

**Central Michigan University
Fiscal Year 2020 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 5 percent of U.S. universities in the highest two Carnegie research classifications. CMU is the 120th 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 850 CMU students, almost all attending on campus this fall, are majoring in programs such as those cited above. Thirty-nine percent of students admitted to CMU as part of the fall 2018 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:

- Master of Information Technology
- Environmental Engineering
- Health Information Management
- Technology Management
- Ph.D in Applied 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 Transactions
 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 5 percent of institutions classified as R2 doctoral universities, or those with higher research activity. Our degree programs serve more than 23,000 on-campus, online and satellite location students. 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.
- More than 16,000 employers recruit CMU students each year. Employers post more than 31,000 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.
- U.S. News and World Reports ranks CMU No. 12 in the nation for best online graduate education programs for veterans. Our online MBA ranks No. 27 for veterans; CMU is the only Michigan institution in the top 50.
- Ian Eickholdt, who graduated in May, was named the No. 1 engineering student leader in America by the Society of Automotive Engineers.
- CMU is in the process of developing and adding 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 will launch in fall 2019 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 last four years, CMU has added programs such as a Master in Applied Statistics and Analytics, a Ph.D. in Earth and Ecosystem Science and a cellular-molecular biology/biochemistry/biomedical Ph.D., 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.

- A CMU neuroscience researcher, Ute Hochgeschwender, has received a National Institutes of Health grant for \$2.25 million to study brain disorders.
- 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. More than 800 CMU students major in biological and biomedical sciences; another 300 major in conservation and natural resources/chemistry/earth and atmospheric sciences.
- Stephan Hlohowskyj, an earth and ecosystem graduate student, was the only geoscientist this summer studying at the nation's two top research laboratories: Argonne National Laboratory and Oak Ridge National Laboratory.
- Highlights of CMU's health care programs include:
 - 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.
 - CMU's new, 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.
 - Both of CMU's first two classes of medical students have 100 percent residency placement rates. The second class graduated in May, with 75 percent of its students receiving primary care residencies and 54 percent staying in Michigan.
- Two psychology faculty, Carl Johnson and Christie Nutkins, have a \$500,000 State of Michigan grant to train students in the leading treatments

for children with autism. Their work will help address a critical need for certified autism service providers.

- CMU psychology faculty also work with doctoral students to provide low- or no-cost outpatient mental health services to area residents.
- Students from multiple health care disciplines started visiting rural homes this fall to check the health of residents.
- An engineering faculty member, Brian DeJong, has been named Michigan College Science Teacher of the Year.
- CMU awards the second highest number of undergraduate teacher education degrees in Michigan. This is critical as teachers retire and Michigan school districts see a concerning shortage of applicants.
- CMU is the North American leader in SAP certifications for the business enterprise software used by nearly 40,000 companies worldwide.
- Of the top 10 students in the nation during this spring's Pi Sigma Epsilon national sales competition, six were from Central Michigan University. CMU, as an institution, received both a Sustained Excellence Award and gold standing for a fifth consecutive year at the competition.
- CMU enroll 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.
- Some 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's online fashion merchandising and design program is ranked No. 1 in Michigan by U.S. News & World Report and No. 2 in the nation by bestcolleges.com. Fashion-Schools.org ranks CMU fashion programs — on campus and online — in the top 20 percent of all U.S. colleges and universities.

C. Other Initiatives and Their Impact on Facilities Usage: 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 with move-in wrapped up in time for classes to start 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. Over 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 the College of Business Administration. 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.

In a study released last winter, Anderson Economic Group determined the total economic impact of CMU, its affiliates and its students and alumni to exceed \$1.2 billion in Michigan.

Our business programs such as that 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 \$80,000, with the best overall proposal receiving \$30,000. 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.

Historical data shows about 70 percent of CMU graduates choose to live and work in Michigan. Over 135,000 CMU alums currently reside in Michigan and contribute to the state's economy.

Further, 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 is No. 1 in terms of jobs created and companies formed. It recently opened a centers in Bay City this past winter, and is in the process of developing a third location in Saginaw.

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 2017):

CMU is the 120th 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	1	1	0	0
Area, Ethnic & Cultural & Gender Studies	209	8	2	0
Biological & Biomedical Sciences	704	117	2	8
Business Management, Marketing & Related Support Services	2,790	233	251	1,297
Communication, Journalism & Related Programs	941	105	5	11
Computer & Information Sciences & Support Services	334	54	3	30
Education	1,134	144	20	522
Engineering	377	28	0	0
Engineering Technologies/Technicians	243	27	8	89
English Language & Literature/Letters	175	26	4	7
Family & Consumer Sciences/Human Sciences	264	45	9	91
Foreign Languages & Literatures & Linguistics	43	9	0	0

History	80	30	0	3
Legal Professions & Studies	47	2	1	1
Liberal Arts & Sciences, General Studies & Humanities	3	10	0	0
Mathematics & Statistics	58	37	0	0
Multi/Interdisciplinary Studies	7	7	0	0
Natural Resources & Conservation	154	24	0	2
Health Professions & Related Programs	1,635	80	22	226
Parks, Recreation, Leisure & Fitness Studies	976	78	2	29
Philosophy & Religious Studies	32	3	0	0
Physical Sciences	131	70	0	2
Psychology	531	75	90	173
Public Administration & Social Service Professions	254	29	83	355
Social Sciences	525	56	14	28
Visual & Performing Arts	352	49	1	9
Undecided / Unsigned	4,534	274	92	174
Total	16,534	1,621	609	3,057

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>
2018	20,838
2019	20,192
2020	19,465
2021	19,134
2022	18,981

That said, CMU has completed a thorough enrollment management planning process and is implementing a number of strategies to maintain and grow its student population to benefit students, employers and the state as a whole.

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 1,105, which represents the 67th percentile of SAT scores. Similarly, CMU's mean ACT score is 23.3, which represents the 68th percentile of ACT scores. CMU's mean high school GPA is 3.36.

Further, CMU has implemented several measures during the past five years to increase retention and four-year graduation rates. These include an Office of Student Success, additional academic advisors, and an online advising workbench

that allows faculty and students to see how well they are progressing toward graduation and what classes they still need to take.

CMU's latest, six-year graduation rate, for the fall 2011 cohort, was 58 percent. Based on its then-R3 Carnegie classification, CMU outperformed the national peer average of 50 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 5,265 undergraduate students, compared to 2,230 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 remained relatively stable for the past decade. As the data below show for Michigan-based enrollment, the range between CMU's highest and lowest enrollments is 2,740 students - about 10.7 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

* 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	7.7	297.4
Biological & Biomedical Sciences	13.2	24.5
Business Management, Marketing & Related Support Services	20.7	92.2
Communication, Journalism & Related Programs	16.2	84.0
Computer & Information Sciences & Support Services	13.3	135.7
Education	13.5	51.9
Engineering	12.3	84.2
Engineering Technologies & Engineering- Related Fields	11.7	80.5
English Language & Literature/Letters	12.9	91.0
Family & Consumer Sciences/Human Sciences	19.5	56.3
Foreign Languages, Literatures, & Linguistics	12.6	215.9
History	13.7	196.1
Legal Professions & Studies	19.2	92.2
Liberal Arts & Sciences, General Studies & Humanities	16.5	54.2
Mathematics & Statistics	17.4	110.7
Medicine (MD)	36.7	1013.8
Reserve Officer Training Corps	N/A	14.9
Multi/Interdisciplinary Studies	22.4	24.7
Natural Resources & Conservation	11.8	30.6
Health Professions & Related Programs	13.4	30.5
Parks, Recreation, Leisure & Fitness Studies	17.8	104.4
Philosophy & Religious Studies	23.2	153.7
Physical Sciences	14.1	45.8
Psychology	17.7	33.0
Public Administration & Social Service Professions	12.1	160.5
Public Health	7.1	16.2
Social Sciences	18.4	91.0
Visual & Performing Arts	10.1	53.8
Total	16.1	66.1

E. Future Staffing Needs:

Year	Fall Enrollment Changes	Additional Staffing
2018	-1,074	0
2019	-646	0
2020	-727	0
2021	-331	0
2022	-153	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, and student success centers.

Average Class Size:

At CMU, class sizes remain small, giving students optimal opportunity to interact directly with their professors. Ninety-four 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 2017 National Survey of Student Engagement, 67 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 63 percent of seniors at peer institutions and 59 percent of seniors at universities within our Carnegie class.

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	2017-2018 Average Class Size			2018-19 Projected
	On Campus Avg. # of Students	Off Campus-MI Avg. # of Students	Overall Avg. # of Students	
<100	7	0	7	7
100-299	28	24	27	28
300-499	25	26	25	25
500-599	19	13	17	17
600 +	18	17	17	17

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. The capital plan was updated in 2017 to reflect the master plan at work and identify priorities for the next 5 to 10 years. The university has begun updating its database to include a description of every facility on campus to match the DTMB categories and have buildings with more than one ‘type’ of space broken down by percentage.

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., 3-9 p.m.) time frames as shown in the following charts:

Scheduled Classroom Use by Day and Time (Fall 2011)

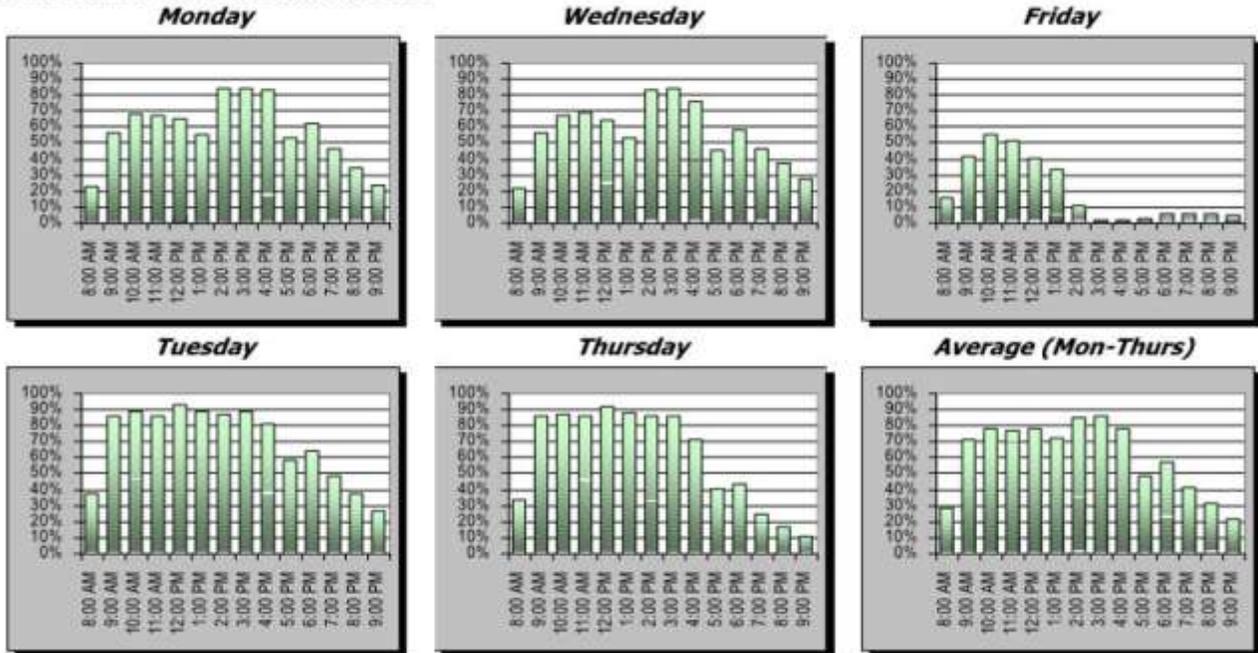
(Darker colors indicate a large percentage of rooms are scheduled.)

Time of Day	Monday		Tuesday		Wednesday		Thursday		Friday		Average*	
	Rooms in Use	% In Use										
8:00 AM	41	23%	68	38%	39	22%	62	34%	28	16%	53	29%
9:00 AM	100	56%	154	86%	100	56%	154	86%	75	42%	127	71%
10:00 AM	122	68%	160	89%	121	67%	156	87%	99	55%	140	78%
11:00 AM	121	67%	155	86%	124	69%	155	86%	91	51%	139	77%
12:00 PM	117	65%	167	93%	116	64%	165	92%	73	41%	141	78%
1:00 PM	99	55%	161	89%	96	53%	159	88%	61	34%	129	72%
2:00 PM	151	84%	157	87%	150	83%	154	86%	19	11%	153	85%
3:00 PM	152	84%	160	89%	152	84%	154	86%	4	2%	155	86%
4:00 PM	149	83%	146	81%	137	76%	128	71%	4	2%	140	78%
5:00 PM	96	53%	104	58%	82	46%	74	41%	6	3%	89	49%
6:00 PM	112	62%	115	64%	105	58%	80	44%	10	6%	103	57%
7:00 PM	84	47%	89	49%	84	47%	45	25%	10	6%	76	42%
8:00 PM	63	35%	69	38%	69	38%	30	17%	10	6%	58	32%
9:00 PM	43	24%	48	27%	50	28%	20	11%	9	5%	40	22%

Total classrooms = 180

* Based upon the consultant’s experience, Friday is typically underutilized, therefore the average is calculated on Monday thru Thursday use.

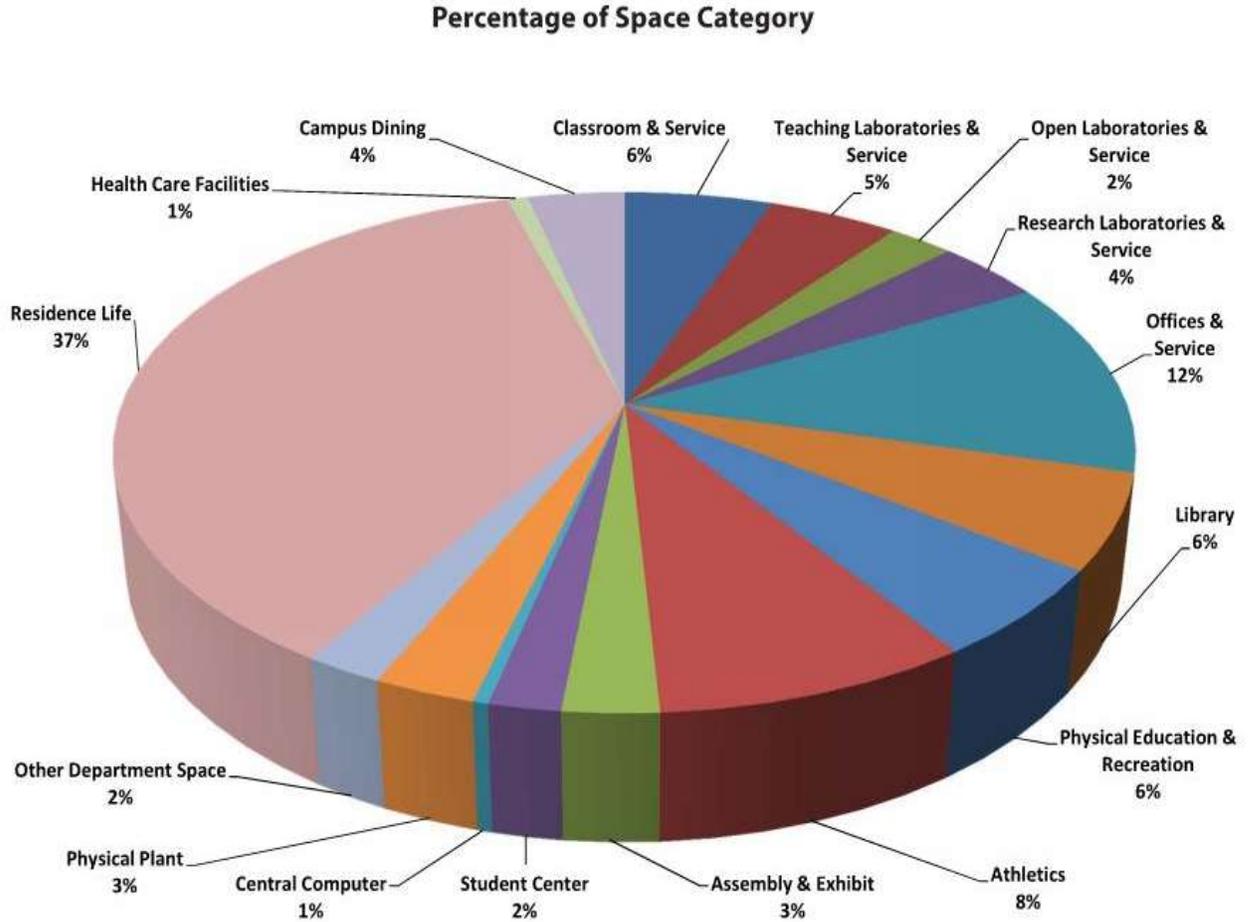
Percent of Classrooms In Use



- 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 the physician assistant and physical therapy programs, biology and chemistry laboratories, speech and hearing clinics, performance spaces, library collections, and art exhibit spaces. Programs also meet the stringent, mandated facility standards of the National Association of Industrial Technology. In programs such as those in the health professions area, CMU is at capacity as allowed by the standards and must add physical space in order to grow to serve more students and meet the increasing needs of Michigan residents and employers. Additional space is in the process of being added through our Center for Integrative Health Studies capital outlay project.

D. Functionality and Space Allocation:

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



<i>Average age of buildings:</i>	General Fund	36.3 years
	Auxiliary	43.8 years
	All buildings	40.1 years

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

General Fund	\$1,251,573,331
Auxiliary	597,235,571
Total	\$1,848,808,902

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.

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 reasonably 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 0.093.

The deferred maintenance needs identified as part of the Facilities Condition Assessment for general fund buildings total \$87.3 million and for auxiliary buildings, \$172.3 million, in repair, upgrade and replacement costs for building assets valued at \$1.8 billion.

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

1. City Water: CMU is working with the city of Mount Pleasant to improve on documentation of system age and our shared responsibilities for maintaining the distribution 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 has completed maintenance of manholes and catch basins across campus.
4. Electrical Distribution System: Ongoing assessments during planned electrical outages have identified immediate and long-term repair requirements. A short circuit analysis and an arc flash study have been completed. The campus electric distribution system is in generally good condition. The campus has a 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 generally in good shape.
6. Chilled Water System: The 10.4 miles of chilled water lines, supply and return, are in generally good condition.

7. Central and Satellite Energy Facilities: These facilities house 1 wood/gas boiler, 3 gas boilers, 1 steam turbine, 1 gas turbine, 6 electric chillers and 3 steam absorption chillers and are in generally 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. With increasing reliance on bicycles, the university recognizes that bike paths are needed to separate pedestrians and bicyclists.
5. Bridges: None
6. IT Infrastructure: There are two infrastructure components:
 - a. CMU is researching options for relocation of its IT disaster recovery capability.
 - 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 expected to migrate to network infrastructure during FY 19, and approximately 70 percent of the university's phone infrastructure should be migrated by fiscal year end, with the remainder to be completed 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: Two projects totaling \$1.5 million are in design to complete infrastructure improvements to the central plant to improve controls on three boilers and to upgrade the absorption chiller.
2. Storm System Upgrade: Federal Emergency Management Agency grant funding has been requested to expand two storm water detention facilities to mitigate flooding and controlling storm water runoff to a county drain. Significant storm water improvements have been made across campus since the fall of 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 before FY 24.

The rest of the utility and infrastructure systems have the capacity necessary to support current and five-year needs.

I. Enterprise-wide energy plan:

Central Michigan University began a formal energy reduction effort in 2009. The effort has resulted in numerous energy reductions projects focused on both individual buildings and optimizing like systems that were operational in multiple buildings. From fiscal year 2009-10 to fiscal year 2017-18, CMU has reduced its energy consumption by 22 percent from \$1.36 per square foot, to \$1.06 per square foot.

In 2018, CMU received the APPA Sustainability Award in Washington D.C. From 2014 to 2017, CMU was awarded the Environmental Protection Agency Region 5 Food Recovery Challenge Award.

Over the past year, CMU has diverted 40 percent or 1,038 tons of solid waste from landfills. The diverted materials include 369 tons of fiber, 334 tons of food waste and 197 tons of recycled materials.

CMU is composting 100 percent of its pre-consumer and post-consumer waste from all five residence hall food service operations.

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 Center for Integrative Health Studies is on that 10-year capital plan and was selected as CMU's Fiscal Year 2017-18 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.

Our Fiscal Year 2019-20 Capital Outlay submittal is a renovation of Brooks Hall. This facility is also on our 10-year capital plan. The building 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 2019-20 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 \$89.4 million Biosciences Building began in July 2014 and was substantially completed in September 2016. Classes began in the building in January 2017. This project takes a significant step in addressing CMU's 54 percent space deficit for academic research laboratories and services as identified in the 2013 utilization and space needs analysis.

The Center for Integrated Health Studies construction began in spring of 2018 with substantial completion and move-in scheduled for fall of 2019.

- 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 could allow 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

It is CMU's intent to continue to fund major maintenance at a minimum of \$5.7 million a year, and more if possible. 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.