

RB22
University of Maryland, College Park
University System of Maryland

Capital Budget Summary

State-owned Capital Improvement Program
(\$ in Millions)

<i>Projects</i>	<i>Prior Auth.</i>	<i>2015 Request</i>	<i>2016 Est.</i>	<i>2017 Est.</i>	<i>2018 Est.</i>	<i>2019 Est.</i>	<i>Beyond CIP</i>
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H.J. Patterson Hall – Wing 1 Renovation	\$0.878	\$11.686	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
Campuswide Building System and Infrastructure Improvements	25.000	10.000	10.000	10.000	10.000	10.000	60.000
Edward St. John Learning and Teaching Center	5.470	11.700	47.150	3.900	0.000	0.000	0.000
Chemistry Building Wings 1 and 2 Replacement/Renovation	0.000	1.560	0.000	16.500	19.200	1.550	144.026
New Bioengineering Building	10.000	0.000	0.000	53.450	73.500	0.000	0.000
Total	\$41.348	\$34.946	\$57.150	\$83.850	\$102.700	\$11.550	\$204.026

<i>Fund Source</i>	<i>Prior Auth.</i>	<i>2015 Request</i>	<i>2016 Est.</i>	<i>2017 Est.</i>	<i>2018 Est.</i>	<i>2019 Est.</i>	<i>Beyond CIP</i>
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GO Bonds	\$31.348	\$14.976	\$37.150	\$68.850	\$87.700	\$6.550	\$174.026
Revenue Bonds	10.000	15.000	15.000	5.000	5.000	5.000	30.000
Nonbudgeted Funds	0.000	5.000	5.000	10.000	10.000	0.000	0.000
Total	\$41.348	\$34.976	\$57.150	\$83.850	\$102.700	\$11.550	\$204.026

CIP: *Capital Improvement Program*

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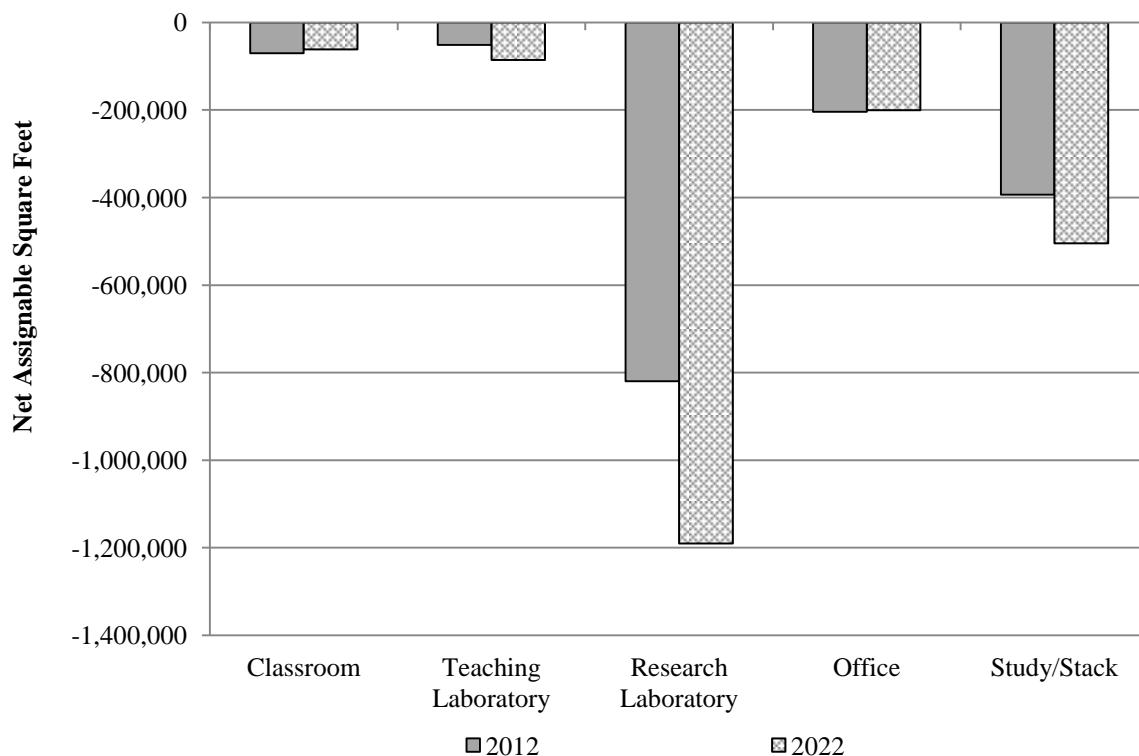
Summary of Recommended Bond Actions

	<u>Funds</u>
1. Campuswide Building System and Infrastructure Improvements	
Approve continued funding for the Campus Building System and Infrastructure.	
2. Chemistry Facilities Expansion, Replacement, and Renovations	-\$1,560,000 GO
Deletes design funds for Chemistry Building Wing 1 and 2 Replacement and Renovation.	
3. Edward St. John Learning and Teaching Center	\$11,560,000 GO
Amends authorization by \$11.6 million to allow the chemistry laboratories to be constructed concurrently with the Edward St. John Learning and Teaching Center.	
4. H. J. Patterson Hall – Wing I Renovation	
Approve funds to renovate H. J. Patterson.	
5. SECTION 2 University of Maryland, College Park – Physical Sciences Complex	
Approve the de-authorization of \$2.0 million for the Physical Science Complex.	
6. SECTION 12 University of Maryland, College Park – Edward St. John Learning and Teaching Center	
Amend the fiscal 2016 pre-authorization to include the addition of chemistry instruction and related functions.	
7. SECTION 13 University of Maryland, College Park – Edward St. John Learning and Teaching Center	
Amends the fiscal 2017 pre-authorization to include the addition of chemistry instruction and related functions.	
Total Reductions/Additions	\$10,000,000

Performance Measures and Outputs

The University of Maryland, College Park (UMCP) has an overall classroom and teaching laboratory space deficit of 121,834 net assignable square feet (NASF) as of fall 2012, as shown in **Exhibit 1**. According to the Maryland Higher Education Commission (MHEC), the classroom deficit will somewhat ease by fiscal 2022, decreasing 8,249 NASF. However, UMCP will still have a deficit of 61,877 NASF, which is based on MHEC's projection of 641 students, or 2%, enrollment growth in full-time day equivalent students. Additionally, it is estimated that UMCP's research space deficit will worsen to 1.2 million NASF by fiscal 2022.

Exhibit 1
Academic Space Deficiency
Fall 2012 and Projected Fiscal 2022



Source: Maryland Higher Education Commission, Four-year Public Colleges and Universities Academic Space Surplus/Deficiency, Fall 2012, Projected Fiscal 2022

Budget Overview

Campuswide Building System and Infrastructure Improvements

The 2014 capital budget provides a fourth year of funding for campuswide building system and infrastructure improvements to address the backlog of deferred maintenance, particularly those related to UMCP's failing infrastructure. Since fiscal 2013, \$10 million in funding has been provided annually, equally from general obligation (GO) and revenue bonds, which continues into fiscal 2015. The estimated cost for the upgrades and improvements to the infrastructure totals \$135 million over a 14-year period.

Projects for fiscal 2015 include \$6.6 million for three heating, ventilation, and air conditioning infrastructure improvements; \$0.9 million for an elevator repair; \$0.8 million for three fire safety projects; \$0.6 million to replace a water line; \$0.6 million for road repair; and \$0.5 million for two electrical gear improvements.

This project addresses the urgent needs arising from \$670.9 million in facilities renewal backlog. Overall, 33%, or 1.8 million NASF of UMCP's State-supported space has not had a major renovation in more than 40 years. In addition, there is a backlog for infrastructure outside the buildings such as underground utilities, road, and exterior lighting, for a total backlog, according to UMCP, of three-quarters of a billion dollars. Funding for facilities renewal over the years has not been sufficient to address the steadily increasing needs of an aging campus with a deteriorating infrastructure. Projects are classified into two categories – infrastructure and building systems. Infrastructure includes work outside of the buildings, such as replacing underground heating, cooling, and water piping; repairing building foundations; and replacing exterior security lighting and cameras. Building system projects include the installation or upgrade of the life safety systems. Current systems compromise UMCP's ability to ensure the safety of faculty, staff, students, and visitors.

Edward St. John Learning and Teaching Center

The Edward St. John Learning and Teaching Center (St. John Center) is solely dedicated to providing technologically advanced classroom space, replacing eight large obsolete lecture halls that are located in several buildings. Prior authorizations for design of the center total \$5.5 million. The 2013 *Capital Improvement Program* (CIP) programmed \$25.3 million and \$25.6 million in fiscal 2015 and 2016, respectively, for construction, which is leveraged with a \$10.0 million private donation. However, due to other budget priorities, GO bond funding for the project was reduced from \$20.3 million to \$6.7 million in the 2014 capital budget bill which also includes \$5.0 million of the private donation allowing UMCP to complete design and begin site and utility work. In addition, instead of split funding the construction over a two-year period, \$47.2 million is programmed in fiscal 2016 with \$3.9 million programmed in fiscal 2017 to complete construction and equip the facility.

The total cost of the project increases \$11.9 million, from \$56.3 million to \$68.2 million due to changes in the scope and an escalation in costs due to extending the project schedule. After a re-evaluation of the Part II program from 2002, several issues were identified, resulting in a 1,957 NASF/8,963 gross square feet (GSF) increase in the scope of the project. An Academic Advisory Group was convened to review the project and in consultation with the Architectural and Engineering team, provide direction regarding current and future learning needs. It was determined that the original program provided an average size of 18 NASF per seat for classrooms, but in order to provide adequate space for current and future learning (which is more collaborative and makes more use of technology than a decade ago), 24 NASF per seat is required. Additionally, it was determined that the original plan to fully utilize 27,400 GSF of Holzapfel Hall was not feasible because even the smallest of the planned classrooms are too large to fit within the limited dimensions of Holzapfel Hall. Overall, these factors resulted in a larger project which includes more construction and less renovation than originally anticipated, thereby increasing the cost of the project. Due to the space limitations, only about one-third of Holzapfel Hall will be renovated, with UMCP using \$6.0 million in institutional funds to renovate the front portion of the facility for office space. The revised program includes a 78-seat classroom designed as an add-alternative in the event that the bid prices allow for it within the project's budget.

Overall, the center will address UMCP's insufficient and poorly configured lecture hall space which cannot accommodate technologies used in today's classrooms. In the currently used lecture halls, sight lines are blocked by support columns causing blind spots. This, combined with low ceilings, prevents the installation of audiovisual equipment, requiring faculty to post information in multiple locations to ensure that all students can view the material. Since many of the classrooms were constructed prior to the integration of technology into the buildings, rooms cannot support the use of computers, teleconferencing, or video equipment.

The center will not only address UMCP classroom deficit by providing 34,134 NASF of classroom space but will also alleviate a shortage of mid- and large-sized classrooms that can accommodate 70 to over 320 students. For fall 2010, the room utilization rate was 70% for classrooms with 50 to 70 seats; 73% for rooms with 120 to 200 seats; and 81% for rooms with 300 to 500 seats. The rate indicates the percentage of time a room is being used between 8:00 a.m. and 5:00 p.m. during the weekdays. The recommended rate for any size classroom is 67%. The higher the percentage, the harder it is to offer classes at convenient times, relocate classes during emergencies, or hold events, such as a guest lecturer or conferences. Current utilization rates of large classrooms provide little to no flexibility in scheduling, leading to the cancellation of classes due to the lack of usable space.

Chemistry Building Wings 1 and 2 Replacement/Renovation

UMCP originally planned the chemistry building renovations as a multi-phase project to be completed in small phases due to the lack of permanent relocation and/or surge space. The project was modified in the 2005 CIP to be completed in two phases. Phase I would renovate Wing 2 and a portion of Wing 1, and the balance of Wing 1 would be renovated under Phase II of the project. The 2013 CIP programmed a total of \$4.1 million for planning in fiscal 2016 and 2017, with \$20.0 million

(\$10.7 million in GO and \$10.0 million in revenue bonds) for construction planned in fiscal 2018. The total estimated cost is \$80.2 million. However, this two-phased plan is not feasible due to the lack of surge space. The construction of the St. John Center afforded UMCP the opportunity to expand the project and incorporate teaching chemistry laboratories into the design of the facility, thereby allowing for concurrent construction of the projects. In order to facilitate the modification to the St. John Center, UMCP used \$1.5 million of institutional funds to include the teaching laboratories in the design of the facility.

The 2015 CIP reflects the change in scope of the chemistry building replacement/renovation to expand the St. John Center to include teaching laboratories by providing \$1.6 million in fiscal 2015 to complete design and programming \$16.5 million and \$19.2 million in construction funding in fiscal 2017 and 2018, respectively. However, as programmed, the expansion would occur in fiscal 2017 – a year after construction is completed on the St. John Center. By staggering the constructing of the St. John Center and the chemistry laboratories, economies of scale are lost. This results in an increase in cost and time, including expenses related to additional site work; demolition of a portion of the exterior wall to connect to the new addition; and due to a lack of integration with St. John Center, the addition would be larger to accommodate stairs and mechanical space. Furthermore, construction of the expansion to St. John Center would be disruptive to the classes occurring in the facility, and most likely would result in a suspension of holding classes in many of the rooms during construction. It should be noted that construction funding programmed in the CIP already reflects cost savings of concurrently constructing the nine general chemistry laboratories and four additional classrooms and the St. John Center. **Due to the above mentioned factors, the Department of Legislative Services (DLS) recommends aligning the construction of the chemistry laboratories with that of the St. John Center. Therefore, DLS recommends amending budget language related to the St. John Center to include the addition of the chemistry laboratories and related classrooms. To reflect the additional costs associated with increasing the scope of the project, DLS further recommends increasing funding in fiscal 2015 to \$11.7 million to complete design and start construction and amending the pre-authorizations to \$65.7 million and \$5.1 million in fiscal 2016 and 2017, respectively, to reflect the increase in costs associated with the expansion of the St. John Center. This would also allow the construction contract to be bid and awarded in fiscal 2015.** A result of aligning the construction of the chemistry laboratories with the St. John Center is the funds originally programmed in fiscal 2017 and 2018 will be available for other projects.

This expanded project includes the renovation of 11,130 GSF and the construction of 150,900 GSF of new space, resulting in a 77,644 NASF/162,030 GSF facility. The facility will provide 39,846 NASF of classroom space and 21,584 NASF of laboratory space. The expanded St. John Center will also provide some of the permanent and surge space needed to renovate and replace Wings 1 and 2.

Overall, the renovation and replacement of Wings 1 and 2 of the chemistry building will be implemented in multiple phases and include not only constructing new labs at the St. John Center, but also the renovation of Wing 2 and replacement of Wing 1 of the chemistry building, which are the oldest of the five wings, constructed in 1968 and 1952, respectively. Due to the cost efficiencies, Wing 1 will be replaced, and portions of Wing 2 (including the basement, third floor, and portions of the other floors that have not been renovated) will be renewed. Wing 1 and portions of Wing 2 have

not had any significant renovations since the original construction, and many of the building's systems are aging and require updates or replacements.

The ventilation system cannot properly dilute indoor air contaminants, control odors, reduce humidity, or provide the required number of air changes per hour, creating life safety hazards. Most of the fume hoods and exhaust systems are original and inadequate to provide the level of safety expected in a modern chemistry facility. While some fume hoods have been replaced, much of the original exhaust system was retained. There is no cooling capacity in Wings 1 and 2, and temperatures in research and teaching laboratories exceed over 90 degrees in the summer. While window air conditioners have been installed in the laboratories, the building does not have enough electrical capacity to support the current units or to distribute them throughout the building. In Wing 1, most of the electrical system needs to be replaced; there is no capacity to expand and the age and condition of the wiring presents a fire hazard. In Wing 2, most of the transformers, switchgear, and secondary electrical panels are original and are difficult to repair. Furthermore, the piping systems are original and, as a result, the potable water system and water pressure is erratic, resulting in flooding and damage to laboratory equipment.

Laboratory space is outdated and does not adequately support the needs of modern chemistry teaching and research. These needs include more laboratory benches and cabinets, greater electrical capacity to accommodate modern equipment, and more access to utilities such as gas and water. Many of the teaching laboratories are still configured for the learning pedagogy of the 1950s rather than the discovery-based or group-based teaching methods currently used in chemistry instruction. Some teaching space has been updated to better support modern teaching methods, but the inadequate space does not allow for optimal safety (*i.e.*, limited circulation space around student workstations and fume hoods increases the risk of accidents.) In addition, UMCP issues general chemistry students glassware each semester, which they lock in drawers under the workstation. The limited number of drawers restricts the number of sections of general chemistry labs that can be offered each semester.

Currently, there are six general chemistry laboratories in Wing 1, which would be relocated to the proposed expansion of the St. John Center. However, based on the projected growth of the department's weekly student contact hours (WSCH) in class laboratories, UMCP decided to add three more laboratories for a total of nine. The Department of Chemistry and Biochemistry provides a two-year course sequence for biological science majors and introductory chemistry courses required for other majors, such as engineering and animal science. Over 80% of the credit hours taught by the department are to these students. Furthermore, it was decided to add four classrooms to the expansion to help meet the projected growth in WSCH. The expansion project will help alleviate UMCP's classroom and teaching laboratory space deficit by 5,712 and 14,739 NASF, respectively.

H. J. Patterson Hall – Wing 1 Renovation

The project provides space for those programs that will be displaced due to the construction of the St. John Center. The 2013 capital budget provided \$0.9 million to design the project, and the 2013 CIP programmed \$11.5 million in GO bonds to fund construction and equip the facility in

fiscal 2015. However, in order to ensure that the project remains on track given the construction schedule of St. John Center, \$10.0 million in Academic Revenue Bonds and \$1.7 million in GO bonds will be used to renovate and equip the second, third, and fourth floors of Wing 1 of H. J. Patterson Hall.

The renovation of Wing 1 will create 17,135 NASF of office space for eight international programs that are housed in Holzapfel and Taliaferro halls. Being in separate locations has prevented collaboration among the programs and hindered the ability of UMCP to develop cross-culture opportunities for students. The construction of the St. John Center will displace five international programs housed in Holzapfel Hall and the Department of American Studies, which will be relocated to Tawes Theatre after it is converted to office space. The three other smaller international programs will be moved to H. J. Patterson, with the vacated space to be used to meet other space needs of the university.

Wing 1, which has never been significantly updated, was constructed in 1937 and originally housed research and teaching laboratories for the life sciences program. The wing has largely been vacant since the previous occupants relocated to the Bioscience Research Building in 2007. Due to the structural constraints of the building, which do not allow for cost-effective installation of the infrastructure needed to support modern laboratories, the facility cannot be used for research. Furthermore, the building systems are outdated, resulting in increasing maintenance costs despite the wing being vacant. For instance, failing plumbing has caused frequent flooding and leaks, the electrical system is outdated, the breaker and subpanels are overloaded, and there is insufficient capacity to expand, resulting in offices not being able to support multiple computers. Additionally, the wing lacks fire sprinklers, the fire alarm system is not compliant with the Americans with Disabilities Act (ADA), and the exterior wood portico and windows are rotting and need to be replaced.

UMCP plans to fund the renovation of the first floor of Wing 1 so that it is renovated concurrently with the renovation of the three upper floors. This will allow for the relocation of an additional international program currently housed in Susquehanna Hall to H. J. Patterson and frees up space in Susquehanna Hall so that it can be used for its intended purpose as surge space.

Operating Budget Impact Statement

Executive's Operating Budget Impact Statement (\$ in Millions)

	<i>FY 2015</i>	<i>FY 2016</i>	<i>FY 2017</i>	<i>FY 2018</i>	<i>FY 2019</i>
Edward St. John Learning and Teaching Center					
Estimated Operating Cost	\$0.0	\$0.551	\$3.163	\$3.232	\$3.313
Estimated Staffing	0	5	18	18	18
H. J. Patterson Hall – Wing 1 Renovation					
Estimated Operating Cost	0.590	0.000	0.000	0.000	0.000
Estimated Staffing	0	0	0	0	0
Chemistry Building Renovation					
Estimated Operating Cost	0.000	0.000	0.881	2.256	2.307
Estimated Staffing	0	0	7	12	12
Total Operating Impact					
Estimated Operating Cost	\$0.590	\$0.551	\$4.044	\$5.488	\$5.620
Estimated Staffing	0	5	25	30	30

Summary of Other Projects in the Capital Improvement Program

Projects Deferred in Fiscal 2015

Funding for the New Bioengineering Building is deferred from fiscal 2015 to 2017 due to other budget priorities. A description of the project is shown in **Exhibit 2**. The General Assembly included \$5.0 million in each of the 2012 and 2013 capital budget bills to complete design of the facility. In neither instance were these funds programmed in the CIP, but instead, the funding was advanced by the General Assembly. As such, the funds programmed in the 2013 CIP to complete design are not needed and have been taken out of the 2014 CIP. Funding for construction is programmed to be split funded over fiscal 2017 and 2018 totaling \$108.6 million which is leveraged with \$20.0 million in private donations. The estimated cost of the project totals \$137.0 million.

Funding for the Toll Physics Building South Wing Renovation is deferred from fiscal 2018 and is not included in the 2014 CIP. A description of the project is shown in Exhibit 2. The 2013 CIP programmed \$1.7 million for planning in fiscal 2018, with construction funding provided in the out-years. The total cost of the project was estimated to be \$50.7 million.

Exhibit 2 Projects Deferred Fiscal 2015 (\$ in Millions)

<u>Project</u>	<u>Description</u>	<u>Reason for Deferral</u>
New Bioengineering Building	Construct a new facility to house the Robert E. Fischell Department of Bioengineering and the Institute for Biomedical Devices, providing space needed for continued expansion and growth of the department	Other budget priorities
Toll Physics Building South Wing Renovations	Renovate the south wing that was originally constructed in 1950 and is dilapidated and obsolete and perform selective renewal throughout the building	Other university priorities

Source: Department of Budget and Management, 2014 *Capital Improvement Program*

Pre-authorizations and De-authorizations

Exhibit 3 shows the pre-authorizations for the St. John Center as previously discussed and the de-authorization of \$2.0 million for the Physical Science Center.

Exhibit 3 **Pre-authorizations and De-authorizations**

Pre-authorizations

<u>Project</u>	<u>FY 16</u>	<u>FY 17</u>	<u>FY 18</u>	<u>Reason</u>
Edward St. John Learning and Teaching Center	\$42.150	\$2.500	\$0.000	Allows for the bidding and awarding of the construction contract in fiscal 2015

De-authorizations

<u>Project</u>	<u>De-authorized Amount</u>	<u>Reason</u>
Physical Sciences Complex	\$2.000	Project completed

Source: Department of Budget and Management, 2014 *Capital Improvement Program*

GO Bond Recommended Actions

1. Approve \$10 million (\$5 million general obligation and \$5 million revenue bonds) to continue funding for the Campus Building System and Infrastructure Improvements.
2. Deletes design funds for Chemistry Building Wing 1 and 2 Replacement and Renovation.

RB22B	Chemistry Facilities Expansion, Replacement, and Renovations	\$0
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<u>Allowance</u>	<u>Change</u>	<u>Authorization</u>
1,560,000	-1,560,000	0

Explanation: Deletes \$1.6 million for design of the Chemistry Building Wing 1 and 2 Replacement and Renovation, which will be added to the Edward St. John Learning and Teaching Center to reflect aligning the construction of the chemistry instruction laboratories and related functions expansion with the Edward St. John Learning and Teaching Center.

3. Amends authorization by \$11.6 million to allow for the chemistry laboratories to be constructed concurrently with the Edward St. John Learning and Teaching Center.

RB22C	Edward St. John Learning and Teaching Center.....	\$ 18,260,000
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Add the following language:

Edward St. John Learning and Teaching Center. Provide funds to design and construct the new Edward St. John Learning and Teaching Center, including design and construction of the addition of chemistry instruction and related functions provided that notwithstanding Section 6 of this Act, work may commence on this project prior to the appropriation of all funds necessary to complete this project

<u>Allowance</u>	<u>Change</u>	<u>Authorization</u>
6,700,000	11,560,000	18,260,000

Explanation: Amends the fiscal 2015 authorization by \$11.6 million, which includes \$1.6 million originally authorized for design of the Chemistry Building Wing 1 and 2 Replacement/Renovation to complete the design of the expanded center and an additional \$10.0 million to begin construction on the expanded Edward St. John Learning and Teaching Center.

4. Approve \$1.7 million in general obligation bonds to renovate and equip Wing 1 of H. J. Patterson.
5. Approve the de-authorization of \$2 million for the Physical Science Complex due to the project being completed.
6. Amend the fiscal 2016 pre-authorization to include the addition of chemistry instruction and related functions.

ZF3300	SECTION 12 University of Maryland, College Park – Edward St. Jon Learning and Teaching Center.....	\$ 0
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Add the following language:

RB22 UNIVERSITY OF MARYLAND, COLLEGE PARK
(Prince George's County)

(A) Edward St. John Learning and Teaching Center. Provide funds to design and construct the new Edward St. John Learning and Teaching Center <u>and construct the addition of chemistry instruction and related functions</u>	42,150,000
	<u>65,650,000</u>

Explanation: Amends the fiscal 2016 authorization to include the addition of chemistry instruction and related functions and increases the pre-authorization by \$23.5 million to \$65.7 million to account for the associated increase in cost related to expanding the Edward St. John Learning and Teaching Center.

7. Amends the fiscal 2017 pre-authorization for Edward St. John Learning and Teaching Center to include the addition of chemistry instruction.

ZF4800	SECTION 13 University of Maryland, College Park – Edward St. John Learning and Teaching Center.....	\$ 0
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Add the following language:

RB22 UNIVERSITY OF MARYLAND, COLLEGE PARK
(Prince George's County)

(A) Edward St. John Learning and Teaching Center. Provided the funds to design and construct the new Edward St. John Learning and Teaching
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Center and construct the addition of chemistry instruction and related functions	2,500,000
	<u>5,100,000</u>

Explanation: Amends the fiscal 2017 pre-authorization to include the addition of chemistry instruction and related functions and increases the pre-authorization by \$2.5 million to \$5.1 million to account for the associated increase in cost related to expanding the Edward St. John Learning and Teaching Center.

Total Reductions/Additions **\$10,000,000**