

**Central Michigan University
Fiscal Year 2021 Capital Project Request
Recommended Five-Year Master Plan Components**

I. University Vision Statement

Central Michigan University, an inclusive community of scholars, is a national leader in higher education, inspiring excellence and innovation.

– Adopted by the CMU Board of Trustees, December 6, 2012

Mission Statement

At Central Michigan University, we are a community committed to the pursuit of knowledge, wisdom, discovery and creativity. We provide student-centered education and foster personal and intellectual growth to prepare students for productive careers, meaningful lives and responsible citizenship in a global society.

– Adopted by the CMU Board of Trustees, December 2, 2010

Core Values

To achieve our mission, we adhere to the core values of integrity, respect, compassion, inclusiveness, social responsibility, excellence and innovation.

– Adopted by the CMU Board of Trustees, December 2, 2010

II. Instructional Programming

A. Existing Academic Programs and Projected Changes:

Central Michigan University (CMU) has grown from a teachers' college founded in 1892 to being among just six percent of U.S. universities in Carnegie's Doctoral Universities: High/Very High Research Activity category. CMU is the 137th largest four-year public institution in America and offers more than 200 academic programs at the undergraduate, masters, specialist and doctoral levels. Its nationally acclaimed degrees include programs ranging from the health professions and biosciences to business and communications.

The proposed capital project would further the university's mission of being committed to the pursuit of knowledge, wisdom, discovery and creativity. The project would assist students in fostering personal and intellectual growth through their studies in the sciences. The renovation of Brooks Hall would benefit all students in the College of Science and Engineering, as well as students in every major across the university as they fulfill their general education program. Specific programs that would benefit from the renovation include:

- Astronomy
- Biology
- Environmental Engineering

- Environmental Sciences
- Fermentation Science
- Geology
- Meteorology
- Neuroscience

More than 925 CMU students are majoring in programs such as those cited above. Also, 38 percent of new, incoming students admitted to CMU as part of the fall 2019 freshman class indicated an interest in science.

CMU is actively exploring the development of many new programs — whether in preliminary discussion or in some stage of approval and implementation — including:

- Data Science
- Environmental Engineering
- Health Information Management
- Technology Management
- Ph.D. in Physics

These programs would be a mixture of on-campus and online programs and in some cases, have the potential for implementation in collaboration with other colleges and universities.

CMU's current degree listing is:

Bachelor of Arts
 Bachelor of Applied Arts
 Bachelor of Science in Electrical Engineering
 Bachelor of Science in Engineering Technology
 Bachelor of Fine Arts
 Bachelor of Individualized Studies
 Bachelor of Science in Mechanical Engineering
 Bachelor of Music
 Bachelor of Music Education
 Bachelor of Science
 Bachelor of Science in Athletic Training
 Bachelor of Science in Business Administration
 Bachelor of Science in Computer Engineering
 Bachelor of Science in Education
 Bachelor of Science in Nursing
 Bachelor of Social Work
 Master of Arts
 Master of Business Administration
 Master of Entrepreneurial Ventures
 Master of Health Administration
 Master of Music

Master of Public Administration
Master of Public Health
Master of Science
Master of Science in Administration
Specialist in Education
Specialist in Psychological Services
Doctor of Audiology
Doctor of Education
Doctor of Educational Technology
Doctor of Health Administration
Doctor of Medicine
Doctor of Philosophy
Doctor of Physical Therapy

The university's academic planning process involves an analysis of the needs of students and the demands of public- and private-sector employment markets. Thus, the potential for new and/or revised academic programs reflects a continuous feedback cycle in the university's planning system.

B. Institutional Characteristics:

- CMU is among just six percent of U.S. universities in Carnegie's Doctoral Universities: High/Very High Research Activity category. Our degree programs serve more than 21,700 on-campus, online and satellite location students throughout the year. In 2016, the Higher Learning Commission reaffirmed our accreditation until 2025, giving CMU the highest-possible marks in every evaluation area.
- CMU was founded to address Michigan's shortage of teachers. Our College of Medicine was created to address a shortage of physicians in rural and medically underserved communities. We have the longest-standing audiology program in the country and Michigan's first entrepreneurship and leadership minors.
- CMU offers more leadership programming than any other institution, teaching students about responsibilities to each other, their communities and their employers. We fuel leadership skills such as communication, collaboration and critical/innovative thinking, through programs such as Leadership Safari, which immerses about 2,000 incoming students in a five-day leadership experience before classes start.
- More than 155 U.S. flag officers hold CMU degrees, and the university has been named a Gold-Level Veteran-Friendly School with the Michigan Veterans Affairs Agency for three consecutive years.
- Employers post more than 42,000 jobs a year through the university's Career Development Center.

- Students can choose from nearly 400 student organizations, including at least one tied to every academic major.
- Over 750 CMU student volunteers go on the nation's third most Alternative Break trips each year during the holidays and spring/summer breaks. CMU students rank No. 1 among all Michigan public universities for their participation, providing more than 39,000 hours of service to communities around the world.
- CMU enrolls students from every county in Michigan. Nearly 90 percent of on-campus students are from the state.
- CMU's Global Campus offers online programs to students around the world as well as degree programs at more than 30 locations in the United States and Canada. More than 15 are on military bases, continuing CMU's long-standing commitment to those who serve our country.
- U.S. News and World Reports ranks CMU 24th in the nation for best online graduate education programs for veterans. Our online MBA ranks 39th for veterans; CMU is the only ranked institution in Michigan.
- Highlights of CMU's science and engineering programs include:
 - CMU is in the process of developing an environmental engineering program. Demand for entry-level environmental engineers has grown in recent years by 51 percent in Michigan and 26 percent in the Great Lakes region, with more job openings than graduates.
 - CMU recently launched an online Bachelor of Science in Nursing degree completion program and an online Bachelor of Science in Business Administration degree. Both address employer and student needs across the state and beyond.
 - In the past five years, CMU has added programs such as a Master in Applied Statistics and Analytics, as well as doctorate degrees in earth and ecosystem science and cellular-molecular biology/biochemistry/biomedical, which is a collaboration among biology, chemistry and College of Medicine faculty.
 - Among CMU chemistry, biochemistry, physics and astronomy students, 100 percent engage in research projects. Also, 100 percent of engineering and engineering technology students do senior design projects.

- CMU's microscopy program joins three other universities to receive a combined \$7.5 million from the National Science Foundation to modify corn genes and overcome drought and other environmental stressors.
- Two CMU physics faculty, Koblar Alan Jackson and Juan Peralta, are leading a five-university partnership that received \$4.8 million from the U.S. Department of Energy to develop a new computational approach to modeling the properties of molecules and solids. Students working on the project combine physics with ideas from computer science, chemistry and materials science to spur progress in applications such as artificial photosynthesis and quantum computing.
- Three faculty in CMU's College of Science and Engineering, Xantha Karp, Matthew Redshaw and Ben Swarts, have received prestigious, national early career rewards. They are researching the mysteries of organism development, what makes bacteria so resilient, and the development of a mass spectrometer that could perform some of the world's most precise atomic mass measurements.
- CMU leads the way in research to sustain and manage the world's largest supply of fresh water, with \$20 million from the U.S. Environmental Protection Agency to monitor and assess Great Lakes coastal wetlands. CMU's Institute for Great Lakes Research is led by biology professor Don Uzarski.
- In 2019, CMU's earth and atmospheric sciences department debuted the only mobile weather research vehicle among Michigan universities.
- Faculty member Jennifer Schisa received her fourth National Institutes of Health grant, \$425,000 for three years, to pursue her research into how women's unfertilized eggs maintain their integrity for up to 40 years and under stress.
- Chemistry and biochemistry faculty member Linlin Zhao is using a five-year, \$1.5 million National Institute of General Medical Sciences grant to target diseases such as Parkinson's and cancer by focusing on the fuel of a human cell, its mitochondria.
- Nearly 600 CMU students major in biological and biomedical sciences; another 300 major in conservation and natural resources/chemistry/earth and atmospheric sciences.

- Highlights of CMU's health care programs include:
 - CMU's new \$26 million, 50,000-square-foot Center for Integrated Health Studies will empower students from multiple high-demand fields of study to learn and practice together, a best practice in health care education. It opens for classes in January 2020.
 - CMU's College of Medicine received full accreditation in 2018 from the Liaison Committee on Medical Education, completing the charge by the Board of Trustees in 2009 to address a shortage of physicians across Michigan and beyond.
 - The Carls Center for Clinical Care and Education provides state-of-the-art hearing and balance diagnostics, hearing aid sales and service, cochlear implants, speech and language therapy, and world-renowned summer speech clinics to more than 8,000 patients each year. The center has received a grant for pediatric cochlear implants and this summer activated the implants of three young sisters on the same day.
 - The privately funded Mobile Health Central motor coach takes medical services on the road to residents and families who lack access to medical services.
 - Through a 25-year affiliation agreement between the College of Medicine and Covenant HealthCare in Saginaw, Michigan, CMU medical students complete clinical rotations at Covenant facilities under the supervision of physicians who serve as CMU faculty members.
 - CMU's Interdisciplinary Center for Community Health and Wellness is helping to address regional health epidemics such as opioid use, engaging students and faculty from five CMU colleges to develop comprehensive solutions to large issues.
 - In the College of Medicine's third graduating class, an impressively high 71% of graduates received residency placements in primary care, and 45% placed in Michigan, aligned with the college's mission to meet needs in rural and medically underserved areas of the state.

C. Other Initiatives and Their Impact on Facilities Usage: CMU completed the following campus construction projects over the past four years. The projects enhanced instructional, research and student collaboration space across campus.

CMU's Biosciences Building added essential wet lab research and classroom space in the biosciences area. The four-story, 169,000 square foot building includes active-learning classrooms, a vivarium to replicate aquatic conditions for research, a molecular biology core, an isotope laboratory, an imaging center for scanning and transmission electron microscopes, an herbarium and a staging and processing storage area for ecological fieldwork. The project was completed in September 2016 and classes started in January 2017.

Grawn Hall's recent renovation brought CMU's longest-serving building into the future. Grawn Hall was built 102 years ago. The recent \$10.8 million renovation updated 16,200 square feet of the building and added 6,600 square feet. A large portion of the new space is intended for student collaboration with mediated study rooms and Skype-ready "huddle" spaces. In addition, classrooms were modernized and the new atrium provides flexible space for events as well. More than 4,000 students learn and build their futures in Grawn Hall each day.

CMU also continues to repurpose facilities as new academic programs and initiatives are implemented. For example, CMU has installed state-of-the-art active learning classrooms in Pearce Hall and the Dow Sciences Building and a Bloomberg financial trading floor in Grawn Hall. It also completed a \$14 million renovation and upgrading of its busiest academic space, Anspach Hall, which serves more than 5,000 students a day.

D. Economic Development Impact: CMU and its programs have a direct impact on economic development in the State of Michigan.

Historical data shows about 70 percent of CMU graduates choose to live and work in Michigan. More than 145,000 CMU alums currently reside in Michigan and contribute to the state's economy.

A study released in September 2017 by Anderson Economic Group determined the total economic impact of CMU, its affiliates and its students and alumni exceeds \$1.2 billion in Michigan.

The University's business programs (e.g. in entrepreneurship) are one example of those that have direct impact on economic development. While at CMU, students can take part in a New Venture Competition where they develop an entrepreneurial mindset, learn business start-up techniques and develop business ideas. Workshops assist students along the way and as they prepare proposals to be judged on innovation and viability. Winners in six different categories last year were awarded more than \$75,000, with the best overall proposal receiving \$25,000. Fifteen Michigan businesses are in operation today thanks to this competition.

In the sciences, as another example, undergraduate science majors often pursue high-wage medical and health professions. Scientific research also affects the economy

through innovation, preservation of the Great Lakes and improved medical treatments.

CMU is a leader in assisting entrepreneurs bring their ideas to fruition. The Michigan Economic Development Corporation (MEDC) has designated a Michigan SmartZone near our campus, where the City of Mount Pleasant and CMU have developed a 300-acre technology park that includes an incubator and business accelerator called the CMU Research Corporation (CMURC). It houses 9,300 square feet of wet laboratories and 7,900 square feet of offices, and it leverages CMU’s diverse capabilities to assist start-up businesses.

Among the state’s MEDC-funded business incubators, CMURC ranks first in terms of jobs created and companies formed. In the past three years, CMURC opened centers in Bay City and Saginaw, to assist with business start-ups throughout the Great Lakes Bay region.

CMURC offers hands-on expertise and CoWork opportunities. Its services include a competitive, three-phased scholarship program for early stage entrepreneurs; industry, market and feasibility analyses; product, manufacturing and supply chain development; business strategy and implementation; marketing services; and investor relations and partnerships. More than 30 companies are active between feasibility and launch in this Right Choice Program.

III. Staffing and Enrollment

A. Full- and Part-Time Student Enrollment (Fall 2018):

CMU is the 137th largest 4-year public university in America. It is the fifth-largest in Michigan.

Classification of Instructional Program (CIP)	Mount Pleasant Campus		Off Campus (MI)	
	Full time	Part time	Full time	Part time
Agriculture, Agriculture Operations & Related Sciences	0	0	0	0
Area, Ethnic & Cultural & Gender Studies	133	11	0	1
Biological & Biomedical Sciences	690	129	0	4
Business Management, Marketing & Related Support Services	2,563	252	304	1,752
Communication, Journalism & Related Programs	868	85	5	15
Computer & Information Sciences & Support Services	310	47	9	97
Education	1,131	148	31	559
Engineering	376	33	0	0
Engineering Technologies/Technicians	208	23	8	117

English Language & Literature/Letters	160	32	0	4
Family & Consumer Sciences/Human Sciences	242	36	28	190
Foreign Languages & Literatures & Linguistics	51	1	0	0
History	66	26	0	0
Legal Professions & Studies	50	2	1	0
Liberal Arts & Sciences, General Studies & Humanities	4	4	1	0
Mathematics & Statistics	67	29	0	0
Multi/Interdisciplinary Studies	7	4	0	0
Natural Resources & Conservation	130	29	0	0
Health Professions & Related Programs	1,552	81	50	350
Parks, Recreation, Leisure & Fitness Studies	870	101	4	31
Philosophy & Religious Studies	39	4	1	2
Physical Sciences	110	55	1	1
Psychology	513	83	102	215
Public Administration & Social Service Professions	233	36	80	366
Social Sciences	500	55	23	47
Visual & Performing Arts	383	46	1	5
Undecided / Unsigned	3,959	202	79	144
Total	15,215	1,554	730	3,900

B. Future Enrollment:

If one considers ONLY the size of Michigan's high school graduating class, CMU's overall enrollment would gradually decrease through the next five years:

<u>Year</u>	<u>Enrollment</u>
2019	19,876
2020	19,124
2021	18,561
2022	18,303
2023	18,528

That said, CMU has completed a thorough enrollment management planning process and is implementing a number of strategies to recruit and retain students.

CMU is committed to maintaining a high caliber of students who have demonstrated an ability to be successful in college. CMU's mean SAT is 1,103, which represents the 58th percentile of SAT scores. Similarly, CMU's mean ACT score is 23.2, which represents the 69th percentile of ACT scores. CMU's mean high school GPA is 3.41.

Further, CMU has implemented several measures during the past five years to support students and increase CMU’s four-year graduation rate. These efforts include an Office of Student Success, additional academic advisors, additional counselors, and an online advising tool that allows faculty and students to see how well they are progressing toward graduation.

CMU’s latest, six-year graduation rate, for the fall 2012 cohort, was 62 percent. Based on its then-R3 Carnegie classification, CMU outperformed the national peer average of 51 percent.

CMU was a national pioneer in distance learning, offering its first off-campus programs in 1971. At first, most of its programs were at the graduate level. Today, CMU’s Global Campus serves 5,254 undergraduate students, compared to 2,265 a decade ago. Many of these students take classes online, as today’s CMU Global Campus also is a recognized leader in classes available anytime, anywhere — delivering the flexibility students need.

C. Enrollment History: (Michigan Students Only)

CMU’s total enrollment has slowly declined over the past decade, following state and national trends resulting from the 2008 recession and generational change in family size. As the data below show for Michigan-based enrollment, the range between CMU’s highest and lowest enrollments is 3,671 students - about 14 percent. Nearly 90 percent of CMU’s on campus students today are from the state of Michigan.

Fiscal Year	FYES*	Fall Headcount		
		Mount Pleasant	Off Campus-MI	Unduplicated Total
2001-02	20,961	19,188	5,466	24,492
2002-03	21,307	19,380	5,384	24,594
2003-04	21,447	19,402	5,195	24,496
2004-05	21,431	19,792	4,929	24,550
2005-06	21,579	19,917	4,787	24,562
2006-07	21,356	20,025	4,177	24,033
2007-08	21,142	19,867	4,511	24,083
2008-09	21,529	20,246	4,507	24,348
2009-10	21,888	20,444	4,875	24,799
2010-11	22,522	21,290	5,169	25,583
2011-12	22,510	21,220	5,842	25,473
2012-13	21,694	20,504	6,196	24,744
2013-14	20,891	19,634	6,618	23,875
2014-15	21,278	19,858	6,831	24,184
2015-16	20,804	19,549	6,798	23,565
2016-17	20,203	19,068	6,839	22,843
2017-18	19,673	18,155	7,398	21,912

* Based on 30 SCH for undergraduates

D. Staff/Student Ratios:

Classification of Instructional Program (CIP)	Student/Instr. Staff Ratio	Student/Admin. Staff Ratio
Area, Ethic & Cultural & Gender Studies	13.8	504.4
Biological & Biomedical Sciences	14.0	21.1
Business Management, Marketing & Related Support Services	22.3	92.5
Communication, Journalism & Related Programs	16.9	88.7
Computer & Information Sciences & Support Services	10.3	109.2
Education	14.4	57.5
Engineering	11.0	67.0
Engineering Technologies & Engineering- Related Fields	15.2	93.3
English Language & Literature/Letters	13.2	92.3
Family & Consumer Sciences/Human Sciences	20.7	53.0
Foreign Languages, Literatures, & Linguistics	14.7	189.9
Health Professions & Related Programs	14.2	37.5
History	13.7	149.7
Legal Professions & Studies	18.4	N/A
Liberal Arts & Sciences, General Studies & Humanities	5.9	19.9
Mathematics & Statistics	16.5	124.6
Medicine (MD)	22.6	N/A
Multi/Interdisciplinary Studies	25.7	26.9
Natural Resources & Conservation	9.7	12.7
Parks, Recreation, Leisure & Fitness Studies	18.2	108.3
Philosophy & Religious Studies	24.2	171.4
Physical Sciences	13.4	39.7
Psychology	18.2	28.8
Public Administration & Social Service Professions	19.7	N/A
Public Health	10.0	N/A
Reserve Officer Training Corps	N/A	14.6
Social Sciences	20.1	77.5
Visual & Performing Arts	10.2	55.7
Total	16.7	65.3

E. Future Staffing Needs:

Year	Fall Enrollment Changes	Additional Staffing
2019	-646	0
2020	-727	0
2021	-331	0
2022	-153	0
2023	225	0

This chart reflects staffing needs with current academic programs and projected enrollments based on Michigan high school graduating class sizes only. As noted earlier, the entire CMU campus is engaged in recruitment and retention efforts that are showing success. That said, the millennial generation was very large and brought a high volume of students into higher education. As each generation transitions into higher education, they have different needs than the previous generation. CMU invests significant funding into student support services through our counseling center, writing center, math center, career services, advising and student success centers.

Average Class Size:

At CMU, class sizes remain small, giving students optimal opportunity to interact directly with their professors. Ninety-five percent of CMU classes are taught by professional faculty rather than teaching assistants or graduate students. Students at CMU are more than a number; they're known by name.

According to the 2019 National Survey of Student Engagement (NSSE), 63 percent of CMU seniors say they have worked with faculty members on activities other than coursework. This would include research, creative endeavors, career-related experiences and volunteer efforts. CMU's survey results exceed the 58 percent of seniors at universities within our Carnegie class and 57 percent of all NSSE 2018 and 2019 respondents.

In many cases, even undergraduate students are able to do research in concert with their instructors. At larger universities, this hands-on experience often is reserved for graduate-level students.

Course Level	2018-2019 Average Class Size			2019-20 Projected
	On Campus Avg. # of Students	Off Campus-MI Avg. # of Students	Overall Avg. # of Students	
<100	16	0	16	16
100-299	27	24	27	27
300-499	24	26	24	24
500-599	19	12	16	16
600 +	16	17	17	16

IV. Facility Assessment

A. A comprehensive Campus Master Plan, which addresses facilities condition, space utilization, utility infrastructure, land use, telecommunications infrastructure and capital planning, was completed July 2013. The comprehensive plan for the physical campus reflects and upholds the vision, imperatives and strategies established for CMU in its strategic plan. Included in the Master Plan was a 2013 Capital Plan which outlined 22 projects; by 2017 CMU had successfully completed 11 of the projects. The University’s Capital Plan was subsequently updated in 2017 to reflect the master plan at work and identified additional priorities for the next 5 to 10 years. The updated 2017 Capital Plan includes 19 projects, with four of the listed projects underway.

B. Building and/or Classroom Utilization Rates:

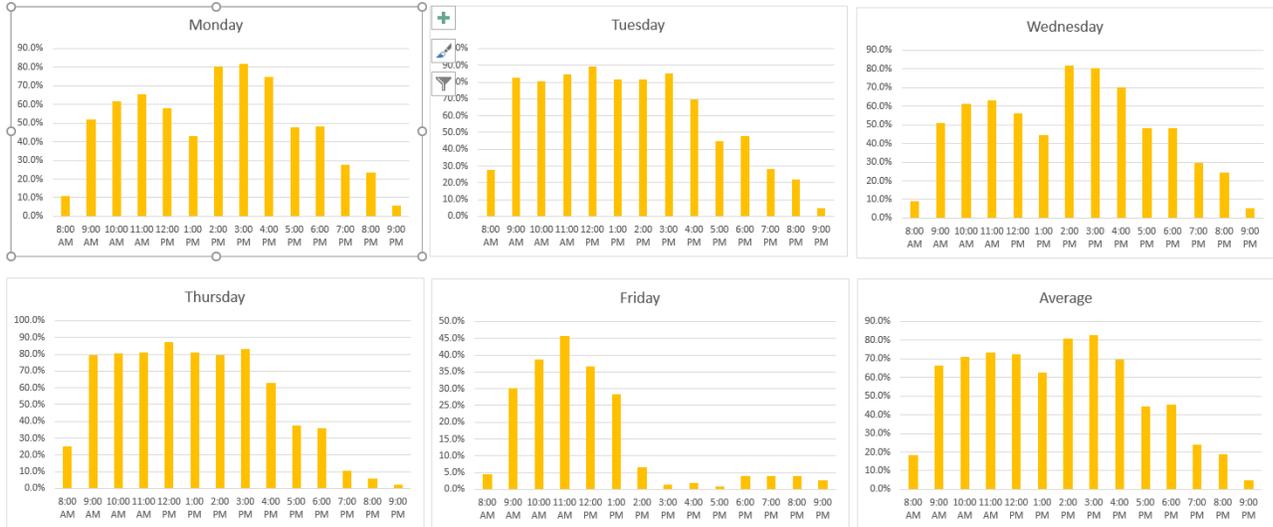
A comprehensive utilization and space needs analysis was completed by Paulien and Associates as part of the master planning process. This study was completed in accordance with the Postsecondary Education Facilities Inventory and Classification Manual.

- Classroom Utilization: CMU’s 180 classrooms are utilized an average of 34 hours per week, with an average student station occupancy of 63 percent. The average space per student station is 21 ASF.
- Teaching Laboratory Utilization: CMU’s 102 teaching laboratories are utilized an average of 24 hours per week, with average student station occupancy of 77 percent. The average space per student is 54 ASF.
- Classroom utilization rates were studied for peak (M-F, 10-3) and off peak (M-F, 8-10 a.m., and 3-9 p.m.) time frames as shown in the following charts:

Classroom Utilization - Fall 2018

Time of Day	Monday		Tuesday		Wednesday		Thursday		Friday		Average M-Th	
	Rooms in Use	% in Use										
8:00 AM	17	10.9%	43	27.6%	14	9.0%	39	25.0%	7	4.5%	28	18.1%
9:00 AM	81	51.9%	129	82.7%	79	50.6%	124	79.5%	47	30.1%	103	66.2%
10:00 AM	96	61.5%	126	80.8%	95	60.9%	125	80.1%	60	38.5%	111	70.8%
11:00 AM	102	65.4%	132	84.6%	98	62.8%	126	80.8%	71	45.5%	115	73.4%
12:00 PM	90	57.7%	139	89.1%	87	55.8%	136	87.2%	57	36.5%	113	72.4%
1:00 PM	67	42.9%	127	81.4%	69	44.2%	126	80.8%	44	28.2%	97	62.3%
2:00 PM	125	80.1%	127	81.4%	127	81.4%	124	79.5%	10	6.4%	126	80.6%
3:00 PM	127	81.4%	133	85.3%	125	80.1%	129	82.7%	2	1.3%	129	82.4%
4:00 PM	116	74.4%	109	69.9%	109	69.9%	98	62.8%	3	1.9%	108	69.2%
5:00 PM	74	47.4%	70	44.9%	75	48.1%	58	37.2%	1	0.6%	69	44.4%
6:00 PM	75	48.1%	75	48.1%	75	48.1%	56	35.9%	6	3.8%	70	45.0%
7:00 PM	43	27.6%	44	28.2%	46	29.5%	16	10.3%	6	3.8%	37	23.9%
8:00 PM	36	23.1%	34	21.8%	38	24.4%	9	5.8%	6	3.8%	29	18.8%
9:00 PM	9	5.8%	8	5.1%	8	5.1%	3	1.9%	4	2.6%	7	4.5%

Based on 156 on campus classrooms with at least one course scheduled

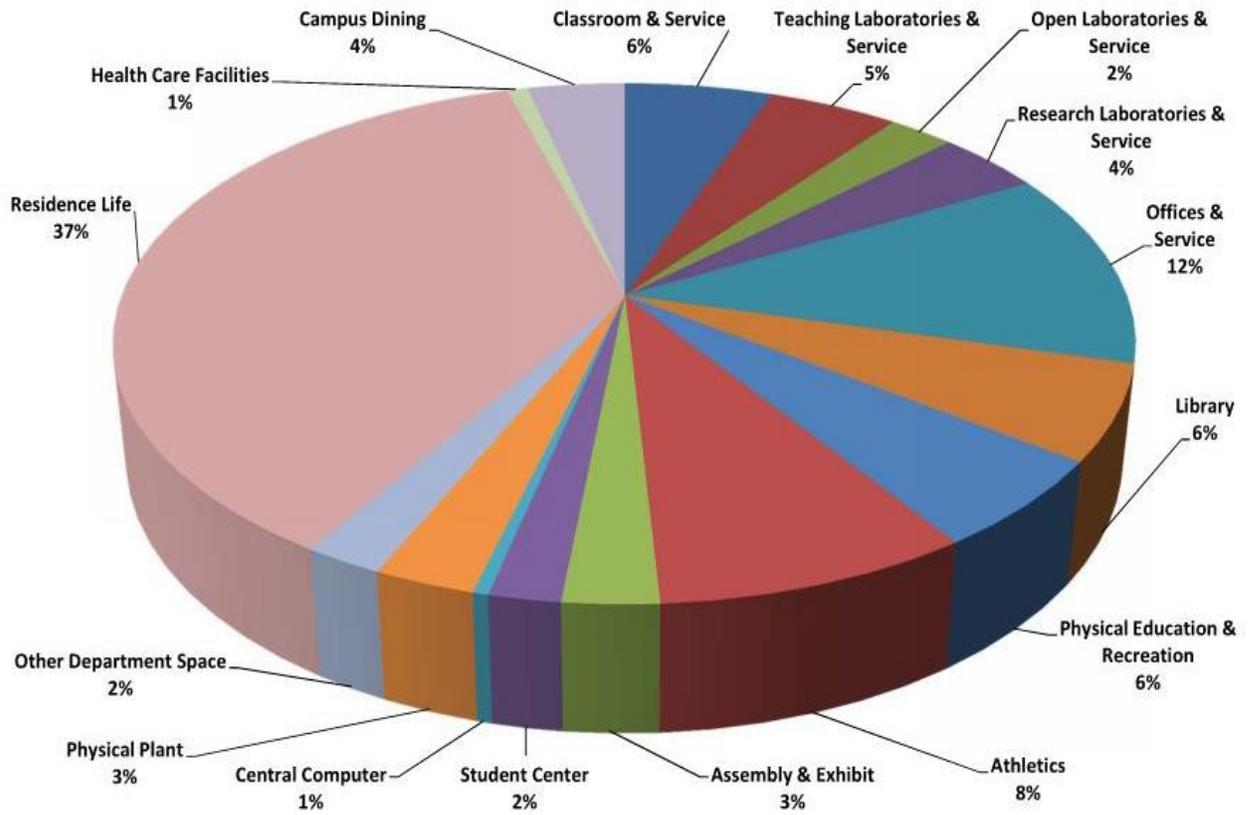


C. Mandated Facility Standards: CMU meets general and minimum space requirements as noted in federal accreditation standards. This includes successfully meeting higher levels of space and equipment standards for specialized programs such as biology and chemistry laboratories, performance spaces, library collections, and art exhibit spaces. Programs also meet the stringent, mandated facility standards of the National Association of Industrial Technology.

D. Functionality and Space Allocation:

Found in the Campus Master Plan, the following chart depicts the percentage of space on campus by category:

Percentage of Space Category



<i>Average age of buildings:</i>	General Fund	40.6 years
	Auxiliary	<u>44.0 years</u>
	All buildings	42.3 years

E. Replacement Value of Existing Facilities (Insured Value):

General Fund	\$1,312,766,978
Auxiliary	<u>599,302,868</u>
Total	\$1,912,069,846

F. Utility System Condition:

The campus master plan includes a facilities infrastructure assessment of the HVAC, electrical and domestic hot water systems in all of the buildings on CMU’s main campus. Additionally, an initial facilities condition assessment was started in 2019 for the CMU Biological Research Station on Beaver Island.

The majority of CMU buildings have served the campus for more than 40 years. The buildings have been well maintained, are structurally sound and functioning well. In a number of cases, mechanical and electrical systems are functioning successfully beyond their projected useful lives. The Facilities Condition Index for the campus is 0.091.

The deferred maintenance needs identified as part of the Facilities Condition Assessment for general fund buildings total \$87.2 million and for auxiliary buildings, \$171.7 million, in repair, upgrade and replacement costs for building assets valued at \$1.9 billion.

CMU has campus utility distribution system assets totaling approximately \$125 million.

1. City Water: CMU works closely with the city of Mount Pleasant to coordinate the expansion of water system requirements on campus and to maintain documentation of the existing system.
2. Sanitary Sewage System: The 12.7 miles of sanitary sewer collection system, which is integrated with the city of Mount Pleasant system, is sufficient for the existing and future needs of CMU in Mount Pleasant.
3. Storm Sewer System: The 22.6 miles of storm sewer on CMU's campus are in generally good condition. CMU works closely with the city of Mount Pleasant and Isabella County to coordinate the expansion of storm sewer systems on campus and to ensure proper inspection and maintenance of the infrastructure.
4. Electrical Distribution System: Scheduled assessments during planned electrical outages allow our skilled trades to identify immediate and long-term repair requirements; this also allows for planned system repairs with minimal impact to campus operations. The campus electric distribution system is in generally good condition. The main campus has redundant primary feeds from Consumers Energy.
5. Steam and Condensate System: The campus has 7.8 miles of steam and condensate lines located both within our 3.5 miles of utility tunnels and direct-buried. These lines are in good shape.
6. Chilled Water System: The 10.4 miles of chilled water lines, supply and return, are in good condition.
7. Central and Satellite Energy Facilities: These facilities house 1 gas/wood boiler, 3 gas boilers, 1 steam turbine, 1 gas turbine, 6 electric chillers and 3 steam absorption chillers and are in good condition. The Central Energy

Facility has a Facilities Condition Index of 0.02 and the Satellite Energy Facility, which was built in 2006 has a Facilities Condition Index of 0.00.

G. Facility Infrastructure Condition:

1. Roads: Roads are generally adequate. Repairs are made on a planned basis. An all-campus pavement condition study was completed in 2004, with follow-up annual inspection by CMU personnel. Several campus roads, particularly West Campus Drive, serve significant city and county/state traffic.
2. Parking lots: Central Michigan University has 89.4 acres of parking lots with 11,205 spaces. Parking lots were inspected and condition rated in 2018; all parking lots are on a specific schedule for sealing, crack filling and overlayment.
3. Parking structures: None
4. Sidewalks: Central Michigan University has 33.2 miles of sidewalks, and work occurs every year to replace and repair designated portions.
5. Bridges: None
6. IT Infrastructure: There are two infrastructure components:
 - a. CMU has a stand-alone, secured data center with backup generators and uninterruptable power systems.
 - b. The university's network infrastructure has been strengthened in order to transition the existing Cable TV and traditional telephone systems to Voice and Video over Internet Protocol (VOIP) solutions. Cable TV is will migrate to network infrastructure during FY19, and the university's phone infrastructure is scheduled to be migrated by the end of FY20.

H. Adequacy of existing utilities and infrastructure systems to current and 5-year projected programmatic needs:

As part of our campus master plan, the overall facilities condition assessment, utility infrastructure assessment, land use and capital planning work products have identified the following utility and infrastructure upgrades that are required to support current and 5-year project programmatic needs.

1. Central Energy Facility Improvements: CMU has completed three major system improvements at the central plant totaling \$3.2M. These projects included projects to upgrade controls for three boilers and the gas turbine, plus the installation of a new absorption chiller. Two scheduled projects

include heavy maintenance of the Gas Turbine and upgraded electrical switch gear.

2. Storm System Upgrades: The Federal Emergency Management Agency, through the Michigan State Police, Homeland Security Division, has awarded CMU a nationally competitive Pre-Disaster Mitigation grant for a \$908K stormwater system improvement project. CMU is also completing submittal for a separate, post-disaster mitigation grant to further improve stormwater management on the campus; the second project is valued at \$497K. Additionally, CMU has completed multiple smaller projects across campus to improve its storm water system since the heavy rains and flooding in July 2017.
3. Although the campus network is currently running well and reliably, IT strategic planning has determined a need for approximately \$10 million in deferred maintenance investment across the CMU network by FY24.

I. Enterprise-wide energy plan:

Central Michigan University continues executing a formal energy reduction effort since 2009, to include an ongoing Direct Digital Controls upgrade program. The overall effort has resulted in numerous energy reductions projects focused on individual buildings, optimizing like systems that were operational in multiple buildings, and improving its central utilities infrastructure. From fiscal year 2009-10 to fiscal year 2018-19, CMU has reduced its energy consumption by 22 percent from \$1.42 per square foot, to \$1.01 per square foot.

J. Land Owned by the University:

Improved (landscaped)	579.58 acres
Unimproved	1,179.15 acres
Total	<u>1,758.73 acres</u>

The Land Use Study completed as part of the Campus Master Plan confirmed the capacity to meet immediate and long-range (100 year) demands. In the future, CMU may need to change some of its land use strategies such as migrating to parking structures or increasing building density, however there is sufficient land to support the university's needs for the next 100 years. Furthermore, our long-term land use plan will allow CMU to make short-term building decisions with the confidence that we are doing what is right for the future of CMU.

- K. State Building Authority: CMU has five buildings obligated to the State Building Authority. The buildings include Park Library, The Herbert H. and Grace A. Dow Health Professions, Education and Human Services Building, the Biosciences

Building, and the upcoming Center for Integrated Health Studies. The expiration dates of the State Building Authority leases are shown in the table below:

Building	Proposed Lease Expiration Date
Park Library	04/01/2037
Health Professions	11/01/2040
Education and Human Services	12/01/2044
Biosciences	08/31/2052
Center for Integrated Health Studies	Estimated to be in 2055, currently in construction phase.

V. Implementation Plan

A. Prioritized Major Capital Projects Requested:

As part of the campus master plan, a 10-year capital plan project list was approved by the CMU Board of Trustees in July 2013; an updated list was approved in June 2017. These lists were developed by a cross-campus team of faculty and staff based on input from thousands of on-campus and community stakeholders. The CMU Brooks Hall Renovation project is on CMU’s capital plan and was selected as CMU’s Fiscal Year 2020-21 Capital Outlay Project based on student and state needs. Student demand for these programs is high and is not met by Michigan’s higher education system. We appreciate the state’s support of this project and look forward to the completion of this project.

Brooks Hall opened in 1964 and serves students with courses and programs in the fields of biology, biomedical science, earth and atmospheric sciences, astronomy, chemistry, biochemistry, geology, and fermentation science. For more detail, please see the FY 2020-21 Capital Outlay Project Request Form.

Impact of Addressing Deferred Maintenance and Structural Repairs: The 2013 Facilities Condition Assessment of buildings on CMU’s main campus identified \$259 million in projected repair, upgrade and replacement costs for building assets valued at \$1.8 billion. In addition, deferred maintenance funds will be required to maintain the utility distribution systems valued at \$125 million and site infrastructure valued at \$45 million.

- i. Status of Ongoing SBA Projects: Construction of the \$26M Center for Integrated Health Studies began in 2018 and will support classes in January 2020.
- ii. Rate of Return on Planned Capital Expenditures: Brooks Hall has significant deferred maintenance needs. If the Brooks Hall project is approved, the deferred maintenance funds otherwise slated for the

building will be moved to other projects. In addition, a modernized Brooks Hall with cutting-edge technology will assist the university in recruiting and retaining students who will go on to serve Michigan communities and businesses. While it is hard to quantify a specific rate of return, it is clear that approval of this project would greatly assist the university in addressing deferred maintenance issues and provide additional classroom and laboratory space to alleviate scheduling challenges on campus. The additional, modern laboratory space would allow for more research to be performed with enhanced safety. Funded research provides a direct return on the capital expenditures.

- iii. Alternatives to New Infrastructure: Science courses are some of the most difficult to deliver in a virtual environment. The active learning and lab component are harder to recreate online. Traditional face-to-face instruction is the preferred method for subjects taught in Brooks Hall. During the last decade, a few science courses became available in an online format, yet these offerings are limited due to course content and the need for hands-on, face-to-face experiences.

Maintenance Schedule for Major Items:

As defined in the 2013 facilities condition assessment, priority areas for major maintenance are:

- Deferred maintenance and repair/improvement of life safety systems (all meet code; this work would take us forward voluntarily)
- Building envelopes
- Mechanical, electrical, plumbing systems, including HVAC
- Utility infrastructure

CMU annually funds a minimum of \$5.7 million in deferred maintenance projects. Allocations among the various types of maintenance will depend on priority rankings and most urgent needs.

- iv. Non-Routine Maintenance:

CMU has consistently focused on deferred maintenance of buildings and grounds. Funding levels for deferred maintenance totaled \$5.7 million annually since 2010. In fiscal year 2014, an additional \$1.3 million in one-time funds was budgeted for roof replacement. Funding for deferred maintenance comes from the capital budget, which is funded by Auxiliary Services, Parking Services and an annual general fund allocation of \$2.8 million. Since 2008, CMU also has invested about \$6 million in the renovation and upgrading of individual classrooms and auditoriums.