Fall 2017

Fiscal Year 2019 Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted by:

MICHIGAN STATE UNIVERSITY

MICHIGAN STATE
UNIVERSITY

October 30, 2017

Mr. Alton Pscholka
State Budget Director
State Budget Office
State of Michigan
Lansing, Michigan 48909

Dear Mr. Pscholka,

In accordance with the State Budget Office instructions, an update of Michigan State University's Five-Year Capital Plan and SFY2019 Capital Outlay request, Appendix G, is posted at the following institutional website: https://opb.msu.edu/info-insight.html. The SFY2019 Capital Outlay request has also been submitted via SIGMA as instructed by your office. The Five-Year Capital Planning document follows from your instructions and the academic direction of the university.

While an expanded list of capital investment needs are noted in our Five-Year Capital Plan, construction of the ***STEM Teaching and Learning Facility*** continues as our ***top priority*** for a funding partnership with the State. We sincerely appreciate the recent planning appropriation, Public Act 107 of 2017, for the STEM Teaching and Learning Facility, and anticipate submitting the necessary planning documents in early 2017 for construction funding consideration.

The STEM Teaching and Learning facility will allow us to properly support the approximate 40 percent increase in STEM student credit hours, over the past ten years. It will also facilitate the bringing together of currently dispersed and outdated instructional teaching laboratories and related instructional and support spaces to create a hub for STEM education. The new facility will support the developing and evolving curriculums and teaching methods associated with STEM, and provide opportunities for continued research in STEM education. It will leverage interdisciplinary learning with goals to improve recruitment, retention and student success, and graduate individuals that are prepared to contribute to society and support economic development in the state and beyond.

In reviewing the university's 5-Year Capital Outlay plan, you will see that the projects support programs that have strong national reputations, expanding research bases, and high enrollment demand that will advance the university and sustain its contributions to Michigan. Emphasis is placed on construction and renovation of facilities that focus on supporting current and future programmatic initiatives with an emphasis in science, technology, engineering and mathematics, including biomedical, biological and engineering sciences; computation and data sciences; water and energy. We believe that investment in these critical resources will achieve advancements in engineering and the sciences, support and facilitate innovation; interdisciplinary learning, and research collaborations, and pay dividends now and in the long term, both economically and intellectually for the citizens of Michigan and beyond.

We remain committed to Michigan businesses, students, and families, and continue to be a critical partner in advancing Michigan's economic transformation.

Sincerely,

Satish Udpa

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Preface

The Capital Planning Framework and the Campus Land Use Master Plan guide Michigan State University's capital planning. The Capital Planning Framework integrates academic, support, human resources, fiscal, and facility infrastructure planning and informs the Campus Land Use Master Plan. This Plan provides a flexible framework for guiding the physical organization of the MSU campus, and includes overarching campus planning principles, specific system recommendations, the University Zoning Ordinance; and works in concert with other planning frameworks such as utilities and infrastructure, energy conservation, and mobility. Institutional participation in the planning process ensures consideration is given to relevant issues and that decisions reflect the fundamental mission and direction of the university.

The planning process includes near to long-term strategy development to ensure the university has the space and facility resources necessary to carry out its mission. This is accomplished within the context of continuing to identify ways to best utilize our resources of people, dollars, and space. Strategy development takes into consideration internal and external challenges and opportunities, the capacity to be flexible and nimble allowing for responsiveness to new opportunities, and the dynamic and evolving nature of higher education.

The following *Capital Planning Principles* are guided by the *Core Values* of the university: Quality, Inclusiveness, and Connectivity and the six imperatives of the *Bolder by Design* strategic framework: Enhance the Student Experience; Enrich Community, Economic, and Family Life; Expand International Reach; Increase Research Opportunities; Strengthen Stewardship; and Advance our Culture of High Performance.

Guiding Principles and Overarching Goals

- *Create an Environment that Supports Research, Innovation, and Scholarship* – MSU continues to ensure that research programs grow, providing an impetus for economic development and graduate education while creating a culture of innovation and creativity that advances the University's international competitiveness. Intention-based research is central to MSU's mission. Thus, MSU must provide state-of-the-art facilities and infrastructure that will help attract and retain top-quality faculty and researchers and provide the necessary tools to continue to be competitive now and well into the future.

- *Create an Environment that Supports Teaching, Learning and Student Success* – MSU is committed to providing world-class opportunities for success and to making those opportunities available to a broad spectrum of talented students from across Michigan and around the world. MSU provides increasingly diverse learning experiences that blend the theoretical with the practical. The educational experience is focused on preparing "T-shaped" graduates who are prepared not just for their first job, but for a lifelong career. The approach to teaching has become more interactive across all disciplines. There is active promotion and use of technology-enabled teaching/learning models as well as an initiative to provide facilities that support evolving pedagogies including student-centered and collaborative learning.
- *Create an Environment that Supports Safety, Security, and Health and Wellness* – MSU will advance its commitment to fostering a healthier, more diverse and inclusive community by developing and sustaining a campus environment that encourages and cultivates health, wellness, and resilience among its students, staff, and faculty.
- *Create an Environment that Supports Stewardship, Sustainability, and a High Performing Culture* – New construction and renovation of existing facilities are planned so a project's financial investment actively reflects the life cycle of the facility in relation to the needs of the program, while providing flexibility in the structure to accommodate potential changes over time. Emphasis is placed on strategic allocation of space to meet program objectives, inclusive design, accessibility, integration of technology, and energy conservation. Attention is given to creating places that are welcoming, inspiring, promote the exchange of ideas, and enhance the Spartan Experience.

I. Mission Statement

For more than 160 years, Michigan State University has been advancing knowledge and transforming lives through high-impact, innovative teaching, research, and outreach initiatives. Today, as it continues to help students become responsible, knowledgeable, and productive citizens, MSU is a major public research university with global reach and extraordinary impact.

We are an inclusive, academic community known for our traditionally strong academic disciplines and professional programs, and our liberal arts foundation. Our cross- and interdisciplinary enterprises connect the sciences, humanities, and professions in practical, sustainable, and innovative ways to address society's rapidly changing needs.

As a public, research-intensive, land-grant university, funded in part by the State of Michigan, our mission is to advance knowledge and transform lives by:

- providing outstanding undergraduate, graduate, and professional education to promising, qualified students in order to prepare them to contribute fully to society as globally engaged citizen leaders
- conducting research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and make a positive difference, both locally and globally
- advancing outreach, engagement, and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities, at home and around the world.[1]

Since the mid-1960's, MSU has been recognized as a top academic institution and is a member of the prestigious Association of American Universities, consisting of a group of elite research universities in the United States and Canada. MSU is one of only 20 public land-grant universities with membership in the Association of American Universities. MSU's success is further evidenced by its consistent inclusion among the top 100 universities in the world and in its acclaimed programs with 35 featured in the top 25 nationally, including eight rated number one.

In 2005, at the launch of our 150th Anniversary, we made a commitment to be recognized worldwide as the leading land-grant research university in the nation. This commitment was framed in our Boldness by Design strategy. Beginning in 2012, we refined and expanded this framework to refresh our strategic vision, now articulated as Bolder by Design. At the heart of Bolder by Design is the original five imperatives of Boldness by Design, plus a sixth one that reflects the urgency and acceleration demanded by today's higher education environment. This sixth imperative applies to all five imperatives and every area of our mission providing high-impact, high-value results, experiences, and services. Together, we will focus and excel in:

- Enhancing the student experience
- Enriching community, economic, and family life
- Expanding international reach
- Increasing research opportunities
- Strengthening stewardship
- Advancing our culture of high performance

In addition, we continuously re-affirm our commitment to the land-grant movement through: **access** to a quality post-secondary education; **inclusion,** not only of diverse populations, but of practical, applied knowledge with the classics throughout the curriculum; and **connectivity** with society to disseminate knowledge widely to meet the needs of individuals, communities and the world at large.

[1] See http://president.msu.edu/advancing-msu/msu-mission-statement.html

Since 2005, we have made great progress despite pressing constraints. MSU's design was never just about survival but rather resilience, and we have achieved it, sparking innovation in every area of our enterprise during a time when many individuals, communities, and organizations have been held at a standstill. Whether through job-creating innovations and life-saving research or world-class education and talent development, MSU's full impact is often immeasurable, but can be quantified in one sense with an annual economic impact of more than $5 billion. Additionally, in 2016, MSU's Translational Research and Commercialization Program was designated as an "innovation hub," the first university in the state to receive such a designation. This designation is recognition of the years of successful work in the areas of technology transfer, start-up support, and a portfolio of dedicated business and community partnerships.

MSU continues to ensure that research programs grow, providing an impetus for economic development while creating a culture of innovation and creativity that maintains the University's international competitiveness. MSU is a leader in creating knowledge for the 21st century, receiving in excess of $600 million in sponsored awards annually, focused in areas such as food systems; plant sciences; health sciences; computational sciences emphasizing biology and food/food-chain; and population and the environment, including food, water, and energy. To enhance these efforts and maintain its position as a world-class research university, in 2014 MSU committed to hiring approximately 100 additional faculty members over the five-year period of 2015-2020, with approximately 65 hired to date. These faculty are being hired in some of the highest demand disciplines and research areas to help accelerate finding solutions to the world's "Grand Challenges" in areas including: computation (aka "Big Data"), advanced engineering, cybersecurity, genomics, plant sciences, antibiotic resistance, and precision medicine.

Our value proposition is to make high-quality education accessible to qualified students, ensuring access and investing in Michigan's future. MSU is consistently ranked as one of the top institutions nationally for internationalization while also enrolling a larger percentage of resident students than Big Ten peers. MSU enrolls more Michigan students than any public university in the state. In fact, MSU's approximately 75 percent resident undergraduate population exceeds the Big Ten average by 10 percent, making it among the most home-state centric in the conference. MSU reaches individuals from 82 counties in Michigan, all 50 states in the United States, and more than 130 countries. In an ongoing effort to uphold its commitment to access, MSU has established strong and substantial financial aid programs to assure student access to high-quality MSU programs. MSU routinely enrolls in excess of 8,500 Pell Grant recipients, representing approximately 22 percent of the undergraduate population while at the same time keeping both the average debt amount and the proportion of students graduating with debt below state and national averages. MSU administers in excess of $680 million in financial aid annually, with more than 59 percent of students receiving some form of aid. Budgetary increases to financial aid routinely outpace increases to tuition as MSU carefully monitors family income distribution, financial aid

distribution, debt measures, and other financial aid metrics. The result of our dedication to access and careful stewardship is only 43 percent of undergraduates leave MSU with debt, significantly less than the national average of 68 percent.

MSU is committed to creating a national model for student success with particular emphasis on closing the opportunity gaps for lower-income, first-generation, and underrepresented minority student populations. Additionally, we remain focused on helping students reduce the time to and cost of their degree. The Go Green Go 15 initiative is one way we are tackling these challenges, seeking to create higher rates of credit momentum (i.e., enrolling in 15 credits per semester) among our students that strongly correlates to higher levels of student academic success. This initiative is simply the latest in a comprehensive set of projects under the university's Student Success Collaborative focused on delivering high quality educational experiences for all students.

MSU provides diverse learning experiences that blend the theoretical with the practical, combines curricular and co-curricular experiences, and instills an entrepreneurial mindset in its students. Student learning experiences include study abroad, hands-on research engagement, service learning, internships, co-ops, field placement, student teaching, and clinical placement during their degree program. All complement a variety of classroom experiences to provide rich learning opportunities. The entrepreneurial ethos fits hand-in-glove with our progressive pedagogy and overall approach to developing "citizen scholars" and what we and our partners at IBM call "T-shaped" scholars: students who are prepared for real-world careers demanding both technical and disciplinary expertise along with connective soft skills. Curricular and co-curricular experiences aim to help students develop both deep knowledge within a specific content area as well as a broad set of skills across content areas focused on critical thinking, analytical reasoning, and communication.

To ensure MSU remains at the forefront of innovation, we launched the Hub for Innovation in Learning and Technology (The Hub) in 2015 to create and accelerate new ways to collaborate, learn, research, and deliver instruction. Ongoing projects include launching a cohort-based, interdisciplinary learning experience for first year students, linking math, arts and humanities, social science, and biological courses in a themed sequence to create a common intellectual experience for students. Additionally, MSU continues to enhance its offerings to students interested in entrepreneurship. MSU's entrepreneurship minor, launched in spring 2016, is adding a new track focused on social innovation.

Our collective efforts aimed to enhancing the student experience has resulted in MSU's graduation rate exceeding the *U.S. News and World Report* predicted graduation rate by 10 percentage points. Additionally, more than 90% of MSU graduates are employed or continuing their education within nine months of graduation, 10 percent above the national average. Further, MSU's efforts have been recognized nationally. MSU is ranked 30th by Money Magazine based upon the combination of educational quality, affordability, and alumni success, placing

us higher than all but three Big Ten universities and ahead of such institutions as the University of Chicago, Cornell, Duke, and Dartmouth. We are also extremely proud to be ranked as the nation's top public research university in the student engagement category of the first-ever *Wall Street Journal/Times Higher Education* college ranking.

MSU fulfills the mission of the Morrill Act in the 21st century by taking the best of Michigan to the world and bringing the best of the world to Michigan. Thinking globally has always been a priority at MSU. MSU ranks seventh in the nation for study abroad participation and ranks eleventh in the country (first in Michigan) for international student enrollment. MSU's international student population contributes more than $300 million to the Greater Lansing economy. More than 1,400 faculty members are involved in international research, teaching, and service projects and programs, and MSU maintains partnerships with more than 300 international institutions in 80 countries. We continue to expand our reach around the globe through:

- The Alliance for African Partnership is a new initiative at MSU that will develop a collaborative and cross-disciplinary platform for addressing today's global challenges. The Alliance is developing new models of engagement for shared research while enhancing the resources and capacities of African universities, institutions, and scholars. Formally launched in May 2016 this alliance builds off MSU's longstanding work in Africa and will serve as a model for Africa-led partnerships, cross-disciplinary research, and applying science and the humanities to development challenges.
- More than 170 faculty across 65 departments are engaged in projects and programs in Latin America and the Caribbean, ranging from study abroad opportunities for undergraduates to research projects in agriculture, health, and engineering. Programs include MSU's College of Osteopathic Medicine annual trip to Peru to work with Peruvian physicians and researchers and an agreement signed in 2016 between MSU and Mexico's Council of Science and Technology that will fund Mexican students to pursue Masters and PhD studies at MSU.
- MSU plays a leading role in the federal government's Feed the Future initiative to help fight global hunger and poverty and create sustainable and safe agricultural opportunities in developing countries. A few examples of MSU's work in this area include a $10 million grant from the U.S. Agency for International Development (USAID) to lead the Feed the Future Innovation Lab for Food Security Policy. This is a partnership with the International Food Policy Research Institute in Washington, D.C. and South Africa's University of Pretoria; a $16.3 million federal grant from the Borlaug Higher Education Agricultural Research and Development program to train a new generation of agricultural scientists in developing countries; and a $5.8 million USAID grant to improve potato production in Bangladesh and Indonesia.

- A partnership with The MasterCard Foundation brings academically talented and economically disadvantaged youth in Sub-Saharan Africa to MSU to pursue undergraduate and graduate studies at MSU. This $45 million award is an acknowledgment of MSU's more than fifty-year history of engagement and partnership with Africa.

  Additionally, The MasterCard Foundation began a five-year $13 million collaboration with MSU in 2017 to help 15,000 young people access employment and entrepreneurship opportunities in the fast-growing horticulture, aquaculture, poultry, cassava and oilseed sectors in Tanzania and Nigeria. The partnership, the AgriFood Youth Opportunity Lab, will focus on youth ages 18 to 24 and will assist economically disadvantaged, hard-to-reach, and out-of-school youth transition into employment and entrepreneurship opportunities in the agrifood system.

Michigan State University is committed to providing world-class opportunities for success and to making those opportunities available to a broad spectrum of talented students from across Michigan and around the world. The institution manages its resources as effectively as possible to ensure that it continues to provide an education that allows graduates to take on leadership roles in the 21st century and be a successful "citizen scholar."

II. Instructional Program and Structural Needs

As one of 62 members of the prestigious Association of American Universities, a Carnegie Research University (highest research activity) institution, and Michigan's land-grant university, Michigan State is dedicated to reflecting its mission in its instructional offerings.

The continuing high quality of MSU's educational offerings has led to a steady increase in demand from students in Michigan and around the world. Indicators of this increased demand include:

- Received 36,143 first time undergraduate applications this year. Total enrollment for fall 2017 is 50,019.
- Median high school grade point average (GPA) of entering students is 3.74 and median ACT score of 26. Both reflect an increase over the past ten years.
- MSU experienced its second highest number of applications, resulting in a fall 2017 entering undergraduate class of 8,108 students, and includes 1,751 students of color and 981 international students.
- Total graduate enrollment, including graduate professional students, is expected to approximate 11,023, of which 1,838 are new graduate masters and PhD students and 585 are new graduate-professional students.

- MSU continues to have an outstanding record of students earning prestigious national and international scholarships. MSU has produced 17 Rhodes Scholars, 43 Goldwater Scholars, 38 Boren Scholars, 20 Churchill Scholars, 18 Marshall Scholars, 16 Truman Scholars, 12 Udall Scholars, and 9 Presidential Fellows.

Michigan State offers more than 200 programs of study, many of them nationally ranked, to meet the needs of Michigan citizens and students from across the country and around the world. MSU's undergraduate Supply Chain Management Program ranks #1 and the Broad College of Business is ranked 14th among public universities for undergraduate business programs according to *U.S. News & World Report*. Seven MSU graduate programs: nuclear physics, organizational psychology, elementary education, secondary education, rehabilitation counseling, African history, and supply chain/logistics are ranked #1 nationally by *U.S. News & World Report*. In addition, *U.S News* mentions MSU for having outstanding learning communities, study abroad, service learning, and undergraduate research programs.

To ensure MSU remains a best value for students and other stakeholders, the university monitors its standing against relevant regional, national, and international peers. Areas of importance include academic quality, efficiency and value, affordability and access, and economic impact. To remain competitive, MSU must be an effective steward of its resources. As an operational baseline, in addition to targeted reductions, MSU imposes a one percent funding reduction annually on all units to encourage operating efficiency and create resources to invest in new initiatives. With resources focused on mission-centric areas of the institution, MSU continues to preserve its academic rigor with a competitive student-faculty ratio (17:1) that is consistent with the Big Ten public universities' average. Major initiatives supported through strategic investments include restructuring the student services model, including the implementation of student success-focused campus neighborhoods, and a five-year re-design of the university's biology curriculum, which impacts thousands of students yearly. Further investments include: expansion of our medical colleges' programs, including developing deeper ties in Flint, Grand Rapids, and metro Detroit along with East Lansing-based programs; creation of two new academic departments - Computational Mathematics, Science and Engineering and Biomedical Engineering; and opening two new institutes - Institute for Quantitative Health Science and Engineering and the Plant Resilience Institute.

As we maintain and enhance the academic quality of our program offerings, we must also be vigilant about the quality, flexibility, and expansion needed for our academic and instructional space. Intention-based research is central to MSU's mission and to building a mid-Michigan "talent center" as is providing learning opportunities that take place in and outside of the classroom and employ progressive pedagogy. MSU must provide state-of-the-art facilities and infrastructure that will help attract and retain top-quality students, faculty, and researchers. This is vital to remaining competitive in key fields, both nationally and

internationally. Through entrepreneurship and a systems approach, MSU research moves rapidly from classrooms and laboratories to create new products, new industries, and new jobs. Examples of facilities that are attracting researchers and professionals include:

- In August 2017, construction began on the new Interdisciplinary Science and Technology Building, with an anticipated opening in fall 2019. This $100 million, approximate 170,000 square-foot facility will be crucial in attracting top researchers and in landing multidisciplinary grants from the National Science Foundation and the National Institutes of Health. The building's five stories will comprise wet bench laboratories, computational research space, offices, and collaborative space, including areas for shared equipment. Its location, adjacent to the Bioengineering and Life Science buildings and other core research facilities on campus, will allow the new facility to play an integral role in MSU's development of a neighborhood of scientific research in the biomedical and biological sciences.
- MSU celebrated the opening of the new Bio Engineering Facility in October 2016. This approximate 130,000 square-foot facility is a key component in the expansion of biomedical engineering research at MSU. It is home to the new Institute for Quantitative Health Science and Engineering and the Department of Biomedical Engineering, bringing together researchers from the College of Engineering, the College of Human Medicine, and the College of Natural Science. This facility represents MSU's commitment to research i
- n the life sciences and engineering and the power of this combination to improve human health. The research areas range from computational genomics, nanotechnology, robotics, tissue engineering, and imaging, among others. Collectively, MSU will hire 40-50 faculty researchers across these areas over the next four years.

  The Bio Engineering Facility is also reflective of our partnership with the State of Michigan to provide opportunities to educate, innovate, train, and develop the next generation of scientists, thought leaders, and entrepreneurs, while creating a transformational bio-based economy that will have positive impact for years to come. The laboratory space is designed to integrate wet bench experiments and computational analysis to allow a systems approach to biomedical research in an open floor plan that supports collaboration.
- This fall (2017), the MSU Grand Rapids Research Center opened. The $88.1 million, six-story, approximate 160,000 square-foot facility includes research program spaces and five core labs that will benefit MSU College of Human Medicine scientists, researchers, and students, as well as partnering institutions. The need for biomedical research space in Grand Rapids is crucial to support the projected growth of MSU and its NIH-funded research portfolios, including the research arm of the College of Human Medicine. This center will serve a crucial role in research teams finding

answers in autism, inflammation, transplantation, cancer, genetics, pediatric neurology, Parkinson's disease, Alzheimer's disease, women's health, and reproductive medicine, among other critical health areas. This facility will house over 20 research teams by the end of 2017.

- In May 2017, MSU broke ground on a $5.4 million Food Processing and Innovation Center (FPIC). When the center opens in December 2017, it will serve as a place for established companies to create and commercialize vibrant new food products. The FPIC project is largely funded through the Economic Development Administration of the United States Department of Commerce with matching funds from the Michigan Economic Development Corporation, Michigan Department of Agriculture and Rural Development, MSU Extension, and MSU AgBioResearch. The goal of FPIC is to increase economic activity and jobs created by the expansion of food processing and manufacturing companies. Private companies can use modern, flexible equipment to commercialize and scale up new food products and production processes at a lower cost and lower risk within the FPIC facility than they could on their own.
- Demonstrating the breadth of programs and people at Michigan State are two significant facilities projects in our professional programs. In September 2017, the Eli Broad College of Business broke ground on its $60 million Business Pavilion, which will house undergraduate and graduate programs. The Pavilion represents the next phase of higher education and is designed around spaces dedicated to collaboration, teamwork, sustainability, and state-of-the-art technology. Planning is also underway for a major new addition and facility renovations for the College of Music. Preliminary plans detail a $35 million project that includes a 35,000 square-foot expansion and 8,500 square feet of renovated space.

MSU's faculty bring in significant new grants for far-reaching projects. Most have substantial implications for lab space, equipment, and facilities. Examples include:

- In 2009, MSU's National Superconducting Laboratory was awarded the Department of Energy federal science project in nuclear research titled: Facility for Rare Isotope Beams (FRIB). FRIB will be a new U.S. Department of Energy Office of Science national user facility for nuclear science research. The centerpiece of the new user facility will be a superconducting linear accelerator that will increase dramatically the reach of rare isotope research in the United States. The accelerator will produce isotopes that normally exist only in the most extreme environments in the universe and will expand the usefulness of isotopes in a broad range of applications from modeling stars to understanding the workings of nanoscale electronic devices.

  FRIB is an important project for American science and the State. It not only will keep MSU on the cutting edge of nuclear science, but will also ensure the training of the nuclear scientists of tomorrow while bolstering the economies of mid-Michigan and the entire State. FRIB will cost $730 million

to design and build. In FY14, the State made a commitment to bond and service the community cost share of $94.5 million. Construction began in 2012 and will be completed by 2022. It is projected to create hundreds of jobs in mid-Michigan while bringing in more than $4.4 billion of economic activity to Michigan in the next 20 years. MSU looks forward to continuing its partnership with the State of Michigan to assure the successful completion of this project.

- MSU AgBioResearch encompasses the work of more than 330 scientists in seven colleges with grants in excess of $92 million. These researchers, in on-campus laboratories and at 13 outlying research centers across the state, investigate topics that range from agricultural production, alternative energy and biofuel production, food safety and environmental stewardship to childhood obesity, community development, and the quality of life of Michigan youth and families.
- MSU is a lead contributor to the research and development of autonomous vehicles through a project known as CANVAS (Connected and Autonomous Networked Vehicles for Active Safety). Scientists are focusing their energy on key areas, including: recognition and tracking objects such as pedestrians or other vehicles, fusion of data captured by radars and cameras, artificial intelligence algorithms that allow an autonomous vehicle to maneuver in its environment, and computer software to control the vehicle. MSU recently acquired a car that is equipped with a series of radars and LIDARs (laser radar), cameras, and accompanying software that will be housed and tested on the MSU campus, requiring the requisite space to simulate activity in a realistic but safe environment.
- MSU is partnering with seven other top-tier research universities through the smaRt Institute, part of the National Network for Manufacturing Innovation. The smaRt Institute will cultivate a portfolio of projects focused on reducing the embedded energy in manufactured products through technological advances and new processes that consider the entire lifecycle of the manufacture and reuse system. The institute will focus on four categories of materials - metals, plastics, fibrous materials, and e-waste. Transformative and novel technologies developed by industry, universities, and research centers will be employed to tackle critical issues associated with recycling, reusing, and remanufacturing products. The institute will tackle cross-cutting challenges related to clean manufacturing, and those associated with improving the efficiency of the manufacturing sector.
- The MSU Fraunhofer Center for Coatings and Diamond Technologies is expanding with an investment by MSU and corporate partner Fraunhofer USA. The investment will include a building addition with an estimated cost of $6.7 million. The building addition will allow the number of scientists to double from approximately 30 to 60 once complete. The lab focuses on thin-film coatings and growing diamonds for industrial purposes in the areas of

manufacturing and automobiles. The expanded center is expected to generate $7 million in research revenues annually.

- MSU's new Plant Resilience Institute will work to meet the challenge of needing to double agricultural production by 2050 to feed the world's growing population. The institute will conduct fundamental research to identify mechanisms that contribute to plant resilience and impact plant productivity. Research will include understanding how plants cope with environmental conditions associated with climate change.
- In 2015, the National Science Foundation renewed funding for MSU's BEACON Center for the Study of Evolution in Action. The renewal is for another five years at $22.5 million. BEACON researchers have provided insights into the evolution of disease, reducing the evolution of antibiotic resistance and predicting how populations of organisms respond to climate change. Overall, BEACON researchers have published more than 565 peer-reviewed papers and written proposals that have netted nearly $47 million in external funds. BEACON is headquartered at MSU with partners including the University of Idaho, North Carolina A&T State University, University of Texas Austin, and University of Washington.
- MSU, along with the University of Michigan and Wayne State University, will receive $9 million over the next five years as part of a new statewide center dedicated to understanding the treatment of Alzheimer's disease and related dementia, with funding coming from the U.S. National Institutes of Health.
- MSU and the University of Wisconsin-Madison are partnering in the Great Lakes Bioenergy Research Center with $125 million in funding from the U.S. Department of Energy, focusing on the conversion of plant biomass to bioenergy.
- MSU is the leader in a research project funded by a $10 million grant from the U.S. Environmental Protection Agency and the Department of Homeland Security to create the Center for Advancing Microbial Risk Assessment, a consortium of scientists from seven universities with expertise in quantitative microbial risk assessment methods, biosecurity, and infectious disease transmission through environmental exposure.
- MSU's many externally-funded research projects to improve the health of our population include a five-year $4.15 million grant to examine how a high-fat diet interacts with a common chemical found in sunscreen and what effect it has on breast cancer risk, and a $5.67 million grant to study mild cognitive impairment, considered a precursor to Alzheimer's among Latinos and Hispanics. Further, MSU maintains federal grants totaling more than $2 million to initiate subspecialty fellowships in gynecology, oncology, and maternal fetal medicine.

Our continued success in meeting our value proposition of high quality programs with access to qualified students demands that we continue to provide high quality, collaborative, flexible, technology enabled and expanded academic and instructional spaces. These teaching and learning environments need to support emerging pedagogies including those that support development of the "T-shaped" scholar, curriculum revisions, student-centered, collaborative learning, and self-guided learning. The learning environments coupled with the changing pedagogies and curriculums provide opportunities for research on and leadership in instructional methods and foster innovation through a technology-rich environment.

The approach to teaching has become more interactive across all disciplines, and the use of instructional technology has changed significantly what faculty and students accomplish in classrooms, teaching labs, and informal learning environments. All areas of research, instruction, and outreach incorporate technology and the underlying infrastructure that makes them possible. There is active promotion and use of technology-enabled teaching/learning models for on-campus and off-campus students, as well as an initiative to provide facilities that support evolving pedagogies including student-centered and collaborative learning. Over 100 university classrooms have been updated to support active learning principles and emerging technology through movable furniture solutions and/or technology to facilitate the exchange of ideas and collaborative interactions that are essential to engaged learning and facilitating student success. Quality support services, such as libraries, technology integration, specialized labs, field stations, clinics, informal learning areas, and state-of-the-art equipment also need to be sustained at a level commensurate with support of nationally competitive research and scholarship efforts that are consistent with instructional goals. The convergence of these factors calls for increased investment in the facilities and equipment that support these developments. It also calls for the creation of new learning environments that support the significant increase in STEM student credit hours and our commitment to educate, train, and graduate more students in STEM.

As a result of these many factors, MSU has examined the capital assets necessary to support academic programs and identified needs that involve new construction, comprehensive renewal, renovation, reprogramming of selected facilities, and renewal of major subsystems in other facilities.

The institution's assessment of existing facilities shows that the infrastructure components of many campus buildings have aged significantly. Despite ongoing maintenance and repair, which in most cases has extended the expected usable life of components well beyond the industry standard, many buildings are now at a point where they require significant investment or may need to be replaced.[2]

The demands placed upon building systems by updated building codes and more sophisticated programs, many of which are equipment and ventilation-intensive,

[2] See Appendix C: Map of Campus Buildings by Age.

have resulted in facilities that act as a barrier rather than a support to program success. For example, higher environmental protection and safety standards place pressure on day-to-day maintenance and in some cases exceed the capacity of particular systems.

The proliferation and advancements in technology across disciplines requires updating of data resources and distribution systems. The configuration of older building spaces limits the efficient use of the areas available to programs and can hinder collaboration and interactions, which is increasingly important in today's learning, research, and work environments. Increasingly complicated and environmentally sensitive equipment places higher demands on power for operating and climate control for proper functioning.

In summary, new construction is necessary to provide facility capacity, improve quality, and align infrastructure and programmatic needs for both instruction and research. This is especially true when current facilities are either too costly to renovate compared to the benefits realized and/or inadequate in the amount of space provided.

The needs for existing facilities include repairing and replacing internal building systems, such as electrical, plumbing, mechanical, and structural renewal; reworking interiors to increase the utilization and functionality of the space; and attending to the building envelope in order to maintain the integrity of the building. In some cases, the improvements are needed for only selected aspects of a facility; in others, total renovation and/or replacement of the building is warranted.

Following a very detailed and carefully conceived master planning process, it was estimated that the University would need a 10 percent increase in building space over the next 20 years. The growth in space is driven by a planned increase in the number of faculty and increase in funded scientific research, new academic programs, increased enrollments, selective and qualitative changes in academic teaching programs, the enhancement of common facilities that enrich campus life and the sense of community, and the consolidation and upgrading of operational support facilities.

III. Staffing and Enrollment

For 2017, fall enrollment at Michigan State University totaled 50,019. These numbers represent careful and deliberate enrollment management in an effort to maintain academic quality and to continue to provide the optimal classroom and laboratory environments for all students. 71% percent of the overall students at MSU are Michigan residents, representing virtually every county in the state; 76% percent of the undergraduate students are Michigan residents. There has been a steady increase in applications over the last five years. Over this period the entering class high school grade point average has improved as have the ACT scores.

A summary of enrollments for fall 2017 by college and level can be found in Appendix D. Based on Michigan demographic data, enrollment management practices at the University, and current faculty/staff and physical infrastructure resources, enrollment patterns over the next five years are projected to remain stable.

While the University currently offers bachelor's or bachelor's completion programs and master's programs off campus and the Virtual University continues to increase access to programs through web-supported and entirely web-based courses, it is important to note that the vast majority of students utilize the facilities of MSU's East Lansing campus to complete their degree programs. The University will continue to expand opportunities to offer instruction that complements more traditional academic programs, but it is expected that the majority of enrolled students will continue to utilize the main campus.

The full-time equivalent faculty and academic staff count for fall 2017 is approximately 5,230. Of that total, a significant percentage is engaged in instruction, with the rest distributed across research, public service, academic and student support services, and other institutional support areas. To enhance these efforts and maintain its position as a world-class research university, in 2014 MSU committed to hiring approximately 100 research focused faculty members over the five-year period of 2015-2020, with approximately 65 hired to date.

The current average class size for lower division undergraduate classes is approximately 47 students. The average class size is approximately 35 for upper division undergraduate classes and 15 for graduate classes. The most recent calculation of the student/faculty ratio is 17:1, which is consistent with the Big 10 public average.

IV. Facilities Assessment

In addition to seeking and retaining high-quality faculty, staff, and students, MSU recognizes that its physical infrastructure requires ongoing evaluation, maintenance, and renovation in a manner that is consistent with the high quality of its personnel and programs. As one of MSU's most important assets, the built environment supports the institution's academic mission of teaching, research, and outreach, creates a sense of place for the campus and surrounding communities, and facilitates the successful performance of students, faculty, and staff. Perceptions of the built environment are a significant component in the overall campus experience.

- The physical infrastructure of Michigan State University broadly encompasses buildings; the utility generation and distribution system; the campus grounds, including the natural and built landscape, sidewalks, roadways, and paved parking; and the electronic network and security systems.

  In an effort to better understand and plan for the campus capital infrastructure, a Geographic Information System (GIS) is utilized. This spatial and tabular database tool brings together, in a logical framework, data that record a description of the capital infrastructure. The GIS continues to evolve and increase in sophistication. At present, data such as condition, use, special planning characteristics, and other related information support ongoing assessment, cross-unit planning, and more effective allocation of limited dollars to institutional priorities.

- The campus grounds, including the natural and built landscape, are a principal aspect of the campus infrastructure. The main East Lansing campus approximates 5,200 acres, or eight square miles. The developed campus is 2,047 acres, and the experimental research farm area approximates 2,743 acres with the remainder supporting auxiliary activities.

  Yet, despite this rich land area, the master planning process recognizes that land resources are finite and should be conserved for future generations. As a result, the Campus Land Use Master Plan adopted an approach of compact campus development. While allowing for some horizontal expansion across the campus, this approach protects the capacity and contiguity of the farm areas and uses a strategy of carefully conceived "infill" on the developed campus.

- The developed campus is recognized as one of the nation's most beautiful campuses. This is particularly true of the North Campus "Circle Area" where the University first developed. The open space quality of this area, the Red Cedar River corridor, and the Sanford and Baker woodlots is very highly regarded and reinforces the social and intellectual vitality of the campus. Currently, the campus arboretum has over 900 different taxa, represented by more than 20,000 individual trees, and innumerable shrubs and vines,

which serve as a vast collection for research, teaching, and demonstration, as well as to provide landscape value.

The developed landscape has an estimated replacement value exceeding $354 million.

- There is also an extensive transportation system of approximately 60 lane miles of university-owned roadways with a replacement value of $40.8 million.

  Currently, the condition of the roads is estimated to be 8 percent poor; 12 percent fair; 23 percent good; and 57 percent excellent. A significant emphasis is put on improving safety for vehicles, pedestrians, and bicyclists, as streets are rebuilt.

- The University owns eight bridges on campus; three are for pedestrians only, three are for both vehicles and pedestrians, and two are for trains. The bridges have a replacement value of $20 million. One bridge is in fair condition, four are in good condition, and three are in excellent condition.

- There are 121 miles of walkways valued at $43.5 million.

- By MSU Board of Trustees policy, the parking system of approximately 27,000 spaces for students, faculty, staff, and visitors is self-supporting and has a replacement value of approximately $280.4 million: $133.4 million for seven parking structures and $147 million for surface parking. One parking structure is in poor-to-fair condition, two are in good condition, and four are in excellent condition. The condition of the approximately 21,200 surface parking spaces breaks down to 13% poor condition, 27% fair condition, 28% good condition and 32% excellent condition.

- As a continuation of the master planning process, the All University Traffic and Transportation Committee addresses the issues related to parking access, the location of new facilities and the associated cost implications, and ways to increase use of mass transit and non-motorized transportation. MSU continues its partnership with the Capital Area Transport Authority to provide service for on-campus and surrounding area routes, a collaboration that first began in 1998. In early 2017, the Executive Vice President for Administrative Services initiated a mobility planning[3] effort that will work to develop a robust campus mobility plan that connects current initiatives, engages stakeholders, builds on the Campus Land Use Master Plan, and provides the framework to improve campus mobility for all.

- Michigan State University's campus comprises approximately 23.97 million gross square feet of building space in 562 structures, including both general-fund and self-supporting facilities. The replacement cost of the buildings is calculated at $4.54 billion. University general-fund buildings account for approximately 13.4 million square feet of space representing $2.93 billion in replacement cost, and Residential and Hospitality Services

[3] http://www.adminsv.msu.edu/mobility/

and other self-supporting facilities account for approximately 10.5 million square feet and the remaining $ 1.61 billion.

Facility condition appraisals, including the utility distribution system, are updated on an ongoing basis using input from University maintenance and custodial staff, as well as the users of the buildings. College and program units also provide programmatic facility reviews and forward needs through the annual program planning and review process.

- A comprehensive building appraisal for general-fund facilities has been completed and receives updates as various needs are addressed and systems are re-examined.

  Building capital renewal needs are identified on many campuses utilizing the "industry-expected useful life" of the various significant building components. At MSU, this approach substantially overstates needs, since the effective maintenance program typically results in building components lasting much longer than the industry standard.

  In order to develop a more accurate prediction of the building capital renewal needs, MSU utilizes a "just-in-time" approach to project major maintenance needs. This technique considers the age of major building components, adjusted to account for each component's maintenance history and current condition based on field observations. MSU manages and forecasts major maintenance needs through a capital renewal program. The program prioritizes facility needs that address life safety, accessibility, asset performance, resource efficiency, and renewal of critical building systems. This process considers the age of major building components, adjusted to account for each component's maintenance history and current condition based on field observations. The five-year major maintenance facility needs (apart from the utility distribution system) for general-fund facilities is approximately $254.9 million[4], or an average of $51 million per year.

- The college and program units provide programmatic facility reviews and forward space needs, including alteration and improvement requests, and major capital planning needs through the annual program planning and review process. This process identifies the high-priority programmatic needs of the campus through an annual, systematic approach.

  Because of the dynamic nature of academic and academic-support programs, the planning horizon for these requests is typically five years. The types of projects forwarded through this process include, for example, the comprehensive renovation of a research lab to support current research foci and sophisticated research equipment and modifications to office and dry research space for improved efficiency and program functionality. This process also helps inform the broader capital needs by identifying

[4] See Appendix E for capital renewal needs.

programmatic areas that would benefit from new construction or major renovations.

Based on the most recent planning cycle, approximately $11.0 million is needed in fiscal year 2017 to address high priority, selected programmatic improvements. It is anticipated that this magnitude of annual funding need will continue through fiscal year 2023 and beyond, given the limited resources, age of the physical plant, growth in research and hiring of approximately 100 new faculty, and changes in curriculum and evolution of teaching and learning methods and student learning experiences.

This also enables the University to coordinate projects and assemble the work scope in a way that reduces overall project costs by coupling programmatic alteration needs with infrastructure improvements and the removal of maintenance items. As a result, limited building improvement funds are expended more effectively.

- The utility generation and distribution systems are also major components of the campus infrastructure. The generation system includes the T. B. Simon Plant, a modern gas-fired cogeneration power plant with an interconnection to the national electrical power grid that serves the campus energy needs. This utility generation approach coupled with the stoppage of coal use in 2017 are key contributors to our decrease in greenhouse gas emissions. The replacement value of this facility is $283.6 million.

  At present, forthcoming state and federal regulatory changes are being evaluated for their impact on power plant systems. The distribution system includes water lines (approximately 73 miles), steam lines in tunnels (approximately 26 miles), direct buried steam lines (approximately 3 miles), electrical conduit and cable (approximately 168 miles), communication cable and fiber (approximately 106 miles), storm and sanitary sewers (approximately 158 miles), and chilled water distribution (more than seven miles). The replacement value of the utility system is approximately $317 million.

  While we have made significant investment to update the north campus steam and electric utility systems, the south campus systems have deteriorated and are in need of repairs to provide reliable service, and meet the service demands of the overall campus community. Improvement needs over the next five-year period are calculated at approximately $95.5 million; and power plant modernization at approximately $88 million.

- MSU has a long history of demonstrated energy conservation. Since the energy crisis of the 1970's the university has continued to reduce consumption using a central building energy management system, combined heat and power energy generation with an underground utility micro-grid on main campus, and enhanced construction standards which incorporate the United States Green Building Council Leadership in Energy and Environmental Design requirements for sustainability. The Board of Trustees approved a 10 MWatt solar array constructed as carports over

various parking lots on campus with a power purchase agreement and completion during fall semester 2017.

In April of 2012 the MSU Board of Trustees adopted the Energy Transition Plan setting goals to reduce greenhouse gas emissions 30 percent by 2015 and increase renewable energy 15 percent by 2015. The long-range energy strategy approved by the MSU Board of Trustees will help prepare the University to be a responsible global citizen and become a model community of economic sustainability. As a commitment towards this sustainable model, the university had its last firing of coal as a fuel source in spring of 2017. Progress on the energy transition plan includes reduced greenhouse gas emissions by 25 percent since 2010 and uses 10 percent less heating units (BTU) per person than it did in 2006. Upon completion of the solar carport arrays increased renewables by 11.3 percent from baseline fiscal year 2010.

The university joined the Department of Energy's (DOE) Better Buildings Challenge (BBC), which is an initiative to reduce energy consumption in commercial buildings across the nation. The university pledged to reduce energy consumption by 20 percent in 20 million square feet of facilities by the year 2020. A plan has been developed to retro-commission 115 major buildings over a 10-year period including energy audits of these facilities, which enable the university to meet the DOE's Better Buildings Challenge goals. To date, the university has reduced energy use intensity by approximately 13 percent (weather adjusted) on average across the fleet of buildings on the East Lansing campus.

A ten-year plan to retro-commission 115 major campus buildings in approximately 16 million square feet of space is currently in the final stages of completion, expected by June 30, 2018. The scope of work for building analysis included mechanical system retro-commissioning and whole building energy audits. The initial group of buildings that have completed the process demonstrated a 20 – 30 percent reduction in energy consumption, including implementation of energy conservation measures. Additionally, through leveraging our existing HVAC building control system, an analytics-based fault detection and diagnostics (FDD) software platform has been connected to eight buildings allowing for the real-time identification and monetization of maintenance and energy related mechanical system issues. Through an alignment of focused re-commissioning and FDD technology, a robust foundation to ongoing commissioning has been laid to retain the significant reduction in energy consumption across campus.

All major buildings on campus have smart electrical metering for viewing real time data at http://energydashboard.msu.edu. In addition, an interactive energy dashboard is available in the lobby of Emmons Hall and Brody Hall to raise student awareness of consumption. On-line access to monthly and annual reports on energy consumption and waste/recycling

efforts by building are also available.[5] Access to this data is part of the University's effort to educate the campus community about its consumption and encourage conservation.

MSU is committed to being good stewards of our resources by reducing consumption and greenhouse gas (GHG) emissions and increasing recycling. The commitment to recycling is supported by the MSU Surplus Store and Recycling Center that has facility capacity to support a comprehensive recycling program and will allow the university to expand recycling collection to all occupied buildings on campus.

- A primary component of the teaching and learning environment is the University's instructional space. The University maintains approximately 324 centrally scheduled classrooms and lecture halls, and approximately 700 departmentally assigned instructional spaces. These spaces range from centrally scheduled classrooms that can be utilized by any discipline to more specialized spaces, such as teaching laboratories with fume hoods and wet-bench space. As part of the University's main campus facilities, the instructional space accounts for approximately 1 million assignable square feet.

  For fall semester 2016, utilization of these instructional spaces by scheduled instructional periods ranges as high as 88.5 percent of the available hours, and averages 62 percent across all rooms for centrally scheduled classrooms, excluding events. The seat utilization ranges as high as 71 percent of the available capacity and averages 62 percent across all rooms. One-time events, such as help sessions, department and student organization meetings, on average increases utilization by 18 percent, for an average overall utilization of 80 percent.

  Departmentally scheduled class laboratory spaces that are scheduled regularly for courses averages 33 percent across all rooms and disciplines, and ranges as high as 44 percent of the available hours. This utilization does not include prep or clean-up time, open lab time for tutoring, or student research use. The seat utilization ranges as high as 75 percent of the available capacity and averages 38 percent across all rooms and disciplines. The level of utilization is indicative of the highly specialized nature of these room types.

  At this time, approximately 40 percent of the instructional space is in fair condition and 10 percent in poor condition, with the remaining in good to excellent condition. Rooms in need of upgrade require either comprehensive or selected renovation, and may include replacement of furniture, ceiling, and lighting, painting; upgrade of power and data; and replacement of lab benches and fume hoods. Rooms requiring upgrades are identified through a multiyear improvement plan that is informed by on-site reviews of each room, input from users, and analysis of room utilization, as well as the academic program planning process. In addition to these

[5] See http://energydashboard.msu.edu/

needs, the investments in instructional space must incorporate the shift to more learner-centric environments; the continuous evolution of technology and its role in teaching and learning; variations in pedagogy and delivery methods such as hybrid, flipped, self-guided, and engaged and active learning.

The quality of these rooms are essential to the teaching and learning process. These rooms are intended to support a range of learning methods from lecture to active learning environments; curricular and co-curricular activities; and self-guided learning. While the university continues to make significant improvements, further investment is necessary in order to keep pace with the changes in learning methods, to continue to add value, and remain competitive in our recruitment and retention of high quality students and faculty, and increase participation at both the undergraduate and graduate levels. To address these needs it is estimated that $60M over 5 years, or $12 million annually, would make a substantial improvement in the condition of the existing university instructional environment and improve alignment with changes in curriculum and learning methods.

- Campus communications cabling infrastructure is composed of an extensive underground fiber optic distribution system. This system carries backbone network data, voice over Internet protocol telephone traffic, cable television service, cellular carrier signals, two-way radio traffic and other specialized services. This system also provides service to roughly 180 buildings on the main campus. Mesh wireless provides connections for 40 buildings in the south-campus farm district.

  In addition to the campus backbone network, each building has internal cabling infrastructure and equipment. Approximately 75 percent are in need of infrastructure and equipment upgrades. Over 9,100 access points provide Wi-Fi service; approximately 50 percent of main campus buildings have full coverage, approximately 30 percent have partial coverage, and approximately 20 percent have little or no Wi-Fi coverage.

  The estimated replacement value of campus data infrastructure is over $60 million; annual maintenance costs are in excess of $7.5 million.

  A number of off-campus sites in the Lansing metropolitan area are connected via a 45-mile fiber optic ring operated by Zayo Enterprise Networks. Several other university facilities such as the Secchia Center, Kellogg Biological Station, Troy Management Education Center, MSU Bioeconomy Institute, and MSU Detroit Center are attached via Merit Network, Inc. or other providers. External network connectivity from MSU's main campus is provided via redundant links to the commodity Internet and Internet2, also provided by Merit Network, Inc.

  Two-way radio services are being transitioned from a stand-alone system to the State of Michigan MPSCS hosted two-way radio system.

- University facilities beyond the East Lansing campus cover more than 20,400 acres and contribute to the built environment with 13 AgBioResearch research centers across the state (the Kellogg Biological Station and Saginaw Valley Research and Extension Center are examples). Other agricultural field research locations include the South Campus Farms teaching and research centers. Sites supporting other programs include facilities for engineering research in Okemos; the BioEconomy Research and Development Center in Holland; conference facilities, such as Tollgate Education Center in Novi, the Management Education Center in Troy, and WaWaSum in Grayling; Hidden Lake Gardens in Tipton; and the Grand Rapids location of the College of Human Medicine. The replacement value for the facilities located at these sites is calculated at more than $259 million.

  At nearly all of the research facilities, there is a continuing need to upgrade existing research space to meet current technological, regulatory, and operational requirements of researchers and funding organizations. . Research maintenance items consist of both wet and dry lab upgrades and equipment replacement, while conference facilities require continual improvements and expansion as they relate to extension and outreach. General Maintenance and infrastructure improvements include exterior repair/replacement, technology and security upgrades, environmental enhancements directed at storm water and process water management, energy efficiencies, regulatory requirements and mechanical upgrades that include electrical, plumbing, and heating, ventilation, and air conditioning (HVAC). Other facility repairs include well and septic systems that require continual maintenance and the periodic repair of roadways and parking areas. With more than 265 buildings located at various off-campus research, teaching, and extension facilities, the items listed above are placed on a 5 to 10-year maintenance schedule, valued at $1.5M per year.

While the University has obtained facility improvement funds by issuing bonds, the University's general revenues secure these debt instruments and the facilities are not encumbered. The exceptions to this are the completed Chemistry Building addition; Biomedical and Physical Sciences Building; Diagnostic Center for Population and Animal Health laboratory building; and the Bio Engineering Facility. These facilities were funded in part with bonds issued by the Michigan Department of Treasury, State Building Authority (SBA) and secured by mortgages on the facilities.

V. Implementation

Michigan State University's approach to capital planning employs a continuous process that integrates academic, support, human resources, fiscal, and facility infrastructure planning. Institutional participation in the planning process ensures that consideration is given to relevant issues and that decisions reflect the fundamental mission and direction of the University.

Capital needs are informed by the University's Capital Planning Framework, Campus Land Use Plan, and planning activities that occur within major components of the institution at regular cycles throughout the year. These components include the annual academic program planning and review, administrative support planning and review, deferred capital renewal, technology, utility systems, energy and sustainability planning, as well as planning for transportation (roads and sidewalks), parking, and open space. Within this context, budgetary and fiscal analyses at the local, state, and federal levels are taken into account.

Within each component of planning, a number of more detailed issues are reviewed and examined relative to their impact on facilities over the short and long term. One approach used for this more detailed planning is the Campus Infrastructure Planning Work Group. Bringing together a comprehensive cross section of University constituents, the group evaluates infrastructure projects on a number of dimensions to ensure thoroughness of planning, conformance with master planning principles adopted by the MSU Board of Trustees, and impact across the University.

As a matter of operating philosophy and practice, facility planning encompasses the following issues:

- Renovations, as well as maintenance of existing campus facilities, and new construction are focused to support programs that are central to the academic mission of the University.
- A fundamental guiding principle is that planning is holistic and comprehensive. In addition to capital renewal of existing facilities, academic program needs are considered and facility adaptation is planned accordingly. A premium is placed on reuse of existing facilities, on conservation of open space, energy conservation, and on health, safety, security, and regulatory requirements. Barrier-free modifications are given priority, and needs related to technology are incorporated. Where appropriate, fixed building equipment, particularly for laboratories and instructional spaces, is included in the plans.
- New construction and renovation of existing facilities are planned so a project's financial investment actively reflects the life cycle of the facility in relation to the needs of the program, while providing flexibility in the structure to accommodate potential changes over the longer term. Through the least life cycle cost analysis, facilities are positioned to be responsive to

immediate programmatic needs, as well as longer-term adaptation needs brought about by changes in programs, advances in technology, and related issues.

- The least life cycle cost analysis also enables project development to focus on designs that reduce the ongoing maintenance cost of facilities. Within this context, MSU's high-quality construction standards intentionally create plans and assemble materials that "design out" as much near and long-term maintenance as possible.

  In summary, the anticipated expenses of a facility over its life cycle are carefully considered in relation to the initial investment in design and materials.

Through facility-planning activities, Michigan State University recognizes that campus programmatic and facility capital renewal issues are significant and constantly changing. As a result, needs exist simultaneously in three major areas:

1. Renovations and Additions
2. New Construction
3. Major Systems Maintenance

Many more needs exist than can be addressed at any one time. However, within this context and informed by the planning processes described above, the STEM Teaching and Learning Facility remains the institutions priority request, as noted in Section I of the following table[6]. Other projects included in Section I of the table reflect the institutions anticipated capital project needs during the upcoming 5-year planning framework. Projects listed in Section II are currently in active planning or in process, with funding primarily from institutional resources. Within the context of this planning and the capital outlay process, Appendix H[7] contains information regarding FRIB and the community cost share provided by the state.

[6] See Appendix G for the State Fiscal Year 2019 Capital Outlay Project Request – Attachment B for the STEM Teaching and Learning Facility.
[7] See Appendix H for FRIB.

Capital Planning and Major Maintenance SFY19-23
Planning Timeframe: One to Five Years

Section I: MSU Capital Outlay SFY19 Request and 5-Year Planning	
	FY18 Est. (mil.)
MSU SFY19 Capital Outlay Request – New Construction	
• STEM Teaching and Learning Facility - State Authorization to Plan per Public Act 107 of 2017	$ 72.5
MSU 5-Year Capital Planning	
Renovations and Additions	
• Plant Science Facilities- Bioeconomy (Total estimate $125.8M)	
Additional Greenhouses - Research Expansion	$ 7.5
Plant and Soil Sciences Building - Renovation in support of Plant Resilience Institute	$ 2.5
Plant Biology Building - Renovation Learning and Research Facilities	$ 115.8
• BioMedical Frontier (Total Estimate $200.9 - 213.9M)	
BSL-3 Laboratories (2.) - Research Expansion	$ 4.0–12.0
BioMedical Animal Resources - Provision for Large Animal Facilities	$ 15.0–20.0
Research Laboratory Renovations - Various (STEM Related Backfill)	$ 15.0
cGMP Facility/Infrastructure - Research Expansion	$ 15.0
Clinical Center A-Wing - Renovate for Research Expansion	$ 115.5
Clinical Center B-Wing - Renovate for Research Expansion and Learning	$ 36.4
• Learning Spaces	
Shaw Lane Power Plant - Adaptive Reuse for Innovation Hub	$ 20.0–25.0
Learning Space Improvements - 5-year	$ 60.0
Library Improvements - Learning and Collections Support	TBD
Learning and Assessment Center Expansion - Health Colleges	$ 2.6
• Healthy Campus Initiative - Health and Wellness - Olin Phase 2	$ 2.0–2.5
• Student Services Building - Renovate for Student Support Services	$ 8.0-32.5
• Music Building - Renovation for Improved Program Support	$ 9.0-31.9
• Munn Ice Arena - Renovation and Addition	$ 22.5
• Multi-Purpose Arena - University and Athletic Programming	TBD
• MSU Chapel and Columbarium - Renovation and Accessibility	$ 2.7
• Old Botany - Comprehensive Renovation	$ 8.8
• High Performance Computing Center (HPCC) Grant Capacity - Data Center - Internal Build-out	$ 6.5–18.0
New Construction - New Building	
• MSU Health Team Building - New Clinical Care Facility	TBD
• GRRC Innovation Park - cGMP (P^3 opportunities)	TBD
Major Systems Maintenance	
• Capital Renewal	
General Fund Buildings	$ 254.9
Utilities	$ 88.0
Auxiliaries	$ 8.0

Section II: Projects in Active Planning or In Process/Funding from Other Resources	
Projects Authorized by the Board of Trustees for Construction (Arranged Alphabetically)	
• 2016-2017 Major Maintenance Projects	
Wells Hall - Replace Induction Units (Ph.1)	$ 1.8
Wharton Center - Roof Replacement Sections	$ 1.8
• Business College Complex - Graduate Pavilion Addition	$ 62.0
• Data Center - New Facility	$ 46.0
• Engineering Research Complex - Addition and Renovations (Fraunhofer Expansion)	$ 6.7
• Food Processing and Innovation Center - New Construction and Renovation	$ 6.4
• Grand Rapids Research Facility Development - New Construction	$ 85.1
• Hubbard Hall - Exterior Masonry Repair Phase 2	$ 2.5
• IM Sports West - Selected Infrastructure Upgrades (Healthy Campus Initiative)	$ 3.995
• Interdisciplinary Sci. and Tech. Building - Strategic Acad. Development Initiative - Research	$ 100.0
• Parking Lot 63 - Reconstruction & Expansion	$ 1.5
• State Police Post Redevelopment - 1855 Place	$ 156.7
• Wharton Center - Cobb Great Hall and Pasant Theatre Seat Replace.	$ 1.5
Projects Authorized by the Board of Trustees Pending Award of Contract	
• 2016-2017 Major Maintenance Projects - Communication Arts and Sci. Roof Replacement	$ 1.9–2.2
• Wilson Road - Extension	$ 11.5–13.5
Projects Authorized by the Board of Trustees for Planning (In Design, Arranged Alphabetically)	
• 2016 - 2017 Major Maintenance Projects	
Biochemistry Building - Window Replacement	$ 1.6–2.0
Student Services Building - Window Replacement	$ 3.4–4.0
Student Services Building - Replace Air Handlers	$ 1.4–1.7
• 2017 - 2018 Capital Renewal Program - Projects	
Dairy Research Complex - Electrical Distribution	$ 1.6–2.0
Veterinary Medical Center - Replace HVAC-1 and HVAC-2	$ 1.6–2.0
Wells Hall - Replace Induction Units (Phase 2 of 2)	$ 3.5–4.0
• Cook Hall - Renovation	$ 3.8–4.8
• Healthy Campus Initiative - Strategic Development - Recreation, Fitness, Sport	$ 35.0
• Horticulture Gardens - Construct Welcome Center	$ 2.2
• Hubbard Hall (6.) - Exterior Masonry Repair (4 Phases @ $3M each)	$ 12.0
• International Center - Revitalization Project	TBD
• Jenison Field House Alterations - Main Building Renovation	$ 5.0–8.0
• Kellogg Hotel and Conference Center - First Floor Amenities and Space Renov. Phase 1	$ 2.75–3.5
• Music Building Addition - Program Expansion and Needs	$ 30.0–35.0
• Packaging Building - First Floor Renovations	$ 1.7
• Water Distribution - Campus Water System Improvements	$ 12.0–32.0
• Wonders Hall - Teaching, Learning, Student Support Renovation	$ 12.0- 13.0

Addressing the above projects within the next five-year timeframe is extremely important, not only to the effectiveness of the academic programs but also to the operational efficiency of the institution. Finally, funding these projects is consistent with the University's commitment to responsible stewardship of critical state resources. It will also ensure that the capital infrastructure is available to carry out our commitment to intellectual leadership in developing new knowledge and to conveying and applying that knowledge to students and the public in practical ways.

VI. Capital Outlay Planning[8]

The capital outlay request and capital priorities support programs that have strong national reputations, expanding research bases, and high enrollment demand that will sustain the university and its contributions to Michigan. Funding these requests will provide economic development in the state, now and in the long term. Our capital outlay request is the construction of the STEM Teaching and Learning facility that aligns with state and national priorities.

Over the past ten years, student credit hours in science, technology, engineering, and mathematics (STEM) have increased by approximately 40 percent. Construction of a new instructional facility focused on supporting education in STEM disciplines is necessary to continue this programmatic direction. Such a facility would address the continued state and national priority to educate increasing numbers of students in STEM disciplines. A new STEM teaching and learning facility would include modern wet bench teaching laboratories that incorporate active learning principles, foster cross-disciplinary teaching and learning, and support developing and evolving changes in curriculum and its delivery. The facility would bring together a significant number of teaching laboratories that are currently dispersed across campus to create a central hub for STEM teaching and learning.

Renovations and additions

Renovations and/or additions address extensive programmatic and maintenance improvements required by buildings previously funded by the state. Renovations and/or additions are necessary to reconfigure and or expand space in order to support the work of the programs housed in those facilities; create core/shared research support facilities and modern learning spaces; and in some instances, adaptive re-use or modernization of aging buildings including alignment with current codes and provisions for accessibility.

Major renovations and/or additions include the plant sciences – bioeconomy, biological and biomedical sciences, music and learning facilities.

New construction

New construction is needed to support high-priority instructional and research programs. The facilities are necessary to support current and future programmatic initiatives in the STEM disciplines including biomedical, biological, and engineering sciences; computation and data sciences; water and energy; and economic development of Michigan.

[10] See Appendix G for the State Fiscal Year 2018 Capital Outlay Project Request – STEM Teaching and Learning Facility.

Major systems replacement

Current forecasts anticipate general fund capital renewal (deferred maintenance) and utility needs of approximately facility, instructional and infrastructure needs of approximately $342.9 million over the next five years. In view of the extensive facility needs it faces, MSU has drawn upon an increasing amount of internal university resources to address the most critical facility maintenance and programmatic requirements. Self-funding these capital improvements is not sustainable without impact negative impacts on other programs.

The University seeks funding for more targeted and specific building systems maintenance and utilities. Examples of systems in need of repair or replacement include roofing, windows, electrical, mechanical, chiller, refrigeration, steam, fire, security and barrier-free access.

VII. Conclusion

Michigan State University's programmatic strategy is premised on the Bolder by Design strategic framework and seeks to further education and research in Science, Technology, Engineering, and Math as well as other curricular priorities in order to expand economic impact locally, regionally, and internationally advancing the common global good. MSU routinely receives in excess of $600 million in sponsored awards annually, focused in areas such as food systems; plant sciences; health sciences; computational sciences emphasizing biology and food/food-chain; and population and the environment, including food, water, and energy. Additionally, MSU's programmatic investments seek to improve technology and teaching, prioritize interdisciplinary study, the narrowing of graduation gaps amongst various student groups, and fostering a healthier campus.

MSU is a vital engine in Michigan's prosperity and provides value for students and stakeholders across the state. MSU maintains a presence in each of the state's 83 counties and is deeply engaged in the cities of Flint, Detroit, and Grand Rapids, working collaboratively to provide expertise and a network of resources in education, food, water, health, and sustainability.

Michigan State University has an annual economic impact of more than $5 billion and seeks to instill an entrepreneurial and high performance mind-set in its students, faculty, and staff. MSU Extension's presence touches all 83 Michigan counties, availing Michigan residents to the resources and expertise they need to advance the state and its economy. Agribusiness is among the fastest growing economic sectors in the state, and the MSU AgBioResearch and MSU Extension contribute to Michigan's economy with significant research, educational programs and a community presence to boost economic development and growth related to agriculture and natural resources, community vitality, entrepreneurship, and career preparation for young people.

More than 90 percent of MSU's graduates were employed or continuing their education within nine months of graduation and a similar percentage rated their educational experience as excellent and would choose MSU again if starting their experience over. Of 2015 graduates with employment, more than 62 percent remained in Michigan, with an additional 15 percent employed in other regional states.

MSU requests recurring FY19 appropriations support for the general fund, MSU AgBioResearch, and MSU Extension. For general university operations, it is imperative that new incremental funding appropriated to higher education this coming year goes to restoring the funding of complying institutions to at least the 2011 levels. In addition, it is important that the model be modified to better reflect the performance of all institutions. This would include addition of the IPEDS marker for community engagement, proportion of undergraduates graduating with debt, and the number of Pell students, or combinations of the above. Finally, additional consideration should be provided to those institutions that feature the combination of significant numbers of Pell students, high graduation rates, and a low proportion of students graduating with debt. For MSU AgBioResearch and MSU Extension, it is essential that full recurring support be provided to both, including inflationary increases.

Michigan State University is an institution founded on a dynamic balance between the theoretical and the practical, discovery and dissemination, knowing and being. Standing among the 62 great research institutions comprising the Association of American Universities, Michigan State is yet differentiated in its fidelity to each of its core land-grant values: quality, inclusiveness and connectivity. They are tightly linked and demonstrated in myriad ways, from the university's roster of top scholars and programs to its diverse campus community to its many forms of local, regional and international engagement.

Fall 2017

Appendix A: Mission Statement

Fiscal Year 2019
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

MSU Mission Statement

The following statement was approved by the Board of Trustees on April 18, 2008

Michigan State University, a member of the Association of American Universities and one of the top 100 research universities in the world, was founded in 1855. We are an inclusive, academic community known for our traditionally strong academic disciplines and professional programs, and our liberal arts foundation. Our cross- and interdisciplinary enterprises connect the sciences, humanities, and professions in practical, sustainable, and innovative ways to address society's rapidly changing needs.

As a public, research-intensive, land-grant university, funded in part by the State of Michigan, our mission is to advance knowledge and transform lives by:

- providing outstanding undergraduate, graduate, and professional education to promising, qualified students in order to prepare them to contribute fully to society as globally engaged citizen leaders

- conducting research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and make a positive difference, both locally and globally

- advancing outreach, engagement, and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities, at home and around the world

Fall 2017

Appendix B: Campus Land Use Master Plan

Update February 2017

Fiscal Year 2019
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Michigan State University

Campus Land Use Master Plan: Update 2017

February 2017

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PREFACE

PURPOSE OF THE CAMPUS LAND USE MASTER PLAN

The Campus Land Use Master Plan provides a flexible framework for guiding the physical organization of the Michigan State University (MSU) campus. The plan includes overarching campus planning principles, specific system recommendations, and the University Zoning Ordinance. The plan is updated every five years to provide University administration with a current and relevant decision-making tool in concert with additional planning documents that include but are not limited to:

- Mobility Plan (under development)
- Five-Year Plan and Capital Outlay Request
- Capital Renewal (deferred maintenance) Priorities
- Residential and Hospitality Services Strategic Plan
- Utility and Infrastructure Plans (water, steam, electric, gas, storm water)
- Power Plant Master Plans
- Storm Water Permit
- Barrier Free Accessibility Plan
- Energy Conservation Plan
- Well Head Protection Plan

Given the size and complexity of the campus's physical composition, coordinating the land use plan with a mobility plan will facilitate the University's ability to achieve its mission within a culture of high performance. Together, the land use and mobility plans will enable the connections, collaboration, and conversations required to drive academic success and research innovation. To this end, President Simon has directed the Executive Vice President for Administrative Services to lead the effort in developing a mobility plan.

SIGNIFICANT ACCOMPLISHMENTS SINCE THE 2011 UPDATE

Over the past five years, the Campus Land Use Master Plan: Update 2011 informed the implementation of the following major projects.

- Major building projects completed or under construction include: NSCL/FRIB (various projects), Brody Neighborhood (various projects), Bott College of Nursing Education, Case Hall Addition and Renovation, Shaw Hall Addition and Renovation, Old College Field (various projects), Wells Hall Addition, Molecular Plant Science, Landon Hall Addition and Renovation, Endocrine Research, Spartan Stadium North End Zone Addition, MSU Performing Arts and Teaching Lab, Parking Ramp 7, Bio Engineering Research, Breslin Center Upgrades and Hall of History, Intercollegiate Golf Facility, Poultry-Laying Hen Research, Sheep Lambing and Research, and 1855 Place.
- Close adherence to the University Zoning Ordinance, with only 5 projects requiring a zoning variance.
- Completion of the RHS Dining Services Master Plan.
- Major enhancements to the campus open space system including removal of parking to create open space adjacent to Shaw Hall and the Munn Field artificial turf field.

- Receipt of a Silver Bicycle Friendly University Award from the League of American Bicyclists. Today more than 68% of campus roads have bike lanes. The campus has six do-it-yourself fix-it stations in the residential neighborhoods and two secure bicycle storage facilities with fix-it stations (Grand River and Communication Arts Garages) and one secure storage facility within the FRIB complex. Nearly 60% of the MSU River Trail (dedicated bicycle and pedestrian trail) has been constructed from Harrison Road to Farm Lane.
- Completed the four-year West and East Circle Drive infrastructure enhancement project that improved non-motorized and motorized circulation within the North Academic District.
- Completed the Chestnut Road reconstruction from Shaw Lane north to Red Cedar Road.
- Reconfigured the Bogue Street and Shaw Lane intersection, removing the last vehicular traffic circle on campus along with closing the Bogue Street segment between Shaw Lane and Wilson Road to accommodate the FRIB project.
- Completion and full operation of the Capital Gateway Multimodal Transit Center operated by CATA.

CAMPUS PLANNING PRINCIPLES

INTRODUCTION

The University is committed to a comprehensive and continuous land use planning process that results in a flexible framework to guide future decision making. The University will consider the use of resources from environmental, regulatory, operational, economic, historic, and cultural perspectives in support of its teaching/learning, research, and outreach mission.

The following planning principles will guide future planning for, and development on, the Michigan State University campus. The principles are organized in the following categories: General Principles, Land Use and Facilities, Environmental Sustainability, Open Space, Parking, Circulation, and Utility Infrastructure.

GENERAL PRINCIPLES

- Arrange campus buildings, open space, circulation and utility systems to:
  - establish positive interactions among academic, research, outreach, cultural, and operational activities;
  - protect and strengthen the campus as a living-learning resource integral to the University's mission;
  - protect and enhance campus beauty;
  - enhance environmental stewardship;
  - minimize energy impacts and increase/retain energy efficiencies; and
  - optimize safety and facilitate risk management.

PLANNING PRINCIPLES RELATED TO LAND USE AND FACILITIES

- Organize the campus in logical districts of compatible land uses.

- Implement compact campus development to achieve the following benefits:
  - preserve and protect existing natural areas and systems to support teaching and research;
  - conserve land and maximize land productivity;
  - protect contiguous agricultural teaching and research land;
  - encourage social interactions and vitality;
  - encourage collaboration, partnering, and interdisciplinary connections;
  - reinforce ties between research and undergraduate teaching;
  - control utility, transportation, parking, and infrastructure costs;
  - enhance functional efficiencies;
  - maximize efficient energy use; and,
  - minimize utility distribution extensions, which are inefficient and costly to maintain.

- Provide intramural recreation fields in locations that balance accessibility for both on- and off-campus participants.

- Protect and enhance campus open space, providing an appropriate balance (qualitative and quantitative) to the built environment.

- Protect the land south of Mount Hope Road from development to support AgBio Research and the College of Agriculture and Natural Resources' teaching, research, and outreach mission.

- Protect existing and future drinking water well locations in the Agricultural District in accordance with the Well Head Protection Plan.

- Favor reuse, renovation, and repurposing of existing buildings after carefully assessing programmatic alignment, functionality, long-term capital renewal (deferred maintenance), historic significance, location, energy efficiency, and replacement costs.

- Organize the arrangement and design of campus buildings and exterior spaces to encourage human interaction and to foster a sense of shared community among the University's diverse population. This may include, for example, incorporating "transitional spaces" outside of classrooms for pre- and post-class collaboration and "blended spaces" where food service, study space, and general meeting resources coexist.

- Design new buildings and renovations to be architecturally compatible with the best features of existing adjacent buildings and to be harmonious with their contextual surroundings.

- Maximize flexibility in the design of new and renovated space to accommodate changing needs and functions over time.

- Recognize historically significant aspects of the campus and the heritage of the campus as a park and as a living and learning laboratory.

- Acknowledge that the campus is part of the larger surrounding community. Build compatible land use relationships and circulation patterns.

- Consolidate support service facilities into the Services District as defined by the University Zoning Ordinance.

- Organize land uses, facilities, and infrastructure to encourage physical activity.

PLANNING PRINCIPLES RELATED TO ENVIRONMENTAL SUSTAINABILITY

- Minimize environmental impacts and maximize resource conservation through prudent and compact land use, protecting sensitive environmental systems, and incorporating low-impact development guidelines.

- Minimize negative impacts to the water quality of the Red Cedar River Watershed; incorporate Best Management Practices for storm water.

- Acknowledge the intrinsic value of biodiversity and enhance natural system integrity by creating, restoring, and maintaining large-block natural areas and improving their interconnections.

- Provide a suite of transportation options that maximize the movement of people and minimize the movement of cars, thus reducing congestion, vehicle miles traveled, and greenhouse gas emissions.

- Continuously pursue building and utility systems that encourage renewable resource use and that decrease waste and hazardous materials.

- Recognize land use issues associated with climate vulnerability including storm water management, flooding, snow removal, temperature extremes, and storm intensity.

PLANNING PRINCIPLES RELATED TO OPEN SPACE

- Protect and extend the park-like character of the historic circle campus in order to reinforce and enhance the University's distinctive physical identity.

- Enhance the landscape quality south of the Red Cedar River.

- Promote efficient land use that protects existing, and creates new, green space.

- Protect, maintain, and develop the campus as an arboretum to support the University's teaching/learning, research, and outreach mission.

- Provide opportunities for academic and social interaction.

- Provide a variety of open spaces that accommodate the full range of outdoor activity, for example, large athletic fields to intimate spaces for personal reflection and meditation.

- Preserve and protect existing natural areas and enhance their interconnectivity.

- Integrate public art appropriate to surrounding context (excluding Natural Areas).

PLANNING PRINCIPLES RELATED TO PARKING

- Safely and efficiently meet the parking needs of faculty, staff, students, and visitors.

- Integrate parking facilities into the campus setting in an aesthetically pleasing manner consistent with its park-like setting.

- Utilize a variety of parking resources including surface lots, decks, and parking garages; emphasize parking on the campus perimeter.

- Provide conveniently located barrier-free spaces across campus.

- Reclaim surface lots for green space and future building sites when appropriate.

- Relocate parking that contributes to unsafe traffic, bicycle, and pedestrian conditions.

- Minimize the loss of open space for small inefficient surface parking lots.

- Connect the campus transit system to major parking facilities.

PLANNING PRINCIPLES RELATED TO CIRCULATION

- Emphasize personal safety in the circulation system's planning and design.

- Design all roads as complete streets (designed and operated to enable safe, attractive, and comfortable access and travel for all legal users).

- Provide a safe, efficient, and effective transportation network that enhances the overall quality of life on the campus.

- Incorporate traffic-calming measures where appropriate.

- Plan and design for the following circulation priorities:
  - pedestrians first;
  - bicycles and other forms of non-motorized transportation second;
  - mass transit and service vehicles third; and,
  - private vehicles last.

- Design for the safety of persons with disabilities in accordance with the Americans with Disability Act.

- Reduce private vehicular traffic in academic and residential districts.

- Effectively integrate with the regional transportation system.

- Establish a coordinated bicycle system including bike lanes within roadways, dedicated pathways and/or shared-use pathways, and convenient and appropriately sized storage facilities where appropriate.

- Enable an effective and efficient mass transit system including developing residential neighborhood transit centers to gain transit efficiencies.

PLANNING PRINCIPLES RELATED TO UTILITY INFRASTRUCTURE

- Develop campus buildings and infrastructure to foster energy conservation.

- Use centralized utility systems wherever feasible to maximize production efficiencies and to minimize life-cycle operational costs.

- Establish consolidated distribution corridors that co-locate utilities and accommodate maintenance with minimal campus disruptions.

- Provide adequate protection and security for critical system components including electric, steam, chilled water, potable water, existing and future water wells, fiber, and natural gas.

- Provide redundancy for steam, electric, water, and communication utilities.

- Enable resource conservation and management through appropriate system design and controls.

- Prepare for developing technologies and their integration into the campus infrastructure.

- Implement practices, install systems, and develop procedures that prolong the capacity of the power plant, increase reliability, protect health and wellness, reduce greenhouse gas emissions, while managing affordability.

LAND USE RECOMMENDATIONS

PROGRAMS AND FACILITIES

Academic and Planning Imperatives

The University's Bolder by Design strategic initiative employs six imperatives to guide the institution's teaching/learning, research, and outreach mission. The campus's physical organization directly and indirectly supports these imperatives.

- Enhancing the student experience
- Enriching community, economic, and family life
- Expanding international reach
- Increasing research opportunities
- Strengthening stewardship
- Advancing a culture of high performance

The Campus Land Use Master Plan recognizes that land utilization must be optimized to support the academic mission; that extensive infrastructure systems are expensive to maintain; and that land conservation, especially in the research farms area, is mission critical. As a result, the plan centers on these smart growth principles:

- Establishing a compact campus composition
- Providing a variety of transportation choices
- Preserving open space, farmland, and critical environmental areas
- Developing a mix of land uses
- Creating a walkable community

Facilities Planning Principles

The University continually examines the capital assets necessary to support academic programs and physical needs that involve new construction, comprehensive renewal, renovation, reprogramming of selected facilities, and renewal of major subsystems in other facilities. The assessment of existing facilities shows that the infrastructure components of many campus buildings have aged significantly. Despite ongoing maintenance and repair that extends the expected usable life of components well beyond industry standards, many buildings are now at a point where they require either significant investment or replacement.

Space planning seeks to support student success, growth of the research enterprise, infrastructure stewardship, and operational efficiencies by:

- aligning space resources with academic framework;
- allocating and utilizing space strategically;
- supporting a range of teaching and research methodologies;
- leveraging emerging technology;
- effecting operational efficiencies and cost effectiveness;
- anticipating evolving teaching and research environments;
- forecasting changes in demand and aging infrastructure;
- providing accessibility based on universal design and inclusion; and
- assessing strategic property acquisitions.

Projected Facility Needs

Michigan State University, through the Office of Planning and Budgets, employs a continuous capital planning process that integrates academic, support, fiscal, and physical planning. Institutional participation in the planning process ensures that consideration is given to relevant issues and that decisions support the University's direction and mission.

Following a very detailed and carefully conceived planning process, it was estimated that the University will need a 10 percent increase in building space over the next 20 years. The growth in space is driven by a planned increase in the number of faculty and the anticipated increase in funded scientific research, selective and qualitative changes in academic teaching programs; enhancement of common facilities that enrich campus life and community; and consolidation and upgrading of operational support facilities.

Capital needs are informed by the Campus Land Use Master Plan and planning activities that occur within major components of the institution at regular cycles throughout the year. These components include the annual academic program planning and review, administrative support planning and review, deferred capital renewal, technology, utility systems, energy and sustainability planning, as well as planning for motorized and non-motorized circulation and open space. In this context, budgetary and fiscal analyses at the local, state, and federal levels are taken into account.

Within each component of planning, a number of more detailed issues are reviewed and examined relative to their impact on facilities over the short and long term. One approach used for this more detailed planning is the Campus Infrastructure Planning Work Group. Bringing together a comprehensive cross section of University constituents, the group evaluates major construction projects on a number of dimensions to ensure conformity with the Campus Land Use Master Plan's planning principles, physical recommendations, and the University Zoning Ordinance as adopted by the Board of Trustees.

As a matter of operating philosophy and practice, facility planning encompasses the following issues:

- Renovations, as well as maintenance of existing campus facilities and new construction, are focused to support programs that are central to the University's academic mission.
- A fundamental guiding principle is that planning is holistic and comprehensive. In addition to capital renewal of existing facilities, academic program needs are considered and facility adaptation is planned accordingly. A premium is placed on reuse of existing facilities, on conservation of open space, energy conservation, and on health, safety, security, and regulatory requirements. Barrier-free modifications are given priority, and needs related to technology are considered. Where appropriate, fixed building equipment, particularly for laboratories and classrooms, is included in the plans.
- New construction and renovation of existing facilities are planned so a project's financial investment actively reflects the life cycle of the facility in relation to the needs of the program, while providing flexibility in the structure to accommodate

potential changes over the longer term. Through the "least life cycle cost analysis," facilities are positioned to be responsive to immediate programmatic needs, as well as longer-term adaptation needs brought about by changes in programs, advances in technology, and related issues.

- The least life cycle cost analysis also enables project development to focus on designs that reduce the ongoing maintenance cost of facilities. Within this context, MSU's high-quality construction standards intentionally create plans and assemble materials that "design out" as much near and long-term maintenance as possible. In summary, the anticipated expenses of a facility over its life cycle are carefully considered in relation to the initial investment in design and materials. Project decisions made within the context of MSU's construction standards may, in some cases, be viewed as more expensive initially but, in practice, actually reduce the total cost of ownership.

Future Building Opportunities

Future building opportunities are depicted on two graphics. The first entitled Building Framework, illustrates future opportunities that do not require major demolition of existing facilities. The second graphic, entitled Major Redevelopment Opportunities, explores additional development parcels that will require careful assessment of existing facilities relative to highest and best land use, program relocation, deferred maintenance needs, and facility replacement costs. Both graphics employ the smart growth strategy of carefully conceived building "infill" to maximize land use capacity through greater building density.

The plans illustrate where future buildings can be assimilated into the campus context while reinforcing the Campus Planning Principles and University Zoning Ordinance. As such, the plans do not dictate when and where growth will occur, rather they identify development opportunities that can be evaluated to address specific programmatic needs when a project is identified and funding secured.

Each numbered site is measured and a potential building gross square foot yield is estimated by incorporating zoning allowances and important contextual features. Where development opportunity land areas are too large, and architectural speculation is not definable, a floor area ratio planning metric is assigned to estimate future building square footage.

Based on this assessment, the following quantifies future building opportunities for the campus lands north of Mount Hope Road. The estimated net potential represents future building opportunities less any existing building demolition. The campus has historically added, on average, approximately 2.0 million gross square feet (MGSF) every decade. At that rate, the net opportunities support nearly 58 years of future growth assuming each site is developed to its optimal capacity and all redevelopment zones are strategically implemented.

The following identifies future development potential based on opportunities that do not require significant redevelopment or removal of existing facilities.

Zoning Designation	Estimated Gross Potential	Estimated Net Potential
North Academic District	405,350 GSF	405,350 GSF
Central Academic District	1,832,615 GSF	1,832,615 GSF
South Academic District	2,457,686 GSF	2,457,686 GSF
Mixed Use District	4,538,950 GSF	3,733,890 GSF
Athletic/Recreation District	429,800 GSF	429,800 GSF
Service District	835,100 GSF	824,235 GSF
Residential District East	130,000 GSF	130,000 GSF
Total Opportunity (w/o redevelopment)	**10,638,715 GSF**	**9,813,576 GSF**

Adding in all redevelopment opportunities, the estimated future development potential increases as noted below.

Zoning Designation	Estimated Gross Potential	Estimated Net Potential
North Academic District	845,350 GSF	532,340 GSF
Central Academic District	3,560,115 GSF	3,169,583 GSF
South Academic District	2,457,686 GSF	2,457,686 GSF
Mixed Use District	4,538,950 GSF	3,733,890 GSF
Athletic/Recreation District	524,300 GSF	524,300 GSF
Service District	901,850 GSF	873,143 GSF
Residential District East	642,750 GSF	231,582 GSF
Total Opportunity (with redevelopment)	**13,480,215 GSF**	**11,522,524 GSF**

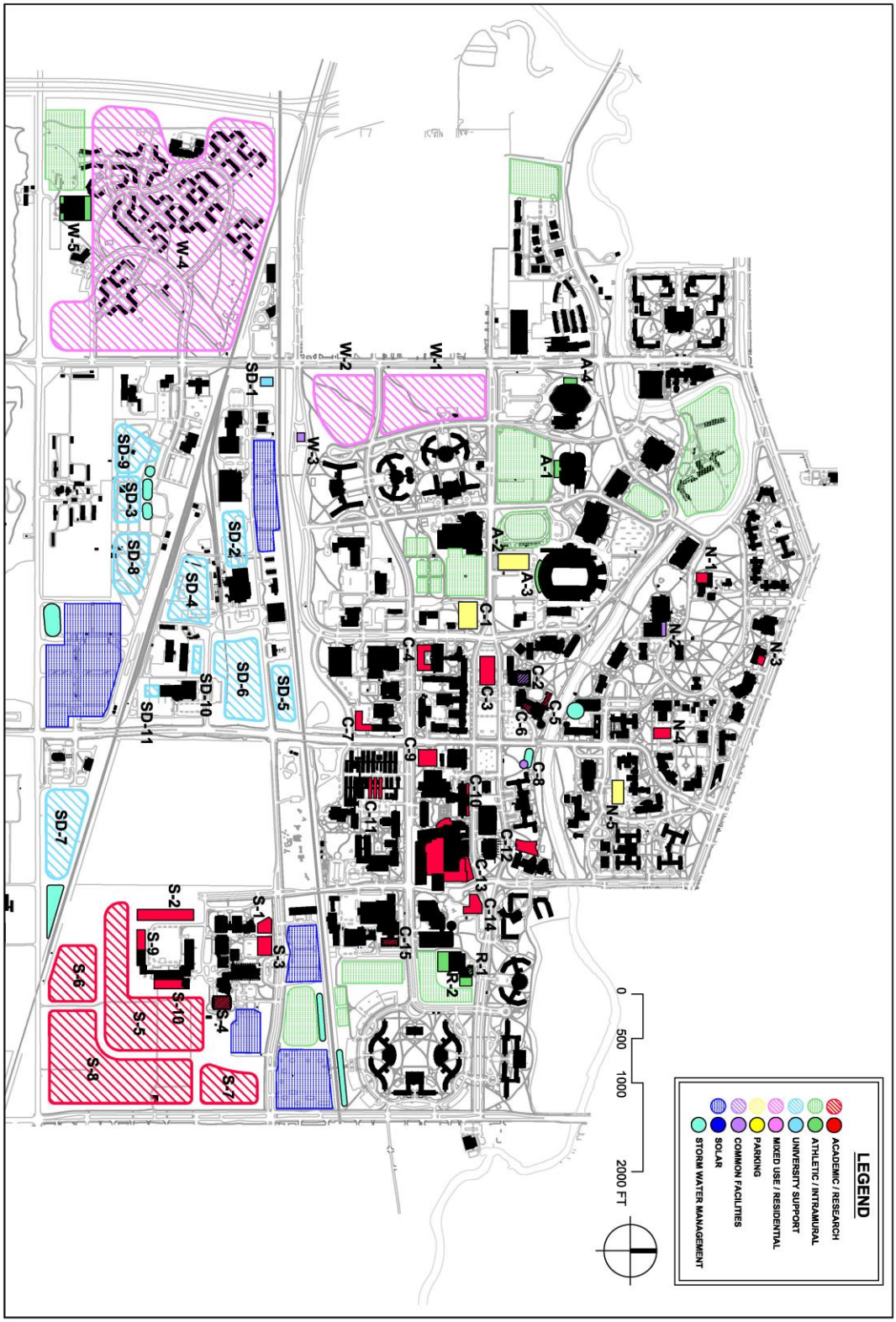
STRATEGIC LAND ACQUISITION

The University continually assesses land adjacent to the campus for acquisition to meet academic and research needs. The existing USDA Avian Disease and Oncology Lab at Harrison and Mount Hope Roads is a land acquisition priority due to its strategic location within the contiguous campus boundary. The University has communicated its intent to reacquire this parcel to congressional representatives and will communicate with the United States Department of Agriculture when a formal decision to relocate the facility is announced.

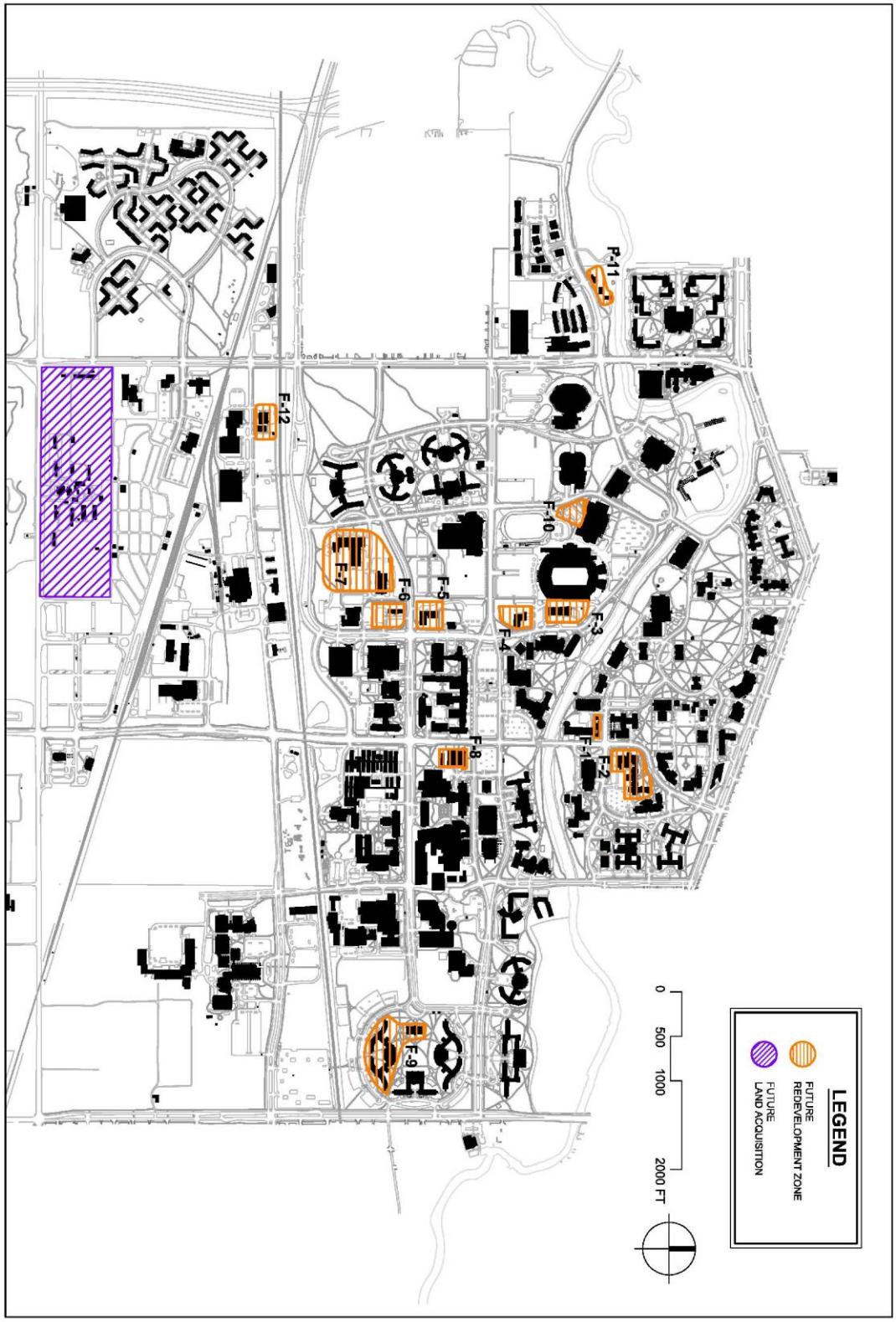
100-YEAR FLOODPLAIN AND STORM WATER MANAGEMENT

Campus land is reserved to provide future storm water management facilities that will address municipal storm water regulations under the Clean Water Act. Individual building projects are evaluated by the University Engineer and a technical work group to assess its ability to meet current storm water management regulations on site. If a project cannot meet its requirements on site, due to existing development constraints or other unique project attributes, then the University has the option of utilizing a sub watershed facility in another location on campus per Michigan Department of Environmental Quality agreements.

Two important Campus Land Use Master Plan recommendations will help reduce the impact on the Red Cedar River. First, the removal/relocation of Parking Ramp #2 (Auditorium Road) will convert a sizeable amount of land back to its function as floodplain. Second, the removal and relocation of approximately 1,000 surface parking spaces in the Central Academic District will remove an existing land use that has negative impacts both in terms of storm water quantity and quality.



1 OF 1	CAPITAL PROJ. NO.	BUILDING FRAMEWORK	MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities



MAJOR REDEVELOPMENT OPPORTUNITIES

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

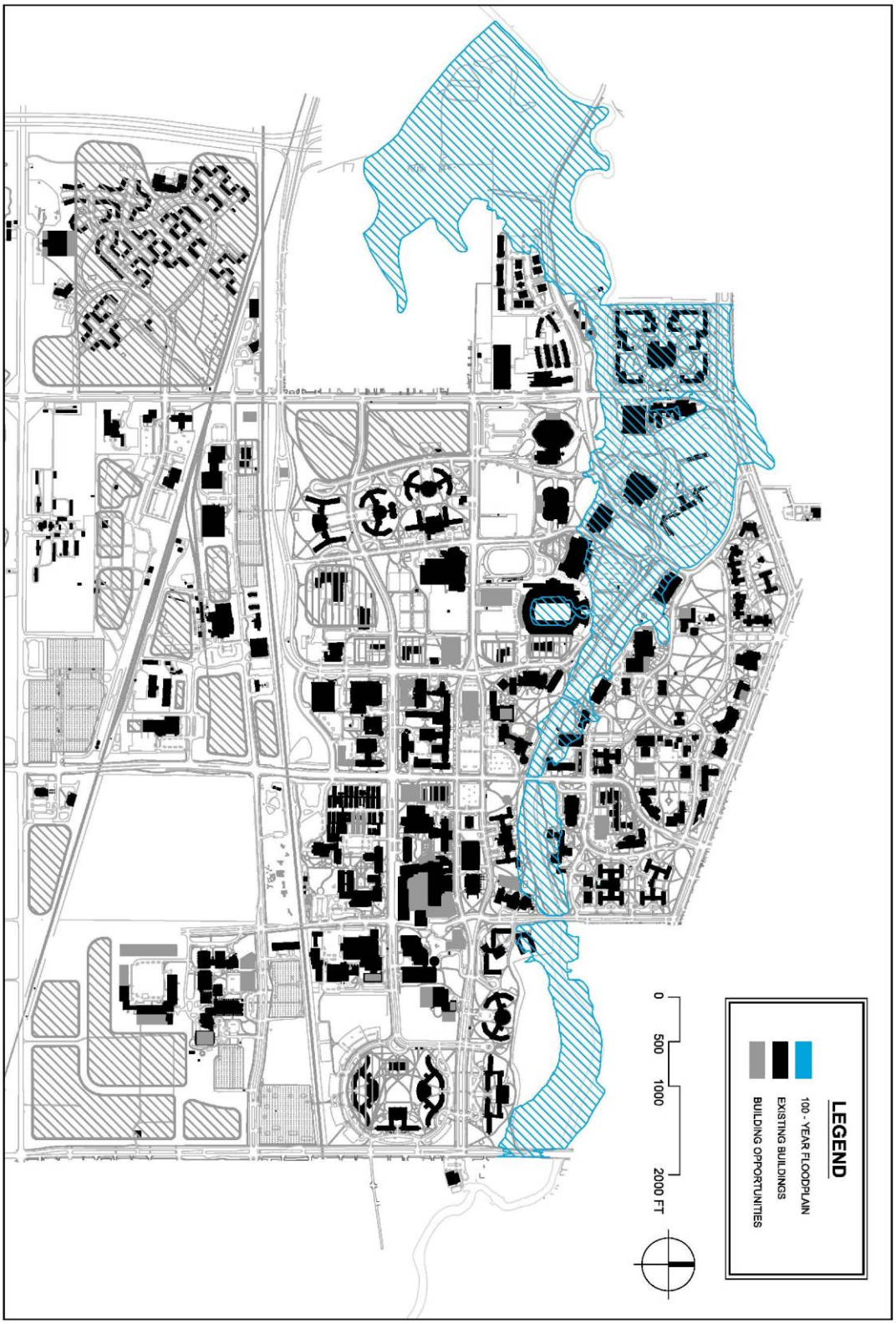
Campus Master Plan - Update 2016
Building Opportunity Framework Plan
Updated 12/19/2016

District	#	Project	Estimated Envelope	Proposed Envelope Utilization (%)	Potential Footprint	Footprint Demolition	Proposed Height	Potential GSF	GSF Demolition	GSF Net New	Notes
NORTH ACADEMIC DISTRICT											
N	1	College of Music Addition	14,200	0.75	10,650		4	53,250		53,250	Restrict buildings from Adams Field
N	2	Library Addition	8,400	1	8,400		4	42,000		42,000	
N	3	Human Ecology Expansion	7,700	1	7,700		4	38,500		38,500	
N	4	New Academic Building	22,000	0.8	17,600		4	88,000		88,000	
N	5	Parking Garage	34,000	0.9	30,600		6	183,600		183,600	750 spaces approx.
F	1	Bessey Hall Office Wing Redevelopment	20,000	1	20,000	-20,000	4	100,000	-60,000	40,000	Demolish Bessey Hall north wing
F	2	New Academic Building	170,000	0.4	68,000	-55,974	4	340,000	-253,010	86,990	Demolish Giltner Hall
		District Subtotal			**162,950**			**845,350**		**532,340**	
CENTRAL ACADEMIC DISTRICT											
C	1	Parking Garage	63,000	0.9	56,700		6	340,200		340,200	1100 spaces approx.
C	2	International Center Vert. Expansion	10,000	1	10,000		1	10,000		10,000	
C	3	New Academic Building	53,000	0.75	39,750		6	278,250		278,250	
C	4	Engineering Addition	34,000	0.75	25,500		6	178,500		178,500	
C	5	Erickson Office Vertical Expansion	8,800	1	8,800		2	17,600		17,600	
C	6	Erickson Front Vertical Expansion	7,000	1	7,000		2	14,000		14,000	
C	7	Natural Resources Addition	24,000	0.9	21,600		6	151,200		151,200	
C	8	Special Feature	6,000	1	6,000		1	6,000		6,000	Possible amphitheater/stage
C	9	New Academic Building	38,000	0.75	28,500		6	199,500		199,500	
C	10	Chemistry Additions (East & West)	7,500	1	7,500		6	52,500		52,500	
C	11	Greenhouse Expansion	28,000	1	28,000		1	28,000		28,000	
C	12	Business College Graduate Pavilion	24,000	1	24,000		4	96,000		96,000	Per LMN program
C	13	FRIB Expansion	123,037	1	123,037		2	261,365		261,365	Per B. Bull
C	14	New Academic Building	32,000	0.75	24,000		6	168,000		168,000	
C	15	Veterinary Oncology Vert. Expansion	17,500	0.9	15,750		2	31,500		31,500	
F	3	New Redevelopment Zone	107,000	0.25	26,750	-22,922	1	275,000	-70,035	204,965	Demolish Central Service, per HOK study
F	4	Shaw Power Plant Redevelopment	80,000	0.25	20,000	-13,234	6	140,000	-40,661	99,339	Repurpose or demolish existing plant
F	5	New Academic Building	87,000	0.25	21,750	-18,634	6	152,250	-47,013	105,237	Demolish existing UPLA building
F	6	New Academic Building	93,000	0.25	23,250	-6,700	6	162,750	-19,896	142,854	Demolish Oyer Speech and Hearing
F	7	New Academic Zone	482,000	0.25	120,500	-88,371	6	723,000	-131,298	591,702	Demo IPF and LS
F	8	New Academic Building	61,000	0.75	45,750	-47,352	6	274,500	-81,629	192,871	Demolish Farrall Hall and Storage Building
		District Subtotal			**684,137**			**3,560,115**		**3,169,583**	
SOUTH ACADEMIC DISTRICT											
S	1	Life Science Addition	23,000	0.9	20,700		6	144,900		144,900	
S	2	New Academic Building	76,000	0.75	57,000		2	171,000		171,000	Assume two-story or high-bay massing
S	3	New Academic Building	33,000	0.75	24,750		6	173,250		173,250	
S	4	Radiology Vertical Expansion	30,000	1	30,000		1	30,000		30,000	
S	5	New Academic Zone	912,000	0.75	228,000		1	684,000		684,000	Assume FAR @ 0.75 with surface parking
S	6	New Academic Zone	300,000	0.75	75,000		1	225,000		225,000	Assume FAR @ 0.75 with surface parking
S	7	New Academic Zone	234,000	0.75	58,500		1	175,500		175,500	Assume FAR @ 0.75 with surface parking
S	8	New Academic Zone	1,085,000	0.75	271,250	-3,724	1	813,750	-9,214	804,536	Assume FAR @ 0.75, remove misc. structures
S	9	Automotive Research Addition	21,000	0.9	18,900		1	18,900		18,900	No basement
S	10	Fraunhofer Addition	34,000	0.9	30,600		1	30,600		30,600	No basement
		District Subtotal			**814,700**			**2,466,900**		**2,457,686**	
RESIDENTIAL DISTRICT EAST											
R	1	IM East Vertical Expansion	4,000	1	4,000		1	4,000		4,000	
R	2	IM East Additions	42,000	0.75	31,500		3	126,000		126,000	
F	9	Fee Hall Redevelopment	293,000	0.25	73,250	-94,055	6	512,750	-411,168	101,582	Demo Conrad and Fee Hall
		District Subtotal			**108,750**			**642,750**		**231,582**	
MIXED USE DISTRICT											
W	1	New Mixed use	618,000	0.75	tbd		1	463,500		463,500	Assume FAR @ 0.75 with surface parking
W	2	New Mixed use	447,000	0.75	tbd		1	335,250		335,250	Assume FAR @ 0.75 with surface parking
W	3	Visitor Center Expansion	8,000	0.9	7,200		1	7,200		7,200	No basement
W	4	New Mixed Use	4,940,000	0.75	tbd	-396,132	1	3,705,000	-793,857	2,911,143	Assume FAR @ 0.75, demo apts.
W	5	Tennis Center Addition	28,000	1	28,000		1	28,000		28,000	No basement
F	11	Demolition Zone	63,000	0.5	0	-8,149	0	0	-11,203	-11,203	Flood plain limitations, no basement
		District Subtotal			**35,200**			**4,538,950**		**3,733,890**	
ATHLETIC AND RECREATION DISTRICT											
A	1	Munn Addition	25,000	1	25,000		2	50,000		50,000	Per athletic's program
A	2	Parking Garage	62,000	0.9	55,800		6	334,800		334,800	1,000 spaces approx.
A	3	South Stadium Addition	35,000	1	35,000		1	35,000		35,000	Per athletic's program
A	4	Breslin Addition	10,000	1	10,000		1	10,000		10,000	
F	10	IM West Expansion/Renovation	63,000	0.75	47,250		2	94,500		94,500	Expansion of IM West
		District Subtotal			**173,050**			**524,300**		**524,300**	
SERVICE DISTRICT											
SD	1	New Support Building	14,000	0.85	11,900		4	59,500		59,500	
SD	2	Simon Power Plant Addition	138,000	0.75	103,500		1	103,500		103,500	
SD	3	Future Development Zone	142,000	0.35	49,700	-4,620	1	49,700	-4,872	44,828	Assume FAR @ 0.35, demo misc. structures
SD	4	Future Development Zone	260,000	0.35	91,000		1	91,000		91,000	Assume FAR @ 0.35
SD	5	Future Development Zone	125,000	0.35	43,750		1	43,750		43,750	Assume FAR @ 0.35
SD	6	Future Development Zone	396,000	0.35	138,600		1	138,600		138,600	Assume FAR @ 0.35
SD	7	Future Development Zone	350,000	0.35	122,500		1	122,500		122,500	Assume FAR @ 0.35
SD	8	Future Development Zone	232,000	0.35	81,200	-4,778	1	81,200	-4,786	76,414	Assume FAR @ 0.35, demo misc. structures
SD	9	Data Center	181,000	0.35	63,350	-1,207	1	63,350	-1,207	62,143	Assume FAR @ 0.35, demo misc. structures
SD	10	Future Development Zone	24,000	0.75	18,000		4	72,000		72,000	
SD	11	Recycling Center Addition	10,000	1	10,000		1	10,000		10,000	
F	12	New Academic Zone	89,000	0.75	66,750	-17,792	1	66,750	-17,842	48,908	Assume FAR @ 0.75, demolition of housing office
		District Subtotal			**800,250**			**901,850**		**873,143**	
		TOTAL GSF			**2,779,037**			**13,480,215**		**11,522,524**	

Key:

Academic / Research
Athletic / Intramural
University Support
Mixed Use / Residential
Parking
Common Facilities
Solar
Stormwater Management
Future Redevelopment Opportunities

Potential building GSF includes above ground stories as indicated plus basement unless indicated.



1 OF 1	100 - YEAR FLOODPLAIN	MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

OPEN SPACE AND LANDSCAPE

THE CAMPUS AS AN ARBORETUM

In 1980, President John A. Hannah remarked, *"Long ago it was planned that the campus should be an outdoor laboratory, with all the variety of trees, shrubs, and woody plants that could be made to grow in Michigan, labeled and tagged not only for students in botany and silviculture and landscape architecture, but for all students and faculty and people in the community."*

President Hannah was reflecting on Professor William Beal's 1872 proposal for a campus arboretum. Professor Beal hoped this would lead to a more formalized campus tree planting program. At the time, trees were grown in an arboretum located between what are today, Mary Mayo and Campbell Halls; from there they were transplanted across campus. Professor Beal conducted the first inventory of campus trees in the 1880's and began the labeling program identifying trees by common name, scientific name, family, and geographic origin, a program which continues today (Telewski 2010). As envisioned by Professor Beal, the campus arboretum serves as a valuable resource for teaching, research, and outreach.

The MSU campus is renowned and beloved by students, faculty, staff, alumni, and visitors. As such, detailed recommendations are required to protect and enhance its open space and landscape aesthetic while maintaining an appropriate balance with the evolving built environment.

The Campus Land Use Master Plan provides a unifying vision for the campus open space and landscape aesthetic. The plan directs stewardship and preservation of the historic campus park and guides future enhancement of the built environment, including the campus as an arboretum for teaching, research, and public outreach.

PROTECTED GREEN SPACE

Based on a detailed classification for the open space system, the following areas are deemed sensitive to development and are subject to protection from any new building footprint or material change to the campus landscape under the definitions and regulations of the University Zoning Ordinance.

Component 1 areas identify and protect landscape areas that have an ecological or historic aspect. *Component 2* areas identify and protect green space that provides a unique programmatic or research land use.

DISTRICT CHARACTERISTICS AND PLANNING GUIDELINES

Historic and Historic Contributing

The park-like setting that students, alumni, and visitors endear is directly influenced by the historic campus landscape(s). The West Circle Drive area from Grand River Avenue to the Red Cedar River and from the Beal Entrance to the Lab Row building group is the site of the

original built campus founded in 1855. The prairie-style landscape and informal grouping of buildings provides a picturesque campus park, unique among American college campuses. The trees and undulating lawns within the West Circle Drive area were recognized by O.C. Simonds as "sacred space" (circa 1905). The historic landscape shall be protected from future development and enhanced through landscape stewardship.

Park-Like Academic

The academic districts of campus, comprised of a diverse collection of trees and shrubs, lend themselves to supporting teaching, research, and student life activities.

The Prairie School patterning of "sun openings" is prevalent in the North Academic District. This concept consists of creating alternating areas of deep shade and sunlit lawns that are reminiscent of the indigenous savannah that once covered much of the northern Midwest. The trees and undulating lawns within the Circle Campus area were recognized by O.C. Simonds as "sacred space" (circa 1905) and remain so today.

The extensive roadway network and large building massing within the Central Academic District creates an intensive built aesthetic that requires substantial landscape interventions to mitigate for human comfort. Much of what a pedestrian perceives is strongly influenced by the adjacent roadways and architectural design. Therefore, a strong streetscape and front-yard landscape is essential to mitigate these elements and to properly transition the landscape scale from the roadway to the building entrances. Special focus should be on safety and providing a pleasant experience and sense of scale along pedestrian walkways.

The South Academic District is defined by large architectural structures that collectively do not provide a sense of place or a pleasant relationship with the pedestrian realm. This requires that the landscape mitigate for this poor composition; creating a comfortable pedestrian environment. The landscape needs to be strengthened to better unify the visual aesthetic and to provide places for social interaction, academic collaboration, and personal health/relaxation.

Park-Like Residential

Approximately 17,500 students call the University's seven residential neighborhoods home. The landscape design for the neighborhoods must address a wide variety of issues including: scale transition, screening of service functions, providing room for informal recreation, and more intimate areas for relaxation and mental restoration. Transitioning the scale from large roadway spaces to more intimate building entrances is important in the front yards. Recreational amenities and areas for personal relaxation are appropriate in the back yards.

Park-Like Service

The Campus Land Use Master Plan strategizes consolidating support services south of the Canadian Northern railroad tracks. The landscape should reinforce this area as a vital part of the overall campus, while acknowledging its purpose and functionality.

Athletic and Recreation

Intercollegiate athletics and intramural recreation activities require a landscape capable of handling large volumes of people, heavy foot traffic, and various activities that can stress the landscape (e.g., event parking on intramural fields). While the venues themselves require a very utilitarian design, this must be balanced with the fact that they are also gateways for thousands of visitors each year, and as such, must present a high quality aesthetic that properly represents the University along with mitigating for each venue's architectural scale.

River Corridor

The Red Cedar River is an iconic campus element that is a core attribute of the campus park. It is an active natural system that is constantly impacting the campus landscape. A large collection of ash trees inhabit the river corridor and with the ongoing destruction by the Emerald Ash Borer, most of these will not survive. The University needs to invest in the river corridor from a historic, cultural, aesthetic, and environmental perspective.

Signature Landscapes

Signature landscapes are focal points throughout the campus. They vary in size and purpose; are associated with a heightened design aesthetic; utilize high-quality materials; are often associated with public art, fountains, or historic features; include irrigation; and, demand elevated maintenance standards and practices. They are important for encouraging community interaction and can be considered as eddies within the larger campus park wherein people can slow down and enjoy a more intimate sense of scale. Signature landscapes require either priority or elite maintenance levels.

Gardens and Arboreta

These areas are delineated and overseen by a curator or established administrative group. They are actively designed, planted, and managed - not naturalized. A primary goal for the use of these areas is education and research with elite maintenance required to sustain the integrity of the plantings and collections.

Natural Areas

The natural areas are designated by Board of Trustee action and are overseen by the Campus Natural Areas Committee. They are classified into three categories of protection and academic use based on their overall quality and their potential for sustained use. They serve as protected examples of Michigan's native landscape and wildlife.

Conservation and Demonstration

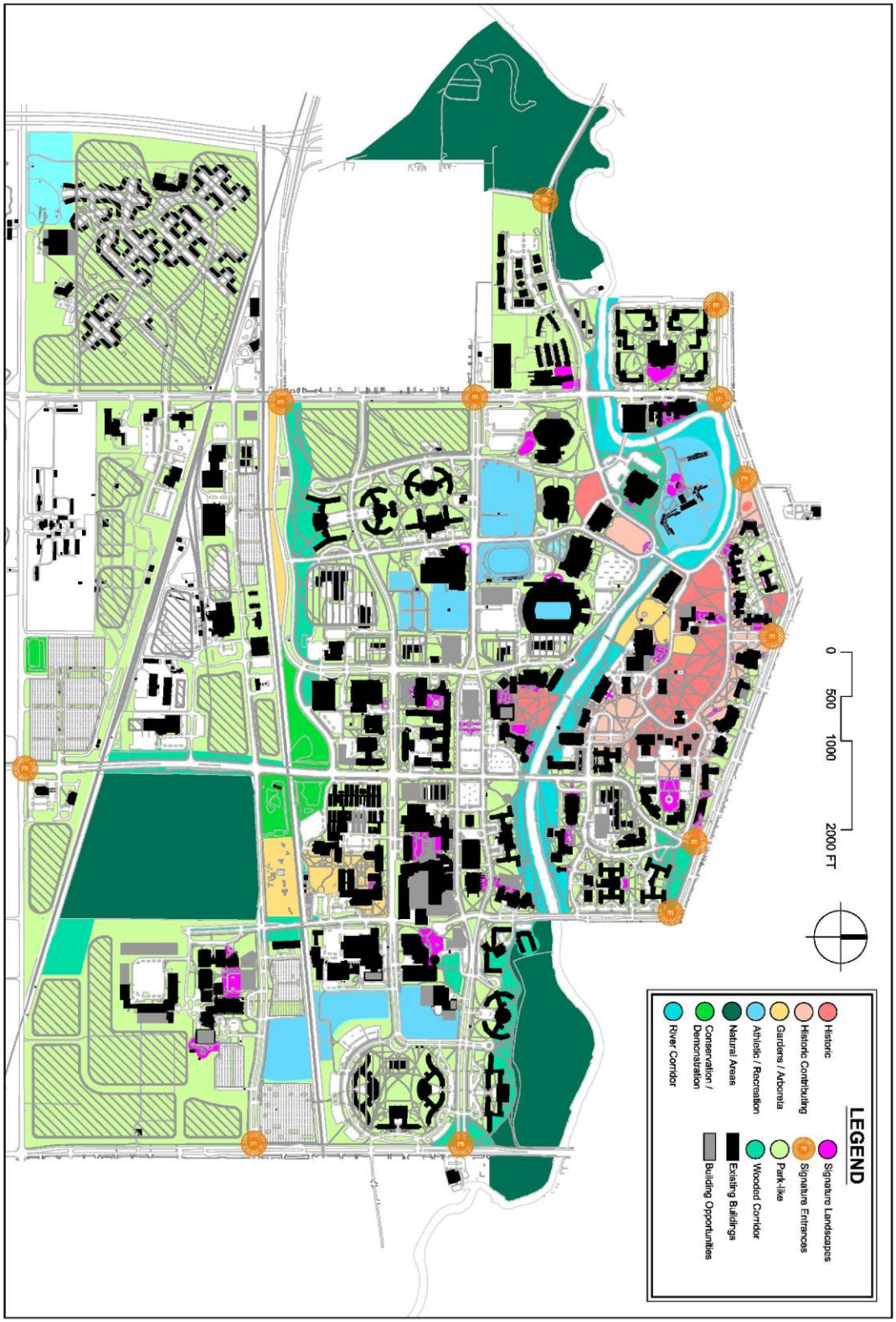
Conservation and demonstration areas are built landscapes for the purpose of storm water management, education, and research. They are actively designed, planted, and managed, requiring a moderate amount of maintenance to ensure integrity of the plantings and operation of the storm water management features.

Campus Entrances

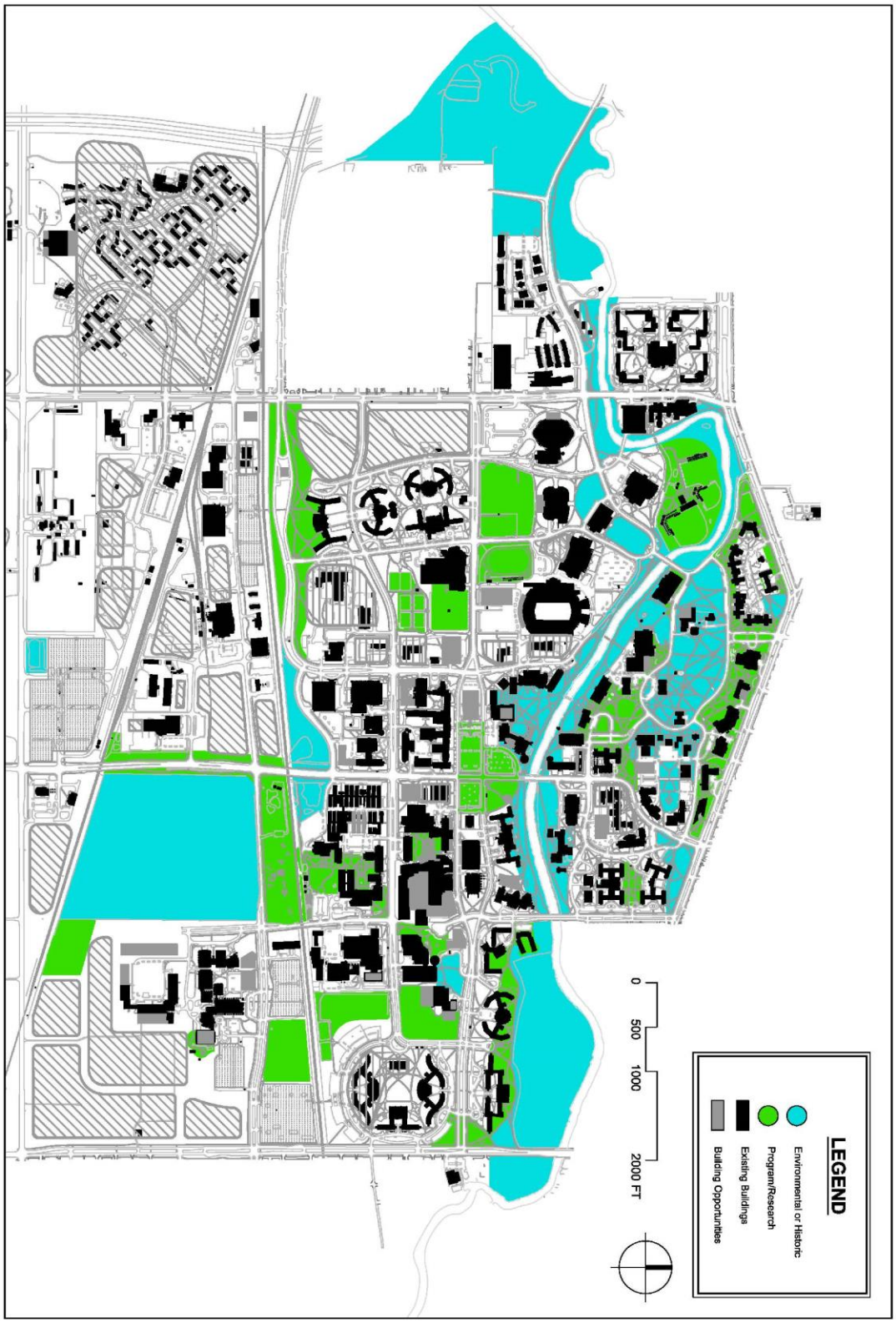
Campus Entrances (vehicular and pedestrian) provide an opportunity to strengthen the University's image and reinforce its reputation for excellence. High quality landscape design and maintenance practices (elite and priority) are required. Consistent signage and a homogeneous landscape treatment are desirable for assisting visitor wayfinding and the efficient movement of goods and services.

Streetscapes

The campus roadway system provides approximately 18 miles of opportunity to establish a quality image for the University. The streetscape (the landscape setting adjacent to the road) must address numerous design issues, including safety, image, environmental sustainability, and wayfinding all within what is often a harsh growing condition.

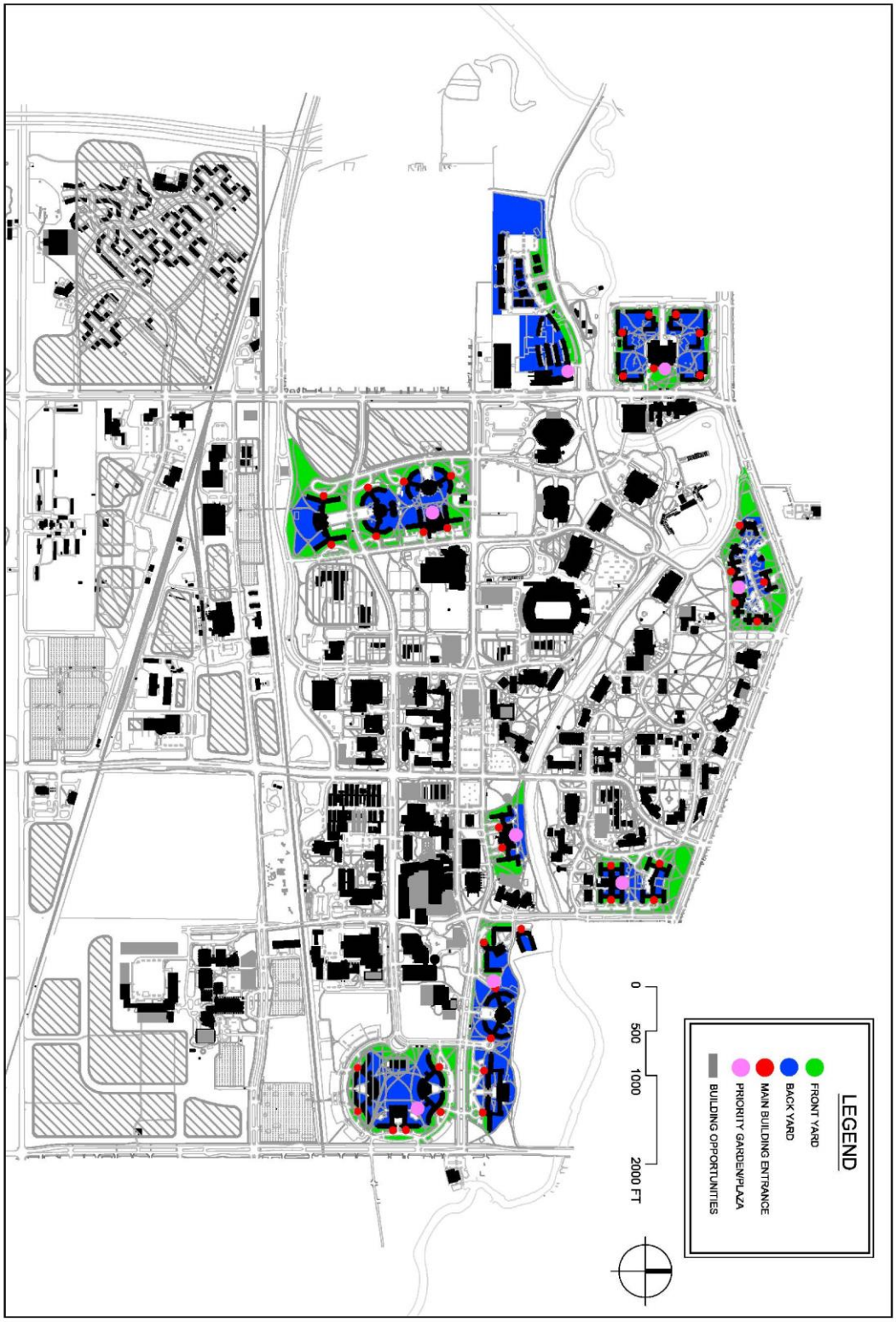


1 OF 1	OPEN SPACE FRAMEWORK	MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities



PROTECTED GREEN SPACE

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities



RESIDENTIAL NEIGHBORHOODS
LANDSCAPE FRAMEWORK

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

MOTORIZED CIRCULATION FRAMEWORK

NEAR-TERM PRIORITIES

The following motorized projects and initiatives are anticipated in the near term (five- to ten-year planning horizon).

- Develop a comprehensive mobility plan that addresses the movement of people to, from, and around campus.
- Extend Wilson Road to Hagadorn Road with the goal of improving safety by reducing traffic within the East Residential District, relocating parking adjacent to Fee Hall, and providing a signalized intersection to aid pedestrians crossing Hagadorn Road.
- Remove Parking Ramp #2 when engineering analysis directs and restore the river floodplain. Address parking replacement consistent with the mobility plan (under development) and planning principles guiding more parking on the campus periphery.

LONGER-TERM OPPORTUNITIES

The following projects should be considered in long-range planning to address various motorized circulation issues.

- Redesign the Farm Lane and Grand River intersection including a new traffic signal at East Circle Drive to improve operational efficiency and safety.
- Reconstruct the section of Farm Lane between North and South Shaw Lane to provide appropriate vehicular turning movements and bike lanes.
- Extend Bogue Street through the South Academic District as a two-lane roadway with center-turn lane as required.
- Redesign the Bogue Street and Service Road intersection, removing the awkward transition from the boulevard cross section.
- Extend East Crescent Road through the former Agriculture Exposition site.
- Reconfigure Red Cedar Road to provide greater distance from the Kalamazoo and Beal Streets intersection.
- Close the segment of North Shaw Lane between Red Cedar and Science Roads to private automobile traffic, change South Shaw Lane into a two-way street, and relocate surface parking.

NON-MOTORIZED CIRCULATION

NEAR-TERM PRIORITIES

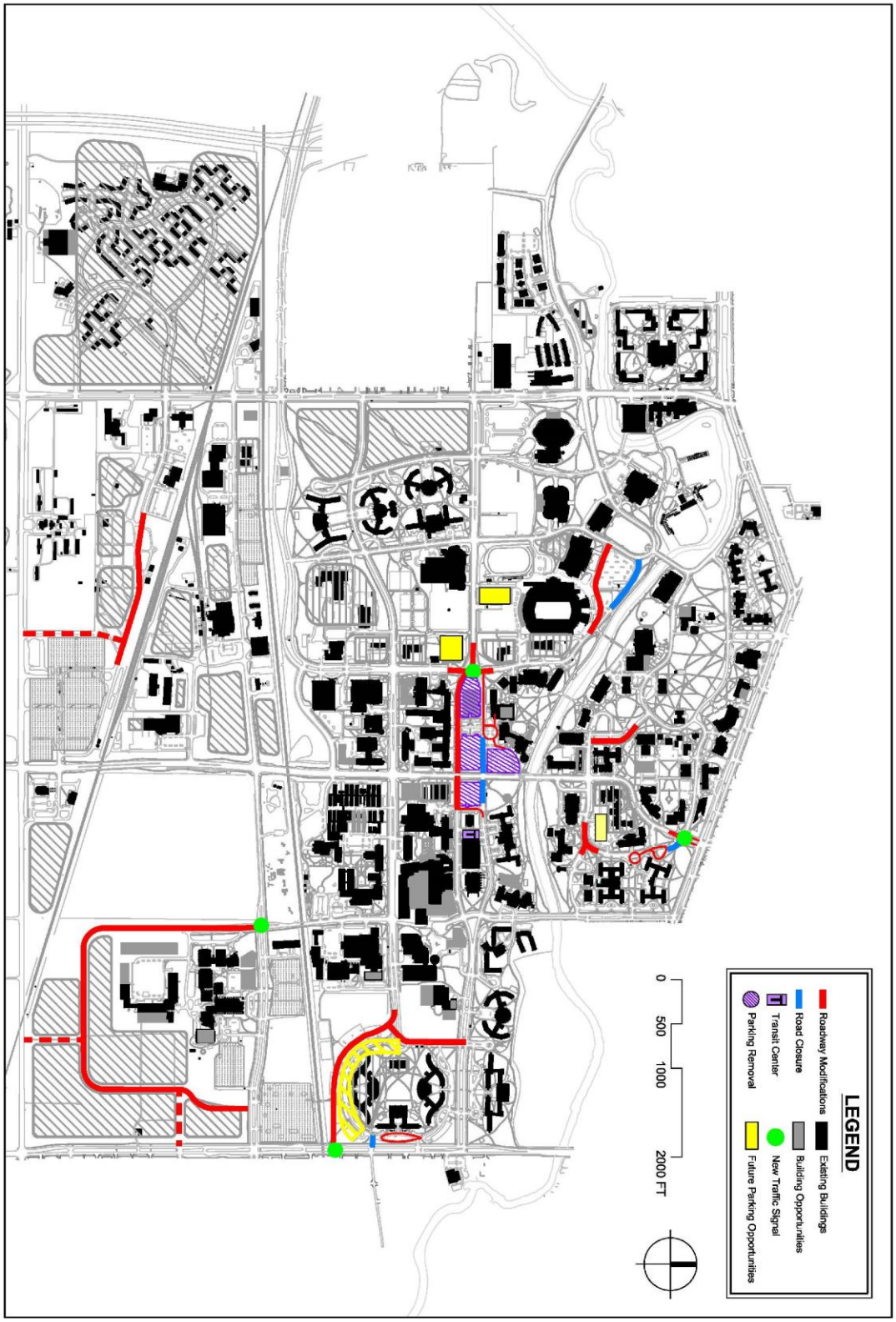
The following non-motorized projects and initiatives are anticipated in the near term (five- to ten-year planning horizon).

- Continue to design all roadways as complete streets in accordance with State of Michigan Public Acts 134 and 135 of 2010 wherein all roadways are to be planned and designed to meet the needs of all legal users.
- Continue to meet the needs of persons with disabilities working through the Accessibility Committee that includes IPF, FPSM, RCPD, RHS, and athletics.
- Continue bringing crosswalk pathway ramps up to ADA standards (e.g., maximum slopes, truncated domes).
- Provide infrastructure to support a suite of transportation options that discourage single-occupancy vehicle trips to, from, and around campus (e.g., CATA Clean Commute and Zipcar car-sharing programs) in alignment with the mobility plan.
- Fund and construct the final segments of the MSU River Trail.
- Enhance and expand bicycle parking within the academic and residential districts with a goal to accommodate 30% of the resident population.

LONGER-TERM OPPORTUNITIES

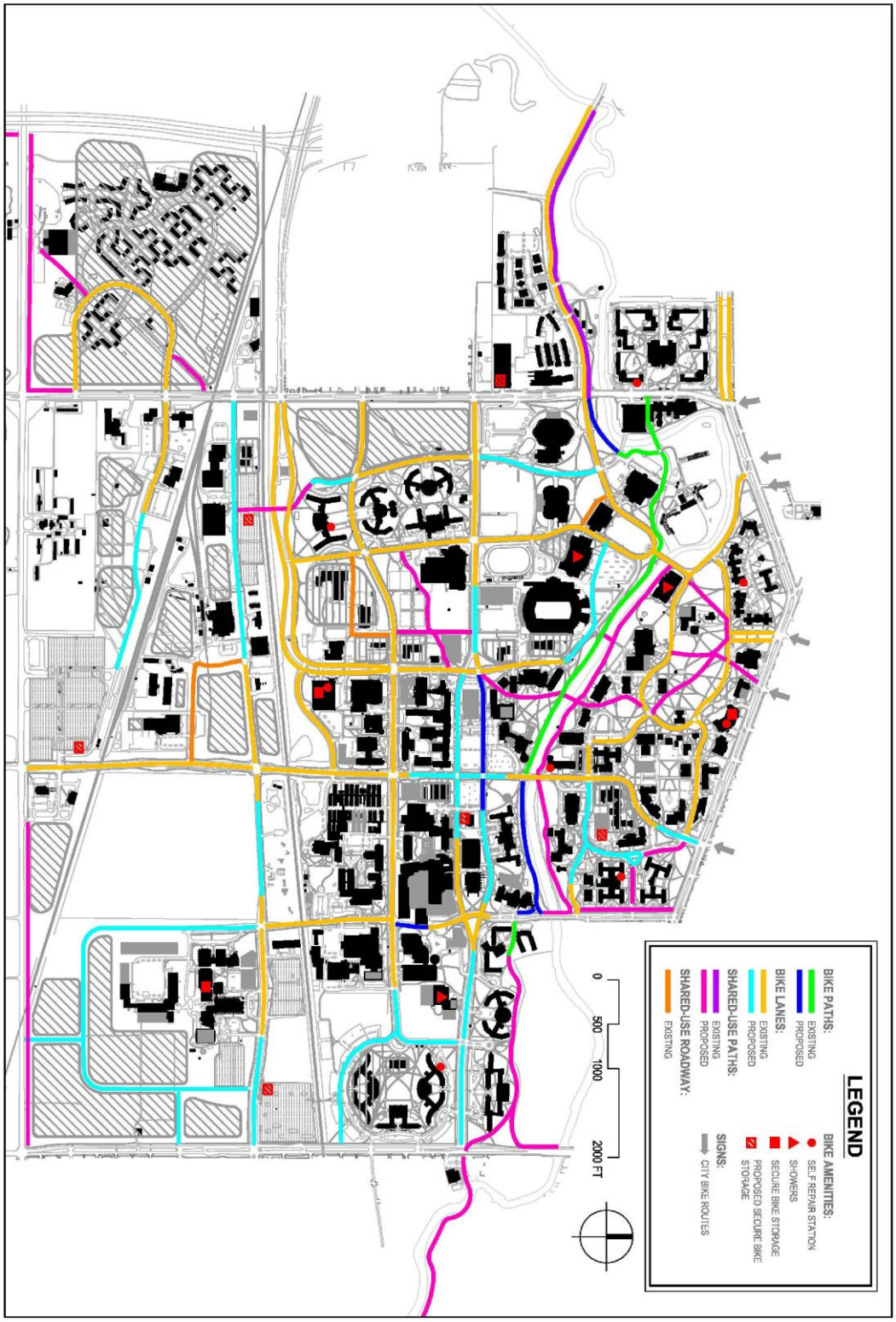
The following projects should be considered in long-range planning to address various non-motorized circulation issues.

- Study and implement site improvements at the southwest corner of Chestnut Road and Shaw Lane to curtail existing J-walking and to enhance pedestrian safety.
- Convert dirt-worn paths to permanent walkways.
- Continue working with the City of Lansing, City of East Lansing, and Meridian Township on interconnecting campus and municipal trail systems.
- Construct an accessible route from Bessey Hall under the Farm Lane Bridge to Auditorium Field.
- Continue working with the City of East Lansing on reconstructing the Bogue Street bridge over the river and incorporating the MSU River Trail along the river and east of Van Hoosen Hall.
- Develop a system of sidewalk shared-use pathways along major bicycle travel routes not adjacent to roadways.
- Establish a pedestrian and bicycle pathway along with the North Shaw Lane road closure between Red Cedar Road and Science Drive.
- Consider protected bike lanes where enhanced safety is required.



MOTORIZED
CIRCULATION FRAMEWORK

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities



1 OF 1	CAPITAL PROJ. NO.	NON - MOTORIZED CIRCULATION FRAMEWORK	MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

MICHIGAN STATE UNIVERSITY ZONING ORDINANCE

CERTIFICATION

I HEREBY CERTIFY that the following Act to Codify Regulations Affecting Campus Planning, Designating Land Area Uses, Establishing a Campus Land Use Master Plan, and Providing for the Administration Thereof, for the Benefit and Protection of the Property of the Board of Trustees of Michigan State University, was passed by the Board of Trustees at a meeting duly called and held at East Lansing, Michigan, on the seventeenth day of February, 2017, at which a quorum was present and voted.

_____

Bill Beekman, Vice President and Secretary of the Board of Trustees

Dated: April 19, 1968

Revision Date: February 17, 2017

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AN ACT TO CODIFY REGULATIONS AFFECTING CAMPUS PLANNING, DESIGNATING LAND AREA USES, ESTABLISHING A MASTER PLAN, AND PROVIDING FOR THE ADMINISTRATION THEREOF, FOR THE BENEFIT AND PROTECTION OF THE PROPERTY OF THE BOARD OF TRUSTEES OF MICHIGAN STATE UNIVERSITY, PURSUANT TO AUTHORITY CONFERRED BY THE CONSTITUTION AND STATUTES OF THE STATE OF MICHIGAN.

1.00 - STATEMENT OF PURPOSE

1.1 The Board of Trustees of Michigan State University believes that regulations are essential to preserve the campus environment of spaciousness and landscape beauty, promote order and unity, and minimize congestion on the property governed by the Board, and to provide guidelines affecting the improvement thereof, the Board hereby adopts the following provisions:

2.00 - EFFECTIVENESS OF ORDINANCE

2.1 This ordinance became effective at 12:01 a.m. September 1, 1968. This Ordinance is coordinated with and becomes an integral part of the Campus Land Use Master Plan and all updates.

3.00 – AUTHORITY OF BOARD OF TRUSTEES

3.1 This ordinance is enacted by the Board of Trustees of Michigan State University pursuant to, and in accordance with, the authority and responsibility of said Board contained in the Constitution of the State of Michigan and Public Acts relating thereto.

4.00 – DEFINITIONS

4.1 The term “institution” pertains specifically to Michigan State University at East Lansing, Michigan.

4.2 The term “academic use” encompasses any building or portion thereof that is used for the teaching of classes, research facilities and administrative and operational facilities, or any similar function and use for the educational and research purposes of the institution.

4.3 The term “building” refers to principal-use and accessory structures, and all attached architectural elements including stairs, areaways, ramps, and retaining walls that are integral to the design and function of the building.

4.4 The term “accessory building” includes a subordinate building or portion of a main building, located within the same block or district, which is secondary in nature to the principal use.

4.5 The term “accessory use” refers to a use that is subordinate to the principal use within the same block or district, comprising purposes secondary in nature to those of the principal use.

4.6 The term “ground area of a block” includes all land from the centerline of adjacent streets and roads or abutting use area established by description on the Zoning District Map. Such lines may be established by curb lines, section lines, institution property lines, other property lines, or those lines as shown and described on the Zoning District Map which is a part of this ordinance.

4.7 The term “curb line” is defined by the back of curb on either side of a road that is used for the general movement of motor vehicles, and encompasses those existing or extended, but does not include the curb line of parking bays, bus turnouts or similar variations. If no curb exists, the location of a proposed curb will be considered as the curb line. All setbacks are measured from the back of curb.

4.8 The term “nearest roadway” means that road which lies nearest any side of a building that is used for the general movement of motor vehicles, and does not include service drives or related variations thereof.

4.9 The term “non-conforming use” includes any building or land occupied and used at the time of the original adoption of this zoning ordinance which use does not conform with the use regulations established therefore.

4.10 The term “coverage” refers to the amount of ground area covered by buildings within a specified block of land defined by the adjacent roadway centerlines.

4.11 The term “protected green space” includes any land area essentially kept in an open lawn, wooded or landscaped condition, that is free of parking and buildings, and reserved for the general use and enjoyment by students, faculty, staff, alumni, and the general public. Protected green space areas may include recreation fields, walkways, bicycle paths, bicycle parking, bridges, sculpture, pavilions, amphitheaters and other related structures that are compatible with the purpose of these areas.

4.12 The term “service use” refers to any building or land area that is primarily involved with utility services and functions, and other accessory uses essential to the operation of the institution.

4.13 The terms “story” and “story height” refer to that portion of a building that is included between the surface of any floor and the surface of the next floor above it.

4.14 The term “setback” refers to the dimension between a building and the adjacent roadway curb line.

4.15 The terms “footprint” and “footprint change” refers to existing buildings or the modification of any existing building’s footprint.

4.16 The term “material change to the campus landscape” refers to all new buildings. It also refers to new constructed site features deemed of significant impact to the campus landscape by the Zoning Administrator.

5.00 - GENERAL REGULATIONS

5.1 Footprint Change: The modification of any existing building footprint requires BOT review.

5.2 Material Change to the Campus Landscape: All new buildings require BOT review. Any non-building project that has a significant impact on the campus landscape, and not already covered by the BOT project authorization process, will be identified by the Zoning Administrator and referred to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

5.3 Districts Established: In order to regulate and restrict the location of buildings and other structures erected or altered for specified uses, the campus is hereby divided into the following Zoning Districts:

AC-N	North Academic District
AC-C	Central Academic District
AC-S	South Academic District
R	Residential District
AR	Athletic and Recreation District
SE	Service District
N	Natural Areas District
AG	Agricultural and Natural Resources District
MU-N	North Mixed Use District
MU-S	South Mixed Use District

5.4 Area Boundaries: The boundaries of Zoning Districts are established on the Zoning District Map attached hereunto and made a part hereof, and all notations, references, and other descriptions contained thereon are made a part of this ordinance.

5.5 Compliance: Except as herein provided, no land shall be used, and no building shall be erected, converted, enlarged, reconstructed, or substantially altered, which does not comply with the district regulations established by this ordinance for the district in which the building or land is located.

5.6 Essential Utility Services: Structures required in conjunction with the distribution and maintenance of essential utility services may be permitted in any location when approved by the Zoning Administrator (refer to Section 7.0 Administration), who shall submit a determination of necessity to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

5.7 Except as provided herein, no buildings, roads or parking spaces shall be located in the Protected Green Space areas designated within the Zoning Districts as shown on the Protected Green Space map. The design of all elements proposed within the protected areas shall be approved by the Zoning Administrator. Such elements include walkways, bridges, sculpture, pavilions, amphitheaters, bicycle storage, essential utility services, storm water management features, and modifications to pre-existing disallowed elements such as parking lots, roads, and service drives. Expansion of existing buildings that abut Protected Green Space areas requires approval from the Zoning Administrator and shall be allowed only when other alternatives are proven to be unreasonable and when the expansion will only cause a minor change in the character of the Protected Green Space.

6.00 - DISTRICT REGULATIONS

6.1 "AC" Academic Districts: The following provisions shall apply to the Academic Districts AC-N, AC-C, and AC-S:

6.1.1 Permitted Uses: Permitted Uses for the AC Districts shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the AC Districts unless otherwise provided for in this ordinance:

6.1.1.1 Principal Uses and Buildings:

- Teaching facilities, including classrooms, lecture halls, instructional laboratories, and similar facilities used for general educational purposes.
- Research laboratories, general student facilities other than student housing, faculty offices, public/private business incubators, and facilities for administrative and operational functions.

6.1.1.2 Accessory Uses and Buildings:

- Surface parking and parking garages.
- Uses and structures necessary for the operation of the principal uses and buildings.
- Recreation fields and buildings.
- Solar or wind power generation and storage.

6.1.2 Building Height Requirements:

6.1.2.1 All buildings shall be limited to six stories of occupied space plus any required rooftop equipment in Districts AC-C and AC-S, and to four stories of occupied space plus any required rooftop equipment in AC-N.

6.1.2.2 Teaching facilities shall be located in the lowest floors possible, and not above the fourth floor of any building.

6.1.2.3 Parking garages shall be limited to six parking levels above and including the ground level.

6.1.2.4 Accessory buildings shall be no higher than necessary to accommodate the proposed use, and under no circumstances shall exceed the height of principal uses in the district.

6.1.3 Set Back Requirements: All buildings shall be set back a minimum of 40 feet from the nearest curb line of the nearest roadway.

6.1.4 Building Coverage:

6.1.4.1 Buildings shall not cover more than 30% of the ground area of any given block within the AC District unless otherwise specified herein.

6.1.4.2 Buildings shall not cover more than 35% of the ground area of any given block within the specific area defined by Red Cedar Road to the west, the CN Railroad to the south, the Residential District to the east, and South Shaw Lane to the north unless otherwise specified herein.

6.1.4.3 Buildings shall not cover more than 42% of the ground area for the block of land defined by South Shaw Lane to the north, Farm Lane to the west, Wilson Road to the south, and the Residential District to the east.

6.2 "R" Residential District: The following provisions shall apply to the Residential District:

6.2.1 Permitted Uses: Permitted Uses for the "R" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the R District unless otherwise provided for in this ordinance:

6.2.1.1 Principal Uses and Buildings:

- Residence halls and facilities used to provide associated services, such as food services, and health and wellness.
- Multiple unit dwellings.
- Primary schools, daycare centers, playgrounds, and other outdoor recreation facilities.

6.2.1.2 Accessory Uses and Buildings:

- Limited academic uses.
- Limited retail, recreation, and commercial uses to serve residents.
- Other uses necessary to the operation of the principal uses and buildings.
- Surface parking and parking garages.

6.2.2 Building Height Requirements:

6.2.2.1 Residence Halls: Height shall be limited to six stories plus any required rooftop equipment.

6.2.2.2 Accessory Uses and Buildings: Height shall be limited to three stories.

6.2.2.3 Parking garages shall be limited to six levels above and including the ground level.

6.2.3 Set Back Requirements: All buildings shall have a set back of a minimum distance of 50 feet from the nearest curb line of the nearest roadway.

6.2.4 Building Coverage: Buildings shall not cover more than 20% of the ground area within any given block in the "R" Districts.

6.3 "AR" Athletic and Recreation District: The following provision shall apply to the Athletic and Recreation District:

6.3.1 Permitted Uses: Permitted Uses for the "AR" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the AR District unless otherwise provided for in this ordinance:

6.3.1.1 Principal Uses and Buildings:

- Facilities related to recreational, intramural, and sporting events.

6.3.1.2 Accessory Uses and Buildings:

- Other uses and buildings necessary to the operation of the principal uses and buildings.
- Surface parking and parking garages.

6.3.2 Building Height Requirements:

6.3.2.1 All buildings shall be limited to four stories in height or to the height necessary to accommodate the particular sport function and design.

6.3.2.2 Parking garages shall be limited to six levels above and including the ground level.

6.3.3 Set Back Requirements:

6.3.3.1 All recreation, intramural, or sport fields and courts shall have a set back of a minimum distance of 50 feet from the nearest curb line of the nearest roadway.

6.3.3.2 All buildings shall have a set back of a minimum distance of 65 feet from the nearest curb line of the nearest roadway.

6.3.4 Building Coverage: Buildings shall not cover more than 25% of the ground area within any given block in the "AR" District.

6.4 "SE" Service District: The following provisions shall apply to the Service District:

6.4.1 Permitted Uses: Permitted Uses for the "SE" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the SE District unless otherwise provided for in this ordinance:

6.4.1.1 Principal Uses and Buildings:

- Power plants, including solar or wind energy generation and storage.
- Maintenance centers.
- Water storage and treatment facilities.
- Institutional stores.
- Storage facilities.

- Recycling facilities.
- Office buildings.

6.4.1.2 Accessory Uses and Buildings:

- Other uses and buildings necessary or similar to the principal uses and buildings pertinent to the operation of the institution.
- Surface parking.

6.4.2 Building Height Requirements: All buildings shall be limited to six stories in height. The only exceptions allowed will be power plant chimneys, water storage, and similar accessory uses.

6.4.3 Set Back Requirements: All buildings shall have a set back of a minimum distance of 50 feet from the nearest curb line of the nearest roadway or from the edge of the pavement where curbs do not exist.

6.4.4 Building Coverage: Buildings shall not cover more than 30% of the ground area within any given block of the "SE" District.

6.5 "N" Natural Areas District: The following provisions shall apply to the Natural Areas District:

6.5.1 Permitted Uses: Permitted Uses for the "N" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the N District unless otherwise provided for in this ordinance:

6.5.1.1 Principal Uses:

- Permitted uses include observation, nature study, teaching, research and demonstration in Category I, II, and III Natural Areas as defined by the Campus Natural Areas Committee and shown on the most recent version of the MSU Campus Natural Areas Map and Zoning District Map.

6.5.2 Special Provisions: The Natural Areas District shall remain undeveloped. No buildings, roads, improved walks, utility, or other structures and alterations are permitted in the Natural Areas District.

6.6 "AG" Agricultural and Natural Resources District: The following provisions shall apply to the Agriculture and Natural Resources District:

6.6.1 Permitted Uses: Permitted Uses for the "AG" District shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the AG District unless otherwise provided for in this ordinance:

6.6.1.1 Principal Uses and Buildings:

- Program-related single-family dwellings.
- Agricultural and natural resources research, teaching, and outreach facilities for plants and animals.
- Farm areas for experimentation, teaching, outreach, and cultivation or production of plants and animals for institutional use.
- Associated agricultural facilities not operated by the institution.

6.6.1.2 Accessory Uses and Buildings:

- Other uses and buildings that are necessary to the operation of the principal uses and buildings, such as silos, wells, and pumping stations. Potable water storage and treatment, and maintenance facilities shall be allowed.
- Surface parking.
- Solar or wind energy generation and storage.

6.6.2 Building Height Requirements: All buildings shall be limited to a height of two stories, with the exception of silos and similar structures that are necessarily of greater height.

6.6.3 Set Back Requirements: All buildings shall be set back a minimum distance of 100 feet from the centerline of the nearest public roadway.

6.7 "MU" Mixed Use Districts: The following provisions shall apply to the two independent mixed-use districts, MU-N and MU-S:

6.7.1 Permitted Uses: Permitted uses for the MU Districts shall include the following Principal and Accessory Uses. All uses not listed are not permitted in the MU Districts unless otherwise provided for in this ordinance:

6.7.1.1 Principal Uses and Buildings MU-N:

- Teaching facilities, including classrooms, lecture halls, instructional laboratories, general student facilities, and similar facilities used for general educational purposes.
- Research laboratories.
- Public/private business incubators.
- Student and visiting faculty housing.
- Faculty and administrative offices.
- Health and wellness facilities.
- Academic support.
- Auxiliary retail services.

6.7.1.2 Principal Uses and Buildings MU-S

- Research laboratories.
- Public/private business incubators.
- Student, faculty, and alumni retirement housing.
- Administrative offices.
- Health and wellness facilities.
- Auxiliary retail services.

6.7.1.3 Accessory Uses and Buildings:

- Surface parking and parking garages.
- Uses and structures that are necessary to the operation of the principal uses and buildings.
- Athletic/recreation fields and buildings.
- Solar or wind energy generation and storage.

6.7.2 Building Height Requirements:

6.7.2.1 All buildings in the MU-N District shall be limited to six stories of occupied space plus any required rooftop equipment. Buildings within the MU-S District that incorporate parking, office space, and housing space are limited to eight stories of occupied space plus any required rooftop equipment.

6.7.2.2 Teaching facilities shall be located in the lowest floors possible, and not above the fourth floor of any building.

6.7.2.3 Parking garages shall be limited to six parking levels above and including the ground level.

6.7.2.4 Accessory buildings shall be no higher than necessary to accommodate the proposed use and under no circumstances shall exceed the height of the principal use buildings in the district.

6.7.3 Set Back Requirements: All buildings shall be set back a minimum of 40 feet from the nearest curb line of the nearest roadway.

6.7.4 Building Coverage: Buildings shall not cover more than 30% of the ground area of any given block within the MU-N District and 35% of the ground area of any given block within the MU-S District.

6.8 Non-Conforming Uses and Buildings:

6.8.1 Non-conforming uses: The use of any land area existing at the time of the adoption of this ordinance, or any amendment to it, may be continued although such use does not conform to the provisions thereof.

6.8.2 Non-conforming buildings: The use of any building existing at the time of the adoption of this ordinance, or any amendment to it, may be continued although such use does not conform to the provisions thereof. Such non-conforming use may be extended throughout a building.

7.00 - ADMINISTRATION

7.1 The Campus Planner shall serve in the role of Zoning Administrator and shall be responsible for the administration of this ordinance, the District Map, the Protected Green Space map, and the Campus Land Use Master Plan, all as hereafter amended and modified.

7.1.1 The Campus Planner is specifically granted authority to:

7.1.1.1 Assure that University projects are in compliance with the University Zoning Ordinance and Campus Land Use Master Plan, including Campus Planning Principles.

7.1.1.2 Approve the extension, reduction, revision, or interpretation of a zoning district or building coverage block boundary.

7.1.1.3 Approve the reconstruction of a non-conforming building that has been destroyed or partially destroyed.

7.1.1.4 Approve the erection and use of a building or the use of land in any location for an essential utility service, or allow for the enlargement, extension or relocation of these existing uses.

7.1.1.5 Interpret the provisions of this ordinance where the street layout actually on the ground varies from the street layout as shown on the Zoning District Map.

7.1.1.6 Determine whether the use of a planned building is permitted in the district in which it is to be erected, and whether the planned building will cause the ground area covered by the buildings to exceed the maximum percentage allowed within the block in which it is to be erected.

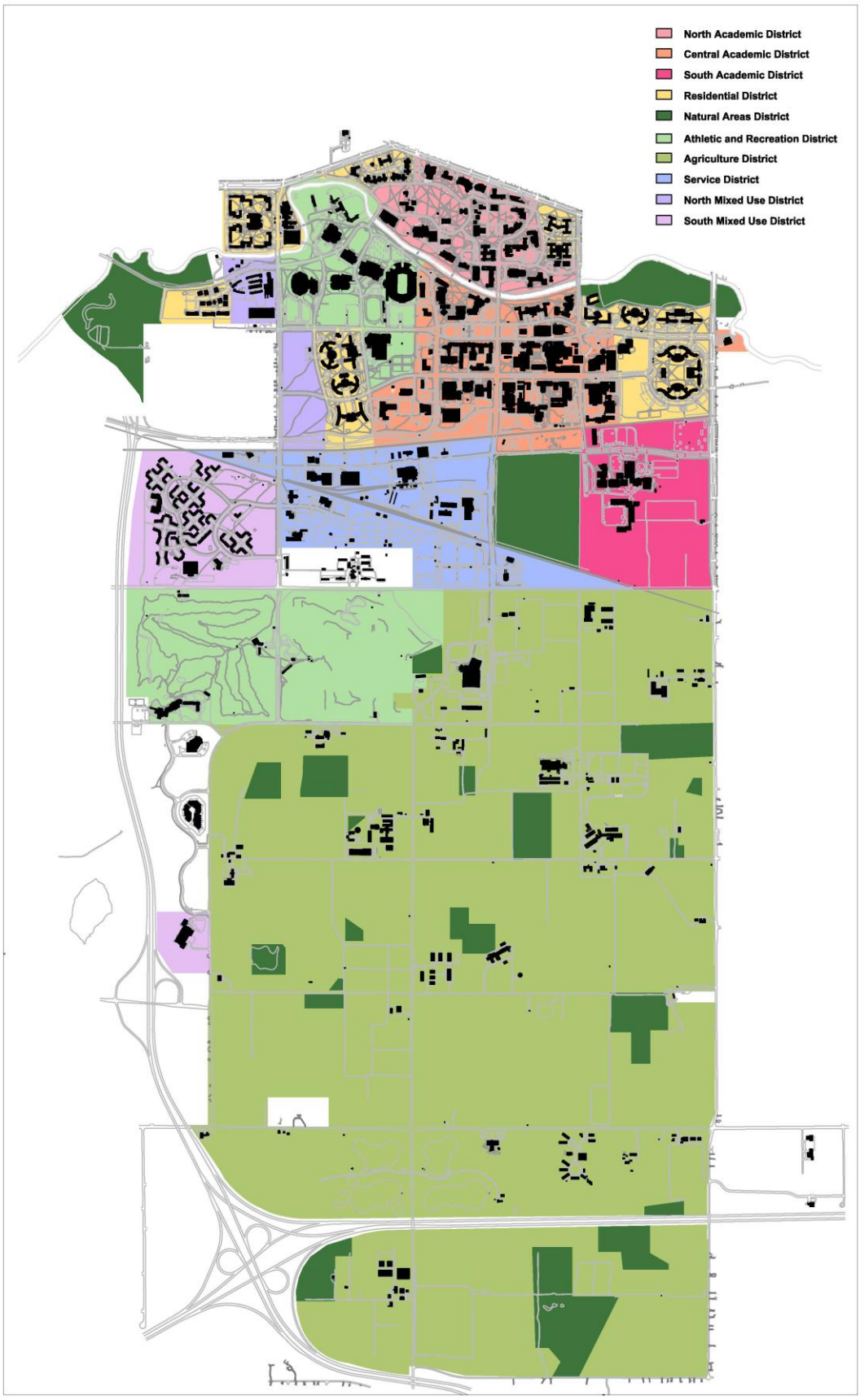
7.1.1.7 Approve the design of all building and site features, modifications, and improvements within Protected Green Space areas when a variance has been authorized.

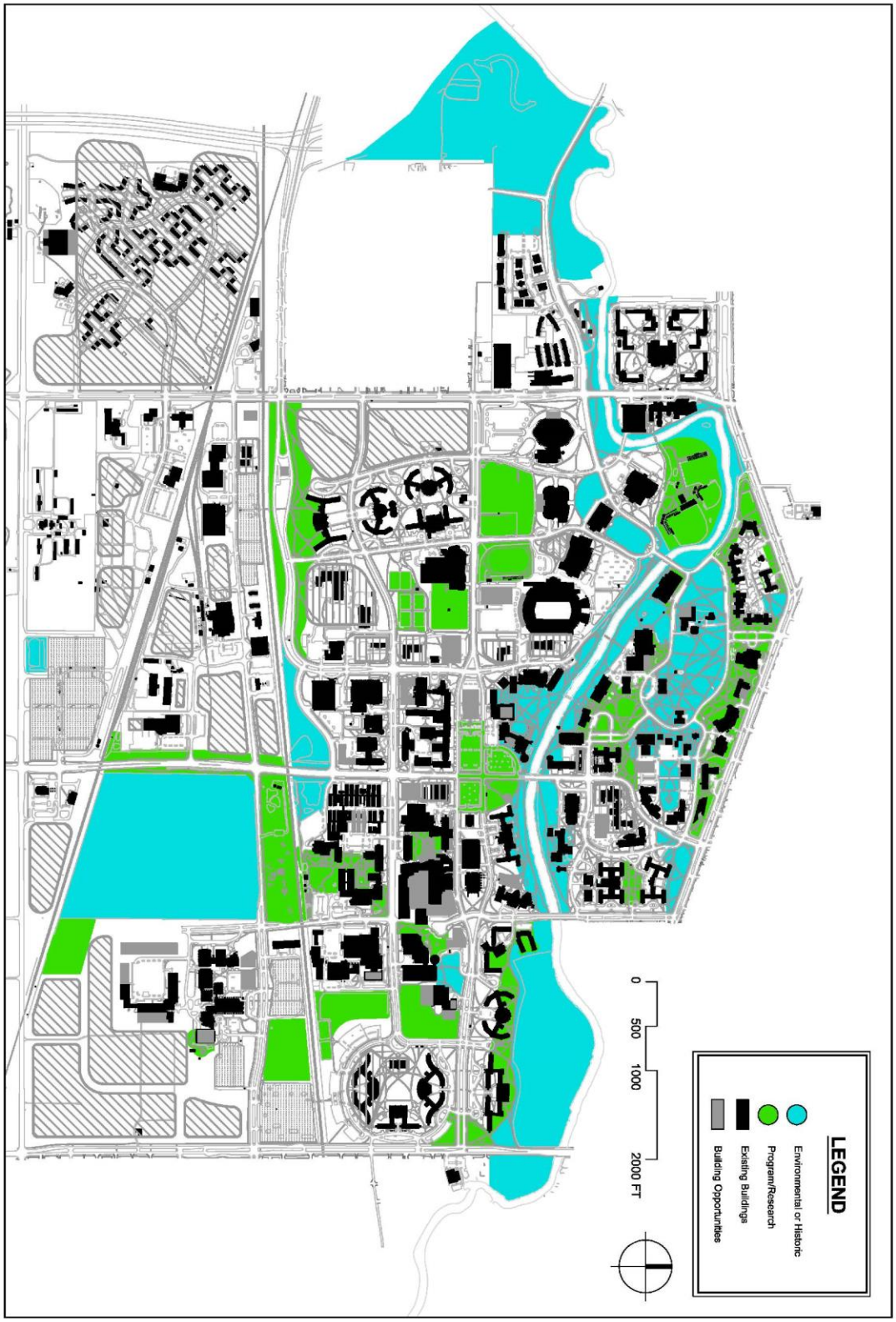
7.1.1.8 Refer any specific request for a variance to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

8.00 - AMENDMENTS

8.1 This ordinance may be amended through approval by the Board of Trustees.

End


North Academic District
Central Academic District
South Academic District
Residential District
Natural Areas District
Athletic and Recreation District
Agriculture District
Service District
North Mixed Use District
South Mixed Use District



PROTECTED GREEN SPACE

MICHIGAN STATE UNIVERSITY | Infrastructure Planning and Facilities

Fall 2017

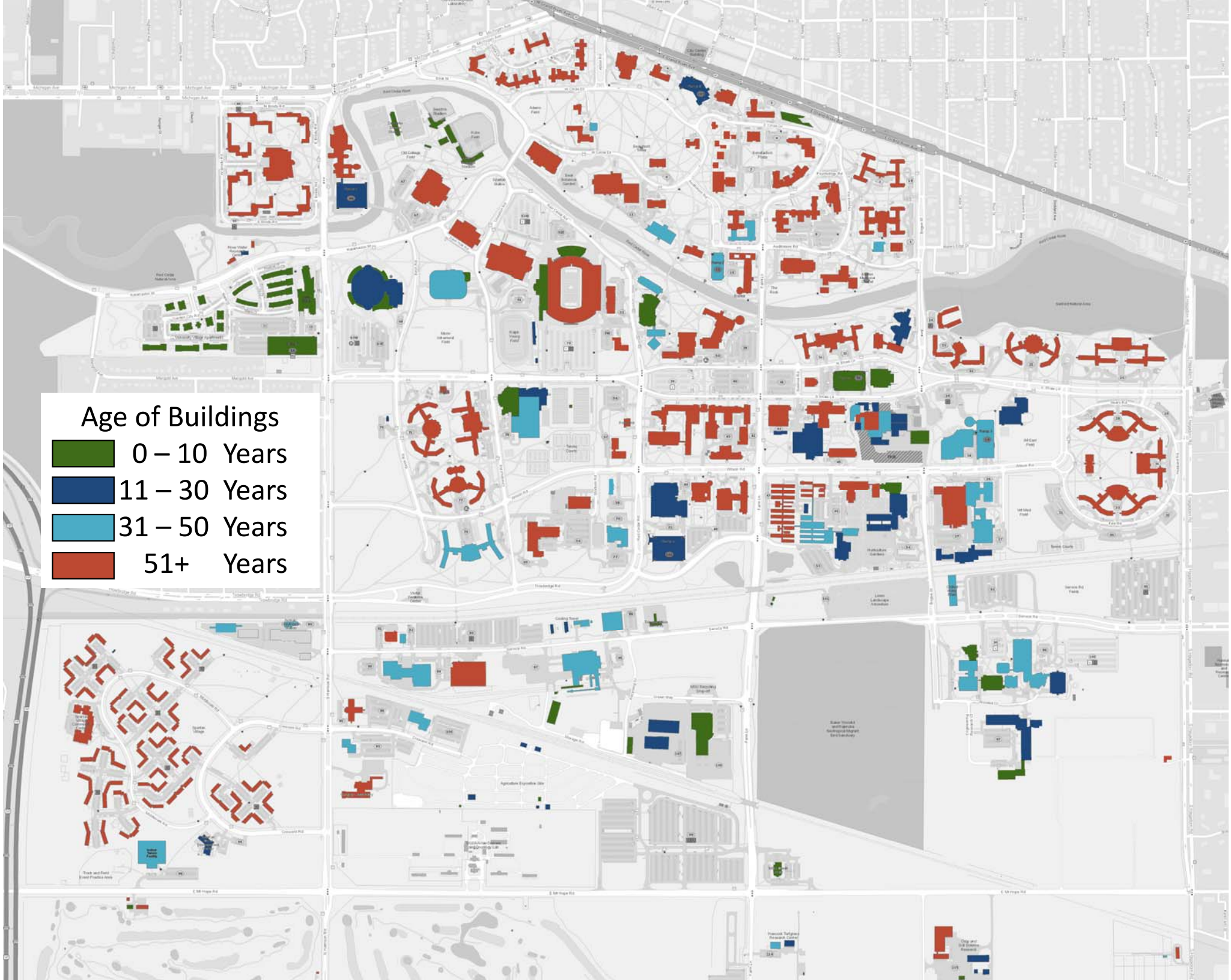
Appendix C: Buildings by Age

Fiscal Year 2019
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY


Age of Buildings
0 – 10 Years
11 – 30 Years
31 – 50 Years
51+ Years

Fall 2017

Appendix D: Student Enrollments Fall Semester 2017

Fiscal Year 2019
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Michigan State University Office of the Registrar

Comparison of Student Enrollments

FALL 2017

COLLEGE/UNIT	Students Enrolled		Full Time Students		Fiscal Year Equated		Teaching College Course	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Agriculture and Natural Resources	4,372	8.7%	3,700	8.5%	2,880	6.8%	15,268	7.4%
Arts and Letters	1,810	3.6%	1,598	3.7%	5,242	12.3%	21,441	10.4%
Resdntl Coll Arts and Humanities	251	0.5%	233	0.5%	94	0.2%	404	0.2%
Business	8,194	16.4%	7,183	16.5%	4,211	9.9%	23,492	11.4%
Communication Arts and Sciences	3,450	6.9%	3,046	7.0%	2,211	5.2%	11,236	5.5%
Education	3,477	7.0%	2,794	6.4%	2,330	5.5%	11,586	5.6%
Engineering	6,342	12.7%	5,873	13.5%	3,063	7.2%	14,922	7.3%
Human Medicine	977	2.0%	840	1.9%	1,080	2.5%	3,357	1.6%
James Madison College	1,165	2.3%	1,073	2.5%	539	1.3%	2,001	1.0%
Lyman Briggs College	1,991	4.0%	1,853	4.3%	623	1.5%	2,762	1.3%
Music	566	1.1%	507	1.2%	454	1.1%	3,273	1.6%
Natural Science	6,362	12.7%	5,676	13.0%	9,542	22.5%	48,689	23.7%
Nursing	1,071	2.1%	864	2.0%	356	0.8%	1,428	0.7%
Osteopathic Medicine	1,360	2.7%	1,189	2.7%	1,214	2.9%	5,958	2.9%
Social Science	6,272	12.5%	5,343	12.3%	7,664	18.1%	33,522	16.3%
Assoc Prov Undergraduate Education	837	1.7%	813	1.9%	126	0.3%	990	0.5%
Veterinary Medicine	957	1.9%	716	1.6%	758	1.8%	5,174	2.5%
Assoc Provost Academic Services	0	0.0%	0	0.0%	67	0.2%	161	0.1%
Assoc Provost Lifelong Education	565	1.1%	206	0.5%	0	0.0%	0	0.0%
Total University	**50,019**		**43,507**		**42,454**		**205,664**	
CLASS/LEVEL								
Doctoral	3,351	6.7%	3,212	7.4%	2,368	5.6%	6,462	3.1%
Masters	4,422	8.8%	2,063	4.7%	2,679	6.3%	13,242	6.4%
Total Graduate	**7,773**		**5,275**		**5,047**		**19,704**	
Freshman	9,360	18.7%	9,182	21.1%	8,702	20.5%	42,477	20.7%
Junior	9,501	19.0%	8,969	20.6%	8,583	20.2%	42,729	20.8%
Senior	10,730	21.5%	8,473	19.5%	8,721	20.5%	44,318	21.5%
Sophomore	8,695	17.4%	8,382	19.3%	8,038	18.9%	39,227	19.1%
Total Undergraduate	**38,286**		**35,006**		**34,043**		**168,751**	
Graduate Professional	2,454	4.9%	2,390	5.5%	2,454	5.8%	13,169	6.4%
Total Graduate Professional	**2,454**		**2,390**		**2,454**		**13,169**	
Non-Degree	1,506	3.0%	836	1.9%	910	2.1%	4,040	2.0%
Total Non-Degree	**1,506**		**836**		**910**		**4,040**	
Grand Total	**50,019**		**43,507**		**42,454**		**205,664**	
Percent of Total Students		100.0%		87.0%		84.9%		

Average Student Course: 4.1 Course Enrollments

Full-Time Students column: A head count of students who are carrying minimum credits for full-time status: Undergraduate-12; Masters-9; Doctoral-6; and Graduate Professional-12.

Fiscal Year Equated students column: Calculated by dividing the total number of credit hours by the number of credits carried by a full-time student (full-time status: Undergraduate-15 (prior to FS99, 15 1/2 credits); Masters-12 credits; Doctoral-8 credits; and Graduate Professional-head count).

Fall 2017

Appendix E: Building Condition Assessment

Fiscal Year 2019 Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
AG EXPO EXHIB-STORAGE 1 EAST	0402	2017	BUILDING ENVELOPE	ROOF #1	$21,000
					$21,000
ALUMNI CHAPEL	0030	2010	BUILDING INTERIOR	BUILD PERMANENT ACCESSABILITY RAMPS	$355,000
ALUMNI CHAPEL	0030	2010	BUILDING ENVELOPE	EXTERIOR WATERPROOFING AND MASONRY RESTORATION	$91,000
ALUMNI CHAPEL	0030	2010	BUILDING INTERIOR	INTERIOR PAINTING - PAINT ALL AREAS	$23,000
ALUMNI CHAPEL	0030	2010	BUILDING ENVELOPE	ROOF REPLACEMENT/RESTORATION, BUILT-UP ROOFING, SLATE REPAIR, COPPER REPAIRS, ROOFS 2 AND 3.	$34,000
ALUMNI CHAPEL	0030	2010	BUILDING ENVELOPE	STAINED GLASS WINDOW REPAIR AND PROTECTION	$39,000
					$542,000
ANGELL UNIV SERVICES	0133	2014	BUILDING INTERIOR	REPLACE EXTERIOR DOOR HARDWARE AND SELECTED INTERIOR DOORS.	$31,000
ANGELL UNIV SERVICES	0133	2017	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$34,000
ANGELL UNIV SERVICES	0133	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$1,020,000
ANGELL UNIV SERVICES	0133	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$210,000
ANGELL UNIV SERVICES	0133	2019	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$64,000
ANGELL UNIV SERVICES	0133	2019	BUILDING SYSTEMS	REPLACE HOT WATER HEAT PUMPS	$66,000
ANGELL UNIV SERVICES	0133	2020	BUILDING SYSTEMS	REPLACE MECHANICAL CHILLER	$306,000
ANGELL UNIV SERVICES	0133	2020	BUILDING SYSTEMS	VAV SYSTEM	$217,000
					$1,948,000
ANTHONY HALL	0132	2017	BUILDING SYSTEMS	ANTHONY HALL - REPLACE CONDENSATE RECIEVER AND REPIPE STEAM COIL IN SB RM. 245	$100,000
ANTHONY HALL	0132	2017	BUILDING SYSTEMS	VAV SYSTEM	$307,000
ANTHONY HALL	0132	2018	BUILDING SYSTEMS	REPLACE ENTIRE FIRE SPRINKLER PROTECTION SYSTEM	$2,680,000
ANTHONY HALL	0132	2019	BUILDING INTERIOR	DOORS - INTERIOR	$2,216,000
ANTHONY HALL	0132	2020	BUILDING SYSTEMS	COOLING TOWERS	$274,000
ANTHONY HALL	0132	2020	BUILDING SYSTEMS	COOLING TOWERS	$315,000
ANTHONY HALL	0132	2020	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FAUCETS AND TRIM, URINAL FLUSH VALVES AND TOILET FLUSH VALVES	$39,000
ANTHONY HALL	0132	2021	BUILDING SYSTEMS	PUMPS	$1,302,000
ANTHONY HALL	0132	2021	BUILDING SYSTEMS	PUMPS	$254,000
ANTHONY HALL	0132	2022	BUILDING SYSTEMS	CHILLER AND COOLING TOWER REPLACEMENT - #1 ABSC955	$1,958,000
ANTHONY HALL	0132	2022	BUILDING SYSTEMS	REPLACE CHILLER #2 AND COOLING TOWER	$1,864,000
					$11,309,000
AUDITORIUM	0031	2014	BUILDING SYSTEMS	REPLACE STAGE LIFT ELEVATOR	$968,000
AUDITORIUM	0031	2015	BUILDING ENVELOPE	REPLACE EXTERIOR WOOD DOOR HARDWARE AND REFINISH DOORS	$117,000
AUDITORIUM	0031	2016	BUILDING SYSTEMS	AUDITORIUM ROOFTOP UNIT	$200,000
AUDITORIUM	0031	2017	BUILDING SYSTEMS	REPLACE DOMESTIC WATER HEATER	$65,000
AUDITORIUM	0031	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM - LAVATORY FAUCETS AND TRIM, TOILET SEATS AND	$37,000
AUDITORIUM	0031	2022	BUILDING ENVELOPE	REPLACE ROOF #15	$44,000
					$1,431,000
BAKER HALL	0182	2014	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$52,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
BAKER HALL	0182	2018	BUILDING SYSTEMS	REPLACE LAVATORY FAUCETS AND TRIM, TOILET FLUSH VALVES, URINAL FLUSH VALVES, AND TOILET SEATS	$42,000
BAKER HALL	0182	2020	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER SHUT OFF VALVES AND WATER METER WHERE WATER ENTERS BUILDING	$24,000
					$118,000
BEEF CATTLE RESEARCH-ANIMAL SHLTR	0471I	2022	BUILDING ENVELOPE	REPLACE ROOFS #1	$103,000
					$103,000
BEEF CATTLE RESEARCH-MAIN	0471A	2013	BUILDING ENVELOPE	EXTERIOR PAINTING - DOOR TRIM & FROM OF OFFICE BUILDING	$44,000
BEEF CATTLE RESEARCH-MAIN	0471A	2018	BUILDING SYSTEMS	REPLACE LIGHTING FIXTURES, LIGHTING PANELS, WIRING, AND SERVICES.	$462,000
BEEF CATTLE RESEARCH-MAIN	0471A	2020	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT BLDG 471 - ROOF #A-2, A-1, C, H, K	$350,000
					$856,000
BERKEY HALL	0002	2010	BUILDING INTERIOR	REPLACE SELECTED MENS AND WOMENS RESTROOM DOORS AND HARDWARE	$37,000
BERKEY HALL	0002	2014	BUILDING ENVELOPE	REPLACE EXTERIOR WOOD DOORS	$133,000
BERKEY HALL	0002	2015	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING	$84,000
BERKEY HALL	0002	2017	BUILDING SYSTEMS	REPLACE MECHANICAL CHILLER	$400,000
					$654,000
BESSEY HALL	0079	2010	BUILDING INTERIOR	REPLACE 24 BATHROOM DOORS AND HARDWARE ON THE CLASSROOM WING.	$22,000
BESSEY HALL	0079	2012	BUILDING INTERIOR	REPLACE CORRIDOR CEILINGS & LIGHTING	$186,000
BESSEY HALL	0079	2015	BUILDING SYSTEMS	BASEMENT AIR PLENUMS-REMOVE ALL ASBESTOS PIPE INSULATIONS & REINSULATE WITH NON-ASBESTOS.	$133,000
BESSEY HALL	0079	2015	BUILDING ENVELOPE	REPLACE WINDOWS AND EXTERIOR DOORS	$2,098,000
BESSEY HALL	0079	2016	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING REPAIRS	$79,000
BESSEY HALL	0079	2017	BUILDING SYSTEMS	BESSEY HALL - REPLACE STEAM DOMESTIC WATER HEATER	$61,000
BESSEY HALL	0079	2018	BUILDING SYSTEMS	VAV SYSTEMS	$125,000
BESSEY HALL	0079	2019	BUILDING SYSTEMS	REPLACE 200 TON CHILLER AND COOLING TOWERS	$1,748,000
BESSEY HALL	0079	2020	BUILDING SYSTEMS	REPLACE DUPLEX CONTROL AIR COMPRESSOR	$31,000
BESSEY HALL	0079	2020	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM LAVATORY FAUCETS AND TRIM, TOILET FLUSH VALVES,	$98,000
					$4,581,000
BIOCHEMISTRY	0168	2010	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$31,000
BIOCHEMISTRY	0168	2014	BUILDING ENVELOPE	REPLACE EXTEROR ALUMINUM DOORS AND HARDWARE	$37,000
BIOCHEMISTRY	0168	2015	BUILDING SYSTEMS	REPLACE BOOSTER COILS, VAV AND VALVES THAT SERVE ANIMAL ROOMS	$20,000
BIOCHEMISTRY	0168	2019	BUILDING SYSTEMS	COOLING TOWERS - CT3	$2,915,000
					$3,003,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2015	BUILDING SYSTEMS	UPGRADE 3 DDC PANEL SERVING ULAR AREA	$66,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
BIOMEDICAL PHYSICAL SCIENCES	0160	2018	BUILDING SYSTEMS	REPLACE 4 CHILLED WATER PUMPS FOR ULAR ANIMAL AREA	$98,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2020	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$31,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2022	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$37,000
BIOMEDICAL PHYSICAL SCIENCES	0160	2022	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$37,000
					$269,000
BOX FARM - BARN	0477C	2019	BUILDING ENVELOPE	ROOFING - SH ROOF #1	$20,000
					$20,000
BOX FARM - HOUSE	0477A	2019	BUILDING ENVELOPE	ROOFING - SH ROOFS #1, 2, AND 3	$20,000
BOX FARM - HOUSE	0477A	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$39,000
					$59,000
BRESLIN	0069	2009	BUILDING SYSTEMS	REPLACE COOLING TOWER 01	$190,000
BRESLIN	0069	2015	BUILDING INTERIOR	REPLACE CARPET AND WALLBASE IN OFFICES AND CONFERENCE ROOMS OF BERKOWITZ ADDITION.	$58,000
BRESLIN	0069	2018	BUILDING SYSTEMS	UPGRADE 2 EXISTING DDC PANELS (MBC 11 AND 12) IN BERKOWITZ TO NEWER TECHNOLOGY	$24,000
BRESLIN	0069	2019	BUILDING ENVELOPE	BRESLIN EXPANSION JOINT REPAIR	$144,000
BRESLIN	0069	2019	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #3,4,5,6	$81,000
BRESLIN	0069	2019	BUILDING SYSTEMS	SECURITY & EMERGENCY SYSTEMS/TIME CLOCKS - FIRE ALARM	$414,000
BRESLIN	0069	2020	BUILDING SYSTEMS	REPLACE AIR HANDLING UNITS 1 - 14, HV-1 AND HV-5, PLUS 15 SMALL EXHAUST FANS FOR BERKOWITZ ADDITION.	$3,496,000
BRESLIN	0069	2020	BUILDING SYSTEMS	REPLACE AIR PUMPS AMD ELECTRICAL CONTROLS ON SEWAGE EJECTION SYSTEM	$87,000
BRESLIN	0069	2021	BUILDING SYSTEMS	REPLACE BUNDLE IN HEAT EXCHANGER(S) FOR BERKOWITZ ADDITION	$23,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE 2 HOT WATER HEAT PUMPS IN MECH ROOM A-140.	$29,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN BERKOWITZ	$47,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE MAIN CHILLER FOR BERKOWITZ, TRANE MODEL RTAA, LOCATED IN OUTSIDE ENCLOSURE TO RM A-138	$186,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE TWO CHILLED WATER PUMPS AND ASSOCIATED ELECTRICAL IN MECH ROOM A-140	$29,000
BRESLIN	0069	2022	BUILDING SYSTEMS	REPLACE TWO VERTICAL TURBINE SEWAGE PUMPS LOCATED IN BERKOWITZ MECH ROOM A-180	$26,000
					$4,834,000
BUSINESS COLLEGE	0080	2011	BUILDING INTERIOR	REPLACE CEILINGS AND LIGHT FIXTURES IN PUBLIC AREA CORRIDORS	$373,000
BUSINESS COLLEGE	0080	2015	BUILDING ENVELOPE	REPAIR RAINWATER INFILTRATION ISSUE IN ROOMS 14, 14A AND 25	$79,000
BUSINESS COLLEGE	0080	2015	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN BASEMENT MR-B1	$58,000
BUSINESS COLLEGE	0080	2016	BUILDING INTERIOR	REPLACE LANDING FLOORING AND TREADS AND RISERS IN TWO (2) STAIRWELLS	$46,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
BUSINESS COLLEGE	0080	2016	BUILDING SYSTEMS	VAV SYSTEM	$1,513,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	ADD CONTROLS TO AIR DISTRIBUTION SYSTEM	$51,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	BUSINESS COLLEGE - REPLACE EXISTING FIRE ALARM PANEL	$1,800,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	ELEVATOR - 2	$630,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	HVAC S1 & S2 DISTRIBUTION SYSTEM	$1,327,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$69,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT	$41,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE HVAC S1 & S2	$715,000
BUSINESS COLLEGE	0080	2017	BUILDING SYSTEMS	REPLACE SECOND OF TWO DOMESTIC STEAM WATER HEATERS IN MR-N1	$58,000
BUSINESS COLLEGE	0080	2019	BUILDING SYSTEMS	TRACTION ELEVATOR - 1	$400,000
BUSINESS COLLEGE	0080	2020	BUILDING SYSTEMS	CHILLER	$178,000
BUSINESS COLLEGE	0080	2020	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES IN MR-N1	$29,000
BUSINESS COLLEGE	0080	2020	BUILDING SYSTEMS	REPLACE URINALS IN MENS PUBLIC RESTROOMS	$29,000
					$7,396,000

CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2015	BUILDING INTERIOR	REPLACE CORRIDOR FLOORING AND WALL BASE ON BASEMENT AND 2ND FLOORS. INCLUDE STAIRWELL LANDINGS.	$44,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CENTER INTEGRATIVE PLANT - REPLACE DOMESTIC WATER HEATERS IN WEST BASEMENT MECHANICAL ROOM	$120,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CENTER INTEGRATIVE PLANT - REPLACE FIRE ALARM SYSTEM	$479,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CENTER INTEGRATIVE PLANT-REPLACE(4) HOT WATER HEAT CIRCULATING PUMPS AND ASSOCIATED ISOLATION VALVES	$126,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CIPS - BUILDING TEMPERATURE CONTROL UPGRADES	$163,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CIPS - UPGRADE BUILDING EXHAUST SYSTEMS	$2,809,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	CIPS - UPGRADES TO BUILDING HEATING SYSTEMS	$420,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE CONDENSATE DUPLEX PUMPS IN WEST BASEMENT MECH ROOM	$49,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN MECH ROOM B-13	$49,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE HVAC #1 LOCATED IN PENTHOUSE	$1,627,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE HVAC #2 LOCATED IN PENTHOUSE	$1,627,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE STEAM PRV STATION LOCATED IN THE PENTHOUSE MECHANICAL ROOM	$43,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2017	BUILDING SYSTEMS	REPLACE STEAM PRV STATION LOCATED IN THE WEST BASEMENT MECHANICAL ROOM NEAR THE WEST END	$60,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2018	BUILDING SYSTEMS	CENTER INTEGRATIVE PLANT SYS - FEASIBILITY STUDY	$200,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2018	BUILDING SYSTEMS	CENTER INTEGRATIVE PLANT- REPLACE DUPLEX WATER SOFTNER SYSTEM IN BASEMENT MECHANICAL ROOM-B-14	$43,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
					$7,859,000
CENTRAL SCHOOL	0204	2012	BUILDING INTERIOR	INTERIOR PAINTING - REPAINT HALLWAYS AND HIGH USE ROOMS	$56,000
CENTRAL SCHOOL	0204	2016	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING REPAIRS	$42,000
CENTRAL SCHOOL	0204	2017	BUILDING SYSTEMS	CENTRAL SCHOOLS BOILER 1, 2 AND 3 REPLACEMENT	$200,000
CENTRAL SCHOOL	0204	2018	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
CENTRAL SCHOOL	0204	2019	BUILDING SYSTEMS	REPLACE ALL TOILET FLUSH VALVES, LAVATORY FAUCETS AND TRIM, KITCHEN SINK FAUCETS	$26,000
CENTRAL SCHOOL	0204	2019	BUILDING ENVELOPE	REPLACE ROOFING #1, 2, 3, 4	$105,000
					$709,000
CENTRAL SERVICES	0060	2014	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER IN MR3 -	$65,000
CENTRAL SERVICES	0060	2014	BUILDING ENVELOPE	REPLACE OLD WINDOWS WITH ALUMINUM FRAMED, INSULATED GLASS.	$249,000
CENTRAL SERVICES	0060	2015	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$280,000
CENTRAL SERVICES	0060	2016	BUILDING SYSTEMS	REPLACE ALL OLD LIGHTING PANELS	$187,000
CENTRAL SERVICES	0060	2016	BUILDING SYSTEMS	REPLACE AND UPGRADE ELECTRICAL DISTRIBUTION AND LIGHTING PANELS	$278,000
CENTRAL SERVICES	0060	2020	BUILDING SYSTEMS	REPLACE CAST IRON RADIATORS WITH CONVECTORS	$194,000
CENTRAL SERVICES	0060	2020	BUILDING SYSTEMS	REPLACE ROOF TOP AIR CONDITIONING UNIT FOR ROOMS 115 AND 116	$50,000
					$1,303,000
CHEMICAL WASTE 2	0475B	2022	BUILDING SYSTEMS	WASTE PIPING	$85,000
					$85,000
CHEMISTRY	0163	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 3	$56,000
CHEMISTRY	0163	2017	BUILDING ENVELOPE	MASONRY AND CAULKING RESTORATION IN CHEM HALL	$524,000
CHEMISTRY	0163	2017	BUILDING SYSTEMS	REPLACE COOLING COILS IN HVAC-1 LOCATED IN SB OF CHEMISTRY	$533,000
CHEMISTRY	0163	2017	BUILDING SYSTEMS	REPLACE COOLING COILS IN HVAC-2 LOCATED IN SB OF CHEMISTRY	$533,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	INSTALL NEW LIGHTING PANELS (12)	$73,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	REMOVE DI-ELECTRIC UNIONS AND REPLACE WITH BRASS UNIONS OR WATER WAYS - 4TH AND 5TH FLOORS.	$26,000
CHEMISTRY	0163	2020	BUILDING INTERIOR	REPLACE LANDING FLOORING AND TREADS AND RISERS IN THREE (3) STAIRWELLS	$149,000
CHEMISTRY	0163	2020	BUILDING SYSTEMS	REPLACE TOILET FLUSH VAVLES, LAVATORY FAUCETS AND TRIM, AND TOILET SEATS.	$35,000
					$1,929,000
CLINICAL CENTER-ANIMAL	0202	2013	BUILDING SYSTEMS	REPLACE ANIMAL ROOM WET VACUUM SYSTEM	$40,000
					$40,000
CLINICAL CENTER-CLINIC	0200	2010	BUILDING INTERIOR	REPLACE EXTERIOR OVERHANG AND CEILING AT NORTH ENTRANCE	$184,000
CLINICAL CENTER-CLINIC	0200	2013	BUILDING ENVELOPE	REPLACE EXISTING METAL SIDING ON ENTIRE COMPLEX	$4,410,000
CLINICAL CENTER-CLINIC	0200	2014	BUILDING INTERIOR	REPLACE CEILING TILE AND GRID IN ENTIRE BUILDING	$995,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
CLINICAL CENTER-CLINIC	0200	2016	BUILDING INTERIOR	REPLACE CARPET AND FLOOR TILE IN ENTIRE BUILDING	$932,000
CLINICAL CENTER-CLINIC	0200	2017	BUILDING SYSTEMS	CLINICAL CENTER-CLINIC - REPLACE ELEVATOR A1	$150,000
CLINICAL CENTER-CLINIC	0200	2017	BUILDING SYSTEMS	CLINICAL CENTER-CLINIC - REPLACE ELEVATOR B2	$150,000
CLINICAL CENTER-CLINIC	0200	2017	BUILDING SYSTEMS	CLINICAL CENTER-CLINIC - REPLACE ELEVATOR C3	$150,000
CLINICAL CENTER-CLINIC	0200	2017	BUILDING SYSTEMS	CLINICAL CENTER-CLINIC - REPLACE ELEVATOR D4	$150,000
CLINICAL CENTER-CLINIC	0200	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$391,000
CLINICAL CENTER-CLINIC	0200	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$33,000
CLINICAL CENTER-CLINIC	0200	2018	BUILDING SYSTEMS	REPLACE 10 INCH BACKFLOW PREVENTER AND SHUTOFF VALVES WHERE DOMESTIC COLD WATER ENTERS THE BUILDING	$93,000
CLINICAL CENTER-CLINIC	0200	2019	BUILDING SYSTEMS	REPLACEMENT OF CHILLED WATER PUMPS	$98,000
CLINICAL CENTER-CLINIC	0200	2019	BUILDING SYSTEMS	UPGRADE PCB TRANSFORMERS AND ELECTRICAL DISTRIBUTION	$1,600,000
CLINICAL CENTER-CLINIC	0200	2020	BUILDING SYSTEMS	REPLACE STEAM SERVICE TO INSIDE OF BUILDING	$153,000
CLINICAL CENTER-CLINIC	0200	2020	BUILDING SYSTEMS	REPLACE URINAL FLUSH VALAVES, TOILET FLUSH VALVES, AND TOILET SEATS IN PUBLIC RESTROOMS	$29,000
CLINICAL CENTER-CLINIC	0200	2022	BUILDING ENVELOPE	ROOF REPLACEMENT/RESTORATION ON WINGS A, B, C	$1,707,000
					$11,225,000
CLINICAL CENTER-OFFICE/LAB	0201	2001	BUILDING SYSTEMS	CLINICAL CENTER - B1 ELEVATOR REPLACEMENT	$400,000
CLINICAL CENTER-OFFICE/LAB	0201	2001	BUILDING SYSTEMS	CLINICAL CENTER - B2 ELEVATOR REPLACEMENT	$400,000
CLINICAL CENTER-OFFICE/LAB	0201	2011	BUILDING SYSTEMS	REPLACE DUAL SYSTEM ELEVATORS B1 & B2	$896,000
CLINICAL CENTER-OFFICE/LAB	0201	2017	BUILDING INTERIOR	REPLACE CEILING TILE IN ENTIRE OFFICE WING	$62,000
CLINICAL CENTER-OFFICE/LAB	0201	2021	BUILDING INTERIOR	REPLACE FLOOR TILE AND WALL BASE IN CORRIDORS OF OFFICE WING	$87,000
					$1,845,000
COMMUNICATION ARTS	0084	2017	BUILDING SYSTEMS	REPLACE 17 AIR HANDLING UNITS AND ASSOCIATED FANS, PLUS 255 VAV BOXES	$3,232,000
COMMUNICATION ARTS	0084	2018	BUILDING SYSTEMS	CHILLER REPLACEMENT	$3,839,000
COMMUNICATION ARTS	0084	2019	BUILDING ENVELOPE	DOORS - EXTERIOR - BD	$32,000
COMMUNICATION ARTS	0084	2020	BUILDING SYSTEMS	INSTALL NEW DISTRIBUTION PANELS (6)	$171,000
COMMUNICATION ARTS	0084	2020	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER METER AND ASSOCIATED SHUT OFF VALVES.	$29,000
COMMUNICATION ARTS	0084	2020	BUILDING SYSTEMS	REPLACE ONE CONDENSER PUMP	$76,000
					$7,379,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
COMMUNICATION ARTS - MITN STORAGE	0084A	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$27,000
COMMUNICATION ARTS - MITN STORAGE	0084A	2020	BUILDING SYSTEMS	VAV SYSTEM	$86,000
					$113,000
COMPUTER CENTER	0035	2015	BUILDING SYSTEMS	BASEMENT AIR PLENUMS-REMOVE ALL ASBESTOS PIPE INSULATIONS & RE-INSULATE W/ NON-ASBESTOS.	$102,000
COMPUTER CENTER	0035	2015	BUILDING SYSTEMS	REPLACE 13 BRANCH CIRCUIT PANELS	$93,000
COMPUTER CENTER	0035	2015	BUILDING SYSTEMS	REPLACE ALL HOT AND COLD WATER SHUT OFF VALVES AND RE-INSULATE.	$87,000
COMPUTER CENTER	0035	2016	BUILDING ENVELOPE	WINDOWS - REPLACE BUILDING WINDOWS AND GLASS BLOCK.	$700,000
COMPUTER CENTER	0035	2017	BUILDING SYSTEMS	COMPUTER CENTER - REPLACE FIRE ALARM SYSTEM	$397,000
COMPUTER CENTER	0035	2017	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING RESTORATION	$84,000
COMPUTER CENTER	0035	2018	BUILDING SYSTEMS	COOLING TOWERS - DC1	$102,000
COMPUTER CENTER	0035	2018	BUILDING SYSTEMS	COOLING TOWERS - DC2	$102,000
COMPUTER CENTER	0035	2018	BUILDING SYSTEMS	COOLING TOWERS - DC3	$102,000
COMPUTER CENTER	0035	2020	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR	$37,000
COMPUTER CENTER	0035	2020	BUILDING SYSTEMS	SUBSTATIONS/TRANSFORMERS - 13.2 KV	$662,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERT A/C SYSTEM	$97,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERT A/C SYSTEM	$97,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 15 TON WATER COOLED LIEBERY A/C SYSTEM	$97,000
COMPUTER CENTER	0035	2022	BUILDING SYSTEMS	REPLACE 30 TON DRY COOLER & 2 PUMPS THAT SERVE FOR HEAT REJECTION ON THE CONDENSER LOOP FOR RM 204	$36,000
					$2,795,000
CONRAD HALL	0328	2014	BUILDING SYSTEMS	REPLACE BOOSTER COIL VALVES	$140,000
CONRAD HALL	0328	2016	BUILDING SYSTEMS	REPLACE OLD LIGHTING PANELS	$34,000
CONRAD HALL	0328	2018	BUILDING SYSTEMS	CHILLER - CH1	$236,000
CONRAD HALL	0328	2020	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER SHUTOFF VALVES AND WATER METER WHERE WATER COMES INTO THE BUILDING.	$29,000
					$439,000
COWLES HOUSE	0009	2010	BUILDING ENVELOPE	REPLACE WINDOWS WITH NEW THERMALPANE INSULATED GLASS WINDOWS	$119,000
COWLES HOUSE	0009	2016	BUILDING SYSTEMS	REPLACE CHILLER, CHILLED WATER PIPING, AND PUMPS	$146,000
COWLES HOUSE	0009	2017	BUILDING ENVELOPE	CONCRETE & MASONRY REPAIRS AT BUILDING ENTRANCES	$21,000
COWLES HOUSE	0009	2017	BUILDING SYSTEMS	COWLES HOUSE - REPLACE FIRE ALARM SYSTEM	$95,000
COWLES HOUSE	0009	2017	BUILDING SYSTEMS	REPLACE EXISTING HVAC AND CONTROLS	$400,000
COWLES HOUSE	0009	2017	BUILDING SYSTEMS	REPLACE WALK-IN COOLER AND WALK-IN FREEZER REFRIGERATION EQUIPMENT AND DOORS.	$43,000
COWLES HOUSE	0009	2018	BUILDING SYSTEMS	REPLACE 2 REACH-IN COOLERS, ONE REACH-IN FREEZER & UNDERCOUNTER COOLER.	$21,000
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE 2 KITCHEN DISHWASHERS AND 1 GARBAGE DISPOSAL	$20,000
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE 3-SEASONS ROOM AIR CONDITIONING SYSTEM	$21,000
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE BATHROOM SINKS, FAUCETS AND TOILETS. REPLACE KITCHEN FAUCETS.	$33,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
COWLES HOUSE	0009	2020	BUILDING SYSTEMS	REPLACE KITCHEN HVAC EQUIPMENT, FIRE ALARM SYSTEM AND MAIN HVAC EQUIPMENT.	$291,000
COWLES HOUSE	0009	2020	BUILDING ENVELOPE	REPLACE OR REPAIR ROOFS 3,4,5,6,7 AND 9.	$168,000
					$1,378,000
CROP SCIENCE - PESTICIDE/HERBICIDE	0442F	2017	BUILDING ENVELOPE	ROOF #1	$20,000
					$20,000
CROP SCIENCE - STRG 1	0442E	2017	BUILDING ENVELOPE	REPLACE ROOF #1	$111,000
					$111,000
CROP SCIENCE-FIELD LAB	0213	2016	BUILDING SYSTEMS	VAV SYSTEM	$276,000
CROP SCIENCE-FIELD LAB	0213	2018	BUILDING SYSTEMS	REPLACE MAIN LIGHTING AND POWER DISTRIBUTION PANELS	$56,000
CROP SCIENCE-FIELD LAB	0213	2018	BUILDING SYSTEMS	REPLACE RESTROOM PLUMBING FIXTURES	$29,000
CROP SCIENCE-FIELD LAB	0213	2019	BUILDING SYSTEMS	PUMPS	$93,000
CROP SCIENCE-FIELD LAB	0213	2020	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
					$734,000
CYCLOTRON	0164	2010	BUILDING ENVELOPE	EXTERIOR PAINTING	$20,000
CYCLOTRON	0164	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$403,000
CYCLOTRON	0164	2015	BUILDING SYSTEMS	HVAC EQUIPMENT	$238,000
CYCLOTRON	0164	2019	BUILDING SYSTEMS	FRIB COOLING SYSTEM IT ROOM/DATA CENTER	$600,000
CYCLOTRON	0164	2019	BUILDING SYSTEMS	PUMPS	$27,000
CYCLOTRON	0164	2020	BUILDING SYSTEMS	HVAC EQUIPMENT	$2,522,000
CYCLOTRON	0164	2020	BUILDING ENVELOPE	REPLACE / COAT ROOFS #23, 24	$102,000
CYCLOTRON	0164	2020	BUILDING ENVELOPE	REPLACE ROOFS 2, 3, 4, 5, 6, 7, 12	$684,000
CYCLOTRON	0164	2022	BUILDING SYSTEMS	REPLACE COOLING TOWER RM 176 & COOLED CONDENSER RM 244	$56,000
					$4,652,000
DAIRY RESEARCH-FOREMAN'S HSE	0469F	2017	BUILDING SYSTEMS	REPLACE BOILER	$21,000
					$21,000
DAIRY RESEARCH-HEIFER BARN	0469A	2012	BUILDING INTERIOR	REPAIR SETTLING FLOOR AND REPIPE HEATING LINES TO CONVECTORS IN MAIN ENTRANCE AREA.	$49,000
DAIRY RESEARCH-HEIFER BARN	0469A	2017	BUILDING SYSTEMS	REPLACE DISTRIBUTION PANELS, LIGHTING PANELS AND BRANCH CIRCUITS,	$281,000
DAIRY RESEARCH-HEIFER BARN	0469A	2018	BUILDING SYSTEMS	REPLACE DISTRIBUTION PANEL, LIGHTING PANELS AND BRANCH CIRCUITS, AND LIGHTING FIXTURES IN BARN 469A.	$66,000
					$396,000
DAIRY RESEARCH-MAIN BARN	0469H	2012	BUILDING SYSTEMS	DAIRY RESEARCH BARN BOILER 1 REPLACEMENT	$22,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
DAIRY RESEARCH-MAIN BARN	0469H	2012	BUILDING SYSTEMS	DAIRY RESEARCH BARN BOILER 2 REPLACEMENT	$22,000
DAIRY RESEARCH-MAIN BARN	0469H	2017	BUILDING SYSTEMS	DAIRY RES BARN (469H)(001)- REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$30,000
DAIRY RESEARCH-MAIN BARN	0469H	2017	BUILDING SYSTEMS	DAIRY RES BARN (469H)(002)- REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$30,000
					$104,000
DEMONSTRATION HALL	0057	2015	BUILDING SYSTEMS	REPLACE OBSOLETE HEATING AND VENTILATING UNITS, CONTROL VALVES, AND TRAPS	$323,000
DEMONSTRATION HALL	0057	2015	BUILDING SYSTEMS	UPGRADE ARENA AUDIENCE LIGHTING	$121,000
DEMONSTRATION HALL	0057	2016	BUILDING SYSTEMS	REPLACE OLD INCANDESCENT FIXTURES WITH NEW FLUORESCENT- FOR CLASS ROOMS, OUTSIDE AND STORAGE AREA	$50,000
DEMONSTRATION HALL	0057	2016	BUILDING SYSTEMS	REPLACE UNIT HEATERS IN OLD HOCKEY RINK	$73,000
DEMONSTRATION HALL	0057	2016	BUILDING ENVELOPE	WINDOWS - REPLACE ALL OLD BUILDING WINDOWS (-197)	$1,077,000
DEMONSTRATION HALL	0057	2017	BUILDING INTERIOR	DEMOSTRATION HALL - REPAIR FLOORING AND STRUCTURAL SUPPORT BEAM	$30,000
DEMONSTRATION HALL	0057	2017	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER	$65,000
DEMONSTRATION HALL	0057	2017	BUILDING SYSTEMS	UPGRADE FIRE ALARM SYSTEM AND ADD SMOKE DETECTION	$416,000
DEMONSTRATION HALL	0057	2018	BUILDING SYSTEMS	REPLACE RESTROOM FIXTURES AND WATER COOLERS	$58,000
DEMONSTRATION HALL	0057	2018	BUILDING SYSTEMS	REPLACE WATER SOFTENER SYSTEM IN EAST MECH ROOM 3	$58,000
					$2,271,000
ENDOCRINE RES - SWINE	0470D	2017	BUILDING SYSTEMS	PUMPS	$20,000
					$20,000
ENG RESEARCH COMPLEX	0203A	2016	BUILDING SYSTEMS	HVAC EQUIPMENT	$823,000
ENG RESEARCH COMPLEX	0203A	2016	BUILDING SYSTEMS	LIGHTING FIXTURES	$585,000
ENG RESEARCH COMPLEX	0203A	2018	BUILDING SYSTEMS	REPLACE DOMESTIC COLD WATER METER AND ISOLATION VALVES IN MR-B105	$29,000
					$1,437,000
ENGINEERING	0081	2010	BUILDING INTERIOR	REPLACE OLD METAL PAN CEILINGS AND LIGHTING IN STAIRWELLS OF OLD ENGINEERING WING	$24,000
ENGINEERING	0081	2013	BUILDING ENVELOPE	EXTERIOR DOORS - REPLACE ALL EXTERIOR DOORS, HARDWARE AND FRAMES -	$210,000
ENGINEERING	0081	2014	BUILDING SYSTEMS	COMPLETE OVERHAUL OF OLD FREIGHT ELEVATOR, CONVERT TO PASSENGER ELEVATOR	$490,000
ENGINEERING	0081	2014	BUILDING ENVELOPE	REPAIR CONCRETE AND BRICK SCREENWALLS	$82,000
ENGINEERING	0081	2016	BUILDING ENVELOPE	REPLACE FAILED GLASS UNITS	$117,000
ENGINEERING	0081	2016	BUILDING SYSTEMS	VAV SYSTEM	$949,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACE 2 MECHANICAL CHILLERS	$367,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACE MOTOR CONTROL CENTERS	$56,000
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACE ORIGINAL STEAM WATER HEATER IN MECH RM MR-21	$70,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
ENGINEERING	0081	2017	BUILDING SYSTEMS	REPLACEMENT OF CONDENSATE RECEIVER LOCATED IN THE BASEMENT HALLWAY	$43,000
ENGINEERING	0081	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$4,345,000
ENGINEERING	0081	2018	BUILDING SYSTEMS	REPLACE DUPLEX 5HP CONTROL AIR COMPRESSORS ON 120 GALLON TANK AND AIR DRYER	$29,000
ENGINEERING	0081	2018	BUILDING SYSTEMS	REPLACE LAVATORY FAUCETS AND TRIM, TOILET FLUSH VALVES AND SEATS, AND URINALS IN ORIGINAL BUILDING	$41,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$2,770,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	LIGHTING FIXTURES	$961,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	REPLACE DUPLEX CONTROL AIR COMPRESSORS, AIR DRYER AND AIR BOARD LOCATED IN PENTHOUSE RM #500	$29,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$280,000
ENGINEERING	0081	2019	BUILDING SYSTEMS	REPLACE ELEVATOR 5	$400,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	REPLACE CHILLED WATER COILS IN HVAC FANS	$232,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	REPLACE LAVATORY FAUCETS AND TRIM, URINAL AND TOILET FLUSH VALVES AND TOILET SEATS	$29,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	REPLACE STEAM WATER HEATER IN MR-B510	$58,000
ENGINEERING	0081	2020	BUILDING SYSTEMS	VAV SYSTEM	$1,323,000
ENGINEERING	0081	2021	BUILDING SYSTEMS	PUMPS	$145,000
					$13,330,000
ENTOMOLOGY FIELD RESEARCH-MAIN	0474	2016	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS (2) OHD`S AND (3) HM DOORS	$24,000
					$24,000
ERICKSON HALL	0144	2015	BUILDING INTERIOR	REPLACE LANDING FLOORING, STAIR TREADS AND RISERS IN (2) TWO STAIRWELLS	$61,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	ERICKSON HALL- REPLACE TWO BUNDLES IN NORTH BASEMENT MECHANICAL REPLACE EXPANSION TANK IN PENTHOUSE	$60,000
ERICKSON HALL	0144	2017	BUILDING ENVELOPE	FUND STUDY OF EXTERIOR MASONRY AND CAULKING FOR RESTORATION	$51,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE (2) SMALLER CONDENSATE RETURN UNIT AND ONE LARGER CRU IN MECH ROOM 1, 7, & 13	$149,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE ALL OLD POWER PANELS	$337,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE FAILED GLASS UNITS	$30,000
ERICKSON HALL	0144	2017	BUILDING SYSTEMS	REPLACE STEAM COIL, VALVES, TRAPS ON HVAC #2 IN NORTH BASEMENT MECHANICAL ROOM	$32,000
ERICKSON HALL	0144	2018	BUILDING SYSTEMS	REPLACE URINAL AND TOILET FLUSH VALVES	$41,000
ERICKSON HALL	0144	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES (SOUTH SIDE OF MR-13)	$35,000
ERICKSON HALL	0144	2020	BUILDING SYSTEMS	UPDATE FIRE ALARM SYSTEM	$910,000
					$1,706,000
EUSTACE-COLE HALL	0015	2018	BUILDING SYSTEMS	PUMPS	$126,000
EUSTACE-COLE HALL	0015	2018	BUILDING SYSTEMS	VAV SYSTEM	$265,000
EUSTACE-COLE HALL	0015	2019	BUILDING SYSTEMS	CHILLER - CH1	$189,000
					$580,000
FARRALL HALL	0091	2010	BUILDING INTERIOR	REPAIR PLASTER AROUND WINDOW WALL AREAS (NO THERMAL BREAK) AND REPAIR INTERIOR MASONRY	$98,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
FARRALL HALL	0091	2015	BUILDING INTERIOR	BASEMENT CORRIDOR - NEW FLOORING AND LIGHTING	$34,000
FARRALL HALL	0091	2015	BUILDING INTERIOR	INTERIOR DOOR/ FRAME/ HARDWARE REPLACEMENTS IN BASEMENT LEVEL	$46,000
FARRALL HALL	0091	2015	BUILDING SYSTEMS	REPLACE LIGHTING AND POWER DISTRIBUTION PANELS	$54,000
FARRALL HALL	0091	2015	BUILDING SYSTEMS	REPLACE OBSOLETE FIXTURES AND BRANCH CIRCUIT WIRING	$591,000
FARRALL HALL	0091	2015	BUILDING ENVELOPE	REPLACE STEEL WINDOWS WITH NEW INSULATED WINDOWS	$612,000
FARRALL HALL	0091	2017	BUILDING SYSTEMS	FARRALL HALL - INSTALL NEW ELECTRICAL MAIN STEAM VALVE	$40,000
FARRALL HALL	0091	2017	BUILDING SYSTEMS	FARRALL HALL - UPGRADE FIRE ALARM SYSTEM	$392,000
FARRALL HALL	0091	2019	BUILDING SYSTEMS	PUMPS	$32,000
					$1,899,000
FARRALL-PROTOTYPE ASSEMBLY	0091A	2019	BUILDING SYSTEMS	PUMPS	$47,000
FARRALL-PROTOTYPE ASSEMBLY	0091A	2019	BUILDING SYSTEMS	VAV SYSTEM	$85,000
					$132,000
FEE HALL	0327	1994	BUILDING SYSTEMS	FEE - 5 ELEVATOR REPLACEMENT	$400,000
FEE HALL	0327	2011	BUILDING INTERIOR	FLOOR COVERING - REPLACE OR REPAIR IN STAIRWELLS	$232,000
FEE HALL	0327	2011	BUILDING INTERIOR	PLASTER CONDITIONS - PLASTER REPAIRS IN EAST, WEST AND CENTER STAIRWELLS	$58,000
FEE HALL	0327	2013	BUILDING INTERIOR	REPLACE CEILINGS AND LIGHTING IN PUBLIC CORRIDORS AND RESTROOMS FLOORS 2-6.	$224,000
FEE HALL	0327	2015	BUILDING SYSTEMS	REMOVE SPRAY-ON FIREPROOFING IN MR-E15 AND MR-B2 AND REINSULATE	$186,000
FEE HALL	0327	2018	BUILDING SYSTEMS	REPLACE TOILET AND URINAL FLUSH VALVES, FAUCETS, TRAPS, DRAINS IN PUBLIC RESTROOMS	$52,000
					$1,152,000
FIRE STATION	0131	2017	BUILDING ENVELOPE	REPLACE ROOF #4	$22,000
FIRE STATION	0131	2017	BUILDING SYSTEMS	REPLACE THE CONDENSATES RETURN DUPLEX UNIT IN THE BASEMENT MECH ROOM	$42,000
FIRE STATION	0131	2020	BUILDING INTERIOR	DOORS - INTERIOR	$110,000
					$174,000
FOOD SAFETY TOXICOLOGY	0186	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$31,000
FOOD SAFETY TOXICOLOGY	0186	2017	BUILDING SYSTEMS	VAV SYSTEM	$3,295,000
FOOD SAFETY TOXICOLOGY	0186	2018	BUILDING SYSTEMS	REPLACE DUPLEX WATER SOFTENER SYSTEM IN BASEMENT MR-21	$41,000
FOOD SAFETY TOXICOLOGY	0186	2020	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER	$56,000
FOOD SAFETY TOXICOLOGY	0186	2020	BUILDING SYSTEMS	UPGRADE 1 DDC PANEL SERVING ULAR AREA	$21,000
FOOD SAFETY TOXICOLOGY	0186	2022	BUILDING SYSTEMS	PUMPS	$361,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
FOOD SAFETY TOXICOLOGY	0186	2022	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR (DUPLEX 5HP), MR B21	$29,000
FOOD SAFETY TOXICOLOGY	0186	2022	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FIXTURES	$29,000
					$3,863,000
FOOD SCIENCE	0179	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$31,000
FOOD SCIENCE	0179	2015	BUILDING SYSTEMS	REPLACE AHU-1 AND EF-6	$245,000
FOOD SCIENCE	0179	2015	BUILDING SYSTEMS	REPLACE CONDENSOR LINES FOR PROCESS REFRIGERATION	$213,000
FOOD SCIENCE	0179	2017	BUILDING SYSTEMS	FOOD SCIENCE BUILDING - REPLACE AIR COOLED A/C CHILLER SERVING ANIMAL AREA IN BASEMENT	$232,000
FOOD SCIENCE	0179	2017	BUILDING SYSTEMS	REPLACE LIFE SAFETY AUTOMATIC TRANSFER SWITCH	$26,000
FOOD SCIENCE	0179	2017	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #3, 7	$41,000
FOOD SCIENCE	0179	2018	BUILDING SYSTEMS	REPLACE 4 DISTRIBUTION AND POWER PANELS IN ULAR AREA	$31,000
FOOD SCIENCE	0179	2018	BUILDING SYSTEMS	REPLACE LAB FIXTURE PLUMBING TRIM AND TRAPS	$565,000
FOOD SCIENCE	0179	2019	BUILDING INTERIOR	REPLACE INTERIOR LAMINATE CLAD OFFICE DOORS & HARDWARE AS NECESSARY	$306,000
FOOD SCIENCE	0179	2019	BUILDING SYSTEMS	UPGRADE 1 DDC PANEL SERVING ULAR AREA	$37,000
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS FOR THE ANIMAL AREA	$37,000
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES	$29,000
FOOD SCIENCE	0179	2020	BUILDING SYSTEMS	REPLACE FLUSH VALVES, TOILET SEATS, LAV FAUCETS ANDS TRIM	$23,000
					$1,816,000
GEOGRAPHY	0176	2014	BUILDING INTERIOR	REPLACE CORRIDOR AND REST ROOM CEILINGS AND LIGHTING	$92,000
GEOGRAPHY	0176	2017	BUILDING SYSTEMS	GEOGRAPHY - REPLACE DOMESTIC WATER HEATER	$61,000
GEOGRAPHY	0176	2017	BUILDING SYSTEMS	REPLACE OBSOLETE MOTOR STARTERS AND DISCONNECTS.	$39,000
GEOGRAPHY	0176	2020	BUILDING SYSTEMS	REPLACE MAIN DOMESTIC COLD WATER SHUT OFF VALVES AND WATER METER,	$27,000
					$219,000
GILTNER HALL	0028	2010	BUILDING SYSTEMS	REPLACE AHU 2 AND 3, AND ASSOCIATED EXHAUST FANS	$336,000
GILTNER HALL	0028	2012	BUILDING SYSTEMS	REPLACE HEATING COILS IN HV1 AND HV2	$323,000
GILTNER HALL	0028	2013	BUILDING SYSTEMS	REPLACE 10 DISTRIBUTION AND POWER PANELS IN ULAR AREA.	$80,000
GILTNER HALL	0028	2015	BUILDING SYSTEMS	REPLACE 480 VOLT DISTRIBUTION SYSTEM, MOTOR STARTERS	$749,000
GILTNER HALL	0028	2016	BUILDING INTERIOR	CEILINGS - REPLACE VARIOUS LAB ROOM CEILINGS THROUGHOUT THE ENTIRE BUILDING	$140,000
GILTNER HALL	0028	2016	BUILDING SYSTEMS	CONNECT TO CENTRAL CONTROL	$484,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	ELEVATOR # 4 REPLACEMENT	$280,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - BASEMENT AIR PLENUMS-REMOVE ALL PIPE INSULATION ON UTILITY PIPING & REINSULATE	$160,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - ELEVATOR #1 REPLACEMENT	$448,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - ELEVATOR #2 REPLACEMENT	$280,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - ELEVATOR #3 REPLACEMENT	$448,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
GILTNER HALL	0028	2017	BUILDING SYSTEMS	GILTNER HALL - REPLACE SUBSTATION	$800,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE AHU WITH THE SITE BUILT UNIT	$79,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE AHU-1 AND ASSOCIATED EXHAUST FAN	$153,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN MR-22	$58,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN MR-35	$58,000
GILTNER HALL	0028	2017	BUILDING SYSTEMS	SPLIT A/C 1 - REPLACE COND. UNIT AND EVAP. COIL	$64,000
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE 2 CONTROL AIR COMPRESSORS WITH LARGER ONES	$50,000
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE ALL RESTROOM URINALS WITH 1/8 GAL. FLUSH URINALS.	$46,000
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE FUSE PANELS	$186,000
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM LAVATORIES.	$41,000
GILTNER HALL	0028	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM TOILETS, TOILET SEATS AND FLUSH VALVES	$52,000
GILTNER HALL	0028	2018	BUILDING ENVELOPE	WINDOWS - CI	$57,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$92,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	REPLACE BOOSTER COILS FOR ANIMAL ROOMS	$92,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	REPLACE HEAT EXCHANGERS FOR ANIMAL ROOMS	$37,000
GILTNER HALL	0028	2020	BUILDING SYSTEMS	REPLACE HEAT PUMPS FOR ANIMAL ROOMS	$73,000
GILTNER HALL	0028	2020	BUILDING ENVELOPE	WINDOWS - CI	$32,000
GILTNER HALL	0028	2021	BUILDING ENVELOPE	WINDOWS - REPLACE ALL OLD WOOD WINDOWS (-495)	$1,346,000
					$7,044,000

HANCOCK TURFGRASS-FIELD LAB	0476	2018	BUILDING SYSTEMS	REPLACE ORIGINAL EXTERIOR SIDING	$40,000
					$40,000

HANNAH ADMINISTRATION	0067	2014	BUILDING SYSTEMS	REPLACE CEILING AND ADD NEW DUCT WORK - ROOMS 50 & 60	$299,000
HANNAH ADMINISTRATION	0067	2014	BUILDING ENVELOPE	REPLACE WINDOWS WITH A CURTAINWALL AND WINDOW RETROFIT. DOORS.	$2,511,000
HANNAH ADMINISTRATION	0067	2017	BUILDING INTERIOR	CEILINGS - REPLACE CEILINGS IN ENTIRE BUILDING	$884,000
HANNAH ADMINISTRATION	0067	2017	BUILDING ENVELOPE	EXTERIOR RESTORATION AND CAULKING	$157,000
HANNAH ADMINISTRATION	0067	2017	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-5 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000
HANNAH ADMINISTRATION	0067	2017	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-6 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000
HANNAH ADMINISTRATION	0067	2017	BUILDING SYSTEMS	REPLACE (4) HOT WATER HEATING PUMPS AND VALVES	$85,000
HANNAH ADMINISTRATION	0067	2018	BUILDING SYSTEMS	COMPLETE REPLACEMENT OF SPECIAL ELEVATOR	$323,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-7 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	REPLACE 20 TON CHILLER	$306,000
HANNAH ADMINISTRATION	0067	2019	BUILDING SYSTEMS	REPLACE CHILLER	$163,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-1 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-2 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-3 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000
HANNAH ADMINISTRATION	0067	2020	BUILDING SYSTEMS	HANNAH ADMIN: REPLACE SF-4 - UNIT IS BEYOND LIFE EXPECTANCY	$270,000
HANNAH ADMINISTRATION	0067	2022	BUILDING SYSTEMS	REPLACE 2 BASE MT. SUMP PUMPS (GORMAN RUPP) IN MR B1	$27,000
					$6,645,000
HORSE RESEARCH-BARN	0456O	2020	BUILDING ENVELOPE	ROOFING - SH, ROOF #1	$41,000
					$41,000
HORSE RESEARCH-STRG/EXERCISE	0456M	2015	BUILDING ENVELOPE	ROOFS #1	$40,000
					$40,000
HORSE RESEARCH-WEST HORSE BARN	0456B	2017	BUILDING ENVELOPE	ROOFS #2 AND 3	$100,000
					$100,000
HORTICULTURE RES - HOUSE/OFFICE	0407A	2017	BUILDING SYSTEMS	REPLACE HOT WATER BOILER WITH HIGH EFF. EQUIPMENT..	$30,000
					$30,000
HORTICULTURE RES - WINERY	0407F	2017	BUILDING ENVELOPE	ROOFS #1 AND 2	$50,000
HORTICULTURE RES - WINERY	0407F	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$131,000
HORTICULTURE RES - WINERY	0407F	2019	BUILDING SYSTEMS	PUMPS	$131,000
					$312,000
HUMAN ECOLOGY	0005	2016	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$189,000
HUMAN ECOLOGY	0005	2017	BUILDING SYSTEMS	HUMAN ECOLOGY - ELEVATOR 1 REPLACEMENT	$400,000
HUMAN ECOLOGY	0005	2018	BUILDING ENVELOPE	HUMAN ECOLOGY: MASONRY AND CAULKING RESTORATION	$291,000
HUMAN ECOLOGY	0005	2018	BUILDING SYSTEMS	REPLACE 19 TON MCQUAY AIR-COOLED CHILLER	$103,000
HUMAN ECOLOGY	0005	2019	BUILDING ENVELOPE	ROOF REPLACEMENT - ASBESTOS SHINGLES, BUILT UP, COPPER	$755,000
HUMAN ECOLOGY	0005	2020	BUILDING INTERIOR	REPLACE CEILING AND LIGHTING IN BUILDINGS CORRIDORS	$81,000
HUMAN ECOLOGY	0005	2020	BUILDING INTERIOR	REPLACE SELECTED HALLWAY ROOM DOORS AND HARDWARE AS NECESSARY (APPROXIMATELY 40)	$73,000
					$1,892,000
IM SPORTS-CIRCLE	0051	2010	BUILDING INTERIOR	REPLACE 1ST FLOOR GYMNASIUM ENTRY DOORS AND HARDWARE	$20,000
IM SPORTS-CIRCLE	0051	2014	BUILDING SYSTEMS	REPLACE OUTSIDE AIR DAMPERS	$76,000
IM SPORTS-CIRCLE	0051	2016	BUILDING INTERIOR	DEMO 30'X50' 12"X12" VINYL TILE & REPLACE CEILING W/ 2'X2' DROP CEILING	$45,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
IM SPORTS-CIRCLE	0051	2016	BUILDING SYSTEMS	REPLACE BATTERY OPERATED EM LIGHTS	$218,000
IM SPORTS-CIRCLE	0051	2016	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$311,000
IM SPORTS-CIRCLE	0051	2017	BUILDING INTERIOR	REPLACE STAIR TREADS, RISERS, STRINGERS AND LANDING FLOORING	$31,000
IM SPORTS-CIRCLE	0051	2017	BUILDING INTERIOR	REPLACE CEILINGS AND LIGHTING IN CORRIDORS	$82,000
IM SPORTS-CIRCLE	0051	2017	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM	$413,000
IM SPORTS-CIRCLE	0051	2018	BUILDING SYSTEMS	REPLACE GASKETS/SEALS ON LIGHTS, UPGRADE TO HID FIXTURES	$93,000
IM SPORTS-CIRCLE	0051	2018	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN BUILDING WATER SOFTENERS	$60,000
IM SPORTS-CIRCLE	0051	2020	BUILDING SYSTEMS	REPLACE COLUMN AND WALL SHOWERS IN THE MEN'S & WOMEN'S LOCKER ROOMS	$90,000
IM SPORTS-CIRCLE	0051	2020	BUILDING SYSTEMS	REPLACE TOILETS, LAVATORIES & URINALS IN RESTROOMS	$67,000
IM SPORTS-CIRCLE	0051	2022	BUILDING INTERIOR	IM SPORTS-CIRCLE - REPLACE FLOOR IN 2ND FLOOR GYM	$420,000
					$1,926,000
IM SPORTS-EAST	0175	2011	BUILDING INTERIOR	PAINT ENTIRE FACILITY	$91,000
IM SPORTS-EAST	0175	2011	BUILDING INTERIOR	REPLACE FLOORING ON RUNNING TRACK. APPROXIMATELY 7000 SQFT	$67,000
IM SPORTS-EAST	0175	2016	BUILDING ENVELOPE	ROOF REPLACEMENT / RESTORATION	$1,005,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$1,497,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$262,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$64,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
IM SPORTS-EAST	0175	2018	BUILDING SYSTEMS	REPLACE HW HEAT PUMPS	$64,000
					$3,330,000
IM SPORTS-WEST	0151	2010	BUILDING INTERIOR	PREP AND PAINT WALLS IN RACKETBALL COURTS	$37,000
IM SPORTS-WEST	0151	2010	BUILDING INTERIOR	REPLACE GYM FLOOR - ROOM 10	$140,000
IM SPORTS-WEST	0151	2010	BUILDING INTERIOR	REPLACE EXISTING WOOD FLOORING IN 9 RACKETBALL COURTS	$128,000
IM SPORTS-WEST	0151	2010	BUILDING INTERIOR	REPLACE GYM FLOORS - ROOMS 230 AND 233	$280,000
IM SPORTS-WEST	0151	2012	BUILDING INTERIOR	REPLACE CEILING AND LIGHTING IN 2ND FLOOR GYMNASIUM	$93,000
IM SPORTS-WEST	0151	2014	BUILDING SYSTEMS	REPLACE DETERIORATED DUCTWORK ABOVE CEILINGS AT ROOMS 138 & 140.	$51,000
IM SPORTS-WEST	0151	2015	BUILDING SYSTEMS	REPLACE AIR CONDITIONING SYSTEM FOR ROOM 231 BY CONNECTING TO NEW CHILLER SYSTEM	$105,000
IM SPORTS-WEST	0151	2015	BUILDING ENVELOPE	REPLACE ROOF #13	$58,000
IM SPORTS-WEST	0151	2016	BUILDING INTERIOR	INTERIOR DOORS - SELECTED OFFICE AND COURTS	$42,000
IM SPORTS-WEST	0151	2016	BUILDING SYSTEMS	REMOVE ASBESTOS ACOUSICAL PLASTER	$302,000
IM SPORTS-WEST	0151	2016	BUILDING SYSTEMS	REPLACE CABINET HEATERS NORTH ENTRANCE	$25,000
IM SPORTS-WEST	0151	2017	BUILDING INTERIOR	IM SPORTS-WEST - REPLACE DOORS IN TURF ARENA (3 PAIR ENTRY DOORS AND 2 EXTERIOR ROLL UP DOORS)	$22,000
IM SPORTS-WEST	0151	2017	BUILDING ENVELOPE	IM SPORTS-WEST - REPLACE EXTERIOR DOORS	$216,000
IM SPORTS-WEST	0151	2017	BUILDING SYSTEMS	IM WEST - REPLACE HYDRONIC HEATING SYSTEM BASEMENT MECH RM	$400,000
IM SPORTS-WEST	0151	2017	BUILDING INTERIOR	REPAIR RACKETBALL BALL COURT WALLS	$131,000
IM SPORTS-WEST	0151	2018	BUILDING SYSTEMS	REPLACE 20 ORIGINAL HOT AND COLD WATER SHUT OFF VALVES	$45,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
IM SPORTS-WEST	0151	2019	BUILDING ENVELOPE	IM WEST NW AND NE ENTRY MASONRY RESTORATION	$165,000
IM SPORTS-WEST	0151	2020	BUILDING SYSTEMS	REPLACE 40 TOILETS, 40 LAVATORIES, AND 25 URINALS IN RESTROOMS	$84,000
IM SPORTS-WEST	0151	2020	BUILDING SYSTEMS	REPLACE COLUMN SHOWERS AND WALL SHOWERS VALVES IN LOCKER ROOMS	$112,000
IM SPORTS-WEST	0151	2020	BUILDING SYSTEMS	REPLACE EXHAUST FANS IN ARENA, TENNIS COURTS, AND UPPER WEST GYM.	$65,000
					$2,501,000
INFRASTRUCTURE PLAN FAC-STRG 1	0209	2018	BUILDING ENVELOPE	ROOFING - FM ROOF #1	$82,000
					$82,000
INFRASTRUCTURE PLAN FAC-STRG 2	0210	2019	BUILDING ENVELOPE	ROOFING - FM ROOF #1	$102,000
					$102,000
INFRASTRUCTURE PLANNING FACILITIES	0167	2016	BUILDING SYSTEMS	REPLACE ELEVATOR AND CONVERT TO PASSENGER	$194,000
INFRASTRUCTURE PLANNING FACILITIES	0167	2017	BUILDING SYSTEMS	REPLACE CONDENSTATE PUMPS 1 & 2	$52,000
INFRASTRUCTURE PLANNING FACILITIES	0167	2018	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR AND AIR DRYER	$47,000
					$293,000
JENISON FIELDHOUSE	0056	2013	BUILDING INTERIOR	REPLACE WOOD FLOOR IN NORTH UPPER GYM	$280,000
JENISON FIELDHOUSE	0056	2014	BUILDING INTERIOR	REPLACE OLD STEEL TOILET PARTITIONS	$29,000
JENISON FIELDHOUSE	0056	2015	BUILDING SYSTEMS	REPLACE ALL DETERIORATED UNDERGROUND SANITARY AND STORM WASTE PIPING	$925,000
JENISON FIELDHOUSE	0056	2015	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSOR (DUPLEX 200GAL 7.5HP)	$31,000
JENISON FIELDHOUSE	0056	2016	BUILDING ENVELOPE	REPAIR MASONRY AT ENTRANCES	$122,000
JENISON FIELDHOUSE	0056	2017	BUILDING SYSTEMS	REPLACE HEATING AND VENTILATING UNITS	$559,000
JENISON FIELDHOUSE	0056	2017	BUILDING SYSTEMS	REPLACE STEAM PRV SYSTEM IN MAIN MECHANICAL ROOM	$140,000
JENISON FIELDHOUSE	0056	2018	BUILDING SYSTEMS	REPLACE ALL ORIGINAL EXPOSED SANITARY WASTE PIPING	$233,000
JENISON FIELDHOUSE	0056	2018	BUILDING SYSTEMS	REPLACE ORIGINAL STORM WASTE PIPING	$233,000
JENISON FIELDHOUSE	0056	2018	BUILDING SYSTEMS	REPLACE URINALS, TOILETS, LAVATORIES, AND WATER COOLERS IN PUBLIC RESTROOMS	$111,000
JENISON FIELDHOUSE	0056	2019	BUILDING SYSTEMS	REMOVE AND REPLACE ORIGINAL EXPOSED DOMESTIC HOT AND COLD WATER PIPING IN BASEMENT.	$175,000
JENISON FIELDHOUSE	0056	2019	BUILDING ENVELOPE	REPLACE BALANCE OF STEEL FRAMED SINGLE GLAZED WINDOWS	$297,000
JENISON FIELDHOUSE	0056	2019	BUILDING SYSTEMS	REPLACE ELECTRICAL BRANCH CIRCUIT PANELS, PANEL FEEDERS, AND BRANCH CIRCUITS	$1,748,000
JENISON FIELDHOUSE	0056	2019	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN TWO WATER SOFTENER TANKS LOCATED IN THE BASEMENT MECH ROOM.	$35,000
JENISON FIELDHOUSE	0056	2020	BUILDING SYSTEMS	REPLACE TWO 4" GORMON RUPP BASE MTD SUMP PUMPS	$42,000
JENISON FIELDHOUSE	0056	2021	BUILDING SYSTEMS	VAV SYSTEM	$343,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
JENISON FIELDHOUSE	0056	2022	BUILDING SYSTEMS	REPLACE 2 CHILLERS LOCATED ON ROOF.	$396,000
JENISON FIELDHOUSE	0056	2022	BUILDING SYSTEMS	REPLACE FILTRINE CHILLER, PUMPS, AND CONTROLS FOR THE TRAINING ROOM COLD TUB	$23,000
					$5,722,000
KEDZIE HALL	0029	2010	BUILDING INTERIOR	CEILING REPLACEMENTS IN CORRIDORS OF 1ST, 2ND AND 3RD FLOORS OF NORTH WING	$98,000
KEDZIE HALL	0029	2011	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #12	$20,000
KEDZIE HALL	0029	2015	BUILDING SYSTEMS	BASEMENT AIR PLENUMS-REMOVE ALL ASBESTOS PIPE INSULATIONS & RE-INSULATE W/ NON ASBESTOS.	$78,000
KEDZIE HALL	0029	2016	BUILDING INTERIOR	REPLACE STAIRTREADS/ RISERS AND LANDING MATERIAL IN STAIRWELL	$61,000
KEDZIE HALL	0029	2017	BUILDING SYSTEMS	KEDZIE HALL - REPLACE FIRE ALARM SYSTEM AND SMOKE DETECTOR	$661,000
KEDZIE HALL	0029	2017	BUILDING INTERIOR	REPLACE MARBLE TOILET PARTITIONS WITH NEW STAINLESS STEEL	$44,000
KEDZIE HALL	0029	2017	BUILDING SYSTEMS	REPLACE NON GLASS PANELS AT THE TOP OF NORTH KEDZIE WINDOWS	$144,000
KEDZIE HALL	0029	2017	BUILDING ENVELOPE	REPLACE ROOF SPLIT AC 6	$37,000
KEDZIE HALL	0029	2017	BUILDING SYSTEMS	SOUTH KEDZIE REPLACE STEAM PRV	$77,000
KEDZIE HALL	0029	2018	BUILDING SYSTEMS	REPLACE AIRCO WATER HEATER	$60,000
KEDZIE HALL	0029	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER	$35,000
KEDZIE HALL	0029	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM FIXTURES	$29,000
KEDZIE HALL	0029	2019	BUILDING SYSTEMS	KEDZIE HALL - UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$112,000
KEDZIE HALL	0029	2019	BUILDING SYSTEMS	REPLACE CONSOLE INDUCTION TERMINAL UNITS AT SOUTH KEDZIE	$1,158,000
KEDZIE HALL	0029	2020	BUILDING SYSTEMS	REPLACE 4 HWH PUMPS #3,4,5,6 (BASE MTD., B&G 1510'S)	$63,000
					$2,677,000
KRESGE ART	0150	2014	BUILDING INTERIOR	REPLACE 9X9 ASBESTOS FLOOR TILE IN CORRIDORS	$124,000
KRESGE ART	0150	2014	BUILDING INTERIOR	REPLACE LAMINATE CLAD INTERIOR DOORS FROM HALLWAYS TO OFFICES AND CLASSROOMS THROUGHOUT BLDG	$115,000
KRESGE ART	0150	2014	BUILDING INTERIOR	REPLACE RECESS IN WALL METAL LOCKERS IN CORRIDORS (APPROXIMATELY 370)	$59,000
KRESGE ART	0150	2014	BUILDING INTERIOR	REPLACE STAIRTREADS/ RISERS AND LANDINGS FLOORING IN 2 STAIRWELLS	$37,000
KRESGE ART	0150	2015	BUILDING ENVELOPE	REPLACE CURTAIN WALL/WINDOWS	$5,444,000
KRESGE ART	0150	2015	BUILDING SYSTEMS	REPLACE HOT WATER HEATING SYSTEM	$2,178,000
KRESGE ART	0150	2016	BUILDING ENVELOPE	REPLACE BALCONY DOORS AND HARDWARE ON SOUTH SIDE OF BLDG	$120,000
KRESGE ART	0150	2017	BUILDING SYSTEMS	CHILLER	$323,000
KRESGE ART	0150	2017	BUILDING SYSTEMS	COOLING TOWERS	$274,000
KRESGE ART	0150	2018	BUILDING SYSTEMS	ABATE PLASTER/SPRAY-ON FIREPROOFING	$750,000
KRESGE ART	0150	2018	BUILDING ENVELOPE	DOORS - EXTERIOR - ED	$47,000
KRESGE ART	0150	2022	BUILDING SYSTEMS	INSTALL DUPLEX CONTROL AIR COMPRESSOR	$28,000
					$9,499,000
KRESGE ART-SCULPTURE STUDIO	0150A	2013	BUILDING ENVELOPE	REPLACE EXTERIOR ALUMINUM DOORS AND HARDWARE IN (2) LOCATIONS	$24,000
					$24,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
LANDSCAPE SERVICES	0158	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$35,000
					$35,000
LANDSCAPE SRVCS NURSERY-HEADHOUSE	0406A	2015	BUILDING ENVELOPE	REPLACE ROOF #1, 2, AND 3	$33,000
					$33,000
LARGE ANIMAL RES - HAY BARN	0447B	2022	BUILDING ENVELOPE	ROOFING - MT #1	$44,000
					$44,000
LIBRARY	0049	2015	BUILDING ENVELOPE	REPLACE EXTERIOR ALUMINUM ENTRANCE DOORS AND HARDWARE	$135,000
LIBRARY	0049	2017	BUILDING SYSTEMS	REPLACE DOMESTIC STEAM WATER HEATER IN BASEMENT MR WB-12	$58,000
LIBRARY	0049	2017	BUILDING SYSTEMS	REPLACE HOT WATER HEATER (STEAM) 1	$75,000
LIBRARY	0049	2017	BUILDING ENVELOPE	REPLACE ROOF #14	$80,000
LIBRARY	0049	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND ISOLATION VALVES ON MAIN COLD WATER PIPING IN BASEMENT MR WB-12	$29,000
LIBRARY	0049	2019	BUILDING SYSTEMS	LIBRARY - UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
LIBRARY	0049	2019	BUILDING SYSTEMS	PUMPS	$47,000
LIBRARY	0049	2020	BUILDING SYSTEMS	VAV SYSTEM	$102,000
					$757,000
LIFE SCIENCE	0183	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$49,000
LIFE SCIENCE	0183	2016	BUILDING ENVELOPE	GENERAL MASONRY & CAULKING REPAIRS	$373,000
LIFE SCIENCE	0183	2017	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM	$755,000
LIFE SCIENCE	0183	2017	BUILDING SYSTEMS	REPLACE HEAT PUMPS #5, #6, AND #7 IN THE NORTH A-WING PENTHOUSE, ADD 4TH PUMP	$122,000
LIFE SCIENCE	0183	2017	BUILDING SYSTEMS	REPLACE TWO ORIGINAL STEAM WATER HEATERS	$175,000
LIFE SCIENCE	0183	2018	BUILDING SYSTEMS	LIFE SCIENCE - ABATE SPRAY-ON FIREPROOFING ABOVE CEILINGS IN ENTIRE BUILDING	$10,000,000
LIFE SCIENCE	0183	2018	BUILDING SYSTEMS	REPLACE 6 DISTRIBUTION AND POWER PANELS IN ULAR AREA.	$43,000
LIFE SCIENCE	0183	2018	BUILDING SYSTEMS	REPLACE ALL PUBLIC RESTROOM LAVATORY FAUCETS AND TRIM,	$35,000
LIFE SCIENCE	0183	2020	BUILDING SYSTEMS	REPLACE BOOSTER COILS AND VALVES FOR ANIMAL ROOMS	$31,000
LIFE SCIENCE	0183	2020	BUILDING SYSTEMS	REPLACE HUMIDIFICATION FOR ANIMAL ROOMS	$31,000
LIFE SCIENCE	0183	2021	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$56,000
					$11,670,000
LINTON HALL	0014	2010	BUILDING INTERIOR	REPLACE CEILINGS AS NECESSARY	$75,000
LINTON HALL	0014	2011	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$56,000
LINTON HALL	0014	2013	BUILDING INTERIOR	REPLACE FLOOR TILE IN PUBLIC AREA HALLWAYS, RESTROOMS & STAIR TREADS/RISERS	$106,000
LINTON HALL	0014	2014	BUILDING ENVELOPE	REPLACE WINDOWS IN ORIGINAL BUILDING TO MATCH 1996 ADDITION.	$979,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
LINTON HALL	0014	2018	BUILDING INTERIOR	INTERIOR DOORS - REPLACE SELECTED INTERIOR DOORS AND HARDWARE	$48,000
LINTON HALL	0014	2020	BUILDING SYSTEMS	REPLACE ALL WATER PIPING IN BUILDING.	$932,000
					$2,196,000
MANLY MILES	0154	2014	BUILDING ENVELOPE	REPLACE ALL WINDOWS	$1,361,000
MANLY MILES	0154	2017	BUILDING SYSTEMS	REMOVE ALL ASBESTOS CONTAMINATED CEILING PLASTER AND SPRAY ON FIRE RETARDANT ABOVE IN BLDG	$612,000
MANLY MILES	0154	2018	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$394,000
MANLY MILES	0154	2018	BUILDING SYSTEMS	PUMPS	$154,000
MANLY MILES	0154	2018	BUILDING INTERIOR	STAIRWELL TREADS AND LIGHTING FLOORING REPLACEMENT	$31,000
MANLY MILES	0154	2019	BUILDING INTERIOR	INSTALL NEW SUSPENDED CEILINGS AND LIGHTING IN BLDG	$489,000
MANLY MILES	0154	2019	BUILDING ENVELOPE	REPLACE ALUMINUM ENTRANCE DOORS, FRAMES, GLAZING AND HARDWARE	$31,000
MANLY MILES	0154	2019	BUILDING INTERIOR	REPLACE STAIRWELL FIRE DOORS AND HARDWARE, LIFECYCLE REPLACEMENT BY YEAR 2019	$24,000
MANLY MILES	0154	2020	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$32,000
MANLY MILES	0154	2020	BUILDING SYSTEMS	REPLACE EXISTING CHILLER	$250,000
MANLY MILES	0154	2020	BUILDING SYSTEMS	REPLACE FAN COIL UNITS	$2,773,000
					$6,151,000
MORRILL HALL OF AGRICULTURE	0022	2016	BUILDING ENVELOPE	REPLACE ROOFS #4 AND 5	$327,000
MORRILL HALL OF AGRICULTURE	0022	2019	BUILDING SYSTEMS	CHILLER - CH1	$276,000
MORRILL HALL OF AGRICULTURE	0022	2019	BUILDING SYSTEMS	PUMPS	$104,000
MORRILL HALL OF AGRICULTURE	0022	2019	BUILDING SYSTEMS	VAV SYSTEM	$618,000
MORRILL HALL OF AGRICULTURE	0022	2020	BUILDING SYSTEMS	REPLACE TOILET FLUSH VALVES, URINAL FLUSH VALVES, LAVATORY FAUCETS AND TRIM, AND TOILET SEATS	$23,000
MORRILL HALL OF AGRICULTURE	0022	2021	BUILDING SYSTEMS	VAV SYSTEM REPAIRS	$158,000
					$1,506,000
MSU SURPLUS AND RECYCLING	0223	2019	BUILDING SYSTEMS	REPLACE DOMESTIC HOT WATER HEATER	$48,000
					$48,000
MUNN ICE ARENA	0059	2010	BUILDING INTERIOR	REPLACE CEILINGS IN HALLWY AND OFFICE AREAS AS NEEDED	$21,000
MUNN ICE ARENA	0059	2010	BUILDING INTERIOR	REPLACE HOLLOW METAL INTERIOR DOORS AND FRAMES IN VARIOUS AREAS	$40,000
MUNN ICE ARENA	0059	2011	BUILDING ENVELOPE	PAINT METAL ROOF 2	$542,000
MUNN ICE ARENA	0059	2012	BUILDING ENVELOPE	REPAIR MASONRY AT ALL ENTRANCES	$29,000
MUNN ICE ARENA	0059	2013	BUILDING INTERIOR	REPLACE SELECTED HOLLOW METAL DOORS AND HARDWARE.	$52,000
MUNN ICE ARENA	0059	2014	BUILDING SYSTEMS	REPLACE FREIGHT ELEVATOR HYDRAULICS, CONTROLLER AND WORN CAR PARTS.	$291,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
MUNN ICE ARENA	0059	2014	BUILDING INTERIOR	REPLACE RUBBER FLOOR TILES IN AREAS WHERE FLOOR IS WALKED ON WITH SKATES	$29,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	MUNN ICE ARENA - REPLACE CONTROL AIR COMPRESSOR AND AIR DRYER	$37,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	MUNN ICE ARENA - UPGRADE ALL 208 AND 480 VOLT DISTRIBUTION BREAKERS	$150,000
MUNN ICE ARENA	0059	2017	BUILDING ENVELOPE	REPLACE ROOF #1 (NORTH ENTRANCE OVERHANG)	$35,000
MUNN ICE ARENA	0059	2017	BUILDING ENVELOPE	REPLACE ROOF #3 (WEST ENTRANCE OVERHANG)	$58,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	REPLACE SNOW MELT SERVICE	$52,000
MUNN ICE ARENA	0059	2017	BUILDING SYSTEMS	REPLACE TWO DOMESTIC WATER HEATERSIN THE MAIN MECHANICAL ROOM	$117,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE COLD WATER METER, TWO ISOLATION VALVES AND ONE BYPASS VALVE IN MAIN BSMNT MECH RM	$29,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN MAIN BASEMENT MECHANICAL ROOM	$58,000
MUNN ICE ARENA	0059	2018	BUILDING INTERIOR	REPLACE PAINTED TOILET PARTITIONS	$26,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE PLUMBING FIXTURES IN 1ST FLR AND BASEMENT	$35,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE STEAM PRV SERVICE INCLUDING SAFTEY VALVE/VENT	$117,000
MUNN ICE ARENA	0059	2018	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN TWO WATER SOFTENERS IN THE BASEMENT MAIN MECH ROOM	$50,000
MUNN ICE ARENA	0059	2019	BUILDING SYSTEMS	REPLACE 2 GORMAN RUPP PUMPS (AND ASSOCIATED ELECTRICAL), THAT PUMP OUT THE ZAMBONI MELTING PIT.	$35,000
MUNN ICE ARENA	0059	2019	BUILDING SYSTEMS	REPLACE 2 STORM SUMP PUMPS AND ELECTRICAL DISCONNECTS LOCATED IN ROOM 23.	$33,000
MUNN ICE ARENA	0059	2019	BUILDING SYSTEMS	REPLACE CONDENSATE RETURN UNIT IN MECH ROOM 127.	$29,000
MUNN ICE ARENA	0059	2020	BUILDING INTERIOR	REPLACE CEILING TILES AND GRID AS NEEDED IN ALL AREAS OF ORIGINAL BUILDING.	$35,000
					$1,900,000
MUSEUM	0013	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
MUSEUM	0013	2014	BUILDING ENVELOPE	WINDOWS - REPLACE ALL EXTERIOR WINDOWS, OLD STEEL (341)	$870,000
MUSEUM	0013	2015	BUILDING SYSTEMS	REPLACE EF-1, EF-1A, EF-1B, EF-1D, EF-2, EF-2A, SF-1, SF-1A	$734,000
MUSEUM	0013	2015	BUILDING SYSTEMS	REPLACE VENTILATION FOR MAIN GALLERY ROOM 105 AND HERITAGE GALLERY ROOM 106	$1,069,000
MUSEUM	0013	2017	BUILDING INTERIOR	DOORS - INTERIOR	$82,000
MUSEUM	0013	2017	BUILDING SYSTEMS	REPLACE FIRE ALARM SYSTEM IN MUSEUM	$231,000
MUSEUM	0013	2018	BUILDING SYSTEMS	REPLACE CLASSMATE UNIT WITH NEW SELF CONTAINED COMPUTER ROOM AIR CONDITIONING UNIT	$58,000
MUSEUM	0013	2019	BUILDING SYSTEMS	REPLACE CAST IRON RADIATORS AND CONTROL VALVES	$323,000
MUSEUM	0013	2022	BUILDING SYSTEMS	REPLACE FUME HOOD FAN FH-1 LOCATED IN THE ATTIC	$31,000
					$3,678,000
MUSIC	0011	2014	BUILDING INTERIOR	INTERIOR DOORS - REPLACE SOME OLD DOORS AT BASEMENT AND 1ST FLOOR, INCLUDING HARDWARE	$31,000
MUSIC	0011	2014	BUILDING ENVELOPE	WHOLE BUILDING WINDOW REPLACEMENT	$1,224,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
MUSIC	0011	2015	BUILDING INTERIOR	FLOOR COVERING - REPLACE FLOORING AT BASEMENT LEVEL	$105,000
MUSIC	0011	2015	BUILDING INTERIOR	REPLACE VINYL FLOORING AND WALL BASE ON 1ST AND 2ND FLOOR CORRIDORS INCLUDING ROOM 120	$98,000
MUSIC	0011	2016	BUILDING INTERIOR	DOORS - INTERIOR	$296,000
MUSIC	0011	2017	BUILDING SYSTEMS	MUSIC BUILDING - REMOVE AND REPLACE ALL AIR DUCTS IN THE ORIGINAL PART OF THE BUILDING.	$524,000
MUSIC	0011	2017	BUILDING SYSTEMS	REPLACE 2 AIR CONDITIONING SYSTEMS WITH CHILLER	$1,468,000
MUSIC	0011	2017	BUILDING SYSTEMS	REPLACE RF-1, EF-2, EF-3, EF-6, RF-8, RF-11, RF-12, RF-9, SF-1, SF-10, SF-15, SF-16, SF-3, AND SF-5	$1,346,000
MUSIC	0011	2017	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #4, 5, 7, 8 AND 9	$192,000
MUSIC	0011	2018	BUILDING SYSTEMS	REPLACE HALLWAY LIGHTING AND WIRING ON THE 1ST AND 2ND FLOORS (MR5)	$31,000
MUSIC	0011	2019	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
					$5,595,000
MUSIC PRACTICE	0021	2012	BUILDING INTERIOR	FLOOR COVERING - REPLACE FRONT STAIRWELL AND LANDINGS	$105,000
MUSIC PRACTICE	0021	2017	BUILDING SYSTEMS	REPLACE 2 HOT WATER HEATING SYSTEMS	$123,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	CEILINGS - CEILING TILE REPLACEMENT	$32,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPALCE CORRIDOR FLOORING AND WALL BASE	$94,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE CEILING AND LIGHTING IN PUBLIC CORRIDORS AND STAIRWELLS	$80,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE STAIR TREADS/ RISERS AND LANDING MATERIAL IN BACK STAIRWELL	$92,000
MUSIC PRACTICE	0021	2018	BUILDING INTERIOR	REPLACE STAIRWELL FIRE DOORS AND HARDWARE	$37,000
					$563,000
NATURAL RESOURCES	0180	2010	BUILDING INTERIOR	REPLACE DAMAGED/OUTDATED CEILING TILE AND LIGHTING	$210,000
NATURAL RESOURCES	0180	2017	BUILDING SYSTEMS	NATURAL RESOURCES - REPLACE 2 DOMESTIC HOT WATER HEATERS	$117,000
NATURAL RESOURCES	0180	2017	BUILDING SYSTEMS	NATURAL RESOURCES - UPGRADE SUBSTATION BREAKERS IN ELECTRICAL VAULT	$130,000
NATURAL RESOURCES	0180	2017	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS/ JAMBS/ AND HARDWARE (6-OHD) (16 ENTRY)	$171,000
NATURAL RESOURCES	0180	2017	BUILDING SYSTEMS	REPLACE HEAT EXCHANGER 1	$71,000
NATURAL RESOURCES	0180	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER	$35,000
NATURAL RESOURCES	0180	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM PLUMBING FIXTURES	$29,000
					$763,000
NATURAL SCIENCE	0024	1978	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 1	$162,000
NATURAL SCIENCE	0024	1978	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 2	$152,000
NATURAL SCIENCE	0024	1978	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 3	$161,000
NATURAL SCIENCE	0024	1978	BUILDING SYSTEMS	REPLACE AIR HANDLING UNIT SF - 4	$176,000
NATURAL SCIENCE	0024	2010	BUILDING INTERIOR	FLOOR COVERING - REPLACE DETERIORATED FLOOR TILE	$306,000
NATURAL SCIENCE	0024	2010	BUILDING INTERIOR	INTERIOR DOORS - REPAIR DOORS AND HARDWARE, BASEMENT THROUGH 4TH FLOOR	$105,000
NATURAL SCIENCE	0024	2014	BUILDING SYSTEMS	REPLACE WATER HEATER IN EAST BASEMENT MR	$70,000
NATURAL SCIENCE	0024	2015	BUILDING SYSTEMS	BASEMENT AIR PLENUMS-REMOVE ALL ASBESTOS PIPE INSULATIONS & REINSULATE W/ NON-ASBESTOS.	$220,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
NATURAL SCIENCE	0024	2017	BUILDING SYSTEMS	NATURAL SCIENCE - REPLACE ELEVATOR 2	$280,000
NATURAL SCIENCE	0024	2017	BUILDING SYSTEMS	REPLACE AIR-COOLED CHILLERS	$900,000
NATURAL SCIENCE	0024	2020	BUILDING SYSTEMS	REPLACE 4 BASE MT. SUMP PUMPS IN AIR PLENUMS E & W	$52,000
					$2,584,000
NISBET	0128	2014	BUILDING SYSTEMS	HVAC EQUIPMENT	$22,000
NISBET	0128	2016	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$94,000
NISBET	0128	2019	BUILDING SYSTEMS	CHILLER - CH1	$260,000
NISBET	0128	2019	BUILDING SYSTEMS	CHILLER - CH2	$260,000
					$636,000
OLD BOTANY	0017	2015	BUILDING SYSTEMS	REPLACE LIGHTING AND BRANCH CIRCUITS	$187,000
OLD BOTANY	0017	2018	BUILDING SYSTEMS	REPLACE HOT AND COLD WATER PIPING THROUGHOUT BUILDING	$58,000
OLD BOTANY	0017	2018	BUILDING SYSTEMS	REPLACE OLD BOTANY 1-PIPE HOT WATER HEATING SYS WITH 2-PIPE SYS	$292,000
					$537,000
OLD HORTICULTURE	0025	2016	BUILDING SYSTEMS	REMOVE ELECTRICAL DISTRIBUTION SYSTEM FROM AIR PLENUM	$255,000
OLD HORTICULTURE	0025	2018	BUILDING SYSTEMS	CHILLER	$178,000
OLD HORTICULTURE	0025	2021	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$311,000
					$744,000
OLDS HALL	0047	2015	BUILDING SYSTEMS	BASEMENT CRAWL SPACE-REMOVE ALL ASBESTOS PIPE INSULATIONS & REINSULATE WITH NON-ASBESTOS INSULATIONS	$25,000
OLDS HALL	0047	2016	BUILDING ENVELOPE	REPLACE FIRE ESCAPE EXTERIOR DOORS, FRAMES AND HARDWARE (9)	$61,000
OLDS HALL	0047	2017	BUILDING SYSTEMS	INSTALL NEW HEATING/VENTILATING UNIT TO SERVE ENTIRE BUILDING,	$7,660,000
OLDS HALL	0047	2017	BUILDING SYSTEMS	VAV SYSTEM	$158,000
OLDS HALL	0047	2019	BUILDING ENVELOPE	REPLACE ROOF #1, 2 AND 3	$232,000
OLDS HALL	0047	2019	BUILDING SYSTEMS	REPLACE ROOF TOP AIR CONDITIONING UNIT #1	$61,000
OLDS HALL	0047	2020	BUILDING SYSTEMS	REPLACE ALL DOMESTIC HOT AND COLD WATER PIPING INSIDE THE BUILDING,	$1,165,000
					$9,362,000
OYER SPEECH AND HEARING	0089	2014	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$168,000
OYER SPEECH AND HEARING	0089	2017	BUILDING SYSTEMS	REPLACE ORIGINAL STEAM REDUCING STATION	$45,000
					$213,000
PACKAGING	0177	2017	BUILDING SYSTEMS	HVAC EQUIPMENT	$1,002,000
PACKAGING	0177	2017	BUILDING INTERIOR	REPLACE APPROXIMATELY (23) INTERIOR BIRCH VENEER DOORS AND HARDWARE	$34,000
PACKAGING	0177	2018	BUILDING SYSTEMS	RESIZE AND REPLACE CONTROL AIR COMPRESSORS IN THE BASEMENT MECHANICAL ROOM	$30,000
PACKAGING	0177	2019	BUILDING INTERIOR	REPLACE CORRIDOR FLOOR TILE IN ORIGINAL BUILDING	$44,000
					$1,110,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
PATHOLOGICAL INCINERATOR	0524	2017	BUILDING SYSTEMS	REPLACE 2 EXHAUST FANS	$20,000
					$20,000
PAVILION AG LIVESTOCK	0212	2012	BUILDING ENVELOPE	REPLACE VARIOUS HOLLOW METAL AND OVERHEAD DOORS WHERE DAMAGED	$28,000
PAVILION AG LIVESTOCK	0212	2013	BUILDING INTERIOR	INTERIOR PAINTING WALL AREAS WHERE NEEDED	$70,000
PAVILION AG LIVESTOCK	0212	2016	BUILDING ENVELOPE	EXTERIOR MASONRY REPAIRS AND CAULKING	$52,000
PAVILION AG LIVESTOCK	0212	2016	BUILDING SYSTEMS	VAV SYSTEM	$309,000
PAVILION AG LIVESTOCK	0212	2018	BUILDING SYSTEMS	REPLACE PUBLIC RESTROOM PLUMBING FIXTURES	$35,000
PAVILION AG LIVESTOCK	0212	2020	BUILDING SYSTEMS	CHILLER	$226,000
PAVILION AG LIVESTOCK	0212	2021	BUILDING SYSTEMS	PUMPS	$240,000
					$960,000
PLANT AND SOIL SCIENCE	0086	2012	BUILDING SYSTEMS	REPLACE HVAC SYSTEM 1 (MPS)	$400,000
PLANT AND SOIL SCIENCE	0086	2014	BUILDING SYSTEMS	REPLACE HYDRAULIC ELEVATOR	$484,000
PLANT AND SOIL SCIENCE	0086	2015	BUILDING ENVELOPE	REMOVE DOUBLE STRENGTH GLASS IN ROOF AND REPLACE WITH POLYCARBONATE.	$89,000
PLANT AND SOIL SCIENCE	0086	2016	BUILDING SYSTEMS	HVAC EQUIPMENT	$6,535,000
PLANT AND SOIL SCIENCE	0086	2017	BUILDING SYSTEMS	REPLACE 5 SUPPLY FANS, 4 PLENUM EXHAUST FANS.....,	$3,108,000
PLANT AND SOIL SCIENCE	0086	2018	BUILDING SYSTEMS	LIGHTING FIXTURES	$2,080,000
PLANT AND SOIL SCIENCE	0086	2019	BUILDING SYSTEMS	REPLACE PLUMBING FIXTURES	$47,000
					$12,743,000
PLANT BIOLOGY	0178	2010	BUILDING SYSTEMS	REPLACE ALL AUTO VALVES ON BOOSTER COILS; INSTALL SHUT OFF VALVES ON ALL AUTO VALVES (BOTANY WING)	$44,000
PLANT BIOLOGY	0178	2012	BUILDING SYSTEMS	ADD A REDUNDANT HOT WATER HEAT PUMP SO THAT WORK CAN BE PERFORMED ON THE EXISTING PUMP.	$21,000
PLANT BIOLOGY	0178	2015	BUILDING SYSTEMS	HVAC EQUIPMENT	$1,310,000
PLANT BIOLOGY	0178	2015	BUILDING SYSTEMS	LIGHTING FIXTURES	$307,000
PLANT BIOLOGY	0178	2017	BUILDING ENVELOPE	PLANT BIOLOGY - EXTERIOR DOORS - REPLACE ALL MAIN ENTRANCES.	$75,000
PLANT BIOLOGY	0178	2018	BUILDING ENVELOPE	REPLACE ALUMINUM ENTRANCE DOORS, FRAMES AND HARDWARE (EXCLUDING DOCK ENTRY)	$61,000
PLANT BIOLOGY	0178	2018	BUILDING INTERIOR	REPLACE CEILING TILE IN BUILDING, 20,000 SQ. FT.	$199,000
PLANT BIOLOGY	0178	2020	BUILDING SYSTEMS	MOVE AND RE-PIPE HWHT BOOSTER COILS THAT ARE LOCATED IN THE HERBARIUM.	$67,000
					$2,084,000
PLANT SCIENCE GREENHOUSE-EAST	0098C	2011	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$168,000
PLANT SCIENCE GREENHOUSE-EAST	0098C	2011	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$168,000
					$336,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
PLANT SCIENCE GREENHOUSE-WEST	0093	2017	BUILDING SYSTEMS	PLANT SCIENCE GREENHOUSE-WEST- REPLACE ALL STEAM PIPING,FIN TUBE, VALVES,TRAPS AND CONDENSATE PIPING	$1,600,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR	$25,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR	$25,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR	$25,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2018	BUILDING INTERIOR	DOORS - INTERIOR - IND	$25,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - FRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2019	BUILDING ENVELOPE	WINDOWS - GRN	$52,000
PLANT SCIENCE GREENHOUSE-WEST	0093	2020	BUILDING SYSTEMS	REPLACE 160 SIDEWALL EXHAUST FANS	$612,000
					$3,040,000
POULTRY-LAB	0473B	2015	BUILDING INTERIOR	FLOORS	$21,000
					$21,000
POULTRY-SERVICE	0473A	2012	BUILDING SYSTEMS	POULTRY SERVICE BOILER 1 REPLACEMENT	$22,000
POULTRY-SERVICE	0473A	2017	BUILDING SYSTEMS	REPLACE 6 GAS-FIRED UN-VENTED HEATING UNITS.	$43,000
POULTRY-SERVICE	0473A	2017	BUILDING SYSTEMS	REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$30,000
					$95,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
PSYCHOLOGY	0027	2010	BUILDING INTERIOR	INTERIOR DOORS - REPLACE VESTIBULE DOORS, (4) ON NORTH ENTRANCE.	$21,000
PSYCHOLOGY	0027	2016	BUILDING SYSTEMS	CHILLER	$178,000
PSYCHOLOGY	0027	2018	BUILDING SYSTEMS	REPLACE DOMESTIC WATER METER AND SHUT OFF VALVES	$27,000
PSYCHOLOGY	0027	2018	BUILDING SYSTEMS	REPLACE ORIGINAL TOILETS, FLUSH VALVES, URINALS, & URINAL FLUSH VALVES	$49,000
PSYCHOLOGY	0027	2019	BUILDING SYSTEMS	PSYCHOLOGY - UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$116,000
PSYCHOLOGY	0027	2022	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$448,000
					$839,000
PUBLIC SAFETY	0087	2014	BUILDING INTERIOR	PAINT MAIN LOBBY AND HALLWAYS	$48,000
PUBLIC SAFETY	0087	2015	BUILDING ENVELOPE	EXTERIOR ENTRANCE DOORS/ FRAMES/ HARDWARE	$83,000
PUBLIC SAFETY	0087	2017	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION	$70,000
PUBLIC SAFETY	0087	2017	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #1,2,3,5	$575,000
PUBLIC SAFETY	0087	2017	BUILDING SYSTEMS	VAV SYSTEM	$265,000
					$1,041,000
PUREBRED BEEF - HAY SHED	0450E	2015	BUILDING ENVELOPE	PAINT ROOF	$45,000
					$45,000
PUREBRED BEEF - MAIN	0450A	2013	BUILDING ENVELOPE	REPLACE EXISTING VINYL SIDING WITH NEW STEEL VERTICAL BARN SIDING AND TRIM	$98,000
PUREBRED BEEF - MAIN	0450A	2014	BUILDING ENVELOPE	REPAIR CRACKED BLOCK WALLS	$50,000
PUREBRED BEEF - MAIN	0450A	2018	BUILDING SYSTEMS	REPLACE BRANCH CIRCUIT WIRING IN ALL BILDINGS, REPLACE LIGHT FIXTURES.	$150,000
					$298,000
PUREBRED BEEF-LOOSE HOUSING	0450C	2010	BUILDING ENVELOPE	RE-COAT NE ROOF	$22,000
					$22,000
RADIO FACILITY - RADIO TRANSM WKAR	0600A	2020	BUILDING ENVELOPE	ROOFS #1, 2 AND 3. REPLACEMENT.	$72,000
					$72,000
RADIOLOGY	0214	2018	BUILDING SYSTEMS	PUMPS	$243,000
RADIOLOGY	0214	2018	BUILDING SYSTEMS	VAV SYSTEM	$496,000
					$739,000
REGIONAL CHILLED WATER PLANT	0189	2014	BUILDING ENVELOPE	GENERAL MASONRY & CAULKING RESTORATION OF ENTIRE BUILDING	$157,000
REGIONAL CHILLED WATER PLANT	0189	2015	BUILDING ENVELOPE	EXTERIOR DOOR REPLACEMENT (2) ENTRY DOORS & (2) OVERHEAD DOORS	$24,000
REGIONAL CHILLED WATER PLANT	0189	2015	BUILDING SYSTEMS	LIGHTING FIXTURES	$22,000
REGIONAL CHILLED WATER PLANT	0189	2015	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #2	$98,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
REGIONAL CHILLED WATER PLANT	0189	2017	BUILDING SYSTEMS	REGIONAL CHILLED WATER PLANT - UPGRADE ALL 208 AND 480 VOLT DISTRIBUTION BREAKERS	$200,000
REGIONAL CHILLED WATER PLANT	0189	2018	BUILDING SYSTEMS	REPLACE CHILLER #10 AND COOLING TOWER	$2,123,000
REGIONAL CHILLED WATER PLANT	0189	2018	BUILDING SYSTEMS	REPLACE STEAM POWERED CONDENSATE PUMPS SERVING NORTH CHILLERS	$200,000
REGIONAL CHILLED WATER PLANT	0189	2018	BUILDING SYSTEMS	REPLACE STEAM POWERED CONDENSATE PUMPS SERVING SOUTH CHILLERS	$275,000
REGIONAL CHILLED WATER PLANT	0189	2019	BUILDING SYSTEMS	REPLACE CHILLER #9 AND COOLING TOWER	$2,098,000
REGIONAL CHILLED WATER PLANT	0189	2020	BUILDING SYSTEMS	PROVIDE CONNECTION FOR PORTABLE GENERATOR TO RUN ABSORBER AND CIRCULATING PUMPS FOR ULAR BUILDINGS.	$177,000
					$5,374,000
RIVER WATER RESEARCH	0052	2013	BUILDING ENVELOPE	DOORS - EXTERIOR	$20,000
					$20,000
RIVER WATER RESEARCH - LAB	0052A	2014	BUILDING ENVELOPE	REMOVE AND REPLACE ROOFS 1 AND 2	$68,000
					$68,000
SHAW LANE POWER PLANT	0061	2016	BUILDING ENVELOPE	ABATE AND REPLACE ROOF	$919,000
					$919,000
SHEEP BARN	0449	2017	BUILDING ENVELOPE	ROOF #1 AND 2	$80,000
					$80,000
SOIL SCIENCE - LAB	0430A	2015	BUILDING ENVELOPE	EXTERIOR DOORS - REPAIR AND PAINT	$48,000
					$48,000
SPARTAN CHILD DEVELOPMENT	0217	2017	BUILDING SYSTEMS	REPLACE HVAC SYSTEM	$3,092,000
					$3,092,000
STUDENT SERVICES	0142	2013	BUILDING INTERIOR	CORRIDOR CEILING AND LIGHTING REPLACEMENTS ON 1ST, 2ND & 3RD FLOORS	$147,000
STUDENT SERVICES	0142	2015	BUILDING SYSTEMS	REPLACE 10 OBSOLETE MOTOR STARTERS, BRANCH CIRCUIT FEEDERS.	$39,000
STUDENT SERVICES	0142	2016	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION AND EXTERIOR WATERPROOFING	$394,000
STUDENT SERVICES	0142	2017	BUILDING ENVELOPE	DOORS - EXTERIOR	$189,000
STUDENT SERVICES	0142	2017	BUILDING SYSTEMS	REPLACE 4 HOT WATER HEAT PUMPS AND VALVES	$70,000
STUDENT SERVICES	0142	2017	BUILDING SYSTEMS	REPLACE HOT WATER DOMESTIC CONVERTOR	$65,000
STUDENT SERVICES	0142	2017	BUILDING INTERIOR	REPLACE INTERIOR DOORS AND HARDWARE TO OFFICES AND CLOSETS	$612,000
STUDENT SERVICES	0142	2018	BUILDING SYSTEMS	REPLACE CHILLER 1 AND CW PUMPS	$300,000
STUDENT SERVICES	0142	2019	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMP N-3	$36,000
STUDENT SERVICES	0142	2019	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMP N-4	$36,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE ALL PUBLIC RESTROOM LAVATORY FAUCETS AND TRIM, AND TOILET FLUSH VALVES AND TOILET SEATS.	$35,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE EXISTING SHUT OFF VALVES AND WATER METER....	$29,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE SUMP PUMP 03	$21,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	REPLACE SUMP PUMP 04	$21,000
STUDENT SERVICES	0142	2020	BUILDING SYSTEMS	UPDATE FIRE SYSTEM AND ADD SMOKE DETECTORS	$538,000
STUDENT SERVICES	0142	2022	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$448,000
STUDENT SERVICES	0142	2022	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$448,000
					$3,428,000
SWINE EVALUATION CTR	0463	2017	BUILDING INTERIOR	DOORS - INTERIOR	$38,000
SWINE EVALUATION CTR	0463	2017	BUILDING SYSTEMS	PUMPS	$20,000
					$58,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2017	BUILDING ENVELOPE	REMOVE OLD ROOF SHINGLES AND REPLACE (AREAS 1,4,5) REPLACE AREA 3 WITH NEW COATING SYSTEM	$98,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2018	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES. (POLE BARN)	$32,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2019	BUILDING ENVELOPE	ROOFING - MT ROOFS #1, 2, 3, 4 AND 5	$102,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES.	$94,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES. (BARN A)	$187,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS, CONDUITS, AND RECEPTACLES. (BARN F)	$113,000
SWINE RESEARCH - BARN/ELEVATOR STGE	0440A	2020	BUILDING SYSTEMS	REPLACE LIGHT FIXTURES AND BRANCH CIRCUITS. (BARN G)	$34,000
					$660,000
SWINE RESEARCH - GARAGE	0440B	2015	BUILDING ENVELOPE	DOORS - EXTERIOR	$38,000
					$38,000
SWINE RESEARCH-AG POLLUTION CNTRL	0440F	2015	BUILDING SYSTEMS	WASTE PIPING	$46,000
SWINE RESEARCH-AG POLLUTION CNTRL	0440F	2015	BUILDING SYSTEMS	WATER PIPNG	$32,000
					$78,000
SWINE RESEARCH-HSE 1	0440L	2014	BUILDING SYSTEMS	HVAC EQUIPMENT	$28,000
					$28,000
SWINE RESEARCH-PORTER	0440J	2018	BUILDING ENVELOPE	ROOFING - MT ROOF #1	$41,000
					$41,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
TB SIMON POWER PLANT	0065	2015	BUILDING ENVELOPE	REPLACE MAIN ENTRANCE EXTERIOR DOOR AND VESTIBULE DOOR AND HARDWARE	$24,000
TB SIMON POWER PLANT	0065	2015	BUILDING ENVELOPE	REPLACE ORIGINAL HOLLOW METAL EXTERIOR DOORS AND HARDWARE	$55,000
TB SIMON POWER PLANT	0065	2015	BUILDING ENVELOPE	REPLACE ORIGINAL OVERHEAD DOORS ON BLDG EXTERIOR	$122,000
TB SIMON POWER PLANT	0065	2016	BUILDING ENVELOPE	REPLACE ROOFS 9, 12, 13, 14, 17	$137,000
TB SIMON POWER PLANT	0065	2017	BUILDING SYSTEMS	REPLACE EXISTING FIRE PUMP WITH NEW FIRE PUMP AND CONTROLLER	$120,000
TB SIMON POWER PLANT	0065	2018	BUILDING SYSTEMS	ELEVATOR - 2	$630,000
TB SIMON POWER PLANT	0065	2019	BUILDING SYSTEMS	CAMPUS STEAM TRAP REPLACEMENT PROGRAM	$544,000
TB SIMON POWER PLANT	0065	2019	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #17,16	$69,000
TB SIMON POWER PLANT	0065	2019	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT ROOF #2	$71,000
					$1,772,000
THAYER HOUSE	0445A	2017	BUILDING SYSTEMS	REPLACE BOILER PAST LIFE EXPECTANCY WITH ENERGY EFFICIENT OPERATION UNIT	$30,000
THAYER HOUSE	0445A	2018	BUILDING ENVELOPE	DOORS - EXTERIOR	$29,000
					$59,000
TREE RESEARCH-HEADHOUSE	0472D	2014	BUILDING ENVELOPE	ROOF REPAIR/REPLACEMENT - GREENHOUSE (NORTH) ROOF #1, GREENHOUSE (SOUTH)	$191,000
					$191,000
TREE RESEARCH-RESIDENCE	0472H	2016	BUILDING SYSTEMS	HVAC EQUIPMENT	$39,000
					$39,000
TREE RESEARCH-SHOP/OFFICE	0472A	2017	BUILDING SYSTEMS	REPLACE HOT WATER HEATING BOILER AND PERIPHERAL EQUIPMENT IN SHOP	$30,000
					$30,000
UFSC - COMMUNITY STORAGE	0453D	2015	BUILDING ENVELOPE	ROOF #1	$101,000
					$101,000
UFSC - MATERIALS & PESITCIDE STRG	0453J	2015	BUILDING ENVELOPE	ROOF #1	$60,000
					$60,000
UFSC - NORTH MORTON	0453I	2015	BUILDING ENVELOPE	ROOF #1	$80,000
					$80,000
UFSC-4-H	0453G	2016	BUILDING ENVELOPE	ROOF #1	$147,000
					$147,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
UFSC-MAINTENANCE	0453H	2014	BUILDING ENVELOPE	ROOF #1	$80,000
UFSC-MAINTENANCE	0453H	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$79,000
					$159,000
UNIV RESEARCH CONTAINMENT	0211	2010	BUILDING INTERIOR	PAINT INTERIOR WALLS, DOORS AND FRAMES, AND RECOAT FLOORS IN ULAR AREA	$24,000
UNIV RESEARCH CONTAINMENT	0211	2017	BUILDING SYSTEMS	REPLACE SHEET METAL PANS IN HVAC 3 AND HVAC 5	$40,000
UNIV RESEARCH CONTAINMENT	0211	2017	BUILDING SYSTEMS	UPGRADE DDC ROOM LEVEL CONTROLLERS SERVING ULAR AREA	$200,000
UNIV RESEARCH CONTAINMENT	0211	2018	BUILDING SYSTEMS	REPLACE AHU 1, 2, 3, 4, 5, 6, EXHAUST FANS 1, 2, 7, AND 8.	$1,346,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE ENERGY RECLAIM PUMPS (2)	$92,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE HEAT EXCHANGERS	$31,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE HOT WATER HEATING PUMPS	$73,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	REPLACE SUMP PUMPS	$54,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING ENVELOPE	ROOFING - FM ROOFS #1, 2, 3, AND 4	$266,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	VAV SYSTEM	$770,000
UNIV RESEARCH CONTAINMENT	0211	2020	BUILDING SYSTEMS	VAV SYSTEM	$443,000
UNIV RESEARCH CONTAINMENT	0211	2021	BUILDING SYSTEMS	REPLACE CHILLED WATER PUMPS	$325,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	REPLACE EAST LOW PRESSURE BOILER	$306,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	REPLACE HIGH PRESSURE BOILER	$245,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	REPLACE WEST LOW PRESSURE BOILER	$306,000
UNIV RESEARCH CONTAINMENT	0211	2022	BUILDING SYSTEMS	UPGRADE 5 DDC PANELS SERVING ULAR AREA/ ENTIRE FACILITY	$159,000
					$4,680,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2017	BUILDING SYSTEMS	URBAN PLANNING LANDSCAPE - REPLACE FIRE ALARM SYSTEM	$234,000
					$234,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2018	BUILDING SYSTEMS	REPLACE HOT WATER HEAT PUMPS 1 AND 2, INCLUDING CHECK, BALANCING AND ISOLATION VALVES	$37,000
URBAN PLANNING LANDSCAPE ARCH-IMC	0082	2019	BUILDING SYSTEMS	VAV SYSTEM	$44,000
					$81,000
VET RESEARCH-GERM FREE BARN	0446F	2015	BUILDING ENVELOPE	REPLACE ROOF #1	$130,000
VET RESEARCH-GERM FREE BARN	0446F	2020	BUILDING ENVELOPE	DOORS - EXTERIOR - ED	$66,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
VET RESEARCH-GERM FREE BARN	0446F	2020	BUILDING INTERIOR	DOORS - INTERIOR - IND	$25,000
					$221,000
VET RESEARCH-LARGE ANIMAL	0446A	2018	BUILDING ENVELOPE	DOORS - EXTERIOR - ED	$38,000
VET RESEARCH-LARGE ANIMAL	0446A	2018	BUILDING INTERIOR	DOORS - INTERIOR - IND	$22,000
VET RESEARCH-LARGE ANIMAL	0446A	2020	BUILDING SYSTEMS	BARN "A" - REWIRE BUILDING	$29,000
VET RESEARCH-LARGE ANIMAL	0446A	2020	BUILDING SYSTEMS	BARN "B" - REWIRE	$39,000
					$128,000
VET RESEARCH-MANAGER'S HOUSE	0446C	2011	BUILDING ENVELOPE	COMPLETE EXTERIOR RENOVATION INCLUDING WINDOWS, DOORS, SIDING, AND ROOFING.	$41,000
VET RESEARCH-MANAGER'S HOUSE	0446C	2013	BUILDING ENVELOPE	REPLACE ALL WINDOWS AND MAIN ENTRY DOORS	$21,000
					$62,000
VET RESEARCH-OFFICE	0446E	2015	BUILDING SYSTEMS	REPLACE OVERHEAD HIGH VOLTAGE LINE WITH UNDERGROUND	$199,000
					$199,000
VET RESEARCH-ROUND ROOF	0446B	2018	BUILDING ENVELOPE	RECOAT ROUND ROOF BARN 446B.	$45,000
VET RESEARCH-ROUND ROOF	0446B	2019	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS	$25,000
					$70,000
VET RESEARCH-SMALL ANIMAL	0446J	2015	BUILDING SYSTEMS	PROVIDE CONNECTION POINT FOR PORTABLE GENERATOR TO POWER ULAR AREAS.	$31,000
VET RESEARCH-SMALL ANIMAL	0446J	2020	BUILDING SYSTEMS	REPLACE GAS FIRE DOMESTIC WATER HEATER	$31,000
VET RESEARCH-SMALL ANIMAL	0446J	2020	BUILDING SYSTEMS	REPLACE LOW PRESSURE STEAM BOILER AND BOILER FEED SYSTEM	$245,000
					$307,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2020	BUILDING SYSTEMS	REPLACE STEAM DOMESTIC WATER HEATER LOCATED IN PENTHOUSE	$58,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2020	BUILDING SYSTEMS	REPLACE WATER SOFTENER MINERAL IN 2 DOMESTIC WATER SOFTENER TANKS IN MR-032	$41,000
VETERINARY DIAGNOSTIC LABORATORY	0215	2022	BUILDING SYSTEMS	REPLACE FILTER MEDIA IN THE IRON FILTER TANKS FOR DOMESTIC COLD WATER IN MR-032	$41,000
					$140,000
VETERINARY MEDICAL CENTER	0170	2010	BUILDING INTERIOR	CEILINGS - REPLACE ALL CEILINGS IN BASEMENT A WING.	$138,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
VETERINARY MEDICAL CENTER	0170	2014	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION AND EXTERIOR WATERPROOFING	$407,000
VETERINARY MEDICAL CENTER	0170	2016	BUILDING SYSTEMS	COMPLETE ELEVATOR REPLACEMENT	$255,000
VETERINARY MEDICAL CENTER	0170	2017	BUILDING ENVELOPE	FUND STUDY OF EXTERIOR MASONRY AND CAULKING FOR RESTORATION	$51,000
VETERINARY MEDICAL CENTER	0170	2018	BUILDING SYSTEMS	REPLACE STEAM PRV STATION, RECONFIGURE PIPING MR-A50	$49,000
VETERINARY MEDICAL CENTER	0170	2019	BUILDING SYSTEMS	REPLACE CONTROL AIR COMPRESSORS (3 SETS)	$87,000
VETERINARY MEDICAL CENTER	0170	2020	BUILDING SYSTEMS	REPLACE ELEVATOR D2	$311,000
VETERINARY MEDICAL CENTER	0170	2020	BUILDING SYSTEMS	REPLACE ELEVATOR G3	$311,000
VETERINARY MEDICAL CENTER	0170	2020	BUILDING SYSTEMS	REPLACE ELEVATOR G4	$311,000
VETERINARY MEDICAL CENTER	0170	2021	BUILDING SYSTEMS	VAV SYSTEM	$789,000
					$2,709,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2018	BUILDING SYSTEMS	2 TRANE UNITS - 20/30 TONS - DX ON WEST END	$160,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2019	BUILDING SYSTEMS	HVAC EQUIPMENT - AHU	$607,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2019	BUILDING SYSTEMS	LIGHTING FIXTURES	$63,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2019	BUILDING SYSTEMS	REPLACE GROUND MOUNTED AIR COOLED DX CHILLER	$153,000
VETERINARY MEDICAL CENTER-EQUINE	0170A	2020	BUILDING SYSTEMS	PUMPS	$129,000
					$1,112,000
WELLS HALL	0078	2014	BUILDING ENVELOPE	REPLACE 6 EXTERIOR DOORS AND HARDWARE AT A & D WINGS	$37,000
WELLS HALL	0078	2015	BUILDING SYSTEMS	REMOVE ALL ASBESTOS	$1,493,000
WELLS HALL	0078	2017	BUILDING SYSTEMS	WELLS HALL - COOLING TOWERS - CT1	$100,000
WELLS HALL	0078	2017	BUILDING SYSTEMS	WELLS HALL - COOLING TOWERS - CT2	$100,000
WELLS HALL	0078	2020	BUILDING SYSTEMS	PLUMBING FIXTURES	$98,000
					$1,828,000
WHARTON	0085	2010	BUILDING INTERIOR	FLOOR COVERING - REPLACE CARPET IN HIGH TRAFFIC AREAS.	$161,000
WHARTON	0085	2010	BUILDING INTERIOR	INTERIOR DOORS - REPLACE LEVER HANDLE HARDWARE, (CONSTANT REPAIR PROBLEM).	$77,000
WHARTON	0085	2012	BUILDING INTERIOR	REPLACE CEILING TILE IN OFFICES, PUBLIC AREAS, BATHS AND HALLWAYS, AS NECESSARY.	$128,000
WHARTON	0085	2012	BUILDING SYSTEMS	REPLACE ELEVATOR 1	$280,000
WHARTON	0085	2012	BUILDING SYSTEMS	REPLACE ELEVATOR 2	$280,000
WHARTON	0085	2012	BUILDING SYSTEMS	REPLACE ELEVATOR 3	$403,000
WHARTON	0085	2014	BUILDING INTERIOR	INTERIOR PAINTING - THROUGHOUT THE ENTIRE BUILDING.	$168,000

Building Name	Bldg	Work Plan Year-Proposed	Type	Description (Title)	Estimated Cost (2018 dollars)
WHARTON	0085	2017	BUILDING ENVELOPE	EXTERIOR MASONRY RESTORATION AND EXTERIOR WATERPROOFING	$189,000
WHARTON	0085	2017	BUILDING ENVELOPE	REPLACE EXTERIOR DOORS, FRAMES, HARDWARE (DOOR ID #988)	$116,000
WHARTON	0085	2017	BUILDING SYSTEMS	UPDATE TO DIGITAL TRIP UNITS	$190,000
WHARTON	0085	2020	BUILDING SYSTEMS	REPLACE 3 DISTRIBUTION PANELS	$115,000
WHARTON	0085	2020	BUILDING SYSTEMS	REPLACE FUSIBLE SWITCH TO BREAKERS OR NEW SWITCHES	$75,000
WHARTON	0085	2020	BUILDING SYSTEMS	REPLACE URINAL FLUSH VALVES, TOILET FLUSH VALVES AND TOILET SEATS	$29,000
					$2,211,000
WILLS HOUSE	0008	2013	BUILDING INTERIOR	INTERIORS RENOVATIONS AND UPGRADES STAIRS, DOORS,TRIM, FLOORING, PATCH AND PAINT	$110,000
WILLS HOUSE	0008	2013	BUILDING ENVELOPE	REPLACE (3) ENTRANCES, DOORS, FRAMES, AND HARDWARE	$24,000
WILLS HOUSE	0008	2014	BUILDING ENVELOPE	REPLACE ALL WINDOWS AND EXTERIOR DOORS	$381,000
WILLS HOUSE	0008	2016	BUILDING ENVELOPE	EXTERIOR MASONRY AND CAULKING RESTORATION	$26,000
WILLS HOUSE	0008	2017	BUILDING SYSTEMS	LIGHTING FIXTURES	$47,000
WILLS HOUSE	0008	2019	BUILDING ENVELOPE	ROOFING - FC 1 AND 2	$41,000
WILLS HOUSE	0008	2020	BUILDING SYSTEMS	REPLACE CAST IRON RADIATORS WITH CONVECTORS AND SELF CONTAINED VALVES.	$39,000
					$668,000
				All Buildings Total	$254,904,000

Fall 2017

Appendix F: Utilities

Fiscal Year 2019 Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

2018 - 2022 Utility Distribution Maintenance

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Estimated Cost (2018 dollars)
SEWER DISTRIBUTION	9572	2017	UTILITIES	STORM WATER DISTRIBUTION - SEWER SEPARATION FOR LOT 87	$419,000
SEWER DISTRIBUTION	9572	2017	UTILITIES	SEWER DIST SYSTEM - STORM/SANITARY CROSS CONNECTION STUDY	$157,000
COMMUNICATION DISTRIBUTION	9576	2017	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE - HOLMES AND AKERS HALL AREA	$1,210,000
COMMUNICATION DISTRIBUTION	9576	2017	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE FROM SHAW LANE TO MCDONEL HALL	$294,000
STEAM DISTRIBUTION	9570	2017	UTILITIES	STEAM DISTRIBUTION - MISC MAJOR REPAIRS	$1,092,000
WATER DISTRIBUTION	9571	2017	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATED CAST IRON DISTRIBUTION MAINS	$1,792,000
STREET LIGHT DISTRIBUTION	9574	2017	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE - PHASE 5 OF 12 PHASES	$193,000
					2017: $3,077,000
REGIONAL CHILLED WATER PLANT	0189	2018	UTILITIES	RCWP STEAM METERING	$200,000
STEAM DISTRIBUTION	9570	2018	UTILITIES	REMOTE MONITORING SYSTEM - HIGH PRESSURE STEAM TRAPS	$200,000
STEAM DISTRIBUTION	9570	2018	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$1,571,000
WATER DISTRIBUTION	9571	2018	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON WATER MAINS	$1,792,000
ELECTRICAL DISTRIBUTION	9573	2018	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$2,389,000
					2018: $6,152,000
HANNAH ADMINISTRATION	0067	2019	UTILITIES	ADMINISTRATION-UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$224,000
OYER SPEECH AND HEARING	0089	2019	UTILITIES	OYER- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$350,000
VETERINARY MEDICAL CENTER	0170	2019	UTILITIES	VETERINARY MEDICAL CENTER- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$224,000
PACKAGING	0177	2019	UTILITIES	PACKAGING- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$112,000
PLANT BIOLOGY	0178	2019	UTILITIES	PLANT BIOLOGY- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
FOOD SCIENCE	0179	2019	UTILITIES	FOOD SCIENCE- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$224,000
CENTER INTEGRATIVE PLANT SYS-LAB	0181A	2019	UTILITIES	CIPS- UPGRADE PCB TRANSFORMERS AND ELECTRICAL SYSTEMS	$242,000
LIFE SCIENCE	0183	2019	UTILITIES	LIFE SCIENCE- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
CLINICAL CENTER-CLINIC	0200	2019	UTILITIES	CLINICAL CENTER- UPGRADE TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
AKERS HALL	0326	2019	UTILITIES	AKERS- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
FEE HALL	0327	2019	UTILITIES	FEE HALL- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
CONRAD HALL	0328	2019	UTILITIES	CONRAD HALL- UPRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$108,000

2018 - 2022 Utility Distribution Maintenance

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Estimated Cost (2018 dollars)
HOLMES HALL	0330	2019	UTILITIES	HOLMES HALL- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
HUBBARD HALL	0331	2019	UTILITIES	HUBBARD HALL- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$231,000
HOLDEN HALL	0332	2019	UTILITIES	HOLDEN HALL- UPGRADE PCB TRANSFORMERS AND ELECTRICAL EQUIPMENT	$116,000
STEAM DISTRIBUTION	9570	2019	UTILITIES	STEAM DISTRIBUTION - MISC. MAJOR REPAIRS	$838,000
STEAM DISTRIBUTION	9570	2019	UTILITIES	STEAM DISTRIBUTION INSTALL SECOND 18" CR LINE FROM PWR PLT TO VLT 206	$2,053,000
WATER DISTRIBUTION	9571	2019	UTILITIES	LEADED HYDRANT REPLACEMENT PHASE 1 OF 3	$100,000
WATER DISTRIBUTION	9571	2019	UTILITIES	LEADED HYDRANT REPLACEMENT PHASE 2 OF 3	$100,000
WATER DISTRIBUTION	9571	2019	UTILITIES	LEADED HYDRANT REPLACEMENT PHASE 3 OF 3	$100,000
WATER DISTRIBUTION	9571	2019	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAIN	$597,000
WATER DISTRIBUTION	9571	2019	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$1,792,000
SEWER DISTRIBUTION	9572	2019	UTILITIES	SAW GRANT MATCH YEAR 3 OF 3	$200,000
SEWER DISTRIBUTION	9572	2019	UTILITIES	SAW GRANT REPAIR ALLOWANCE YEAR 3 OF 3	$200,000
ELECTRICAL DISTRIBUTION	9573	2019	UTILITIES	ELECTRICAL DISTRIBUTION - INSTALL ELE DUCTBANK FROM FARM LANE TO INTERDISPL BLDG ALONG SERVICE RD	$2,000,000
ELECTRICAL DISTRIBUTION	9573	2019	UTILITIES	REPLACE CONTACTORS, CONTROL SYSTEMS, WIRE AND LIGHT FIXTURES IN STEAM TUNNELS AND VAULTS	$155,000
ELECTRICAL DISTRIBUTION	9573	2019	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE - PHASE 7 OF 12 PHASES	$233,000
STREET LIGHT DISTRIBUTION	9574	2019	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 3 OF 10	$350,000
					2019: $11,935,000
STEAM DISTRIBUTION	9570	2020	UTILITIES	STEAM DISTRIBUTION - MISC MAJOR REPAIRS	$1,571,000
WATER DISTRIBUTION	9571	2020	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$2,389,000
SEWER DISTRIBUTION	9572	2020	UTILITIES	CLEAN AND VIDEO TAPE CAMPUS SANITARY AND STORM SEWERS	$233,000
ELECTRICAL DISTRIBUTION	9573	2020	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$2,389,000
STREET LIGHT DISTRIBUTION	9574	2020	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE	$233,000
STREET LIGHT DISTRIBUTION	9574	2020	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 4 OF 10	$350,000
COMMUNICATION DISTRIBUTION	9576	2020	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE ALONG WB SHAW LANE FROM FARM LANE TO RED CEDAR	$617,000
					2020: $7,782,000
STEAM DISTRIBUTION	9570	2021	UTILITIES	STEAM DISTRIBUTION - MISC MAJOR REPAIRS	$2,389,000
WATER DISTRIBUTION	9571	2021	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAIN AND UPSIZE FOR FLOW CAPACITY	$806,000
WATER DISTRIBUTION	9571	2021	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$2,987,000

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Estimated Cost (2018 dollars)
SEWER DISTRIBUTION	9572	2021	UTILITIES	CLEAN AND VIDEO TAPE CAMPUS SANITARY AND STORM SEWERS	$157,000
ELECTRICAL DISTRIBUTION	9573	2021	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$2,389,000
STREET LIGHT DISTRIBUTION	9574	2021	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE - PHASE 9 OF 12 PHASES	$233,000
STREET LIGHT DISTRIBUTION	9574	2021	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 5 OF 10	$350,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE ALONG BOGUE (SOUTH OF SERVICE RD) TO LIFE SCI	$748,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE FROM LIFE SCI AND CLINICAL CENTER	$791,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE FROM UNION TO HUMAN ECOLOGY	$124,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO FOOD STORES	$124,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO OWEN HALL	$221,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO PACKAGING BUILDING	$59,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO UNIVERSITY SERVICES	$235,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE INTO WELLS HALL	$50,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE TO HUBBARD, FEE AND CONRAD HALL AREA	$1,765,000
COMMUNICATION DISTRIBUTION	9576	2021	UTILITIES	COMMUNICATION DUCTLINE - NEW DUCTLINE TO RAMP NO. 2 AND BESSEY HALL (COORDINATE WITH PARKING RAMP NO	$220,000
					2021: $13,648,000

OLIN HEALTH CENTER	0003	2022	UTILITIES	REPLACE ALL PLUMBING PIPING IN BUILDING	$2,722,000
COMPUTER CENTER	0035	2022	UTILITIES	COMPUTER CENTER - STUDY - ADD PERM. DATA CENTER GENERATOR	$25,000
COMPUTER CENTER	0035	2022	UTILITIES	COMPUTER CENTER - UPGRADE EXISTING ELECTRIC SUBSTATION TO 1.0 TO 1.5 MW	$950,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	ADDITIONAL STEAM MAIN AND UPGRADE TO EXISTING MAINS AT RIVER CROSSING PEDESTRIAN BRIDGE-WELLS HALL	$1,886,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	INCREASE STEAM LINE SIZE FROM A 12" TO A 20" ALONG BOGUE ST. FROM WILSON RD. TO RED CEDAR RIVER BRID	$3,921,000

2018 - 2022 Utility Distribution Maintenance

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Estimated Cost (2018 dollars)
STEAM DISTRIBUTION	9570	2022	UTILITIES	INSTALL A SECOND 24" STEAM AND 12" CR ALONG SERVICE ROAD FROM STM0206 (PWR PLNT) TO BOGUE AND SERVIC	$10,479,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	INSTALL SECOND 20" STEAM AND 10" CR LINE FROM WELLS HALL BRIDGE TO NCS	$4,085,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM - REPLACE STEAM AND CONDENSATE RETURN FROM VAULT 1 TO VAULT 4, INCREASE CAPACITY	$2,566,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM DISTRIBUTION - INSTALL SECOND 20" HPSTM / 10"PCR FROM V267 TO V193	$6,914,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM DISTRIBUTION - INSTALL SECONDARY STEAM SERVICE TO NORTH CAMPUS, BOGUE STREET RIVER CROSSING.	$8,795,000
STEAM DISTRIBUTION	9570	2022	UTILITIES	STEAM DISTRIBUTION - MISC MAJOR REPAIRS AND RESTORATION	$2,389,000
WATER DISTRIBUTION	9571	2022	UTILITIES	WATER DISTRIBUTION - REPLACE DETERIORATING CAST IRON DISTRIBUTION MAINS	$2,987,000
ELECTRICAL DISTRIBUTION	9573	2022	UTILITIES	ELECTRICAL DISTRIBUTION - CABLE/MISC REPLACEMENT AND REPAIRS	$2,389,000
STREET LIGHT DISTRIBUTION	9574	2022	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE	$157,000
STREET LIGHT DISTRIBUTION	9574	2022	UTILITIES	REPLACE UNDERGROUND STREET LIGHT CABLE - PHASE 12 OF 12 PHASES	$233,000
STREET LIGHT DISTRIBUTION	9574	2022	UTILITIES	STREET LIGHT DISTRIBUTION - CABLE REPLACEMENT - PHASE 6 OF 10	$350,000

2022: $50,848,000

2018 - 2022 Power Plant Modernization

Building Name	Bldg	Work Plan Year	Type	Description (Title)	Estimated Cost (2018 dollars)
RICE PLANT		2018	UTILITIES	BUILD 37.5MW RICE PLANT	40,000,000
MEDIUM PRESSURE STEAM BOILER		2018	UTILITIES	UPGRADE 200,000LB MEDIUM PRESSURE STEAM BOILER	4,000,000
RO-WATER TREATMENT SYSTEM		2018	UTILITIES	UPGRADE RO-WATER TREATMENT SYSTEM FOR MEDIUM PRESSURE STEAM BOILER	1,000,000
ELECTRICAL CENTRIFUGAL CHILLER		2018-2022	UTILITIES	INSTALL 8,400 TON ELECTRICAL CENTRIFUGAL CHILLER	14,500,000
ENERGY STORAGE SYSTEM		2018-2022	UTILITIES	UPGRADE BATTERY ENERGY STOARE SYSTEM	3,500,000
NATURAL GAS PIPELINE		2018-2022	UTILITIES	UPGRADE SHARED NATURAL GAS PIPELINE	25,000,000

Estimated Cost (2018 dollars): $88M

All Values: $183,522,000*

* Includes ~$95M in Utility Maintenance as noted in State Instructions

Fall 2017

Appendix G: SFY2019 Capital Outlay Request

Fiscal Year 2019
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

STATE FISCAL YEAR 2019
CAPITAL OUTLAY PROJECT REQUEST

Institution Name:	Michigan State University		
Project Title:	STEM Teaching and Learning Facility		
Project Focus:	☒ Academic	☐ Research	☐ Administrative/Support
Type of Project:	☐ Renovation	☐ Addition	☒ New Construction

Program Focus of Occupants:	Undergraduate student teaching and learning focused on science, technology, engineering and mathematics
Approximate Square Footage:	Approximately 120,000 gross square feet
Total Estimated Cost:	$72.5 million
Estimated Start/Completion Dates:	Start: Fall 2018 (upon authorization) Completion: Summer 2020 (Fall Semester 2020 occupancy)

Is the Five-Year Plan posted on the institution's public internet site?	☒ Yes ☐ No
Is the requested project the top priority in the Five-Year Capital Outlay Plan?	☒ Yes ☐ No
Is the requested project focused on a single, stand-a/one facility?	☒ Yes ☐ No

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Project Purpose

As reported in the prior year, over the past ten years Michigan State University has experienced an increase in Science, Technology, Engineering and Mathematics (STEM) course activities that include a more than 40 percent increase in overall credit hours, a 28 percent increase in lab course enrollments, a 22 percent increase in the number of courses, and a 20 percent increase in the number of sections. The STEM Teaching and Learning Facility will support the increased demand for STEM education and bring together currently dispersed and outdated teaching laboratories and related instructional and support spaces. The bringing together of dispersed STEM teaching spaces will create a hub for STEM education. The new facility will support the changing curriculums and teaching methods associated with STEM. It will leverage interdisciplinary teaching and learning with goals to improve recruitment, retention and student success. Further, we are intent on graduating individuals that leave Michigan State University prepared to contribute to society in focused and broad ways, with the skills and experiences that support life-long learning and contributions, including economic development in the state and beyond.

While the university has continued to invest in upgrades to instructional space within existing facilities, it has become increasingly difficult to support enrollment growth in STEM disciplines and maintain a quality learning experience for the student. Instructional pedagogy has changed from one that was largely instructor-focused to one that is student-centered. Current instructional laboratory configurations and infrastructure make it challenging for instructors and students alike to be collaborative, innovative, and successful in the classroom. The current disbursement of STEM related instructional laboratories makes it difficult to increase productivity of the space and the essential need for more cross-disciplinary teaching and learning.

As we look forward, instructional models have evolved with emphasis on bringing the traditional lecture and lab together to improve student learning, as well as incorporation of self-guided learning opportunities. Construction of a new instructional facility focused on supporting teaching and learning in STEM disciplines is necessary to continue this programmatic direction. This facility would

address the continued national and State of Michigan priority to educate increasing numbers of students in STEM disciplines. The STEM Teaching and Learning facility would include modern wet bench teaching laboratories that incorporate active learning principles, foster cross-disciplinary teaching and learning, and support developing and evolving changes in curriculum and its delivery. This facility will give students a more grounded realistic experience in the STEM disciplines by allowing instructors to further develop pedagogies that will better prepare students for the professional workplace, as well as to develop critical thinking and problem solving skills. This facility would also create opportunities to address the emerging pedagogies that involve project based laboratories using laboratory experiments running multiple days or even an entire semester long. It also creates opportunities for instructors from different disciplines to work collaboratively to explore/create new methodologies to teach STEM courses. The overarching purpose and goal of the facility is to improve and enhance the undergraduate learning experience, support experiential teaching and learning, attract and retain more students in STEM disciplines, and better prepare those students for professional careers in fields of science, health and engineering. In addition, the facility will create opportunities for increased utilization, operational efficiencies, and consolidation of instructional support services. Space that would be vacated by bringing the currently dispersed and obsolete teaching laboratories together, will be re-purposed and renovated to address primarily research laboratory needs of the campus.

Scope of the Project

This new facility will support primarily laboratory based instruction associated with courses in science, technology, engineering and mathematics. Preliminary planning anticipates construction of an approximate 120,000 gross square foot facility that would house undergraduate teaching laboratories for biological related sciences, chemistry, physics, and engineering disciplines in a central campus location. The teaching laboratories would emphasize active-learning design concepts, and provide a range of sizes to best accommodate freshman-level and upperclassmen courses. The teaching laboratories would be modular and flexible in design, incorporate and leverage the use of modern building systems and technology, and allow academic programs to respond to changing and evolving instructional models, including student research, self-guided learning, and capacity for tech immersion. In addition to modern teaching laboratories, the facility is envisioned to also include computer labs, informal study areas, break-out spaces, and associated support spaces. The project is formally in planning with the state authorization to plan per Public Act 107 of 2017.

Please provide detailed, yet appropriately concise responses to the following questions that will enhance our understanding of the requested project:

1. **How does the project support Michigan's talent enhancement, job creation and economic growth Initiatives on a local, regional and/or statewide basis?**

   This project aligns with state and national priorities to increase the number and diversity of STEM and STEM-related graduates. Michigan State University provides educational opportunity to over 50,000 students and has positioned itself to provide the state with the type of graduates' employers demand and who drive economic growth in the 21st century. In fact, over the last ten years STEM based student credit hours at MSU have increased by approximately 40 percent. Currently, over 17,000 students at MSU are enrolled in a STEM degree-granting program.

   While enrollments have increased, it is vitally important to educate and graduate even more students in STEM and STEM-related disciplines, and to provide the type of curriculum and applied knowledge that successfully transfers to the student's chosen career. The state

projects that by 2020, approximately 1 in 5 new job opportunities in the state requiring post-high school education will be in STEM related disciplines. Further, students graduating in the STEM disciplines generally command a higher salary. In 2013, the average wage among all occupations in Michigan was $21.40 per hour, compared to $34.40 per hour for STEM occupations. (Source: DTMB, Bureau of Labor Market Information and Strategic Initiatives, A Look at Science, Technology, Engineering, and Math (STEM) Talent in Michigan, March 2015)

Michigan State University is a national leader for improving science and math education. Its faculty are involved in funded research to improve science and math education. These funded grants contribute to our intellectual capacity, and spur further grant activities, increasing our research expenditures and productivity. They create opportunities for student engagement and success at both the undergraduate and graduate level, and provide economic development by bringing research dollars to the state and local economy. These research projects also inform and advance the methods and approaches for educating students in STEM. Examples of these funded research projects include $5.0 million from the Herbert H. and Grace A. Dow Foundation for STEM Success, designed to help students who didn't receive the pre-college math and science training they needed to pursue degrees and, ultimately, careers in science- related fields; $1.5M from the Howard Hughes Medical Institute to expand efforts for students in science to learn effectively and graduate successfully, especially those who belong to groups underrepresented in science; and part of a national effort to improve science and math education as one of eight sites across the country selected by the Association of American Universities to host a project designed to improve science and math education.

During the planning, design and construction process it is estimated that the project will employ approximately 400 people in jobs ranging from architects and engineers, to skilled trades and laborers for a collective period of approximately 36 months. This does not include the purchase of equipment, materials, and supplies, or the people employed in these businesses that support the construction of a building.

Overall, investment in this project will enhance economic growth regionally and state-wide in a number of ways. It will allow the University to continue to attract and retain talented students and faculty; prepare students for careers in fields of science, technology, engineering, and mathematics; create an environment that encourages innovation and entrepreneurship and would also attract/increase federal and corporate research dollars. Long-range economic impact will be realized by producing more highly-trained, sought after graduates for professional careers in science, health, and engineering fields throughout the State of Michigan.

2. How does the project enhance the core academic and/or research mission of the institution?

The teaching and learning of MSU's over 50,000 students, including approximately 17,000 STEM-related undergraduate students, is core to our mission. Over 80 percent of MSU's instructional facilities are at least 40 years old, and of these approximately 70 percent of the STEM-related teaching laboratories are in facilities that are over 40 years old. Further, MSU has not constructed a facility focused on teaching and learning in over 45 years. With the national and state agenda focused on an increase in STEM education, coupled with an aging infrastructure, dispersed facilities, and the increase in STEM course enrollments at MSU, it is a top university priority to create new STEM instructional space.

Michigan State University is one of eight universities participating in the Association of American Universities' Undergraduate STEM Education Initiative. The initiative is aimed at improving the quality of undergraduate teaching and learning in STEM fields, encouraging faculty members to use student-centered, active learning pedagogy in their classes. MSU is at the forefront of

changing the traditional model of STEM teaching and learning to one that involves three dimensional learning, providing students with opportunities to develop models, construct explanations, and engage in arguments using evidence. This transformational model of teaching and learning requires that courses, and the instructional facilities that support them, be more student-centered, interactive, and technologically robust.

The university recently established CREATE for STEM Institute, a joint endeavor of the College of Natural Science and the College of Education, in coordination with the Office of the Provost. The institute's mission is to improve teaching and learning in the STEM disciplines for students from grades K-16 through research and development efforts. In addition, the National Science Foundation recently awarded a $3.6 million grant to a team of MSU researchers and colleagues in Finland to develop and test innovative project-based science units in physics and chemistry classes designed to increase student engagement and encourage underrepresented groups of students to continue learning science.

A modern STEM Teaching and Learning Facility will not only leverage the research being conducted at MSU on STEM teaching and learning, but will facilitate scientific interactions at the undergraduate student level and improve the University's ability to successfully compete for and retain talented students in STEM disciplines. There is untapped training potential that can be developed with the establishment of a facility that places instructors together based on the ability to create and investigate emerging pedagogies. These new pedagogies will help to ensure student success and better prepare students for graduation and professional careers in the fields of scientific discovery, health and engineering.

3. Is the requested project focused on a single, stand-alone facility? If no, please explain.

Yes, the requested project is focused on a single 120,000 gross square feet facility to create a centralized hub for STEM instruction.

4. How does the project support investment in or adaptive re-purposing of existing facilities and infrastructure?

In addition to greatly improving STEM teaching and learning, relocating several dispersed STEM-related teaching labs to a modern centralized facility creates the opportunity for MSU to re-purpose a significant amount of outdated teaching labs for research. This re-purposed space will help offset the pressure to construct new research labs in order to meet the universities growing research needs. The majority of the planned release space is anticipated to be within some of our most research intensive buildings including Biomedical and Physical Sciences, Chemistry, Biochemistry, Engineering, Giltner Hall, and Natural Science Buildings. While this project is not requesting support to re-purpose these spaces, MSU remains committed to the re-investment in our existing infrastructure and to the renovation of these spaces in support of our growing research and hiring of new faculty, and that supports the states future economic goals, in particular in science, technology, engineering and mathematics.

The new facility, to the extent possible, will utilize existing utility infrastructure resources already in place on central campus. This includes campus steam distribution, chilled water, water and sewer, and power and data.

5. Does the project address or mitigate any current health/safety deficiencies relative to existing facilities? If yes, please explain

The majority of instructional laboratory functions that will be placed in the new facility are currently located in buildings that are over 40 years old, including Chemistry, North Kedzie Hall,

Natural Science, and Giltner Hall. While there have been renovations to these rooms over time, they come with inherent infrastructure commensurate with the age of the buildings. The new construction will address obsolescence of infrastructure and room configurations that do not support active and interdisciplinary learning. Renovation of the vacated spaces as a subsequent set of projects would bring the spaces into compliance with current codes.

6. How does the institution measure utilization of its existing facilities, and how does it compare relative to established benchmarks for education facilities? How does the project help to improve the utilization of existing space and infrastructure, or conversely how does current utilization support the need for additional space and infrastructure?

For instructional space, centrally scheduled classrooms and classlabs, the University tracks and measures utilization of both day-time use and distribution, as well as enrollment and seat usage. The overall utilization rate for centrally scheduled space ranks comparably with our peer institutions of the Big 10. For fall semester 2016, utilization of these instructional spaces by scheduled instructional periods ranges as high as 88.5 percent of the available hours, and averages 62 percent across all rooms for centrally scheduled classrooms. The seat utilization ranges as high as 71 percent of the available capacity and averages 62 percent across all rooms. One-time events, such as help sessions, department and student organization meetings, on average increases utilization by 18 percent, for an average overall utilization of 80 percent.

Departmentally scheduled class laboratory spaces that are scheduled regularly for courses averages 33 percent across all rooms and disciplines, and ranges as high as 44 percent of the available hours. This utilization does not include prep or clean-up time, open lab time for tutoring, or student research use. The seat utilization ranges as high as 75 percent of the available capacity and averages 38 percent across all rooms and disciplines. The level of utilization is indicative of the highly specialized nature of these room types. However, when focusing on classlabs in Chemistry and Biological Sciences, two components of the STEM Teaching and Learning Facility, the utilization increases to a range of 60 – 80 percent. This rate reflects the growth in STEM credit hours and also includes the prep and clean-up time, and open lab time for tutoring and student research use.

For research laboratories and academic office space the University employs a university-wide process that includes space metrics for quantitatively measuring productivity and utilization. Over the last eight years, the productivity and utilization of research labs has improved by approximately 40 percent in terms of research expenditures per square foot. During the same time period, research and office space square feet per FTE has remained steady, thus achieving improved efficiency and growth within existing facilities.

Many of the university's STEM-related instructional labs are housed in buildings that are over 40 years old with obsolete and aging infrastructure, comprising over 70 percent of the space currently serving STEM-related laboratory instruction. With few exceptions, the instructional labs have received minimal upgrades, are inefficiently configured, and ineffective for supporting active-learning principles that support student learning and success. Further, the university has not constructed a new facility focused on teaching and learning in over 45-years and our instructional pool has remained relatively stable at just over 1 million square feet or approximately 5 percent of overall space, while enrollments have increased by 4,000 students over the last 10-years.

The proposed project includes a planning principle to facilitate the sharing of resources, including equipment and staff with the intent to increase the overall utilization. This project anticipates bringing together 20-25 existing instructional labs, which are currently dispersed

among seven buildings, into a central location which will improve cross-disciplinary teaching and utilization, and operational efficiencies. The new facility will provide modern building systems and technology infrastructure for enhancing the learning experience, as well as flexible lab configurations to foster collaborative and interdisciplinary instructional methods and support experiential learning. In addition to significantly improving the learning experience, the new facility will also address the needed capacity to support the approximate 40 percent growth in STEM-related credit hours, and support continued growth in STEM-related fields. Furthermore, overall space utilization will be improved through the repurposing of several existing instructional labs to meet research space needs in STEM fields.

7. How does the institution intend to integrate sustainable design principles to enhance the efficiency and operations of the facility?

Michigan State University's design guidelines and construction standards require that all new buildings and major renovation projects are designed to qualify for at least LEED Silver Certified as defined by the most current version of the United States Green Building Council LEED design requirements. The STEM Teaching and Learning Facility will be designed and constructed to a minimum of LEED Silver certification requirements, with the intent to achieve a minimum of LEED Gold. The university also evaluates functional requirements, and seeks opportunities for efficiency and productivity improvements in its space design and allocation. In addition the university utilizes the least life cycle cost analysis to inform the design, equipment and material selection, thereby minimizing the cost of operations and maintenance.

The University's Energy Transition Plan includes long range energy models for the reduction of greenhouse gas emissions and reduced energy consumption of existing and new facilities, including a goal of 20 percent of energy consumption from renewable sources by the end of 2020. In 2016, MSU fully transitioned its power plant from coal to natural gas and continues to identify methods to supplement its capacity with renewable energy sources like the recently installed carport solar arrays on five parking lots, and an anaerobic digester. Progress on the energy transition plan includes reduced greenhouse gas emission by close to 32 percent and once the solar array panels are completed increased renewables by 11 percent from baseline fiscal year 2010.

In addition, MSU joined the Department of Energy’s (DOE) Better Buildings Challenge which is an initiative to reduce energy consumption in commercial buildings across the nation. The university pledged to reduce energy consumption by 20 percent in 20 million square feet of facilities by the year 2020. A plan has been developed to retro-commission 115 major buildings over a 10-year period including energy audits of these facilities, which enable the university to meet the DOE’s Better Buildings Challenge goals. To date, the university has reduced energy use intensity by approximately 13 percent (weather adjusted) on average across the fleet of buildings on the East Lansing campus.

The STEM Teaching and Learning Facility will seek energy efficiency design features similar to those employed at the recently completed Bio Engineering Facility that exceeds energy standards for building performance by 50%. In the Bio Engineering Facility, these energy efficiency technologies included both natural and networked LED lighting with sensor technology, low velocity fume hoods with proximity sensors, and building automation to maximize HVAC efficiency.

8. **Are match resources currently available for the project? If yes, what is the source of the match resources? If no, identify the intended source and the estimated timeline for securing said resources?**

   Yes, Michigan State University commits resources in the amount of $42.6 million (58.8%) of the $72.5 million estimated project cost. The university match will be from MSU capital and/or bonding paid for from general fund revenue.

9. **If authorized for construction, the state typically provides a maximum of 75% of the total cost for university projects and 50% of the total cost for community college projects. Does the institution intend to commit additional resources that would reduce the state share from the amounts indicated? If so, by what amount?**

   The total cost of the STEM Teaching and Learning Facility is estimated at $72.5 million. Michigan State University commits $42.6 million or 58.8% of its resources to assist with bringing this project to fruition, and respectfully requests State Capital Outlay funding in the amount of $29.9 million or 41.2%.

10. **Will the completed project increase operating costs to the institution? If yes, please provide an estimated cost (annually, and over a five-year period) and indicate whether the institution has identified available funds to support the additional cost.**

    Building operating costs for utilities, custodial, and maintenance are estimated at approximately $800,000 annually, or $4 million over a 5-year period, based on current dollars. The operating costs would be funded by efficiency gains and budgeted general fund revenues. The operating costs are expected to be offset with efficiency gains anticipated for instructional laboratory operations as a result of centralizing the laboratories that will enable the sharing of equipment and staff resources. The building will be designed with energy efficiency features similar to those employed at the recently completed Bio Engineering Facility that exceeds energy standards for building performance by 50% and utilize least life cycle cost analysis, thereby minimizing the cost of operations and maintenance. Further the conversion of the vacated instructional laboratories that result from this facility will be retro-fitted to research space partially off-setting the operating expenses with cost avoidance associated with re-purposing a significant amount of net assignable square feet of space.

11. **What impact, if any, will the project have on tuition costs?**

    This project will not have any direct impact on tuition costs.

12. **If this project is not authorized, what are the impacts to the institution and its students?**

    The students and faculty will be disadvantaged in both learning experiences and research activities as we have to accommodate programs in spaces that are insufficient in capacity, have obsolete infrastructure, and physical designs that do not support the evolving pedagogical methods for STEM-related instruction. Further it hinders our ability to attract, retain, and graduate students when their experiences are limited due to facility constraints. This will affect the quality of the University's teaching and outreach efforts in STEM disciplines, its ability to increase undergraduate student research opportunities, and its ability to attract and retain talented faculty and students. It also will affect the University's ability to compete for federally funded contracts and grants that ultimately would have a positive impact, both economically and intellectually on the campus and throughout the state of Michigan.

13. What alternatives to this project were considered? Why is the requested project preferable to those alternatives?

The University has for many years focused on renovation of existing instructional spaces, including teaching laboratories. Over the last 10 years a significant number of instructional rooms have received some form of renovation and/or technology upgrade. However, in recent years it has become clear that this approach is no longer sufficient. Replacing the furniture, finishes, and technology in the existing rooms does not address the issues of increasing enrollments, or changes in curriculum and learning methods. In many instances we cannot accommodate the necessary changes, such as increased space per student station and increased capacity to meet enrollment demands. This results in sub-optimal learning spaces. The emphasis on active learning, supported by research, has led us to plan much more strategically on how we address this need. It has become clear that accommodating broader changes, at a quicker pace is necessary to provide our faculty and students with the tools they need to succeed in the classroom and beyond. As a result of this the preferred alternative is to construct a new instructional laboratory facility.

Michigan State University has not constructed a dedicated instructional facility in over 45 years. As previously noted a majority of the instructional laboratories are located in facilities over 40 years old, dispersed across campus, and embedded in primarily research intensive facilities. The requested project will create a hub for STEM education by placement of an anticipated 20-25 instructional laboratories and related instructional spaces in one place, in a central campus location. This will allow us to put science on display and engage the broader student body and community in ways today that we can only imagine. Further, MSU has seen an approximate 40 percent increase in overall STEM credit hours. Accommodating this growth in existing space has become increasingly difficult, if not impossible, to accommodate. By creating this STEM hub we believe it positions the university to support and encourage increased student participation in these disciplines. It will allow us to create spaces that support and encourage active learning principles, interdisciplinary teaching and learning, and higher enrollments in STEM.

Fall 2017

Appendix H: Facility for Rare Isotope Beams

Fiscal Year 2019
Budget Information

5-Year Capital Request Planning and Capital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

Facility for Rare Isotope Beams

Background

The Facility for Rare Isotope Beams (FRIB) is a critical project for American science and the State of Michigan. FRIB not only will keep MSU on the cutting edge of nuclear science, but also will ensure the training of the nuclear scientists of tomorrow while bolstering the economies of mid-Michigan and the entire State. FRIB will cost $730 million to design and build. In FY14, the State made a commitment to bond and service the community cost share of $94.5 million. Construction began in 2014 and will be completed by 2022, with current forecasts anticipating early completion in 2021. FRIB is projected to create hundreds of jobs in Michigan, while bringing in more than $1 billion of economic activity to Michigan in the next 10 years. MSU looks forward to continuing its partnership with the State of Michigan to assure the successful completion of this project.

MSU continues to work with the U.S. Department of Energy Office of Science (DOE-SC) in developing FRIB and continues to manage against the annual plan prepared by MSU and approved by DOE-SC. On August 1, 2013, the DOE-SC approved Critical Decisions (CD) 2-3a, baselining the scope, cost and schedule, and authorizing the start of civil construction. The project received CD-3b approval (start of technical construction) in August 2014 with project progress well in advance of DOE-SC targets, and with civil construction nearing completion.

The centerpiece of the new user facility will be a superconducting linear accelerator that will increase dramatically the reach of rare-isotope research in the United States. The accelerator will produce isotopes that normally exist only in the most extreme environments in the universe and will expand the usefulness of isotopes in a broad range of applications from modeling stars to understanding the workings of nanoscale electronic devices, opening the door for critical applications in fields such as medicine, homeland security and industry.