficial partnerships.

Finally, VIMS is located in GO Virginia Region 6, and the VIMS Dean and Director is a voting member of the Region’s Council. The Region 6 Council awarded a planning grant in April, 2018 to Virginia Sea Grant, housed at VIMS, to explore developing a partnership that would focus on flooding, resiliency, and research commercialization in the Middle Peninsula. The intent is to determine the most appropriate approach for submitting a larger collaborative project.

- b. State industries to which the institution’s research efforts have direct relevance
There are several industries in which VIMS’ research efforts have had a direct impact. Examples include:
- Oyster and Clam Aquaculture Industry. In 2017, the farm gate value for Virginia’s shellfish aquaculture industry was \$56.6 million, of which \$38.1 million was attributed to Hard Clams and \$18.5 million to Oysters. This is an all-time high for the shellfish aquaculture industry. The research conducted at VIMS by our faculty and staff over the last 50 years has led to this economic success. Specifically, VIMS researchers provide genetically superior oyster brood stock to industry without charge, and provide guidance to industry on the leading diseases that impact shellfish to provide guidance to industry.
 - East Coast Off Shore Scallop Industry. In the early 1990s, the scallop fishery along the U.S. Atlantic seaboard was on a sharp downward slide. Commercial fishermen were having to spend more and more time at sea, up to 240 days per year, but were catching fewer and smaller scallops. Today, that fishery is the second most valuable commercial fishery on the East Coast, with more than \$400 million in scallops landed in 2014. Virginia alone unloaded \$33.6 million in scallops in that year, generating an additional \$21 million in economic activity in the Commonwealth for a total impact of over \$50 million. A large part of the recovery and growth of the East Coast scallop fishery is due to a long-term collaboration between scallopers, fishery managers, and scientists at VIMS. Our scientists have spent thousands of days on commercial scallop boats and research vessels during the last decades, testing and refining dredge equipment to maximize sustainable scallop harvests while minimizing bycatch of yellowtail flounder and sea turtles.
 - Agriculture Industry. The Eastern Shore of Virginia is home to tomato farms and, increasingly, chicken farms. VIMS’ researchers work with the state and local municipalities to understand the potential impacts of these industries on water quality, and assist in developing mitigation strategies to reduce the impacts.
 - Environmental Industry. VIMS researchers developed state-of-the-art biosensors that have early detection functionality for oil spills, rapid quantification in real-time of polycyclic aromatic hydrocarbons (PAHs) concentration (EPA considers PAHs highly toxic and lists 17 as suspected carcinogens), and other contaminants.

- c. High-impact programs designed to meet the needs of local families, community partners, and businesses
- Oyster Aquaculture Training Program. The Oyster Aquaculture Training program is a popular five-month hands-on program that focuses on the principles of oyster aquaculture. Participants learn and work alongside researchers during our oyster hatchery season from April to August. They receive a stipend for the duration of their involvement. To ensure a one-on-one experience, we accept a maximum of only 3-5 participants. During the five-month program, participants rotate through various stages of oyster aquaculture, from our hatchery and field grow-out operations, to our laboratory. Working through these rotations provides a sound understanding of all phases of the oyster life-cycle. Participants also work in the field, learning the importance of seawater flow rates, sieve and bag sizes, and oyster seed sizes and densities. They learn various field grow-out methods, such as suspended culture and rack and bag techniques. By the end of the program, participants have a clear understanding of all areas of oyster aquaculture and are highly qualified and confident in their ability to perform tasks in both oyster hatchery and field operations. Although there are only a small number of participants in any given year, the impact of the program is high and community and industry relations are enhanced.
 - Community Outreach. VIMS and its federal partners offer a wide variety of free public programs both on VIMS' campuses in Gloucester Point and Wachapreague, as well as throughout Hampton Roads and the lower Chesapeake Bay region. In calendar year 2017, VIMS offered more than 350 outreach programs that reached nearly 25,000 citizens. Our programs include After Hours Lecture Series, Discovery Labs, Annual Open Houses at Gloucester Point and Wachapreague, Public Tours, Seafood Symposia, Speakers Bureau, Technical Training and Workshops, Summer Camps for K-8th graders, Field and Classroom Experiences, and booths at local Fairs and Festivals.

d. Business management/consulting assistance

As the state's mandated advisor on a wide range of natural resources management and use issues, VIMS plays a truly unique role as an institution of higher education. In fact, VIMS is a model for the nation in this regard because our advisory services mission is so significantly different from traditional university service to the community, and it shapes VIMS in a most fundamental way. VIMS is identified in 36 sections of the Code of Virginia, and as such we are on call and expected to provide advice based on the highest quality science when requested by the Governor, the General Assembly, state agencies, marine industries, and citizens. The charge put forth to us in the Code of Virginia is an asset, an advantage, and a vibrant part of our institutional culture. Advisory service is in many ways the public face of VIMS.

Currently, there are eight to ten major projects ranging from municipal surface water intakes, to Dominion Virginia Power river crossings, to the Chesapeake Bay Bridge Tunnel

expansion. Expectations from stakeholders are high and we have a long history of furnishing advice of unsurpassed quality. Many of these projects require multiple permits and are complicated, time-consuming and often controversial. VIMS brings, at no charge, an objective voice that ultimately results in better policy and management decisions, and that help sustain the environment and protect public health.

The Commonwealth Center for Recurrent Flooding Resiliency (CCRFR), a partnership between Old Dominion University, W&M Law School's Virginia Coastal Policy Center (VCPC) and VIMS, was established in 2016 to bring university-based expertise to the growing challenge of recurrent flooding. The CCRFR conducts studies, provides training and offers a variety of services in the area of recurrent flooding resiliency, and is currently working with local governments and state and federal agencies throughout Tidewater Virginia to enhance the region's resiliency to flooding. Examples include: 1) working with the City of Virginia Beach to assess resiliency in the tourism industry and assemble policy recommendations; 2) collaborating with Newport News and Norfolk to install low cost-water level-monitors to enhance prediction and visualization tools; 3) assisting the City of Portsmouth in incorporating resiliency to future storms in their comprehensive plan; 4) evaluating the effectiveness of various risk communication methods; 5) mapping local land subsidence rates; 6) contributing to the development of easy-to-use data portal, Adapt Virginia, that provides a wide range of technical and policy decision support for building resiliency; 7) providing leadership in addressing storm water concerns in rural Tidewater, and; 8) developing an improved version of TideWatch, which currently predicts water levels at selected tide gauge stations 36 hours in advance, and will soon provide flood inundation predictions up to 48 hours in advance.

G. CAPITAL OUTLAY

VIMS has 11 proposed capital projects over the Six-Year Plan period; however, there are three projects that are the top priorities for VIMS in the upcoming biennium and that will have a significant impact on several of the strategies listed in our Six Year Plan. They are (1) Construct an Oyster Research Hatchery, (2) Replace Fisheries Science Building, and (3) Expand and Renovate Watermen's Hall.

Relocate and Construct an Oyster Research Hatchery. The current hatchery is nearly four decades old and was originally designed as a production facility for planting large numbers of seed oysters in the Chesapeake Bay. The new hatchery will be 22,000 square feet and constructed on the north side of campus, out of the flood plain, and be specifically purposed for oyster aquaculture research, oyster restoration, industry and economic development, and educational and training space. This research hatchery supports the Virginia Plan Goals 3 and 4 and TJ 21 Objective D5. VIMS' Aquaculture Genetics and Breeding Technology Center (ABC) will be housed in the new hatchery. The 1997 General Assembly established ABC in recognition of the role that genetic research and selective breeding play in aquaculture development. ABC is the first genetics program to focus on oysters and one of the first dedicated Centers for breeding marine species. ABC's mission is to continuously improve oyster aquaculture through the manipulation and control of the genetics and culture of the

oyster. These improvements, through application of cutting edge research, have and will continue to have regional impact and worldwide application. Most importantly, aquaculture is one of the leading economic development opportunities for Chesapeake Bay. ABC addresses industry requirements for a more profitable enterprise by running a breeding and applied research program, which comprises a research hatchery, labs, and farms that are staffed with technicians, students, and trainees. ABC does not sell seed or larvae, but enables industry to meet this demand by providing the best available brood stock.

Replace Fisheries Science Building. Currently, the Department of Fisheries Science is housed in three different buildings across campus, Nunnally Hall/Fisheries Science Building, Chesapeake Bay Hall, and Andrews Hall. Nunnally Hall/Fisheries Science Building, that houses 80 percent of the department, is 27 years old and has had three additions in order to accommodate the expanded needs of office, laboratory, and storage space. The building is one story, of VB type construction, and has reached its maximum allowable size according to state building code. This proposed project will demolish the current Nunnally Hall/Fisheries Science Building and construct a new 34,000 square-foot multi-level research laboratory building.

The Department of Fisheries Science provides critical scientific information and objective technical advice on resource management to the Commonwealth (via VMRC), the nation, and the international community. Fisheries faculty and staff have extensive experience and knowledge on the biology and status of fishes, molluscs, and crustaceans, applying both classical skills and novel approaches to enhance our understanding of these animals in their estuarine and marine environments. The research conducted by members of this department informs society and is often the basis for resource policy. This combination of research and advice provides a rich environment for graduate education. Fisheries students integrate into department research, actively participating in VIMS' advisory function. Graduates find employment as teachers, researchers, and resource managers at universities, in local, state, national and international agencies, and in private corporations. This project supports the Virginia Plan Goals 2, 3 and 4 and TJ 21 Objective D5.

Expand and Renovate Watermen's Hall. This project consists of expanding and renovating the 1984 vintage Watermen's Hall. This renovation and expansion is critical to meeting the programmatic, technological, and instructional needs of graduate marine education and public outreach at VIMS. The project includes renovation of existing classrooms, and an 11,800 square foot addition for an educational center with classrooms, conference rooms, convertible meeting rooms, and an informal lounge.

Watermen's Hall is a multipurpose building that houses the Institute's administration, advisory services, main research library, classrooms, and an auditorium. Not only does Watermen's Hall provide essential functions and act as the nerve center for the Institute's faculty, staff, and students, but it is the main building where the Institute and the public interface. The building has been well maintained and improvements have included a handicapped accessibility project, re-roofing project, and partial face lift to the McHugh Auditorium, and mechanical equipment

replacement as part of an energy performance contract. However, the building is 31 years old, has never been renovated, and is showing its age. Moreover, VIMS is unable to host regional and national conferences due to lack of proper facilities and class scheduling conflicts. The proposed addition would allow VIMS to hold workshops for 50-100 people with breakout rooms for small discussion groups and improve VIMS' ability to provide advisory services to state and local governments and the general public through outreach training workshops. This project supports the Virginia Plan Goals 2, 3 and 4 and TJ 21 Objective D5.

H. RESTRUCTURING – Not Applicable

VIRGINIA INSTITUTE OF MARINE SCIENCE
SIX-YEAR PLAN UPDATE
INCREMENTAL EXPENSE BY PRIORITY

Priority	Strategy	FY 2018-19	FY 2019-20
1	Increase Graduate Financial Aid	\$425,00	\$425,000
2	Increase Base Operating Support	\$0	\$0
3	Utilize Advanced Modeling and Assessment Technology for CB Water Quality Improvement	\$0	\$0
4	Monitor Bay Grasses	\$297,084	\$297,084
5	Enhance Chesapeake Bay Environmental Technology	\$557,091	\$292,091
6	Boost Marine Aquaculture and Fisheries Health	\$424,519	\$424,519
7	Establish a Molecular Core Facility	\$1,145,935	\$495,935
8	Develop an Oyster Biosecurity Plan	\$315,144	\$315,144
9	Accelerate Economic & Community Impacts from Coastal & Marine Science and Technology	Will be pursued in the 2020-2022 biennium	Will be pursued in the 2020-2022 biennium
10	Implement a post-graduate Commonwealth Fellows Program	Will be pursued in the 2020-2022 biennium	Will be pursued in the 2020-2022 biennium
11	Continue to Operate as a Year Round Facility	No dollar impact	No dollar impact

VIRGINIA INSTITUTE OF MARINE SCIENCE

FY20 OPERATING AND CAPITAL BUDGET AMENDMENTS

The Virginia Institute of Marine Science has developed operating and capital budget requests as part of the Commonwealth's budget development process for the 2019 General Assembly session. The Institute has followed the guidelines as directed by the Governor, and given that this budget is to amend the biennial budget, VIMS is not putting forward any new initiatives for consideration.

The two operating budget initiatives are consistent with amendment requests previously approved by the Board of Visitors, are included in the Institute's Six-Year Plan, and align with the goals and objectives of the Commonwealth. In addition, the two capital requests include projects that are on the Institute's Capital Outlay Six Year Plan.

THEREFORE, BE IT RESOLVED, That the Board of Visitors of the College of William & Mary in Virginia approves the following operating and capital budget requests for the Virginia Institute of Marine Science for submission to the Commonwealth as part of the 2019 General Assembly budget development process.

VIRGINIA INSTITUTE OF MARINE SCIENCE

FY20 OPERATING AND CAPITAL BUDGET AMENDMENTS

OPERATING REQUESTS

Monitor Bay Grasses

\$381,590 GF (one-time) 2.8 FTE

\$365,805 GF (ongoing) 2.8 FTE

Submerged bay grasses are a critical living resource in Chesapeake Bay that supports valuable fish and crab resources. VIMS has conducted a bay-wide annual survey of Bay grasses since 1987, with considerable support from EPA, NOAA and the State of Maryland. The results of the annual survey are vitally important to the Commonwealth because: (1) Bay grass acreage is embodied in Virginia's water quality standards; (2) the Virginia Secretary of Natural Resources must report annually to various Virginia House and Senate Committees on the status of Bay grass abundance from the annual surveys (*Code of Virginia* §2.2-220); (3) Bay grass acreage is an important component of the blue crab fisheries management plan (*Code of Virginia* §28.2-203.1); (4) Bay grass survey maps are used by the Virginia Marine Resources Commission in evaluating aquaculture lease applications; and (5) Bay grass acreage is used as a metric for attainment of the restoration goals established by the Chesapeake Bay Program and its partners, including the Commonwealth of Virginia. In addition, the *Governor's Workgroup on Shellfish Aquaculture* has identified a key issue for the continuing development of oyster aquaculture in Virginia to be the development and implementation of best management practices that promote the co-existence of this important industry and bay grasses. With declining federal support and rising costs for this survey, we are seeking to establish a stable funding base for maintaining the Virginia portion of this valuable survey and to ensure that aquaculture can co-exist with bay grasses.

Graduate Program Support

\$425,000 GF (ongoing)

The graduate program of the William & Mary School of Marine Science at VIMS is one of the largest and most successful marine science programs in the nation. We have awarded over 1,000 degrees since VIMS was founded over 75 years ago. VIMS graduate students provide essential capacity in support of mission-focused research programs and advisory services mandated in the *Code of Virginia*. Our alumni are highly successful in competing for jobs in academia, federal and state agencies, K-12 education, non-profits, and marine-related businesses within the private sector. Many have gone on to become leaders in areas such as aquaculture, fisheries management, storm surge modeling, water quality research (including the science of dead zones and harmful algal blooms), and management and restoration approaches for our coasts and estuaries. Despite the quality and success of the program, the high cost to our faculty of supporting research-focused graduate students is an ever-increasing concern because it limits program enrollment below capacity and also puts VIMS at a competitive disadvantage. Increased state graduate financial support of \$425,000 is vital to program stability. It will increase faculty competitiveness in winning external grants and contracts by providing matching funds (also

known as cost share), thereby enhancing VIMS' ability to conduct the research that is vital to the Commonwealth. We have prioritized this request in order to reflect the very high value of the graduate program to VIMS, the Commonwealth, and the nation.

CAPITAL OUTLAY REQUESTS

Construct New Oyster Hatchery

\$18,900,000 GF (one-time)

Supports the construction of a new 22,000 square-foot state-of-the-art Oyster Hatchery that will house space for industry and economic development, oyster restoration, and educational and training space. The new hatchery will be a single story masonry and concrete wet lab building featuring a brood stock lab, spawning lab, larvae cultural families lab, larvae culture lines labs, setting lab, algae lab, experimental lab, workshop, shared and field labs, and support spaces.

Construct New Fisheries Science Building

\$26,500,000 GF (one-time)

Supports the construction of a new 34,000 square-foot state-of-the-art research laboratory building to replace the 28-year-old Nunnally/Fisheries Science Complex which will include office and laboratory space supporting the Department of Fisheries Science. The new building will consolidate most of the Fisheries Science Department in one location and improve the colloquy between the faculty, staff, and students of the department. Also residing in the building will be the Nunnally Ichthyology Collection which serves as the largest repository for freshwater, Chesapeake Bay, and coastal fishes in Virginia.

**VIRGINIA INSTITUTE OF MARINE SCIENCE
2018-2019 OPERATING BUDGET SUMMARY**

	2015-2016 <u>Actual</u>	2016-2017 <u>Actual</u>	Original FY 2017-18 <u>Budget</u>	2017-2018 <u>Actual</u>	Variance	Approved 2018-2019 <u>Budget</u>
REVENUE						
General Fund	\$19,699,566	\$21,127,470	\$21,565,359	\$21,798,906	233,547	\$23,041,574
Nongeneral Funds						
Educational/General	1,941,120	2,263,009	1,843,030	1,819,801	(23,229)	1,892,041
Eminent Scholars	43,647	78,088	77,185	70,023	(7,162)	79,139
Sponsored Programs	<u>23,234,922</u>	<u>22,405,424</u>	<u>23,250,000</u>	<u>22,515,417</u>	<u>(734,583)</u>	<u>23,250,000</u>
Total Revenue	\$44,919,255	\$45,873,990	\$46,735,574	\$46,204,148	(531,426)	\$48,262,754
EXPENDITURES						
Instruction	\$1,045,649	\$948,236	\$1,424,566	\$1,028,199	(396,367)	\$1,537,516
Research and Advisory Services	9,260,758	9,834,263	9,738,659	9,839,313	100,655	9,877,246
Academic Support	4,897,996	5,150,593	5,049,269	4,983,686	(65,583)	5,993,692
Institutional Support	2,334,682	2,884,700	2,409,454	3,247,986	838,532	2,683,218
Plant Operations	3,855,280	4,123,222	4,374,876	4,116,010	(258,866)	4,480,941
Student Financial Assistance	241,540	319,617	321,002	321,002	-	321,002
Sponsored Programs/Eminent Scholars	<u>23,278,569</u>	<u>22,483,511</u>	<u>23,327,185</u>	<u>22,585,440</u>	<u>(741,745)</u>	<u>23,329,139</u>
Total Expenditures	\$44,914,473	\$45,744,142	\$46,645,011	\$46,121,636	(523,375)	\$48,222,754