Five-Year Master Plan
University of Michigan-Ann Arbor
FY2020

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Facilities and Operations
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FIVE-YEAR MASTER PLAN AND PROJECT REQUEST
UNIVERSITY OF MICHIGAN-ANN ARBOR
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I. MISSION STATEMENT

The mission of the University of Michigan is to serve the people of Michigan and the world through preeminence in creating, communicating, preserving and applying knowledge, art, and academic values, and in developing leaders and citizens who will challenge the present and enrich the future.

VISION STATEMENT

As the University of Michigan prepares to embark on its third century, we fully embrace the legacy bestowed upon us by President James B. Angell in our first century. We are proud to offer "an uncommon education for the common man."

We are a community of learners. We serve our multiple constituents by providing access to and participation in scholarly and creative endeavors on a vast scale. Our academic research enterprise affects the world. The university is defined by a culture of interdisciplinary teaching and research, coupled with academic rigor. We encourage our students, faculty, and staff to transcend disciplinary boundaries by tackling complex and vexing problems facing modern societies at local, national, and global levels.

We endorse and promote creativity in its many facets. We recognize the arts as a human essential and a foundation that helps to define our future. We create new knowledge and share the joy of discovery, and we see information technology as a powerful means for broadening access to knowledge and exchanging ideas.

We draw from study and experience to prepare our students for leadership in a wide range of social endeavors, including government, law, education, medicine and business, reflecting the university's many roles in contributing to good design and decision making within major domestic and international institutions.

We celebrate and promote diversity in all its forms, seeking the understanding and perspective that distinct life experiences bring. We proclaim ourselves a scholarly community in which ideas may be freely expressed and challenged, and all people are welcomed, respected, and nurtured in their academic and social development.

We are committed to providing for our students and faculty international learning and teaching experiences that will prepare them for a rapidly changing global community. The university encourages intellectual and cultural exchange in other countries, and programs that deeply engage scholars from disparate areas of the globe. We support and promote student, faculty, and staff immersion in local and national communities via service, learning, and leadership endeavors. We nurture lifelong relationships with alumni who span the globe.

We advance health care through discovery and practice. We deliver clinical services to people within our state and the world, educate future generations of health care professionals, conduct basic research in fundamental processes of life, and vigorously advance research on the mechanisms, detection and treatment of a spectrum of human diseases. The university champions fitness, disease prevention, and policy research to advance health, quality of life, and longevity of our own community, the nation, and the globe.

We stimulate economic growth and development in Michigan and beyond. The university engages in productive partnerships among academe, industry, and government to sustain and grow a vigorous and dynamic economy. University students, faculty, and staff embody and advance innovative attitudes and entrepreneurial spirit.

We strive to be an exemplary employer and a positive influence in our community. We provide an environment where all employees have opportunities to develop their potential, and where there is a shared passion for excellence and a commitment to respect for one another.

We dedicate ourselves to ethical and responsible stewardship of financial, physical and environmental resources. We look for tools and strategies to create and enhance sustainable practices in all facets of operations and seek to lead in the global quest for a sustainable future.

We gladly accept the challenges and opportunities confronting us and understand that the University of Michigan must change, adapt and grow to meet the needs of a rapidly evolving society. We will always focus on the horizon.

II. INSTRUCTIONAL PROGRAMMING

The University of Michigan, founded in 1817, has a history of over 200 years of leadership in education, innovative research, stewardship and service to the State of Michigan. The university consistently ranks in the top ten of public universities in the U.S., according to the U.S. News and World Report, and receives high marks for retention and graduation rates and for the reputation and excellence of many of the undergraduate, graduate, and professional degree programs offered by the university's 19 schools and colleges. As a public institution, the university strives to achieve its mission through teaching, research, and service, set within the framework of various schools, colleges, institutes and centers and through strategic partnerships with public and private institutions in Michigan and beyond.

The following information describes various programs that support the core mission of the university and activities that will impact facility needs in the next five years.

A. Alfred Taubman College of Architecture and Urban Planning

The University of Michigan offered its first courses in architecture in 1876. The program became a department in 1913, and by 1931, the College of Architecture was established as a separate entity. Today, the college offers bachelor's, master's, and doctoral degrees in various fields, including architecture, urban and regional planning, and urban design. The college was renamed in 1999 in honor of A. Alfred Taubman, a longtime donor and adviser to the college. In 2014, A. Alfred Taubman continued his generosity to the college with a gift to support a partial renovation and expansion of the Art and Architecture Building, where the Taubman College is located. Opened for the fall 2017 term, the new A. Alfred Taubman wing provides modern instructional space, expanded student studios, and more spaces for student and faculty interaction, critiquing, and exhibitions. While the addition and partial renovation provide the college with much needed program growth space, much of the original 1970s building contains outdated classrooms, administrative and faculty spaces, and other support spaces that will need to be addressed at some point in the future.

Penny W. Stamps School of Art & Design

Education in the arts was first offered as part of architecture and engineering studies at the university. As art evolved as a discipline, the programs were moved out of these colleges and the School of Art & Design became a separate school in 1974. The school was renamed the Penny W. Stamps School of Art & Design in 2012 after receiving a significant donation from Penny and E. Roe Stamps. The school shares the Art and Architecture Building with the A. Alfred Taubman College of Architecture and Urban Planning, where it provides a comprehensive range of bachelor's and graduate degree programs in art, design, and inter-arts performance. In 2011, in response to a pressing programmatic need for graduate student and faculty art studios and limited space within their shared building, the university renovated and repurposed an existing university warehouse building for this purpose. In 2014, the school conducted a study of its long-term facilities needs and identified the need for a major renovation and expansion of their space in the Art and Architecture Building. This study has helped shape plans to repurpose their on-site art gallery into much needed student maker space and collaboration space and move the gallery to an off-campus lease. While this has helped to free a small amount of space within the Art and

Architecture Building, the 1970s structure limits the capabilities of the school to have all of the modern, collaborative teaching and studio spaces it needs.

Stephen M. Ross School of Business

The School of Business Administration was formally established in 1924. Today, at all levels of instruction—bachelor's, master's, doctoral, and executive education—its programs consistently rank high nationally and internationally. In 2004, Stephen M. Ross made a historic gift to the school, and it was renamed in his honor. The gift supported the construction of a new Ross School of Business academic building, which opened in 2009, and provided state-of-the-art instructional and research space to support the school's core mission. Stephen M. Ross continued his generous support of the school with another gift in 2013. The gift, along with other donor gifts, supported the renovation of the Kresge Business Administration Library and construction of a new academic building, all connected to the main Ross School of Business academic building. The new academic building is named Jeff T. Blau Hall in recognition of Blau's generous financial contributions. Opened for the fall 2016 term, the new and renovated facilities house modern and innovative spaces for instruction, study and collaboration, and student and career services spaces, which will enable the school to continue its long-standing history of excellence in business education into the future. A recent additional gift from Stephen M. Ross is enabling the school to make exterior enhancements that unify the Stephen M. Ross School of Business complex, a project expected to be completed in 2019. While this series of capital projects has addressed many of the school's highest priority needs, the school continues to lease nearby off-campus space for some core functions. We expect the school to want to address this through an on-campus space solution at some point in the future.

School of Dentistry

Established in 1875, the School of Dentistry is one of only two schools of dentistry in the State of Michigan and continues to be a top-ranked program nationally. It offers bachelor's, master's, and doctoral degrees, as well as certification and continuing education, in a variety of dental fields including dental hygiene, pediatric dentistry, orthodontics, periodontics, oral and maxillofacial pathology, and surgery. The school's dedication to health and wellness extends well beyond the research lab and classroom. The school provides clinical services to patients on campus and around the State of Michigan and is particularly dedicated to providing care to underserved, at-risk, and special needs patients. Through its community-based dental education program, the school's faculty, students, and staff are serving these patients throughout the state in federally qualified health centers, community clinics, and in private offices. The school occupies two adjoined buildings that are in serious need of attention and limit the school from fully achieving its core mission. Addressing this need has been a high priority for the university, which is why the university submitted the School of Dentistry project to the state for fiscal years 2015, 2016 and 2017 capital outlay funding consideration. Last year, the university received construction authorization from the state for a project that will construct a modest addition and partially renovate the building to improve the school's research and clinic spaces and to improve patient access to the building. The university is very appreciative of the state's recognition of this high priority need. Construction is expected to begin later in 2018 and conclude in 2022. This project

will address the school's most pressing needs; however, the remaining areas not being renovated will still require attention and investment sometime in the future.

School of Education

The School of Education was formally founded in 1921; however, teacher diplomas were first offered at the university in 1874 with master's and doctoral degrees added in the decades following. The school prepares students for professional careers in teaching and administration and offers advanced training and certification for researchers and practitioners at all levels of education. The school is housed in a 1920s building (a former elementary and high school) and has had only modest renovations over the past several years. The renovations included remodeling a large auditorium and constructing the Brandon Professional Resource Center and Archive in 2011. Made possible by a generous gift from Jan and David Brandon, this space houses digital records of professional practice and other important resources for professional study and use and offers student-focused study and collaboration areas. In 2015, the university completed a renovation project that addressed the building's aging infrastructure and made modest improvements to the teaching and learning environment. The project addressed only some of the school's needs. The school continues to be challenged by its facilities, and has identified needs for an additional renovation and future addition to fully support its academic and research mission.

College of Engineering

The College of Engineering, established in 1895 is renowned, both nationally and internationally, for delivering high-quality education and cutting-edge research to help solve the world's problems. Today, nearly all of the college's undergraduate and graduate programs rank in the top 10 nationally, enabling its students to experience academic excellence at its best. The college occupies over 30 buildings on the university's North Campus, many of which were built over 40 years ago when engineering program requirements were much different than they are today. Further, given the student demand, many programs lack sufficient classroom and research space. While the college and university make every effort to maintain and improve the college's facilities, they are challenged to keep up with demands for state-of-the-art space to support ever changing fields of engineering study and research.

In 2014, the college completed a 62,500 square foot addition to the G. G. Brown Memorial Laboratories, which houses the Center for Excellence in Nano Mechanical Science and Engineering. In 2016, with a combination of university and state capital outlay funding, the college completed a deep renovation of the G. G. Brown Building to accommodate the growing needs of the Departments of Mechanical Engineering and Civil and Environmental Engineering. Thanks to the support from the state, the college was able to renovate the entire building, creating state-of-the-art academic and instructional spaces and upgrading much of the building's mechanical, electrical, and life safety systems. In 2015, the college began a major renovation of the former Ford Nuclear Reactor with a generous gift from long-time donors Bob and Betty Beyster. Opened in spring of 2017, the newly named Nuclear Engineering Laboratory building repurposed the former nuclear reactor space into modern research labs, offices, and student collaboration space to support the growing needs of the Department of Nuclear Engineering and

Radiological Sciences. The Ford Motor Company Robotics Building, currently under construction with expected completion in 2020, aims to better support its programs and research in robotics and autonomous systems, including autonomous vehicles. This new facility will bring together faculty and students from across departments and schools under one roof and will house state-of-the-art research labs, teaching labs, classrooms, machine shops and garages, and robot test facilities both indoors and outdoors. In a unique and exciting arrangement, the university formalized a long-term lease of space within the Robotics Laboratory for researchers from Ford Motor Company. In addition to a generous gift to name the building, Ford will contribute funding to the project to provide additional space for its needs. Once completed, the building will be a prime example of industry engagement and interdisciplinary research, teaching, and application at the university.

While the projects noted above address many of the college's needs for modern teaching and research space, the college still has a number of departments and programs in inadequate spaces that hinder their academic and research missions. The college recently completed a strategic facilities master plan to identify capital needs and prioritize projects across its many departments, with particular focus on Computer Science and Engineering (CSE), Biomedical Engineering, Chemical Engineering, Civil Engineering, and Naval Architecture and Marine Engineering. While addressing outdated facilities for these programs is critical to maintaining the college's excellence in these fields, the needs of CSE are most critical to address.

CSE currently occupies space in the Bob and Betty Beyster Building, which was designed to meet the department's needs a decade ago when its combined undergraduate and graduate enrollment was less than 600 students. Due in large part to the program's reputation and significant demand for computer science graduates in the job market, the program today has over 2,000 students. Despite experiencing such substantial growth, the department's physical space has not changed. CSE has been at 100 percent capacity for the past several years and the space constraints are preventing it from growing its program further to meet market demands and from providing CSE students with the quality experience that they deserve. The college anticipates that the demand for its CSE graduates will continue to grow for the foreseeable future, aligning with national and state trends in this field. As a result, addressing CSE's space need is the university's highest priority capital project need and the reason it was submitted for consideration of state capital outlay funding in 2017 and again this year. The proposed solution aims to combine CSE's capital project needs with those of the School of Information (described in the School of Information section), since both have similar types of space needs and would benefit with a combined solution.

School for Environment and Sustainability

The university is making significant, highly innovative changes to its environmental education and research programs. Building on more than a century of leadership in environmental science, management, policy, and design, the School of Natural Resources and Environment (former name) became a new school, the School for Environment and Sustainability (SEAS) in 2017. The original school was founded in the late 1880s and was the first of its kind in the country. Since its founding, the school has been a pioneer in developing a scientific understanding of ecosystems,

including their conservation, management, and restoration; and trains leaders, assists in policy-making, and teaches the skills necessary to manage and conserve the earth's resources. The school offers degrees at the master's and doctoral levels, as well as certification in fields like conservation ecology, environmental informatics, geographic information system (GIS) and modeling, environmental policy and planning, and sustainable systems. The school's historic home, the Samuel Trask Dana Building, underwent a series of renovations in the 2000s, thanks in large part to capital outlay funds from the state. At the time of completion in 2004, it was the first major academic renovation to receive a LEED gold level rating for sustainable construction in the state of Michigan and among the first in the country. As the newly formed SEAS, the school is currently undergoing a significant transformation and reorganization. The goal of this new school is to dramatically strengthen and expand both the mission and the quality of partnerships with the other schools and programs at U-M dealing with environmental and sustainability issues. With this type of administrative reorganization and focus, the university expects that space in both the school's historic home in the Dana Building and in their future partners' and affiliates' space will need to be addressed.

School of Information

A formal program in library and information studies began in 1926 when the Department of Library Science was created within the College of Literature, Science, and the Arts. The department became a fully independent school in 1969. In response to rapid changes brought on by technology, the school broadened its teaching and research significantly in the 1990s and was renamed the School of Information. Its focus is offering a highly interdisciplinary and collaborative approach education to those who will serve as leaders in the information professions. The School of Information occupies space in the North Quadrangle Residential and Academic Complex (North Quad), which was built in 2010. Since 2010, the school has added two new programs (a Master of Health Informatics and a Bachelor of Science in Information) and experienced significant growth in student enrollment and faculty hires. In 2011, the school had 425 students. Today, the school has 820 students with plans to grow enrollment to 850 students by 2021 (an increase of 100 percent from when the school first occupied North Quad). With its significant growth in programs and enrollment, it is increasingly pressed for space to meet its needs. The school is currently leasing space in three nearby off-campus locations as a temporary solution, but this is costly and will not meet the school's space needs as it continues to grow. Operating from three locations is also a serious challenge for the school and hinders its ability to fulfill its academic mission and build community for its students, faculty, and staff. Identifying a long-term solution to meet the School of Information's needs has been a high priority to the university. The school began formally studying its needs in coordination with the College of Engineering's Computer Science and Engineering (CSE) program (noted in the College of Engineering section). The space and enrollment challenges faced by the School of Information and CSE are similar, and both units would benefit programmatically by having a joint solution. As a result, the university submitted a combined School of Information and CSE project to the state for consideration for capital outlay funding in 2017 and is submitting this project again in 2018.

School of Kinesiology

Kinesiology has been part of the University of Michigan curriculum since the turn of the twentieth century. In 1984, a Division of Kinesiology was created and was later designated as the School of Kinesiology in 2008. The school offers bachelor's, master's and doctoral degrees in a variety of subject areas, including athletic training, health and fitness, movement science, and sport management. In 2008, a State of Michigan Capital Outlay project for the renovation and upgrade of Observatory Lodge, now called the Kinesiology Building, was completed which provided classrooms, office, and research space for the school. The project also addressed deferred maintenance, code and accessibility requirements for the building. The school has since experienced tremendous growth and now has programs distributed across multiple on-campus buildings and off-campus leased spaces, which makes it very challenging to foster collaboration and community. In response to the growth in enrollment, faculty hires, and research and the need to collocate these functions, the university approved a complete renovation of and addition to the historic Edward Henry Kraus Natural Sciences Building. This 1915 building previously housed the university's recently relocated biological sciences programs. The university is very proud to be able to renovate this historically significant Albert Kahn building, while enabling the school to consolidate its programs and accommodate its growth. The university is also using this complete renovation to plan for the next generation of modern, flexible team-based learning spaces that will serve both Kinesiology and campus at large. Construction is underway and expected to conclude in 2020.

Law School

Since its founding in 1859, the Law School has been a national and international leader in the field of law and educational access—in 1870, the school was the nation's second university to award a law degree to an African American and, in 1871, the first in the nation to award a law degree to a woman. The school's graduates work in every state and all over the world in business, as practitioners and professors, as legislators and members of Congress, and as distinguished civil servants and members of the judiciary. In recent years, the Law School was able to significantly improve and expand its historic and iconic facilities through a series of renovations and construction projects. The school now houses state-of-the-art student interaction and study spaces, improved classrooms, multi-purpose and clinical spaces, and offices for faculty and administrators in the new South Hall building, new Aikens Commons, and partially renovated Hutchins Hall. A gift from Robert and Ann Aikens helped fund the school's recent building and renovation projects. In 2013, the university reopened the newly renovated Charles T. Munger Residences in the Lawyers' Club building, a residence hall adjacent to the Law School. This significant renovation to the historic 1923 building was made possible in large part by a donation from Charles T. Munger.

University Library System

The University Library system can trace its history to 1838, one year after the university's relocation to Ann Arbor, with the purchase of John James Audubon's *Birds of America* books that are still on display in the historic Harlan Hatcher Graduate Library. Much has changed since the library's founding, but its central role in advancing the university's research and teaching missions continues. Today, the University Library is one of the largest university library systems in the

United States, with 13.1 million volumes stored in various buildings around the Ann Arbor campus. The library is also leading the university's efforts in materials digitization, online, distance, and digital education, looking at ways to enhance the effectiveness and efficiency of on-campus teaching and educational technology and at ways to expand the university's outreach to new audiences. Such technological advancements and a general shift in how students and the community interact with collection materials have significantly changed the responsibilities and operations of the library, and as a result, the library has begun to transform the way its buildings are used to provide new ways for the university community to interact with its materials. In 2008, a donation from alumnus Bert Askwith enabled the University Library to renovate a portion of the Shapiro Undergraduate Library Building into high-quality study and collaboration areas with a small food service operation to meet student needs. The building now operates 24-hours-a-day to accommodate the demand on its spaces and collections.

As is the case with many university libraries, the University Library's greatest challenge is balancing the need to house continually growing collections with the need to provide services and spaces that support modern teaching, learning, and research needs. To address this, the University Library has moved many of its collections to buildings on the fringe of campus or to various off-campus lease sites to free up prime library space for higher priority library needs. For example, earlier this year the university completed a modest renovation to a building at the North Campus Research Complex to preserve a number of University Library collections and other campus collections that require a more stable environment. Having multiple locations for library collections is less than ideal and is a temporary solution to solving the University Library's greater need, which is to have a large library repository (consolidated storage facility) that can house and preserve millions of volumes of materials. Having this type of facility would enable the University Library to free up space in its main library complex, consisting of the interconnected Shapiro Undergraduate Library and the historic Harlan H. Hatcher Graduate Library, and repurpose the Hatcher/Shapiro library complex space to better serve campus library needs in the future. The library repository is the first step to eventually modernizing the Hatcher/Shapiro library complex and we are just starting to study options for the repository now. We may submit the Hatcher/Library complex as a candidate for state capital outlay in the future.

College of Literature, Science, and the Arts

The College of Literature, Science, and the Arts (LSA), founded in 1841, was the first duly constituted college of the university. Distinguished in the humanities since its earliest years, the college became preeminent in the natural sciences during the early twentieth century and went on to become a leader in social science research. As the largest college on campus serving the greatest number of undergraduates, the college's departments and centers are housed in several buildings on Central Campus. The university is continually making improvements to these spaces to keep up with its ever-changing fields of study and research. LSA's most urgent need has been to provide improved and collocated research, teaching, administrative, and exhibit space for its programs in Ecology and Evolutionary Biology; Molecular, Cellular and Developmental Biology; and the Museums of Natural History, Paleontology, and Zoology. This need is being addressed by the completion of a new 300,000 gross square foot Biological Sciences Building, opened for the fall of 2018. This building connects to the Life Sciences Institute building in order to share core

research facilities, resulting in a significant savings in overall cost of building construction. Related to this project, the university recently renovated an off-campus university warehouse building, to create a state-of-the-art storage and research facility, called the Research Museums Center, for the collections of the programs and departments noted above. A generous donation from Ambassador Ronald Weiser and Eileen Weiser enabled LSA to repurpose the former Dennison Building, now Weiser Hall. Opened for the fall 2017 term, the project transformed the 1963 facility comprised mainly of outdated classrooms into an academic center for programs and institutes with international and interdisciplinary themes. The collocation of these programs, previously housed in numerous buildings across campus, provides students, faculty, and staff with a single location for these academic centers and services and enhances programmatic synergies and overall operational efficiencies for the college. LSA is currently in the process of renovating and constructing a modest addition to the west side of Literature, Science, and the Arts Building. The goal of this project is to provide students with a gateway to explore the connection between their liberal arts education and their goals and aspirations in the real world. The new student services space will provide access to a wide variety of experiences and opportunities, including internships, study and work abroad options, funding and employment opportunities, and connections to college alumni. The college is also interested in studying how to improve the east of the LSA building to improve accessibility and to better connect students to the core services housed within. Lastly, LSA also has a pressing need to increase both the number and the quality of instructional spaces to support both existing and developing curriculum and teaching methodologies, particularly team-based learning methodology. The university is looking at options to address both the LSA and university-wide need for modern, team-based instructional spaces, and we hope to partially address their need with a new classroom addition to the existing Alexander G. Ruthven building on Central Campus.

Medical School

Since opening its doors in 1850, the Medical School has been a leader in medical education, biomedical research, and patient care. In addition to its professional Doctor of Medicine program, the school offers master's and doctoral degrees in the basic medical sciences. The school is renowned for its many firsts in medicine, including establishing the nation's first university-owned and operated teaching hospital and creating the first departments of pharmacology and human genetics in the United States. The Medical School was also among the first major American medical schools to admit and graduate women and minorities. In an effort to maintain its excellence in all areas of its mission, the Medical School continues to renovate and modernize instructional and research facilities as priorities dictate and funds allow.

The school's ongoing activation and renovation of the North Campus Research Complex (NCRC, formerly the Pfizer research and development headquarters) has provided faculty and staff immediate opportunities to expand interdisciplinary research and programs and translational research programs, such as emergency medicine. The university is proud to have activated and leveraged the NCRC campus and the complex is now home to more than 3,000 faculty, staff and external partners. Additionally, the school is taking advantage of recently renovated A. Alfred Taubman Health Sciences Library building—home to many of the school's medical student education programs. The facility reopened for the fall 2015 term and now houses high-quality,

contemporary teaching, clinical simulation, student services, and study space. The school is also in the process of renovating space throughout the Medical Campus to create more modern, modular, and flexible research labs. Shifting from traditionally dedicated, smaller labs to the modular configuration has been a priority for the school in all lab renovations in recent years, and it allows them to accommodate growth for existing and new research and to manage operational costs more effectively. The school recently completed a significant renovation of four interconnected buildings at NCRC their pathology department. Previously, the Department of Pathology was spread across five campus buildings plus a number of off-campus leased spaces. The project allows the school to co-locate Pathology faculty, students, staff, and researchers and the associated clinical and research labs into one efficient and flexible facility. Currently, the school is in the early stages of a study for a medical education facility. This project would co-locate a number of student-focused functions, provide additional team-based teaching spaces, and create a welcoming front door to the Medical School.

School of Music, Theatre & Dance

As one of the oldest and largest schools of music in the United States, the School of Music, Theatre & Dance ranks among the top conservatories and schools of music in the country. Degrees are offered at the bachelor's, master's, and doctoral levels in nearly all fields of music, dance, and theater. The school's academic programs are distributed across six buildings on North and Central Campuses. In 2015, the school completed a significant facilities project to partially renovate and expand the school's principal building, the Earl V. Moore Building, made possible by a generous donation from William K. and Delores S. Brehm. The project included new and updated rehearsal halls, new state-of-the-art classrooms, performance technology suite, more student practice rooms, and improved faculty space. While the Moore project addressed the school's most pressing needs, the remaining areas that were not renovated (older practice rooms, some classrooms, and administrative spaces) still require attention and investment sometime in the future. Having programs and operations distributed across multiple buildings on two campuses continues to be a challenge for the school. This includes the dance, musicology, and music education departments, as well as other key administrative functions for the school. The school and university have identified relocating the Dance program to North Campus as a high priority. Lastly, in 2017, the university completed a modest infrastructure improvement project to Revelli Hall, constructed in the early 1970s and home to the university's world-renowned marching band.

School of Nursing

The School of Nursing has maintained a reputation of excellence for more than 100 years and has been a national leader in the advancement of nursing knowledge and the promotion of trends in health care since its founding. The school offers bachelor's, master's, doctoral, and certification programs in a wide variety of nursing fields, such as pediatrics, gerontology and midwifery. In 2015, the school completed construction on a new 78,000 gross square foot building adjacent to their current building. The new building provides active-learning classrooms, a technology rich clinical learning center with simulation and skills labs and simulated patient suites, offices for student services and a few faculty offices. With the opening of the new building, the original

Nursing Building, which is over 100 years old and still houses a number of core functions for the school, will eventually need attention or be replaced.

College of Pharmacy

Established first as a department in 1868, Pharmacy became an independent college in 1876, the first at any university in the United States. Today, Pharmacy is the oldest college of pharmacy in the country and is a top 3 ranked program nationally, offering a number of bachelor's, master's, and doctoral degrees in fields such as pharmaceutical sciences, pharmaceutical engineering, and medicinal chemistry. The college is also actively involved with other health science schools and colleges on campus in developing and teaching interprofessional health science courses that provide a holistic, real-world approach to healthcare education, bringing together students from multiple health science programs (pharmacy, medicine, social work, dentistry, public health, etc.) to focus on patient-centered care. In addition to contributing well-trained pharmacists to the health care industry, the college also plays an instrumental role in research, providing a hub that intersects basic, clinical, and social science disciplines with leading research centers and scientific institutes. Its translational research/drug discovery center plays an instrumental role in taking advanced projects in early drug discovery from idea to clinical proof-of-concept. Other research with the Federal Department of Agriculture (FDA), pharmaceutical industry, and in innovating pharmacy care in physician organizations also contribute to better healthcare of citizens in the state, nation, and world-wide. The college has been successful in delivery high-quality education and research, but this is becoming harder to do in its current facilities. The college currently occupies space in six buildings on campus, excluding clinical space, five of which were built prior to 1960. For a small college like Pharmacy, being physically distributed across these many locations significantly challenges its ability to meet its core academic, research, and clinical mission, to building a sense of community within the college, and to operate efficiently.

In 2013, the university completed a modest $2.6 million capital project that addressed some mechanical and electrical issues in the College of Pharmacy Building and made small improvements to student, faculty, and administrative spaces. The college continues to be significantly challenged to meet its research and team-based learning pedagogical needs, however. The college has been exploring ways to reconfigure existing spaces to construct team-based learning spaces in their building, but the outdated building infrastructure is unable to accommodate this need—severely hindering the college's desire to shift more curriculum in this direction. Having research labs distributed across multiple buildings with outdated infrastructure and structural limitations limit the college's ability to conduct cutting edge research. We recently started a programming study of Pharmacy's needs and consider Pharmacy to be one of our highest priorities. Depending on timing and near-term pressures, we will either move forward with a capital project for Pharmacy or we may submit Pharmacy as a candidate for state capital outlay in the future.

School of Public Health

Though formally established in 1941, the School of Public Health can trace its beginning to 1887 when the first professor of hygiene was appointed, and to 1897 when the university awarded its first degree in that field. Today, the school offers master's and doctoral degrees in fields such as

biostatistics, environmental health sciences, epidemiology, health behavior and health education, nutritional sciences, and health management and policy, and health informatics. For fall 2015, the college began offering undergraduate courses for the first time, and in fall 2017, it formally launched two undergraduate degree programs. Over the past decade, the university made a series of renovations and an expansion to the school's existing buildings to provide higher quality research, classroom, and administrative space, as well as to make significant infrastructure improvements to its research-heavy facilities.

Gerald R. Ford School of Public Policy

The Gerald R. Ford School of Public Policy traces its history to the founding of the Institute of Public Administration in 1914, the first university program in the United States to provide a systematic course of study in municipal administration. Today, named in honor of Gerald R. Ford, the 38th President of the United States and an alumnus of the University of Michigan, the school prepares graduates for distinguished careers in policy analysis and management and promotes improved public policy through research. Its graduates work in government and in the private and nonprofit sectors all over Michigan, the United States, and throughout the world. Traditionally a graduate and professional school, the school launched a highly successful undergraduate degree program in 2007. Thanks to a generous gift from Joan and Sanford Weill, the school was able to consolidate into a single building, named Weill Hall, in 2006. The school is beginning to look at how to use their existing facility in new ways to accommodate changes to their research and pedagogy.

Horace H. Rackham School of Graduate Studies

The Horace H. Rackham School of Graduate Studies oversees and coordinates graduate education, bringing together graduate students and faculty from across the institution to experience and take full advantage of the university as a scholarly community. In 2003, a major renovation of the historic Horace H. Rackham Building, originally constructed in 1938, was completed. Additional infrastructure improvements to the facility were completed in 2015. Given the iconic building's age, historic significance, and its prime location as an event and study facility on Central Campus, it is a building that will require on-going upkeep.

School of Social Work

The program in Social Work began in 1921 and was granted the status of a school in 1951. The School of Social Work consistently ranks as one of the top programs in the nation and offers master's and doctoral level degrees and continuing education that prepare practitioners, researchers, and academics in the fields of interpersonal therapy, community organization, management of human services, and social policy and evaluation. Its graduates work throughout Michigan, the U.S., and the globe, with individuals, children and their families, organizations, and communities in such fields as substance abuse, aging, mental health, education, child and public welfare, and public policy. In 2011, the school completed a renovation of the lower level of its building, which repurposed space previously housing a small library into areas that enable students to practice and observe clinical approaches, accommodate expanded continuing education programs, and provide much needed student collaboration and study space. The school recently identified the need for additional space for a variety of administrative, faculty,

instructional, and student service functions. The school is currently renovating space within the School of Social Work Building, previously occupied by a number of non-social work functions, to address some of their pressing space needs.

Other Initiatives Impacting Facilities and the Economic Development Impact of Current/Future Programs

As one of the top-ranked public and research institutions in the world, the University of Michigan is fully committed to its role of stewardship and contributing to the state's economy. The university supports students and faculty well beyond the traditional walls of studies and research by creating an environment that fosters innovation, robust collaborations and partnerships, and by providing resources to transfer education and research into applications. Several endeavors are underway that impact current and future facilities usage, and also spur economic development in Michigan and beyond.

Leadership in Transportation, Automotive and Autonomous Systems Research

The University of Michigan has historically held a leadership role in automotive and transportation research and continues to view its strong partnerships with the state government, federal government, and the private sector, particularly automakers, as essential to the application of the university's research and to the state economy.

- In 2013, the university established the Mobility Transformation Center (MTC), a university-government-industry partnership formed at U-M to transform global mobility by dramatically improving transportation safety, sustainability, and accessibility. Mcity, a cityscape designed expressly for testing connected and automated (including driverless) vehicle systems was launched in 2015. The MTC draws on U-M's broad strengths in engineering, urban planning, energy technology, and information technology to accelerate progress in diverse areas such as connected-vehicle systems, driverless or autonomous vehicles, shared vehicles, and advanced propulsion systems. A key focus of the MTC is a series of model deployments that will enable researchers to test emerging concepts in connected and automated vehicles in on-road settings. Through interdisciplinary cooperation, MTC also addresses the many social, political, regulatory, and economic issues inherent in the transition to new mobility technologies and systems. The MTC collaborates closely with its state and federal government founding partners as well as private sector partners including auto manufacturers and suppliers, insurance, telecommunications, data management, and mobility services companies. In 2018, the Mcity Driverless Shuttle was launched on the U-M campus. This partnership between the university and the French firm NAVYA is a real-world application of driverless technology and an actual research study of passenger reactions and acceptance of this technology. The shuttle travel roughly one-mile round-trip route at the North Campus Research Complex (NCRC) and nearby parking lots. The university expects to expand the shuttle routes to other areas of campus and the research focus to other areas, like passenger accessibility.

- The U-M Transportation Research Institute (UMTRI) is a research institute that collaborates with other university units and with public and private sector institutions and automakers. Its mission is to achieve safe and sustainable transportation, increase driving safety, and further transportation systems knowledge through interdisciplinary research. UMTRI's portfolio is vast and its research covers areas such as vehicle safety and injury biomechanics; connected-vehicle research and testing; sustainable mobility systems; transportation data fusion and analysis; and the efficient movement of heavy freight.

- The College of Engineering has a strong portfolio dedicated to automotive and transportation research and works closely with UMTRI and national and local institutions and business in finding solutions to real world problems. Its research and outreach activities on these topics take place mainly in its Mechanical Engineering department and in a variety of centers within the college, such as the Automotive Research Center, a partnership with the U.S. Army; GM/U-M Smart Materials & Structures Collaborative Research Laboratory; and GM/UM Advanced Battery Coalition for Drivetrains. In 2018, the college and Penn State University was awarded a $2 million grant from the US Department of Energy's Vehicle Technologies Office to study algae and bio-fuels. This is just one recent example of the college's leadership in this area.

Lightweight Materials Manufacturing Research and Application

Founded in 2014 with U-M as a founding partner, the consortium Lightweight Innovations for Tomorrow (LIFT) is a public-private partnership headquartered in Detroit with a mission to develop and deploy advanced lightweight materials manufacturing technologies and to implement education and training programs to prepare the workforce. LIFT serves the U.S. manufacturing sector by supporting innovative manufacturing technologies, and enabling cost-effective light weighting of components used in transportation systems. Target manufacturing sectors include automotive, aerospace, defense, over the road truck, and rail. The institute's partners identify priorities for technology, workforce, and supply chain development, as well as provide financial support for precompetitive research. This effort aims to yield results in technology insertion, maturation, and opportunities for commercialization. LIFT also develops relevant manufacturing workforce, education, and apprenticeship programs that can reach students at all levels of the education system.

Leadership in Data Science Research and Application

The University of Michigan is investing $100 million in a Data Science Initiative (DSI), launched in fall 2015, to enhance opportunities for student and faculty researchers across the university to research and develop the enormous potential of big data. Progress in a wide spectrum of fields ranging from medicine to transportation relies critically on the ability to gather, store, search and analyze big data—collections of information so vast and complex that they challenge traditional approaches to data processing and analysis. The DSI supports interdisciplinary data-related research initiatives to foster new methodological approaches to big data. Industry engagement is also central to the initiative, with a particular focus on the automotive, advanced manufacturing, chemical, finance, health care and pharmaceutical sectors, and the DSI supports existing and future research that have practical applications in all of these fields. In one project

at U-M's Transportation Research Institute, for example, researchers have collected a continuous stream of data at a rate of 10 times per second from each of nearly 3,000 private cars, trucks and buses on the streets of Ann Arbor to test the operation of connected vehicles. The DSI helps collect, store and analyze the huge amount of data being generated as researchers expand the number of vehicles to more than 20,000 across Southeast Michigan. In medicine and public health, U-M researchers seek to use big data to boost the effectiveness of data-driven biomedical and health research to accelerate the translation from basic research to patient care. By sifting through the massive amount of data generated from DNA sequencing, medical histories and other sources, for example, the DSI helps researchers looking to more precisely diagnose or assess an individual's risk for certain types of cancer and to formulate the most effective personalized therapies.

Economic Growth Institute

The Economic Growth Institute leverages the University of Michigan's resources, research, technologies, and expertise to foster innovation and create positive economic impact for local, state, national, and global communities and economies by working with small and medium-sized enterprises.

- *The institute works with companies that are considered to be strategically critical to the economy.* During the great recession, the institute worked with 200 Midwest manufacturing companies, important to automotive supply chains, which were predicted to declare bankruptcy within six months. After conducting 1) financial analysis and restructuring, 2) market analysis and new customer support, 3) operational excellence strategies, and 4) assistance with adopting new university technologies to improve companies' competitiveness; 198 companies survived.

- *The institute works with companies that are launching their first technical product, or an existing technical product into a new market.* For example, the institute worked with a small rural company that had developed a waterproof fabric and was selling outdoor clothing. The institute's team of project managers searched for and found faculty to develop a flame retardant fabric treatment at a university and helped the company integrate the technology into their design. The institute then found a customer that needed a waterproof, flame-retardant fabric to manufacture military tents.

- *The institute works with communities that would like to improve their economy.* With funding from the U.S. Department of Commerce Economic Development Administration (EDA) in response to the automotive crisis, U-M Economic Growth Institute formed and led rapid response teams at the University of Michigan, Ohio State University, Cleveland State University, Purdue, and the University of Wisconsin-Whitewater. These teams worked with communities experiencing the adverse impacts of 50 major auto manufacturing plant closings. At the end, there was approximately 350 million square feet of empty manufacturing space in the six-state EDA Chicago region. The institute launched the National Catalog of Excess Manufacturing Capacity and created a matching algorithm and website for foreign direct investment, targeting site selectors internationally.

One site was the General Motors Willow Run plant in Michigan. The institute was part of the team that facilitated a transaction that transferred ownership of the site to the American Center for Mobility (ACM). ACM is now located on the 350-acre site and transforming into the nation's premier research facility, certification site, and test and development location for connected and autonomous vehicles. When fully operational, the ACM is expected create hundreds of jobs, spin-off innovations and startups.

Technology Transfer and Business Engagement

The U-M Office of Technology Transfer is the organization responsible for bringing university research to the marketplace by encouraging licensing and broad deployment with existing businesses and newly formed U-M start-ups. The office includes the Michigan Venture Center, which opens the university to entrepreneurs and venture partners interested in start-up opportunities based on U-M technology, and the Venture Accelerator, which provides space to start-ups that leverage the expertise and services of the Michigan Venture Center. In addition to these programs, the Office of Technology Transfer provides patenting, licensing, legal, and general decision-making and business advice to the U-M community. Tech Transfer had 169 U.S. patents issued in fiscal year 2018. It also signed 169 license and option agreements with companies seeking to commercialize the discoveries of university researchers in the past fiscal year.

The Business Engagement Center, which is collocated with the Office of Technology Transfer, has a mission to strengthen the university's ties to business and community partners and to help revitalize and diversify Michigan's economy. Acting as a gateway to the university, the Business Engagement Center assists business and community partners in maximizing their growth potential by identifying and accessing the university's vast resources, including research discoveries, new technology, high-tech facilities, student and alumni talent, continuing education programs, and strategic giving opportunities.

Precision Health

In 2017, the university launched a new initiative to harness campus-wide research aimed at finding personalized solutions to improve the health and wellness of individuals and communities. Precision Health brings together researchers from across campus and combines biomedical expertise with big data and social science approaches to tailor health solutions for the population. This initiative is about more than traditional personalized medicine, and there are three complementary components: discovery, treatment, and implementation. An initial Precision Health project will focus on the prescribing of opioids to manage pain from surgery. For this project, researchers will identify risk factors that might increase the likelihood of someone becoming a chronic opioid user – based on each patient's health, genetics, social, environmental and lifestyle factors. From there, they can create guidelines to tailor pain management plans and reduce opioid prescriptions. In 2018, the university received a $6.8 million grant from the National Cancer Institute to fund research to create new bioinformatics resources and identify new cancer biomarkers to improve diagnosis and to develop new therapies.

Poverty Solutions

The university launched Poverty Solutions in 2016, an initiative dedicated to the prevention and alleviation of poverty. While rooted in an understanding of the causes and consequences of poverty, Poverty Solutions engages multiple disciplines and extends beyond basic research. It drives change by focusing on collaborative, action-based research partnerships with communities, policymakers, and stakeholders. U-M students at every level have opportunities to work and learn with real-world practitioners, testing strategies to change the trajectory of poverty in a meaningful and lasting way. Projects within the initiative include a summer youth employment program and research on housing instability and the employment of a less educated workforce. In 2018, the university launched a partnership with Harvard University and created the Equality of Opportunity Project. The goal of the project is to spur economic mobility and reduce poverty in the City of Detroit, as well as combine resources and expertise in response to the national opioid crisis. The universities will collaborate with the City of Detroit and local partners on an action plan to identify promising, results-based interventions for improving the livelihoods of low-income Detroit residents.

Sustainability and Great Lakes Research

The University of Michigan has long been engaged in many aspects of sustainability, and in recent years has begun focusing resources to spur progress in this critical arena. Through a number of research centers and initiatives, the university is finding realistic solutions to many major sustainability problems—whether related to energy, water conservation, air pollution, or transportation. In the coming years, we expect research, application, and partnerships in these areas to increase significantly with the recent announcement by the university of a new school of sustainability.

- The Great Lakes Integrated Sciences and Assessments Center (GLISA) is a collaboration of the University of Michigan, Michigan State University, Ohio State University, and Michigan Sea Grant. GLISA's focus is mainly the watersheds of Lake Huron and Lake Erie in Michigan, Ohio, and Ontario, but also encompasses the broader Great Lakes basin. Its research and outreach spotlight critical sectors in the region—agriculture, watershed management, urban management, water quality, and natural resources-based tourism.

- The University of Michigan Water Center, part of the university's Graham Sustainability Institute, was established in 2012 to bolster freshwater ecosystem restoration and protection efforts. The center engages researchers, practitioners, policymakers, and nonprofit groups, and its initial efforts are focused on the Great Lakes with an emphasis on working closely with academic colleagues and practitioners in the region to improve restoration outcomes. The U-M Water Center extends its reach beyond the Upper Midwest and is a partner with the National Oceanic and Atmospheric Administration. Together, they oversee research at a nationwide network of coastal reserves. The Center also coordinates the National Estuarine Research Reserve System's collaborative science program. This program supports water quality monitoring and long-term research on the impacts of land-use change, pollution and

habitat degradation in the context of climate change trends. The overarching goal is improved stewardship of these economically significant estuaries.

Academic and Practical Training Programs in Entrepreneurship

The university is committed to fostering and nurturing the entrepreneurial spirit with faculty and students through academic programs and incubator-like centers across campus:

- The Zell Lurie Institute, part of the Stephen M. Ross School of Business, is a globally recognized academic program in entrepreneurial studies. The program provides curriculum, program initiatives, community involvement, and alumni outreach activities that deliver exclusive resources for future entrepreneurs at the university. The institute's innovative real-world approach, combined with the Ross School of Business's traditional management excellence encourages, nurtures, and prepares students for entrepreneurial careers and to be leaders for new venture creation and growth.

- The Center for Entrepreneurship, part of the College of Engineering, connects current students with Michigan alumni in the start-up community; provides grants for students to pursue their own ideas for companies and products; supports, simplifies and clarifies intellectual property transfer processes for students and the broader community; and develops entrepreneurship-focused programming on campus. The Center for Entrepreneurship is responsible for launching brand new courses and formal academic programs focused on entrepreneurship and for co-managing the TechArb student startup accelerator, described below.

- TechArb, supported by the Center for Entrepreneurship and the Zell Lurie Institute, is a student venture accelerator program at the university. TechArb provides community space in Ann Arbor for students to interact with each other and with mentors, who include experienced entrepreneurs, investors, venture capitalists, accountants, and lawyers—often U-M alumni. Mentors and TechArb staff hold regular office hours with students to help them work through their ideas with the goal of building and growing actual companies. TechArb also provides students with summer grants so they can work full time on their venture. Numerous companies have been founded by students and cover a wide range of areas from the development of software applications for mobile devices to a clothing manufacturing company that uses recycled and eco-friendly materials.

- The Desai Accelerator was founded in 2013 to expand the growing Ann Arbor technology startup community. Equipped with resources from both the University and the city of Ann Arbor, the Desai Accelerator is able to help entrepreneurs build their businesses and maximize their potential. Its programming unites entrepreneurs who want to tap into Michigan's vast network and resources, including those in Ann Arbor's rich entrepreneurial community and at U-M. Startups receive funding, tailored mentorship opportunities, national visibility, and other resources that help them achieve successful sustainability.

- OptiMize is the College of Literature, Science, and the Art's signature initiative for social innovation and entrepreneurship. The program, which started as a student-led initiative, has served 2,500 students and developed a national reputation, resulting in features in Forbes 30 Under 30, Crain's 20 in their 20s, and many other press outlets. OptiMize supports students in finding solutions to real-world problem through funding challenges and awards, social innovation program, summer fellowships, and mentorship programs.

- Innovate Blue, launched in 2014, is the university's academic home for entrepreneurial activities for undergraduate students, and it connects them to many of the programs and opportunities noted above. Innovate Blue is home to an actual minor in entrepreneurship that equips undergraduate students from any background or area of study with the necessary skills and experience to translate ideas into real impact in the arts, sciences, commercial, and social areas.

Energy Institute

Established in 2006 and building on the legacy of the Michigan Memorial Phoenix Project, which began in 1948, the Energy Institute builds on a strong energy research heritage at the heart of the nation's automotive and manufacturing industries. The Energy Institute develops and integrates science, technology and policy solutions for the world's pressing energy challenges, in order to address the demand for economically and environmentally sound energy solutions that are urgent and global. In 2013, an addition to and renovation of the Michigan Memorial Phoenix Laboratory was completed for the Energy Institute. This project replaced building systems and created state-of-the-art laboratory spaces for energy-related research. The institute recently opened its Battery Fabrication and Characterization User Facility, a space developed in cooperation with the Michigan Economic Development Corporation and Ford Motor Company, to enable industry and university researcher collaboration on developing cheaper and longer lasting energy-storage devices.

University Research Corridor

One example of the university's commitment to the state's economy is its role in the University Research Corridor (URC), a collaboration between the University of Michigan, Michigan State University and Wayne State University that focuses on stimulating economic development in the state and region by leveraging the collective research assets of these three institutions. The URC is an umbrella organization that disseminates information to key stakeholders, including the business community, researchers and students, policymakers, and other investors. In doing so, the URC enhances outreach and collaborative efforts, speeds up technology transfer and development, and communicates the advantages of doing business in Michigan. The URC retained its second-place standing in the Innovation Power Ranking among the nation's most respected innovation clusters for the fourth year in row. The URC contributed $18.7 billion in state economic activity in 2017 alone. The URC also generated over 78,000 jobs in 2017. Since 2002, the URC has cultivated hundreds of start-up companies in the state.

Academic and Research Programs in the City of Detroit

The University of Michigan was founded in Detroit in 1817 and has continued its commitment to the city for over 200 years. Currently, numerous U-M programs and activities are held in the city that include education, research and scholarship, community service and outreach, and cultural exchange that mutually enrich both the U-M and Detroit communities.

A few examples of the university's Detroit partnerships and connections include:

- Sponsored and non-sponsored research projects with Wayne State University, Henry Ford Health System, the Karmanos Cancer Institute, the Automotive Research Center, the Detroit Schools Higher Education Consortium, and various local community groups. A recent example comes from the School of Public Health, which is working to combat health issues like asthma and cardiovascular disease through a $2.8 million grant from the National Institute of Health and Environmental Sciences. To implement the grant, U-M researchers have partnered with academic peers and Detroit community organizations to form Community Action to Promote Healthy Environments, a collaborative initiative to help improve air quality and resident health in Detroit.

- Engaged learning opportunities and arrangements that enable U-M students to apply what they've learned in the classroom to real life, such as student teaching assignments in the Detroit Public Schools and clinical placements in Detroit-based hospitals, clinics, medical practices, and schools.

- Community service and outreach that immerses U-M students, faculty, and staff in the Detroit community through programs. Examples include the Michigan Engineering Zone which exposes Detroit middle and high schools students to science, engineering, and technology through hands-on learning experiences and the Semester in Detroit program where U-M students live, study, and work in Detroit, interning with Detroit-based community and cultural organizations to strengthen and transform themselves and to make a positive impact on the Detroit region.

- The university is part of a consortium that will help fund a one-of-a-kind school campus at Marygrove College and fuel neighborhood revitalization efforts in northwest Detroit. U-M is partnering with the Kresge Foundation; the Detroit Public Schools Community District; Starfish Family Services; IFF, a Chicago-based nonprofit community development financial institution with an office in Detroit; the Detroit Collaborative Design Center of the University of Detroit Mercy; and the Marygrove Conservancy. Marygrove will be the site of a P-20 campus, meaning it will include early childhood, preK-12, post-secondary and graduate education. At full capacity, in 2029, the partnership will serve about 1,000 students. It will begin with ninth-grade in 2019. Kindergarten and pre-kindergarten classes will begin in 2020. A partnership between the school district and University of Michigan's School of Education will house an innovative approach to preparing newly certified teachers that is modeled on residency programs for medical doctors.

- The university is exploring additional ways to work with Wayne State University toward common goals in Detroit.

- The university is currently exploring opportunities to better leverage the Horace H. Rackham Education Memorial building in Detroit to further its programs and outreach within the city. The first step is the recently completed purchase of approximately one third of the building not previously owned by the university.

III. STAFFING AND ENROLLMENT

Enrollment at the University of Michigan – Ann Arbor has been slowly increasing, from 33,600 in 1969 to more than 46,000 today, with the intent to maintain enrollment within a few percent of this level over the next five years. The university believes that this represents a level appropriate for the size of the university's faculty, facilities, and funding. Increased enrollment in key programs is expected — for example, we anticipate an increase in demand for instruction in fields such as computer science and engineering; information sciences; and biological, biomedical and life sciences. Education in these fields is an important part of the university's mission, and it meets a very real need in the state and the nation. Detailed enrollment data by school and college follows this page.

Average class size varies by discipline. In fall 2017, 57 percent of the primary sections taught to undergraduate students contained fewer than 20 students. Some sections are taught to large groups where appropriate; primary sections with 50 or more students represented about 18 percent of the undergraduate sections taught in fall 2017.

Total headcount enrollment has grown by about 16.3 percent since fall 2007, and the volume of research has increased 80 percent. The number of General Fund full time equivalents (FTEs) has grown by about 15.1 percent overall from fall 2007 through fall 2017. Non-academic staff General Fund FTEs grew by about 14.6 percent while the university has deliberately grown the General Fund academic staff ranks, which are up 16 percent since fall 2007. Furthermore, in the past several years the university has launched initiatives to hire 150 new faculty members in a concerted effort to improve student-faculty ratio.

Impact of Distance Learning

Distance learning has been primarily used to combine technological advances with current methods of instruction for on-campus students. Some academic units, such as the College of Engineering; the College of Literature, Science, and the Arts; the School of Nursing; the School of Public Health; and the Stephen M. Ross School of Business, use distance learning to supplement their Ann Arbor offerings. This approach enhances the quality of the education provided to our students by ensuring that we maintain our competitive edge.

In addition to distance learning, the university is expanding its presence with new online degree programs. The School of Information and School of Public Health are implementing two new fully online masters degree programs that will be offered in Fall 2019 through Coursera, one of the largest online education platforms. The degrees will offer a flexible, personalized, and networked opportunity for learners around the world to obtain a U-M education from wherever they are and to join the U-M community in understanding and addressing global problems.

We expect that distance learning and online degree programs will continue to grow, but they will not replace the university's on-campus programs or affect overall enrollment.

University of Michigan-Ann Arbor

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	28,386	28,312	28,964	29,821	30,318
Graduate	12,557	12,628	13,014	13,415	13,492
Professional	2,682	2,711	2,740	2,766	2,906
Total	43,625	43,651	44,718	46,002	46,716

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	28,029	28,189	27,884	28,653	29,414
Graduate	13,599	13,466	13,644	14,170	14,531
Professional	2,909	2,863	2,858	2,931	2,948
Total	44,537	44,518	44,386	45,754	46,893

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts (Includes Hospital)

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	4,819.2	4,931.0	5,097.5	5,219.6	5,346.1
Primary Faculty	938.2	930.0	935.4	943.3	947.9
Supplemental *	4,039.9	4,016.8	4,065.0	4,159.5	4,288.9
Staff	27,846.6	28,829.9	29,594.5	30,837.0	32,291.4
Total	37,643.9	38,707.7	39,692.4	41,159.5	42,874.3

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

* Supplemental includes Research Fellows, House Officers, Graduate Student Services, and other Supplemental

Research Grants and Contracts ($000)

	2013-14	2014-15	2015-16	2016-17	2017-18
Schools & Colleges	836,121	871,461	911,711	969,282	1,003,375
Hospital, Acad., & Resrch. Units	168,975	152,743	170,957	174,634	198,536
Total	1,005,096	1,024,203	1,082,668	1,143,917	1,201,911

Source: U-M Financial Data Warehouse

Fall Term Student to Faculty Ratio

2014	2015	2016	2017	2018
15:1	15:1	15:1	15:1	*Avail. Jan 2019*

Source: Common Data Set

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

A. Alfred Taubman College of Architecture and Urban Planning

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	178	152	145	162	184
Graduate	490	492	495	490	479
Professional	- -	- -	- -	- -	- -
Total	668	644	640	652	663

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	203	189	168	167	186
Graduate	612	616	634	619	633
Professional	- -	- -	- -	--	--
Total	815	805	802	786	819

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	86.9	88.8	72.3	87.1	89.5
Primary Faculty	0.0	0.0	0.0	0.0	0.1
Supplemental *	16.3	20.3	15.1	15.2	14.7
Staff	40.9	42.1	44.0	43.9	47.4
Total	144.0	151.2	131.5	146.2	151.7

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

* Supplemental includes Research Fellows, House Officers, Graduate Student Services, and other Supplemental

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
1,888	730	1,037	1,150	758

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
15	15	17	18	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

Penny W. Stamps School of Art and Design

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	538	540	535	540	582
Undergraduate Joint Program	10	7	15	11	12
Graduate	16	16	19	18	19
Professional	--	--	--	--	--
Total	564	563	569	569	613

Source: Dashboard 04. Student Enrollment | Enrollment Trends
Note: Art/Music Joint Program count is reported here and with Music/Theater/Dance, but unduplicated in the Summary.

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	442	440	442	423	456
Graduate	23	25	20	24	21
Professional	--	--	--	--	--
Total	465	465	462	447	477

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	50.9	45.8	54.5	56.3	57.8
Primary Faculty	0.0	0.0	0.0	0.0	0.0
Supplemental *	5.5	4.0	4.1	4.9	3.9
Staff	37.8	36.3	33.5	34.0	35.3
Total	94.2	86.1	92.1	95.3	97.0

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

* Supplemental includes Research Fellows, House Officers, Graduate Student Services, and other Supplemental

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
0	4	94	125	0

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
12	14	14	15	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

Stephen M. Ross School of Business

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	1,510	1,595	1,733	2,330	2,385
Graduate	1,832	1,804	1,752	1,814	1,838
Graduate Joint Program	11	--	--	--	--
Professional	--	--	--	--	--
Total	3,353	3,399	3,485	4,144	4,223

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Note: Business/Engineering Joint Program (ended 2014) count reported here and with Engineering, but unduplicated in the Summary.

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	1,089	1,192	1,270	1,518	1,653
Graduate	2,245	2,210	2,150	2,109	2,213
Professional	--	--	--	--	--
Total	3,334	3,402	3,420	3,627	3,866

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	150.1	150.3	160.4	164.6	161.3
Primary Faculty	8.0	7.0	10.9	9.0	10.0
Supplemental *	23.7	21.6	24.3	24.3	23.9
Staff	278.4	306.3	330.6	357.8	383.8
Total	460.3	485.3	526.2	555.8	579.0

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
372	865	3,092	1,109	2,750

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
53	47	50	52	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Dentistry

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	86	102	111	110	102
Graduate	107	103	98	110	121
Professional	435	447	460	471	469
Total	628	652	669	691	692

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	66	63	74	80	84
Graduate	78	76	89	109	148
Professional	625	637	661	680	695
Total	769	776	824	869	926

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	142.1	143.7	140.9	133.1	132.7
Primary Faculty	14.1	14.9	14.8	11.0	9.8
Supplemental *	30.5	27.2	21.1	20.8	23.6
Staff	328.9	324.8	323.5	325.2	339.7
Total	515.6	510.6	500.2	490.1	505.9

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
17,713	16,833	15,700	14,680	19,369

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018

Not Available

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School for Environment and Sustainability

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	--	--	--	--	--
Graduate	324	287	301	284	283
Professional	--	--	--	--	--
Total	324	287	301	284	283

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	1	3	2	4	6
Graduate	268	278	256	270	238
Professional	--	--	--	--	--
Total	269	281	258	274	245

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	31.3	35.0	33.7	36.6	41.0
Primary Faculty	9.8	5.2	6.3	6.5	7.3
Supplemental *	43.9	43.8	37.7	35.2	38.8
Staff	101.6	78.4	78.9	85.7	78.5
Total	186.6	162.4	156.5	163.9	165.7

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
13,401	14,159	14,702	13,209	14,704

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
15	15	16	14	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Education

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	156	133	113	118	130
Graduate	371	337	357	379	383
Professional	--	--	--	--	--
Total	527	470	470	497	513

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	257	223	190	190	170
Graduate	430	467	425	451	447
Professional	--	--	--	--	--
Total	687	690	615	641	617

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	63.2	66.0	64.0	63.2	60.5
Primary Faculty	5.6	5.4	3.7	3.9	2.9
Supplemental *	56.8	52.1	47.1	45.5	43.7
Staff	91.1	83.5	84.7	90.5	87.9
Total	216.7	207.0	199.5	203.2	194.9

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
8,865	7,797	9,454	10,175	11,036

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
13	11	11	12	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

College of Engineering

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	6,024	6,097	6,231	6,442	6,648
Graduate	3,169	3,331	3,515	3,637	3,537
Graduate Joint Program	11	--	--	--	--
Professional	--	--	--	--	--
Total	9,204	9,428	9,746	10,079	10,185

Source: Dashboard 04. Student Enrollment | Enrollment Trends
Note: Business/Engineering Joint Program (ended 2014) count reported here and with Business, but unduplicated in the Summary.

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	4,235	4,430	4,613	4,844	5,091
Graduate	2,639	2,700	2,892	3,051	3,126
Professional	--	--	--	--	--
Total	6,874	7,130	7,505	7,895	8,217

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	400.3	412.7	424.2	438.3	447.1
Primary Faculty	115.3	104.7	116.2	103.4	101.7
Supplemental *	776.5	780.9	822.6	846.8	855.5
Staff	603.0	613.3	616.9	645.4	666.4
Total	1,895.1	1,911.6	1,979.9	2,033.9	2,070.7

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
187,401	213,456	228,875	229,720	209,686

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
31	32	31	35	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Information

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	84	151	206	252	313
Graduate	410	376	410	472	507
Graduate Joint Program	43	55	73	75	71
Professional	--	--	--	--	--
Total	537	582	689	799	891

Source: Dashboard 04. Student Enrollment | Enrollment Trends
Note: Information/Public Health Joint Program count is reported here and with Public Health, but unduplicated in the Summary.

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	124	181	224	282	343
Graduate	435	374	342	395	460
Professional	--	--	--	--	--
Total	559	555	566	677	803

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	35.2	38.8	39.5	45.6	47.3
Primary Faculty	1.2	1.6	0.7	1.2	1.8
Supplemental *	33.5	41.3	37.0	39.0	49.3
Staff	48.8	54.5	54.0	61.6	67.3
Total	118.7	136.1	131.2	147.3	165.6

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
5,756	4,679	2,563	3,711	4,385

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
33	31	36	41	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Kinesiology

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	925	924	947	973	965
Graduate	60	79	79	94	108
Professional	--	--	--	--	--
Total	985	1,003	1,026	1,067	1,073

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	533	530	579	572	602
Graduate	42	50	55	60	64
Professional	--	--	--	--	--
Total	575	580	634	632	666

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	40.1	39.1	43.7	44.6	45.6
Primary Faculty	5.4	4.2	3.7	3.4	0.8
Supplemental *	16.4	20.8	16.0	18.6	11.8
Staff	67.3	67.6	61.1	55.8	45.6
Total	129.2	131.6	124.4	122.3	103.7

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
8,245	7,946	11,059	9,231	7,391

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
19	19	19	21	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

Law School

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	--	--	--	--	--
Graduate	--	--	--	--	--
Professional	1,047	977	973	967	1,051
Total	1,047	977	973	967	1,051

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	--	--	--	--	--
Graduate	6	8	8	7	10
Professional	1,101	1,045	974	983	955
Total	1,107	1,053	982	990	965

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	85.7	82.8	82.4	86.2	90.1
Primary Faculty	9.4	10.0	11.0	10.0	11.0
Supplemental *	6.3	6.0	7.0	9.0	8.0
Staff	163.2	163.8	153.8	153.8	150.8
Total	264.5	262.6	254.2	259.0	259.9

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
2,676	2,035	1,925	788	594

Source: U-M Financial Data Warehouse

Weighted Average Class Size

2014	2015	2016	2017	2018
26	23	24	23	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

College of Literature, Science, and the Arts

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	17,307	16,969	17,216	17,075	17,149
Graduate	2,339	2,369	2,452	2,513	2,524
Professional	--	--	--	--	--
Total	19,646	19,338	19,668	19,588	19,673

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	19,247	19,054	18,417	18,601	18,825
Graduate	3,095	3,009	3,024	3,101	3,128
Professional	--	--	--	--	--
Total	22,342	22,063	21,441	21,702	21,954

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	1254.8	1284.8	1295.5	1340.6	1343.8
Primary Faculty	49.6	54.0	56.2	53.1	44.8
Supplemental *	926.2	893.2	910.7	943.6	986.2
Staff	922.7	921.0	955.9	1012.9	1072.5
Total	3153.3	3152.9	3218.3	3350.1	3447.3

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
81,306	77,953	79,862	88,015	91,052

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
29	28	28	28	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

Medical School

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	--	3	30	25	28
Graduate	458	450	451	469	521
Professional	842	932	909	909	923
Total	1,300	1,385	1,390	1,403	1,472

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	261	260	267	281	249
Graduate	663	703	705	722	755
Professional	787	782	813	824	805
Total	1,711	1,745	1,785	1,827	1,809

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	1938.4	1998.5	2118.5	2125.5	2198.7
Primary Faculty	330.6	338.5	327.8	357.5	364.4
Supplemental *	648.1	610.7	632.9	634.5	678.8
Staff	3151.5	3228.2	3380.7	3625.3	3649.6
Total	6068.5	6175.8	6459.9	6742.8	6891.5

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
417,874	430,422	441,989	480,432	518,377

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018

Not Available

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Music, Theatre and Dance

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	791	821	820	825	808
Undergraduate Joint Program	10	7	15	11	12
Graduate	298	282	281	303	316
Professional	--	--	--	--	--
Total	1,099	1,110	1,116	1,139	1,136

Source: Dashboard 04. Student Enrollment | Enrollment Trends
Note: Art/Music Joint Program count is reported here and with Art, but unduplicated in the Summary.

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	827	826	850	850	870
Graduate	381	360	353	362	389
Professional	--	--	--	--	--
Total	1,208	1,186	1,203	1,212	1,259

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	153.8	153.2	160.1	165.4	168.0
Primary Faculty	0.0	0.0	0.0	0.0	0.0
Supplemental *	24.9	27.4	30.3	32.5	30.8
Staff	84.7	86.6	91.1	94.0	98.5
Total	263.4	267.2	281.5	291.9	297.2

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
112	285	124	79	285

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
17	17	17	17	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Nursing

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	649	670	706	672	630
Graduate	331	372	351	293	249
Professional	27	27	54	85	122
Total	1,007	1,069	1,111	1,050	1,001

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	506	566	544	591	530
Graduate	223	207	236	274	215
Professional	23	35	43	72	118
Total	752	808	823	937	864

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	85.0	86.6	89.7	95.3	103.3
Primary Faculty	1.5	3.3	1.2	2.4	3.2
Supplemental *	3.8	2.5	2.5	2.5	2.0
Staff	81.6	82.1	96.8	106.6	117.9
Total	171.8	174.4	190.3	206.8	226.4

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
7,197	7,056	8,920	9,874	11,550

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
11	10	11	13	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

College of Pharmacy

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	5	9	33	41	56
Graduate	107	97	91	83	90
Professional	324	328	312	334	341
Total	436	434	436	458	487

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	1	3	5	11	24
Graduate	102	108	106	122	107
Professional	374	364	367	374	375
Total	477	475	478	507	506

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	37.8	38.5	36.7	39.6	42.2
Primary Faculty	17.0	18.6	23.0	22.4	24.4
Supplemental *	38.6	41.1	45.6	49.8	65.5
Staff	55.6	60.7	59.1	65.1	67.0
Total	149.0	159.0	164.4	177.0	199.1

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
8,460	10,901	14,187	17,597	16,353

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
39	43	49	46	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Public Health

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	--	--	--	95	172
Graduate	940	897	942	998	998
Graduate Joint Program	43	55	73	75	71
Professional	--	--	--	--	--
Total	983	952	1,015	1,168	1,241

Source: Dashboard 04. Student Enrollment | Enrollment Trends
Note: Information/Public Health Joint Program count is reported here and with Information, but unduplicated in the Summary.

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	101	97	104	104	178
Graduate	1,131	1,092	1,096	1,190	1,228
Professional	--	--	--	--	--
Total	1,232	1,189	1,200	1,294	1,405

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	110.3	116.7	116.7	124.9	130.8
Primary Faculty	34.3	31.1	30.5	32.9	33.8
Supplemental *	108.0	107.7	103.7	105.3	110.2
Staff	274.9	290.8	285.4	321.8	338.9
Total	527.3	546.3	536.4	585.0	613.8

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
67,275	69,669	69,425	81,421	84,999

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
31	31	33	34	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

Gerald R. Ford School of Public Policy

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	126	139	142	150	154
Graduate	191	179	186	194	192
Professional	--	--	--	--	--
Total	317	318	328	344	346

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	76	80	87	90	97
Graduate	259	229	225	238	231
Professional	--	--	--	--	--
Total	335	309	312	328	328

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	31.0	26.7	32.4	33.4	35.1
Primary Faculty	0.9	0.9	1.0		0.2
Supplemental *	13.8	14.0	12.9	13.8	12.6
Staff	43.1	44.4	39.8	39.7	45.0
Total	88.8	86.0	86.0	86.8	92.9

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
3,048	2,894	4,176	3,260	4,979

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
32	31	30	31	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

Horace H. Rackham School of Graduate Studies

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	--	--	--	--	--
Graduate	449	455	488	495	545
Professional	--	--	--	--	--
Total	449	455	488	495	545

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	1	0	1	1	0
Graduate	70	66	80	93	95
Professional	--	--	--	--	--
Total	71	66	81	94	96

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	1.2	0.0	0.0	0.5	0.5
Primary Faculty	1.0	0.0	0.0	0.0	0.2
Supplemental *	20.0	23.0	17.9	14.3	16.9
Staff	96.8	94.6	94.8	88.2	97.9
Total	118.9	117.5	112.6	103.0	115.5

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
1,270	487	751	617	539

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
18	14	20	18	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

School of Social Work

Fall Term Headcount Enrollment by Level

	2014	2015	2016	2017	2018
Undergraduate	--	--	--	--	--
Graduate	618	647	686	694	711
Professional	--	--	--	--	--
Total	618	647	686	694	711

Source: Dashboard 04. Student Enrollment | Enrollment Trends

Fiscal Year Equated Students

	2013-14	2014-15	2015-16	2016-17	2017-18
Undergraduate	31	28	26	20	28
Graduate	896	888	948	970	1022
Professional	--	--	--	--	--
Total	927	916	974	990	1050

Source: Dashboard 05. Student Credit Hours | Student Credit Hours and FYES Crosstabs

FTE Faculty and Staff Counts

	2013-14	2014-15	2015-16	2016-17	2017-18
Instructional Faculty	62.8	62.4	71.9	69.8	66.3
Primary Faculty	2.0	1.5	1.0	1.4	1.1
Supplemental *	9.8	14.0	11.1	12.0	18.7
Staff	67.1	70.3	66.2	62.4	69.2
Total	141.7	148.2	150.1	145.6	155.3

Source: Dashboard 02. Faculty and Staff | FTE Distribution by Funding Source

Research Grants and Contracts

($000)

2013-14	2014-15	2015-16	2016-17	2017-18
3,261	3,291	3,775	4,090	4,571

Source: U-M Financial Data Warehouse

Fall Term Weighted Average Class Size

2014	2015	2016	2017	2018
19	19	20	21	*Avail. Jan 2019*

Source: Dashboard 06. Student Class Size | Class Size - Weighted Average

Differences between values in these tables and the applicable source dashboards might occur due to rounding.

IV. FACILITY ASSESSMENT

Space Management

The university has campus-wide policies, processes, and reporting tools to support a culture of agile space management, more efficient utilization, and coordinated planning. The policies and tools address all types of space, including instructional, research, office, and food operations, and reinforce a culture where space is considered more of an institutional resource that is to be shared and managed effectively for the good of the institution.

Tools to measure classroom utilization and class time offerings and distribution have led to more efficient use of classrooms throughout the day and week and enable the campus to better manage demand during peak hours.

The campus better utilizes existing General Fund space overall and emphasizes renovating and repurposing space to meet campus needs first, before considering building expansion. Examples of creative repurposing include renovating:

- A decommissioned research facility at the North Campus Research Complex to house library, art, and other historical collections.
- Weiser Hall, an aging and outdated 1960s classroom building, to house international programs and other centers and institutes currently housed in numerous buildings around campus.
- A number of lesser-used classrooms in the Modern Languages Building into a testing center for students with special test-taking needs.
- A previously vacant university-owned warehouse, the Varsity Drive Building, into a multi-use facility that houses research labs and specimen collections for the College of Literature, Science, and the Arts.
- The former Ford Nuclear Reactor into the Nuclear Engineering Laboratory building – a project that increased overall space utilization, resulting in a 20 percent increase in the total building square footage.
- Through more disciplined practices and culture change, the university has slowed the growth of new General Fund space in the past 10 years. This would not have been possible without the campus-wide policies and tools described above.

Physical Properties

The university owns approximately 3,200 acres of property within the Ann Arbor area and approximately 21,000 acres overall (most within the State of Michigan). A summary of the university's land holdings is included in this section. Also included is a building report for the Ann Arbor area. The report includes the following attribute data: building number, building name, location, building type, gross square feet, original construction date, and the deferred

maintenance backlog for the building. The approximate replacement value of the Ann Arbor area campus facilities is $9.1 billion

University of Michigan
Physical Properties Inventory - FY18
(Land Holdings Expressed as Acreage)

	2014	2015	2016	2017	2018
Ann Arbor Area:					
General Fund	1,717	1,715	1,709	1,709	1,705
Auxiliary Activities:					
Student Residences	29	32	32	32	32
University Hospitals Group	446	446	448	448	448
Other	1,019	1,019	1,019	1,019	1,018
Total Ann Arbor Area	**3,211**	**3,211**	**3,207**	**3,207**	**3,202**
Outside the Ann Arbor Area:					
Dearborn Campus	228	228	228	228	228
Flint Campus	48	48	51	51	51
Other Michigan Properties:					
Biological Station	10,199	10,199	10,329	10,329	10,329
Osborn Preserve	3,188	3,188	3,188	3,188	3,188
Willow Run	156	156	156	156	156
Other	3,934	3,934	3,934	3,647	3,649
Total Outside Ann Arbor Area	**17,753**	**17,753**	**17,886**	**17,599**	**17,600**
Camp Davis - Wyoming	120	120	120	120	120
Grand Total	**21,084**	**21,084**	**21,212**	**20,925**	**20,922**

Facility Condition Assessment Program

The university's Facility Condition Assessment (FCA) program evaluates buildings on campus in an effort to identify infrastructure deficiencies and establish a priority for funding renovations and repairs. The objective of the program is to develop and maintain a 5-year model for buildings showing facility related needs (projects) and track the status of each project through completion. The model considers the highest priority needs and spreads such needs over a 5-year period. Needs addressed in the database include building components and systems: architectural, structural, civil, mechanical, electrical, occupational safety and security, life safety and fire protection, environmental health, and building accessibility. The database provides a good baseline of the overall condition of General Fund buildings. Overall, the FCA program provides a platform to implement an ongoing system of identification and prioritization of capital repair projects at the U-M. A more detailed description of the FCA program is located later in this section.

Campus Parking Structure Assessment

While planning for parking on campus, the university has continued to enhance and explore new commute strategies, including bicycle and ride share programs, shuttles, mopeds and study of high-capacity transit. The existing parking system provides approximately 28,000 total parking

spaces, serving members of the university community as well as patients and visitors. The university has 15 parking structures plus joint ownership with the City of Ann Arbor of another structure consisting of approximately 13,000 parking spaces.

To complement the information in the FCA Program, every five years U-M engages a parking restoration consultant to assess the condition of the existing parking structures to develop a system-wide maintenance program that serves as a guide for future repairs and includes cost estimates (adjusted for inflation). An update to this Capital Improvement and Protection Plan (CIPP) will begin in 2019.

The parking structures on campus vary in both type of construction, level of previous repairs and current condition. The plan for facility repairs and improvements based on the CIPP was continued. Projects completed in 2018 include drain system replacement at Fletcher structure; extensive concrete and waterproofing repairs at Simpson Circle Drive (P4) structure; installation of traffic topping at the East Medical Center Drive (P3) and Cardiovascular Center (P5) structures; replacement of the northeast stairway and handrails in the west tower at the NCRC structure; waterproofing repairs at Ann structure; and concrete and stair tower repairs at the Thayer structure. The first phase of a 2-year concrete and waterproofing repair project began at Glen structure with planned completion in 2019. This project includes refinishing of the four stair tower risers and installation of new stair treads. A nitrogen inerting system was installed in Palmer structure in response to the development of pinhole leaks in the fire suppression systems for both the structure and Undergraduate Science Building above. The system will fill water supply lines with nitrogen that prevents the corrosion process from occurring.

Numerous parking lots received asphalt repair maintenance, up to and including complete asphalt mill and overlay. At three locations, fiber-reinforced asphalt was used to improve long-term performance against fatigue cracking and rutting deformation. Expansion of parking lot NC53 was completed in August 2018, which replaces lost spaces due to other building projects on North Campus.

Staff participated on a committee for site improvement planning at the North Campus Research Complex (NCRC). The outcome was a near-term (5-year) program of site work to improve circulation, bus service, and parking. Phase II of the plan will be completed by November 2018 and includes reconstruction or resurfacing of the north, east and part of the west and south campus roadways, reconstruction of lot NC90 and construction of a new lot to provide 50 additional parking spaces. Phase III projects planned for 2019 include reconstruction of lot NC91 to provide an additional 40 spaces and resurfacing of the southwest portion of the campus roadway.

Additional construction and repair projects planned for 2019 include completion of the Glen structure concrete and waterproofing repairs including traffic topping installation; replacement of the handrails and stair repairs at Hill structure; drain system repairs/replacement at East Medical Center Drive (P3) structure; traffic topping installations at Ann, Catherine and Church structures and reconstruction/repair of numerous asphalt lots.

Improving the sustainability features of the university's parking facilities continues to be a key goal. In 2018 installation of LED lighting with integrated controls was completed at the North Entrance (P1) structure, replacing high-energy use metal halide lighting. Lighting upgrades using LED fixtures were also completed in four parking lots, part of a multi-year plan of lot lighting improvements. Replacement of the existing lighting at the NCRC with LED fixtures is in design.

Campus growth and new programs continue to drive high demand for parking. The Wall Street West parking structure, currently in design, will provide a net gain of approximately 900 new spaces and feature the distinctive exterior design of the Wall Street East structure, pre-cast concrete construction and LED lighting. Power will be sourced from the Wall east structure, using untapped capacity and saving cost by eliminating the need for an electrical substation and generator. To accomplish this, lighting at the Wall Street East structure will be upgraded to LED fixtures.

Utilities Assessment

Utilities master planning assessments are routinely updated to ensure the necessary production, distribution and collection systems for steam, natural gas, compressed air, potable water, electricity, chilled water and sanitary and storm sewer systems are in place to support the facilities needed to accomplish the university's academic and research missions. Projects are identified and implemented annually from these assessments. Currently, the university is planning to expand the electric generating capacity of the Central Power Plant by 15 MW. The additional power would be provided by gas turbine technology. Implementation of this arrangement will reduce university scope two emissions by approximately 80,000 MT of CO2 yearly and provide capacity for future growth load. The aging electrical switchgear in the Central Power Plant as well as several campus switching stations on central campus are planned for replacement over the next several years.

The steam tunnel system is in the midst of being reinforced in select areas to accommodate the weight of fire trucks that need to drive over the tunnels to access buildings. Projects on Ingalls Mall and Monroe Mall and near the Ruthven Museum Building are complete. Near term projects are planned along South University Avenue near Shapiro Library (2021) and in the area of the Medical School (2021).

Water, sewer, and storm water master planning efforts have routinely been conducted over the years. This year a potable water system condition/risk assessment was completed. Projects that come out of these planning activities are prioritized into a capital plan. Over the next two years, water main replacement projects are anticipated on Hubbard Street and on Bonisteel Boulevard. A large storm water detention/infiltration system near Alumni Memorial Hall designed to eliminate or significantly reduce the flooding potential to buildings surrounding the Central Campus Diag is nearing completion. The university is also working with the city to model the storm and sanitary systems on Central Campus with the goal of developing a long-term plan for addressing a number of legacy issues that have existed for some time.

Facility Condition Assessment Program

The FCA Program includes a comprehensive database on the physical condition of the building portfolio. The database addresses the condition of most major building components and systems, including architectural, structural, civil, mechanical, electrical, life safety and fire protection, environmental health and occupational safety, and building accessibility. Deficiencies and anticipated needs are listed in the database as independent projects and assigned a priority, estimated budget, and classification. Costs related to the presence of environmental hazards (asbestos and lead-based paint) are not included. While the university has attempted to make the FCA Program as comprehensive as possible, it is a policy-neutral, technical assessment of existing conditions. It does not include costs related to programs and/or the reconfiguration of building spaces.

The FCA building condition and cost data are intended to serve the university community by: (1) identifying near-term needs to maintain standards and assure the service integrity of aging systems and building components; and (2) providing an information base to support the institution's process for shaping the future of its campus. The FCA Program, therefore, is not a comprehensive capital plan for building renewal.

Recommended scope of work is aimed at restoring the existing buildings, as they presently exist, with some upgrades to meet codes, such as accessibility, and social norms, such as air-conditioning.

Program Benefits

The FCA Program provides the platform that is used to implement an ongoing system of identification and prioritization of capital repair projects within the U-M. The FCA Program has a wide range of benefits to several different departments within the university and provides:

- A central location for storing of facility condition data.
- A useful tool for organizing and prioritizing all deficiency corrective measures using standardized criteria. FCA reports can be viewed and printed using a wide variety of criteria.
- A facility condition needs index (FCNI) value. The FCNI is the cost required to correct all deficiencies in a building divided by the total replacement cost of that building. This indicator is useful in determining which buildings should be considered for major renovations or upgrades.
- A useful tool in the development of a five-year capital renewal model.

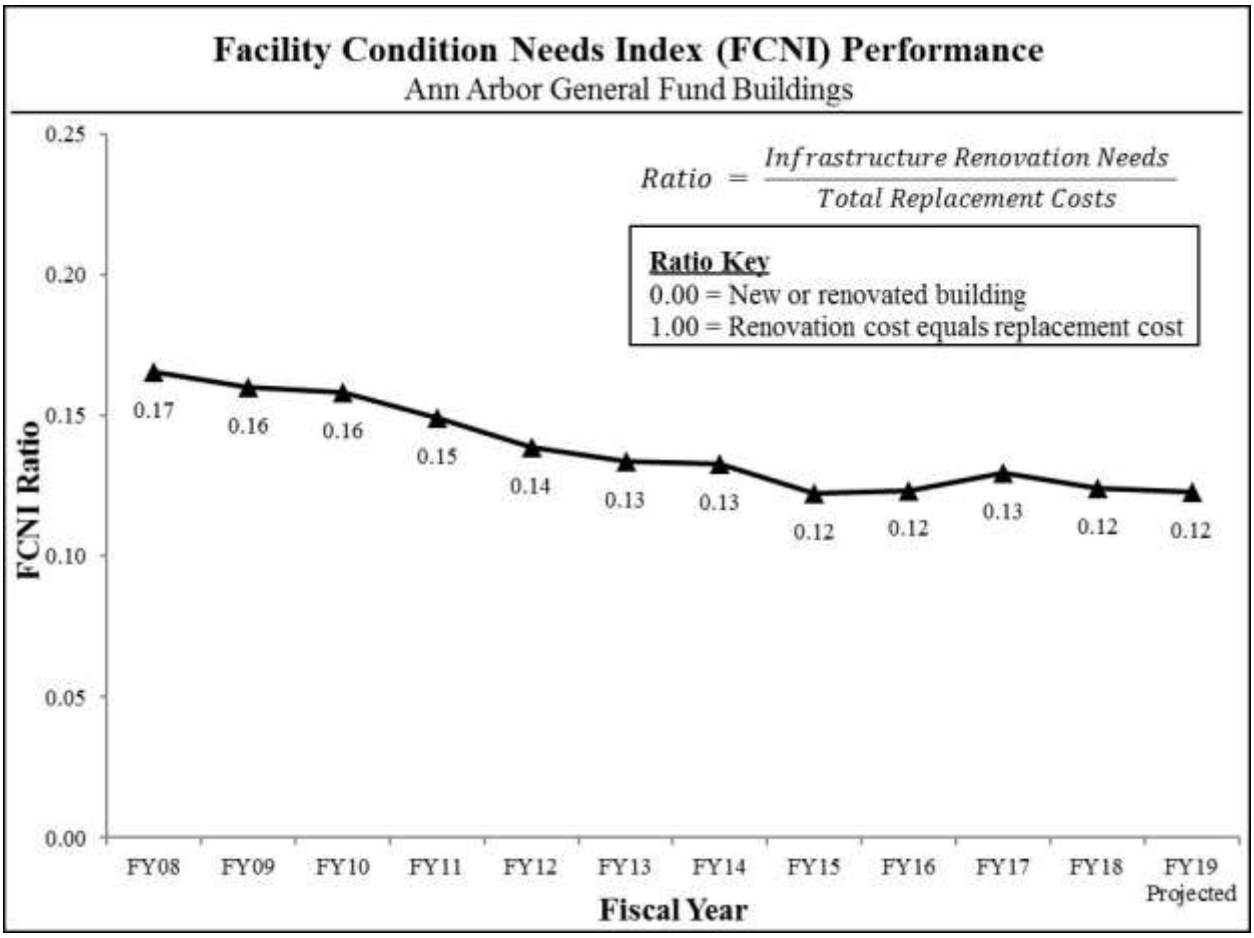
FCA Priority Classification System

The following system was developed to help clarify priorities and assist with consistency in planning and decision-making:

Priority		Definitions
Necessary	**Priority #1** **Critical**	Needed work that requires near-term action to accomplish one or more of the following: (1) restore building occupancy due to natural disaster or catastrophic failure (2) address cited or known life-threatening safety hazard
	Priority #2 **High Priority**	Needed work that requires near-term action to accomplish one or more of the following: (1) avoid situation from becoming a priority #1 (2) prevent accelerated deterioration of building component or system (3) replace component that has worn out or is no longer in service (4) avoid loss of critical system that would significantly affect services, impact occupancy, or create a safety hazard (5) address existing non-life-threatening safety hazard (6) maintain, restore, or upgrade conditions to minimum acceptable university standards (7) reduce unacceptably high maintenance, energy and/or other operating costs (economically justified via payback) (8) meet program requirements
Deferrable	**Priority #3** **Necessary**	Needed work that is expected to become a priority #1 or #2 within the next 10 years.
	Priority #4 **Deferrable until Building Renewal**	Needed work that can probably wait more than 10 years. This work will be completed during a building renewal.

Overall FCA Program Impact

The chart below shows improvement of the General Fund FCNI through the years as infrastructure needs are addressed. Since fiscal year 2008, the FCNI has improved approximately 25 percent.



The university maintains a database of all buildings, including size and use. Deferred maintenance estimates are included here when the information is available. This information allows comparisons of buildings and trends over time with respect to overall condition. Deferred maintenance information is continually updated and sometimes with detailed needs and specific cost estimates to implement projects. The summary information provided here is a planning tool. It is not intended to accurately reflect all costs listed and should not be used for cost estimates. *Denotes building is under construction.

Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1005200	1009 CORNWELL PLACE	3,340	1886	Income Properties	
1008060	101 SIMPSON DRIVE	2,791	1988	Clinical Delivery System	
1008039	1011 CORNWELL PLACE	2,879	1951	Income Properties	
1000327	1018 FULLER BUILDING	8,349	1965	Clinical Delivery System	
1000205	1027 EAST HURON BUILDING	6,066	1896	Administration & Support	$1,371,799
1000816	1032 GREENE BUILDING	5,903	1975	Administration & Support	$1,162,062
1000188	1100 NORTH UNIVERSITY BUILDING	187,433	1925	Teach, Research, Support	$8,206,981
1000891	1736 BROADWAY GARAGE	480	1965	Income Properties	
1000885	1736 BROADWAY HOUSE	2,970	1965	Income Properties	
1005179	202 SOUTH THAYER BUILDING	59,825	2006	Teach, Research, Support	
1000335	300 400 N INGALLS BOILER HSE	9,908	1955	Administration & Support	$1,583,586
1000332	300 N INGALLS BUILDING	325,677	1955	TeachResSupport/CDS	$37,743,606
1000333	400 NORTH INGALLS BUILDING	141,981	1913	Teach, Research, Support	$14,237,321
1005327	439 S DIVISION STREET	3,210	1900	Income Properties	
1005287	523 SOUTH DIVISION BUILDING	9,315	2010	Administration & Support	
1000815	ADMINISTRATIVE SERVICES	91,653	1963	Administration & Support	$9,545,170
1000423	AERO ENG LAB PUMPING STATION	2,456	1955	Teach, Research, Support	
1000426	AERO ENG POWER PLANT	697	1955	Teach, Research, Support	
1000425	AEROSPACE ENGINEERING LAB PLASMA RESEARCH	25,941	1961	Teach, Research, Support	$383,000
1000422	AEROSPACE ENGINEERING LAB PROPULSION LAB	8,067	1955	Teach, Research, Support	$2,320,251
1000421	AEROSPACE ENGINEERING LAB WIND TUNNEL LAB	14,171	1955	Teach, Research, Support	$2,873,774
1000192	ALUMNI CENTER	34,447	1983	Administration & Support	$1,833,225
1005123	ALUMNI FIELD	12,209	2008	Intercollegiate Athletics Bldg	
1000151	ALUMNI MEMORIAL HALL	99,304	1910	Teach, Research, Support	$648,527
1000206	ANGELL HALL AUDITORIUMS	29,293	1952	Teach, Research, Support	$908,990
1000152	ANGELL JAMES B HALL AND TISCH HALL	209,256	1924	Teach, Research, Support	$4,423,659
1000168	ANIMAL RESEARCH FACILITY	15,591	1963	Teach, Research, Support	$2,877,773
1005132	ANN STREET PARKING STRUCTURE	189,202	2009	Parking Structure	
1008079	ARBOR LAKES 1	39,867	1976	AdminSupport/CDS	$3,872,526
1008080	ARBOR LAKES 2	89,278	1979	AdminSupport/CDS	$10,456,982
1008081	ARBOR LAKES 3	86,330	1981	AdminSupport/CDS	$11,851,136
1000831	ARGUS BUILDING II	69,214	1941	Teach, Research, Support	$6,369,274
1000432	ART ARCHITECTURE BUILDING	258,602	1974	Teach, Research, Support	$8,892,055
1000803	ATHLETIC CAMPUS SWITCH STATION	2,467	1973	Switching Stations	
1005371	ATHLETIC DEPARTMENT OPERATIONS CENTER	18,674	2015	Intercollegiate Athletics Bldg	

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1005402	ATHLETICS FACILITY SUPPORT BUILDING	2,976	2015	Intercollegiate Athletics Bldg	
1005195	ATHLETICS MAINTENANCE BUILDING	1,473	1985	Intercollegiate Athletics Bldg	
1005168	AUTO LAB FUEL STORAGE BUILDING	427	2005	Teach, Research, Support	
1002501	AUXILIARY SERVICES BUILDING 1	80,469	1968	Administration & Support	$10,296,677
1002502	AUXILIARY SERVICES BUILDING 2	2,893	1983	Administration & Support	
1000395	BAGNOUD FRANCOIS-XAVIER BUILDING	101,812	1991	Teach, Research, Support	$7,216,303
1005236	BAHNA WRESTLING CENTER	22,072	2009	Intercollegiate Athletics Bldg	
1000510	BAITS VERA I EATON HOUSE	36,148	1966	Resident Hall	$55,954,361
1000511	BAITS VERA I LEE HOUSE	33,017	1966	Resident Hall	included in above
1000512	BAITS VERA I PARKER HOUSE	34,411	1966	Resident Hall	included in above
1000513	BAITS VERA I SMITH HOUSE	29,190	1966	Resident Hall	included in above
1000514	BAITS VERA I STANLEY HOUSE	32,600	1966	Resident Hall	included in above
1000515	BAITS VERA II COMAN HOUSE	48,603	1967	Resident Hall	$43,900,072
1000516	BAITS VERA II CONGER HOUSE	26,929	1967	Resident Hall	included in above
1000517	BAITS VERA II CROSS HOUSE	35,118	1967	Resident Hall	included in above
1000518	BAITS VERA II THIEME HOUSE	25,219	1967	Resident Hall	included in above
1000519	BAITS VERA II ZIWET HOUSE	33,931	1967	Resident Hall	included in above
1000051	BARBOUR BETSY HOUSE	33,884	1920	Resident Hall	$10,637,925
1005290	BAXTER ROAD MONITORING SHED	49	2010	Administration & Support	
1000439	BENTLEY ALVIN M & ARVELLA D HISTORICAL LIBRARY	66,537	1973	Library Building	$4,728,939
1005092	BEYSTER BOB AND BETTY BUILDING	104,132	2006	Teach, Research, Support	
1005169	BIOLOGICAL SCIENCES BUILDING	312,212	2018	Teach, Research, Support	
1005370	BLAU JEFF T HALL	106,172	2016	Teach, Research, Support	
1000402	BONISTEEL INTERDISCIPLINARY RESEARCH BUILDING	21,993	1954	Teach, Research, Support	$2,131,241
1000880	BOYER BUILDING	15,472	1969	Administration & Support	$1,145,256
1005102	BREHM TOWER	252,234	2009	TeachResSupport/CDS	
1008076	BRIARWOOD 1	17,699	1993	TeachResSupport/CDS	$2,305,237
1008130	BRIARWOOD 10	17,435	1996	Clinical Delivery System	$221,377
1008030	BRIARWOOD 2	15,924	1988	TeachResSupport/CDS	$438,376
1008065	BRIARWOOD 3	10,611	1991	Clinical Delivery System	$311,643
1008042	BRIARWOOD 4	14,063	1991	Clinical Delivery System	
1008016	BRIARWOOD 5	9,378	1986	Clinical Delivery System	$113,695
1008142	BRIARWOOD 9	5,287	1998	Clinical Delivery System	$479,711
1000407	BROWN GEORGE GRANGER MEMORIAL LABORATORIES	290,494	1957	Teach, Research, Support	$1,150,000
1000210	BUHL LAWRENCE D RESEARCH CEN FOR HUMAN GENETICS	18,971	1964	Teach, Research, Support	$399,646

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000799	BUHR BUILDING	187,245	1952	Administration & Support	$5,894,071
1000010	BURNHAM HOUSE	3,482	1837	Teach, Research, Support	$167,807
1000555	BURSLEY JOSEPH A & MARGUERITE K HALL	341,588	1967	Resident Hall	$79,954,409
1000155	BURTON MEMORIAL TOWER	20,103	1936	Teach, Research, Support	$3,276,434
1000139	BUSINESS ADMIN EXECUTIVE DORM	50,737	1985	Teach, Research, Support	$3,052,315
1000742	CAMPUS SAFETY SERVICES BUILDING	108,241	1978	Administration & Support	$5,875,495
1000718	CANHAM DONALD B NATATORIUM	77,639	1988	Intercollegiate Athletics Bldg	$53,300
1005146	CARDIOVASCULAR CENTER PARKING STRUCTURE	168,596	2009	Parking Structure	
1000258	CATHERINE ST PARKING STRUCTURE	140,168	1959	Parking Structure	
1005126	CENTRAL CAMPUS AND UM HOSPITAL LOAD CENTER	3,884	2006	Switching Stations	
1000226	CENTRAL CAMPUS REC BLD BELL MARGARET POOL	194,261	1954	Recreational Sports Building	$19,740,234
1005042	CENTRAL CAMPUS REC BLD STORAGE FACILITY	739	2000	Recreational Sports Building	
1005379	CENTRAL CAMPUS SUPPORT FACILITY	88	2014	Administration & Support	
1005421	CENTRAL CAMPUS SWITCHING STATION	1,002	1984	Switching Stations	
1000260	CENTRAL POWER PLANT	123,112	1914	Administration & Support	$51,747,706
1000158	CHEMISTRY & DOW WILLARD H LABORATORY	544,628	1909	Teach, Research, Support	$21,155,477
1000443	CHRYSLER CENTER CONTINUING ENGINEERING EDUCATION	45,310	1968	Teach, Research, Support	$1,953,952
1000257	CHURCH ST PARKING STRUCTURE	228,214	1957	Parking Structure	$3,944,450
1000159	CLEMENTS WILLIAM L LIBRARY	27,257	1923	Library Building	
1000441	CLIMATE AND SPACE RESEARCH BUILDING	105,521	1965	Teach, Research, Support	$13,049,092
1000710	COLISEUM	38,404	1926	Recreational Sports Building	$1,850,758
1000230	COLLEGE OF PHARMACY BUILDING	56,772	1960	Teach, Research, Support	$4,501,675
1005221	CONSTRUCTION TRAILER CHILDRENS AND WOMENS HOSPITAL	3,900	2007	Administration & Support	
1000109	COOK JOHN P BUILDING	63,906	1930	Resident Hall	
1000052	COOK MARTHA BUILDING	71,925	1915	Resident Hall	$20,097,962
1000184	COOK WILLIAM W LEGAL RESEARCH LIBRARY	212,255	1931	Library Building	$8,902,616
1000403	COOLEY MORTIMER E BUILDING	46,225	1953	Teach, Research, Support	$5,116,643
1000053	COUZENS HALL	185,523	1925	Resident Hall	$484,618
1000498	CRAM PLACE COMMUNITY CENTER	7,298	1958	Residence	$35,601,521
1000700	CRISLER CENTER	264,041	1968	Intercollegiate Athletics Bldg	$4,799,138
1000189	DANA SAMUEL TRASK BUILDING	117,148	1904	Teach, Research, Support	$309,658
1000225	DANCE BUILDING	12,042	1977	Teach, Research, Support	$1,303,502
1005289	DAVIDSON WILLIAM PLAYER DEVELOPMENT CENTER	70,737	2011	Intercollegiate Athletics Bldg	
1000162	DENTAL BLDG AND W K KELLOGG FOUNDATION INSTITUTE	378,556	1940	Teach, Research, Support	$46,304,942
1000198	DETROIT OBSERVATORY	5,370	1854	Teach, Research, Support	$433,011

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000447	DOW HERBERT H BUILDING	154,419	1983	Teach, Research, Support	$10,365,830
1000396	DUDERSTADT JAMES AND ANNE CENTER	240,256	1996	Teach, Research, Support	$8,963,845
1005038	EAST ANN ARBOR AMBULATORY SURGICAL CENTER	49,906	2006	Clinical Delivery System	
1000350	EAST ANN ARBOR HEALTH AND GERIATRICS CENTER	97,158	1996	Clinical Delivery System	$4,410,225
1000166	EAST HALL	339,619	1923	Teach, Research, Support	$3,798,440
1000306	EAST HOSPITAL MECHANICAL BLDG	8,006	1964	Clinical Delivery System	$6,958,994
1000054	EAST QUADRANGLE	333,036	1940	Resident Hall	$1,333,817
1000221	EDUCATION SCHOOL OF	215,013	1923	Teach, Research, Support	$11,348,746
1008072	EISENHOWER CORPORATE PARK WEST	76,726	1990	Clinical Delivery System	$2,695,904
1000728	ELBEL FIELD LOCKER BUILDING	5,943	1951	Recreational Sports Building	$1,007,953
1000448	ELECTRICAL ENGINEERING AND COMPUTER SCIENCE BLD	305,021	1986	Teach, Research, Support	$9,600,705
1000435	ENGINEERING RESEARCH BUILDING 1	36,033	1964	Teach, Research, Support	$4,368,615
1000436	ENGINEERING RESEARCH BUILDING 2	28,332	1964	Teach, Research, Support	$4,003,423
1002505	ENGINEERING RESEARCH SUPPORT BLD	1,432	1997	Teach, Research, Support	
1000414	ENVIRONMENTAL AND WATER RESOURCES ENGINEERING BL	37,129	1975	Teach, Research, Support	$3,068,780
1000269	EQUIPMENT MAINTENANCE SHOP	2,151	1914	Administration & Support	$54,485
1000800	FACILITIES SERVICES BUILDING A	92,981	1929	Administration & Support	$14,118,581
1000801	FACILITIES SERVICES BUILDING B	44,682	1929	Administration & Support	$4,934,916
1000802	FACILITIES SERVICES BUILDING C	37,309	1929	Administration & Support	$2,526,532
1000706	FERRY FIELD PUMP HOUSE	216	1968	Intercollegiate Athletics Bldg	
1005358	FIELD HOCKEY STADIUM	2,247	2014	Intercollegiate Athletics Bldg	
1005357	FIELD HOCKEY TEAM CENTER	14,683	2014	Intercollegiate Athletics Bldg	
1005359	FIELD HOCKEY TICKET OFFICE	1,977	2014	Intercollegiate Athletics Bldg	
1005387	FIELD HOCKEY TICKET OFFICE WEST	142	2014	Intercollegiate Athletics Bldg	
1000409	FIRE SERV INSTR RES CENTER	21,528	1959	Teach, Research, Support	$1,581,034
1000733	FISHER RAY BASEBALL STADIUM	30,167	1950	Intercollegiate Athletics Bldg	
1000149	FLEMING ROBBEN W & ALDYTH ADMINISTRATION BUILDING	78,759	1968	Administration & Support	$20,947,423
1000055	FLETCHER HALL	17,985	1923	Resident Hall	$7,266,162
1000254	FLETCHER ST PARKING STRUCTURE	387,276	1968	Parking Structure	
1005418	FORD MOTOR COMPANY ROBOTICS BUILDING		*	Teach, Research, Support	
1000252	FOREST SWITCHING STATION	6,089	1988	Switching Stations	
1000234	FRANCIS THOMAS JR PUBLIC HEALTH	171,437	1971	Teach, Research, Support	
1005109	FRANKEL SAMUEL AND JEAN CARDIOVASCULAR CENTER	429,289	2007	Clinical Delivery System	
1000810	GAS PAD STORAGE BUILDING	1,442	1990	Administration & Support	
1000437	GERSTACKER CARL A BUILDING	61,692	1964	Teach, Research, Support	$3,998,669

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1000331	GLEN AVE PARKING STRUCTURE	332,918	1987	Parking Structure	$288,317
1005121	GLICK AL FIELD HOUSE	105,709	2009	Intercollegiate Athletics Bldg	
1000747	GOLF COURSE COMFORT STATION A	533	1994	Intercollegiate Athletics Bldg	
1000748	GOLF COURSE COMFORT STATION B	467	1994	Intercollegiate Athletics Bldg	
1000741	GOLF COURSE GARAGE	3,585	1956	Intercollegiate Athletics Bldg	
1005100	GOLF COURSE MAINTENANCE BUILDING	5,555	2007	Intercollegiate Athletics Bldg	
1000749	GOLF COURSE PRACTICE RANGE BLDG	720	1994	Intercollegiate Athletics Bldg	
1000739	GOLF COURSE PUMP HOUSE II	336	1992	Intercollegiate Athletics Bldg	
1000424	GORGUZE FAMILY LABORATORY	29,155	1972	Teach, Research, Support	$1,768,607
1000201	HARTWIG MARIE DOROTHY ADMINISTRATION BUILDING	14,649	1912	Intercollegiate Athletics Bldg	$1,227,726
1000185	HATCHER H NORTH GRADUATE LIBRARY	194,942	1920	Library Building	$4,243,093
1000181	HATCHER HARLAN H SOUTH GRADUATE LIBRARY	147,674	1970	Library Building	$6,813,144
1000175	HAVEN HALL	123,488	1952	Teach, Research, Support	$1,000,000
1000897	HEALTH MANAGEMENT RESEARCH	12,792	1906	Teach, Research, Support	$1,052,629
1000176	HEALTH SERVICE	79,177	1940	Student Services	$6,330,501
1000057	HENDERSON MARY BARTRON HOUSE	9,329	1892	Resident Hall	$3,350,977
1000177	HILL AUDITORIUM	105,813	1913	Recreational Sports Building	$596,932
1000253	HILL ST PARKING STRUCTURE	151,175	1970	Parking Structure	
1000804	HOOVER ANNEX	1,905	1929	Administration & Support	$100,152
1000805	HOOVER AVE HEATING PLANT	7,121	1929	Administration & Support	
1000179	HUTCHINS HALL	119,856	1933	Teach, Research, Support	$9,110,299
1005398	INDOOR TRACK BUILDING	123,539	2018	Intercollegiate Athletics Bldg	
1000703	INDOOR TRAINING CENTER	69,183	1974	Intercollegiate Athletics Bldg	$3,114,214
1000429	INDUSTRIAL AND OPERATIONS ENGINEERING BUILDING	50,220	1963	Teach, Research, Support	$2,255,626
1000145	INSTITUTE FOR SOCIAL RESEARCH	226,082	1965	Teach, Research, Support	$15,644,104
1000814	INSTITUTE OF CONTINUING LEGAL ED	12,592	1987	Teach, Research, Support	$1,019,623
1005247	INTERCOLLEGIATE SOCCER STADIUM	17,382	2009	Intercollegiate Athletics Bldg	
1000719	INTRAMURAL SPORTS BUILDING	108,676	1928	Recreational Sports Building	$3,599,684
1000434	IST GAS STORAGE BUILDING	200	1964	Teach, Research, Support	
1005160	JUNGE FAMILY CHAMPIONS CENTER	11,749	2006	Intercollegiate Athletics Bldg	
1000732	KEEN CLIFFORD P ARENA	37,261	1956	Intercollegiate Athletics Bldg	$3,643,408
1000324	KELLOGG W K EYE CENTER	81,556	1985	TeachResSupport/CDS	$5,274,694
1000851	KINESIOLOGY BUILDING	30,964	1930	Teach, Research, Support	
1000211	KRAUS EDWARD HENRY BUILDING	182,966	1915	Teach, Research, Support	$26,551,146
1000137	KRESGE HALL	76,731	1985	Teach, Research, Support	$4,527,889

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1005395	LACROSSE STADIUM	26,467	2018	Intercollegiate Athletics Bldg	
1005396	LACROSSE TICKET BUILDING	238	2018	Intercollegiate Athletics Bldg	
1000183	LANE HALL	39,993	1917	Teach, Research, Support	$93,263
1000419	LAUNDRY	48,521	1969	Clinical Delivery System	$3,370,001
1000108	LAWYERS CLUB AND MUNGER CHARLES T RESIDENCES	93,805	1924	Resident Hall	$15,765,229
1000400	LAY WALTER E AUTOMOTIVE ENGINEERING LABORATORY	63,295	1955	Teach, Research, Support	$10,228,214
1005036	LIFE SCIENCES INSTITUTE BUILDING	298,398	2003	Teach, Research, Support	$90,971
1000105	LIPSEY STANFORD STUDENT PUBLICATIONS BUILDING	14,829	1932	Recreational Sports Building	
1000150	LITERATURE SCIENCE AND THE ARTS	129,755	1948	Teach, Research, Support	$10,790
1000059	LLOYD ALICE CROCKER HALL	176,615	1949	Resident Hall	$8,506,328
1000154	LORCH HALL	89,572	1928	Teach, Research, Support	$7,025,664
1000214	LSA ADMINISTRATION ANNEX	10,907	1891	Teach, Research, Support	$1,895,588
1000406	LURIE ANN AND ROBERT H BIOMEDICAL ENGINEERING BLD	65,028	1957	Teach, Research, Support	$1,121,280
1000394	LURIE ANN AND ROBERT H TOWER	11,452	1996	Teach, Research, Support	$790,479
1000397	LURIE ROBERT H ENGINEERING CTR	53,878	1996	Teach, Research, Support	$1,396,467
1000858	MADISON BUILDING	22,318	1883	Administration & Support	$51,304
1005419	M-AIR TEST FACILITY	11,235	2018	Teach, Research, Support	
1000060	MARKLEY MARY BUTLER HALL	285,877	1959	Resident Hall	$57,902,432
1000197	MASON HALL	136,012	1952	Teach, Research, Support	$5,246,748
1000976	MATT BOT GNDS HOUSE	3,650	1825	Income Properties	
1000986	MATTHAEI BOT GDNS ENVIRONMENT	2,762	1962	Teach, Research, Support	
1000991	MATTHAEI BOT GDNS EXHIB GRN HSE	18,747	1966	Teach, Research, Support	$9,220,305
1000983	MATTHAEI BOT GDNS GREENHOUSE #1	6,197	1962	Teach, Research, Support	
1000984	MATTHAEI BOT GDNS GREENHOUSE #2	6,344	1960	Teach, Research, Support	
1000988	MATTHAEI BOT GDNS GREENHOUSE #3	6,195	1960	Teach, Research, Support	
1000989	MATTHAEI BOT GDNS GREENHOUSE #4	2,819	1962	Teach, Research, Support	
1000990	MATTHAEI BOT GDNS GREENHOUSE #5	2,817	1962	Teach, Research, Support	
1000994	MATTHAEI BOT GDNS INSTR SHELTER	168	1978	Teach, Research, Support	
1000979	MATTHAEI BOT GDNS NORTH BARN #1	4,241	1880	Teach, Research, Support	
1000978	MATTHAEI BOT GDNS NORTH BARN #2	1,212	1870	Teach, Research, Support	
1000992	MATTHAEI BOT GDNS REPTILE HSE	3,205	1969	Teach, Research, Support	
1000982	MATTHAEI BOT GDNS RESEARCH-ADMIN	21,811	1960	Teach, Research, Support	
1000987	MATTHAEI BOT GDNS SCREENHOUSE #1	399	1962	Teach, Research, Support	
1000980	MATTHAEI BOT GDNS STORAGE BLDG	1,920	1975	Teach, Research, Support	
1000985	MATTHAEI BOT GDNS SUPT RESIDENCE	2,928	1961	Administration & Support	

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1000981	MATTHAEI BOT GDNS UTILITY-BOILER	12,248	1960	Teach, Research, Support	
1005381	MCITY	4,463	2015	Teach, Research, Support	
1000300	MED CTR N ENTRANCE PARKING STRUCTURE	340,052	1994	Parking Structure	
1000323	MEDICAL CAMPUS SWITCH STATION SE	2,746	1983	Switching Stations	
1000315	MEDICAL CENTER DR PARKING STRUCT	684,123	1984	Parking Structure	
1000319	MEDICAL PROFESSIONAL BUILDING	37,298	1977	Clinical Delivery System	$7,563,320
1000190	MEDICAL SCIENCE UNIT I	298,913	1958	Teach, Research, Support	$33,515,474
1000200	MEDICAL SCIENCE UNIT II	333,207	1969	Teach, Research, Support	$12,289,283
1000223	MEDICAL SCIENCES RESEARCH BLDG I	144,646	1985	Teach, Research, Support	$5,702,054
1000213	MEDICAL SCIENCES RESEARCH BLDG II	163,757	1989	Teach, Research, Support	$12,501,764
1000229	MEDICAL SCIENCES RESEARCH BLDG III	217,894	1994	Teach, Research, Support	$9,349,903
1000308	MED-INN	121,126	1952	Clinical Delivery System	$15,620,372
1000191	MICHIGAN LEAGUE	130,395	1929	Teach, Research, Support	$23,594,794
1000404	MICHIGAN MEMORIAL PHOENIX PROJECT LABORATORY	45,452	1955	Teach, Research, Support	$1,234,658
1000222	MICHIGAN NEWS BUILDING	7,811	1955	Administration & Support	$2,429,306
1000711	MICHIGAN STADIUM	570,377	1927	Intercollegiate Athletics Bldg	
1005242	MICHIGAN STADIUM NORTH PLAZA BUILDING A	9,029	2009	Intercollegiate Athletics Bldg	
1005243	MICHIGAN STADIUM NORTH PLAZA BUILDING B	9,337	2009	Intercollegiate Athletics Bldg	
1000120	MICHIGAN UNION	255,176	1919	Recreational Sports Building	$44,980,187
1002500	MITCHELL FIELD BUILDING	1,440	1981	Recreational Sports Building	
1005380	MITCHELL FIELD RECREATION BUILDING	3,661	2014	Recreational Sports Building	
1000207	MODERN LANGUAGES BUILDING	135,366	1972	Teach, Research, Support	$5,528,547
1005125	MODULAR ATHLETICS MAINTENANCE	506	2002	Intercollegiate Athletics Bldg	
1005348	MODULAR MRI BUILDING	824	2012	Teach, Research, Support	
1000100	MOLECULAR & BEHAVIORAL NEUROSCIENCE INSTITUTE	49,956	1960	Teach, Research, Support	$9,450,785
1000440	MOORE EARL V BLDG	172,639	1964	Teach, Research, Support	$10,309,776
1000061	MOSHER ELIZA M HALL & JORDAN MYRA B HALL	191,152	1930	Resident Hall	
1005173	MOTT CHILDRENS VON VOIGTLANDER WOMENS HOSPITALS	1,126,305	2011	Clinical Delivery System	
1005369	MUNGER GRADUATE RESIDENCES	390,215	2015	Resident Hall	
1000415	NAVAL ARCHITECTURE AND MARINE ENGINEERING	28,207	1962	Teach, Research, Support	$4,355,895
1002518	NC BEAL-CRAM SWITCH GEAR	1,804	1995	Switching Stations	
1005205	NC GROUNDS GARAGE 1	1,692	2007	Administration & Support	
1000220	NC GROUNDS STORAGE BUILDING # 1	3,373	1953	Administration & Support	$56,861
1005111	NC GROUNDS STORAGE BUILDING # 2	2,008	1987	Administration & Support	
1005116	NC GROUNDS STORAGE BUILDING # 3	2,008	1987	Administration & Support	

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1005131	NC STORAGE BUILDING #4	4,792	2003	Administration & Support	
1000178	NEWBERRY HALL	40,574	1891	Teach, Research, Support	
1000062	NEWBERRY HELEN H RESIDENCE	31,304	1915	Resident Hall	$9,413,949
1000007	NICHOLS ARBORETUM GAR WORKSHOP	1,354	1963	Teach, Research, Support	
1000005	NICHOLS ARBORETUM RESIDENCE	2,259	1908	Teach, Research, Support	$272,340
1000006	NICHOLS ARBORETUM STORAGE SHED	308	1908	Teach, Research, Support	$56,210
1000399	NORTH CAMPUS ADMINISTRATIVE COMPLEX	129,114	1987	Clinical Delivery System	$3,429,361
1005223	NORTH CAMPUS AUXILIARY SUPPORT BUILDING	54,428	2009	AdminSupport/CDS	
1005018	NORTH CAMPUS CHILDRENS CENTER	13,567	1999	Teach, Research, Support	$523,963
1005139	NORTH CAMPUS CHILLER PLANT	17,246	2005	Administration & Support	
1002506	NORTH CAMPUS FACILITIES SERVICES BUILDING	48,588	1999	Administration & Support	
1002514	NORTH CAMPUS GROUND SVC FACILITY	28,246	1990	Administration & Support	$339,751
1005140	NORTH CAMPUS GROUND SVC FACILITY ANNEX	112	2003	Administration & Support	
1005297	NORTH CAMPUS GROUNDS STORAGE SHED	256	2009	Administration & Support	
1000449	NORTH CAMPUS HOUSING SERVICE BLD	31,855	1978	Administration & Support	$1,193,465
1002517	NORTH CAMPUS MICROWAVE TOWER	279	1991	Administration & Support	
1000427	NORTH CAMPUS RECREATION BUILDING	66,876	1976	Recreational Sports Building	$1,500,000
1005253	NORTH CAMPUS RESEARCH COMPLEX BUILDING 10	66,940	1959	Teach, Research, Support	$9,580,882
1005276	NORTH CAMPUS RESEARCH COMPLEX BUILDING 100	10,492	1964	Teach, Research, Support	$1,593,613
1005254	NORTH CAMPUS RESEARCH COMPLEX BUILDING 14	53,718	1987	Teach, Research, Support	$6,762,064
1005255	NORTH CAMPUS RESEARCH COMPLEX BUILDING 15	4,623	1959	Administration & Support	$370,428
1005256	NORTH CAMPUS RESEARCH COMPLEX BUILDING 16	121,832	1991	Teach, Research, Support	$6,061,099
1005258	NORTH CAMPUS RESEARCH COMPLEX BUILDING 18	92,349	2000	Teach, Research, Support	$2,899,292
1005259	NORTH CAMPUS RESEARCH COMPLEX BUILDING 20	179,512	1959	Teach, Research, Support	$32,996,433
1005277	NORTH CAMPUS RESEARCH COMPLEX BUILDING 200	26,648	1964	Teach, Research, Support	$2,352,698
1005260	NORTH CAMPUS RESEARCH COMPLEX BUILDING 22	21,270	1999	Teach, Research, Support	$2,776,610
1005261	NORTH CAMPUS RESEARCH COMPLEX BUILDING 23	10,517	2002	Teach, Research, Support	$112,928
1005262	NORTH CAMPUS RESEARCH COMPLEX BUILDING 25	105,221	1984	Teach, Research, Support	$35,660,504
1005263	NORTH CAMPUS RESEARCH COMPLEX BUILDING 26	192,713	2000	Teach, Research, Support	$6,100,099
1005264	NORTH CAMPUS RESEARCH COMPLEX BUILDING 28	131,407	1992	Teach, Research, Support	$25,079,373
1005265	NORTH CAMPUS RESEARCH COMPLEX BUILDING 30	34,632	1965	Teach, Research, Support	$8,227,125
1005278	NORTH CAMPUS RESEARCH COMPLEX BUILDING 300	39,513	1964	Teach, Research, Support	$3,341,188
1005432	NORTH CAMPUS RESEARCH COMPLEX BUILDING 32	7,027	1992	Teach, Research, Support	
1005266	NORTH CAMPUS RESEARCH COMPLEX BUILDING 35	93,162	1985	Teach, Research, Support	$49,257,385
1005267	NORTH CAMPUS RESEARCH COMPLEX BUILDING 36	116,835	2006	Teach, Research, Support	$3,357,367

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1005279	NORTH CAMPUS RESEARCH COMPLEX BUILDING 400	27,571	1982	Teach, Research, Support	$2,514,543
1005280	NORTH CAMPUS RESEARCH COMPLEX BUILDING 500	14,775	1998	Administration & Support	
1005281	NORTH CAMPUS RESEARCH COMPLEX BUILDING 520	199,850	1998	Teach, Research, Support	$8,204,093
1005282	NORTH CAMPUS RESEARCH COMPLEX BUILDING 550	236,634	1998	Teach, Research, Support	$3,782,012
1005270	NORTH CAMPUS RESEARCH COMPLEX BUILDING 60	25,380	1983	Teach, Research, Support	$4,189,441
1005271	NORTH CAMPUS RESEARCH COMPLEX BUILDING 70	773	1959	Teach, Research, Support	$46,990
1005272	NORTH CAMPUS RESEARCH COMPLEX BUILDING 73	231,655	1991	Parking Structure	$529,096
1005273	NORTH CAMPUS RESEARCH COMPLEX BUILDING 80	52,404	1959	Administration & Support	$13,352,424
1005283	NORTH CAMPUS RESEARCH COMPLEX BUILDING 800	20,250	2001	Administration & Support	$985,321
1005274	NORTH CAMPUS RESEARCH COMPLEX BUILDING 85	5,132	2005	Administration & Support	$317,697
1005335	NORTH CAMPUS RESEARCH COMPLEX BUILDING 86	1,034	2006	Switching Stations	
1005275	NORTH CAMPUS RESEARCH COMPLEX BUILDING 90	35,767	1999	Teach, Research, Support	$2,012,318
1000418	NORTH CAMPUS SERVICE BLDG #1	23,191	1965	Administration & Support	$898,679
1000430	NORTH CAMPUS STORAGE BUILDING	45,750	1967	Administration & Support	$1,483,700
1005334	NORTH CAMPUS SUPPORT FACILITY	2,529	2011	Administration & Support	
1000408	NORTH CAMPUS SWITCH STATION	10,161	1957	Switching Stations	$84,124
1005177	NORTH QUADRANGLE RESIDENTIAL AND ACADEMIC COMPLEX	388,357	2010	Resident Hall	$60,000
1000600	NORTHWOOD COMMUNITY CENTER	13,744	1991	Recreational Sports Building	$936,149
1000450	NORTHWOOD I SVC BUILDING 450	3,168	1955	Residence	$18,877,122
1000451	NORTHWOOD I APTS 451	11,744	1955	Residence	included in above
1000452	NORTHWOOD I APTS 452	5,312	1955	Residence	included in above
1000453	NORTHWOOD I APTS 453	14,412	1955	Residence	included in above
1000454	NORTHWOOD I APTS 454	14,412	1955	Residence	included in above
1000455	NORTHWOOD I APTS 455	5,312	1955	Residence	included in above
1000456	NORTHWOOD I APTS 456	11,744	1955	Residence	included in above
1000462	NORTHWOOD II APTS 462	4,246	1957	Residence	included in above
1000464	NORTHWOOD II APTS 464	5,645	1957	Residence	included in above
1000465	NORTHWOOD II APTS 465	5,645	1957	Residence	included in above
1000466	NORTHWOOD II APTS 466	4,246	1957	Residence	included in above
1000467	NORTHWOOD II APTS 467	4,246	1957	Residence	included in above
1000468	NORTHWOOD II APTS 468	4,246	1957	Residence	included in above
1000469	NORTHWOOD II APTS 469	12,405	1957	Residence	included in above
1000470	NORTHWOOD II APTS 470	5,645	1957	Residence	included in above
1000471	NORTHWOOD II APTS 471	5,645	1957	Residence	included in above
1000472	NORTHWOOD II APTS 472	5,645	1957	Residence	included in above

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1000473	NORTHWOOD II APTS 473	12,405	1957	Residence	included in above
1000474	NORTHWOOD II APTS 474	3,738	1957	Residence	included in above
1000475	NORTHWOOD II APTS 475	3,738	1957	Residence	included in above
1000476	NORTHWOOD II APTS 476	3,738	1957	Residence	included in above
1000477	NORTHWOOD II APTS 477	3,738	1957	Residence	included in above
1000478	NORTHWOOD II APTS 478	3,738	1957	Residence	included in above
1000479	NORTHWOOD II APTS 479	5,645	1957	Residence	included in above
1000480	NORTHWOOD II APTS 480	5,645	1957	Residence	included in above
1000481	NORTHWOOD II APTS 481	5,645	1957	Residence	included in above
1000482	NORTHWOOD II APTS 482	3,738	1957	Residence	included in above
1000483	NORTHWOOD II APTS 483	3,738	1957	Residence	included in above
1000484	NORTHWOOD II APTS 484	3,738	1957	Residence	included in above
1000485	NORTHWOOD II APTS 485	3,738	1957	Residence	included in above
1000486	NORTHWOOD II APTS 486	3,738	1957	Residence	included in above
1000487	NORTHWOOD II APTS 487	3,738	1957	Residence	included in above
1000488	NORTHWOOD II APTS 488	3,738	1957	Residence	included in above
1000489	NORTHWOOD II APTS 489	3,738	1957	Residence	included in above
1000490	NORTHWOOD II APTS 490	3,738	1957	Residence	included in above
1000491	NORTHWOOD II APTS 491	3,738	1957	Residence	included in above
1000492	NORTHWOOD II APTS 492	3,738	1957	Residence	included in above
1000493	NORTHWOOD II APTS 493	3,738	1957	Residence	included in above
1000494	NORTHWOOD II APTS 494	3,738	1957	Residence	included in above
1000495	NORTHWOOD II APTS 495	3,738	1957	Residence	included in above
1000496	NORTHWOOD II APTS 496	3,738	1957	Residence	included in above
1000497	NORTHWOOD II APTS 497	3,738	1957	Residence	included in above
1000457	NORTHWOOD II SVC BUILDING 457	5,400	1957	Residence	$40,626,996
1000458	NORTHWOOD II SVC BUILDING 458	2,760	1957	Residence	included in above
1000459	NORTHWOOD II SVC BUILDING 459	2,879	1957	Residence	included in above
1000460	NORTHWOOD II SVC BUILDING 460	5,270	1957	Residence	included in above
1000461	NORTHWOOD II SVC BUILDING 461	2,879	1957	Residence	included in above
1000501	NORTHWOOD III APTS 501	27,371	1958	Residence	included in above
1000502	NORTHWOOD III APTS 502	17,585	1958	Residence	included in above
1000503	NORTHWOOD III APTS 503	17,585	1958	Residence	included in above
1000504	NORTHWOOD III APTS 504	25,068	1958	Residence	included in above
1000505	NORTHWOOD III APTS 505	17,585	1958	Residence	included in above

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000506	NORTHWOOD III APTS 506	17,585	1958	Residence	included in above
1000507	NORTHWOOD III APTS 507	17,585	1958	Residence	included in above
1000508	NORTHWOOD III APTS 508	17,585	1958	Residence	included in above
1000499	NORTHWOOD III SVC BUILDING 499	2,471	1958	Residence	included in above
1000500	NORTHWOOD III SVC BUILDING 500	2,471	1958	Residence	included in above
1000601	NORTHWOOD IV APTS 601	8,029	1969	Residence	$64,154,628
1000602	NORTHWOOD IV APTS 602	4,061	1969	Residence	included in above
1000603	NORTHWOOD IV APTS 603	3,066	1969	Residence	included in above
1000604	NORTHWOOD IV APTS 604	4,899	1969	Residence	included in above
1000605	NORTHWOOD IV APTS 605	10,708	1969	Residence	included in above
1000606	NORTHWOOD IV APTS 606	3,117	1969	Residence	included in above
1000607	NORTHWOOD IV APTS 607	6,763	1969	Residence	included in above
1000608	NORTHWOOD IV APTS 608	5,425	1969	Residence	included in above
1000609	NORTHWOOD IV APTS 609	5,425	1969	Residence	included in above
1000610	NORTHWOOD IV APTS 610	4,123	1969	Residence	included in above
1000611	NORTHWOOD IV APTS 611	7,181	1969	Residence	included in above
1000612	NORTHWOOD IV APTS 612	6,726	1969	Residence	included in above
1000613	NORTHWOOD IV APTS 613	4,442	1969	Residence	included in above
1000614	NORTHWOOD IV APTS 614	5,399	1969	Residence	included in above
1000615	NORTHWOOD IV APTS 615	3,159	1969	Residence	included in above
1000616	NORTHWOOD IV APTS 616	10,707	1969	Residence	included in above
1000617	NORTHWOOD IV APTS 617	7,967	1969	Residence	included in above
1000618	NORTHWOOD IV APTS 618	7,082	1969	Residence	included in above
1000619	NORTHWOOD IV APTS 619	6,727	1969	Residence	included in above
1000620	NORTHWOOD IV APTS 620	6,727	1969	Residence	included in above
1000621	NORTHWOOD IV APTS 621	3,117	1969	Residence	included in above
1000622	NORTHWOOD IV APTS 622	5,876	1969	Residence	included in above
1000623	NORTHWOOD IV APTS 623	8,065	1969	Residence	included in above
1000624	NORTHWOOD IV APTS 624	6,727	1969	Residence	included in above
1000625	NORTHWOOD IV APTS 625	4,061	1969	Residence	included in above
1000626	NORTHWOOD IV APTS 626	5,741	1969	Residence	included in above
1000627	NORTHWOOD IV APTS 627	3,117	1969	Residence	included in above
1000628	NORTHWOOD IV APTS 628	5,425	1969	Residence	included in above
1000629	NORTHWOOD IV APTS 629	5,425	1969	Residence	included in above
1000630	NORTHWOOD IV APTS 630	11,534	1969	Residence	included in above

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000631	NORTHWOOD IV APTS 631	4,442	1969	Residence	included in above
1000632	NORTHWOOD IV APTS 632	2,821	1969	Residence	included in above
1000633	NORTHWOOD IV APTS 633	6,727	1969	Residence	included in above
1000634	NORTHWOOD IV APTS 634	4,123	1969	Residence	included in above
1000635	NORTHWOOD IV APTS 635	4,123	1969	Residence	included in above
1000636	NORTHWOOD IV APTS 636	3,159	1969	Residence	included in above
1000637	NORTHWOOD IV APTS 637	7,034	1969	Residence	included in above
1000638	NORTHWOOD IV APTS 638	5,775	1969	Residence	included in above
1000639	NORTHWOOD IV APTS 639	8,029	1969	Residence	included in above
1000640	NORTHWOOD IV APTS 640	5,425	1969	Residence	included in above
1000641	NORTHWOOD IV APTS 641	4,478	1969	Residence	included in above
1000642	NORTHWOOD IV APTS 642	4,061	1969	Residence	included in above
1000643	NORTHWOOD IV APTS 643	5,363	1969	Residence	included in above
1000644	NORTHWOOD IV APTS 644	8,348	1969	Residence	included in above
1000645	NORTHWOOD IV APTS 645	6,279	1969	Residence	included in above
1000646	NORTHWOOD IV APTS 646	5,425	1969	Residence	included in above
1000647	NORTHWOOD IV APTS 647	4,123	1969	Residence	included in above
1000648	NORTHWOOD IV APTS 648	3,159	1969	Residence	included in above
1000649	NORTHWOOD IV APTS 649	4,442	1969	Residence	included in above
1000650	NORTHWOOD IV APTS 650	4,123	1969	Residence	included in above
1000651	NORTHWOOD IV APTS 651	5,425	1969	Residence	included in above
1000652	NORTHWOOD IV APTS 652	6,701	1969	Residence	included in above
1000653	NORTHWOOD IV APTS 653	4,442	1969	Residence	included in above
1000654	NORTHWOOD IV APTS 654	5,425	1969	Residence	included in above
1000655	NORTHWOOD IV APTS 655	11,099	1969	Residence	included in above
1000656	NORTHWOOD IV APTS 656	10,080	1969	Residence	included in above
1000657	NORTHWOOD IV APTS 657	6,727	1969	Residence	included in above
1000658	NORTHWOOD IV APTS 658	8,480	1969	Residence	included in above
1000659	NORTHWOOD IV APTS 659	9,269	1969	Residence	included in above
1000660	NORTHWOOD IV APTS 660	8,348	1969	Residence	included in above
1000661	NORTHWOOD IV APTS 661	5,744	1969	Residence	included in above
1000662	NORTHWOOD IV APTS 662	3,159	1969	Residence	included in above
1000663	NORTHWOOD IV APTS 663	9,650	1969	Residence	included in above
1000664	NORTHWOOD IV APTS 664	8,348	1969	Residence	included in above
1000665	NORTHWOOD IV APTS 665	3,159	1969	Residence	included in above

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000666	NORTHWOOD IV APTS 666	4,442	1969	Residence	included in above
1000667	NORTHWOOD IV APTS 667	6,665	1969	Residence	included in above
1000668	NORTHWOOD IV APTS 668	9,331	1969	Residence	included in above
1000669	NORTHWOOD IV APTS 669	8,348	1969	Residence	included in above
1000670	NORTHWOOD IV APTS 670	7,095	1969	Residence	included in above
1000671	NORTHWOOD IV APTS 671	10,858	1969	Residence	included in above
1000672	NORTHWOOD IV APTS 672	5,425	1969	Residence	included in above
1000673	NORTHWOOD IV APTS 673	9,779	1969	Residence	included in above
1000674	NORTHWOOD IV APTS 674	8,029	1969	Residence	included in above
1000675	NORTHWOOD IV APTS 675	10,679	1969	Residence	included in above
1000676	NORTHWOOD IV APTS 676	6,727	1969	Residence	included in above
1000677	NORTHWOOD IV APTS 677	8,104	1969	Residence	included in above
1000678	NORTHWOOD IV APTS 678	7,046	1969	Residence	included in above
1000679	NORTHWOOD IV APTS 679	3,159	1969	Residence	included in above
1000680	NORTHWOOD IV APTS 680	7,967	1969	Residence	included in above
1000681	NORTHWOOD IV APTS 681	8,348	1969	Residence	included in above
1000682	NORTHWOOD IV APTS 682	11,045	1969	Residence	included in above
1000683	NORTHWOOD IV APTS 683	6,727	1969	Residence	included in above
1000684	NORTHWOOD IV APTS 684	1,479	1996	Residence	included in above
1002701	NORTHWOOD V APTS 2701	5,603	1972	Residence	$66,081,331
1002702	NORTHWOOD V APTS 2702	10,695	1972	Residence	included in above
1002703	NORTHWOOD V APTS 2703	9,393	1972	Residence	included in above
1002704	NORTHWOOD V APTS 2704	5,603	1972	Residence	included in above
1002705	NORTHWOOD V APTS 2705	9,393	1972	Residence	included in above
1002706	NORTHWOOD V APTS 2706	9,393	1972	Residence	included in above
1002707	NORTHWOOD V APTS 2707	5,603	1972	Residence	included in above
1002708	NORTHWOOD V APTS 2708	8,091	1972	Residence	included in above
1002709	NORTHWOOD V APTS 2709	6,218	1972	Residence	included in above
1002710	NORTHWOOD V APTS 2710	9,393	1972	Residence	included in above
1002711	NORTHWOOD V APTS 2711	8,091	1972	Residence	included in above
1002712	NORTHWOOD V APTS 2712	6,789	1972	Residence	included in above
1002713	NORTHWOOD V APTS 2713	5,603	1972	Residence	included in above
1002714	NORTHWOOD V APTS 2714	6,789	1972	Residence	included in above
1002715	NORTHWOOD V APTS 2715	5,603	1972	Residence	included in above
1002716	NORTHWOOD V APTS 2716	8,091	1972	Residence	included in above

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1002717	NORTHWOOD V APTS 2717	6,218	1972	Residence	included in above
1002718	NORTHWOOD V APTS 2718	6,218	1972	Residence	included in above
1002719	NORTHWOOD V APTS 2719	5,603	1972	Residence	included in above
1002720	NORTHWOOD V APTS 2720	5,603	1972	Residence	included in above
1002721	NORTHWOOD V APTS 2721	5,603	1972	Residence	included in above
1002722	NORTHWOOD V APTS 2722	9,393	1972	Residence	included in above
1002723	NORTHWOOD V APTS 2723	5,603	1972	Residence	included in above
1002724	NORTHWOOD V APTS 2724	6,789	1972	Residence	included in above
1002725	NORTHWOOD V APTS 2725	6,789	1972	Residence	included in above
1002726	NORTHWOOD V APTS 2726	6,218	1972	Residence	included in above
1002727	NORTHWOOD V APTS 2727	6,218	1972	Residence	included in above
1002728	NORTHWOOD V APTS 2728	5,603	1972	Residence	included in above
1002729	NORTHWOOD V APTS 2729	6,789	1972	Residence	included in above
1002730	NORTHWOOD V APTS 2730	5,603	1972	Residence	included in above
1002731	NORTHWOOD V APTS 2731	6,789	1972	Residence	included in above
1002732	NORTHWOOD V APTS 2732	8,091	1972	Residence	included in above
1002733	NORTHWOOD V APTS 2733	9,393	1972	Residence	included in above
1002734	NORTHWOOD V APTS 2734	8,091	1972	Residence	included in above
1002735	NORTHWOOD V APTS 2735	5,603	1972	Residence	included in above
1002736	NORTHWOOD V APTS 2736	5,603	1972	Residence	included in above
1002737	NORTHWOOD V APTS 2737	6,218	1972	Residence	included in above
1002738	NORTHWOOD V APTS 2738	5,603	1972	Residence	included in above
1002739	NORTHWOOD V APTS 2739	6,789	1972	Residence	included in above
1002740	NORTHWOOD V APTS 2740	8,091	1972	Residence	included in above
1002741	NORTHWOOD V APTS 2741	8,091	1972	Residence	included in above
1002742	NORTHWOOD V APTS 2742	9,393	1972	Residence	included in above
1002743	NORTHWOOD V APTS 2743	5,603	1972	Residence	included in above
1002744	NORTHWOOD V APTS 2744	8,091	1972	Residence	included in above
1002745	NORTHWOOD V APTS 2745	9,393	1972	Residence	included in above
1002746	NORTHWOOD V APTS 2746	5,603	1972	Residence	included in above
1002747	NORTHWOOD V APTS 2747	5,603	1972	Residence	included in above
1002748	NORTHWOOD V APTS 2748	5,603	1972	Residence	included in above
1002749	NORTHWOOD V APTS 2749	6,789	1972	Residence	included in above
1002750	NORTHWOOD V APTS 2750	6,789	1972	Residence	included in above
1002751	NORTHWOOD V APTS 2751	5,603	1972	Residence	included in above

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1002752	NORTHWOOD V APTS 2752	8,091	1972	Residence	included in above
1002753	NORTHWOOD V APTS 2753	5,603	1972	Residence	included in above
1002754	NORTHWOOD V APTS 2754	6,789	1972	Residence	included in above
1002755	NORTHWOOD V APTS 2755	5,603	1972	Residence	included in above
1002756	NORTHWOOD V APTS 2756	9,393	1972	Residence	included in above
1002757	NORTHWOOD V APTS 2757	5,603	1972	Residence	included in above
1002758	NORTHWOOD V APTS 2758	9,393	1972	Residence	included in above
1002759	NORTHWOOD V APTS 2759	9,393	1972	Residence	included in above
1002760	NORTHWOOD V APTS 2760	5,603	1972	Residence	included in above
1002761	NORTHWOOD V APTS 2761	5,603	1972	Residence	included in above
1002762	NORTHWOOD V APTS 2762	9,393	1972	Residence	included in above
1002763	NORTHWOOD V APTS 2763	5,603	1972	Residence	included in above
1002764	NORTHWOOD V APTS 2764	6,789	1972	Residence	included in above
1002765	NORTHWOOD V APTS 2765	6,789	1972	Residence	included in above
1002766	NORTHWOOD V APTS 2766	6,218	1972	Residence	included in above
1002767	NORTHWOOD V APTS 2767	5,603	1972	Residence	included in above
1002768	NORTHWOOD V APTS 2768	6,789	1972	Residence	included in above
1002769	NORTHWOOD V APTS 2769	6,789	1972	Residence	included in above
1002770	NORTHWOOD V APTS 2770	8,091	1972	Residence	included in above
1002771	NORTHWOOD V APTS 2771	6,218	1972	Residence	included in above
1002772	NORTHWOOD V APTS 2772	9,279	1972	Residence	included in above
1002773	NORTHWOOD V APTS 2773	9,279	1972	Residence	included in above
1002774	NORTHWOOD V APTS 2774	9,279	1972	Residence	included in above
1002775	NORTHWOOD V APTS 2775	6,218	1972	Residence	included in above
1002776	NORTHWOOD V APTS 2776	9,279	1972	Residence	included in above
1002777	NORTHWOOD V APTS 2777	6,218	1972	Residence	included in above
1002778	NORTHWOOD V APTS 2778	6,218	1972	Residence	included in above
1002779	NORTHWOOD V APTS 2779	9,279	1972	Residence	included in above
1000405	NUCLEAR ENGINEERING LABORATORIES	20,565	1955	Teach, Research, Support	$500,000
1000040	OH MARY ALICE AND LILLIAN GODDARD HALL	21,995	1964	Resident Hall	$31,058,458
1000042	OH ADELIA CHEEVER RESIDENCE	9,413	1964	Resident Hall	included in above
1000041	OH ARTHUR AND HAZEL VANDENBERG HALL	20,117	1964	Resident Hall	included in above
1000043	OH GEDDES RESIDENCE	11,204	1964	Resident Hall	included in above
1000044	OH JULIA ESTHER EMANUEL RESIDENCE	8,984	1964	Resident Hall	included in above
1000046	OH LAUREL HARPER SEELEY HALL	36,375	1964	Resident Hall	included in above

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1000045	OH PAMELA NOBLE RESIDENCE	9,413	1964	Resident Hall	included in above
1000047	OH PLANT SERVICE	3,341	1964	Administration & Support	included in above
1000704	OOSTERBAAN BENNIE FIELD HOUSE	88,942	1981	Intercollegiate Athletics Bldg	$735,317
1005047	PALMER COMMONS	106,471	2005	Teach, Research, Support	$55,511
1000263	PALMER DRIVE PARKING STRUCTURE	389,120	2004	Parking Structure	$5,351
1005399	PERFORMANCE CENTER	147,863	2018	Intercollegiate Athletics Bldg	
1000890	PERRY BUILDING	123,632	1902	Teach, Research, Support	
1000807	PHYSICAL PROPERTIES BUILDING	7,183	1920	Administration & Support	$538,669
1000442	PIERPONT WILBUR K COMMONS	90,487	1965	Recreational Sports Building	$7,019,509
1000261	PLANT SERVICE BUILDING	15,183	1973	Administration & Support	$1,899,459
1008050	PLANT STORAGE BUILDING #1	3,087	1987	Administration & Support	
1008051	PLANT STORAGE BUILDING #2	2,577	1987	Administration & Support	
1008052	PLANT STORAGE BUILDING #3	2,577	1987	Administration & Support	
1005385	POSTMA RICHARD L FAMILY CLUBHOUSE	25,268	2017	Intercollegiate Athletics Bldg	
1000186	POUND MADELON HOUSE	7,571	1898	Teach, Research, Support	$1,518,867
1000187	POUND MADELON HOUSE GARAGE	527	1951	Teach, Research, Support	
1000180	POWER CENTER FOR PERFORMING ARTS	73,087	1971	Teach, Research, Support	$3,612,332
1000203	PRESIDENTS RESIDENCE	13,781	1840	Administration & Support	$552,775
1000172	RACKHAM HORACE H SCHOOL OF GRADUATE STUDIES	157,957	1938	Teach, Research, Support	$665,211
1000416	RADIATION SCIENCES LABORATORY 1	7,708	1962	Teach, Research, Support	$336,348
1000417	RADIATION SCIENCES LABORATORY 2	10,660	1962	Teach, Research, Support	$179,580
1000972	RADRICK FARMS BARN #1	4,902	1962	Administration & Support	
1000955	RADRICK FARMS CARETAKERS HOUSE	2,874	1962	Administration & Support	
1000958	RADRICK FARMS CHICKEN HOUSE	200	1962	Administration & Support	
1000970	RADRICK FARMS COMFORT STATION	251	1987	Administration & Support	
1005331	RADRICK FARMS COMFORT STATION #2	253	1987	Administration & Support	
1000959	RADRICK FARMS CORNCRIB #1	105	1962	Administration & Support	
1000918	RADRICK FARMS DRIVE RANGE SHELT	128	1989	Administration & Support	
1000962	RADRICK FARMS FIRE BARN	792	1962	Administration & Support	
1000960	RADRICK FARMS FOOD SERVICE BLDG	408	1995	Administration & Support	
1000974	RADRICK FARMS GOLF CART BUILDING	2,909	1976	Administration & Support	
1000963	RADRICK FARMS GOLF CLUBHOUSE	10,725	1940	Administration & Support	
1000971	RADRICK FARMS GOLF STORAGE BLDG	6,458	1966	Administration & Support	
1000954	RADRICK FARMS PUMP HOUSE	168	1976	Administration & Support	
1000956	RADRICK FARMS SHED-GARAGE	2,370	1962	Administration & Support	

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1005048	RADRICK FARMS STORAGE	4,055	2003	Administration & Support	
1000957	RADRICK FARMS TACKROOM-BARN	2,855	1962	Administration & Support	
1000953	RADRICK RECREATION FACILITY	2,459	1994	Recreational Sports Building	
1000208	RANDALL HARRISON M LABORATORY	217,169	1924	Teach, Research, Support	$2,368,603
1000812	RESEARCH MUSEUMS CENTER	153,375	1969	Teach, Research, Support	$6,069,789
1005426	REVELLI TEMPORARY STORAGE BUILDING		*	Teach, Research, Support	
1000813	REVELLI WILLIAM D BAND REHEARSAL HALL	15,620	1973	Teach, Research, Support	$2,074,901
1000301	ROGEL CANCER CENTER	277,795	1997	TeachResSupport/CDS	$33,925,404
1005188	ROSS SCHOOL OF BUSINESS BUILDING	292,021	2009	Teach, Research, Support	$50,000
1005120	ROSS STEPHEN M ACADEMIC CENTER	45,356	2006	Teach, Research, Support	
1000193	RUTHVEN ALEXANDER G MUSEUMS BLDG	183,694	1928	Teach, Research, Support	$21,782,557
1003542	SAGINAW FOREST GARAGE	682	1903	Teach, Research, Support	
1003541	SAGINAW FOREST RESIDENCE	567	1903	Teach, Research, Support	
1000268	SALT STORAGE BUILDING	2,385	1984	Administration & Support	$71,448
1000705	SCHEMBECHLER GLENN E HALL	85,526	1971	Intercollegiate Athletics Bldg	$1,320,074
1000420	SCHOOL OF INFORMATION NORTH	30,930	1971	Teach, Research, Support	$5,147,608
1005347	SCHOOL OF NURSING NEW BUILDING	80,301	2015	Teach, Research, Support	
1000219	SCHOOL OF SOCIAL WORK BUILDING	143,450	1997	Teach, Research, Support	$4,357,139
1000999	SEISMOGRAPH STATION	576	1963	Teach, Research, Support	
1000227	SHAPIRO HAROLD T AND VIVIAN B LIBRARY	175,908	1957	Library Building	$6,317,963
1000944	SHEEP RESEARCH FAC EAST BARN	2,016	1983	Teach, Research, Support	
1005406	SHEEP RESEARCH FAC HOOP BARN	2,038	2002	Teach, Research, Support	
1000942	SHEEP RESEARCH FAC PORTAL VISTA	3,744	1993	Teach, Research, Support	
1000943	SHEEP RESEARCH FAC SQUARE DOME	1,280	1985	Teach, Research, Support	
1005405	SHEEP RESEARCH FAC TRACTOR SHED	680	1994	Teach, Research, Support	
1000947	SHEEP RESEARCH FACILITY HAY BARN	280	1976	Teach, Research, Support	
1000973	SHEEP RESEARCH FACILITY OLD BARN	1,153	1962	Teach, Research, Support	
1000946	SHEEP RESEARCH FACILITY P BARN 1	4,575	1976	Teach, Research, Support	
1005349	SHEPHERD DONALD R SOFTBALL CENTER	10,500	2014	Intercollegiate Athletics Bldg	
1005077	SHEPHERD DONALD R WOMENS GYMNASTIC CENTER	22,837	2002	Intercollegiate Athletics Bldg	
1000320	SIMPSON CIRCLE PARKING STRUCTURE	467,374	1968	Parking Structure	$75,621
1000212	SIMPSON THOMAS H MEMORIAL INST MEDICAL RESEARCH	17,769	1927	Teach, Research, Support	$5,936,980
1005401	SOCCER TICKET BUILDING	238	2015	Intercollegiate Athletics Bldg	
1005235	SOUTH HALL	103,128	2011	Teach, Research, Support	$124,800
1000063	SOUTH QUADRANGLE	371,520	1951	Resident Hall	$67,290,303

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000714	STADIUM PUMPING STATION	6,746	1927	Intercollegiate Athletics Bldg	
1005224	STAMPS AUDITORIUM	13,488	2008	Teach, Research, Support	
1000445	STEARNS FREDERICK BUILDING	18,261	1955	Teach, Research, Support	$1,673,488
1000064	STOCKWELL MADELON LOUISA HALL	145,204	1940	Resident Hall	$464,338
1000215	STUDENT ACTIVITIES	119,626	1957	Student Services	$7,376,282
1000216	TAPPAN HALL	37,576	1894	Teach, Research, Support	$1,851,315
1005378	TAPPAN STREET AUXILIARY BUILDING	14,827	2014	Teach, Research, Support	
1005037	TAUBMAN A ALFRED BIOMEDICAL SCIENCE RESEARCH BLDG	593,717	2006	Teach, Research, Support	$71,022
1000317	TAUBMAN A ALFRED HEALTH CARE CTR	405,003	1986	Clinical Delivery System	$33,596,542
1000209	TAUBMAN A ALFRED HEALTH SCIENCES LIBRARY	143,974	1980	Library Building	$339,504
1002515	TELECOMMUNICATIONS BLDG I	311	1985	Administration & Support	
1000259	THAYER ST PARKING STRUCTURE	165,422	1962	Parking Structure	
1000255	THOMPSON ST PARKING STRUCTURE	365,996	1963	Parking Structure	
1000738	TISCH PRESTON ROBERT TENNIS BLD	89,026	1997	Intercollegiate Athletics Bldg	
1000313	TOWSLEY CENTER FOR CONTINUING MEDICAL EDUCATION	52,332	1969	Teach, Research, Support	$7,373,638
1005240	TOWSLEY CHILDRENS HOUSE	25,428	2010	Teach, Research, Support	
1005400	TRACK AND FIELD AUXILIARY BUILDING	2,325	2018	Intercollegiate Athletics Bldg	
1005397	TRACK AND FIELD STADIUM	512	2018	Intercollegiate Athletics Bldg	
1000808	TRANSPORTATION SERVICES BUILDING	40,611	1964	Administration & Support	$1,994,035
1000886	TROTTER WILLIAM MONROE HOUSE OLD	13,799	1943	Student Services	$419,177
1005413	TROTTER WILLIAM MONROE MULTICULTURAL CENTER NEW		*	Teach, Research, Support	
1002519	UM TRANS RES FLAMMABLE STOR BLDG	192	1996	Teach, Research, Support	
1000444	U-M TRANSPORTATION RESEARCH INST	77,883	1969	Teach, Research, Support	$9,776,709
1005338	UM TRANSPORTATION RESEARCH TESTING BUILDING	3,454	2012	Teach, Research, Support	
1005051	UMH MODULAR OFFICE A	2,050	2000	Clinical Delivery System	
1005046	UNDERGRADUATE SCIENCE BUILDING	141,517	2005	Teach, Research, Support	$81,232
1000390	UNIV HOSPITALS CHILD CARE CENTER	14,850	1991	Clinical Delivery System	$450,042
1000309	UNIVERSITY HOSPITAL SOUTH UNIT 1	67,494	1950	Clinical Delivery System	$3,833,352
1000312	UNIVERSITY HOSPITAL SOUTH UNIT 2	266,038	1969	Clinical Delivery System	$57,567,587
1000314	UNIVERSITY HOSPITAL SOUTH UNIT 3	19,988	1972	Clinical Delivery System	$1,279,690
1000318	UNIVERSITY HOSPITAL SOUTH UNIT 4	158,938	1990	Clinical Delivery System	$8,094,187
1000316	UNIVERSITY HOSPITALS	1,714,076	1986	Clinical Delivery System	$179,478,295
1005012	UNIVERSITY HOSPITALS HELIPAD	5,397	2001	Clinical Delivery System	
1005117	UPJOHN RACHEL BUILDING	117,097	2006	Clinical Delivery System	
1000204	VAUGHAN HENRY FRIEZE PUBLIC HEALTH BUILDING	210,906	1942	Teach, Research, Support	$587,053

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Bldg #	Building Name	Gross Sq.Ft.	Original Construction	Building Type	Deferred Maintenance Backlog
1000065	VAUGHAN VICTOR C HOUSE	51,518	1939	Teach, Research, Support	$4,997,390
1005059	WALGREEN CHARLES R JR DRAMA CENTER	84,149	2007	Teach, Research, Support	
1005193	WALL STREET EAST PARKING STRUCTURE	249,962	2014	Parking Structure	
1005430	WALL STREET WEST PARKING STRUCTURE		*	Parking Structure	
1008067	WALLACE MIKE AND MARY HOUSE	7,863	1909	Teach, Research, Support	
1000731	WEIDENBACH JOHN P HALL	23,229	1955	Intercollegiate Athletics Bldg	$505,750
1005101	WEILL JOAN & SANFORD HALL	97,989	2006	Teach, Research, Support	$855,291
1000165	WEISER HALL	144,701	1963	Teach, Research, Support	$10,217,805
1005319	WEISFELD FAMILY GOLF CENTER	11,307	2011	Intercollegiate Athletics Bldg	
1005388	WEST ANN ARBOR HEALTH CENTER NEW	75,260	2017	Clinical Delivery System	
1000167	WEST HALL	166,528	1904	Teach, Research, Support	$41,600
1000066	WEST QUADRANGLE	386,311	1937	Resident Hall	$1,499,622
1008090	WOLVERINE TOWER	224,981	1973	Administration & Support	$8,580,755
1000135	WYLY SAM HALL	82,855	2000	Teach, Research, Support	
1000709	YOST ICE ARENA	125,253	1924	Intercollegiate Athletics Bldg	$2,080,553

V. IMPLEMENTATION PLAN

The university consistently ranks in the top ten of public universities in the United States, according to the U.S. News and World Report. Strategic facility investments allow the university to provide exemplary spaces serving a wide range of needs from classroom and research spaces, student residences and patient care, to athletics and the performing arts.

Several years ago, an integrated planning effort brought together major campus units into one comprehensive master plan. Integrated planning supports efficient resource allocation and identifies immediate, short-term and longer-term needs and planning opportunities to guide future land use planning and capacity targets, functional use requirements, transportation and pedestrian circulation, open space and recreational resources, and utility support. The comprehensive nature of this process ensures alignment between all units and prudent investment decisions.

The effort to enhance transportation between campuses continues with the City of Ann Arbor, the Downtown Development Authority (DDA), the Ann Arbor Area Transportation Authority (AAATA), and the University of Michigan. The high capacity corridor as studied generally extends from the Ross Athletic Campus to Central Campus, the Medical Center Campus, North Campus and eventually East Medical Campus. The alternatives analysis phase of the study identified light rail as the preferred mode of transportation. Recently, several factors have caused the project team to refocus efforts to the core segments of the corridor, which carry the highest volume of trips. The most important of which are much higher than anticipated costs for the planning and impact analysis and uncertain state or federal funding. We have engaged with campus faculty experts in exploring potential lower-cost alternative concepts and newer technologies that may be available in the near-term. We will continue to work with our community partners for long-term planning.

As the university continues to experience new growth and expansion of existing programs and facilities, our commitment to making strategic facility investments remains a high priority. The U-M has maintained a strategic focus on transforming and enriching the student experience, resulting in a rigorous building renewal program for its residential halls and dining facilities. The university has also executed a significant renovation and expansion program for athletic and recreational facilities to address the aging condition of heritage structures, and to provide new amenities needed to remain competitive with U-M peers. The university continues to focus on ways to improve the quality of campus life with emphasis on locations and adjacencies, the selection and organization of programs and services, housing facilities, retail, and other amenities.

The Board of Regents recently approved a project to replace the university's largest recreational sports center. The Central Campus Recreation Building will be replaced by a new 200,000-square foot facility that will allow greater access and opportunity for students, faculty and staff to improve their health and well-being. The project follows recent extensive renovations to the North Campus Recreation Building and the Intramural Sports Building.

The university's housing system serves as home to approximately 10,000 undergraduate students in a typical year. Facilities include 18 residence halls as well as 1,480 apartments on North Campus that accommodate undergraduates, students with families and graduate students. Many years ago, the university implemented a comprehensive capital plan to address significant building renewal of existing residence halls as well as new facilities for housing and dining. This included renovation of several heritage facilities as well as the construction of the first undergraduate residence hall in more than forty years, North Quadrangle Residential and Academic Complex. A new residence for graduate and professional students, the Munger Graduate Residences, opened its doors in August 2015. Made possible by a generous donation from philanthropist and alumnus Charles T. Munger, the facility houses 630 graduate students from multiple disciplines and provides opportunities for living and learning. The university continues to evaluate alternative delivery mechanisms for housing renewal.

Infrastructure planning continues as a critical component of the university's master plan. As the university continues to refine short-term and long-term facility needs, requirements for additional power, chilled water, domestic water, and storm water will evolve. In addition, the university continues to explore ongoing regional storm water management strategies that will support new facilities as well as impacts from renovation and maintenance projects. One example is the Central Campus Storm Water Infiltration System currently under construction near the Alumni Memorial Hall. When complete, this project will reduce the likelihood of recurring flooding in this area and free up capacity in the university and city storm water systems. The university also anticipates a continued transformation to a more technology rich campus environment, which will certainly influence ongoing infrastructure requirements. Parking and transit requirements, and safe/efficient pedestrian circulation remain high priority design components with each upcoming project.

Major projects (over $5 million) in various stages of planning, design or construction are detailed in this section. These projects support student life, collaboration and interdisciplinary learning, preservation of knowledge, international studies, and the university's commitment to nourish the arts and cultural activities on campus. Over the next five years, a wide variety of infrastructure needs or programmatic changes will emerge that will require the development of projects not on the lists. Although the university brings a consistent set of planning principles to all areas of campus, each campus has a unique set of dynamics. A brief description of the planning emphasis of each campus is provided.

Central Campus and Medical Center Campus

The development of Central Campus remains consistent with university planning principles that promote renovating and re-purposing existing facilities while maintaining the character of the historic core. A significant number of projects are planned over the next several years in response to growth pressures by academic and research initiatives.

Plans are progressing on a project to renovate and reuse the historic Alexander G. Ruthven Museums building. The project includes renovations for dry laboratory computational research and administrative space as well as an addition to accommodate the growing need for active-

learning classrooms and auditoriums. Construction will begin this year to renovate the 1915 Edward Henry Kraus Building to consolidate the School of Kinesiology and allow for future growth in programs. The renovation will address the building's deferred maintenance needs including full replacement of the mechanical, electrical and plumbing systems. Renovations currently underway to the College of Literature, Science and the Arts (LSA) building will create new space to connect LSA undergraduates with opportunities such as internships and mentoring.

Construction is underway for the new William Monroe Trotter Multicultural Center. Located in the heart of Central Campus, the Center will serve students of many cultural identities and provide meeting and active-learning spaces. Nearby, renovations to the iconic 97-year-old Michigan Union began in the spring. The project will enhance student social space and improve space for counseling and student support services.

Addressing space needs for the College of Pharmacy remains a high priority for the university. Recently named one of the top most affordable pharmacy schools in the United States, the college offers a number of degrees in pharmaceutical sciences and engineering and medicinal chemistry and was Providing high-quality education and research is becoming increasingly difficult to do in its current facilities. The college occupies space in six different campus building, four of which were built prior to 1960. The university is committed to helping the college identify long-term solutions that address the college's need for consolidated modern teaching and research spaces. Depending on timing and near-term pressures, the university may submit Pharmacy as a candidate for state capital outlay in the future.

Final design and construction plans are progressing for School of Dentistry's renovation and addition project. This project is part of the FY17 Capital Outlay Request with State providing $30 million in funding. The renovation and expansion will create a more welcoming, accessible facility with an improved patient entrance, modern teaching clinics and open, flexible research space. Construction is expected to commence later this year.

The new Biological Sciences Building opened this summer and serves as a hub of scientific innovation. The building's design encourages collaboration through flexible active-learning spaces that allow students to work in groups. Shared laboratories among multiple faculty members' team are distributed throughout the building to facilitate interdisciplinary collaboration. Opening in two phases in 2019, the Museum of Natural History puts science on display and allowing visitors to see exhibits related to current research.

Medical Center Campus planning continues to focus on redevelopment opportunities, as well as transportation and site improvements to support existing facilities. Currently, the Medical School is in the early stages of a study for a medical education facility. This project would co-locate a number of student-focused functions, provide additional team-based teaching spaces, and create a welcoming front door to the Medical School. Longer-term space needs to grow and improve inpatient clinical care may play a significant role in revisiting master planning assumptions. In addition, Michigan Medicine's ongoing strategic facilities master planning effort may have significant impact on planning for the future of the Medical Center Campus core area as well as

the Wall Street district and the North Ingalls area. In response to high demand for patient rooms and surgical suites, Michigan Medicine is undertaking an architectural planning study for a potential new adult inpatient tower on the Medical Center Campus. The clinical program would include up to 264 beds and 23 surgical/interventional radiology suites.

Current and Planned Major Projects Central and Medical Center Campuses (>$5M) FY18–FY22

PROJECT/BUILDING	PROJECT TYPE	GROSS SQUARE FEET	ESTIMATED $ (MILLIONS)
Alumni Center [in planning]	Renovation	25,000	$8.9
Central Power Plant Expansion [in design]	Addition	12,000	$80.0
Central Campus Recreation Building Replacement [in planning]	New Construction	200,000	$150
Detroit Observatory [in planning]	Addition	6,000	$10.0
Alexander Ruthven Museums Building [in planning]	Renov/Addition	150,000 renov 100,000 addition	$150.0
Michigan Medicine Clinical Inpatient Tower [in planning]	Study	N/A	$18.4
Wall Street West Parking Structure [in planning]	New Construction	N/A	$39.5
Central Power Plant Switchgear Upgrade [in design]	Renovation	N/A	$23.0
Dental Building/Kellogg Institute– FY17 Capital Outlay Request [in design]	Renov/Addition	172,000 renov 37,000 addition	$140.0
Edward Henry Kraus Building [in design]	Renov/Addition	159,600 renov 62,000 addition	$120.0
Trotter Multicultural Center [under construction]	New Construction	20,000	$10.0
Literature, Science and the Arts Building [under construction]	Renov/Addition	24,000 renov 21,000 addition	$35.0
Michigan Union [under construction]	Renovation	250,000	$85.2
Michigan Medicine Univ Hospital Interventional Radiology Equipment [under construction]	Renovation/ Equipment	3,700	$12.3
Stephen M. Ross School of Business Exterior Completion [under construction]	Renovation	N/A	$9.3
A. Alfred Taubman Biomedical Science Research Building	Renovation	TBD	TBD
College of Pharmacy	TBD	TBD	TBD
Kinesiology Building	Renovation	TBD	TBD
Medical School Education Building	New Construction	TBD	TBD

North Campus

The development of North Campus continues to be a high priority planning focus. Efforts to strengthen and reinforce connections internally on North Campus, as well as between campuses, and strategies to further enliven and enrich student life remain a primary focus of ongoing planning activities. The university also continues to evaluate alternative delivery mechanisms for housing renewal on North Campus.

The College of Engineering recently completed a review of its facilities to identify capital needs and prioritize projects to address continued growth projections. The space and enrollment challenges faced by the College of Engineering and the School of Information are similar, and both units would benefit programmatically by having a joint solution. As a result, the university submitted a combined School of Information and CSE project to the state for consideration for capital outlay funding in 2017 and is submitting this project again in 2018.

Earlier this year, the Board of Regents approved plans for a new building for the School of Music, Theatre and Dance. The new building will provide much-needed rehearsal and performance space for the Department of Dance, which has outgrown its current space on Central Campus. In joining the other creative disciplines on North Campus, the new building will foster more innovation and collaborations with music, theatre, the visual arts, architecture, and engineering.

Construction started on the new Ford Motor Company Robotics Building. The project will bring faculty and students together from across multiple disciplines and will house research laboratories in an open plan to allow for greater collaboration and increased flexibility of space utilization. Ford will occupy space in the building and work side-by-side with university researchers to accelerate autonomous vehicle research. Several key testing spaces include a robot-walking lab, a flight-testing lab, and labs for electronics and software development.

M-Air, an outdoor fly lab for testing autonomous aerial vehicles, opened in spring 2018. The netted, four-story complex is situated next to the Ford Robotics Building and will complement that facility's indoor drone testing environment. Together, the labs will allow a full spectrum of experiments. Researchers will be able to test unique control and sensing schemes and human-robot interaction. With the opening of M-Air, U-M is the only engineering school in the country with cutting-edge robotic test facilities for air, sea and land. These facilities are another example of the university's commitment to provide students and faculty best-in-class resources.

The North Campus Research Complex (NCRC) is home to approximately 3,000 occupants and continues to play a significant role in the future of North Campus. Comprising 2.1 million square feet of space, NCRC brings together people and activities for research in health, biomedical sciences and other disciplines. Construction is underway to renovate the last two empty buildings on the site to create more than 50 modern research laboratories. Renovations to four NCRC buildings for the Department of Pathology are substantially complete, thereby allowing colocation of a large portion of Michigan Medicine's clinical pathology teams and educational programs.

Current and Planned Major Projects North Campus (>$5M) FY18–FY22

PROJECT /BUILDING	PROJECT TYPE	GROSS SQUARE FEET	ESTIMATED $ (MILLIONS)
Dance Building, New [in planning]	New Construction	24,000	$19.0
Robotics Laboratory [under construction]	New construction	140,000	$75.0
North Campus Research Complex Buildings 20 and 25 [under construction]	Renovation	158,000	$78.5
North Campus Recreation Building [under construction]	Renovation/Addition	50,000 renov 18,00 addition	$17.4
Baits I Complex demolition	Demolition	165,000	TBD
Computer Science and Engineering and School of Information	Renovation/ Addition	TBD	TBD
Transportation Facility	New Construction	TBD	TBD

Ross Athletic Campus

The Ross Athletic Campus is primarily a venue for the Athletics Department, with numerous athletic fields and facilities. Facility program planning by the Athletic Department has resulted in a number of projects that will enrich the experience for student athletes and for student recreation. Completed last year, the Athletics South Competition and Performance Center Project constructed several new indoor and outdoor venues for track and field, cross country, lacrosse, soccer, and rowing. The Performance Center provides specialized team spaces and shared resources for strength and conditioning and athletic medicine as well as study and meeting spaces. The project was made possible by a $100 million lead gift from donor Stephen M. Ross.

The Athletics Department is reviewing potential future uses for the Ferry Field area. Facility needs within the historic core of the Ross Athletic Campus are being re-evaluated in response to the shift of indoor and outdoor track to their new venues.

Current and Planned Major Projects Ross Athletic Campus (>$5M) FY18–FY22

PROJECT	PROJECT TYPE	GROSS SQUARE FEET	ESTIMATED $ (MILLIONS)
Glenn E. Schembechler Hall Football Performance Center [under construction]	Renov/Addition	24,000 renov 8,000 addition	$14.8
Ferry Field Improvements	TBD	TBD	TBD

East Medical Campus

East Medical Campus is primarily an outpatient clinical care complex that includes associated research and medical education activities. Opportunities for growth and investment in the near future include “cluster” development for ambulatory care and/or academic activities. Plans for future facilities at this location will fit within the framework of plans for Michigan Medicine and the university at large. Storm water management, transit and non-motorized transportation strategies, parking, and infrastructure improvements are all campus components that will be considered with any future proposals.

Michigan Medicine Off-Campus

The volume of ambulatory care and specialty care visits continue to grow and the need for strategically located outpatient facilities is core to the Michigan Medicine’s plan to improve access to patient care. The Northville Health Center opened in 2014 and is being used near capacity. Construction was recently completed on two additional off-campus facilities, the West Ann Arbor Health Center and Brighton Health Center South. These new outpatient facilities are part of Michigan Medicine's overall strategy to deliver enhanced and comprehensive services in the communities where patients are located. Thereby allowing outpatient clinical space on the Medical Center Campus to be repurposed for increased acuity care.

Infrastructure and Deferred Maintenance

Each year a significant number of infrastructure projects are prioritized through the Facility Condition Assessment program as described in Section IV. A planning priority is to adapt existing facilities to meet current and future program needs for the campus by updating building infrastructure and re-programming/reconfiguring existing buildings. Re-programming and reconfiguring addresses building density, program and organization adjacencies, open site use, building addition or replacement options, and redistribution of the density to other areas.

In order to support a healthy and strong campus infrastructure for future generations, the university had a policy on fundraising related to facility endowments from 2009 to 2015 for newly named buildings. All such endowed funds are managed by the Executive Vice President and Chief Financial Officer (CFO). The CFO’s office works closely with the users of the building to prioritize the facility needs and the uses of the endowment distributions to support capital maintenance and upkeep of the facility.

Status of State Building Authority Projects (Ann Arbor)

Completed Projects	Lease Start Date	Lease Termination Date
G.G. Brown Memorial Laboratories Renovation	September 2017	September 2052
Student Activities Building Renovation	December 2009	December 2044
Michigan Memorial Phoenix Laboratory Renovation	December 2009	December 2044
Observatory Lodge Renovation	November 2008	November 2043
Literature, Science and the Arts Building Renovation	August 2007	August 2042
West Hall Renovation	January 2005	January 2040
Mason Hall and Haven Hall Renovations and Addition	November 2005	November 2040
S. T. Dana Building Renovation	November 2003	November 2038
Perry Building Renovation	November 2003	November 2038

Sustainability Initiatives

Just as the University of Michigan is committed to breadth and depth of research, teaching, and health care, the U-M is also committed to campus sustainability. A significant amount of resources is required to support the university's physical plant, justifying the development of a comprehensive strategy to minimize the U-M's environmental impact.

As important as it is for U-M physical operations to reduce its own impact on the environment, the most fundamental contribution that the university will make will come from the research of faculty and education of students that creates a future path for environmental progress. What links both together is the opportunity for the campus to serve as both a model for advanced sustainability practices, and a laboratory for students and faculty to test new ideas and approaches. The living-learning laboratory theme leads the U-M to focus on strategies that decrease the university's environmental footprint in measurable ways while creating hands-on experiences for students.

2025 Sustainability Goals and Strategies

The 2025 goals are based on a 2006 baseline for all goals with exception of the Sustainable Food Goal (as no baseline data was available). However, at the request of President Schlissel, the goals for greenhouse gas (GHG) reduction, waste reduction, and culture were re-evaluated beginning in the fall of 2014 in an effort to simulate faster implementation. Goal evaluation and adjustment will be based on many variables including, but not limited to, changes in technology, the State of Michigan energy platform, economics, and competing university priorities.

Goal 1: Decrease campus scope 1 and 2 carbon dioxide emissions by 25 percent by 2025. This goal focuses on reducing U-M's scope I and II greenhouse gas emissions for the Ann Arbor campus.

Strategies include:

- Design guidelines and standard practices that outline the university's detailed requirements related to energy efficiency as well as sustainable design and environmental stewardship, and challenge projects to exceed the minimum baseline energy performance mandated by codes. Typical energy saving measures employed include: additional insulation; energy efficient windows/glazing; occupancy sensors to reduce lighting levels; variable water flow controls; resetting of space temperatures based on occupancy sensors; and exhaust heat recovery.
- Continued evaluation of energy and GHG reduction strategies, including photovoltaics, wind and geothermal generation technologies, the purchase of additional REC's, building automation improvements, and continuous monitoring of building systems.
- Expansion of the electric generating capacity of the Central Power Plant, with additional power provided by gas turbine technology. Implementation of this upgrade will reduce the university's overall GHG emissions by an estimated 80,000 MT of CO2 yearly and ensure we maintain reliable and redundant heat and electricity.

Successes to date:

- Planet Blue Operations Team addresses the growth in building energy demands by actively engaging the university community to conserve utilities thereby saving money and benefiting the environment.
- Expansion of building specific energy conservation projects throughout all General Fund and Auxiliary units of the institution.
- Funding of two renewable energy demonstration initiatives linking renewable energy technology to active research and curriculum on campus: 1) solar panels for the straw bale structure at the Matthaei Botanical Gardens, and 2) a bioreactor demonstration project designed to stabilize municipal solid waste (MSW) in less than a year, generating energy and reducing up to 50 precent of the volume of mixed campus waste sent to MSW landfills.
- 8.5 percent of the electricity purchased by the university came from renewable sources.
- Continued purchase of wind renewable energy credits (RECs) through our DTE partnerships accounting for 2 percent of the GHG emissions.
- Air emission permit awarded for the addition of a 15 MW turbine to the Central Power Plant that will reduce the university's overall greenhouse gas emissions by an estimated 80,000 MT per year.

<u>Goal 2</u>: Decrease carbon intensity of passenger trips on U-M transportation options by 30 percent.

The university aims to reduce emissions associated with transportation by modeling and promoting sustainable transportation alternatives, such as public mass transit, car and van pools, and bike programs.

Successes to date:

- Campus bus ridership (total passengers) has increased 27 percent since 2006.
- U-M sponsored vanpool system has entered its fourth decade of operation, with 608 employees participating. Vanpool passengers as well as passenger miles increased from the previous year.
- The university operates a large alternative fuel fleet with alternative fuel vehicles comprising more than 58 percent of the fleet. Of those that do not use alternative fuel, 29 are hybrid electric and three are fully electric.
- Of the 51 vehicles in the bus class, 100 percent run on alternative fuel, 30 of which are biodiesel hybrid electric.

Goal 3: Reduce waste tonnage diverted to disposal facilities by 40 percent.

Strategies include:

- Promote reuse, leverage new technologies, and reduce the use of disposable products such as plastic non-recyclable outer packaging.
- Establish and install university wide recycling, composting, waste bin, and related signage/labeling standards.
- Implement a university-wide organics-composting program based on and expanding current programs.
- Pursue medical waste diversion opportunities as identified by Michigan Medicine.
- Develop purchasing and procurement strategies to increase the purchase of environmentally friendly products and decrease products that contribute to the solid waste stream.
- Continue to expand the sustainable laboratory program reducing chemical waste disposal.
- Work with university vendors to reduce packaging materials and minimum volume orders to reduce waste.

Successes to date include:

- Eighty-eight percent complete with implementation of the new bin standardization rollout for consistent bin, signage and placement. To date, 339 buildings have been completed with 45 buildings remaining.
- 957 tons of compostable material diverted from the landfill. This is a combination of all compostable waste collected, including pre and post-consumer composting programs in all 9 residence hall dining facilities, Student Life cafes, the conversion of over 150 staff kitchens to “zero waste”, and continued growth of zero waste events.
- OCS directly supported 175 individual staff events, with over 32,000 people engaged, and supported the Student Sustainability Initiative in 226 events in the 2017-18 academic year, a 78 percent increase from the prior year. Many more were indirectly supported through trained departmental ambassadors.

- Fall 2017 implementation of a zero-waste program for the Michigan Stadium, diverting a total of 28 tons of compostable waste from football games and an overall diversion rate of 89 percent. In addition, the catering kitchen in the stadium introduced full scale pre-consumer composting for all daily food-prep.
- Establishing a new waste reduction program to significantly reduce non-regulated medical waste from University Hospital and the Frankel Cardiovascular Center.
- Michigan Medicine exploring options for recycling blue wrap, as well as expanding the collection pre-consumer compostable waste.

Goal 4: Protect Huron River water quality by reducing runoff from impervious surfaces and reducing the volume of land management chemicals used on campus by 40 percent.

The campus landscape is a critical part of the university's commitment to responsible environmental stewardship. The U-M has a legacy of landscape planning that is sensitive to water-use and inputs to the regional Huron River Watershed.

Strategies include:
- Apply an integrated landscaping approach that recognizes vegetation, soils, pavement systems, and storm water management as interlinked, and helps to restore the quality and capacity of the regional Huron River watershed.
- Minimize use of potable water for irrigation, prioritize the use of drought resistant plantings, increase water retained for beneficial purposes on campus, and improve the quality of water outflow.
- Reduce water use for infrastructure to the maximum extent possible.
- Reduce storm water runoff through on-site mitigation techniques such as rain gardens, storm water retention basins, or green roofs, when appropriate.

Successes to date:
- University-wide certification in the Michigan Turfgrass Environmental Stewardship Program (MTESP) for practices which protect waste quality through best management practices.
- Since 2006, the amount of synthetic chemicals used on campus grounds has been reduced by 43 percent.
- Most of the reduction is due to a campus-wide effort to switch to organic fertilizer. At this time, it is estimated that 75 percent of fertilizer used on campus is organic.
- Grounds Services piloting a low-impact weed control regime on 25 percent of campus, including the Central Campus Diag and Ingalls Mall.

Goal 5: Purchase 20 percent of U-M food in accordance with the U-M Sustainable Food Purchasing Guidelines.

The university purchases food for a variety of on-campus dining areas such as Residential Dining

Services and MCatering and patient meals within the hospitals. Food is also purchased for retail areas including campus eateries and University Unions. MDining purchases represent 2/3 of on-campus dining spend and has made significant strides by engaging with new vendors that will help U-M meet this goal.

Successes to date:

- Contracted with a local coffee roaster to provide Fair Trade/Organic coffee for the residential retail and dining halls.
- Transitioned main contract to a supplier that provides aggregation of produce from farmers in Southeast Michigan.
- Expanded local meat purchases.
- The Palmer Commons café operates a Farm-to-Table concept called Field's café.

While not always the case, the sustainability of food generally increases as the distance it travels from the point of harvest to consumption decreases. Minimizing transportation and refrigeration generally reduces fossil fuel consumption and carbon dioxide emissions. Local food also requires fewer preservatives and less packaging. In addition, local production often employs a more diverse crop strategy, which reduces pest susceptibility and the need for pesticide and chemical fertilizer use. Finally, supporting local farmers and growers keeps money circulating within the community longer and directly profits local producers.

Action Item: Community Awareness – The university will pursue stakeholder engagement, education, and evaluation strategies toward a campus-wide ethic of sustainability. The success of achieving the goals in the plan will require the active contribution of every member of the university community. The U-M cannot delegate responsibilities to a handful of departments, but rather must change behaviors as well as policies and practices. The president's committees took a hard look at this effort and made a number of recommendations around communication and marketing activities that can help improve community awareness and work toward faster goal implementation.

Successes to date:

- The latest data from the Sustainability Culture Indicators Program shows the following indicators have increased:
    - Waste Prevention Behavior
    - Sustainable Food Awareness
    - Sustainability Commitment
    - Sustainability Engagement at U-M
    - Awareness of Health Environments (for staff)

UNIVERSITY OF MICHIGAN – ANN ARBOR
FISCAL YEAR 2020
CAPITAL OUTLAY MAJOR PROJECT REQUEST

Institution Name:	University of Michigan – Ann Arbor
Project Title:	Computer Science and Engineering and School of Information
Project Focus:	X **Academic** X **Research** X **Administrative/Support** X **Renovation** X **Addition** **New Construction**
Approximate Square Footage:	163,000 gross square foot addition to the Bob and Betty Beyster Building (98,000 net assignable square feet)
Total Estimated Cost:	$145 million
Estimated Duration of Project:	Preliminary programming is underway. Construction completion is to be determined.

Is the Five-Year Plan posted on the department's public Internet site? Yes

Is the requested project included in the Five-Year Capital Outlay Plan? Yes

Project Purpose

Every day, the world around us is transformed by the combination of technology and information. It permeates nearly every industry that exists, every product we use, every service we receive, how we work, how we communicate, and more. Computer science and information (data) science are driving this innovation and stimulating economic development around the world, and as a result, they are the fastest growing careers in the global marketplace. They account for over half of all projected science, technology, engineering, and math (STEM) jobs, and some of the highest demand, highest paying jobs in the state of Michigan[1] and nationally. Computer science and information science skills are also becoming increasingly important for all careers and are skills that employers seek even beyond traditional STEM fields. The U.S. Department of Labor Bureau of Labor Statistics forecasts that demand for these types of jobs and skills will continue through 2026[2], so this growth trend will remain for the foreseeable future. Despite this demand, computer science and information science jobs remain some of the toughest to fill. There simply are not enough people trained with the necessary skills and not enough new graduates entering the workforce to meet the current or anticipated demand. This capital project addresses this critical need.

[1] State of Michigan Department of Technology, Management and Budget, Bureau of Labor Market Information and Strategic Initiatives, *Hot 50 Michigan's High-Demand, High-Wage Careers.*
[2] U.S. Department of Labor, Bureau of Labor Statistics Employment Projections, *Fastest Growing Occupations*.

As one of the nation's premiere institutions for producing graduates in computer science and information science, the University of Michigan is well-positioned to continue transforming the world through education and innovation and adding top talent to the workforce. Over the past decade, we have seen unprecedented enrollment growth and industry demand for our graduates in these fields, which speaks highly of our top-ranked programs and the type of talent we produce. While we would like to enroll more students in these fields, expose other students to this type of coursework, and increase our throughput of graduates to meet increasing demands, we are severely constrained in doing so by our existing facilities, specifically for our Computer Science and Engineering (CSE) Division and our School of Information (SI).

CSE and SI each occupy facilities that were designed nearly 15 years ago at a time when the demand for their graduates was increasing, but not at the high level we have seen the past few years or that is forecasted in the future. Since that time, both CSE and SI have experienced exponential growth in their programs and have exceeded capacity within their facilities. The lack of sufficient space hinders their ability to serve their existing students, increase enrollments, and produce more graduates.

Existing facilities also limit the ability for CSE and SI to recruit top faculty talent (a crucial need given the highly competitive landscape that exists both in academia and industry), and more importantly, to expand research that will drive the next generation of technological innovation. The next generation of innovation will be deeply interdisciplinary and one that blurs the lines between a wide range of disciplines from transportation and mobility, to education, to manufacturing, to healthcare, and more. For CSE and SI, partnering on interdisciplinary research and teaching is a natural fit and the opportunities to pursue this type of research are endless. However, when these two programs are physically located over two miles apart (as is the case today), the opportunities for interdisciplinary research and teaching are much harder to envision and to fulfill.

To address these challenges and facility constraints, we plan to place an addition on our existing Bob and Betty Beyster (Beyster) Building (the home of CSE) to co-locate CSE and the entire School of Information into one facility. This solution has both programmatic and financial advantages. It supports the teaching and research needs of each unit and increases opportunities for interdisciplinary collaboration and innovation between them. From a financial perspective, it enables us to address the needs of two units with one project (instead of two separate projects), leverages opportunities for the two units to share space where appropriate, and frees up existing SI space for other campus needs.

About the Computer Science and Engineering Division

Founded in 1957, CSE is one of the oldest and most respected computer science and engineering programs in the world. CSE's success is reflected in its top 10 ranking[3] as a computer science and

[3] CSE had the following U.S. News & World Report 2018 program rankings: #6 Computer Engineering (graduate), #6 Computer Engineering (undergraduate).

engineering program with world-class faculty and students who explore and expand new directions of inquiry in a variety of areas. These areas include mobile and cloud computing, ultra-low power and green computing, big data, machine learning, bio and health informatics, security and privacy, virtual environments, autonomous transportation, and more.

CSE has a rich tradition of scientific and technological leadership in the world of computing with renowned alumni ranging from Edgar Codd, who contributed to the theory and practice of database management systems, to Larry Page, the co-founder of Google. Earlier this year, two recent CSE alums, Dug Song and Jon Oberheide, made national news when their Ann Arbor-based Duo Security company (a computer security firm they co-founded in 2010) was purchased by Silicon Valley-based Cisco Systems for $2.35 billion, representing one of the largest acquisitions of a Michigan-based technology company. These individuals represent just a few of the many CSE graduates who have made or are currently making lasting and major impacts to the computing world and the world in general.

About the School of Information

SI started as a program in library and information studies in 1926 when the Department of Library Science was created within the College of Literature, Science, and the Arts and later became a fully independent school in 1969. In response to rapid changes brought on by technology, the school broadened its teaching and research significantly in the 1990s and was renamed the School of Information.

Today, SI is a top five school[4] with highly interdisciplinary programs and research that connect people, information, and technology. Its programs include user experience research and design, human-computer interaction, social media and social computing, health informatics, information visualization, data mining and analytics (big data analysis), applied data science, digital libraries and information science, digital archives and preservation, app design and development, augmented reality and virtual reality, and more. As a result, the school's faculty represent a variety of fields, from computer science to law to social networking to public health, exposing students to a breadth and depth of knowledge they can apply across industries and throughout their careers.

SI faculty and students harness, analyze, and interpret data to answer questions about the impact that technology has on social, cultural, and political life. They explore what people need to improve their lives, how information can help, and how technology can be designed to make it happen. Their research and study embraces everything from big world problems, such as understanding the benefits and risks of increased dependence on autonomous systems or detecting and preventing cyber-attacks to designing practical solutions to everyday needs, such as intuitive user interfaces or a new app. Because information is part of everything, the school's graduates go on to work in a wide range of fields, such as the information technology industry,

[4] SI had the following U.S. News & World Report 2018 graduate program rankings: #1 Archives and Preservation, #1 Information Systems, and #5 overall for Library and Information Studies.

the automotive industry, health care, education, finance, government, libraries, and entertainment, to name a few.

Current CSE and SI Facilities and Facility Constraints

Both CSE and SI have a history of successful programs and research but are severely constrained by their existing facilities. Their facilities are undersized given their current populations and prevent them from growing further.

CSE occupies 44,000 assignable square feet (asf) in the Bob and Betty Beyster (Beyster) Building, which opened in 2006 and is located on the university's North Campus. When CSE moved into the building, it had less than 600 students and 43 faculty. Today, CSE has over 2,000 students (a 230% increase) and 70 faculty (a 63% increase) occupying the same square footage that it has had for the past 12 years.

SI is in a similar situation. SI occupies 35,000 asf in the North Quadrangle Residential and Academic Complex (North Quad), which opened in 2010 and is located on the university's Central Campus. When North Quad was being designed, the university planned for SI growth, but by the time the school moved into their new space, it was already reaching full capacity. Since 2010, the school has added two new degree programs (a Master of Health Informatics and a Bachelor of Science in Information) in response to student and industry demand. Adding these two programs not only increased in the school's enrollment, but also increased its faculty hires to support the new programs. For example, student enrollment increased from 425 students in 2011-12 to 945 students in 2018-19 (a 122% increase). In this same period, SI faculty increased from 31 in 2010 to 59 today (a 90% increase). To accommodate this growth, the school has taken on three off-campus lease spaces (~12,000 rentable square feet) to temporarily address its space needs until a long-term solution is in place. The school recently received approval to add a new online degree (a Master of Applied Data Science) that will require additional faculty and staff to support as many as 750 online students when the initial admissions cycle begins in spring 2019, increasing the school's space pressures further. Overall, the school plans to grow to ~1,000 students by 2021, more than doubling its enrollment from 2011.

The biggest challenge for both CSE and SI is lack of space to support their top-ranked programs now and in the future. Both suffer from overcrowded classrooms and meeting spaces, and undersized and inadequately equipped computational labs and maker spaces. SI, in particular, experiences additional challenges because its programs and services are distributed across four locations (their home in North Quad plus three separate off-campus lease sites), which hurts the school's ability to provide a cohesive sense of community and results in operational redundancies.

The physical separation between CSE and SI also limits opportunities for them to pursue the interdisciplinary collaboration that is vital for transformative innovation in the future. With CSE on the university's North Campus and SI on Central Campus, the two units are physically over two miles apart. The physical distance makes it challenging for them to collaborate or to interact

on a daily basis or in more meaningful ways, which is a missed opportunity given their complementary missions and strategic goals.

Project Vision

This capital project enables U-M to provide appropriate space to accommodate CSE and SI's current and future needs. More importantly, it enables the university to co-locate the two programs in one facility to create a headquarters of computing and information innovation with a vision toward the future. Co-locating CSE and SI into one facility strengthens both programs by:

- *Providing appropriate physical space while leveraging economies of scale*. Both CSE and SI are constrained by their existing facilities, which were built when the two programs were half their current size. This project will provide enough space to meet the current and forecasted needs of each program, while finding opportunities for shared space and economies of scale.
- *Expanding opportunities for interdisciplinary courses and research.* This project enables the university to leverage the full spectrum of instructional and research activities offered by each individual program to deliver more interdisciplinary courses and research in the future.
- *Supporting current and future job market and industry demands*. More than 1,000 CSE and SI students graduate each year. With this capital project, we have the opportunity to educate even more students to meet the growing demand for these types of skills and expertise in the workplace. This is particularly important as industries continue to transform and integrate computing technology into their products. For example, the automotive industry incorporates more and more computer technology into their vehicles, often using millions of lines of computer code per vehicle platform. With the advent of connected and autonomous vehicles and associated technologies, this trend is accelerating rapidly, not stopping, and puts the automotive industry into direct competition with technology giants, like Google, Apple, and Amazon. This project positions U-M to grow its CSE and SI programs to better support rapidly growing demand for technology talent within the State of Michigan and around the world.

Scope of the Project

The scope of this project is to provide expansion space for CSE and accommodate the entire School of Information in one facility. To address these two combined needs, we plan to build a 163,000 gross square foot addition onto the existing Beyster Building, which currently houses CSE. A small amount of renovation will also be needed to the existing building to accommodate connections to the building addition.

The Beyster Building is 12 years old and is in excellent condition. It was originally designed and built to accommodate CSE and will continue to be used for this purpose. The Beyster addition will provide expansion space for CSE and house SI in a state-of-the-art environment that enables both units to successfully fulfill their respective instructional and research missions and support interdisciplinary collaboration. The facility will consist of instructional space, dry research labs, offices and student services/support space.

Both CSE and SI recently completed a preliminary programming study to define their respective needs in anticipation of this capital outlay project request. The study identified the following key priorities and needs for the project:

Research Space

- Create new, modern, and flexible dry research lab space to support the research needs of each unit independently and collaboratively now and in the future.

Instructional Space

- Create new, modern, and flexible classrooms that adapt to a variety of instructional pedagogies for CSE, SI, and other departments nearby.
- Provide new class laboratory and maker space to enable students to practice what they've learned in class and apply it to various projects in creative and meaningful ways.

Student Services and Support Space

- Provide student service space for program areas such as career services, advising, international programs, and student organizations.
- Provide student lounge/gathering space to foster a sense of community and collaboration.

Program Focus of Occupants

The occupants who will benefit from this project have programs focused in computer science, computer engineering, and information science. By co-locating CSE and SI in one facility, our vision is to not only enable these individual programs to excel in appropriately sized space, but to also offer curriculum and conduct research that intersects the strengths of each.

Additional Information:

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

Both CSE and SI have a significant impact on the Michigan job market and economy by contributing talent to the workforce and innovation to industry, both of which will be enhanced by this capital project.

Contributions to Job Creation and Talent Enhancement

As one of the state's largest producers of STEM talent, U-M contributes to the state's economic growth by first providing a high-quality STEM education that is continually in demand.

In 2007, the College of Engineering received 4,474 applications for admission. In 2017, that number grew to 15,780 undergraduate applications, an increase of 253%. In 2018, the number

of undergraduate applications to the College of Engineering reached 17,660, an increase of nearly 300% since 2007. During this same period, the university increased the College of Engineering's entering undergraduate class by 8% to accommodate some of the increased demand, a substantial fraction of which was driven by applicants interested in CSE.

SI programs are also in high demand. In 2013, SI received 565 applications for admission to its Master of Science in Information program. In 2018, that number grew to 1,101 applications, an increase of 95%. Also for 2018, applications from Michigan residents increased from 80 to 133 over 2017 (66% growth) and applications from under-represented minorities increased by 141% over 2017. The 2018 increase in applications yielded 38% and 93% increases in enrollment by Michigan residents and under-represented minorities compared to the previous year. For the current academic year (2018-19), SI welcomed the largest masters cohort in its history and demand for the school's Bachelor of Science in Information program continues to exceed expectations.

Based on the education that U-M CSE and SI students receive, the demand for CSE and SI talent in the workforce is high, as reflected in the following statistics from the career centers of both units. In 2017-18, there were over:

- 4,850+ jobs posted in SI and Engineering career centers, 85% sought computer science students as one of the majors they were seeking;
- 4,200+ interviews hosted on campus for students, with higher numbers expected for 2018-19;
- 980+ unique companies posted jobs in these fields;
- 620+ CSE and SI internships accepted; and
- Nearly 35% of all students providing employment information accepted jobs in the State of Michigan — we expect that number to grow as exciting new opportunities are being created.

In addition to educating U-M students, we recognize that an important part of talent enhancement within the state is generating interest in STEM education and STEM-related careers with K-12 students and communities throughout Michigan. This is something that CSE and SI faculty and staff support and pursue through various outreach programs and activities. A few examples of the types of K-12 and STEM outreach programs offered by CSE and SI include:

- *Qualcomm® Thinkabit™ Lab at the University of Michigan* is a multi-year collaboration between Qualcomm Inc. and the University of Michigan College of Engineering. It provides over 3,000 youth from Detroit-area middle schools each year with a unique, hands-on experience that raises awareness of STEM careers they may not know exist. The program inspires students year-round, hosting classes from local schools during the academic year and camp programs during the summer. Students engage in activities to discover their own talents and are introduced to concepts such as, invention, creative robotics, and data science and communication. They also learn basic programming and strengthen their problem-

solving, teamwork, and critical-thinking skills by designing and building their own robotic inventions.

- *MiBytes* is a series of CSE summer computer camps that provide students in grades 8-12 with a hands-on introduction to computer science and mobile apps. Students attending the camps learn a number of topics, all of which are foundational to many areas of computer science, and are guided through mobile app development, robotics, and embedded systems.
- *Girls Encoded* is a program to develop the pipeline of women in computer science. It includes workshops to encourage high school girls to pursue this field of study.
- *Making in Michigan Libraries* is an SI program that works with librarians, educators, and community members to explore the maker movement in rural and underserved libraries, providing destinations for community members to create, learn, and engage through maker-focused programs. Participants in these maker programs engage in learning a number of scientific and engineering practices including how to ask questions, develop and use models, and evaluate information. These types of programs encourage creativity, entrepreneurial thinking and exploration of how technology can bring together people of all ages and with diverse experiences. The Making in Michigan Libraries program has broad reach across the state, with programs located from southwest Lower Michigan and into the Upper Peninsula.
- *Brave Initiatives* is a non-profit organization that helps high school girls learn front-end design and coding skills, as well as public speaking, project management, time management, ideation, and idea execution. An SI professor, who is a core member of Brave Initiatives, recently spearheaded a local chapter for Detroit's high school girls, where the program's goal is to equip girls with the skills and confidence to code and to provide them with role models in the field of computer science.

Contributions to Economic Growth

As two top-ranked, highly reputable programs, both CSE and SI contribute to the economy in a number of ways.

- *Attracting students, faculty, and staff to the region.* CSE and SI attract students, faculty, and staff from within the state and across the globe who make their residence in southeastern Michigan and contribute to all sectors of the local and state economy.
- *Generating research expenditures.* In fiscal year 2018, CSE and SI accounted for more than $33.2 million in research expenditures. Since 2010, research expenditures for the two units exceeded $230 million[5]. This funding was spent on employees, goods, services, and other expenses that support research activities and directly or indirectly benefitted the local, regional, and state economies.

[5] Since 2010, SI research expenditures were $35.2M and CSE expenditures were $194.8M.

- *Innovating, inventing, and starting new companies.* The university has averaged approximately 400 invention disclosures and 12 start-up companies per year, with CSE and SI accounting for a substantial portion of the overall activity. Since 2000, these efforts have led to the creation of more than 2,000 jobs.
- *Cultivating the future workforce in high-demand fields.* Since 2010, more than 5,200 students graduated from CSE and SI and entered the workforce, commanding starting salaries that range from ~$70k (for an SI bachelor's degree) to in excess of $100k (for CSE master's and Ph.D. degrees). Graduates who remain in the state contribute their intellectual capital to the businesses in which they work and contribute financially to their local communities by renting or owning homes, shopping in stores, and going to restaurants, all of which benefits both the local and state economy. These degrees directly align with the over 270,000[6] information technology/computer science high-demand career openings projected through 2024, which equates to over $20 billion in potential earnings.
- *Attracting and retaining industry interest.* Universities with top computer science-related programs tend to be magnets for attracting and/or retaining technology focused companies to the region. Examples of this type of attraction include Carnegie Mellon University (Uber, Yahoo!, Intel), Massachusetts Institute of Technology (MIT) (Bose, Hewlett Packard, iRobot), and University of Washington (Amazon, Microsoft). Locally, companies like Barracuda Networks, Notion, Duo Security (Cisco), and Arbor Networks all have operations in Ann Arbor to be close to U-M, the University Research Corridor, and to benefit from being based in a technology- and innovation-focused area. Most recently, KLA-Tencor Corp., a Silicon Valley-based provider of process control and yield management solutions for the semiconductor and nanoelectronics industries, announced plans for new a research and development facility in Ann Arbor. The facility is expected to result in a $70 million capital investment and create up to 500 high-tech jobs in the region. KLA-Tencor's decision to invest in this Ann Arbor facility was driven in large part by the local talent pool and opportunities to strengthen its research partnership with U-M, which directly aligns with CSE and SI's core missions.

The combination of all these contributions has, and will continue to have, a profound impact on the state's economic growth and competitiveness.

This project presents an exceptional opportunity for the university and the state to co-locate and expand capacity for these two high-demand programs that are foundational to nearly all sectors of the economy and to invest in fields that show no signs of slowing down. It provides critical state-of-the-art teaching, learning, and research space that will enable CSE and SI to continue attracting top students and researchers to the institution and to the state. It also provides researchers with a modern, collaborative research environment that enables them to expand their research portfolios and engage in new and innovative interdisciplinary research that can lead to more technology transfers and spin-off companies to enhance the state's economy in the future.

[6] Based on Workforce Intelligence Network and LMI Data utilized in the Marshall Plan for Talent.

How does the project enhance the core academic, development of critical skill degrees, and/or research mission of the institution?

This project will have a significant impact on the academic and research missions of CSE, SI, and the institution by enabling CSE and SI to:

- Continue traditions of excellence and leadership as top-ranked programs by providing state-of-the-art teaching, learning, and research environments needed to recruit and retain top students and faculty;
- Better compete for research funding and expand their research portfolios to include more innovative interdisciplinary activities;
- Create a hub of computing and information science activity that attracts and engages others through planned and serendipitous interactions; and
- Develop and offer more classes that benefit both CSE and SI and give students and faculty from both programs more opportunities to engage and to learn from each other.

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

Yes. The project will place an addition on an existing, stand-alone facility.

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

The university is leveraging an existing 12-year-old building (the Beyster Building), which is in excellent condition, and will add to it rather than construct an entirely new facility for CSE and SI, which would be much more costly. Other than minor renovation to accommodate connectivity/circulation to the new building addition, the current facility will not require major repurposing. Additionally, while not directly part of this project scope, the space vacated by SI on Central Campus will be repurposed to address other university space needs.

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

There are no current health/safety deficiencies within the existing building.

How does the institution measure utilization of its existing facilities, and how does it compare relative to established benchmarks for educational 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?

We recognize that physical space is a valuable resource needed to fulfill our core mission and take space utilization seriously. In 2007, we implemented a formal campus-wide Space Utilization

Initiative that implemented policies, processes, and reporting tools to support a culture of agile space management, more efficient utilization, and coordinated planning. We take a holistic approach to ensuring good stewardship of campus space and have been a leader in helping other institutions implement similar approaches on their campuses for years. The key elements of our space utilization model include:

- *Space utilization data, policies, and processes* – Our campus-wide policies, processes, and reporting tools (in place for nearly 10 years and available at provost.umich.edu/space) address all types of space, including instructional, research, office, and food operations, and reinforce a culture where space is considered more of an institutional resource that is to be shared and managed effectively for the good of the institution. Examples of tools we use to monitor and encourage effective utilization of classrooms include:
    - *Classroom time utilization report* – measures the # of hours a classroom is scheduled / # of hours a classroom is available (Mon. – Fri., 8:00 a.m. - 5:00 p.m.)
    - *Classroom seat utilization report* – measures # of enrolled students in a class / # of seats available in the classroom
    - *Scheduling distribution report* – measures how well schools and colleges are distributing their classes and events throughout the day (8:00 a.m. - 5:00 p.m.) and throughout the week (Mon. – Fri.)

- *Budget and space charging model* – The university's activity-based budget model (in place for over 20 years) includes assigning space operating costs (utilities and plant operating costs) directly to schools, colleges, and other units with revenue streams for the space they occupy. This internal space-charging model is somewhat unique in the world of higher education and offers financial incentives for units to use their existing space more effectively and efficiently. For example, units that need more space must demonstrate that they can afford to fund the additional space operating costs associated with the increase in square footage before exploring the possibility of increasing their physical footprints. Conversely, units that reduce their physical square footage also reduce their space operating costs, which enables them to apply the savings to higher priority and mission-focused needs. This space-charging model forces units to think carefully about the financial impact of space and consider if they can better utilize their existing space to avoid incurring these costs associated with additional space.

- *Capital projects process* – General Fund units with major capital project needs (for new buildings, additions, or renovations) have the opportunity to submit their needs for consideration annually. A cross-functional committee comprising executive leaders and deans reviews unit needs submitted (business cases) and tours unit spaces in person to better understand the needs of each individual unit and how they compare relative to each other and against existing needs. The tours are particularly helpful in enabling committee members to visually determine how well a unit is utilizing their existing space.

We applied all of these items in assessing the CSE and SI need that we are submitting for state capital outlay consideration. Both the Bob and Betty Beyster Building (home to CSE) and the North Quadrangle (North Quad) Residential and Academic Complex (home to SI) have exceeded their respective capacities due to the tremendous growth they've experienced since moving into their buildings. SI is currently in a building that was originally designed for approximately 400 students. Today, SI has over 800 students. For Fall 2017, SI classrooms had utilization rates from 67.1 to 79.9%[7], which are considered high in terms of classroom utilization. Similarly, CSE occupies a building originally designed for 600 students but today has an enrollment of over 2,000 students. Classroom utilization for CSE's classrooms ranged from 67 to 81.8%. Both CSE and SI have pursued creative solutions and made tough choices to adapt to the physical constraints they are experiencing. For example, in addition to SI leasing space off campus, CSE repurposed a mailroom into faculty offices, purchased smaller desks to accommodate more students, and converted lunchrooms into graduate and undergraduate offices. CSE also shifted some instructional activities from North Campus to Central Campus to accommodate its capacity and space needs. The growth of both units and high utilization of their existing facilities supports the need for this project.

In terms of benchmarking, U-M participates in the National Science Foundation (NSF) Survey of Science and Engineering Research Facilities every two years. The survey is congressionally mandated and collects data on the amount, construction, repair, renovation, and funding of research facilities at U.S. institutions with more than $1 million in research expenditures. We also share space data and policy information as a method of informal benchmarking with institutional colleagues in the Big 10 as needed.

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

The university is fully committed to sustainability in teaching, research, and student life, and has a long history of environmental stewardship in its approach to facility design and construction. The university requires all projects meet or exceed American Association of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Energy Code 90.1-2013. The university also requires the incorporation of numerous mandatory energy efficiency measures on projects, comprehensive evaluation of additional energy efficiency measures, and comprehensive modeling of energy usage for proposed projects and development of energy impact statements at each phase of design.

[7] Classroom utilization in the range of ~65-70% is considered the industry norm. It acknowledges that a perfect match between available classroom seating capacities and course enrollments is not always possible in every time period. It also acknowledges that classroom seating capacity, course enrollment, room configuration, instructional technology, and other room features impact demand and availability. Utilization in this range also enables rooms to be taken off line for maintenance, construction, equipment replacement, and other ad hoc needs, without negatively impacting campus scheduling needs.

All projects (new construction, addition and renovation) with a construction budget of $5M or greater are also subject to an environmental review process to help guide the design from a sustainable practices standpoint. At the conclusion of schematic design, the architect is required to develop a preliminary Leadership in Energy and Environmental Design (LEED) score for the project, using accredited personnel, as a measure of the project's overall sustainability. The combined CSE and SI project would adhere to these requirements and continue the institution's firm commitment to sustainability.

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.

The university has identified matching funds from an internal capital renewal fund that was established in fiscal year 2011 to address the growing need for major renovations in aging General Fund buildings. Additional funding will be provided by SI and College of Engineering fundraising and reserves to support this project.

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?

Although the current state authorization anticipates a maximum state contribution of 75% toward the total cost of a project, we are very open to funding more than 25%, if required, as we did with our most recent state capital project authorization from fiscal year 2017-18 (HB-4323).

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.

We estimate that the project will increase our annual operating costs by an average of $2.4 million per year or approximately $12 million over a five-year period. Funds have been identified to support these additional costs.

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

The project will have no impact on future tuition costs.

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

Addressing the needs of CSE and SI remains a priority to the university. If the project is not authorized, the institution will either scale back the project or delay the project until all funding is available.

Scaling back the project means that some programmatic needs and square footage will be removed from the project scope, which will limit CSE and SI's ability to provide the highest quality experience for their students, faculty and staff.

Delaying the project means that both CSE and SI will continue to be:

- Significantly pressed for space and continue to operate in cramped, less than ideal facilities;
- Unable to address emerging needs for collaborative, research, and student project space;
- Unable to increase their enrollments beyond the current state, which, in turn, will constrain the number of students that enter the workforce in the future;
- Challenged to increase interdisciplinary collaboration due to the two-mile distance that physically separates them;
- At risk of losing students and faculty to other institutions that are not space-constrained and have modern, collaborative space to support teaching, learning, and research needs; and
- At risk of missing research opportunities and associated funding from external agencies due to the lack of sufficient or appropriate lab space.

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

The alternatives to this project are to build a new standalone facility (either as a joint project or as two separate standalone buildings) or to place major additions onto CSE and SI's existing facilities to address their pressing space needs. All of these options would be costlier to do than the scope of this project, which leverages an existing building and economies of scale.

Both CSE and SI could also assume off-campus leased space to address their pressing space needs, but investing in privately-owned commercial property for a long-term solution away from campus versus investing in a university-owned facility is less than ideal and does not demonstrate good stewardship of university resources.