

(\$ in thousands)

Project Title	Priority Ranking	Funding Source	Project Requests for State Funds		
			2016	2018	2020
Higher Education Asset Preservation and Replacement (HEAPR)	1	GO	\$ 100,000	\$ 100,000	\$ 100,000
Chemistry and Advanced Materials Science Building	2	GO	\$ 27,167	\$ 0	\$ 0
Health Sciences Education Facility	3	GO	\$ 66,667	\$ 0	\$ 0
Plant Growth Research Facility	4	GO	\$ 4,400	\$ 0	\$ 0
Academic and Student Experience Investments	5	GO	\$ 16,000	\$ 0	\$ 0
Pillsbury Hall Renovation	6	GO	\$ 22,000	\$ 0	\$ 0
Total Project Requests			\$ 236,234	\$ 100,000	\$ 100,000
General Obligation Bonds (GO) Total			\$ 236,234	\$ 100,000	\$ 100,000

Higher Education Asset Preservation and Replacement (HEAPR)**AT A GLANCE**

2016 Request Amount:	\$100,000
Priority Ranking:	1
Project Summary:	This request is for funds to renew existing campus facilities and infrastructure in accordance with Minnesota Statutes, section 135A.046.

Project Description

The purpose and use of Higher Education Asset Preservation and Replacement (HEAPR) funds is defined in statute 135A.046 Asset Preservation and Replacement. Funds are intended to preserve and renew existing campus facilities by funding five kinds of projects: Accessibility, Building Systems (e.g. exterior envelope, mechanical, and electrical systems), Energy Efficiency, Health and Safety (e.g. hazardous material abatement, building code compliance), and infrastructure. HEAPR funds are used throughout the University of Minnesota system. Funds are allocated to campuses and research stations based on facility need and overall quantity of space. The University regularly reports on the status of its HEAPR funding to Minnesota Management and Budget and the Legislature.

Project Rationale

HEAPR funds are essential in supporting the teaching, research, and service mission of the University. The University's mission will be compromised without continued, sustained reinvestment in buildings and infrastructure. The University's capital budget principles emphasize investment in existing facilities and infrastructure to extend useful life and to ensure the health, safety, and well-being of building occupants. Individual projects to be funded with HEAPR have been identified and prioritized through the University's Facility Condition Assessment (FCA) process. The FCA is a comprehensive systemwide evaluation of the condition of the University of Minnesota's campus facilities and infrastructure portfolio. FCA data is used to triage existing buildings into those that need long-term investments, those that need short-term investments, and those where no investment is required, in alignment with academic priorities.

HEAPR funds are used throughout the University of Minnesota system and are allocated to campuses and research stations based on facility need and overall space. They are essential in supporting the teaching, research, and service mission of the University. Funds keep people safe and make the campuses accessible for all Minnesotans. The value of the State's past investments is maximized by extending the functionality and useful life of existing buildings. HEAPR dollars are flexible, allowing the University to respond quickly to emergencies and to respond to unique opportunities. Regulatory compliance items, e.g. elevators, storm water and building codes, and other projects that are generally smaller than traditional capital request projects are funded with HEAPR allocations. These projects move faster, put people to work quicker, and provide different firms an opportunity to participate in design and construction at the University. HEAPR projects are green, since renewing an

existing facility is more sustainable than new "green" construction.

Other Considerations

Impact on Agency Operating Budgets

None

Description of Previous Appropriations

The University includes HEAPR in each capital request. The University received \$50 million in 2012, no appropriation in 2013, \$42.5 million in 2014 and no appropriation in 2015.

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Chemistry and Advanced Materials Science Building**AT A GLANCE****2016 Request Amount:** \$27,167**Priority Ranking:** 2**Project Summary:** This request is for funds to design, construct, furnish and equip a new science and engineering laboratory building on the Duluth campus.**Project Description**

This project will construct approximately 58,000 square feet of research laboratories, instructional laboratories, teaching space, offices, and meeting space for the Swenson College of Science and Engineering on the Duluth Campus. The building is conceived as three stories with a mechanical and electrical penthouse. The research laboratory space, consisting of flexible wet and dry labs with adequate utilities, environmental controls and modern safety accommodations, will serve the needs of evolving research and teaching pedagogy.

Project Rationale

The Duluth campus is committed to supporting programs that work to expand the State's Science, Technology, Engineering, and Math (STEM) workforce, in addition to creating an inclusive campus climate through curricula and programs that prepare all students to be successful contributing members of diverse and global communities. Scholarship and research, both basic and applied, are foundations for new discoveries and knowledge, and for economic growth.

The proposed new chemistry and materials science facility will provide much needed new facilities for the Department of Chemistry and Biochemistry and advance an emergent Material Science and Engineering program. The campus has a need for additional upper division or advanced instructional labs in which students receive training on modern instrumental, experimental, and computational techniques. To accomplish this, laboratories need to have both student work spaces and instructional support areas. As new faculty are hired due to retirements in the next 5-10 years, larger and more instrument-rich research programs will be established requiring more research space.

Attracting high quality students in the STEM fields, as well as excellent faculty, who seek a collaborative environment to conduct leading-edge research and teach in interdisciplinary areas, will lead to increased external funding, economic growth and competitiveness, and greater technology- and knowledge- transfer to the state and region. The new research and education programs in material science and engineering will certainly broaden the impact that UMD and the Swenson College of Science and Engineering have on regional and local industries. To achieve these outcomes the campus needs modern laboratory space and rooms with specialized uses (instrument rooms, cold rooms, autoclave room, etc).

The existing Chemistry building was the first building constructed at UMD in 1948, and was not

designed to be dedicated to Chemistry. Utility infrastructure is outdated, frequently in need of repair, and cannot support 21st century science. This building has numerous deficiencies including a lack of adequate eyewashes and showers, lack of chemical storage space, rusty and poorly ventilated under the hood storage, very old and poorly designed labs, lack of adequate wall space for chemical storage cabinets and gas cylinders, lack of adequate supply of wall or bench mounted electrical outlets, and water leaks. In addition, assessments have noted corroded gas lines and gas valves, poor air handling systems, and an elevator which is often out of service. Many of these have the potential to compromise the health and safety of building occupants.

This project will construct approximately 51,000 square feet of research laboratories, instructional laboratories, teaching space, offices, and meeting space for the Swenson College of Science and Engineering on the Duluth Campus. The building is conceived as three stories with a mechanical and electrical penthouse. The research laboratory space, consisting of flexible wet and dry labs with adequate utilities, environmental controls and modern safety accommodations, will serve the needs of evolving research and teaching pedagogy.

Other Considerations

Impact on Agency Operating Budgets

Annual program operating costs for additional faculty and staff are anticipated to increase between \$250,000 and \$350,000. Annual facility operating costs for the new building are estimated to be \$593,688. Operating costs will be offset by additional tuition from increased enrollment and new research funding.

Description of Previous Appropriations

The University received \$1.5 million in 2014 to predesign and design a new facility to meet the research and undergraduate instruction needs of the Swenson College of Science and Engineering on the Duluth campus.

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Health Sciences Education Facility

AT A GLANCE

2016 Request Amount: \$66,667

Priority Ranking: 3

Project Summary: This request is for funds to complete design, renovate, construct, furnish and equip education facilities to meet the needs of the Medical School and Academic Health Center on the Twin Cities campus.

Project Description

This project will renovate, modernize and expand the University’s medical and health sciences learning facilities. Facility planning work funded during the 2015 session is underway and will guide the final facility solution to be presented during the 2016 session. Active learning environments and student-instructor interaction across disciplines, which are the future state of education in academic health, requires different space than what exists today. New education and learning facilities will include classrooms, simulation centers, small group rooms, an advanced technology-rich biomedical library and student services and community amenities.

The legislative and executive commitment in the 2015 session to address aging and obsolete facilities with a major new investment in health education facilities will increase utilization, flexibility and focus on the interdisciplinary approaches will help a renewed vibrant academic clinical environment, innovation and ground-breaking programs.

Project Rationale

The University is home to Minnesota’s only public medical school in addition to health science schools for dentistry, public health, pharmacy, nursing and veterinary medicine. The University’s Academic Health Center (AHC) offers 62 accredited professional degrees, educates 6,400 students, and plays a key role in educating Minnesota’s health care workforce, with two-thirds of the state’s health professionals educated in the AHC. The health of Minnesota families and the economic vitality of the state depend on access to well-trained health providers, innovative health discoveries, quality health care and accessible public health programs.

Today, as Minnesotans live longer and demand for care of an aging population increases and disparities persist in access and in the state’s healthcare workforce, health care requires an interdisciplinary approach to care delivery along a full continuum of primary to specialized care. This change in health care delivery calls for a full integration of health education/training, research, and clinical care. In order to meet future workforce needs, inter-professional and team-based practices should be more integrated into the undergraduate, graduate and post graduate curricula.

Today’s Medical School accreditation at the national level demands the school addresses the new model of care. The educational shift is reflected in a new curriculum, including an early introduction to the care of patients in the first and second year, as well as exposure to the health care "systems" of a

clinic. Meeting these education and training obligations is increasingly difficult in aging and obsolete facilities built for a different era of health education. In order to assure that students and residents are prepared to meet Minnesota's future physician workforce needs investments must be made to strengthen and expand the Medical Center's educational programs and curriculum through the use of interprofessional team-based learning and care environments. Better and more integrated health professional education will lead to improved healthcare for all Minnesotans.

Other Considerations

Impact on Agency Operating Budgets

Description of Previous Appropriations

Minnesota Statutes 2015, section 137.54 provided for an allocation of \$10,000,000 to plan two new facilities - a health sciences education facility and a clinical research facility - and to predesign and start design on the health sciences education facility.

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Plant Growth Research Facility**AT A GLANCE****2016 Request Amount:** \$4,400**Priority Ranking:** 4**Project Summary:** This request for funds to predesign, design, construct, furnish and equip an addition to the plant growth facilities on the St. Paul campus and to demolish the existing Biological Sciences greenhouse.**Project Description**

This project will provide a new approximately 12,000 square foot greenhouse addition to the Plant Growth Facilities for the College of Biological Sciences Conservatory and demolish the existing Biological Sciences Greenhouse on the St. Paul campus. While the existing Plant Growth Facilities are set up for agricultural experimentation, the CBS Conservatory greenhouse will be a specialized unit that serves the related educational missions necessary to ensure the State's agricultural future.

The total cost for this project is estimated to be \$6,600,000. The new greenhouse will be located in the planned expansion area of the Plant Growth Facilities, as identified in the Predesign Study for Plant Growth Facilities Renovation, Replacement and Additions (1997). The new greenhouse will be built similar to the neighboring structures, but will include aspects specific to the plant collection requirements. The greenhouse for the Biological Sciences Conservatory will be furnished with modern temperature, humidity and lighting controls and monitored via the master greenhouse campus control system. Upon completion, plant specimens and program activities currently housed in the existing Biological Sciences Greenhouse will be moved to the new facility and the old greenhouse will be demolished.

Project Rationale

The College of Biological Sciences (CBS) offers an exceptional, nationally recognized educational experience. Replacement of the existing Biological Sciences Greenhouse is essential to meet increased demand for enrollment and to secure a strong return on investment in the rapidly growing life sciences. Today, 33 Faculty, 40 teaching assistants and four support staff teaching 13 courses, depend on the collections and services of the Biological Sciences Greenhouse. The annual enrollment for those courses is more than 1,600 students. The building has a strong outreach function as well, with regular visits from school groups, horticulture clubs, K-12 educators and the broader community.

The University of Minnesota's undergraduate biology program has garnered national attention due to its signature programs (e.g., Nature of Life), its leading edge curriculum, and its pioneering application and use of the active learning classroom. STEM education requires a living plant collection where extremes of diversity and adaptation are displayed and studied across a broad range of environments.

A new and expanded conservatory will remove current constraints to increasing enrollment and enable students to conduct independently designed research. Student interest in the biological sciences is booming across the country. Currently, there are eighteen students who apply for every single seat in the CBS freshman class. Total student enrollment in CBS is anticipated to increase by

up to 40% by the fall of 2018.

The Biological Sciences Conservatory is home to a biodiverse collection of plant species to assist current and future research, help preserve the Earth's plant diversity, as well as building an appreciation for the richness of plant life on our planet in both students and the public. Conservatory staff service the needs of classes, researchers, and the surrounding community through making both our plants and expertise available. The collection is one of the most diverse in the upper Midwestern United States, containing over 1,200 species of plants. The Conservatory cares for everything from rare and endangered plants, to invasive species, to plants that show developing economic potential, to clones of original genome sequenced accessions. The material from this diverse living collection is leveraged for the maximum benefit for our students, scientists, and the public at large.

Through hands-on exposure to living plants within the Biological Sciences Conservatory, students in CBS, CFANS, and other colleges learn how opportunities for discovery and problem solving are rooted in the diversity of life. This education prepares university students to become the next generation of problem solvers in agriculture and food safety, environmental protection and restoration, as well as the production of natural and synthetic products for medical and non-medical uses.

The existing greenhouse is a fragile structure, costly to operate and rife with problems that are expensive to fix. Environmental, structural and functional deficiencies have resulted in escalating maintenance and repair costs, and serious safety issues. Failure of seals around large glass panes allows glass to shift and fall. High humidity levels, resulting in extensive cracking and spalling of the exterior concrete masonry unit kneewalls, and the freeze and thaw cycles have heightened the rate of deterioration of the greenhouse. This facility has the smallest footprint of any like buildings on the St. Paul campus but has the highest energy use and the second highest CO2 emissions. Gaps in the structure's foundation further compromise the plant collections and student projects as a result of insect migration.

Diverse and dynamic greenhouse displays are a highly effective means of communicating the university mission to the broader public. The Biological Sciences Conservatory will demonstrate with living examples how fundamental discoveries are translated into economic and environmental solutions for Minnesota. A new facility will breathe new life into a diverse encyclopedia of rare and spectacular plants by replacing an isolated greenhouse already deteriorated beyond repair with one that is energy efficient and integrated with existing facilities for teaching and research.

Other Considerations

Impact on Agency Operating Budgets

Total annual facility operating costs are expected to be reduced by more than \$90,000 with the completion of this project, including demolition of the existing Biological Sciences Greenhouse. There are no changes expected in personnel costs as the staff currently operating the Biological Sciences Conservatory will continue to maintain the collection without adding staff.

Description of Previous Appropriations

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Academic and Student Experience Investments**AT A GLANCE****2016 Request Amount:** \$16,000**Priority Ranking:** 5**Project Summary:** This request is for funds to predesign, design, renovate, furnish and equip existing teaching, student support and research facilities on the Duluth, Morris, Crookston and Twin Cities campus.**Project Description**

This request is for funds to make targeted strategic investments in modernizing existing teaching, research, outreach and student support spaces on the University's Duluth, Morris, Crookston and Twin Cities campuses. Similar to appropriations for laboratory renovations in 2008 and 2010, this request is intended to update individual spaces that will not otherwise be improved through whole building renovations. Funds will be allocated to each campus to advance high priority projects focused on learning spaces, student support services and research laboratories.

Sample projects include:

- Renovation of obsolete biological sciences library space into modern laboratories
- Creation of new active learning classrooms, traditional classrooms, and small group study spaces
- Conversion of underutilized space into modern teaching and research space

Project Rationale

Learning spaces are at the heart of the University's teaching mission. To meet the needs of faculty and the expectations of students, the University must provide modern, technology-rich classrooms in order to optimize teaching and learning. Improved, up-to-date classrooms, instructional laboratories, and collaboration spaces are essential to attract the best and brightest students and remain competitive with other regional universities. The overall student experience at the University of Minnesota will be improved by enhancing the physical environment and adding modern classroom learning technologies.

Active Learning Classrooms (ALCs), a component of the programmatic request, are designed to foster interactive, flexible, student-centered learning experiences, and to operate using central teaching stations and student-provided laptops. ALCs offer cooperative learning environments that encourage student collaboration and peer teaching, the ability for instructors to interactively coach students during activities and new options for student interaction and class structure.

Modern research facilities are essential to the University's nationally-ranked basic and applied research programs. Research funding and national competitiveness depend upon an institution's researchers, and state-of-the-art laboratories are the foundation of the solid research program at the University of Minnesota. Updated facilities are critical to attract and retain top faculty and students and to obtain competitively awarded sponsored research grants. Without state-of-the-art laboratories

in which to conduct their research, faculty will choose other institutions with better facilities.

Other Considerations

Impact on Agency Operating Budgets

Description of Previous Appropriations

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Pillsbury Hall Renovation**AT A GLANCE****2016 Request Amount:** \$22,000**Priority Ranking:** 6**Project Summary:** This request is for funds to predesign, design, renovate, furnish and equip historic Pillsbury Hall on the Minneapolis campus.**Project Description**

This project will completely renovate Pillsbury Hall, replacing obsolete science facilities with modern, flexible non-laboratory teaching, learning, and research spaces for College of Liberal Arts' humanities programs including the Department of English (which teaches nearly 6,000 students per year). The renovated space is anticipated to be divided approximately equally between classroom- and assembly-type space to support multiple modes of learning and alternative workplace office space. At nearly 60,000 gross square feet, the renovation is expected to maintain an equivalent amount of space when complete. The rehabilitation of Pillsbury Hall is expected to be consistent with the Secretary of the Interior's Standards for Preservation.

Project Rationale

Pillsbury Hall is the second oldest and one of the most iconic building on campus and is a key component of a sequenced plan: (1) relocating the Department of Physics from Tate Laboratory to its new building, (2) relocating the Department of Earth Sciences (formerly Geology and Geophysics) from Pillsbury Hall to a renovated Tate Laboratory, (3) relocating the Department of English from Lind Hall to a renovated Pillsbury Hall, and (4) freeing up Lind Hall for other use.

While Pillsbury Hall is no longer adaptable to modern science research or teaching, it plays a significant role in the East Bank humanities district, which encompasses Folwell, Jones, Nicholson, Nolte, Pillsbury and Scott halls. Recent and planned investments in these buildings all built between 1889 and 1935 on the historic knoll – locate the humanities in proximity, thus creating synergies and collaborations among them, while preserving the University's historic assets for future generations. The renovated Pillsbury Hall is planned to house the Department of English (as the major tenant) and the College of Liberal Arts Minnesota Engagement Lab, focused on research teaching and public service.

English teaches nearly 6,000 students per year, generating about 20,000 student credit hours of non-English major instruction each year and teaching the core skills of liberal education – close reading, textual analysis, and scholarly and creative writing to the entire undergraduate student body. In 2014, English had 627 undergraduate majors, 36 MFA students in the Creative Writing Program, and 77 MA/PhD students in the Literature Program. It is the most popular humanities major on campus with high national rankings.

The new Pillsbury Hall will also be home to the Minnesota Engagement Lab (MEL). MEL is planned to be an innovative and technologically equipped humanities engagement lab where scholars, students, and community members will address challenges facing Minnesota citizens through focused projects,

such as rural and urban access to food resources, histories of Minnesota immigrant institutions and neighborhoods, and literature and literacy services to communities. The high-tech interactive spaces will advance the University's and CLA's goals of integrating research, teaching, and public service about the human condition, producing future leaders who will use the knowledge, skills, and collaboration they learned here to build vibrant communities.

The other feature of Pillsbury Hall will be spaces for production and presentation activities. Production spaces will be equipped with technologies that enable journal editing, video making, digital storytelling, website building, and web-based research. Flexible presentation spaces will host a wide variety of events convened annually by English and other humanities departments.

Other Considerations

Impact on Agency Operating Budgets

The annual operating cost for the renovated facility is anticipated to increase approximately \$70,000 over the cost to operate the current facility.

Description of Previous Appropriations

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