Fall 2022

# Fiscal Year 2024 Budget Information

## 5- Year Capital Request Planning and Capital Outlay Request

Submitted by:

MICHIGAN STATE UNIVERSITY

MICHIGAN STATE
UNIVERSITY

October 28, 2022

Mr. Chris Harkins
State Budget Director
State Budget Office
State of Michigan
Lansing, Michigan 48909

Dear Mr. Harkins,

In accordance with the State Budget Office instructions, an update of Michigan State University's Five-Year Capital Plan and SFY2024 Capital Outlay request, Appendix G, is posted at the following institutional website:

https://ispm.msu.edu/capital-space-planning/capital-outlay

The SFY2024 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.

The Dairy Facility – Research and Teaching and Learning project and the Greenhouses – Renovation of Existing and Addition project are both now actively being planned after the passage of Michigan House Bill 5783 including $53 million in funding for the projects. We sincerely appreciate the state's investment in the projects that will ensure MSU's continued strength in industry relevant research and teaching programs and will support Michigan's farmers and consumers.

While we provide an expanded list of capital investment needs in our Five-Year Capital Plan, the project: ***Engineering and Digital Innovation Building is our Capital Outlay request*** for a funding partnership with the State. Michigan needs 21st Century facilities to educate the 21st Century workforce. This investment will support the emergence of a strong and transformative ecosystem focused on the convergence of digital and physical technologies. This provides the foundation that allows MSU to develop the talent for a future Michigan, respond to industry needs and student demand, support economic development in Michigan, leverage the opportunities provided by FRIB for heavy-ion radiation testing of integrated chip-based systems, and offers research infrastructure for growth in materials research and emerging initiatives. Expanding our data science educational capacity will extend beyond Engineering to benefit all MSU students ranging from Business, Health Sciences, Social Sciences, to Agriculture and Environmental Sciences that now deploy digital technologies, artificial intelligence and machine learning as standard tools. It will also support maintaining and developing research excellence in advanced manufacturing, material science, ultrafast science, quantum computing and heterogeneous micro-electronic technologies.

The university's Five-Year Capital Plan brings forward projects that support programs with 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 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; the arts, and advancing our commitment to diversity, equity and inclusion.

**Office of the President**

Hannah Administration Building
426 Auditorium Road, Room 450
East Lansing, MI 48824

517-355-6560
Fax: 517-355-4670
president.msu.edu

During 2021 the three interconnected strategic initiatives were endorsed that together chart a course for MSU's future and provide three critical roadmap documents: Diversity, Equity, and Inclusion Plan, Relationship Violence and Sexual Misconduct Plan, and the university Strategic Plan. In early 2022 the university launched a University Facilities and Land Use planning effort that will update the current Campus Land Use Plan. This effort is well underway and expected to conclude during the summer of 2023. This effort will be guided and informed by these strategic plans.

As we look to the future MSU is well-positioned to accelerate our contributions and expand our impact as a premier research institution with the unwavering commitment to access and engagement embedded in our land-grant mission.

Sincerely,

Samuel L. Stanley Jr., M.D.
President

C: Provost and Executive Vice President for Academic Affairs Teresa K. Woodruff, Executive Vice President for Health Sciences Norm Beauchamp, Executive Vice President for Administration and Chief Information Officer Melissa Woo, Senior Vice President for Government Relations Kathleen M. Wilbur, Senior Vice President, Chief Financial Officer and Treasurer Lisa A. Frace

# Fiscal Year 2024 Budget Information
# Capital Outlay Request
# 5-Year Capital Request Planning
# Table of Contents

# Fiscal Year 2024 Budget Information
# *Michigan State University*
# Five-year Capital Planning and Capital Outlay Request

## Preface

The Capital Planning Framework and the Campus Land Use 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 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 also 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 align with 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 university adopted in 2021 three interconnected strategic plans[1]: MSU 2030: Empowering Excellence, Advancing Equity, and Expanding Impact; Diversity, Equity, and Inclusion; and Relationship Violence and Sexual Misconduct – with an Academic Strategic Plan Implementation also in process. In 2022 the university launched a University Facilities and Land Use Plan effort to update the current Campus Land Use Plan. This effort will be guided and informed by these university-wide strategic plans.

MSU 2030: Empowering Excellence, Advancing Equity, Expanding Impact envisions that by 2030 Michigan State University will have significantly expanded opportunity and advanced equity, elevated its excellence in ways that attract vital talent and support, and have a vibrant, caring community. The strategic plan identifies goals within six key themes, intentionally ordered to begin with a focus on people, followed by themes focused on excellence reaching across the university's core missions, and concluding with foundational and cross-cutting themes in support of inclusion, sustainability, effectiveness, and excellence in the future:

[1] See Strategic Plan | Michigan State University (msu.edu)

- Student success: Provide an exceptional educational experience for all students that prepares them for postgraduate success, achieving high graduation rates with no opportunity gaps.

- Staff and faculty success: Support career development and well-being of staff, faculty, and postdoctoral research associates at MSU, focusing on creating a best-in-class workplace culture and environment in which excellence and opportunity thrive.

- Discovery, creativity and innovation for excellence and global impact: Be a leader in developing transdisciplinary solutions to ecological and human problems affected by social, economic, political, climate and environmental changes.

- Sustainable health: Enhance quality of life for people everywhere by comprehensively leveraging expertise and research activity to improve health and the systems that affect health.

- Stewardship and sustainability: Provide exemplary stewardship of institutional resources to foster the long-term sustainability of MSU and its high-quality education, research and outreach and engagement programs.

- Diversity, equity and inclusion: Become a national leader in increasing diversity, promoting inclusion, ensuring equity and eliminating disparities on our campus and beyond.

## 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.[2]

Since the mid-1960s, 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 17 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 39 featured in the top 25 nationally, including eight ranked number one.

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, routinely receiving in excess of $600 million in sponsored awards annually, focused in areas such as food systems; plant sciences; health sciences; computational sciences, and population and the environment, including food, water, and energy. In addition, MSU's research expenditures have trended upward for over a decade. According to National Science Foundation Higher Education Research and Development data, MSU's research expenditures for 2020 were $713.2 million. In 2014 Michigan State University launched the Global Impact Initiative (GI2) with a goal to recruit 100 new faculty in some of the most exciting new areas of research. MSU has nearly reached that goal, with candidates hired from Harvard, Stanford, Princeton, MIT, Johns Hopkins University, Lawrence Berkeley National Lab, Los Alamos National Lab, and many other top institutions.

In early 2021 Henry Ford Health System and Michigan State University, two of the state's leading education, research, and health care institutions, formed a partnership: Henry Ford Health + Michigan State University, to make Michigan a national leader in providing access to exceptional health care for all residents; scientific discovery; and education for providers, patients, and families. In a landmark partnership that will last for at least 30 years, both institutions are committed to aligning efforts across key departments and programs to achieve critical health care and educational goals, while addressing social issues that impact health outcomes for patients in Michigan and beyond.

This fall, MSU enrolled 30,491 in-state resident undergraduate students. At the same time, MSU draws students from all over the state, country, and world. This year, MSU enrolled individuals from 82 of 83 counties in Michigan, all 50 states in the country, 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 22% of the undergraduate population. MSU administered $687 million in financial aid for the 2021-2022 fiscal year, with 67% of freshmen receiving

[2] See https://trustees.msu.edu/about/mission.html

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.

Michigan State is committed to student success, and this remains a central focus of the MSU's strategic plan. At Michigan State, we believe every student we admit has the ability to succeed and graduate. As established in the strategic plan, student success is the measure of an institution's ability to provide an inclusive, equitable curriculum and environment with the academic, social, wellness, and financial support that enables all students to learn, thrive, persist, graduate, and succeed after graduation. Understood this way, student success is not a measure of the academic achievement of either individual students or students collectively; rather, measures like academic standing, persistence, graduation, sense of belonging, engagement, time-to-degree, and placement rate indicate how well an institution supports its students. MSU has been a leader in student success initiatives for more than a decade. As a member of the University Innovation Alliance, we have been part of a group of collaborative innovators determined to share knowledge and scale successes to better serve students, raise graduation rates, and create equitable educational outcomes.

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 our progressive pedagogy and approach to developing "citizen scholars" and students prepared for real-world careers demanding both technical and disciplinary expertise along with connective interpersonal skills. Curricular and co-curricular experiences aim to help students develop 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.

Our collective efforts to enhance the student experience have resulted in MSU's graduation increasing for the seventh year in a row, up to 82% in 2021. In terms of employability, 94% of students who earn bachelor's degrees from MSU are immediately employed or pursue additional education; as undergraduate students, nearly 80% graduate from MSU having already completed an internship. MSU's efforts have been recognized nationally, ranking 65th by Money magazine based on the combination of educational quality, affordability, and alumni success, placing us 6$^{th}$ among Big Ten universities.

Thinking globally has always been a priority at MSU, and the university's focus on international engagement has helped establish MSU as one of the world's top 100 research universities. The 2022 Times Higher Education World University Rankings placed Michigan State University in the top 6% of global universities – and #35 among U.S. institutions. Our global ranking helps MSU recruit top students and faculty from around the world, generate revenue and funding from international and internationally

focused donors, and position MSU as a leader on the world stage. MSU ranks #1 for study abroad among public institutions, offering more than 275 education abroad programs on all seven continents. In addition to their invaluable cultural and academic contributions on campus, MSU's 4,200+ international students and scholars contribute $195 million to the Greater Lansing economy. Approximately 1,400 faculty members are involved in international research, teaching, and service projects and programs, and MSU maintains partnerships with more than 325 international institutions in over 80 countries. MSU receives $80 million in external funding for international work each year—which is more than 10% of total external research funding annually. We continue to expand our reach around the globe through:

- The Alliance for African Partnership (AAP) is a collaborative and cross-disciplinary platform for addressing today's global challenges. AAP 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, AAP builds off MSU's longstanding work in Africa and serves as a model for Africa-led partnerships, cross-disciplinary research, and applying science and the humanities to development challenges.

- The Global Youth Advancement Network (GYAN) is a coordinating platform for research and engagement activities related to the education, mentorship, and leadership training of young people around the world. GYAN's three core objectives are convening youth around the world for thought leadership, capacitating youth-serving institutions, and content/knowledge development through action-oriented research. GYAN connects faculty at MSU with faculty in partner countries to engage in collaborative research and program development related to youth employment and entrepreneurship.

- 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 the Feed the Future Innovation Lab for Food Security Policy funded by the U.S. Agency for International Development (USAID). 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 $13.6 million research and capacity building program funded by a USAID grant that focuses on grain legumes.

- The AsiaNexus program is redefining our concept of institutional partnerships and collaboration models in Asia. The program offers an enhanced platform for expanded faculty and student engagement in Asia by engaging key partners, exploring new strategies to co-fund and leverage investments, and facilitating collaborations to advance integrated research and novel academic programming. AsiaNexus partners and research teams create a synergistic network of networks

within and across central Eurasia, East Asia, South Asia, Southeast Asia and the world while building capacity among partners to address global challenges.

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 strategic plan charges us to meet our students where they are, provide high-quality experiences for all of our students, and ensure that every student has the opportunity and support to learn, thrive, and graduate.

## II. Instructional Program and Structural Needs

As one of 65 members of the prestigious Association of American Universities in the U.S. and Canada, 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:

- MSU received 55,525 first-time undergraduate applications this year, well exceeding last year's 50,629. MSU's total enrollment for Fall 2022 is 50,023.
- MSU welcomed 9,676 new undergraduate students, its largest entering class to date, including a record 2,486 students of color and 5,036 women, continuing the steady upward trajectory seen in recent years. Total graduate enrollment, including graduate professional students, is 10,822, of which 1,789 are new graduate masters and doctoral students, and 773 are new graduate-professional degree-seeking students.
- MSU continues to have an outstanding record of students earning prestigious national and international scholarships. MSU has produced 20 Rhodes Scholars, 52 Goldwater Scholars, 19 Marshall Scholars, 17 Truman Scholars, 16 Churchill Scholars, 12 Udall Scholars, 9 Presidential Fellows, 7 Hollings Scholars, 7 Gates Cambridge Scholars, 5 Mitchell Scholars, 5 Beinecke Scholars, and 3 Gaither Fellows.

Michigan State University 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 23$^{th}$ among public universities for undergraduate business programs according to U.S. News & World Report. Six MSU graduate programs: elementary education, secondary education, rehabilitation counseling, curriculum and instruction, nuclear physics, and supply chain/logistics are ranked #1 nationally by U.S. News & World Report. In its 2022 ranking for online graduate programs, U.S. News & World Report ranked seven of Michigan State University's participating online graduate programs in the top 25 and four

specific disciplinary areas in the top 7. Three programs reached top 10 status for online graduate programs for veterans.

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. All colleges and administrative units undergo annual strategic planning resource reviews annually to encourage alignment university strategic priorities and ensure university-wide effectiveness and efficiency. With resources focused on mission-centric areas of the institution, MSU continues to preserve its academic rigor with a competitive student-faculty ratio (16:1) that is consistent with the Big Ten public universities' average.

- In 2021, Michigan State University announced that the Gilbert Family Foundation, in partnership with the Rock Family of Companies, will support the new Apple Developer Academy in Detroit, a transformative education collaboration between Apple and MSU and the first Apple Developer Academy in North America. Apple, MSU, and the Rock Family of Companies share a vision to empower diverse entrepreneurs, creators, and coders by helping them cultivate the skills necessary for pathways in the rapidly growing tech economy. The Gilbert Family Foundation grant will support the Academy's general operations and expenses, including but not limited to program development, infrastructure, and staffing. The Academy graduated the first cohort of students in June 2022 after completing the 10-month program. Tuition to the Academy is free, and priority admission is granted to applicants from Detroit. Apple and MSU anticipate that the Academy will impact close to 1,000 students each year. The grant provides MSU with the capacity to not only build, but also grow and sustain pathways to employment for diverse learners.

- The MSU College of Law started a new chapter in its 129-year history by completing its full integration into the university in August 2020. Prior to the integration, the College of Law had retained its private, financially independent status since starting instruction on MSU's campus in 1997, though the two institutions grew progressively close over the years. College of Law and MSU leadership committed to the integration in 2018 with the unanimous support of both schools' governing Boards of Trustees and work began toward full financial, legal, and administrative integration. College of Law faculty and staff became MSU employees on Jan. 1, 2020, and the College of Law's Board of Trustees was dissolved on Aug. 17. The College of Law's financial reserves were absorbed by the university, and moving forward, operations will be financed in a manner consistent with all other constituent colleges.

- In the spring of 2022, MSU launched a pilot partnership with UWill to expand mental health service capacity for students. UWill services will act as an extension of the university's Counseling and Psychiatric Services (CAPS), providing students with free video, phone, chat, and message sessions with

licensed mental health professionals. The program bolsters on- and off-campus offerings and furthers the goals of the university's strategic plan objective to meet students' mental and physical health needs.

- In 2022 MSU announced that the College of Arts and Letters was awarded a U.S. Department of Education grant to create a national language resource center. The National Less Commonly Taught Languages Resource Center will be a national center building on innovative work already done at MSU to enhance and support the teaching of less commonly taught languages.

- Michigan State University and Lansing Community College (LCC) have formalized a partnership that improves access to a four-year degree, increases student success, and helps build a pipeline of talent to meet the needs of the Mid-Michigan economy. The partnership, called Envision Green, also provides a seamless transition from LCC to MSU by embedding MSU advisors within LCC to guide students through their educational journey — a transition more than 5,500 LCC students have made over the last decade. With this partnership in place, prospective LCC students can consider MSU from the start of their higher education journey. The affordability of the LCC-to-MSU path means a four-year-degree is an option for more people in the region — crucial for building and retaining an educated workforce in Michigan.

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. 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 remain 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:

- The Facility for Rare Isotope Beams (FRIB), a user facility for the U.S. Department of Energy Office of Science, opened its doors to discovery with a ribbon cutting in the spring of 2022. The ribbon cutting officially marked the start of the FRIB's scientific mission. The FRIB houses a world-class research, teaching, and training center which attracts and develops STEM talent from around the world. The facility houses the world's most powerful heavy-ion accelerator, allowing researchers to access new, rare isotopes. FRIB supports a community of 1,600 scientists around the world.

- Fall Semester 2021 saw the opening of the recently renovated teaching and learning space at Wonders Hall. This project renovated 24,000 square feet of space including adaptive reuse of a former dining hall and kitchen into state-of-the-art teaching and learning space. The renovated spaces include three large active learning classrooms, individual and team study space, computer labs, tutoring, and the "Toolbox" for the Cornerstone and Residential Experience program in the College of Engineering. The "Toolbox" includes spaces where ideas can be generated and fabricated using a hands-on approach to learning.

- In July 2021 MSU officially opened the STEM Teaching and Learning Facility that was funded in partnership with the state of Michigan through the Capital Outlay process. The state-of-the-art facility reflects MSU's commitment to undergraduate education. Our goal is to advance the student experience through innovative spaces that foster experiential, collaborative, and inquiry-driven teaching and learning. The effort also serves to attract, retain, and engage students so they are best prepared for careers in the rapidly changing fields of science, technology, engineering, and mathematics.

  The functional and physical design intentionally integrates the STEM Teaching and Learning Facility with the renovation of the former Shaw Lane Power Plant. This new and repurposed complex provides our entire community the opportunity to work and learn in an environment where creativity and adaptive innovation emerge, in part, through the mixing of different ideas and disciplines. This rich mix is a key ingredient for innovative solutions to complex global problems.

- Michigan State University will broaden its research and education partnership with McLaren Health Care. In February 2022 a ribbon cutting marked the opening of the $600 million facility in the University Health Park. This new facility helps MSU recruit top physicians and researchers to the region by providing access to tools and data that will build a healthier society and develop new life-saving therapies and treatments. The comprehensive health care facility provides new, state-of-the-art facilities to better serve patients, educate students, and bring together more than 1,000 physicians, researchers, educators, and other members of academic and medical teams.

- In 2022 TechSmith moved its company headquarters from its Okemos location to Michigan State University's campus. MSU and the Michigan State University Foundation partnered to develop a 62,500 square-foot, two-story office building in the south portion of Spartan Village for this new tenant. The office building is located at the corner of South Crescent and Harrison Road. TechSmith has been a long-time sponsor of MSU, bringing interesting projects to MSU computer science students in the College of Engineering. The new headquarters will enhance employee wellbeing, connectedness to one another, talent opportunities, community partnerships and involvement, local brand awareness, and internship programs.

- In October 2022 MSU opened the William A. Demmer Engineering Center. The $4 million facility provides an on-campus space for registered student organizations in the College of Engineering to work together outside of classes. The facility includes an open shop area where walls and barriers will be kept to a minimum to create flexibility for current and future projects. Core features include a machine shop, computer numerical control, dynamometer space, and a ventilated chamber for composite materials work. A dedicated conference space allows for collaboration among team members, faculty members, and visiting professionals.

- Spartan Greens, a new 7-acre turf field sports complex, opened in fall 2022. The complex includes new artificial turf fields and a new support services building. Spartan Greens is expected to support more than 8,500 students each semester through a mixture of intramural and club sports, including lacrosse, soccer, flag football, ultimate frisbee, softball, and baseball. The turf fields will play a key role in supporting the health and well-being of MSU students.

- In November 2022 the Department of African American and African Studies (AAAS), will celebrate and commemorate AAAS being established as a department and officially open its doors to its newly renovated space in North Kedzie Hall. The space has been designed with the AAAS vision in mind, to combine elements of form and function to maximize the scholarship, creativity, and activism of AAAS students, faculty, and staff.

In 2020 MSU was named one of the fastest rising research universities in the U.S. MSU was ranked 5$^{th}$ according to the Nature Index, which tracks contributions to primary articles in some of the most prestigious scientific journals in the world. 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). Officially opening its doors for discovery in 2022, FRIB is a new U.S. Department of Energy Office of Science national user facility for nuclear science research. The centerpiece of the new user facility is a superconducting linear accelerator that will increase dramatically the reach of rare isotope research in the United States. The accelerator produces 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 a critical project for American science and the state of Michigan. It will not only keep MSU on the cutting edge of nuclear science, but also ensure the training of the nuclear scientists of tomorrow while bolstering the economies of mid-Michigan and the entire state. FRIB cost $730 million to design and build. In FY14, Michigan made a commitment to bond and service the community cost share of $94.5 million. Construction began in 2014, with completion in early 2022. The project reached a significant milestone in 2020 with its designation by the U.S. Department of Energy as a DOE Office of Science user facility. The designation demonstrates a substantial commitment by the sponsoring program, which provides oversight and works with the facility to maximize scientific impact and productivity. The FRIB is projected to create hundreds of jobs in mid-Michigan while bringing in more than $1 billion of economic activity to Michigan in the next 10 years.

- MSU AgBioResearch encompasses the work of more than 300 scientists in six colleges with 3-year average annual grant expenditures of more than $84 million. These researchers, in on-campus laboratories and at 15 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 families.

- MSU and the University of Wisconsin-Madison continue to partner in the Great Lakes Bioenergy Research Center (GLBRC). The GLBRC was established in 2007 and in 2017 was awarded an additional 5 years of Department of Energy funding to develop sustainable alternatives to transportation fuels and products currently derived from petroleum. Since its inception, the GLBRC has received roughly $375 million in DOE funding.
- In 2021, MSU received a $15 million grant from the U.S. Agency for International Development (USAID) to help create job opportunities for 300,000 youth in in Kenya to improve lives and transform communities. MSU will partner with two other universities and youth organizations across Kenya to provide training and starter funds over five years and will strengthen local partner capacity to serve vulnerable and diverse youth groups. The interdisciplinary project includes the College of Education, College of Agriculture and Natural Resources, Global Innovations in Development, Education, and Scholarship (Global IDEAS), the Global Youth Advancement Network, and the Center for Gender in Global Context.
- MSU was awarded a $6.7 million National Institutes of Health (NIH) grant in 2021 to build a new facility for the development of new imaging agents and treatments of diseases that afflict both humans and large animals. The new Large Animal Facility for Imaging and Image-guided Therapies will be one of only a few such medical diagnostic facilities in the world. The facility is expected to open in 2023 and be located in the Clinical Center Building D.
- Researchers in MSU's College of Education were awarded a four-year $2.4 million grant from the National Science Foundation to promote science education through the MothEd program in 2021. The program encourages elementary students to capture moths in their own communities and ask novel questions. The students learn about key concepts in ecosystems through their investigations.
- In 2022 the Charles Stewart Mott Foundation granted $25 million to expand MSU's College of Human Medicine public health presence in Flint, MI. The grant created an endowed fund to increase public health faculty, academic research, and community health collaborations. The grant expands Mott's support for the college's presence in Flint, including renovations to support the relocation of the public health program to the former Flint Journal building.
- MSU researchers received a five-year $3.7 million grant in 2022 from the National Institute on Deafness and Other Communication Disorders to study language in young children with autism. The project will provide greater understanding of how these children process the language they hear from adults. Research findings

will impact theories of language development and clinical best practices and also contribute to evaluations of early language interventions.

- An MSU researcher was awarded a five-year $1.9 million National Institutes of Health grant in 2022 to study how neocortical feedback projections influence sensory processing in the brain. The research findings will provide fundamental knowledge about how the brain works that could lead to improved treatment strategies for neurological and psychiatric disorders.

- An MSU researcher will direct a team awarded a five-year $9.8 million grant in 2020 from the U.S. Department of Agriculture National Institute of Food and Agriculture (USDA NIFA) to study reducing threats of pathogens in low-moisture foods like cereals, flour, dried fruits, and nuts. The multi-disciplinary team will work to reduce the risk of Salmonella, E. coli, and Listeria throughout the production and supply chain for these foods.

- A multi-disciplinary team of Michigan State University scholars was awarded $3.2 million in 2020 from the National Science Foundation (NSF) to deliver renewable energy to off-grid communities. This five-year project will deliver transformative advances in science and technology to communities where energy is too expensive or unreliable. These energy solutions could transform the lives of over 650 million people across the globe who are currently saddled with expensive and unsustainable off-the-grid energy options.

- A $6 million grant from the Centers for Disease Control and Prevention was awarded to MSU researchers in 2021, with the aim of closing the racial gap in health outcomes and COVID-19 vaccination rates. The grant is for the National Network to Innovate for COVID-19 and Adult Vaccine Equity, or NNICE project. The goal of the grant is to boost COVID-19 and other adult vaccine literacy, confidence, access, and receipt.

- In 2021 the Andrew W. Mellon Foundation awarded $1.4 million to Michigan State University for Enslaved: Peoples of the Historical Slave Trade, or Enslaved.org, a first-of-its-kind database containing millions of records cataloging the lives of enslaved Africans and their descendants. Enslaved.org, developed and maintained by MSU researchers, links data collections from multiple universities, archives, museums, and family history centers. The award is for a third phase of Enslaved.org, the first and second phases in 2018 and 2020 were also funded by the Mellon Foundation. The third phase of funding will run through March 2023 and will expand the reach of the project by refining infrastructure; driving sustainability; strengthening a commitment to the inclusion of underrepresented voices in humanities scholarship; and continuing partnerships with scholars, heritage, and cultural organizations and the public.

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 curriculum revisions, student-centered, collaborative, and self-guided learning. The learning environments, coupled with the changing modalities and curriculums provide opportunities for research on and leadership in instructional methods while fostering innovation through a technology-rich environment.

Approaches to teaching and learning have become more interactive across all disciplines, and the use of instructional technology has significantly changed 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, collaborative, and self-guided learning. The majority of university classrooms have received updates to support active learning principles and emerging technologies that are necessary to facilitate the exchange of ideas and collaborative interactions 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 well as provide more opportunities for informal and self-guided learning. The STEM Teaching and Learning Facility that opened in 2021 begins, in a more significant way, to address this need. The Engineering and Digital Innovation building, submitted as the MSU SFY2024 Capital Outlay request, continues this trajectory.

As a result of these many factors, MSU has examined the capital assets necessary to support academic programs and identified needs that involve renovation, additions, new construction, comprehensive renewal, 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.[3]

The demands placed upon building systems by updated building codes and more sophisticated programs, many of which are equipment- and ventilation-intensive, have resulted in facilities that act as a barrier rather than a support to program success. For

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

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, renovations and new construction are necessary to provide 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.

As the university has embarked on the development of an updated University Facilities and Land Use Plan in 2022, with anticipated completion in summer 2023, land, facilities and space needs will be carefully evaluated to support MSU's new strategic plan and academic strategic plan implementation. The strategic plan includes several goals that will impact space and facility needs, including work, teaching and learning modalities; increase in research expenditures; multidisciplinary research projects; and student support services.

## III. Staffing and Enrollment

Fall 2022 enrollment at Michigan State University totaled 50,023, representing careful and deliberate enrollment management to maintain academic quality and optimal classroom and laboratory environments for all students. Michigan residents represent 72% of enrollments and 78% of the university's undergraduates. MSU students come from 82 of 83 counties in the state. A summary of enrollments for fall 2022 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 maintain a positive trend.

While the university currently offers bachelor's, or bachelor's completion programs, and master's programs off campus and intends to increase the number and diversity of learners we serve through an online learning strategy that provides wider access

through targeted programs, 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 the demand for on-campus experience remains high.

The preliminary full-time equivalent faculty and academic staff count for fall 2022 is approximately 5,300. 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 functions.

As of Fall 2022, current average class size for lower division undergraduate classes is 48 students. The average class size is 35 for upper division undergraduate classes and 14 for graduate classes. The most recent calculation of the student/faculty ratio is 16:1 which is consistent with the Big 10 public average.

## IV. Facilities Assessment

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 and learning, research and innovation, and outreach and engagement. University facilities create a sense of place for the campus and surrounding communities, and support the success 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 electronic network, the security systems, and the campus grounds, including the natural and built landscape, sidewalks, roadways, and paved parking.
- 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 and a half square miles. The developed campus approximates 2,000 acres, and the experimental research farm area approximates 2,700 acres with the remaining supporting auxiliary activities. Off-campus MSU land covers approximately 21,000 acres for a total of 26,000 acres across the state.

  Despite this rich land area, the planning process recognizes that land resources are finite and should be conserved for future generations. As a result, the 2020 Campus Land Use Plan adopted compact campus development. While allowing for some horizontal expansion across the campus, the Plan protects the capacity and contiguity of the farm areas and uses a strategy of carefully conceived "infill" on the developed campus.

- The developed campus, and the North Campus "Circle Area" in particular, is recognized as one of the nation's most beautiful campuses. The open space quality of this area, the Red Cedar River corridor, and the Sanford and Baker woodlots is highly regarded and reinforces the social and intellectual vitality of the campus. The campus arboretum grows over 950 different taxa, represented by more than 18,500 individual trees, and innumerable shrubs and vines which serves as a collection for research, teaching, beautification and health and wellness.

  The developed landscape's estimated replacement value exceeds $399 million.

- MSU's transportation system encompasses 82 lane miles of university-owned roadways, with a replacement value of $47.5 million.

  The condition of the roads is estimated to be 1% poor, 18% fair, 23% good and 58% excellent. MSU prioritizes improving safety for vehicles, pedestrians, bicyclists, and other motorized transport 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 $21.8 million. One bridge is in fair condition, four are in good condition, and three are in excellent condition.

- By MSU Board of Trustees policy, the parking system of approximately 28,500 spaces for students, faculty, staff, and visitors is self-supporting and has a replacement value of approximately $291 million: $135 million for seven parking structures and $150 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 28,500 surface parking spaces breaks down to 7% in poor condition, 30% fair condition, 25% good condition and 38% in excellent condition.

- There are 125 miles of walkways valued at $49.9 million.

- The All-University Traffic and Transportation Committee addresses the issues related to parking access, the associated cost implications, and ways to increase use of mass transit and non-motorized transportation. MSU continues its long-standing partnership with the Capital Area Transport Authority to provide service on-campus and for surrounding area routes.

- Main campus inter-building communications is comprised of an underground fiber optic distribution system that supports network data, VoIP telephone, contact center, cable television, cellular, two-way radio dispatch, and other specialized services. The fiber optic system interconnects 236 unique structures on campus. Wireless equipment provides connections for additional structures in the south-campus farm district, well water pump facilities and other critical infrastructure with planning under way to replace this legacy service with direct fiber optic connections. After the upgrade MSU will have 297 unique structures with high-capacity underground fiber optic connections. In addition to the fiber optic distribution system, each building has internal cabling infrastructure and equipment with approximately 75% in need of significant infrastructure and

equipment upgrades to keep up with operational demands. WiFi service is provided by over 13,000 wireless access points. Approximately 58% of main campus buildings have full WiFi coverage, 22% have partial WiFi coverage and 20% have little or no Wi-Fi coverage. All residence halls have WiFi service in student rooms, dining halls and related gathering places.

The estimated replacement value of campus data network infrastructure is over $82 million and annual maintenance costs exceed $10 million.

Off-campus sites in the Lansing metropolitan area are connected to the MSU data network via a 45-mile fiber optic ring operated by Zayo Enterprise Networks. Facilities across the state, those outside of Lansing, are connected via Merit Network, Inc., or other local service providers.

External data network connectivity from the main East Lansing campus is provided via redundant links to the commodity Internet and to the research focused Internet2 network via Merit Network, Inc.

- Cellular infrastructure from all four national cellular carriers is installed on main campus building rooftops and other structures. This carrier-owned equipment provides enhanced service coverage and capacity for the public, university employees, and large campus events.
- Michigan State University has over 24.9 million gross square feet of building space in 570 structures, including both general-fund and self-supporting facilities. The replacement cost of the buildings is calculated at $7.2 billion. University general-fund buildings account for approximately 14.4 million square feet representing $5.1 billion in replacement costs. Student Life and Engagement and other self-supporting facilities account for approximately 10.5 million square feet and the remaining $2.1 billion.

  Facility condition assessments, including the utility distribution system, are updated on an ongoing basis using input from university maintenance, custodial staff, users of the buildings, and external consultants. College and program units also provide programmatic facility reviews and identify needs through the annual budget and planning process.

  Building capital renewal needs are assessed on many campuses utilizing the “industry-expected useful life” of the significant building components. For MSU, this approach substantially overstates needs, since the effective maintenance program typically results in building components lasting much longer than industry standards.

  MSU manages and forecasts major maintenance needs through its 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. A Facility Condition Assessment is currently underway and is 75% complete.

- The utility generation and distribution systems are major components of the campus infrastructure. The generation system includes:

  The T. B. Simon Power Plant, a natural gas-fired Combined Heat & Power (CHP) power plant which generates up to 96 MW of electricity and 815 kpph steam to meet campus needs. The power plant consists of Units 1 & 2 (1965), Unit 3 (1975), Unit 4 (1993) and Units 5/6 (2006). The condition and replacement value of this facility is being assessed as part of the Utility Plan effort currently underway.

  A new RICE Plant (2022) which consists of three (3) x 9.4 MW natural gas engines capable of generating up to 27.9 MW of electricity to meet campus peak power demands allowing the CHP plant to operate more efficiently.

  An interconnection to the local utility electrical distribution power grid through the 100 MW Spartan Substation (new in 2016).

  A drinking water treatment plant (2020) and 2-million-gallon water tower (2020) which treats water produced from 16 water wells to provide drinking water to north campus and for power plant feedwater.

- The utility distribution system includes 70 miles of water lines, 27 miles of steam lines in tunnels, 3.5 miles of direct buried steam lines, 168 miles electrical conduit and cable, 112 miles of communication cable and fiber, 154 miles of storm and sanitary sewers, and more than 7 miles of chilled water distribution. MSU made significant investment to update the north campus steam and electric tunnel and distribution systems. The south campus systems need repairs to provide reliable service and meet the service demands of the overall campus community. Additionally, most facilities south of Mt Hope receive untreated drinking water, have limited fire water flow and coverage, and use less reliable electric supply from local utilities. MSU is developing a Utility Plan to understand current conditions, projected growth, and utility demand requirements.

In 2021, the Michigan State University Board of Trustees unanimously endorsed the MSU Strategic Plan 2030 – Empowering Excellence, Advancing Equity, Expanding Impact. Goals for Stewardship and Sustainability include reducing Scope 1 and Scope 2 Greenhouse Gas (GHG) emissions 50% by 2030 from the 2010 baseline. The new university stewardship and sustainability strategic plan supersedes the previous 2012 Energy Transition Plan and reinforces the university's commitment to reduce its carbon footprint. Since 2010:

- The university completed the transition from solid fuel (coal and biomass) at the central Combined Heat & Power plant to 100% natural gas (April 2016) reducing GHG emissions by over 36% since 2010.
- The university entered into a Power Purchase Agreement (PPA) for Solar Carports covering 5 of the university's largest commuter parking lots covering 5,000 parking spots and capable of producing up to 10.5 MW peak power.

The Carport Solar arrays were placed into service in December 2017 and now contribute from 7% to 11% of the annual campus power demand.

- In October 2015, the Board of Trustees authorized planning for a Reciprocating Internal Combustion Engine (RICE) plant. After Board of Trustee's authorization to proceed in June 2019, the RICE plant was engineered, procured, installed, and placed into service in March of 2022. Since the plant was placed into service MSU is on track to reduce total natural gas fuel usage at the central power plant by over 10% as compared to FY 2019 (pre-COVID).
- In October 2015, the Board of Trustees authorized planning for a Medium Pressure Steam Boiler (aka Aux Boiler). After Board of Trustee authorization to proceed in June 2019, the Aux Boiler plant was engineered, procured, and is being constructed. The plant is forecast to be in service by December 2022. MSU expects to realize additional reductions in total natural gas fuel usage at the central power plant as compared to pre-COVID era usage.
- In February 2020, the MSU Board of Trustees authorized the installation of a 20-megawatt solar array on 110 acres of south campus near the intersection of Jolly and Hagadorn to reduce the university's carbon footprint. Like the Carport Solar, the South Solar Farm used a Power Purchase Agreement (PPA). The project is expected to be complete in 2023.
- MSU is committed to being a good steward of resources by reducing consumption, greenhouse gas (GHG) emissions and increasing recycling. The commitment to recycling is supported by the MSU Surplus Store and Recycling Center. Due to the efforts of the MSU Surplus Store and Recycling Center, the amount of waste on campus has declined even as the Spartan community and campus grows. Since the MSU recycling services began in 1990, MSU has decreased its yearly landfill totals by 55%.

The college and program units systematically provide annual programmatic facility reviews and forward space needs, including alteration and improvement requests, and major capital planning needs through the annual budget and planning process. This process identifies high-priority programmatic needs.

The planning horizon for dynamic academic and academic-support programs is typically five years. Identified projects include 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. The planning process informs broader capital needs by identifying programmatic areas that would benefit from new construction or major renovations.

- Based on the most recent planning cycle, approximately $20.0 million is needed in fiscal year 2023 to address high priority, selected programmatic improvements. It is anticipated that this magnitude of annual funding need will continue through fiscal year 2028 and beyond, given the limited resources, age of the physical plant, strategic plan goals for growth in research over the next 10 years, 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 to reduce 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.

- A primary component of the teaching and learning environment is the university's instructional space. The University maintains 323 centrally scheduled classrooms, and lecture halls, and over 700 departmentally assigned instructional spaces. The instructional space at MSU is 2 million assignable square feet.

  For fall semester 2022, utilization of these instructional spaces by scheduled instructional periods ranges as high as 91% of the available hours, and averages 63% for centrally scheduled classrooms, excluding events. The seat utilization ranges as high as 75% of the available capacity and averages 56% across all rooms. In a typical academic year, one-time events, such as help sessions, department and student organization meetings increases utilization by 10%. These utilization rates reflect a return to more in-person courses following lower utilization in the past two years due to the pandemic.

  Departmentally scheduled class laboratory spaces that are scheduled regularly for courses averages 39% across all rooms and disciplines and ranges as high as 52% 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 72% of the available capacity and averages 36% across all rooms and disciplines.

  Forty% of the instructional space is in fair condition, 10% in poor condition, with the remaining 50% 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 needs, the investments in instructional space incorporate the shift to more learner-centric environments, curriculum revision, 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 is essential 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 and modality, to continue to add value, and remain competitive in the recruitment and retention of high-quality students and faculty and increase participation at both the undergraduate and graduate levels. MSU estimates that $60 million over 5 years, or $12 million annually, would make a

substantial improvement in the condition of the existing university instructional environment through renovation and or replacement and improve alignment with changes in curriculum and learning methods.

- University properties beyond the East Lansing campus cover approximately 21,000 acres and contribute to the built environment with 15 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 the BioEconomy Institute in Holland, Tollgate Farm and Education Center in Novi, The Management Education Center in Troy, WaWaSum in Grayling, Hidden Lake Gardens in Tipton, and The Secchia Center and Grand Rapids Research Center in Grand Rapids. The replacement value for the facilities located at these sites is calculated at more than $377 million.

  Upgrades to existing research space to meet current technological, regulatory, and operational requirements of researchers and funding organizations are needed. Research maintenance items consist of both wet and dry lab upgrades and equipment replacement, and conference facilities upgrades to support extension and outreach activities. General maintenance and infrastructure improvements include exterior repair/replacement, technology and security upgrades, environmental enhancements for 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 maintenance and repairs include well and septic systems, roadways and parking areas. With more than 315 buildings located at various off-campus research, teaching, and extension facilities The replacement value for off-campus facilities is calculated at more than $830 million.

The university obtained facility improvement funds by issuing bonds using the university's general revenues to secure these debt instruments leaving the facilities unencumbered. The completed Chemistry Building renovations, Biomedical and Physical Sciences Building, Diagnostic Center for Population and Animal Health (now named the Veterinary Diagnostic Laboratory) laboratory building, the Bio Engineering Facility, and the STEM Teaching and Learning Facility are exceptions. These facilities were funded in part with bonds issued by the State Building Authority (SBA) in accordance with Act 183.

## 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 guided and informed by the Strategic Plans, 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, 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 considered.

Within each component of planning, several 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 several dimensions to ensure thoroughness of planning, conformance with campus land use 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.
- 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, additions 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 brought about by changes in programs, advances in technology, and related issues.
- The least life cycle cost analysis enables project development to focus on designs that reduce the ongoing maintenance cost of facilities. 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, MSU recognizes that campus programmatic and facility capital renewal issues are significant and constantly evolving. As a result, needs exist simultaneously in three major areas:

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

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 "Engineering and Digital Innovation Building" is the institution's Capital Outlay project request, as noted in Section I of the following table.[4] Other projects included in Section I of the table reflect the institution's anticipated capital project needs for the 5-year planning framework. Projects listed in Section II are currently in active planning or in process, with funding primarily from institutional resources.

[4] See Appendix G for the State Fiscal Year 2024 Capital Outlay Project Request – "Engineering and Digital Information Building."

## Capital Planning and Major Maintenance SFY24-29
## Planning Timeframe: One to Five Years

| **Section I: MSU Capital Outlay SFY24 5-Year Planning** | |
|---|---|
| | FY23 Est. (mil.) |
| **Capital Outlay Priority – Renovation and Addition** | |
| • Engineering and Digital Innovation Building - New Const. - Rsch Support and Expansion | $250.0M |
| **MSU 5-Year Capital Planning (Alphabetical Order)**<br>**Renovations and Additions** | |
| • Auditorium Building - Renovation of the main auditorium to support teaching, learning, outreach | TBD |
| • Barrier-Free Accessibility Projects - Single Occupant/ADA Restrooms - High Priority Buildings | $4.4-$5.5 |
| • Biomedical Discovery | |
| ○ Biomedical Animal Resources - Provision for Large Animal Housing and Surgery | $13.6 - $19.8 |
| ○ Clinical Center A-Wing – Renovate for Research Expansion | $78.5 - $90.5 |
| ○ Clinical Center B-Wing – Renovate for Research Expansion & Learning | $18.2 - $24.1 |
| • BSL-3 - Research Expansion Multi-Species Flexible Housing/Procedure Space (Ph. 2 of 2) | $11.6 - $12.7 |
| ▪ Campbell Hall - Renovation | $22.0 |
| • Chemistry HVAC Renewal | $40.0M |
| • Core Aquatic Species Research Facility - Renovation and/or Addition Rsch. Support and Exp. | $27.5-$33.0 |
| • Duffy Daughterty - Additional Renovations to Support Student Athlete Wellness | $40.0 |
| • Engineering - Renovations - Research and Learning - New Construction Related Backfill | $11.0 - $13.2 |
| • Grand Rapids Research Center (GRRC) 5th Floor Lab Fit-out | $8.4 |
| • Jenison Weight Room/Athletic Training Room Renovation | $20.0 |
| • Kresge Art Center - Comprehensive Renovations - Teaching and Learning, Research | TBD |
| • Learning Space Improvements – Annual Investment for Updates and Improvements (5-Year need - $12.0 annually) | $60.0 |
| • Life Science Building (A & B) HVAC replacement and related (phased approach) | $77.0 - $88.0 |
| • Old Botany – Comprehensive Renovation | $12.4 - $12.8 |
| • One-Stop for Student Services | $2.0-$3.0 |
| • Outdoor Track Relocation | TBD |
| • Owen Hall - Convert back to Student Rooms (requires identification of new locations for remaining academic programs) | $2.6 |
| • Parking Lot 38 (Erickson) | $1.9 |
| • Parking Lot 46 (Integrated Plant Sciences) | $1.5 |
| • Plant and Environmental Sciences - Renovate Existing Plant Biology Building Research, Teaching and Learning | $83.6-$104.5 |
| • Student Services Building - Renovate for Student Support - First Floor Career Services Area | $2.2 - $3.3 |
| • Tennis Courts - New/Relocation to outside of Tennis Building | TBD |

| | |
|---|---|
| • Transportation Services - Relocation | $24.1 - $26.5 |
| • 195 Crescent Road - Limited modifications to 1st and 2nd floors for IT Services space consolidation | $1.2 |

**New Construction - New Building**

| | |
|---|---|
| • Chemical Waste Facility - New Construction | $36.2 |
| • Health/Clinical Sci. Simulation Facility (multi-college) -Teaching/Learning, Rsch., Outreach | TBD |
| • Health Education Building - Teaching and Learning and Academic Support - Renovations and/or New Construction (East Lansing) | TBD |
| • MSU Health Care - Medical Services Building | TBD |
| • MSU, Henry Ford Health System Partnership - New Research Building (Detroit) - Long-term Lease | TBD |
| **Major Systems Maintenance & Utilities (Alphabetical Order)** | |
| • Capital Renewal (5-Year need, $35.0 annually) | $175.0 |
| • Regional Chilled Water Plant - Convert to Electric Chillers | TBD |
| • Utilities (5-year) – Power Plant Modernization | |
| ○ Battery Energy Storage System | $2.2 |
| ○ Combustion Turbine/Heat Recovery Steam Generator/Steam Turbine (Part 1/2 - demolition) | $20.0 |
| ○ Combustion Turbine/Heat Recovery Steam Generator/Steam Turbine (Part 2/2 - design/construction) | $40.0 |
| ○ East Cooling Tower Replacement | $9.0 |
| ○ Electrical Centrifugal Chillers – 8,400 tons | TBD |
| ○ Package Boiler | $20.0 |
| ○ RICE Engine | $16.0 |
| ○ Unit 4 Boiler Fluidized Bed Conversion | $10.0 |
| ○ #2 Steam Turbine Generator Stator Rewind | $2.5 |

| **Section II: Projects in Active Planning or In Process/Funding from Other Resources** | |
|---|---|
| **Projects Authorized by the Board of Trustees for Construction (Arranged Alphabetically)** | |
| • 20MW Solar Array Installation (material change to the landscape and long-term lease) | $2.3 |
| • Anthony Hall Fire Suppression and Fire Alarm Upgrades | $3.5 |
| • Chemistry - Replace Domestic Cold Water Service Ph. 1 | $1.2 |
| • Flint Journal Building - CHM Expansion (lease/build-out) | $25.0 |
| • Football Building - Renovation and Additions - Program Support | $67.0 |
| • FRIB – Renovations to First Floor Lobby and Restrooms & Control Room | $4.6 |
| • Giltner Hall - Replace Elevators | $1.3 |
| • Greenhouse Improvements - Drainage, Environmental Controls, Lighting | $4.0 |
| • Hannah Administration - Alterations to Third Floor (selected area - on hold due to COVID, anticipate 2023 restart) | $3.8 |

| | |
|---|---|
| • Hannah Administration - Upgrade PCB Transformers and Electrical Equipment | $3.0 |
| • Hidden Lake Gardens - Observation Tower and Tree Canopy Walk | $1.3 |
| • Human Ecology - Building Envelope Restoration | $1.2 |
| • Library - West Wing HVAC Zone Level Upgrade | $1.8 |
| • Library - West Wing HVAC Ph. 2 and Hydronic Pump VFDs | $1.0 |
| • Packaging Building - Addition and Renovations - Teaching and Learning, Research | $10.9 |
| • Spartan Child Development - Replace Boilers and Ventilators | $2.0 |
| • Steam Distribution - Major Structural Repairs | $1.0 |
| • Steam Distribution - Various Structural Repairs to Vaults and Tunnels | $1.6 |
| • Student Services - Replace Elevators 1 and 2 | $1.2 |
| • Swine Teaching and Research Center Addition - (Footprint Change) | $1.0 |
| • Utilities – Power Plant Modernization | |
| ○ Medium Pressure Steam Boiler | $17.8 |
| ○ Reciprocating Internal Combustion Engines (RICE) | $47.0 |
| • Veterinary Diagnostic Laboratory - Replace Phoenix Controls | $2.0 |
| • Veterinary Medical Center - HVAC replacement and Programmatic Renovations | $11.3 |
| • Water Distribution - replace deteriorating cast iron distribution mains | $1.5 |
| | |
| **Projects Authorized for Planning (In Design, Arranged Alphabetically)** | |
| ▪ Biomedical Animal Resources - Provision for Large Animal - Imaging (NIH grant) | $7.2 |
| ▪ Broad Art Museum - Retrofit Lower Level to Visible Storage Gallery | $1.0 |
| ▪ Chemistry - Research Laboratory Renovations - Food Safety Toxicology Building | $1.8 |
| ▪ Chemistry - Research Laboratory Renovations (STEM and ISTB related backfill) | $6.0M - $8.0M |
| • Dairy Facility - Research and Teaching and Learning - Accreditation - New Construction | $40.0 - $50.0 |
| • Engineering and Digital Innovation Building - New Construction - Research Support and Expansion | $250.0 |
| • Farm Lane Infrastructure and Mobility Upgrades including Bridge Replacement | |
| ○ Bridge Replacement and Adjacent Approaches (Ph. 1) | $20.0 |
| ○ North of bridge to Auditorium Road (Ph. 2) | $21.4 - $26.6 |
| ○ South of bridge to Wilson Road (Ph. 3) | |
| • Greenhouses - Renovation of Existing and Addition - Research Expansion and Learning | $23.0 |
| • Intramural Facilities - New Construction, Additions and/or Renovations | $164.0 |
| • Library Improvements - Special Collections - Renovate Space on Third Floor | $5.0-$6.0 |
| • Library – West Wing HVAC Zone Level Upgrade | $1.8 |
| • Kellogg Biological Station - Bird Sanctuary Renovation (on hold) | $2.5 – 3.5 |
| • Multicultural Center - New Construction or Addition and/or Renovation (Sept. BOT request Authorization to Plan) | $34.0 |
| • MSU Museum - Infrastructure Improvements - Accreditation | $24.5 |
| • Plant and Environmental Sciences - Research, Teaching and Learning - New Construction | $100.0-$150.0 |

| | |
|---|---|
| • Service Rd and Service/Bogue Intersection Reconstruction | $3.0 |
| • Spartan Stadium - Concourse and Infrastructure Renewal | TBD |
| • Utilities - Power Plant Modernization | |
| ○ Replace U3 Steam Turbine Steam Path | $3.0 |
| ○ TB Simon Power Plant - Install Reverse Osmosis | $1.0 |
| ○ Unit 4 Steam Turbine Generator Rewind | $2.5 |

Addressing the above projects is extremely important to the effectiveness of the academic programs and to the operational efficiency of the institution. Funding these projects is consistent with the university's commitment to responsible stewardship of critical state resources. The investment ensures the capital infrastructure to carry out MSU's commitment to intellectual leadership in developing new knowledge for students and the public in measurable ways.

## VI. Capital Outlay Planning

The capital planning priorities support programs that have strong national reputations, expanding research bases, and high enrollment demand that will sustain the university and increase its contributions to Michigan. Funding of these requests provides economic development in the state, now and in the long term.

### Renovations and additions

Renovations and/or additions address extensive programmatic and maintenance improvements required by buildings previously funded by the state. The improvements are necessary to reconfigure and or expand space to support the work of the programs housed in those facilities, to 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 include the plant sciences, biomedical and biological sciences, water and energy, and the arts.

### 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 engineering sciences, computation and data sciences and data analytics, biomedical, and health sciences education.

### Major systems replacement

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 negative impacts on other programs. The university seeks funding for 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 drives exploration and innovation while empowering excellence, advancing equity, and expanding impact. MSU uses its facilities to attract top students, faculty and staff and routinely receives more than $600 million in sponsored awards annually with research expenditures of $713.2 million in 2021. The university and its scholars excel in food systems, plant sciences, health sciences, computational sciences, and population and the environment, including food, water, and energy. MSU's programmatic investments complement student success goals to provide an inclusive, equitable curriculum and environment with the academic, social, wellness and financial support that enables all students to learn, thrive, persist, graduate and succeed after graduation.

More than 90% of MSU's graduates are employed or continuing their education within nine months of graduation. Among employed graduates in 2021, 62% remained in Michigan with an additional 15% employed in states in the region.

Michigan State University creates annual economic impact of more than $5.8 billion and instills an entrepreneurial and high-performance mindset in its students, faculty, and staff.

MSU works collaboratively in the cities of Flint, Detroit, and Grand Rapids to provide expertise and a network of resources in education, food, water, health, and sustainability. MSU Extension's presence extends to all 83 Michigan counties, sharing resources and expertise to advance the state and its economy. Agribusiness is Michigan's second largest industry. MSU AgBioResearch and MSU Extension contribute research, educational programs, and expertise to boost economic development and growth in agriculture, natural resources, community vitality, entrepreneurship, and career preparation for young people.

MSU's strategic plan guides investment in areas of established and emerging excellence to address global challenges and to meet pressing communities needs in Michigan, in the United States and around the world. MSU advances equity and ethics, to improve the human condition. The university pursues investments in cross-cutting, collaborative, multidisciplinary and partnered solutions and demonstrating respect, responsiveness and inclusiveness. By 2030, we envision a Michigan State University that has significantly expanded opportunity and advanced equity, elevated its excellence in ways that attract vital talent and support, and has a vibrant, caring community.

Fall 2022

# Appendices



## Fiscal Year 2024 Budget Information

5 Year Capital Plan

**Submitted By:**

MICHIGAN STATE UNIVERSITY

Fall 2022

# Appendix A: Mission Statement

Fiscal Year 2024
Budget Information

5 Year Capital Plan

**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 2022

# Appendix B: Campus Land Use Master Plan

## Update February 2017

Fiscal Year 2024
Budget Information

5 Year Capital Plan

Submitted By:

MICHIGAN STATE
UNIVERSITY

# Michigan State University

## Campus Land Use Master Plan: Update 2017

February 2017

# TABLE OF CONTENTS

# 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** |

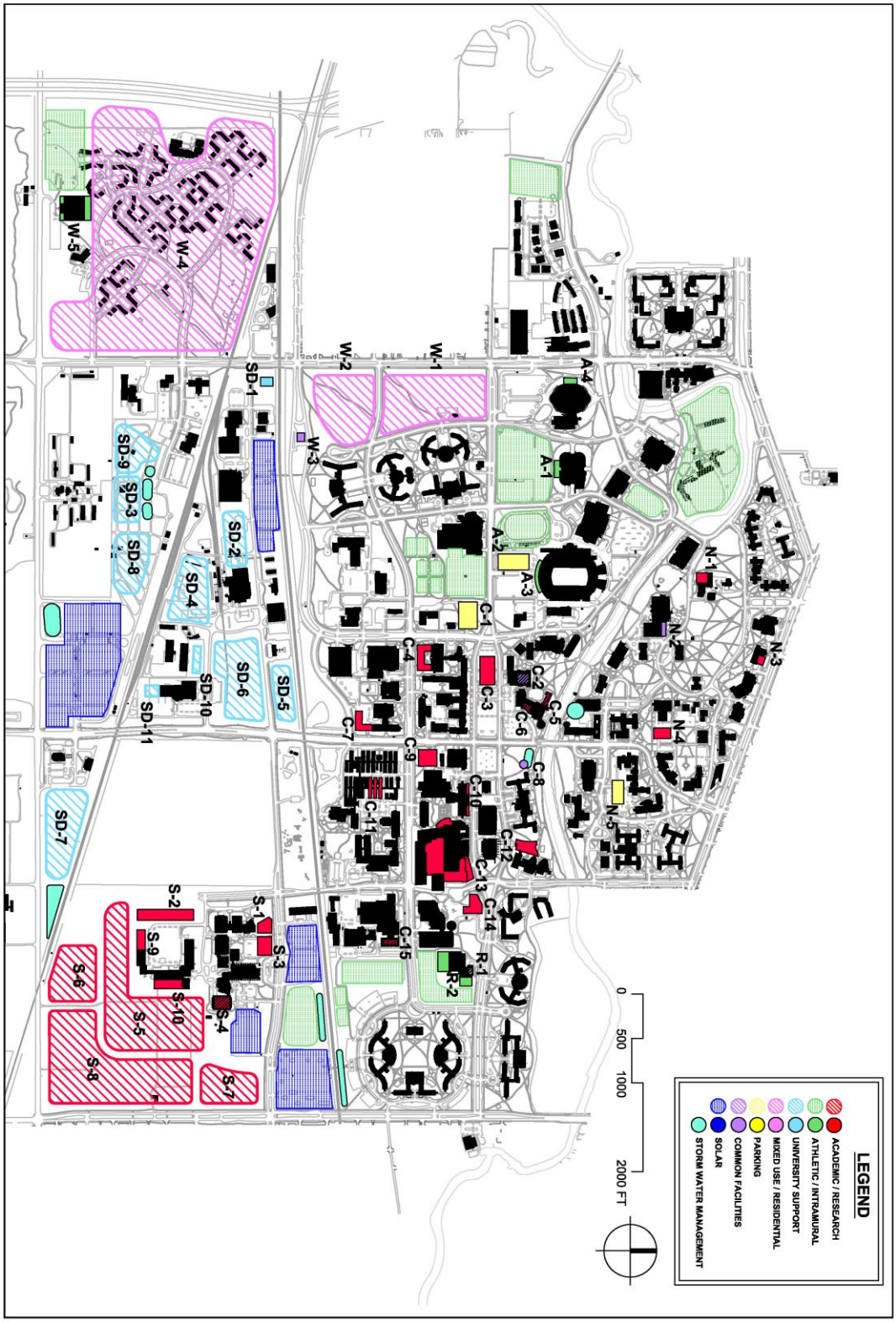
## STRATEGIC LAND ACQUISITION

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.

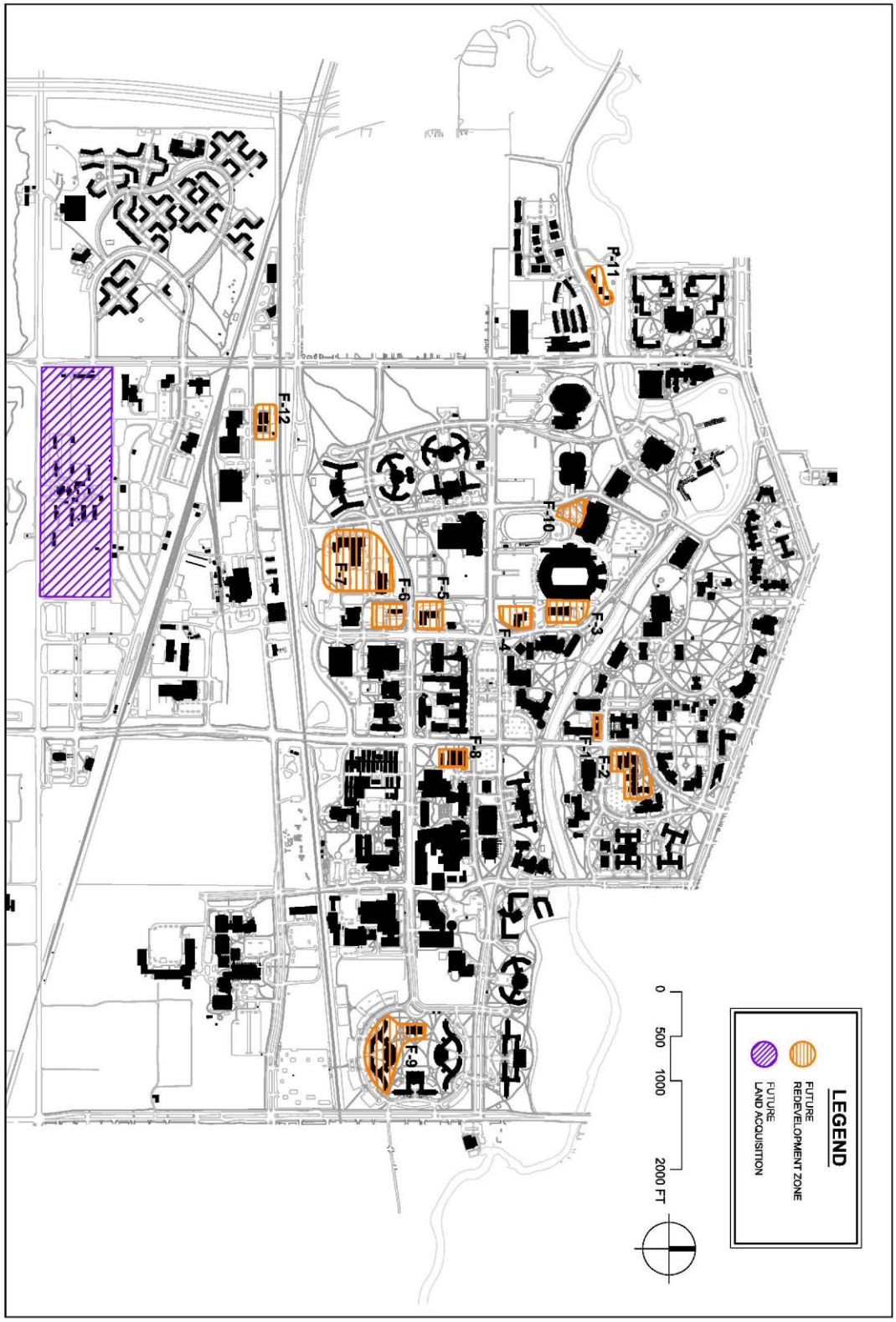
## 100-YEAR FLOODPLAIN AND STORM WATER MANAGEMENT

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

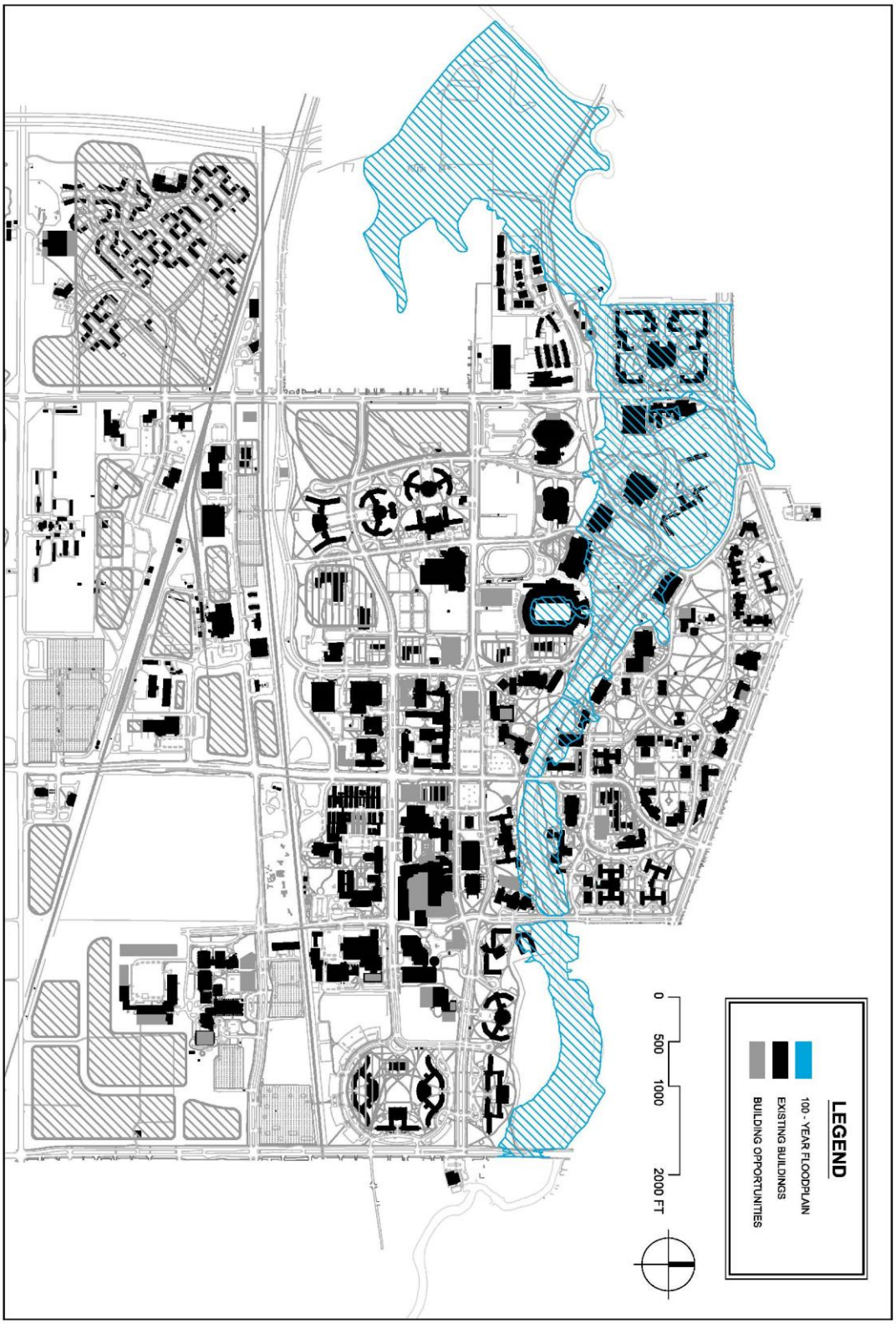
**Campus Master Plan - Update 2016**
**Building Opportunity Framework Plan**
**Updated 12/19/2016**

| 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**

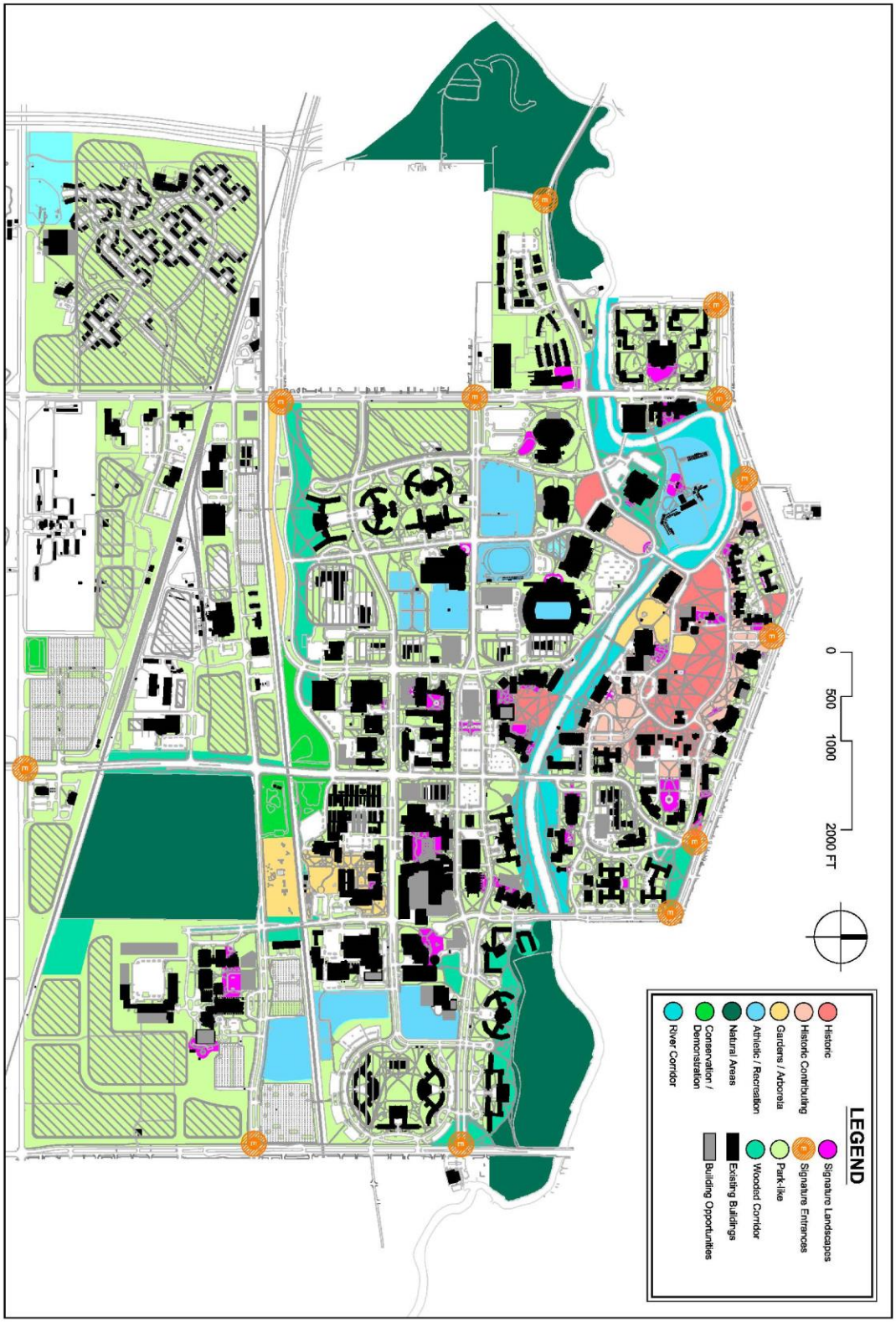
Conservation and demonstration areas are built landscapes for the purpose of storm water management, education, and research. They are actively designed, planted, and managed, requiring a moderate amount of maintenance to ensure integrity of the plantings and operation of the storm water management features.

## Campus Entrances

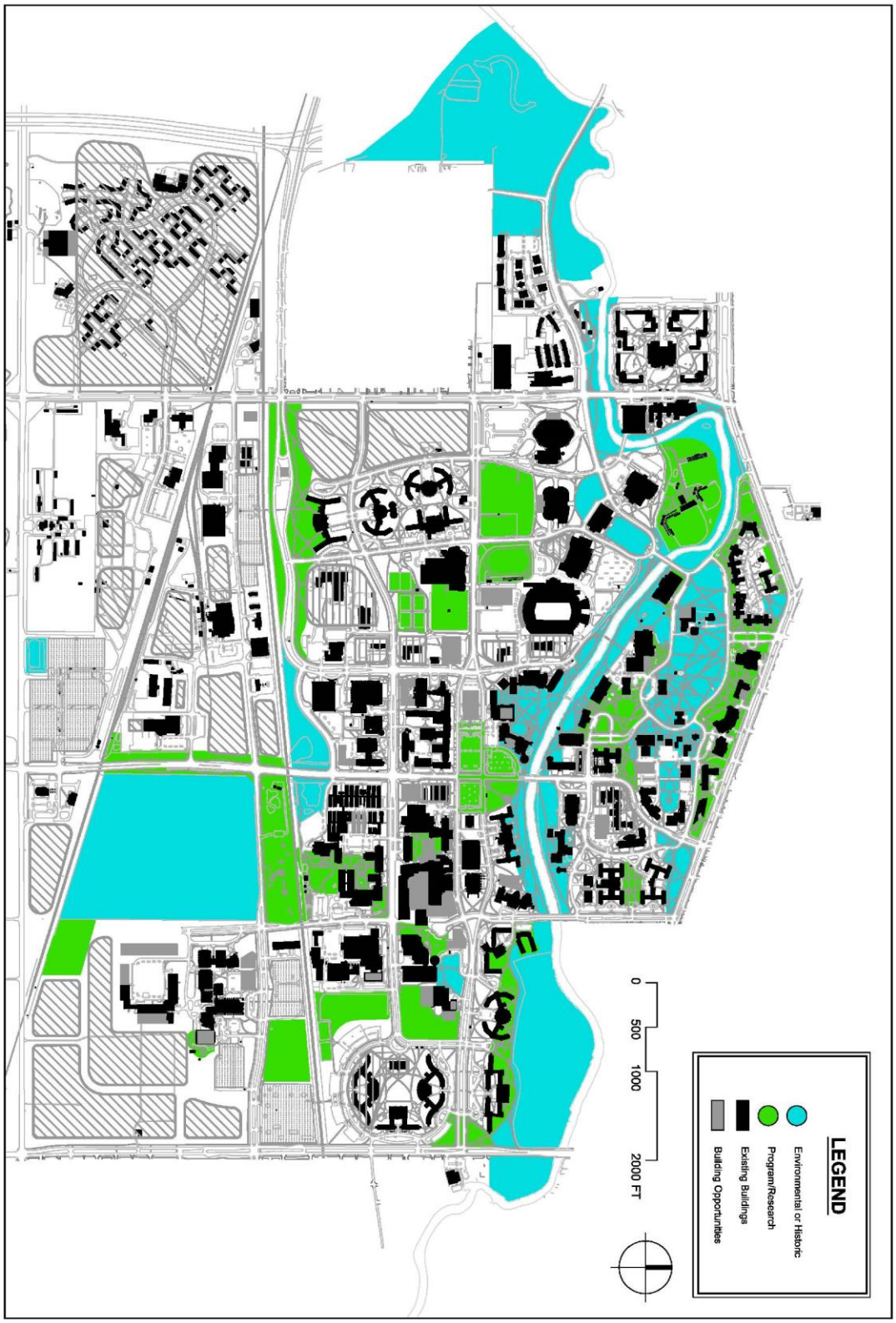
Campus Entrances (vehicular and pedestrian) provide an opportunity to strengthen the University's image and reinforce its reputation for excellence. High quality landscape design and maintenance practices (elite and priority) are required. Consistent signage and a homogeneous landscape treatment are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

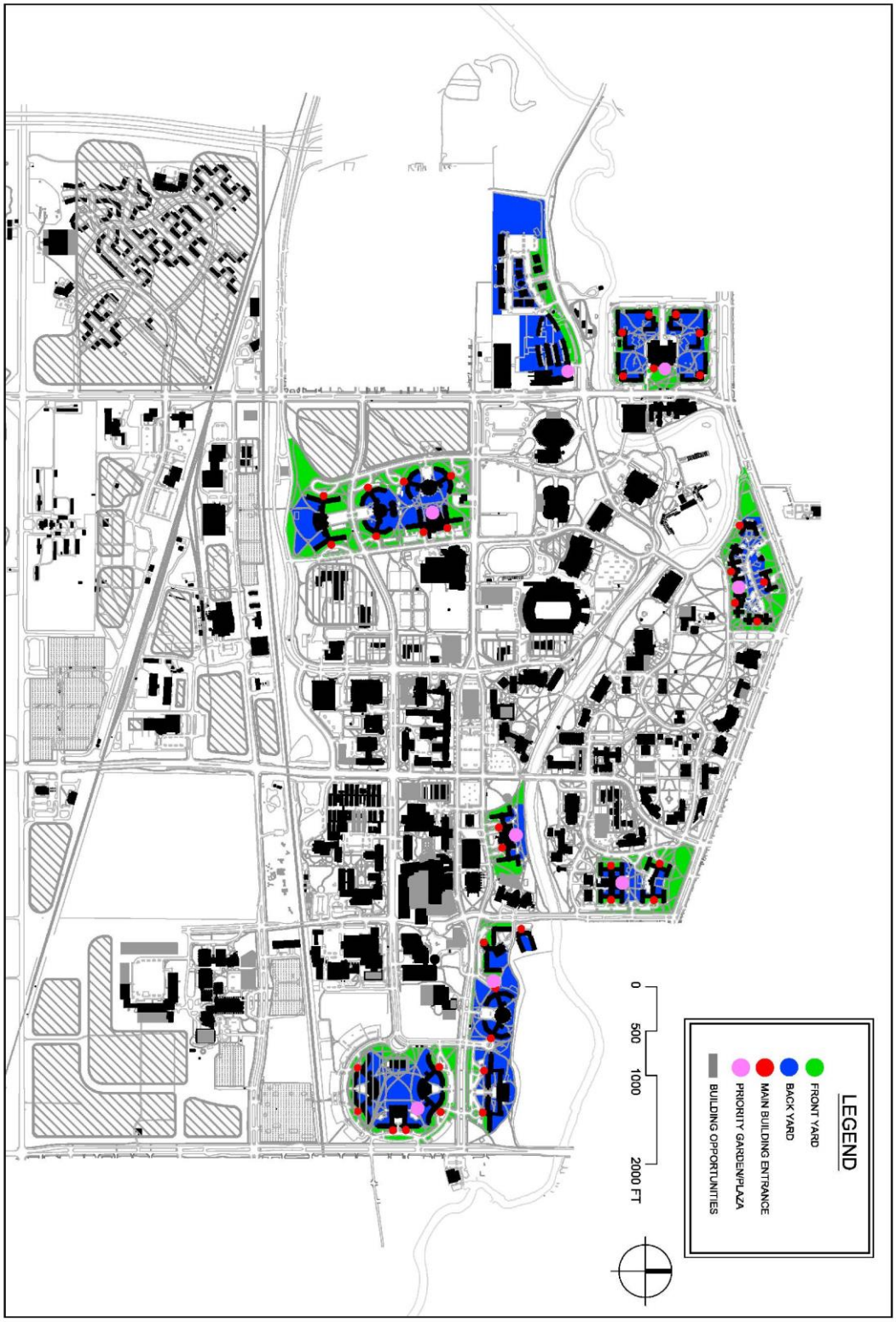



| | | |
|---|---|---|
| 1 OF 1 | OPEN SPACE FRAMEWORK | MICHIGAN STATE UNIVERSITY \| Infrastructure Planning and Facilities |




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

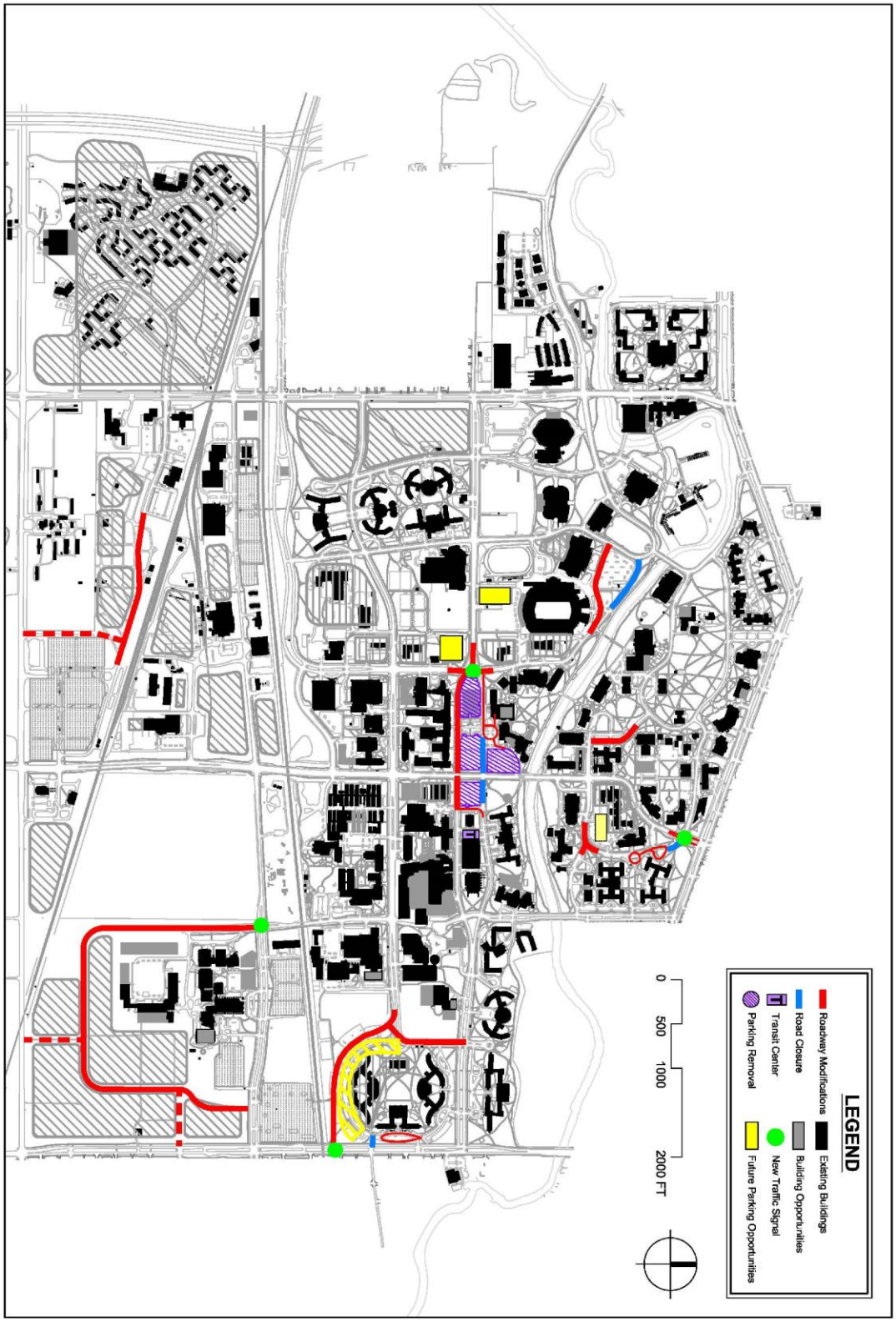
The following non-motorized projects and initiatives are anticipated in the near term (five- to ten-year planning horizon).

- 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**

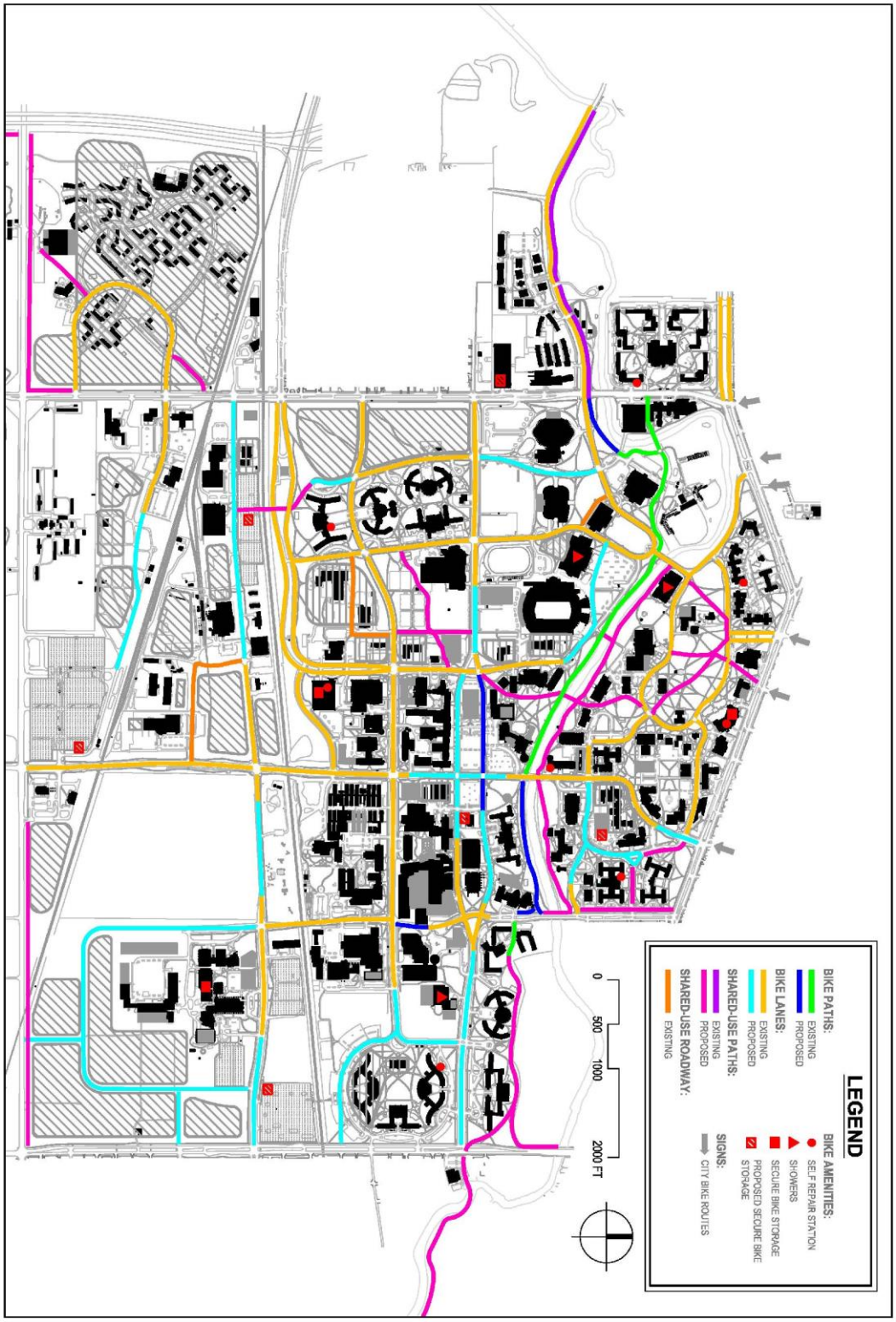
The following projects should be considered in long-range planning to address various non-motorized circulation issues.

- 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

## TABLE OF CONTENTS

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.

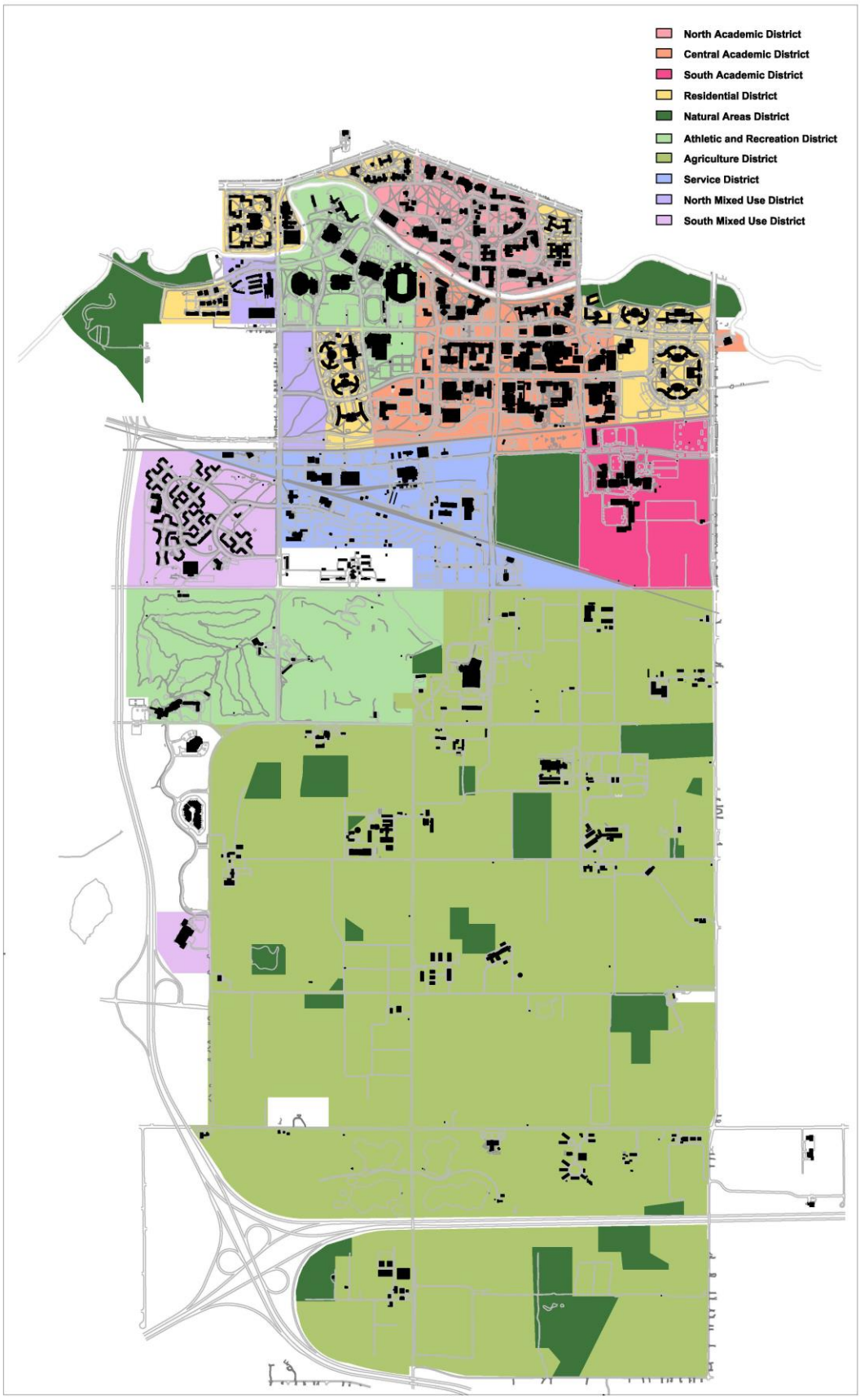
7.1.1.7 Approve the design of all building and site features, modifications, and improvements within Protected Green Space areas when a variance has been authorized.

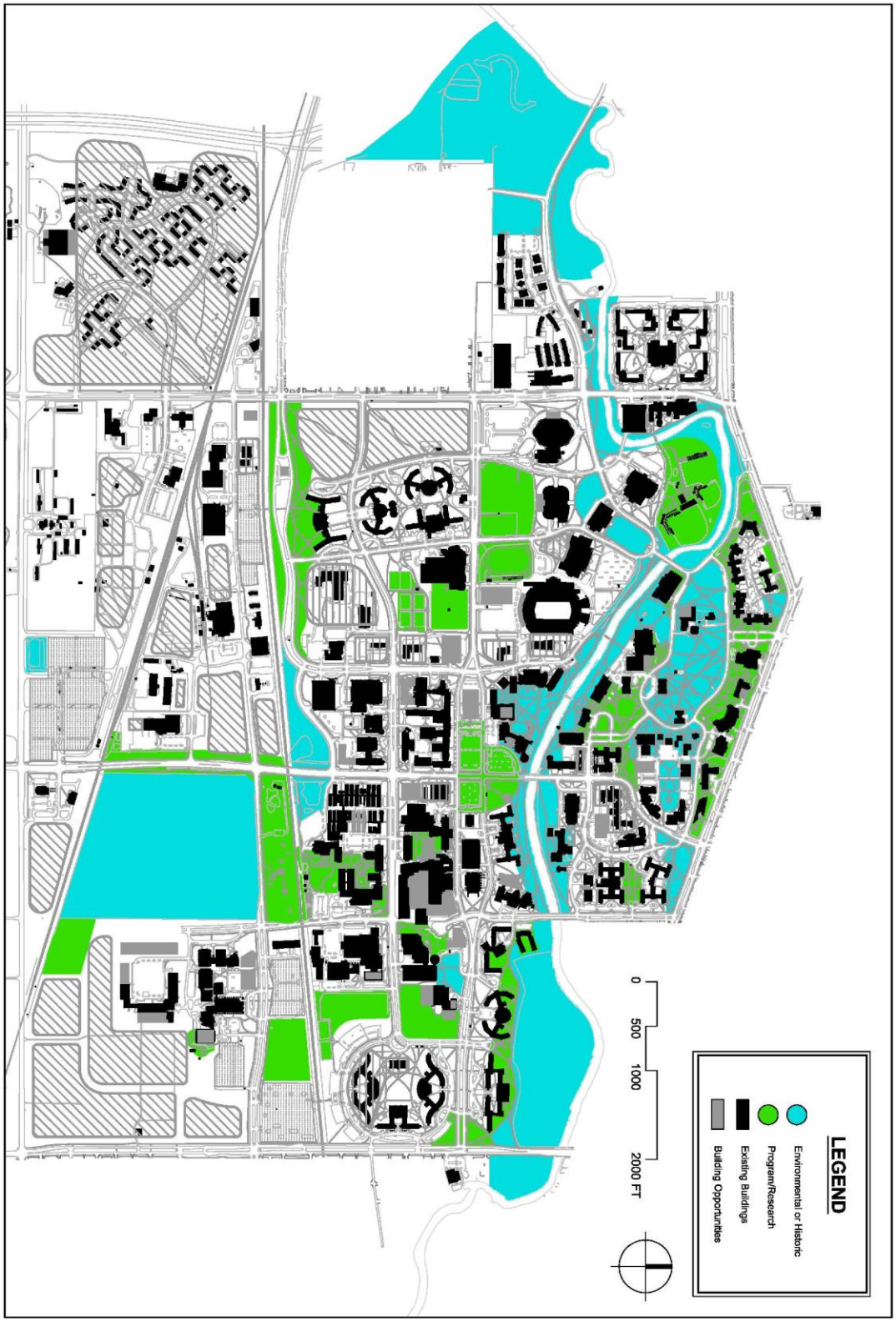
7.1.1.8 Refer any specific request for a variance to the Vice President and Secretary of the Board of Trustees for clarification regarding the need for BOT action.

**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 2022

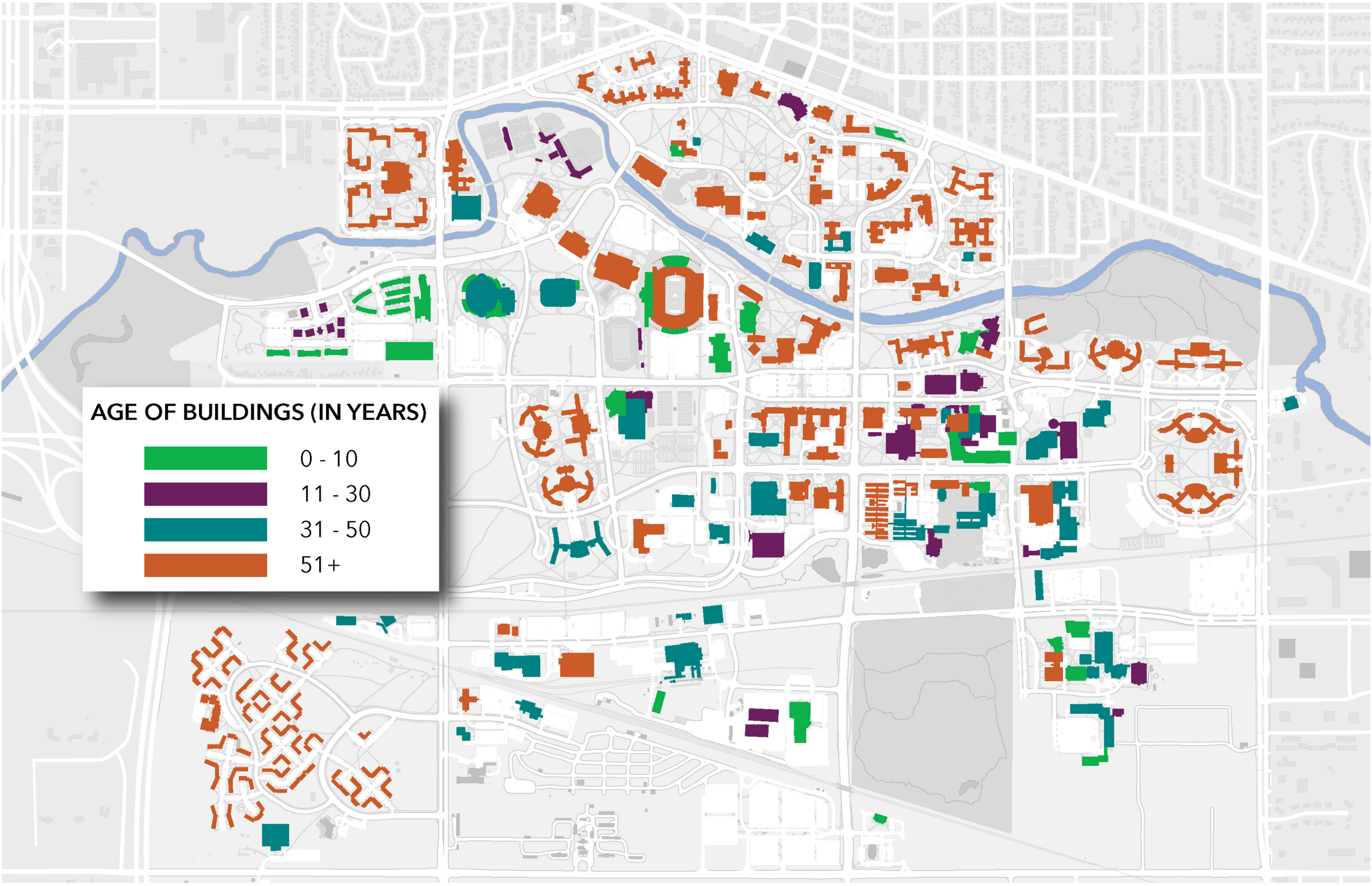
# Appendix C: Buildings by Age

Fiscal Year 2024
Budget Information

5 Year Capital Plan

Submitted By:

MICHIGAN STATE
UNIVERSITY


AGE OF BUILDINGS (IN YEARS)
0 - 10
11 - 30
31 - 50
51+

Fall 2022

# Appendix D: Student Enrollments Fall Semester 2022

Fiscal Year 2024
Budget Information

5 Year Capital Plan

Submitted By:

MICHIGAN STATE
UNIVERSITY

# Fall Semester 2022
# Enrollment Report

# Table of Contents

# Preface

- This report provides historical enrollment related data for the latest term.
- Official enrollment counts for the Fall semester are taken at the quarter of the term.
- Residency in this report is by citizenship and geographic origin at the time of admission.
- MSU and the MSU College of Law fully integrated as of Fall 2020^. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

^ **Note: See https://msutoday.msu.edu/news/2020/college-of-law-completes-full-integration.**

# Total University Enrollment Trend

| Term | MSU |
|---|---|
| Fall 2012 | 49,928 |
| Fall 2013 | 50,335 |
| Fall 2014 | 50,977 |
| Fall 2015 | 51,428 |
| Fall 2016 | 51,195 |
| Fall 2017 | 50,871 |
| Fall 2018 | 51,127 |
| Fall 2019 | 50,578 |
| Fall 2020* | 49,695 |
| Fall 2021 | 49,659 |
| Fall 2022 | 50,023 |

*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# First Time Undergraduate Apps, Admits and Enrollments

| Type | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Applications** | 30,340 | 31,479 | 33,211 | 35,303 | 37,480 | 36,143 | 33,129 | 44,321 | 45,426 | 50,629 | 55,525 |
| Admits | 21,340 | 21,610 | 21,950 | 23,400 | 24,641 | 25,860 | 25,733 | 31,522 | 34,663 | 42,150 | 47,034 |
| Enrollments*** | 8,154 | 7,842 | 7,842 | 7,929 | 7,911 | 8,066 | 8,395 | 8,527 | 8,192 | 9,028 | 9,620 |
| Entering Class**** | 8,201 | 7,887 | 7,883 | 7,967 | 7,950 | 8,108 | 8,442 | 8,570 | 8,228 | 9,065 | 9,676 |
| Admit Ratio | 70.3% | 68.6% | 66.1% | 66.3% | 65.7% | 71.5% | 77.7% | 71.1% | 76.3% | 83.3% | 84.7% |
| Yield | 38.2% | 36.3% | 35.7% | 33.9% | 32.1% | 31.2% | 32.6% | 27.1% | 23.6% | 21.4% | 20.5% |

** Note: Applications beginning in 2019 reflect first time use of the Common App (see https://www.commonapp.org).

*** Note: Enrollments are First Time in the Fall semester.

****Note: Entering Class are First Time in the Fall semester plus those that began in the preceding Summer session.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Honors College Enrollment

## Degree-seeking Undergraduates***

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| New Honors | 531 | 528 | 610 | 648 | 667 | 641 | 724 | 678 | 606 | 678 | 815 |
| % of Entering Class | 6.5% | 6.7% | 7.7% | 8.1% | 8.4% | 7.9% | 8.6% | 7.9% | 7.4% | 7.5% | 8.4% |
| Total Honors | 2,793 | 2,912 | 3,174 | 3,639 | 3,686 | 3,757 | 4,002 | 3,947 | 4,230 | 4,363 | 4,458 |
| % of Undergraduate | 7.5% | 7.7% | 8.2% | 9.3% | 9.4% | 9.6% | 10.2% | 10.1% | 11.0% | 11.5% | 11.5% |
| New Academic Scholars** | 166 | 186 | 198 | 199 | 186 | 94 | 148 | 176 | 159 | 147 | 152 |
| % of Entering Class | 2.0% | 2.4% | 2.5% | 2.5% | 2.3% | 1.2% | 1.8% | 2.1% | 1.9% | 1.6% | 1.6% |
| Entering Class | 8,201 | 7,887 | 7,883 | 7,967 | 7,950 | 8,108 | 8,442 | 8,570 | 8,228 | 9,065 | 9,676 |
| Undergraduate | 37,454 | 37,988 | 38,786 | 39,143 | 39,085 | 38,996 | 39,423 | 39,176 | 38,491 | 38,090 | 38,700 |

** Note: The criteria for inclusion in the Academic Scholars Program was changed in 2017 resulting in a short-term decrease in the number of new members.
*** Note: Data includes only degree-seeking Bachelor's students.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Entering Class by Race/Ethnicity

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hispanic/Latinx (of any race) | 290 | 304 | 355 | 373 | 341 | 399 | 480 | 515 | 525 | 600 | 600 |
| Two or more races | 199 | 213 | 256 | 238 | 266 | 252 | 276 | 317 | 324 | 326 | 478 |
| African American/Black | 511 | 590 | 608 | 656 | 619 | 634 | 699 | 610 | 601 | 571 | 549 |
| Asian | 335 | 380 | 369 | 417 | 451 | 451 | 560 | 608 | 685 | 810 | 826 |
| Hawaiian/Pacific Islander | 8 | 3 | 9 | 3 | 7 | 4 | 3 | 3 | 3 | 7 | 4 |
| American Indian/Alaska Native | 12 | 13 | 16 | 18 | 16 | 11 | 14 | 14 | 17 | 14 | 29 |
| Total Students of color | 1,355 | 1,503 | 1,613 | 1,705 | 1,700 | 1,751 | 2,032 | 2,067 | 2,155 | 2,328 | 2,486 |
| Other/Unknown/Blank | 89 | 58 | 42 | 42 | 40 | 32 | 41 | 170 | 175 | 368 | 138 |
| White | 5,509 | 5,022 | 5,043 | 5,204 | 5,130 | 5,344 | 5,655 | 5,677 | 5,524 | 5,945 | 6,350 |
| Domestic Total | 6,953 | 6,583 | 6,698 | 6,951 | 6,870 | 7,127 | 7,728 | 7,914 | 7,854 | 8,641 | 8,974 |
| International | 1,248 | 1,304 | 1,185 | 1,016 | 1,080 | 981 | 714 | 656 | 374 | 424 | 702 |
| Total | 8,201 | 7,887 | 7,883 | 7,967 | 7,950 | 8,108 | 8,442 | 8,570 | 8,228 | 9,065 | 9,676 |
| PERCENT BY DOMESTIC | | | | | | | | | | | |
| Total Students of Color | 19.5% | 22.8% | 24.1% | 24.5% | 24.7% | 24.6% | 26.3% | 26.1% | 27.4% | 26.9% | 27.7% |
| Other/Unknown/Blank | 1.3% | 0.9% | 0.6% | 0.6% | 0.6% | 0.4% | 0.5% | 2.1% | 2.2% | 4.3% | 1.5% |
| White | 79.2% | 76.3% | 75.3% | 74.9% | 74.7% | 75.0% | 73.2% | 71.7% | 70.3% | 68.8% | 70.8% |
| PERCENT BY TOTAL | | | | | | | | | | | |
| Total Students of Color | 16.5% | 19.1% | 20.5% | 21.4% | 21.4% | 21.6% | 24.1% | 24.1% | 26.2% | 25.7% | 25.7% |
| Other/Unknown/Blank | 1.1% | 0.7% | 0.5% | 0.5% | 0.5% | 0.4% | 0.5% | 2.0% | 2.1% | 4.1% | 1.4% |
| White | 67.2% | 63.7% | 64.0% | 65.3% | 64.5% | 65.9% | 67.0% | 66.2% | 67.1% | 65.6% | 65.6% |
| International | 15.2% | 16.5% | 15.0% | 12.8% | 13.6% | 12.1% | 8.5% | 7.7% | 4.5% | 4.7% | 7.3% |



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Entering Class** Enrollment

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 4,236 | 4,082 | 4,148 | 4,265 | 4,179 | 4,195 | 4,415 | 4,428 | 4,453 | 4,852 | 5,036 |
| % of Total | 51.7% | 51.8% | 52.6% | 53.5% | 52.6% | 51.7% | 52.3% | 51.7% | 54.1% | 53.5% | 52.0% |
| Michigan | 5,990 | 5,622 | 5,593 | 5,742 | 5,526 | 5,859 | 6,508 | 6,435 | 6,528 | 6,952 | 6,782 |
| % of Total | 73.0% | 71.3% | 71.0% | 72.1% | 69.5% | 72.3% | 77.1% | 75.1% | 79.3% | 76.7% | 70.1% |
| U.S. Non-Mich | 963 | 961 | 1,105 | 1,209 | 1,344 | 1,268 | 1,220 | 1,479 | 1,326 | 1,689 | 2,192 |
| % of Total | 11.7% | 12.2% | 14.0% | 15.2% | 16.9% | 15.6% | 14.5% | 17.3% | 16.1% | 18.6% | 22.7% |
| International | 1,248 | 1,304 | 1,185 | 1,016 | 1,080 | 981 | 714 | 656 | 374 | 424 | 702 |
| % of Total | 15.2% | 16.5% | 15.0% | 12.8% | 13.6% | 12.1% | 8.5% | 7.7% | 4.5% | 4.7% | 7.3% |
| Total | 8,201 | 7,887 | 7,883 | 7,967 | 7,950 | 8,108 | 8,442 | 8,570 | 8,228 | 9,065 | 9,676 |

** Note: Entering Class are First Time in the Fall semester plus those that began in the preceding Summer session.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# New Transfer Enrollment

| Group | 2012 | 2013 | 2014** | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 705 | 729 | 777 | 818 | 801 | 821 | 766 | 597 | 632 | 634 | 714 |
| % of Total | 48.7% | 48.2% | 46.6% | 49.0% | 48.8% | 49.2% | 48.2% | 47.2% | 50.4% | 49.7% | 51.8% |
| Michigan | 1,287 | 1,319 | 1,495 | 1,532 | 1,509 | 1,505 | 1,480 | 1,161 | 1,165 | 1,152 | 1,253 |
| % of Total | 88.8% | 87.2% | 89.6% | 91.7% | 92.0% | 90.2% | 93.1% | 91.7% | 93.0% | 90.3% | 90.9% |
| U.S. Non-Mich | 36 | 55 | 66 | 77 | 70 | 67 | 81 | 78 | 62 | 107 | 99 |
| % of Total | 2.5% | 3.6% | 4.0% | 4.6% | 4.3% | 4.0% | 5.1% | 6.2% | 4.9% | 8.4% | 7.2% |
| International | 126 | 139 | 107 | 61 | 61 | 97 | 29 | 27 | 26 | 17 | 26 |
| % of Total | 8.7% | 9.2% | 6.4% | 3.7% | 3.7% | 5.8% | 1.8% | 2.1% | 2.1% | 1.3% | 1.9% |
| Total | 1,449 | 1,513 | 1,668 | 1,670 | 1,640 | 1,669 | 1,590 | 1,266 | 1,253 | 1,276 | 1,378 |

** Note: Beginning Fall, 2014, the methodology for counting transfer students changed to better align with IPEDS federal reporting. New transfer student headcounts will now include Fall semester plus the preceding Summer session.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Entering Undergraduate** Enrollment

| Group | 2012 | 2013 | 2014*** | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 4,941 | 4,811 | 4,925 | 5,083 | 4,980 | 5,016 | 5,131 | 5,025 | 5,085 | 5,486 | 5,750 |
| % of Total | 51.2% | 51.2% | 51.6% | 52.7% | 51.9% | 51.3% | 51.1% | 51.1% | 53.6% | 53.1% | 52.0% |
| Michigan | 7,277 | 6,941 | 7,088 | 7,274 | 7,035 | 7,364 | 7,988 | 7,596 | 7,693 | 8,104 | 8,035 |
| % of Total | 75.4% | 73.8% | 74.2% | 75.5% | 73.4% | 75.3% | 79.6% | 77.2% | 81.1% | 78.4% | 72.7% |
| U.S. Non-Mich | 999 | 1,016 | 1,171 | 1,286 | 1,414 | 1,335 | 1,301 | 1,557 | 1,388 | 1,796 | 2,291 |
| % of Total | 10.4% | 10.8% | 12.3% | 13.3% | 14.7% | 13.7% | 13.0% | 15.8% | 14.6% | 17.4% | 20.7% |
| International | 1,374 | 1,443 | 1,292 | 1,077 | 1,141 | 1,078 | 743 | 683 | 400 | 441 | 728 |
| % of Total | 14.2% | 15.4% | 13.5% | 11.2% | 11.9% | 11.0% | 7.4% | 6.9% | 4.2% | 4.3% | 6.6% |
| Total | 9,650 | 9,400 | 9,551 | 9,637 | 9,590 | 9,777 | 10,032 | 9,836 | 9,481 | 10,341 | 11,054 |

** Note: Entering Undergraduates include the Entering Class (Summer and First-Time Fall) and Transfers.

*** Note: Beginning Fall, 2014, the methodology for counting transfer students changed to better align with IPEDS federal reporting. New transfer student headcounts will now include Fall semester plus the preceding Summer session.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Undergraduate Enrollment by Race/Ethnicity

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hispanic/Latinx (of any race) | 1,319 | 1,357 | 1,475 | 1,573 | 1,629 | 1,704 | 1,888 | 2,009 | 2,166 | 2,352 | 2,358 |
| Two or more races | 777 | 904 | 1,032 | 1,075 | 1,155 | 1,203 | 1,268 | 1,302 | 1,393 | 1,417 | 1,593 |
| African American/Black | 2,514 | 2,538 | 2,594 | 2,700 | 2,724 | 2,841 | 2,930 | 2,905 | 2,947 | 2,802 | 2,590 |
| Asian | 1,551 | 1,606 | 1,679 | 1,816 | 1,946 | 2,040 | 2,237 | 2,386 | 2,577 | 2,818 | 3,044 |
| Hawaiian/Pacific Islander | 26 | 22 | 31 | 30 | 36 | 32 | 32 | 27 | 19 | 23 | 26 |
| American Indian/Alaska Native | 100 | 83 | 80 | 87 | 88 | 75 | 71 | 71 | 75 | 67 | 93 |
| Total Students of color | 6,287 | 6,510 | 6,891 | 7,281 | 7,578 | 7,895 | 8,426 | 8,700 | 9,177 | 9,479 | 9,704 |
| Other/Unknown/Blank | 476 | 418 | 382 | 363 | 330 | 284 | 266 | 373 | 479 | 797 | 857 |
| White | 26,437 | 26,262 | 26,207 | 26,231 | 26,169 | 26,201 | 26,714 | 26,502 | 26,179 | 26,078 | 26,300 |
| Domestic Total | 33,200 | 33,190 | 33,480 | 33,875 | 34,077 | 34,380 | 35,406 | 35,575 | 35,835 | 36,354 | 36,861 |
| International | 4,254 | 4,798 | 5,306 | 5,268 | 5,008 | 4,616 | 4,017 | 3,601 | 2,656 | 2,220 | 2,340 |
| Total | 37,454 | 37,988 | 38,786 | 39,143 | 39,085 | 38,996 | 39,423 | 39,176 | 38,491 | 38,574 | 39,201 |
| PERCENT BY DOMESTIC | | | | | | | | | | | |
| Total Students of Color | 18.9% | 19.6% | 20.6% | 21.5% | 22.2% | 23.0% | 23.8% | 24.5% | 25.6% | 26.1% | 26.3% |
| Other/Unknown/Blank | 1.4% | 1.3% | 1.1% | 1.1% | 1.0% | 0.8% | 0.8% | 1.0% | 1.3% | 2.2% | 2.3% |
| White | 79.6% | 79.1% | 78.3% | 77.4% | 76.8% | 76.2% | 75.5% | 74.5% | 73.1% | 71.7% | 71.3% |
| PERCENT BY TOTAL | | | | | | | | | | | |
| Total Students of Color | 16.8% | 17.1% | 17.8% | 18.6% | 19.4% | 20.2% | 21.4% | 22.2% | 23.8% | 24.6% | 24.8% |
| Other/Unknown/Blank | 1.3% | 1.1% | 1.0% | 0.9% | 0.8% | 0.7% | 0.7% | 1.0% | 1.2% | 2.1% | 2.2% |
| White | 70.6% | 69.1% | 67.6% | 67.0% | 67.0% | 67.2% | 67.8% | 67.6% | 68.0% | 67.6% | 67.1% |
| International | 11.4% | 12.6% | 13.7% | 13.5% | 12.8% | 11.8% | 10.2% | 9.2% | 6.9% | 5.8% | 6.0% |



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Undergraduate Enrollment

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 18,763 | 19,064 | 19,468 | 19,728 | 19,778 | 19,704 | 19,985 | 19,824 | 19,760 | 19,906 | 20,257 |
| % of Total | 50.1% | 50.2% | 50.2% | 50.4% | 50.6% | 50.5% | 50.7% | 50.6% | 51.3% | 51.6% | 51.7% |
| Michigan | 30,053 | 29,864 | 29,768 | 29,751 | 29,509 | 29,546 | 30,521 | 30,464 | 30,799 | 30,786 | 30,491 |
| % of Total | 80.2% | 78.6% | 76.7% | 76.0% | 75.5% | 75.8% | 77.4% | 77.8% | 80.0% | 79.8% | 77.8% |
| U.S. Non-Mich | 3,147 | 3,326 | 3,712 | 4,124 | 4,568 | 4,834 | 4,885 | 5,111 | 5,036 | 5,568 | 6,370 |
| % of Total | 8.4% | 8.8% | 9.6% | 10.5% | 11.7% | 12.4% | 12.4% | 13.0% | 13.1% | 14.4% | 16.2% |
| International | 4,254 | 4,798 | 5,306 | 5,268 | 5,008 | 4,616 | 4,017 | 3,601 | 2,656 | 2,220 | 2,340 |
| % of Total | 11.4% | 12.6% | 13.7% | 13.5% | 12.8% | 11.8% | 10.2% | 9.2% | 6.9% | 5.8% | 6.0% |
| Total | 37,454 | 37,988 | 38,786 | 39,143 | 39,085 | 38,996 | 39,423 | 39,176 | 38,491 | 38,574 | 39,201 |



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# New Graduate** Enrollment

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 1,032 | 980 | 945 | 978 | 976 | 1,005 | 954 | 1,010 | 1,019 | 1,017 | 984 |
| % of Total | 55.9% | 55.1% | 54.1% | 54.9% | 55.3% | 54.2% | 56.1% | 54.7% | 56.5% | 55.4% | 55.0% |
| Michigan | 820 | 779 | 755 | 742 | 748 | 772 | 705 | 846 | 919 | 879 | 851 |
| % of Total | 44.4% | 43.8% | 43.2% | 41.6% | 42.4% | 41.7% | 41.4% | 45.8% | 51.0% | 47.9% | 47.6% |
| U.S. Non-Mich | 498 | 452 | 540 | 579 | 550 | 603 | 582 | 581 | 607 | 551 | 487 |
| % of Total | 27.0% | 25.4% | 30.9% | 32.5% | 31.1% | 32.5% | 34.2% | 31.4% | 33.7% | 30.0% | 27.2% |
| International | 529 | 546 | 451 | 461 | 468 | 478 | 414 | 421 | 277 | 406 | 451 |
| % of Total | 28.6% | 30.7% | 25.8% | 25.9% | 26.5% | 25.8% | 24.3% | 22.8% | 15.4% | 22.1% | 25.2% |
| Total | 1,847 | 1,777 | 1,746 | 1,782 | 1,766 | 1,853 | 1,701 | 1,848 | 1,803 | 1,836 | 1,789 |

** Note: Data includes only new degree-seeking Master's and Doctoral students.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# New Graduate Professional Enrollment

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 478 | 461 | 458 | 478 | 470 | 479 | 472 | 486 | 447 | 498 | 469 |
| % of Total | 49.8% | 50.6% | 51.2% | 52.5% | 53.5% | 56.0% | 57.6% | 57.5% | 56.3% | 59.1% | 60.7% |
| Michigan | 664 | 669 | 660 | 617 | 627 | 600 | 591 | 613 | 590 | 537 | 521 |
| % of Total | 69.2% | 73.4% | 73.8% | 67.7% | 71.3% | 70.1% | 72.1% | 72.5% | 74.3% | 63.8% | 67.4% |
| U.S. Non-Mich | 247 | 204 | 184 | 241 | 214 | 217 | 198 | 211 | 188 | 278 | 222 |
| % of Total | 25.8% | 22.4% | 20.6% | 26.5% | 24.3% | 25.4% | 24.1% | 25.0% | 23.7% | 33.0% | 28.7% |
| International | 48 | 38 | 50 | 53 | 38 | 39 | 31 | 21 | 16 | 27 | 30 |
| % of Total | 5.0% | 4.2% | 5.6% | 5.8% | 4.3% | 4.6% | 3.8% | 2.5% | 2.0% | 3.2% | 3.9% |
| Total | 959 | 911 | 894 | 911 | 879 | 856 | 820 | 845 | 794 | 842 | 773 |



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Graduate** Enrollment

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 5,143 | 5,067 | 4,968 | 5,027 | 4,970 | 4,836 | 4,780 | 4,670 | 4,610 | 4,560 | 4,431 |
| % of Total | 56.9% | 57.0% | 56.4% | 56.2% | 56.5% | 56.0% | 56.4% | 57.0% | 56.9% | 57.3% | 57.0% |
| Michigan | 4,473 | 4,300 | 4,119 | 4,026 | 3,858 | 3,766 | 3,577 | 3,498 | 3,561 | 3,506 | 3,351 |
| % of Total | 49.5% | 48.4% | 46.7% | 45.0% | 43.9% | 43.6% | 42.2% | 42.7% | 43.9% | 44.1% | 43.1% |
| U.S. Non-Mich | 2,213 | 2,226 | 2,400 | 2,652 | 2,730 | 2,710 | 2,743 | 2,712 | 2,759 | 2,652 | 2,474 |
| % of Total | 24.5% | 25.1% | 27.2% | 29.7% | 31.1% | 31.4% | 32.3% | 33.1% | 34.0% | 33.3% | 31.9% |
| International | 2,351 | 2,359 | 2,294 | 2,260 | 2,203 | 2,156 | 2,161 | 1,984 | 1,787 | 1,798 | 1,942 |
| % of Total | 26.0% | 26.6% | 26.0% | 25.3% | 25.1% | 25.0% | 25.5% | 24.2% | 22.0% | 22.6% | 25.0% |
| Total | 9,037 | 8,885 | 8,813 | 8,938 | 8,791 | 8,632 | 8,481 | 8,194 | 8,107 | 7,956 | 7,767 |

**Note: Data includes students at all graduate levels, degree and non-degree-seeking.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Graduate Enrollment by Level

## Degree-Seeking Graduate Students**

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Master's | 4,389 | 4,388 | 4,381 | 4,582 | 4,564 | 4,480 | 4,265 | 4,038 | 4,011 | 3,989 | 3,924 |
| % of Total | 56.0% | 56.0% | 56.0% | 58.1% | 58.1% | 57.2% | 55.3% | 53.6% | 53.8% | 53.7% | 53.8% |
| Doctoral | 3,444 | 3,451 | 3,448 | 3,303 | 3,292 | 3,350 | 3,446 | 3,490 | 3,444 | 3,434 | 3,367 |
| % of Total | 44.0% | 44.0% | 44.0% | 41.9% | 41.9% | 42.8% | 44.7% | 46.4% | 46.2% | 46.3% | 46.2% |
| Total | 7,833 | 7,839 | 7,829 | 7,885 | 7,856 | 7,830 | 7,711 | 7,528 | 7,455 | 7,423 | 7,291 |

** Note: Data includes only degree-seeking Master's and Doctoral students.



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Graduate Professional Enrollment

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 1,768 | 1,755 | 1,733 | 1,750 | 1,728 | 1,741 | 1,774 | 1,811 | 1,775 | 1,827 | 1,794 |
| % of Total | 51.4% | 50.7% | 51.3% | 52.3% | 52.1% | 53.7% | 55.0% | 56.5% | 57.3% | 58.4% | 58.7% |
| Michigan | 2,488 | 2,546 | 2,537 | 2,482 | 2,460 | 2,364 | 2,356 | 2,360 | 2,300 | 2,231 | 2,134 |
| % of Total | 72.4% | 73.5% | 75.1% | 74.2% | 74.1% | 72.9% | 73.1% | 73.6% | 74.3% | 71.3% | 69.9% |
| U.S. Non-Mich | 830 | 792 | 691 | 703 | 709 | 729 | 727 | 728 | 700 | 810 | 832 |
| % of Total | 24.1% | 22.9% | 20.5% | 21.0% | 21.4% | 22.5% | 22.6% | 22.7% | 22.6% | 25.9% | 27.2% |
| International | 119 | 124 | 150 | 162 | 150 | 150 | 140 | 120 | 97 | 88 | 89 |
| % of Total | 3.5% | 3.6% | 4.4% | 4.8% | 4.5% | 4.6% | 4.3% | 3.7% | 3.1% | 2.8% | 2.9% |
| Total | 3,437 | 3,462 | 3,378 | 3,347 | 3,319 | 3,243 | 3,223 | 3,208 | 3,097 | 3,129 | 3,055 |

*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Total Enrollment by Race/Ethnicity

| Group | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hispanic/Latinx (of any race) | 1,724 | 1,766 | 1,918 | 2,077 | 2,117 | 2,216 | 2,432 | 2,564 | 2,783 | 2,985 | 3,061 |
| Two or more races | 960 | 1,097 | 1,253 | 1,310 | 1,384 | 1,455 | 1,514 | 1,561 | 1,662 | 1,682 | 1,935 |
| African American/Black | 3,115 | 3,165 | 3,259 | 3,394 | 3,397 | 3,468 | 3,548 | 3,527 | 3,572 | 3,438 | 3,228 |
| Asian | 2,120 | 2,196 | 2,251 | 2,366 | 2,517 | 2,607 | 2,855 | 3,020 | 3,244 | 3,538 | 3,781 |
| Hawaiian/Pacific Islander | 34 | 26 | 47 | 47 | 58 | 55 | 52 | 42 | 28 | 28 | 30 |
| American Indian/Alaska Native | 153 | 149 | 144 | 129 | 136 | 123 | 116 | 125 | 125 | 113 | 130 |
| Total Students of color | 8,106 | 8,399 | 8,872 | 9,323 | 9,609 | 9,924 | 10,517 | 10,839 | 11,414 | 11,784 | 12,165 |
| Other/Unknown/Blank | 881 | 772 | 692 | 665 | 626 | 587 | 551 | 620 | 690 | 1,010 | 1,036 |
| White | 34,217 | 33,883 | 33,663 | 33,750 | 33,599 | 33,438 | 33,741 | 33,414 | 33,051 | 32,759 | 32,451 |
| Domestic Total | 43,204 | 43,054 | 43,227 | 43,738 | 43,834 | 43,949 | 44,809 | 44,873 | 45,155 | 45,553 | 45,652 |
| International | 6,724 | 7,281 | 7,750 | 7,690 | 7,361 | 6,922 | 6,318 | 5,705 | 4,540 | 4,106 | 4,371 |
| Total | 49,928 | 50,335 | 50,977 | 51,428 | 51,195 | 50,871 | 51,127 | 50,578 | 49,695 | 49,659 | 50,023 |
| PERCENT BY DOMESTIC | | | | | | | | | | | |
| Total Students of Color | 18.8% | 19.5% | 20.5% | 21.3% | 21.9% | 22.6% | 23.5% | 24.2% | 25.3% | 25.9% | 26.6% |
| Other/Unknown/Blank | 2.0% | 1.8% | 1.6% | 1.5% | 1.4% | 1.3% | 1.2% | 1.4% | 1.5% | 2.2% | 2.3% |
| White | 79.2% | 78.7% | 77.9% | 77.2% | 76.7% | 76.1% | 75.3% | 74.5% | 73.2% | 71.9% | 71.1% |
| PERCENT BY TOTAL | | | | | | | | | | | |
| Total Students of Color | 16.2% | 16.7% | 17.4% | 18.1% | 18.8% | 19.5% | 20.6% | 21.4% | 23.0% | 23.7% | 24.3% |
| Other/Unknown/Blank | 1.8% | 1.5% | 1.4% | 1.3% | 1.2% | 1.2% | 1.1% | 1.2% | 1.4% | 2.0% | 2.1% |
| White | 68.5% | 67.3% | 66.0% | 65.6% | 65.6% | 65.7% | 66.0% | 66.1% | 66.5% | 66.0% | 64.9% |
| International | 13.5% | 14.5% | 15.2% | 15.0% | 14.4% | 13.6% | 12.4% | 11.3% | 9.1% | 8.3% | 8.7% |



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Enrollment by Student Level

| Level | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020* | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Undergraduate | 37,454 | 37,988 | 38,786 | 39,143 | 39,085 | 38,996 | 39,423 | 39,176 | 38,491 | 38,574 | 39,201 |
| % of Total | 75.0% | 75.5% | 76.1% | 76.1% | 76.3% | 76.7% | 77.1% | 77.5% | 77.5% | 77.7% | 78.4% |
| Graduate | 9,037 | 8,885 | 8,813 | 8,938 | 8,791 | 8,632 | 8,481 | 8,194 | 8,107 | 7,956 | 7,767 |
| % of Total | 18.1% | 17.7% | 17.3% | 17.4% | 17.2% | 17.0% | 16.6% | 16.2% | 16.3% | 16.0% | 15.5% |
| Graduate Professional | 3,437 | 3,462 | 3,378 | 3,347 | 3,319 | 3,243 | 3,223 | 3,208 | 3,097 | 3,129 | 3,055 |
| % of Total | 6.9% | 6.9% | 6.6% | 6.5% | 6.5% | 6.4% | 6.3% | 6.3% | 6.2% | 6.3% | 6.1% |
| Total | 49,928 | 50,335 | 50,977 | 51,428 | 51,195 | 50,871 | 51,127 | 50,578 | 49,695 | 49,659 | 50,023 |

*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

# Enrollment by Degree-Granting College

| College | Fall 2022 Headcount |
|---|---|
| Broad College of Business | 7,541 |
| Social Science | 7,001 |
| Engineering | 6,789 |
| Natural Science | 6,223 |
| Agriculture & Natural Resources | 3,945 |
| Communication Arts and Sciences | 3,753 |
| Education | 3,064 |
| Lyman Briggs | 2,000 |
| Arts and Letters | 1,735 |
| Osteopathic Medicine | 1,343 |
| Nursing | 1,212 |
| James Madison | 1,112 |
| Human Medicine | 986 |
| Veterinary Medicine | 976 |
| MSU College of Law | 731 |
| Music | 552 |
| Residential College in Arts & Humanities | 145 |

**Note: Not included above are students in MSU Exploratory Preference (541), Lifelong Education (370) and Honors College (4).



*Note: MSU and the MSU College of Law fully integrated as of Fall 2020. Numbers in this report for terms prior to Fall 2020 were adjusted to reflect historical equivalents.

Fall 2022

# Appendix E: Building Condition Assessment

Fiscal Year 2024
Budget Information

5 Year Capital Plan

Submitted By:

MICHIGAN STATE
UNIVERSITY

## MSU FY2023 - FY2028 Facility Renewal Needs by Asset and Year (Including Deferred)

| | | | | | | NONRECURRING NEEDS | | | RECURRING NEEDS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASSET CODE | ASSET NAME | TYPE | BUILT | GSF | CURRENT REPL VALUE | HIGH | MEDIUM | LOW | DEFERRED | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | FNI | FCI |
| 0002 | BERKEY HALL | Classroom / Academic | 1947 | 152,169 | $74,613,000 | $0 | $437,032 | $4,437,080 | $21,566,859 | $58,777 | $26,656 | $4,416 | $0 | $6,515 | $324,373 | 0.39 | 0.29 |
| 0003 | OLIN MEMORIAL HEALTH CENTER | Medical / Clinic | 1939 | 105,750 | $59,830,306 | $0 | $1,162,595 | $8,667,645 | $12,045,499 | $669,418 | $1,924,996 | $76,594 | $220,345 | $2,942 | $207,472 | 0.44 | 0.20 |
| 0005 | HUMAN ECOLOGY | Classroom / Academic | 1924 | 78,459 | $39,653,000 | $54 | $274,097 | $1,447,101 | $12,684,463 | $212,237 | $111,195 | $998,384 | $0 | $83,286 | $300,584 | 0.42 | 0.31 |
| 0011 | MUSIC BUILDING | Classroom / Academic | 1940 | 99,687 | $49,586,764 | $0 | $448,619 | $387,675 | $8,261,172 | $63,843 | $10,638 | $895,968 | $0 | $199,999 | $0 | 0.25 | 0.17 |
| 0013 | MUSEUM | Office / Administrative | 1922 | 54,998 | $31,162,463 | $0 | $271,118 | $4,693,147 | $5,325,167 | $4,598 | $0 | $715,057 | $215,092 | $0 | $34,570 | 0.38 | 0.17 |
| 0014 | LINTON HALL | Office / Administrative | 1881 | 39,839 | $22,899,204 | $0 | $211,199 | $3,931,972 | $3,737,111 | $0 | $526,900 | $29,722 | $263,854 | $107,327 | $0 | 0.39 | 0.14 |
| 0015 | EUSTACE-COLE HALL | Office / Administrative | 1888 | 11,432 | $7,202,000 | $0 | $23,643 | $105,993 | $1,258,198 | $48,679 | $0 | $52,391 | $0 | $0 | $23,799 | 0.21 | 0.07 |
| 0016 | MARSHALL-ADAMS HALL | Office / Administrative | 1902 | 20,189 | $12,095,000 | $0 | $28,010 | $305,339 | $341,298 | $170,724 | $0 | $401,094 | $0 | $170,166 | $39,832 | 0.16 | 0.03 |
| 0017 | OLD BOTANY | Classroom / Academic | 1892 | 14,051 | $8,660,652 | $0 | $562,892 | $969,123 | $821,534 | $0 | $0 | $5,234 | $0 | $0 | $0 | 0.29 | 0.09 |
| 0019 | CHITTENDEN HALL | Classroom / Academic | 1901 | 16,809 | $9,975,000 | $0 | $9,350 | $50,049 | $0 | $0 | $4,383 | $37,171 | $177,063 | $0 | $0 | 0.04 | 0.00 |
| 0020 | COOK-SEEVERS HALL | Office / Administrative | 1889 | 13,689 | $8,624,000 | $0 | $50,362 | $33,416 | $0 | $0 | $0 | $0 | $0 | $0 | $21,350 | 0.04 | 0.00 |
| 0021 | MUSIC PRACTICE | Office / Administrative | 1968 | 35,964 | $20,769,009 | $0 | $321,937 | $980,102 | $4,159,955 | $0 | $2,312 | $44,169 | $132,879 | $336,726 | $447,853 | 0.31 | 0.20 |
| 0022 | MORRILL HALL OF AGRICULTURE | Office / Administrative | 1909 | 133,979 | $62,982,571 | $11,164 | $851,403 | $6,657,921 | $7,950,988 | $341,892 | $2,111,501 | $0 | $187,620 | $0 | $211,395 | 0.31 | 0.12 |
| 0024 | NATURAL SCIENCE | Laboratory | 1948 | 193,313 | $136,448,000 | $0 | $751,322 | $6,926,022 | $61,541,301 | $726,075 | $33,456 | $2,411,328 | $409,866 | $38,595 | $176,144 | 0.56 | 0.44 |
| 0027 | PSYCHOLOGY | Classroom / Academic | 1949 | 113,316 | $55,922,000 | $0 | $282,937 | $1,999,678 | $18,606,512 | $308,061 | $953,465 | $18,594 | $270,373 | $0 | $602,181 | 0.45 | 0.33 |
| 0028 | GILTNER HALL | Laboratory | 1913 | 253,356 | $147,514,107 | $4,676 | $6,290,917 | $28,055,464 | $32,506,661 | $45,300 | $84,456 | $66,582 | $1,339,625 | $10,039,924 | $737,167 | 0.55 | 0.22 |
| 0029 | KEDZIE HALL | Office / Administrative | 1927 | 159,383 | $74,495,928 | $6,934 | $583,554 | $11,715,179 | $9,091,038 | $58,916 | $2,031,909 | $0 | $996,586 | $29,975 | $689,705 | 0.49 | 0.12 |
| 0030 | ALUMNI CHAPEL | Religious Facility | 1952 | 8,678 | $6,140,000 | $0 | $210,956 | $600,098 | $927,338 | $19,058 | $102,002 | $20,690 | $0 | $0 | $0 | 0.32 | 0.15 |
| 0031 | AUDITORIUM | Theater / Auditorium | 1940 | 161,113 | $97,937,000 | $0 | $740,994 | $758,898 | $18,299,323 | $0 | $1,469,748 | $98,356 | $631,900 | $82,025 | $0 | 0.24 | 0.18 |
| 0035 | COMPUTER CENTER | Classroom / Academic | 1948 | 78,933 | $39,892,000 | $0 | $285,045 | $1,972,053 | $16,108,438 | $388,043 | $0 | $1,008,555 | $101,715 | $451,600 | $0 | 0.54 | 0.40 |
| 0047 | OLDS HALL | Office / Administrative | 1916 | 73,319 | $41,543,875 | $0 | $568,255 | $5,491,283 | $5,011,867 | $129,654 | $0 | $1,067,603 | $41,610 | $354,354 | $22,653 | 0.32 | 0.12 |
| 0049 | LIBRARY | Library | 1955 | 458,913 | $265,893,879 | $0 | $1,386,703 | $8,689,253 | $53,287,403 | $121,032 | $0 | $317,193 | $83,795 | $918,633 | $2,245,497 | 0.27 | 0.20 |
| 0051 | IM CIRCLE | Gymnasium / Athletics | 1916 | 163,483 | $79,010,832 | $8,203 | $629,427 | $3,567,146 | $24,368,780 | $336,867 | $77,475 | $698,131 | $561,130 | $0 | $1,417,784 | 0.40 | 0.31 |
| 0056 | JENISON FIELD HOUSE | Gymnasium / Athletics | 1940 | 207,803 | $62,916,424 | $0 | $238,311 | $2,031,426 | $9,876,127 | $0 | $0 | $39,050 | $1,702,136 | $26,903 | $559,306 | 0.25 | 0.16 |
| 0057 | DEMONSTRATION HALL | Gymnasium / Athletics | 1928 | 96,208 | $38,066,677 | $0 | $471,540 | $7,861,509 | $6,207,867 | $154,666 | $18,026 | $158,692 | $0 | $0 | $49,077 | 0.39 | 0.16 |
| 0058 | SPARTAN STADIUM | Football Stadium | 1923 | 488,295 | $217,880,013 | $1,827,011 | $14,069,588 | $1,051,195 | $21,072,804 | $126,327 | $1,050,413 | $5,092,027 | $15,998,213 | $336,915 | $311,241 | 0.32 | 0.10 |
| 0059 | MUNN ICE ARENA | Gymnasium / Athletics | 1974 | 123,191 | $69,419,395 | $0 | $136,526 | $7,266,600 | $10,097,017 | $26,182 | $3,931,202 | $1,025,675 | $557,434 | $0 | $9,158 | 0.34 | 0.15 |
| 0067 | HANNAH ADMINISTRATION | Office / Administrative | 1968 | 170,216 | $96,446,240 | $0 | $710,077 | $3,432,616 | $36,117,992 | $51,166 | $55,664 | $443,156 | $1,525,445 | $124,859 | $4,824,757 | 0.53 | 0.24 |
| 0069A | BRESLIN STUDENT EVENTS CENTER | Gymnasium / Athletics | 1989 | 243,106 | $135,599,850 | $0 | $584,208 | $388,226 | $6,669,536 | $1,668,947 | $872,242 | $1,096,830 | $8,144 | $124,044 | $2,645,207 | 0.18 | 0.05 |
| 0069B | ALFRED BERKOWITZ BASKETBALL COMPLEX | Gymnasium / Athletics | 2001 | 29,915 | $19,149,667 | $0 | $0 | $16,499 | $1,002,964 | $0 | $27,162 | $30,262 | $141,279 | $466,603 | $59,763 | 0.12 | 0.05 |
| 0078 | WELLS HALL | Office / Administrative | 1967 | 315,886 | $148,429,170 | $0 | $1,129,280 | $3,211,583 | $19,813,735 | $82,667 | $99,565 | $10,066,925 | $716,332 | $2,190,521 | $643,834 | 0.35 | 0.13 |
| 0079 | BESSEY HALL | Classroom / Academic | 1961 | 150,663 | $60,936,671 | $0 | $451,432 | $2,387,539 | $24,273,391 | $48,471 | $2,035,210 | $33,058 | $796,069 | $193,033 | $28,292 | 0.51 | 0.20 |
| 0082 | URBAN PLANNING LANDSCAPE ARCH-IMC | Classroom / Academic | 1966 | 47,013 | $24,679,813 | $0 | $639,930 | $3,204,918 | $5,804,224 | $0 | $24,453 | $217,884 | $1,107,964 | $21,827 | $0 | 0.45 | 0.23 |
| 0084 | COMMUNICATION ARTS | Classroom / Academic | 1981 | 263,316 | $129,111,761 | $0 | $214,829 | $4,395,906 | $21,176,826 | $0 | $0 | $668,364 | $17,662,083 | $2,258 | $180,645 | 0.48 | 0.16 |
| 0085 | WHARTON CENTER FOR PERFORMING ARTS | Theater / Auditorium | 1982 | 187,505 | $112,834,265 | $0 | $433,599 | $474,459 | $11,723,495 | $30,369 | $166,390 | $141,947 | $1,025,813 | $10,236,112 | $0 | 0.22 | 0.08 |
| 0089 | OYER SPEECH AND HEARING CENTER | Office / Administrative | 1968 | 19,896 | $12,069,204 | $0 | $201,948 | $444,792 | $3,298,508 | $0 | $26,594 | $5,807 | $126,502 | $0 | $116,601 | 0.40 | 0.27 |
| 0091 | FARRALL HALL | Laboratory | 1948 | 76,620 | $56,029,757 | $0 | $585,277 | $8,176,885 | $14,691,840 | $0 | $432,520 | $95,770 | $0 | $71,723 | $10,741 | 0.43 | 0.26 |
| 0132 | ANTHONY HALL | Laboratory | 1955 | 319,754 | $226,808,648 | $0 | $475,602 | $924,589 | $65,347,271 | $2,516,710 | $63,765 | $4,447,845 | $1,377,290 | $837,032 | $4,855,765 | 0.36 | 0.28 |
| 0142 | STUDENT SERVICES | Office / Administrative | 1957 | 121,938 | $69,091,689 | $0 | $569,762 | $2,513,001 | $14,819,691 | $728,770 | $1,386 | $1,004,326 | $3,083 | $1,191,357 | $33,051 | 0.34 | 0.21 |
| 0144 | ERICKSON HALL | Office / Administrative | 1957 | 219,249 | $102,476,926 | $0 | $425,815 | $3,294,963 | $25,642,395 | $9,388 | $0 | $1,667,118 | $1,387,485 | $200,272 | $549,919 | 0.35 | 0.25 |
| 0151 | IM SPORTS WEST | Gymnasium / Athletics | 1958 | 235,573 | $116,897,550 | $0 | $837,447 | $4,287,810 | $20,012,751 | $556,396 | $242,368 | $1,155,148 | $5,918,551 | $84,431 | $1,101,494 | 0.31 | 0.17 |
| 0160 | BIOMEDICAL PHYSICAL SCIENCES | Laboratory | 2001 | 377,230 | $266,264,875 | $0 | $0 | $886,436 | $9,197,049 | $0 | $2,501,602 | $34,682 | $9,201,286 | $754,270 | $1,841,414 | 0.09 | 0.03 |
| 0163 | CHEMISTRY | Laboratory | 1963 | 317,295 | $219,783,056 | $0 | $3,246,320 | $7,498,127 | $87,888,708 | $13,399,348 | $206,438 | $1,522,616 | $882,082 | $1,321,930 | $1,166,282 | 0.54 | 0.39 |
| 0165 | ABRAMS PLANETARIUM | Laboratory | 1963 | 17,465 | $14,148,028 | $0 | $95,602 | $584,954 | $3,804,293 | $704,289 | $371,946 | $322,792 | $7,942 | $153,143 | $21,309 | 0.43 | 0.27 |
| 0167 | IPF | Shops / Trade | 1963 | 95,249 | $36,262,450 | $0 | $320,452 | $1,685,488 | $5,799,698 | $663,993 | $21,908 | $599,936 | $139,546 | $117,122 | $205,852 | 0.30 | 0.16 |
| 0168 | BIOCHEMISTRY | Laboratory | 1964 | 157,744 | $111,341,987 | $0 | $1,622,789 | $5,324,197 | $30,251,902 | $324,891 | $8,599,588 | $134,793 | $815,013 | $2,693,598 | $90,975 | 0.45 | 0.26 |
| 0169 | INTERNATIONAL CENTER | Office / Administrative | 1964 | 133,524 | $65,329,642 | $0 | $252,152 | $1,417,206 | $14,340,603 | $297,940 | $1,514,953 | $688,376 | $218,380 | $89,761 | $1,280,301 | 0.33 | 0.20 |
| 0170 | VETERINARY MEDICAL CENTER | Laboratory | 1965 | 383,657 | $225,588,800 | $0 | $611,042 | $2,683,633 | $69,992,955 | $1,376,617 | $2,167,860 | $17,356,260 | $4,570,751 | $126,394 | $117,474 | 0.51 | 0.29 |
| 0170A | VETERINARY MEDICAL CENTER-EQUINE | Laboratory | 1989 | 34,305 | $19,219,236 | $0 | $29,667 | $117,857 | $1,567,217 | $0 | $245,872 | $7,246 | $75,183 | $0 | $0 | 0.19 | 0.07 |
| 0170B | VETERINARY MEDICAL CENTER-PEGASUS | Laboratory | 2005 | 8,818 | $5,547,256 | $0 | $0 | $27,037 | $93,975 | $55,472 | $128,742 | $363,096 | $0 | $0 | $211,426 | 0.24 | 0.01 |
| 0175 | IM SPORTS EAST | Gymnasium / Athletics | 1988 | 75,237 | $36,545,446 | $0 | $103,890 | $643,866 | $1,463,552 | $815,160 | $25,634 | $98,442 | $0 | $10,126 | $913,505 | 0.12 | 0.04 |

| | | | | | | NONRECURRING NEEDS | | | RECURRING NEEDS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASSET CODE | ASSET NAME | TYPE | BUILT | GSF | CURRENT REPL VALUE | HIGH | MEDIUM | LOW | DEFERRED | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | FNI | FCI |
| 0176 | GEOGRAPHY | Classroom / Academic | 1965 | 31,221 | $17,021,000 | $0 | $252,850 | $697,047 | $5,460,423 | $0 | $0 | $1,648,453 | $17,317 | $171,746 | $0 | 0.51 | 0.32 |
| 0177 | PACKAGING | Classroom / Academic | 1964 | 50,462 | $24,239,613 | $0 | $233,250 | $375,182 | $6,033,663 | $23,827 | $310,553 | $3,071,528 | $289,770 | $172,381 | $0 | 0.44 | 0.23 |
| 0178 | PLANT BIOLOGY | Laboratory | 1966 | 189,515 | $135,771,552 | $0 | $952,166 | $3,767,064 | $29,961,585 | $80,705 | $186,818 | $23,213,404 | $10,364,730 | $0 | $278,889 | 0.52 | 0.22 |
| 0179 | FOOD SCIENCE | Laboratory | 1966 | 120,101 | $93,576,616 | $0 | $949,441 | $3,631,076 | $17,668,428 | $1,384,769 | $127,487 | $926,562 | $6,349,619 | $179,055 | $1,169,342 | 0.36 | 0.18 |
| 0180 | NATURAL RESOURCES | Classroom / Academic | 1966 | 149,972 | $73,536,511 | $0 | $1,450,293 | $3,422,436 | $26,415,521 | $1,386 | $669,345 | $1,538,890 | $3,423,922 | $505,699 | $400,058 | 0.52 | 0.36 |
| 0181A | CENTER INTEGRATIVE PLANT SYS-LAB (CIPS) | Laboratory | 1967 | 97,563 | $63,183,294 | $0 | $491,117 | $2,104,457 | $29,922,556 | $0 | $168,632 | $365,487 | $0 | $2,070,229 | $383,912 | 0.59 | 0.46 |
| 0182 | BAKER HALL | Office / Administrative | 1967 | 60,298 | $34,166,000 | $0 | $440,784 | $3,010,448 | $8,559,104 | $0 | $0 | $836,359 | $0 | $671,286 | $46,564 | 0.45 | 0.25 |
| 0183 | LIFE SCIENCE | Laboratory | 1971 | 228,471 | $125,626,422 | $0 | $2,661,421 | $521,248 | $66,369,193 | $0 | $1,949,876 | $204,301 | $752,880 | $879,833 | $0 | 0.67 | 0.52 |
| 0186 | FOOD SAFETY TOXICOLOGY | Laboratory | 1997 | 115,133 | $81,265,322 | $0 | $95,830 | $272,658 | $8,267,078 | $0 | $0 | $0 | $0 | $771,492 | $1,064,729 | 0.13 | 0.06 |
| 0200 | CLINICAL CENTER-CLINIC | Medical / Clinic | 1976 | 214,661 | $147,229,292 | $0 | $464,931 | $4,971,423 | $25,578,479 | $364,926 | $839,309 | $540,191 | $14,660,698 | $742,098 | $134,940 | 0.33 | 0.16 |
| 0201 | CLINICAL CENTER-OFFICE/LAB | Office / Administrative | 1976 | 77,530 | $43,929,759 | $0 | $366,243 | $1,851,481 | $12,099,713 | $0 | $0 | $83,292 | $2,919,927 | $20,111 | $0 | 0.41 | 0.25 |
| 0202 | CLINICAL CENTER-ANIMAL | Laboratory | 1976 | 45,308 | $33,811,762 | $0 | $189,727 | $221,422 | $1,844,779 | $0 | $24,453 | $220,039 | $3,465,563 | $1,386 | $2,773 | 0.19 | 0.05 |
| 0214 | RADIOLOGY | Office / Administrative | 1998 | 64,773 | $36,700,940 | $0 | $51,531 | $148,369 | $1,443,586 | $690,510 | $3,083 | $0 | $2,908 | $368,809 | $296,978 | 0.11 | 0.04 |
| 0214A | RADIOLOGY GREENHOUSE | Warehouse/Storage/Utility | 2006 | 1,499 | $538,075 | $0 | $2,278 | $0 | $8,423 | $0 | $0 | $0 | $10,243 | $0 | $0 | 0.04 | 0.00 |
| 0214B | RADIOLOGY STORAGE SHED | Warehouse/Storage/Utility | 2000 | 198 | $22,000 | $0 | $0 | $0 | $1,213 | $0 | $0 | $0 | $0 | $0 | $0 | 0.06 | 0.06 |
| 0327 | FEE HALL | Office / Administrative | 1964 | 388,116 | $219,910,313 | $0 | $2,456,995 | $8,175,782 | $53,396,242 | $81,789 | $4,129,165 | $178,171 | $28,392,542 | $3,155,908 | $35,522 | 0.48 | 0.24 |
| 0328 | CONRAD HALL | Office / Administrative | 1964 | 23,096 | $13,708,038 | $0 | $98,940 | $491,474 | $2,741,411 | $5,486 | $171,377 | $22,454 | $6,688 | $8,926 | $797,305 | 0.32 | 0.20 |
| | | **TOTALS:** | | **9,215,410** | **$5,195,961,593** | **$1,858,041** | **$55,997,249** | **$212,336,521** | $1,155,720,690 | **$29,974,341** | **$42,882,694** | **$90,334,484** | **$142,254,262** | **$43,915,260** | **$33,940,757** | **0.38** | **0.21** |

Notes:
All costs shown as Present Value

Fall 2022

# Appendix F: Utility System Distribution

Fiscal Year 2024
Budget Information

5 Year Capital Plan

Submitted By:

MICHIGAN STATE
UNIVERSITY

**MSU Capital Renewal Utilities FY23 - FY 28 (Including Deferred)**

| Building Name | Deferred | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | Grand Total |
|---|---|---|---|---|---|---|---|---|
| BRIDGES | $ 482,000 | $ 4,400,000 | $ 5,500,000 | $ - | $ - | $ - | | $ 10,382,000 |
| COMMUNICATION DISTRIBUTION | $ 2,190,000 | | | | | | | $ 2,190,000 |
| ELECTRICAL DISTRIBUTION | $ 3,108,000 | $ 2,915,000 | $ 10,632,000 | $ 5,830,000 | $ 5,830,000 | | | $ 28,315,000 |
| REGIONAL CHILLED WATER PLANT | $ - | | | | | | $ 143,000 | $ 143,000 |
| ROADS | $ 4,294,000 | $ 5,102,000 | $ 8,602,000 | $ 10,204,000 | $ 5,102,000 | | | $ 33,304,000 |
| SEWER DISTRIBUTION | $ - | $ 732,000 | $ 732,000 | | | | $ 192,000 | $ 1,656,000 |
| STEAM DISTRIBUTION | $ - | | $ 5,430,000 | $ 4,840,000 | $ 2,915,000 | | | $ 13,185,000 |
| STREET LIGHT DISTRIBUTION | $ 26,000 | $ - | $ 429,000 | $ 429,000 | $ 429,000 | $ 429,000 | | $ 1,742,000 |
| TB SIMON POWER PLANT | $ - | $ 4,954,000 | $ 11,095,000 | $ 16,306,000 | $ 8,075,000 | $ 2,175,000 | | $ 42,605,000 |
| WATER DISTRIBUTION | $ 2,186,000 | $ 3,763,000 | $ 3,644,000 | $ 8,745,000 | $ 3,644,000 | | | $ 21,982,000 |
| Grand Total | $ 12,286,000 | $ 21,866,000 | $ 46,064,000 | $ 46,354,000 | $ 25,995,000 | $ 2,604,000 | $ 335,000 | $ 155,504,000 |

Fall 2022

# Appendix G: SFY2024 Capital Outlay Request

Fiscal Year 2024
Budget Information

5 -Year Capital Request Planning and C apital Outlay Request

Submitted By:

MICHIGAN STATE UNIVERSITY

**STATE FISCAL YEAR 2024**
**CAPITAL OUTLAY PROJECT REQUEST**

| | | | |
|---|---|---|---|
| *Institution Name:* | Michigan State University | | |
| *Project Title:* | Engineering and Digital Innovation Building | | |
| *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 270,000 gross square feet |
| *Total Estimated Cost:* | $250 million |
| *Estimated Start/Completion Dates:* | Start: Fall 2024 (upon authorization to construct)<br>Completion: Summer 2026 (Fall Semester 2026 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 |

---

## Project Purpose

Michigan needs 21st Century facilities to educate the 21st Century work force. This project will support the emergence of a strong and transformative ecosystem focused on the convergence of digital and physical technologies. This provides the foundation that allows MSU to develop the talent for a future Michigan, respond to industry needs and student demand, support economic development in Michigan, leverage the opportunities provided by FRIB for heavy-ion radiation testing of integrated chip-based systems, and offers research infrastructure for growth in materials research and emerging initiatives. Expanding our data science educational capacity will extend beyond Engineering to benefit all MSU students ranging from Business, Health Sciences, Social Sciences, to Agriculture and Environmental Sciences that now deploy digital technologies, artificial intelligence and machine learning as standard tools. It will also support maintaining and developing research excellence in advanced manufacturing, material science, ultrafast science, quantum computing and heterogeneous micro-electronic technologies.

MSU has made people's lives better for 150 years by leveraging its investments and expertise. The MSU 2030 Strategic Plan continues this by investing in excellence in research including addressing the most complex societal problems and challenges of today and tomorrow, creation of research that reaches across disciplines and excellence in teaching, and development of transdisciplinary solutions to ecological and human problems affected by social, economic, political, climate, and environmental changes.

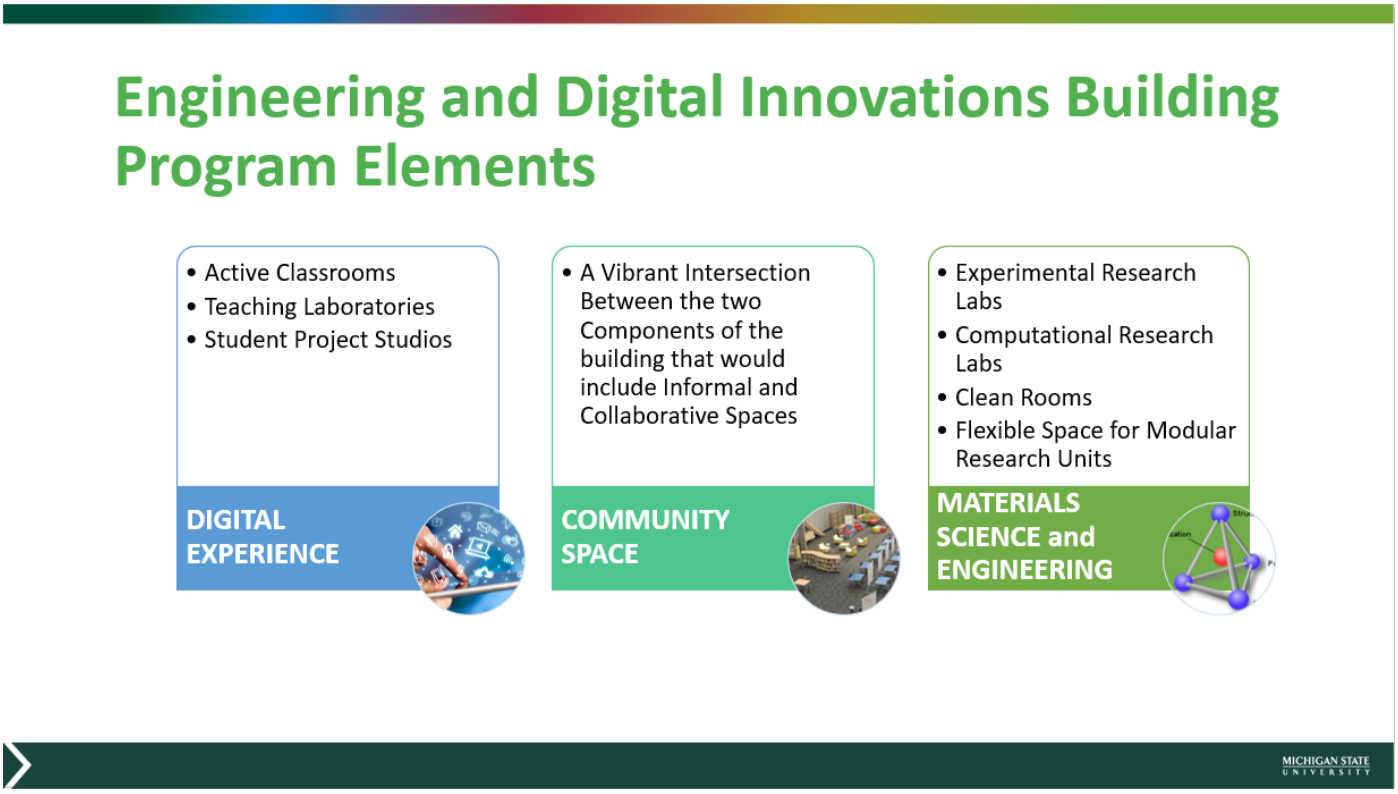
The Engineering and Digital Innovation Building will support the emergence of a strong and transformative ecosystem focused on the convergence of digital and physical technologies. It will bring together a range of teaching, learning and research activities across multiple colleges and disciplines to create an energized, innovative, and entrepreneurial community focused on digital futures. The academic partnership across six colleges: Engineering, Natural Science, Arts and Letters, Business, Communication Arts and Sciences, and Social Science is intentional and will lead to interdisciplinarity in learning and research. The building will (a) provide new capacity to

support an increase in undergraduate and graduate enrollment, and in square footage to support the increased enrollment and changes in pedagogy including experiential, formal and informal teaching and learning opportunities, (b) prepare MSU graduates with skills in computational sciences and digital literacy necessary for postgraduate success (c) align modern building infrastructure and space functionality, and (d) support the consolidation of top-ranked researchers and students, thereby enabling new synergies and enhancing potential for discovery and increase the potential to attract significant federal funding in high-demand research areas. This building will be a physical and symbolic gateway to the digital future of MSU – a home for new ideas and transformational learning and research.

This investment will provide the foundation to respond to industry needs and student demand, support economic development in Michigan, leverage the opportunities provided by FRIB for heavy-ion radiation testing of integrated chip-based systems, and provide research infrastructure for growth in materials research and emerging initiatives such as semiconductor research.

**Scope of the Project**

The building is envisioned to comprise two functional components totaling approximately 270,000 gross square feet of teaching and learning and research space that is modular and flexible in design, incorporates and leverages the use of modern building systems and technology, and allows academic and research programs to respond to changing and evolving instructional and research methods and models. In addition to modern classrooms, teaching and research laboratories, the facility is envisioned to also include informal study areas, break-out spaces, and gathering areas creating a hub for the intellectual and social exchange of ideas, networking, and collaborative work reflective of an educated 21st century work force.



The anticipated location is in the central academic district, in proximity to the Engineering Building, and near the STEM Teaching and Learning Facility. Proximity to the functions that occur in these existing buildings in the central academic district is critical to the collaborative nature of the teaching, learning and research. Site evaluation will account for infrastructure requirements. Planning will set the stage for future demolition of infrastructure such as the obsolete Urban Planning and Landscape Architecture Building, the abandoned Water Reservoir, and adaptive reuse of vacated space for further thematic co-location and optimization of use of existing space.


**Program Focus of Occupants**

The program focus of occupants is on digital futures that include computer science, emerging fields of computational data science and data science, machine learning, quantitative methods, gaming, user experience design, cyber security, digital storytelling, advanced manufacturing material science, ultrafast science and quantum computing including heterogeneous micro-electronic technologies.

*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?**

   Investment in the Engineering and Digital Innovation Building will provide the foundation to respond to industry needs and student demand, support economic development in Michigan,

leverage the opportunities provided by FRIB for heavy-ion radiation testing of integrated chip-based systems, and provide research infrastructure for growth in materials research and emerging initiatives such as semiconductor research. The Engineering and Digital Innovation Building is necessary to provide the capacity and quality of space to educate the 21st Century workforce in this high demand area and for the competitive edge to attract and retain the best and brightest students and faculty,

An increasing number of incoming students are expressing interest in computational science-related majors. These majors, in turn, prepare students for careers in some of the fastest growing and highest paying sectors according to U.S. Bureau of Labor and Statistics. By 2030, BLS is forecasting 667,600 new jobs with a median income of $97,430, more than double median annual wage for all occupations. However, industry demand is far outpacing the supply of workers at both the state and national level. These shortages are projected to increase as the applications of data analytics, machine learning (ML), and artificial intelligence (AI) continue to grow and impact all sectors of the economy, society, and national security. ML/AI occupational employment is also projected to grow twice as fast as employment in *all* occupations, according to the Center for Security and Emerging Technology.

Materials science and manufacturing are pivotal areas for State of Michigan economic development. Semiconductors are becoming ubiquitous in society (from automobiles to communications devices to computers to implantable health-related technology). Polymers have continued to grow as a key performance material for advanced technology including semiconductor packaging. Additive manufacturing is the platform to bring build-to-print manufacturing of many consumer products to fruition. Industrial growth for the future Michigan depends on these materials and methods. Improved facilities with the capacity to accommodate growth in research in this area and with modern and functionally aligned infrastructure is necessary to attract and retain key faculty and to be competitive for externally funded grants and industry partnerships. These research programs will build the reputation of Michigan State University, promote economic development in key sectors of future growth and attract students seeking education in areas of transformational impact in Michigan.

Overall, investment in this project will enhance economic growth regionally and state-wide in several ways. It will allow the University to continue to attract and retain talented students and faculty; prepare students for careers in fields of computational science and digital literacy; create an environment that encourages innovation and entrepreneurship. Long-range economic impact will be realized by producing more highly trained, well-rounded, and sought-after graduates for professional careers in materials and manufacturing, computational science, and digital literacy 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 more than 16,000 STEM-related undergraduate students, is core to our mission. The incorporation of digital experiences and digital literacy credentials is a critical component for preparing all MSU students for tomorrow's job market. It responds to industry needs and student demand for digital-based disciplines and graduates. By expanding and integrating computational and

analytical courses in STEM and into the curriculums of art, business, communications, and social science we will broaden participation across the spectrum and engage students in ways that are reflective of future work.

Through the construction of new facilities, such as the Bio Engineering Facility, the Interdisciplinary Science and Technology Building, and the STEM Teaching and Learning Facility along with the creation of new departments, such as the Department of Computational Mathematics, Science and Engineering, MSU is fostering an interdisciplinary culture, both of research and of teaching and learning. This project would provide an opportunity to substantially impact both the research and academic missions of MSU.

- The instructional aspects of this project will focus on the interdisciplinary nature of digital learning. The vision is to build on the foundations of disciplines such as Computer Science and its emerging fields of Computational Data Science and Data Science, which are intrinsically interdisciplinary, to develop a fully interdisciplinary curriculum with applications across multiple colleges, departments, and programs. Capitalizing on already established collaborations between the colleges of Business, Engineering, and Natural Science on large projects centered around data science, machine learning, and quantitative methods, this project will provide state-of-the-art instructional space for even wider-ranging collaborations with the colleges of Arts and Letters, Communication Arts and Sciences, and Social Science. This new horizon in interdisciplinary learning will provide students with opportunities to build strong critical skills in fields such as user experience design, and expertise industry relies upon in growing wearables market, cybersecurity, and digital storytelling.

- The research aspects of this project will develop a center for excellence in advanced manufacturing materials science, ultrafast science, and quantum computing including heterogeneous micro-electronic technologies by providing a modern, flexible and modular environment with dedicated clean spaces that can evolve with research over the decades and allow for integration of research. The new facility will be a critical component for focusing MSU as a leader in manufacturing and materials research, including on the exponential demand for semiconductors. This project will co-locate interdisciplinary faculty engaged in common research themes providing opportunity for spontaneous collaboration, sharing of ideas, and resources, thereby integrating research development at the basic, applied and production levels.

**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, stand-alone facility of approximately 270,000 gross square feet to create an interdisciplinary hub for the digital futures, spanning teaching and learning and research.

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

While the project is new construction, some of the research programs and instructional activities will be relocated from existing buildings. Much of the vacated research space has been unable to accommodate hood-intensive experimental research, nor support an increase in the number of faculty and large scale externally funded grants. Space vacated as a result

of the new building will be re-purposed in alignment with the available infrastructure and programmatic synergies to support other research and teaching and learning needs.

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.

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

The majority of the instructional and research functions that will be placed in the new building are currently located in buildings that do not have adequate or functionally appropriate square footage and/or infrastructure such as significant fume hoods and air exchanges in the research laboratory(s) to meet the needs of the programs. While there have been renovations to selected rooms and infrastructure, 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, collaborative and interdisciplinary learning and research. Renovation of the vacated spaces as a subsequent set of projects would bring the spaces into compliance with current codes and re-use will be aligned with infrastructure capacity of the space.

The siting of the Digital and Innovation Building will be in proximity to facilities such as the STEM Teaching and Learning Facility, the Engineering Building, and Wells Hall creating a physical and functional ecosystem supporting our students and faculty. In conjunction with this project two facilities will be demolished, the Urban Planning and Landscape Architecture Building (UPLA) and the now defunct water reservoir (closed upon completion of the new water tower in 2020).

**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?**

Michigan State University engages in a multi-faceted and comprehensive process for measuring utilization of its existing facilities. The University utilizes space metrics that quantitatively measures the productivity and utilization of research and academic office space. The metrics include research expenditures per net square feet of research space, and office space; as well as net square feet of space per full-time equivalent employee (FTE). Since the inception of the space metrics the university has realized a greater than 20% improvement in productivity and utilization of research space in terms of research expenditures per square foot. In addition to tracking utilization performance through internal metrics, the university periodically conducts benchmarking of its space metrics and overall space inventory with peer institutions of the Big Ten, using data from the National Science Foundation Science and Engineering Survey, and space survey data from the Higher Education Facilities Management Alliance. The utilization also considers the alignment of infrastructure necessary to support modern teaching and learning and research, as well as the on-going effort to document the Facility Condition Index of building assets. Instructional space utilization is reviewed on a regular basis and considers modality, enrollment, courses

and curriculum, pedagogy, technology, day/time distribution, condition and functional alignment in its assessment of need.

Michigan State University recently completed a strategic facilities plan with SmithGroup of the College of Engineering that included benchmarking against our Big 10 peers. In benchmarking against our peers, MSU has the lowest space per student, 47 assignable square feet. Additionally, space per faculty at 1,468 assignable square feet and academic lab space per student at 9 assignable square feet are the second lowest in our peer group. Research space per faculty at 668 assignable square feet is below the median and average in the peer group.

Upon demolition, the UPLA building functions will be relocated to other existing facilities increasing overall space utilization and improving functional alignment for the programs. These two actions will remove 56,000 gross square feet of obsolete space and eliminate future investment in excess of $20 million to address capital renewal, HVAC, and ADA needs.

**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 university evaluates functional requirements and seeks opportunities for efficiency and productivity improvements in its space design and allocation; and utilizes the least life cycle cost analysis to inform the design, equipment, and material selection, thereby minimizing the cost of operations and maintenance. Further, MSU is currently in the process of a utility master plan update that seeks to align future growth, demand on utility infrastructure, and strategy to move toward climate neutrality by 2050 as called out in the recently adopted university Strategic Plan.

**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 $62.5 million (25%) of the $250 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?**

We respectfully request state consideration and authorization of 75% of the total project cost. Should the state authorization be less than the 75% we are open to funding a higher share of the project cost but doing so would require the university to re-prioritize other high priority needs in order to contribute a higher amount.

**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, maintenance, and staffing for the facility is estimated at approximately $2,500,000 annually or $12,500,000 over a 5-year period, based on current dollars and gross square footage. Additional operating costs will be funded by general fund revenues.

The operating costs will be partially offset by the removal of 56,000 gross square feet of space with annual operating expenses for utilities, custodial, and maintenance services of approximately $400,000 annually and the cost avoidance of over $20 million in future infrastructure reinvestment as a result of demolition of the UPLA Building and the defunct water reservoir.

**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?**

Without this facility MSU will need to constrain enrollment and research growth in high demand engineering, computational, data science, game development and digital futures. This limitation, due in large part to lack of facilities, both in square footage, quality and functional alignment is already limiting our ability to meet the high demand from students and industry that seek high-quality, well-rounded graduates at both the undergraduate and graduate level. The ability to grow research in manufacturing and materials science, including chip development, limits the ability of MSU to be a strong partner with the state of Michigan and regionally on attracting and retaining talent and development of Michigan based industry partnerships and investment. We are at a critical juncture to respond positively to these demands, including a 21st century building to support 21st century education, research and industry partner development.

**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. As a result of this, the preferred alternative is to construct new instructional teaching and learning spaces with the capacity, quality and technology infrastructure to support a range of modalities and experiential learning.

The recently completed strategic facilities plan for the College of Engineering confirmed the need for additional space to meet its projected growth in student enrollment and materials science research. Renovations to existing space in the ageing facilities would yield minor improvements but would not be conducive to providing the specialized labs and robust infrastructure required to support growth in materials science research and emerging initiatives such as heterogeneous micro-electronic technologies, and semiconductor research. Furthermore, renovations would not adequately address the current and future capacity issues impacting student learning spaces and research growth.

As previously noted, this building will bring together learning and research opportunities across multiple colleges creating an ecosystem that supports an interdisciplinary approach, and the way in which future graduates will engage in work. The need for additional space and modern teaching and research environments, coupled with the intentional programmatic integration across multiple colleges, focused on digital futures across teaching and research, requires a new building.