Western Michigan University

5-Year Comprehensive Master

Plan Report FY2015 -2019

November 1, 2013
Western Michigan University Submission
5-Year Comprehensive Master Plan
FY 2015 - 2019

I. Mission Statement
Summary description of the overall mission of the institution.

The following principles and goals set the direction for development and growth at Western Michigan University, as approved by the Board of Trustees:

Mission

Western Michigan University is a learner-centered, research university, building intellectual inquiry and discovery into undergraduate, graduate, and professional programs in a way that fosters knowledge and innovation, and transforms wisdom into action. As a public university, WMU provides leadership in teaching, research, learning, and service, and is committed to enhancing the future of our global citizenry.

Vision

Nationally and internationally recognized, the University aspires to distinguish itself as learner centered, discovery driven, and globally engaged.

Learner centered

Western Michigan University is a university where every member of our community is responsive to and responsible for the education of our students. We challenge and engage all members of our community with a university experience that creates skilled, life-long learners.

Discovery driven

Western Michigan University offers experiences that enable discovery, and promote creativity and research. We are committed to pursuing inquiry, disseminating knowledge, and fostering critical thinking that encourages life-long learning. Our scholarship creates new knowledge, forms a basis for innovative solutions, leads to economic development, and makes substantial contributions to society.

Globally engaged

Western Michigan University impacts the globe positively. We are a community of learners committed to human dignity, sustainability, social responsibility, and justice. Our campus embraces a diverse population of students, faculty and staff who develop learners and leaders who are locally oriented and globally competent, culturally aware and ready to contribute to world knowledge and discovery.

The synergy of these three pillars enables WMU to be a premier and distinctive university of choice. Western Michigan University offers all students a learning community designed for and dedicated to their success. We are committed to access
and affordability, and sustaining an environment in which every student can meet the world head-on and triumph.

**Environmental Mission Statement:**
Approved by the WMU Faculty Senate and the Western Student Association (2003)

We, the Western Michigan University community, are dedicated to creating a safe, healthy, aesthetically pleasing, and sustainable campus. Consistent with the university's mission to "advance responsible environmental stewardship," we affirm our commitment to foster:

- Environmental awareness
- Understanding of and responsibility for the physical environment
- Just and ecologically sustainable resource use
- Sensitivity to the needs and aspirations of future generations
- Global thinking with local action.

As a learning institution, we appreciate that planning for sustainability will be an ongoing, intellectually engaging process. We establish this "Environmental Mission Statement" to identify general goals and strategies for implementing our commitment to environmental responsibility. By enacting and implementing this mission statement, Western Michigan University will be a positive example and confirm its role as a leader in promoting environmental stewardship on campus and beyond.

**Strategic Plan for Academic Affairs - adopted in 2011**

**Goals:**
1. Ensure a distinctive learning experience and foster the success of students.
2. Promote innovative learning, discovery and service.
3. Advance WMU as a major research university.
4. Ensure a diverse, inclusive and healthy community.
5. Advance social, economic and environmental sustainability practices and policies.
II. Instructional Programming

As part of the Five-Year Capital Outlay Plan, each College and University shall provide an overview of current academic programs and major academic initiatives. This “instructional programming” component should:

a. Describe existing academic programs and projected programming changes during the next 5 years, in so far as academic programs are affected by specific structural considerations (i.e., laboratories, classrooms, current and future distance learning initiatives, etc.

Western Michigan University’s strategic planning initiative speaks to our institutional focus of being learner-centered, discovery driven and globally engaged. As such, our instructional programs are designed to increase students’ capacity for learning and service to society, as well as meet the needs of an increasingly diverse student population. In planning to meet the needs of undergraduate and graduate students, WMU’s academic programs will be affected by several structural considerations, most significantly the ability to provide classrooms and laboratories equipped with the technology that specialized disciplines and effective learning require. The delivery of academic programs and, more importantly, effective student engagement and learning are directly related to the need for upgrades and improvements in e-learning systems, classrooms, and laboratories.

Over the next five years, restructuring of programs and shifts in enrollments are expected across the university. Enrollment growth is expected in the areas of health and human services, engineering aviation and business. WMU faculty and students are involved in research projects that are important in the community, state, national, and international domains. This will require growth in our research facilities as well. The University has an established presence in the state through regional sites in Battle Creek, Grand Rapids, Lansing, Traverse City, Muskegon, and Southwest (Benton Harbor), as well as courses and programs delivered through the internet that extend WMU within and beyond the state. In 2010, the university created a regional presence in southeastern Michigan with an office in Royal Oak and classes using Oakland Community College facilities. The regional locations partner with the state’s community colleges to provide access to university education. Regional directors also participate in local community organizations and activities. Programs in business, health and human services and education are particularly important at the regional campuses.

The capital project to rebuild Sangren Hall is complete and the building is fully utilized. The new Sangren Hall provides multiple benefits to the university and to its principle occupants, the College of Education and Human Development and the Department of Sociology (of the College of Arts and Sciences). Sangren Hall is one of the
most heavily-used classroom buildings on campus, and is a key location for first-year programs and retention initiatives. Renewal of this significant classroom stock plus state-of-the-art upgrades to instructional technology enables WMU to provide classroom environments that facilitate students’ learning well into the future. This facility supports graduate programs, research and houses the enhanced practicing/training clinics, the Dorothy J. McGinnis Reading Center and Clinic, and the Center for Counseling and Psychological Services.

A recent donation made expansion of the Lee Honors College possible. The expansion added classrooms to the existing building, and enhanced the study lounge. Construction on this project was completed in the summer of 2012. The expanded space is being utilized for classes and seminars.

Even with the successful completion of the Sangren Hall project and the expansion of the Lee Honors College, as well as the completion of the Zhang Legacy Collections Center (described below), the university has a number of academic program facility needs. Laboratories require periodic improvements and additions to accommodate new programs in engineering and aviation. Examples are an engineering facility to allow relocation of the wind tunnel from Kalamazoo-Battle Creek airport property to the Parkview campus and an engineering facility to extend the materials testing and research partnership with MDOT.

Expanding programs in the following areas will require continued enhancement and support:

- Audiology and Speech Pathology
- Aviation Science
- Biological Sciences
- Blindness and Low Vision Studies
- Civil and Construction Engineering
- Computer Information Systems
- Dietetics
- Family Sciences
- Manufacturing Engineering
- Nursing
- Occupational Therapy
- Physician Assistant

b. Identify the unique characteristics of each institution’s academic mission. For Universities: Major research institution, technical/vocational center, geographic service delivery area(s), community presence activities, etc.
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Western Michigan University is a major research institution; it is one of five in the state. In 2005 the Carnegie Foundation for the Advancement of Teaching placed WMU among the 76 public institutions in the nation designated as research universities with high research activity. *U.S. News & World Report’s* annual ranking of American colleges and universities includes WMU as one of the nation’s top-100 public universities.

Undergraduate students at WMU may choose from 145 program offerings while graduate students may select from 71 master, one specialist, and 30 doctoral programs. A number of these at both the undergraduate and graduate levels have attained national recognition. More than 300 registered student organizations and a full array of NCAA Division IA intercollegiate athletic teams enrich the educational experience.

The university’s commitment to the discovery and dissemination of new knowledge and insight has resulted in initiatives that reward faculty and student research, scholarship and creative activity. In a typical year, WMU faculty and staff conduct approximately $25 million in externally funded research on topics ranging from nuclear physics and special education to developing technology that enables more efficient flight and more environmentally friendly public transportation.

WMU’s campuses encompass more than 1,200 acres and 151 buildings. The main campus, close to downtown Kalamazoo, features some of the finest instructional and performance facilities in the midwest as well as residence halls equipped to house more than 4,700 students. The university’s College of Engineering and Applied Sciences and the Business Technology and Research Park are located on the Parkview Campus, three miles away from the main campus. The nationally recognized College of Aviation is based at the W. K. Kellogg Airport in nearby Battle Creek.

c. *Identify other initiatives which may impact facilities usage.*

**Initiatives**

- **Medical school proposal:** Four years ago President Dunn started a process to determine the feasibility of establishing a private medical school, working with area leaders and the medical communities in Kalamazoo and Battle Creek. Participating organizations are Borgess Health and Bronson Healthcare Group.

  On November 2, 2009 the WMU Board of Trustees adopted a formal statement in support of the medical school feasibility study and authorized the university to pursue the next steps on the process, including securing a “dean pro tem”, filing
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a notice of intent with the national Liaison Committee on Medical Education (LCME), assembling planning committees and finalizing agreements with partner hospitals. WMU received an anonymous $1.8 million gift, which allowed the initial steps of the feasibility study to begin. Dr. Hal Jenson was hired as the Founding Dean of the School of Medicine. The WMU School of Medicine (WMed) also received an anonymous gift of $100 million, and hired an architecture firm to complete programming and design for a new facility. In December, 2011, WMU accepted the private donation of Pfizer-Upjohn Company Building 267, a 330,000 square-foot building located in downtown Kalamazoo, to be leased from the University by the new medical school. A groundbreaking ceremony for the facility was held in October, 2012. Plans are to renovate and slightly expand the donated facility, located on the newly named W.E. Upjohn Campus. WMed received preliminary accreditation from the LCME in October, and is currently accepting applications for the first class of medical students. Building renovations are underway and are scheduled to be completed prior to the entry of the first class of medical students in August, 2014. The School of Medicine will operate as a independent non-profit institution, with key strategic and financial ties to the university.

- **Relocation of the Charles C. and Lynn L. Zhang Legacy Collection Center.** A valuable campus, community and state resource, the University Archives and Regional History Collection, has been primarily housed for the past twenty years in the one-hundred-year-old East Hall. In September 2013, the collections were moved to their new home in the Charles C. and Lynn L. Zhang Legacy Collections Center, a planned 16,000-square-foot, $8.3 million facility on WMU’s Oakland Drive Campus. The facility was built with private funding including several significant gifts. The building houses more than 28,000 cubic feet of the WMU Archives and Regional History Collections, overflow books and serials from the University Libraries, and the complete archives of the *Kalamazoo Gazette*.

- **Extend students’ learning settings/classrooms into their living areas.** Several residence halls are serving as sites for an alternative to the traditional separation of classrooms and housing. So-called learning communities or residential colleges are offered in a floor or a wing within living facilities, and include seminar or study rooms that are convenient for residents, and staff available as tutors and mentors. Residential communities or houses have been created for special interests such as honors students, science scholars, or transfer students, and for students in each of the university’s six colleges. The literature shows that students who are engaged in such arrangements are more likely to persist and graduate than those who are not.
In Fall 2013, Western View II- a new 174 bed apartment complex was completed, the second phase of a two phase residential neighborhood development. It provides up to date housing near the heart of main campus, including a Community Center facility with study, meeting and fitness/recreation spaces.

Planning and design of two new Residence Hall facilities providing 750 beds is currently in progress, with completion of construction expected during summer 2015. The design concept incorporates student rooms clustered in “pods” around Living Rooms and Kitchenettes, in order to foster social interaction and a sense of community.

- **Create multiple methods of learning.** The learning environment is suffused with technology: mobile, digital, and interactive. Classrooms and laboratories afford students opportunities to learn through doing. WMU prides itself in the multiple methods of application based learning, through clinics and laboratories. Programs utilizing theses methods include Psychology, Occupational Therapy, Nursing, Engineering, Aviation and Applied Sciences.

- **Improvements to sports fields.** Over the past few years it has become evident that recreation and athletics facilities are very important to the academic success and retention of students at the university. In 2010 WMU Campus Planning conducted an on-line survey of the campus community. 60% of respondents gave the campus’ recreation facilities top ratings. Maintenance of the outdoor play fields is a chronic problem due to the heavy use in early fall and late spring. Demand currently exceeds available space on campus, with some recreation and club team participants going off-campus to compete. Planning is underway to provide additional fields and to upgrade existing facilities. The WMU track facility is being upgraded and is a popular venue for student activities. At the Seelye indoor practice facility, new turf was installed in 2013.

- The WMU Office of Information Technology (OIT) promotes the teaching, research, and service missions of the university. It provides the information technology infrastructure for those missions, and for the university’s business processes that support all missions. Expected initiatives over the next five years include the following:
  - **Upgrade and refresh classroom technology** through a rotating implementation schedule with the goal of all general university classrooms being equipped with standardized classroom technology, including data projection, document cameras, and the ability to use contemporary media.
Larger classrooms will also have hearing impaired assistive devices as required by ADA regulations.

- **Implementation of instructional technology enhancements** that include robust synchronous communication tools in order to enhance instructional content delivery and provide for a more collaborative learning environment.

- **Improve systems efficiency and effectiveness** through ongoing systems review including consideration of cloud and software as a service when it can be managed more effectively or efficiently in that fashion. A duplication of system critical operations will be achieved through a comprehensive disaster recovery plan and systems off-site location. As well as, continues upgrades to hardware and software pertaining to network infrastructure, with the inclusion of secure wireless access across campus, and unified communication technologies.

- **Continue to manage enterprise systems**, particularly those systems that form the core IT services to students, faculty, staff, and administrative units. These systems manage admissions, financial aid, registration, class and classroom scheduling, academic records, accounts receivables, accounts payables, e-commerce, general ledger, payroll, human resources, identity management, and other primary services. Future enhancements will focus on incorporating mobile device access to these various systems.

- **Monitor information security** throughout the university so that private information is secure while enabling staff access to the information necessary to accomplish their jobs, including the addition of layered security. With the access by mobile devices (bring-your-own-device “BYOD”) and cloud services, specific consideration will be required in securing university data for that access. OIT will ensure that all applicable federal, state, and industry security standards are followed.

- **Membership and stewardship of the Merit Network**, the high speed data network owned in partnership with other Michigan universities.

**Renovation and Construction Projects**

- **New School of Medicine Facility**:

  Construction is currently underway on the new WMU School of Medicine facility, to be located at the site of a former Pfizer research facility in downtown
Kalamazoo. The 350,000 square foot renovation and addition project is planned to be completed in June of 2014. The facility will include the following programs and elements:
1. Academic teaching spaces
2. Simulation center
3. Research laboratories
4. Student study and commons areas
5. Faculty and administrative spaces

- **East Hall Alumni Center:**

  Planning and design has begun for a new Alumni Center in historic East Hall (Administration wing), the first structure constructed on the WMU campus in 1905. The renovated 43,000 sq. ft. building will be a multi-use facility containing offices, assembly and meeting spaces, for use by alumni, faculty, staff and students.

  **d. Demonstrate economic development impact of current/future programs (i.e., technical training centers, Life Science Corridor initiatives, etc.).**

  WMU’s faculty and students are involved in research and outreach projects that are important to the region and enhance the university’s presence in the state. Alternative and renewable energy research are important and growing fields that may have both short- and long-term impacts on economic development. Among the research topics currently being funded are alternative fuels, solid oxide fuel cells, plug-in electric hybrid vehicles, and wind turbines.

  The Business, Technology and Research Park on WMU’s Parkview Campus is a designated Michigan SmartZone. Forty one businesses and start-up companies are currently operating in the BTR Park, employing over 730 people. Many are involved in health and life science research and development, contributing to and enhancing southern Michigan’s life sciences corridor. Strategic partners in the BTR Park are the Michigan Economic Development Corporation, the Michigan Technology Tri-Corridor, and Southwest Michigan First. Phase One of the BTR Park development is now fully occupied.

  WMU’s Biosciences Research and Commercialization Center (BRCC), located in the Southwest Michigan Innovation Center in the BTR Park, supports new life science ventures by providing startup and gap funding assistance, BioLaunch pharmaceutical development services, and pharmaceutical commercialization expertise. Strategic partners in the BRCC are the Core Technology Alliance, the Michigan Economic
Development Corporations, Southwest Michigan First, Southwest Michigan Innovation Center, and the 21st Century Job Fund. In 2011, the WMU School of Medicine received its first research grant from the Michigan Strategic Fund, a $3.8 M investment via the Biosciences Research & Commercialization Center (BRCC).
III. **Staffing and Enrollment**

Colleges and universities must include staffing and enrollment trends in the annual Five-Year Capital Outlay Plan. This component should:

- **a.** *Describe current full- and part-time student enrollment levels by academic program and define how the programs are accessed by the student (i.e., main or satellite campus instruction, collaboration efforts with other institutions, Internet or distance learning, etc.)*

  See Charts A1* and A2*.

- **b.** *Project enrollment patterns over the next five years (including distance learning initiatives)*;

  See Charts A1* and A2*.

- **c.** *Evaluate enrollment patterns over the last five years*;

  See Charts B1* and B2*.

- **d.** *Provide instructional staff/student and administrative staff/student ratios for major academic programs or colleges*;

  See Chart C1*.

- **e.** *Project future staffing needs based on five-year enrollment estimates and future programming changes*;

  See Chart C2*.

- **f.** *Identify current average class size and projected average class size based on institution’s mission and planned programming changes*.

  See Chart D*.

*All charts were prepared by the WMU Office of Institutional Research.*
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by

(assuming a 0% growth)

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| Total SCH by Delivery Type and Department 2013 | 275,959 | 2,250 | 5,160 | 267 | 15,530 | 15 | 252,737 |

Office of Institutional Research  
Source: Banner Census Day Archives  
SCH by Delivery Type and Department 2013  
Page 2 of 2
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### Undergraduate Enrollments
by
Department
Fall 2008 and Fall 2013

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University Undergraduate Student Total: 19,198 19,854

Notes:
TLES includes ED and ES
Graduate Enrollments  
by  
Department  
Fall 2008 and Fall 2013

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## Graduate Enrollments by Department
### Fall 2008 and Fall 2013

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**Notes:**
- ELRT includes EDLD
- TLES includes ED and ES
Western Michigan University  
Instructional Staff/Student Ratio and Administrative Staff/Student Ratio

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<th>Education</th>
<th>Fine Arts</th>
<th>Health &amp; Human Services</th>
<th>Aviation</th>
<th>Engineering</th>
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<td>4,072</td>
<td>4,016</td>
<td>1,135</td>
<td>3,262</td>
<td>726</td>
<td>2,680</td>
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<table>
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<th>Fine Arts</th>
<th>Health &amp; Human Services</th>
<th>Aviation</th>
<th>Engineering</th>
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<td>111.4</td>
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<td>27.4</td>
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<td>10.2</td>
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<td>112.8</td>
<td>40.6</td>
<td>146.9</td>
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** Please Note: A&S student count does not reflect the "general studies" requirement placed upon the instructional staff of the college. The above figures do not include the 1,982 students who have not declared a major. Aviation FTE counts do not reflect the FTE in funds other than Fund 11.

Source: Student data -- Student Master 1st major College of Discipline  
Source: Staffing Data -- Budget Office (Kathy Houser) FTE extract from PeopleSoft Budget
Western Michigan University
Instructional Staff/ Student Ratio and Administrative Staff/Student Ratio
(assuming 0% growth in enrollment and 0% growth in faculty and staff)

**Projected Fall 2018**

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<th>Health &amp; Human Services</th>
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<th>Engineering</th>
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<tbody>
<tr>
<td>Total</td>
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<td>1,135</td>
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**Instructional FTE**

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**Student/Instructional Staff Ratio**

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<td>34.4</td>
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**Departmental Administrative Staff FTE**

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<th>Education</th>
<th>Fine Arts</th>
<th>Health &amp; Human Services</th>
<th>Aviation</th>
<th>Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>68.1</td>
<td>16.2</td>
<td>35.6</td>
<td>27.9</td>
<td>22.2</td>
<td>18.8</td>
<td>23.1</td>
</tr>
</tbody>
</table>

**Student/Departmental Administrative Staff**

<table>
<thead>
<tr>
<th></th>
<th>Arts &amp; Sciences**</th>
<th>Business</th>
<th>Education</th>
<th>Fine Arts</th>
<th>Health &amp; Human Services</th>
<th>Aviation</th>
<th>Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>94.3</td>
<td>251.8</td>
<td>112.8</td>
<td>40.6</td>
<td>146.9</td>
<td>38.6</td>
<td>116.1</td>
</tr>
</tbody>
</table>

**Please Note:**
A&S student count does not reflect the "general studies" requirement placed upon the instructional staff of the college.
The above figures do not include the 2,112 students who have not declared a major.
Aviation FTE counts do not reflect the FTE in funds other than Fund 11.
# Undergraduate and Graduate Classes Fall 2013

Average Class Size | 29.9
---|---

| Percent of classes with enrollment under 1-10 | 17.9% |
| Percent of classes with enrollments 11-25 | 42.2% |
| Percent of classes with enrollments 26-50 | 29.9% |
| Percent of classes with enrollments 51-75 | 4.5% |
| Percent of classes with enrollments 76-100 | 2.0% |
| Percent of classes with enrollments over 100 | 3.4% |
| Total | 100.0% |

Note:
Lab sections are removed
All 7000 level courses are removed
Independent Study and Practicum courses are removed
Main campus courses only

# Projected Undergraduate and Graduate Classes Fall 2018

Average Class Size | 30.0
---|---

| Percent of classes with enrollment under 1-10 | 18.0% |
| Percent of classes with enrollments 11-25 | 42.0% |
| Percent of classes with enrollments 26-50 | 30.0% |
| Percent of classes with enrollments 51-75 | 5.0% |
| Percent of classes with enrollments 76-100 | 2.0% |
| Percent of classes with enrollments over 100 | 3.0% |
| Total | 100.0% |
IV. Facility Assessment
A professionally developed comprehensive facilities assessment is required. The assessment must identify and evaluate the overall condition of capital facilities under college or university control. The description must include facility age, use patterns, and an assessment of general physical condition. The assessment must specifically identify:

+(In the event that comprehensive, current physical facility assessments are not available, the Five-Year Capital Outlay Plan must include data from the most recent physical facility assessment and describe the schedule by which a new assessment will be completed.)

a. Summary description of each facility (administrative, classroom, biology, hospital, etc.) according to categories outlined in “net-to-gross ratio guidelines for various building types,” DMB-Office of Design and Construction Major Project Design Manual, appendix 7. If facility is of more than one “type”, please identify the percentage of each type within a given facility;

The chart, “WMU Facilities Information”, (included in this section) provides a brief conditions assessment of the university’s capital facilities, including building age, replacement value (from the 2013-14 MUSIC property valuation), and type of use. The 2013 General Fund Deferred Maintenance report, produced by the WMU Department of Facilities Management, contains information on building systems conditions and provides lists of recommended deferred maintenance projects. An abridged copy of the report is appended to this document. A copy of the complete report is at the following web link:


Facilities and Infrastructure Summary

- 152 buildings or structures
- 9 million square feet of building space
- 23 miles of roadways; 39 miles of walkways
- 17.5 miles of underground electrical cable. The electrical supply for the campus is a double feed from Consumers Energy at our power plant and then distributed throughout the campus in a looped configuration
- 12.75 miles of steam and condensate line. The 60# looped steam distribution system providing heat for all buildings and chilling capacity for some buildings.
- 6.59 miles of water lines; 11.5 miles of sewer lines; 40 miles of storm piping. Water for the campus is provided by the city of Kalamazoo and is fed from a number of different directions. Storm and sanitary sewers flow into the City’s sewer system.
b. **Building and/or classroom utilization rates (Percentage of rooms used, and percent capacity).** Identify building/classroom usage rates for peak (M-F, 10-3), off-peak (M-F, 8-10 am, 3-5 pm), evening, and weekend periods;

See attached chart, “Classroom Building Utilization”. The chart provides the Time and Class Utilization statistics for the University’s classroom buildings. All class and schedule information is provided by the WMU Office of the Registrar.

c. **Mandated facility standards for specific programs, where applicable (i.e., federal/industry standards for laboratory, animal, or agricultural research facilities, hospitals, use of industrial machinery, etc.);**

See attached chart, “WMU Facilities Information”.

d. **Functionality of existing structures and space allocation to program areas served.**

See attached chart, “WMU Facilities Information”.

e. **Replacement value of existing facilities (insured value of structure to the extent available);**

Current MUSIC “Insurable Values” for 2013-14 are found on the “WMU Facilities Information” chart.

f. **Utility system condition (i.e., heating, ventilation, and air conditioning (HVAC), water and sewage, electrical, etc.);**

See web link below for an assessment and strategic plan for renewal of WMU Utility Infrastructure:

http://www.fm.wmich.edu/engineering/energy_management/energy_management_strategic_plan

g. **Facility infrastructure condition (i.e., roads, bridges, parking structures, lots, etc.);**

The 2000 Campus Master Plan provided guidelines for planning and organizing future road and circulation system improvements. Assessments of campus roads and transit needs are on-going, with prioritization based in part on analysis and recommendations in the annual Deferred Maintenance report.
## Fall 2013 Time and Classroom Utilization Summary

### TIME UTILIZATION - DRAFT

**def.:** the percentage of hours a space is used for scheduled classes as compared to the total hours in the report period.

Buildings listed are major academic classroom buildings with dedicated classrooms or labs.

Time and Class Utilization data is compiled from 2013 Fall academic schedules from the Western Michigan University Office of the Registrar.

<table>
<thead>
<tr>
<th>Classroom Buildings</th>
<th># of Classrooms</th>
<th># of Teaching Labs</th>
<th>Total Number of Student Stations</th>
<th>Time Utilization 8 - 10 a.m.</th>
<th>Time Utilization 10 a.m. - 3 p.m.</th>
<th>Time Utilization 3 - 6 p.m.</th>
<th>Time Utilization 6 - 10 p.m.</th>
<th>*Time Utilization Saturdays</th>
<th>*Time Utilization Sundays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Hall</td>
<td>24</td>
<td>7</td>
<td>1,267</td>
<td>26%</td>
<td>52%</td>
<td>46%</td>
<td>12%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Chemistry Classroom Building</td>
<td>3</td>
<td>15</td>
<td>867</td>
<td>39%</td>
<td>64%</td>
<td>35%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>College of Engineering and Applied Sciences</td>
<td>19</td>
<td>32</td>
<td>1,542</td>
<td>20%</td>
<td>37%</td>
<td>27%</td>
<td>13%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>College of Health and Human Services</td>
<td>14</td>
<td>10</td>
<td>1,002</td>
<td>23%</td>
<td>28%</td>
<td>35%</td>
<td>21%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Dalton Center</td>
<td>5</td>
<td>11</td>
<td>1,444</td>
<td>45%</td>
<td>42%</td>
<td>33%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Dunbar Hall</td>
<td>34</td>
<td>1</td>
<td>1,261</td>
<td>34%</td>
<td>56%</td>
<td>52%</td>
<td>17%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Gilmore Theatre Complex</td>
<td>0</td>
<td>5</td>
<td>220</td>
<td>18%</td>
<td>53%</td>
<td>23%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Knauss Hall</td>
<td>4</td>
<td>0</td>
<td>1,064</td>
<td>17%</td>
<td>55%</td>
<td>25%</td>
<td>9%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Kohrman Hall / South Kohrman</td>
<td>18</td>
<td>27</td>
<td>1,359</td>
<td>17%</td>
<td>49%</td>
<td>27%</td>
<td>7%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Moore Hall</td>
<td>6</td>
<td>0</td>
<td>343</td>
<td>29%</td>
<td>41%</td>
<td>30%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Richmond Center for Visual Arts</td>
<td>1</td>
<td>3</td>
<td>190</td>
<td>39%</td>
<td>46%</td>
<td>43%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Rood Hall</td>
<td>12</td>
<td>25</td>
<td>1,566</td>
<td>18%</td>
<td>31%</td>
<td>20%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Sangren Hall</td>
<td>30</td>
<td>15</td>
<td>2,123</td>
<td>31%</td>
<td>44%</td>
<td>37%</td>
<td>17%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Schneider Hall</td>
<td>39</td>
<td>0</td>
<td>2,398</td>
<td>21%</td>
<td>44%</td>
<td>34%</td>
<td>17%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td>Wood Hall</td>
<td>18</td>
<td>15</td>
<td>1,658</td>
<td>22%</td>
<td>46%</td>
<td>31%</td>
<td>11%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>227</strong></td>
<td><strong>166</strong></td>
<td><strong>18,304</strong></td>
<td><strong>4</strong></td>
<td><strong>7</strong></td>
<td><strong>5</strong></td>
<td><strong>1</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

**AVERAGE TIME UTILIZATION:** 27% 46% 33% 10% 0% 0%
### CLASS UTILIZATION - DRAFT

*def.*: the average percentage of seats used for scheduled classes relative to the classroom's maximum capacity.

Buildings listed are major academic classroom buildings with dedicated classrooms or labs.

Time and Class Utilization data is compiled from 2013 Fall academic schedules from the Western Michigan University Office of the Registrar.

<table>
<thead>
<tr>
<th>Classroom Building</th>
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<td>0%</td>
<td>0%</td>
</tr>
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</tr>
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<td>73%</td>
<td>28%</td>
<td>0%</td>
<td>0%</td>
</tr>
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<td><strong>166</strong></td>
<td><strong>18,304</strong></td>
<td><strong>7</strong></td>
<td><strong>7</strong></td>
<td><strong>7</strong></td>
<td><strong>5</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

**AVERAGE CLASSROOM UTILIZATION**

### Fall 2013 Time and Classroom Utilization Summary
Construction of the College of Health and Human Services building (completed and occupied August 2005) required numerous modifications to the existing site on the Oakland Drive Campus to satisfy parking and circulation needs for both vehicles and pedestrians. Long-term parking needs for the College will continue to be addressed as needed.

Sites for future parking decks on the main campus have been identified. Maintenance and reconstruction projects are planned for main campus roads and parking lots. The reconfiguration of parking lots 41, 49, 68, and 69 are part of the Sangren Hall Site Project.

The two parking decks on the Parkview Campus are under evaluation to determine future maintenance needs. As part of the ongoing efforts to complete and improve the perimeter ring road that is a component of the 2000 Campus Master Plan, there are plans to reconfigure Knollwood Avenue, rebuilding it with curbs, gutters, and sidewalks.

See the 2013 Deferred Maintenance report for additional information on facilities infrastructure.

**h. Adequacy of existing utilities and infrastructure systems to current and 5-year projected programmatic needs;**

The WMU Facilities Management Engineering and Operations Divisions conduct a yearly review of university facilities, including buildings, utilities, and infrastructure systems, which identifies necessary infrastructure repairs, upgrades or replacements, and which prioritizes deferred maintenance projects. See the 2013 Deferred Maintenance report for information on utilities and infrastructure systems.

**i. Does the institution have an enterprise-wide energy plan? What are its goals? Have energy audits been completed on all facilities, if not, what is the plan/timetable for completing such audits?**

Per the 2003 Environmental Mission Statement the university practices environmental sustainability, including energy-reduction practices, to the greatest extent possible. The Engineering and Operations Divisions of WMU Facilities Management operate Energy Management and Water Management programs; energy management strategies and analyses are outlined in the annual Deferred Maintenance report. The Planning and Projects Divisions of WMU Facilities Management apply the university’s Facility Life Cycle Design Guidelines (revised in 2011) to all projects. Per Executive Orders 2005-4 and 2007-22 all major construction and renovation projects are
designed to achieve certification under the Leadership in Energy and Environmental Design guidelines from the United State Green Building Council.

See web link below for a report on the energy management strategic plan:

http://www.fm.wmich.edu/engineering/energy_management/energy_management_strategic_plan

Energy Management initiatives:
http://www.fm.wmich.edu/engineering/energy_management/campus_initiatives

- These include:
  - Load Shedding for Electric Chillers
  - Variable Air Flow HVAC Systems
  - Variable Frequency Drive for HVAC Systems
  - Time-of-Day Scheduling
  - High Efficiency Motors
  - Heat Recovery Systems
  - Occupancy Sensors for Lighting and HVAC
  - Lighting Conversions:
    - electronic ballasts replacements
    - lamp replacements
    - LED exit lights
  - Daylight Harvesting
  - Chlorofluorocarbons (CFC and HCFC) Reductions
  - Carbon Dioxide Monitoring
  - Preventative Maintenance

Water Management initiatives:
http://www.fm.wmich.edu/engineering/energy_management/campus_initiatives/water_management

- These include:
  - Automated Irrigation Control
  - Low Flow Showers and Faucets
  - Chemical-Free Water Treatment
  - Stormwater Runoff Management
  - Water Reduction Program for Cooling Towers
  - Water-Efficient Washing Machines (Residence Halls)
  - Eliminate Water-Cooled Condensers

Building Utility Dashboard:
Facility Life Cycle Design Guidelines:

Additional information may be found in the 2013 Deferred Maintenance Report.

j. Land owned by the institution, including a determination of whether capacity exists for future development, additional acquisitions are needed to meet future demands, or surplus land can be conveyed for a different purpose;

Land Summary: total of 1200+ acres of grounds

a. Main Campus, comprised of West Campus, East Campus, and Oakland Drive Campus - 606 acres, of which 53 acres are leased back to the State for the Kalamazoo Regional Psychiatric Hospital. The University’s 1970 Campus Development Plan called for acquisition of properties contiguous to the west and northwest of the existing campus, to form the basis for future planning and facility development. The 1970 provisions for growth and development formed the central campus as it exists today. The 2000 Campus Master Plan provided an updated growth and development strategy for the future. The Campus Master Plan is available at WMU Facilities Management - Planning Division or on the web at: http://www.cf.wmich.edu/masterplan/

b. Parkview Campus – 276 acres. The Parkview Campus contains the College of Engineering and Applied Sciences building, the Paper Coating Pilot Plant, the Energy Resource Center and two parking decks. It is also the site for the Business, Technology and Research Park. The Parkview Campus Master Plan and the Research Park Design Standards are the basis for development of the Parkview Campus. Both are available at WMU Facilities Management – Planning Division or on the web at: http://www.cf.wmich.edu/planning/WebSites/ParkviewCampusMasterPlan/

c. Asylum Lake Preserve – 274 acres: conveyed to WMU by the State in 1975 for passive recreation and University research activities. The Asylum Lake Policy and Management Council monitors and manages all land use and research activities on the Asylum Lake Preserve. Operating policies and governance documents are found at:
http://www.wmich.edu/asylumlake/Asylum%20Lake%20Management%20Council.htm

d. Colony Farm – 54 acres: conveyed to WMU by the State in 1977 for passive recreation and University research activities. The university received approval from the legislature to allow expansion of the very successful Business, Technology and Research Park onto the Colony Farm property, lifting the existing land-use restrictions. The expansion would follow the Parkview Campus Master Plan and the Research Park Design Standards and would be open to the public, have walking trails, and be ecologically friendly.

e. Kleinstuck Preserve – 48 acres: designated for passive recreation

f. Kilgore Road Aviation Facilities – 5 acres: adjacent to Kalamazoo Regional Airport. Currently houses support facilities for the College of Aviation and the Department of Mechanical and Aeronautical Engineering, although these are to be relocated to the Parkview Campus.

g. Arboretum: property owned by the WMU Foundation for the support of the university.

h. Battle Creek Regional Campus: the Roy and Beulah Kendall Center; facility for WMU Extended University Programs

i. Grand Rapids Regional Campuses
WMU Graduate Center – Beltline (owned) and WMU Graduate Center – Downtown (leased); facilities for WMU Extended University Programs

j. College of Aviation Campus
The facilities at the Battle Creek Airport provide classrooms, offices, hangars, and other support spaces for the College of Aviation. The College of Aviation has completed a campus master plan and development plan to accommodate current and future needs. The report is available at WMU Facilities Management - Planning Division.

k. School of Medicine- WE Upjohn Campus
A former Pfizer research facility in downtown Kalamazoo that is being renovated for the new School of Medicine.
I. What portions of existing buildings, if any, are currently obligated to the State Building Authority and when these State Building Authority leases are set to expire.

See attached chart, “WMU Facilities Information”.
<table>
<thead>
<tr>
<th>Building Name</th>
<th>Original Construction</th>
<th>Most Recent Renovation</th>
<th>Square Footage</th>
<th>Current Use</th>
<th>General Physical Condition</th>
<th>Standards</th>
<th>Functionality</th>
<th>Replacement Value 2013-2014</th>
<th>MUSIC property valuation in 2013</th>
<th>Bonding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Therapy Building (Oakland Drive Campus)</td>
<td>1955</td>
<td>2006</td>
<td>52,700</td>
<td>ROTC Classrooms and Offices - 50%; University Surplus and Storage - 50%</td>
<td>Poor</td>
<td>Fair</td>
<td></td>
<td></td>
<td>4,519,991</td>
<td></td>
</tr>
<tr>
<td>Brown Hall</td>
<td>1967</td>
<td>2007</td>
<td>69,600</td>
<td>Classrooms - 100%</td>
<td>Good</td>
<td>Good</td>
<td>6,390,101</td>
<td>SBA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry Classroom Building</td>
<td>2006</td>
<td></td>
<td>83,331</td>
<td>Lecture halls - 20%; Chemistry labs - 75%; Offices - 5%</td>
<td>Good</td>
<td>Good</td>
<td>30,107,762</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Engineering (Parkview Campus)</td>
<td>2003</td>
<td></td>
<td>330,000</td>
<td>Classrooms - 25%; Engineering labs - 50%; Offices - 20%; Administrative - 5%</td>
<td>Good</td>
<td>Good</td>
<td>83,617,819</td>
<td>SBA expires 2040</td>
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<tr>
<td>College of Health and Human Services (Oakland Drive Campus)</td>
<td>2005</td>
<td></td>
<td>196,000</td>
<td>Classrooms - 35%; Labs - 30%; Offices - 30%; Administrative - 5%</td>
<td>Good</td>
<td>Meets standards</td>
<td>53,612,684</td>
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<td>Dalton Center</td>
<td>1982</td>
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<td>157,340</td>
<td>Classrooms - 75%; Offices - 20%; Administrative - 5%</td>
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<td>Good</td>
<td>21,373,478</td>
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<tr>
<td>Dunbar Hall</td>
<td>1971</td>
<td></td>
<td>75,449</td>
<td>Classrooms - 100%</td>
<td>Fair</td>
<td>Fair</td>
<td>7,213,480</td>
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<td>East Hall</td>
<td>1904</td>
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<td>111,706</td>
<td>University Archives - 30%; Surge Space - 70%</td>
<td>Poor</td>
<td>Poor</td>
<td>8,697,094</td>
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<td>Gilmore Theatre Complex</td>
<td>1967</td>
<td>1994</td>
<td>74,789</td>
<td>Classrooms - 65%; Office - 10%; Auditorium - 30%</td>
<td>Good</td>
<td>Good</td>
<td>16,171,839</td>
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<td>Haenicke Hall</td>
<td>1999</td>
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<td>80,000</td>
<td>Science laboratories (research) - 50%; Offices - 10%</td>
<td>Good</td>
<td>Meets standards</td>
<td>47,335,483</td>
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<td>Knauss Hall</td>
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<td>26,158</td>
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<td>Fair</td>
<td>Fair</td>
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<tr>
<td>Kohrman Hall / South Kohrman</td>
<td>1966</td>
<td>Renovation of South Kohrman completed 2007; Central Kohrman renovation in progress</td>
<td>211,500</td>
<td>Classrooms - 35%; Labs / Studios - 50%; Offices -15%</td>
<td>Poor to Good</td>
<td>Good</td>
<td>30,873,351</td>
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<td>Lawson Ice Arena / Gable Natatorium</td>
<td>1974</td>
<td>Ice Rink - 1996; Lobby / Locker rooms - 2006</td>
<td>103,000</td>
<td>Office - 10%; Athletics - 90%</td>
<td>Fair to Good</td>
<td>Good</td>
<td>17,753,049</td>
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<tr>
<td>Lee Honors College</td>
<td>1990</td>
<td>2012</td>
<td>11,915</td>
<td>Classrooms - 60%; Administrative - 40%</td>
<td>Good</td>
<td>Good</td>
<td>1,757,143</td>
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<td>Legacy Collections Center (Oakland Drive Campus)</td>
<td>2013</td>
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<td>16,373</td>
<td>Library-65%; Offices- 35%</td>
<td>Good</td>
<td>Good</td>
<td>8,612,499</td>
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<tr>
<td>McCracken Hall</td>
<td>1949</td>
<td>1985</td>
<td>185,947</td>
<td>Classrooms - 10%; Surge space - 90%</td>
<td>Poor</td>
<td>Poor</td>
<td>28,401,157</td>
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<td>Moore Hall</td>
<td>1962</td>
<td>Remodeled for new use 1973</td>
<td>71,206</td>
<td>Classrooms 20%; Office 80%</td>
<td>Poor to Fair</td>
<td>Fair</td>
<td>8,569,237</td>
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<tr>
<td>Richmond Center for Visual Arts</td>
<td>2006</td>
<td></td>
<td>52,517</td>
<td>Lecture halls - 10%; Art Studios - 25%; Offices - 25%; Galleries and service - 40%</td>
<td>Good</td>
<td>Good</td>
<td>15,208,601</td>
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<td>Rood Hall</td>
<td>1971</td>
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<td>124,418</td>
<td>Classrooms - 20%; Science laboratory - 60%; Office - 20%</td>
<td>Fair</td>
<td>Fair</td>
<td>19,586,946</td>
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<tr>
<td>New Sangren Hall</td>
<td>2012</td>
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<td>231,296</td>
<td>Classrooms-Office-Administrative-Library</td>
<td>Good</td>
<td>Good</td>
<td>70,087,806</td>
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<tr>
<td>Schneider Hall</td>
<td>1960</td>
<td></td>
<td>173,700</td>
<td>Classrooms - 89%; Office - 20%</td>
<td>Good</td>
<td>Good</td>
<td>24,993,859</td>
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<tr>
<td>School of Medicine (WE Upjohn Campus)</td>
<td>1985</td>
<td>Renovation started 2012; to be completed 2014</td>
<td>335,515</td>
<td>Existing Laboratory Building</td>
<td>Good</td>
<td>Good</td>
<td>69,500,000</td>
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## WMU Facilities Information FY2015

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Original Construction</th>
<th>Most Recent Renovation</th>
<th>Square Footage</th>
<th>Current Use</th>
<th>General Physical Condition</th>
<th>Standards</th>
<th>Functionality</th>
<th>Replacement Value (2013-2014)</th>
<th>MUSC valuation in dollars</th>
<th>Bonding</th>
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<tbody>
<tr>
<td>Student Recreation Center</td>
<td>1956</td>
<td>1994</td>
<td>240,017</td>
<td>Classrooms - 15% Office - 10% Recreation and Athletics - 75%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>36,496,256</td>
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<tr>
<td>Trimpe Building</td>
<td>1966</td>
<td></td>
<td>15,000</td>
<td>Classrooms - 30% Office - 35% Student Activities 35%</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>1,264,348</td>
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<td>School of Medicine &amp; Unified Clinics</td>
<td>1931</td>
<td>1995</td>
<td>36,318</td>
<td>Clinics - 60% Office - 30% Meeting - 10%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>22,641,517</td>
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<td>Waldo Library</td>
<td>1958</td>
<td>1991</td>
<td>261,846</td>
<td>Library - 80% Office - 20%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>362,366,403</td>
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<tr>
<td>Welborn Printing</td>
<td>1957</td>
<td>1995</td>
<td>28,600</td>
<td>Classrooms - 10% Printing Plant - 30%; Offices 20% Grants 40%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>2,084,069</td>
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<tr>
<td>Wood Hall</td>
<td>1962</td>
<td>1998</td>
<td>172,000</td>
<td>Classrooms - 70% Office - 30%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
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### Non-Academic Buildings - Main Campus

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<th>Building Name</th>
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<th>Most Recent Renovation</th>
<th>Square Footage</th>
<th>Current Use</th>
<th>General Physical Condition</th>
<th>Standards</th>
<th>Functionality</th>
<th>Replacement Value (2013-2014)</th>
<th>MUSC valuation in dollars</th>
<th>Bonding</th>
</tr>
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<tbody>
<tr>
<td>Bernhard Center</td>
<td>1957</td>
<td>2010</td>
<td>289,477</td>
<td>Bookstore/Retail - 30%, Offices - 10%, Food/Dining - 25%, Meeting - 20%, Study/Lounge - 10%</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>42,446,030</td>
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<tr>
<td>Campus Services Building</td>
<td>1987</td>
<td></td>
<td>34,150</td>
<td>Offices - 30% Service - 30% Warehouse - 40%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>2,719,600</td>
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<tr>
<td>Energy Resource Center (Parkview Campus)</td>
<td>2002</td>
<td></td>
<td>12,100</td>
<td>Service</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>10,426,136</td>
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<tr>
<td>Ellsworth Hall</td>
<td>1956 remodel for new use 1977</td>
<td>1985</td>
<td>98,348</td>
<td>Offices - 20% Administrative - 80%</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>12,557,439</td>
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<tr>
<td>Ernest Wilbur Building (Oakland Drive Campus)</td>
<td>1956</td>
<td></td>
<td>35,800</td>
<td>Leased space - 25% Offices - 20% Building Services - 50%</td>
<td>Poor</td>
<td>Fair</td>
<td>Fair</td>
<td>2,839,067</td>
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<tr>
<td>Everett Tower</td>
<td>1971 asbestos removal and ceiling replacement 2000</td>
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<td>30,450</td>
<td>Offices - 90% Meeting - 10%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>2,816,897</td>
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<tr>
<td>Faunce Student Services</td>
<td>1970 windows replaced 2001</td>
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<td>55,200</td>
<td>Administrative - 100%</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
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<tr>
<td>Fetzer Center</td>
<td>1983</td>
<td>2001</td>
<td>46,288</td>
<td>Conference Center</td>
<td>Good</td>
<td>Good</td>
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<td>Friedmann Hall</td>
<td>1971</td>
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<td>63,687</td>
<td>Offices</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
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<td>Gilmore House</td>
<td>1925</td>
<td>1998</td>
<td>12,216</td>
<td>Receptions &amp; Meetings</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>1,039,846</td>
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<tr>
<td>Kanley Chapel</td>
<td>1951</td>
<td></td>
<td>11,393</td>
<td>Faith &amp; Spiritual Development</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>1,415,827</td>
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<tr>
<td>Miller Auditorium</td>
<td>1967</td>
<td>1993</td>
<td>174,204</td>
<td>Auditorium</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>23,130,967</td>
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<tr>
<td>Montague House</td>
<td>1961 1983</td>
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<td>5,917</td>
<td>Offices</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>251,509</td>
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<tr>
<td>North Hall</td>
<td>1924</td>
<td></td>
<td>33,948</td>
<td>Surge Space - offices and storage</td>
<td>Poor</td>
<td>Poor</td>
<td>Poor</td>
<td>2,132,818</td>
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<td>Oakland Recital</td>
<td>1942</td>
<td>1997</td>
<td>14,456</td>
<td>Auditorium</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
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<td>Oaklands Residence</td>
<td>1869</td>
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<td>7,259</td>
<td>Reception and meeting center; hospitality</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>550,163</td>
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<td>Paper Coating Pilot Plant (Parkview Campus)</td>
<td>2002</td>
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<td>55,215</td>
<td>Service - 90% Offices - 10%</td>
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<td>Good</td>
<td>Good</td>
<td>22,297,927</td>
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<tr>
<td>Parking Services</td>
<td>Acquired in 1995</td>
<td>1995</td>
<td>2,938</td>
<td>Offices</td>
<td>Good</td>
<td>Good</td>
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<td>Physical Plant</td>
<td>1921</td>
<td>1998</td>
<td>44,795</td>
<td>Offices - 50% Service - 50%</td>
<td>Poor</td>
<td>Fair</td>
<td>Fair</td>
<td>2,199,485</td>
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<td>Power Plant</td>
<td>1930</td>
<td>1996</td>
<td>28,000</td>
<td>Service</td>
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<td>Good</td>
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<td>35,887,024</td>
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<td>Presidential Residence</td>
<td>Acquired in 1974</td>
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<td>Residence</td>
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<td>Seelye Indoor Practice Facility</td>
<td>2003</td>
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<td></td>
<td>Athletics</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
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<td>Building Name</td>
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<td>Functionality</td>
<td>Replacement Value (2013-2014)</td>
<td>Bonding</td>
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<td>Sindecuse Health Center</td>
<td>1969</td>
<td>Major renovation in 1996; Pharmacy renovation in 2006</td>
<td>56,200</td>
<td>Health Center - 85% Counseling and Testing - 20%</td>
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<td>8,606,904</td>
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<td>Siebert Administration Building</td>
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<td>1999</td>
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<td>Administration</td>
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<td>Good</td>
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<td>1967</td>
<td>1999</td>
<td>39,097</td>
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<td>Fair</td>
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<td>62,606</td>
<td>Service - 70% Offices - 30%</td>
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<td>University Fieldhouse</td>
<td>1957</td>
<td>1994</td>
<td>114,900</td>
<td>Offices - 10% Athletics - 90%</td>
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<td>Upholstery Shop</td>
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<td>6,660</td>
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<td>Fair</td>
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<td>Waldo Stadium</td>
<td>1939</td>
<td>2002</td>
<td>88,724</td>
<td>Intercollegiate Athletics</td>
<td>Good</td>
<td>Good</td>
<td>11,157,347</td>
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<td>Walwood Union</td>
<td>1938</td>
<td>1992</td>
<td>63,237</td>
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<td>Good</td>
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<td>Woodlawn Place</td>
<td>1994</td>
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<td>7,562</td>
<td>Daycare - 60% Offices - 40%</td>
<td>Fair</td>
<td>Good</td>
<td>282,239</td>
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### Off-Campus Buildings

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<tr>
<th>Building Name</th>
<th>Original Construction</th>
<th>Most Recent Renovation</th>
<th>Square Footage</th>
<th>Current Use</th>
<th>General Physical Condition</th>
<th>Functionality</th>
<th>Replacement Value (2013-2014)</th>
<th>Bonding</th>
</tr>
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<tbody>
<tr>
<td>Aviation Classroom</td>
<td>NA</td>
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<td>21,144</td>
<td>Classrooms - 20%; Research - 80%</td>
<td>Fair</td>
<td>Fair</td>
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<tr>
<td>Aviation Storage Facility</td>
<td>NA</td>
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<td>3,973</td>
<td>Service</td>
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<td>Fair</td>
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<td>Battle Creek Aviation Center</td>
<td>NA</td>
<td>1996</td>
<td>9,600</td>
<td>Offices</td>
<td>Good</td>
<td>Good</td>
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<tr>
<td>Battle Creek Aviation Center</td>
<td>NA</td>
<td>1996</td>
<td>16,000</td>
<td>Classrooms</td>
<td>Good</td>
<td>Good</td>
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<tr>
<td>Battle Creek Aviation Center</td>
<td>NA</td>
<td>1996</td>
<td>75,000</td>
<td>Aviation teaching laboratory</td>
<td>Good</td>
<td>Good</td>
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<tr>
<td>Battle Creek Aviation Center</td>
<td>NA</td>
<td>1996</td>
<td>14,000</td>
<td>Aviation teaching laboratory</td>
<td>Good</td>
<td>Good</td>
<td>2,378,352</td>
<td></td>
</tr>
<tr>
<td>Battle Creek Aviation Center</td>
<td>NA</td>
<td>1996</td>
<td>16,000</td>
<td>Aviation offices and storage</td>
<td>Fair</td>
<td>Good</td>
<td>2,773,593</td>
<td></td>
</tr>
<tr>
<td>Kendall Center - Battle Creek</td>
<td>NA</td>
<td>1992</td>
<td>38,500</td>
<td>Classrooms - 80% Offices - 20%</td>
<td>Good</td>
<td>Good</td>
<td>3,831,715</td>
<td></td>
</tr>
<tr>
<td>Grand Rapids Graduate Centers</td>
<td>NA</td>
<td>1992</td>
<td>38,075</td>
<td>Classrooms - 70% Offices - 25%</td>
<td>Good</td>
<td>Good</td>
<td>6,505,338</td>
<td></td>
</tr>
<tr>
<td>Grand Rapids Graduate Centers</td>
<td>NA</td>
<td>Leased 2000</td>
<td>55,500</td>
<td>Classrooms - 70% Offices - 25%</td>
<td>Good</td>
<td>Good</td>
<td>12,116,349</td>
<td></td>
</tr>
<tr>
<td>Lansing Campus</td>
<td>NA</td>
<td>Leased 1999</td>
<td></td>
<td>Classrooms - 80% Offices - 20%</td>
<td>NA</td>
<td>Good</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Michigan Basin Core Research Lab</td>
<td>NA</td>
<td>Leased in 2006</td>
<td>30,786</td>
<td>Research 90% Offices 10%</td>
<td>Good</td>
<td>Good</td>
<td>4,099,591</td>
<td></td>
</tr>
<tr>
<td>Muskegon Campus</td>
<td>NA</td>
<td>Leased 1992</td>
<td></td>
<td>Classrooms - 80% Offices - 20%</td>
<td>NA</td>
<td>Good</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Southwest Campus</td>
<td>2002</td>
<td>44,155</td>
<td></td>
<td>Classrooms - 80% Offices - 20%</td>
<td>Good</td>
<td>Good</td>
<td>9,552,710</td>
<td>SBA</td>
</tr>
<tr>
<td>Traverse City Campus</td>
<td>NA</td>
<td>Leased 1992</td>
<td></td>
<td>Classrooms - 80% Offices - 20%</td>
<td>NA</td>
<td>Good</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>West Hills Athletic Club</td>
<td>Acquired</td>
<td>1998</td>
<td>114,740</td>
<td>Recreation - 90% Offices - 10%</td>
<td>Good</td>
<td>Good</td>
<td>5,665,014</td>
<td></td>
</tr>
</tbody>
</table>
V. Implementation Plan

The Five-Year Capital Outlay Plan should identify the schedule by which the institution proposes to address major capital deficiencies, and:

a. Prioritize major capital projects requested from the State, including a brief project description and estimated cost, in the format provided. (Adjust previously developed or prior years figures utilizing industry standard CPI indexes where appropriate.);

Priority No. 1 is the proposed renovation and addition to the College of Aviation Classroom & Fleet Maintenance Building. Master plan studies for the College of Aviation were conducted in 2008 and resulted in the Campus Physical Development Plan in 2009. As a result of that Plan several needed projects were identified. One of those, this project is to improve and expand facilities at the College of Aviation that address current and future enrollment needs. New classrooms/labs are necessary to continue to accept students at the college that will match the quality of instruction and research to the standards of practice needed to meet the needs of the aviation/aerospace industry. Additionally, this improvement and expansion will promote the level of excellence and high standards in all educational programs, recruitment and outreach, and research, which will provide state, national, and international significance.

Refer to the chart, “Major Projects: FY 2013 – 2014”, for proposed or planned projects and estimated schedule information. The chart contains brief project descriptions, capital project priorities, and estimated costs.

The Western Michigan University Campus Master Plan

The Western Michigan University Campus Master Plan, initiated by President Elson Floyd in 1999, was completed and published in 2000. The Master Plan resulted from meetings, interviews, and research involving University faculty, staff, students and alumni as well as representatives of the city of Kalamazoo, neighborhood groups and interested members of the community. Key to the Campus Master Plan are the Fundamental Concepts. These ten guidelines are directions for future planning. They are used to test and evaluate the scope and direction of major projects at the University, including building projects, road and parking improvements, and signage.

The complete Campus Master Plan, including the Summary Brochure and the two-volume Technical Report may be found on the web at: http://www.cf.wmich.edu/masterplan/
Western Michigan University Submission
5-Year Comprehensive Master Plan
FY 2015 - 2019

Development of the new Parkview Campus is governed by the 2000 Parkview Campus Master Plan and the Business, Technology and Research Park Design Standards. Both documents are on file at WMU Campus Facilities or on the web at: http://www.cf.wmich.edu/planning/WebSites/ParkviewCampusMasterPlan/

Western Michigan University Planning Process

The Western Michigan University professional staff continually evaluates the appropriateness of function and performance of its facilities relative to technical needs, anticipated program growth and changing program requirements, modern teaching standards, new and evolving academic delivery systems, student services, facilities support and maintenance services. Priority has been given to academic programs housed in facilities inadequate to support modern technical and teaching requirements, and to colleges and departments that suffer from being physically scattered throughout the campus, causing inefficient operation and administration of programs and services, and diminished or non-existent interaction of students and faculty.

In addition, every potential project is evaluated as to how it will affect existing buildings functions and access, pedestrian and vehicular circulation and parking, demand on utilities, and the capacity of the stormwater management system.

b. If applicable, provide an estimate relative to the institution’s current deferred maintenance backlog. Define the impact of addressing deferred maintenance and structural repairs, including programmatic impact, immediately versus over the next five years;

The annual Deferred Maintenance Report, appended in abridged form to this report, addresses anticipated structural and systems repairs over the next 5 to 10 years, and recommends priorities for all major facilities maintenance. Critical items requiring immediate attention are also identified in the annual report.

Maintenance items relating to health and safety are of critical importance. Maintenance schedules for these items are determined, as appropriate, by WMU Public Safety, Environmental Health and Safety, and the Engineering and Maintenance Divisions of WMU Facilities Management.

c. Include the status of on-going projects financed with State Building Authority resources and explain how completion coincides with the overall Five-Year Capital Outlay Plan;

All current State Building Authority funded projects have been completed.
d. **Identify to the extent possible, a rate of return on planned expenditures. This could be expressed as operational “savings” that a planned capital expenditure would yield in future years;**

A rate of return on planned expenditures, or the future “operational savings” from a planned capital expenditure has not been projected for all projects. The annual Deferred Maintenance Report estimates the yearly cost of preventative and deferred maintenance schedules, and includes analysis of savings and paybacks resulting from the University’s energy management programs.

e. **Where applicable, consider alternatives to new infrastructure, such as distance learning;**

The university conducts on-going faculty development and classroom technology reviews and upgrade. The Office of Information Technology and WMU’s Extended University Programs work directly with the academic departments to develop and provide alternative learning solutions, including on-line courses and degree programs, regional site programs, compressed video interactive television, conversion of face-to-face course content to web-based delivery, and “tape delay” recorded lectures.

In-depth discussions of technology needs and alternative teaching methods occur during the programming phase of each major capital project. Outside professional specialists assist staff from Facilities Management, information and academic technology, the Registrar’s office, and others, in proposing and evaluating the latest trends in institutional facilities and course delivery systems.

f. **Identify a maintenance schedule for major maintenance items in excess of $1,000,000 for FY 2010 – FY 2014.**

The annual Deferred Maintenance Report, included in this submittal, estimates the costs of all anticipated maintenance items.

g. **Identify the amount of non-routine maintenance the institution has budgeted for in its current fiscal year and relevant sources of financing.**

WMU has no budget for non-routine maintenance in the current fiscal year.
| #1 | College of Aviation Classroom and Fleet Maintenance Building Renovation and Addition for Instruction and Research | $19 M | State / WMU | Yes |
| #2 | New Student Union and Services Center | $75 M | State / WMU | Proposed |
| #3 | Renovation of Lab Floors 4 & 6 in the WMU Building on the W. E. Upjohn Campus for Research, Grants and Projects. | $50 M | State / WMU | Proposed |
| #4 | Renovation of Dunbar Hall (Classroom Building) | $21 M | State / WMU | Proposed |
| #5 | Campus Housing Apartments & Residence Halls | $60 M | WMU | No |
| #6 | New Campus Dining Facility | $35 M | WMU | No |
| #7 | WMU School of Medicine Facility in the WMU Bldg on the W. E. Upjohn Campus. | $70 M | Private | No |
| #8 | Renovation of North and Central Kohrman Hall (Classroom Building) | $24 M | State / WMU | Proposed |
| #9 | Addition to College of Engineering for Research, Instruction, and Civil Engineering | $50 M | State / WMU | Proposed |
| #10 | Multidisciplinary Science Research Facility | $100 M | State / WMU | Proposed |
| #11 | Sprau Tower Renovation | $10 M | WMU | No |
| #12 | East Campus Building Renovation for the Alumni Center | $15 M | WMU / Private | No |
| #13 | Upgrades and Improvements to Athletic Facilities | TBD | WMU | No |
| #14 | Relocate Physical Plant | TBD | WMU | No |
| #15 | College of Aviation, Aviation and Flight Operations and Aviation Maintenance Building - Renovation and Addition | $32 M | State / WMU | Proposed |
| #16 | Faculty, Center, and Institute Office Facility | $5 M | WMU | No |
| #17 | Miller Auditorium Addition | $10 M | WMU | No |
| #18 | New Parking Ramp | $8 M | WMU | No |
| #19 | New Auditorium Hall | $11 M | State / WMU | Proposed |

Approved by the Board of Trustees December 5, 2013
APPENDIX
Facility Asset Reinvestment
2013 - 2014

Recommendations:

I. Building Systems
   A. Building Envelope
   B. Elevators
   C. Building Interior
   D. Building Mechanical
   E. Building Electrical
   F. Direct Digital Controls

II. Grounds/Landscape

III. Risk Management/Life Safety
   A. Fire Systems
   B. Emergency Notification
   C. Emergency/Exit Lights
   D. Generator

IV. Roads/Infrastructure

V. Utilities
   A. Chilled Water
   B. Electrical
   C. Steam/Condensate
   D. Sanitary
   E. Storm

VI. Energy Conservation
   A. Energy Management
   B. Commissioning
Building Systems

Building Envelope
- Elevators
- Building Interior
- Building Mechanical
- Building Electrical
- Direct Digital Control

Building Envelope
Building Envelope

Roof Analysis

S.F. by Age and Type  GF Fall 2013
Total Sq. Ft. 2,115,161
Critical Areas
- AT Building – West wing
- EWB – East section
- Physical Plant – area over the shops

Critical Area – Deferred
- East Hall – connector
- McCracken Hall – old, upper section
# Building Envelope
## Roof Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Safety – All Sections</td>
<td>$125,000</td>
</tr>
<tr>
<td>Ernest Wilbur Building – All Sections</td>
<td>$225,000</td>
</tr>
<tr>
<td>Parking Structure 1 – Stair Tower Roofs</td>
<td>$35,000</td>
</tr>
<tr>
<td>Parking Structure 2 – Stair Tower Roofs</td>
<td>$50,000</td>
</tr>
<tr>
<td>AT Building – Section C/ROTC</td>
<td>$95,000</td>
</tr>
<tr>
<td>Power Plant – Sections D, E, F, G, K</td>
<td>$75,000</td>
</tr>
<tr>
<td>Lawson Ice Arena – Pool Roof</td>
<td>$200,000</td>
</tr>
<tr>
<td>Physical Plant – All Sections</td>
<td>$300,000</td>
</tr>
<tr>
<td>AT Building – Section A</td>
<td>$95,000</td>
</tr>
<tr>
<td>AT Building – Sections B</td>
<td>$95,000</td>
</tr>
<tr>
<td>Antenna Farm Building</td>
<td>$20,000</td>
</tr>
<tr>
<td>Salt Dome – Repair Exterior Coating</td>
<td>$35,000</td>
</tr>
<tr>
<td>McCracken Hall – Sections C&amp;E</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

**Recommendation: $1,450,000**
## Building Envelope

### Structural Integrity Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration Bldg – Exterior Caulk</td>
<td>$85,000</td>
</tr>
<tr>
<td>CEAS - exterior caulk repair 1/4 of building</td>
<td>$50,000</td>
</tr>
<tr>
<td>Waldo Stadium – Misc Concrete Repair</td>
<td>$25,000</td>
</tr>
<tr>
<td>Misc Annual Repairs – Pedestrian Bridge/UCC Planter Walls</td>
<td>$15,000</td>
</tr>
<tr>
<td>Moore Hall – Entrance #7 Masonry Repairs</td>
<td>$25,000</td>
</tr>
<tr>
<td>Wood/Haenicke – Connecting Tunnel Repairs</td>
<td>$80,000</td>
</tr>
<tr>
<td>Computer Center – Exterior Caulk/Tile Repair</td>
<td>$50,000</td>
</tr>
<tr>
<td>Waldo Library – Exterior Caulk/Tile Repair</td>
<td>$100,000</td>
</tr>
<tr>
<td>Paper Plant – Exterior Caulk</td>
<td>$50,000</td>
</tr>
<tr>
<td>Seelye Center – Paint Exterior Trim</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $530,000
### Building Envelope

**Window & Door Recommendation Summary**

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilmore Theater Complex – Main Entrance Wind Screen</td>
<td>$20,000</td>
</tr>
<tr>
<td>Haenicke Hall – Replace entrance #2</td>
<td>$10,000</td>
</tr>
<tr>
<td>Haenicke/Wood – Bridge flashing</td>
<td>$15,000</td>
</tr>
<tr>
<td>Henry Hall – ADA ramps at entrances #3 &amp; #4</td>
<td>$15,000</td>
</tr>
<tr>
<td>EWB - Replace windows</td>
<td>$320,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $380,000
Building Systems

- Elevators
- Building Envelope
- Building Interior
- Building Mechanical
- Building Electrical
- Direct Digital Control

Elevator
ELEVATOR
Age of Elevators

- Building Systems
- Grounds/Landscape Risk Management
- Roads/Infrastructure
- Utilities Energy Conservation

![Bar Chart]
## Elevator
### Passenger Elevator Age Analysis

<table>
<thead>
<tr>
<th>2013 Age of Elevator Analysis</th>
<th>General Fund Over 25 Years Old</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years</strong></td>
<td><strong>Elevator</strong></td>
</tr>
<tr>
<td>0 to 5</td>
<td>16</td>
</tr>
<tr>
<td>6 to 10</td>
<td>19</td>
</tr>
<tr>
<td>11 to 15</td>
<td>29</td>
</tr>
<tr>
<td>16 to 20</td>
<td>11</td>
</tr>
<tr>
<td>21 to 25</td>
<td>7</td>
</tr>
<tr>
<td>OVER 25</td>
<td>11</td>
</tr>
</tbody>
</table>

---

*Note: The table above provides the age analysis of passenger elevators and the general fund over 25 years old.*
# Elevator Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprau EV-1 Driver Replacement</td>
<td>$85,000</td>
</tr>
<tr>
<td>Haenicke EV-1 Door Operator Upgrade</td>
<td>$29,000</td>
</tr>
<tr>
<td>Wood EV-1 Door Operator Upgrade</td>
<td>$43,000</td>
</tr>
<tr>
<td>COE Door Operator Controller Kits</td>
<td>$10,000</td>
</tr>
<tr>
<td>Waldo Library EV-1</td>
<td>$213,000</td>
</tr>
<tr>
<td>Miller Parking</td>
<td>$210,000</td>
</tr>
<tr>
<td>Computer Center EV-2</td>
<td>$230,000</td>
</tr>
<tr>
<td>Walwood Union EV-1</td>
<td>$195,000</td>
</tr>
<tr>
<td>Waldo Library EV-3</td>
<td>$91,000</td>
</tr>
<tr>
<td>Sprau EV-1 &amp; EV-2 Ceiling Replacement</td>
<td>$14,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $1,120,000
Building Systems

Building Interior

Building Envelope
Elevators
Building Interior
Building Mechanical
Building Electrical
Direct Digital Control
# Building Interior

## Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rood Hall Classroom Improvements (3391, 3395, 3393, 1107, &amp; 1192)</td>
<td>$100,000</td>
</tr>
<tr>
<td>Painting of Classrooms Across Campus</td>
<td>$50,000</td>
</tr>
<tr>
<td>Painting &amp; Ceiling Pad Replacement</td>
<td>$25,000</td>
</tr>
<tr>
<td>Interior Building Directories (Dalton, Friedmann)</td>
<td>$20,000</td>
</tr>
<tr>
<td>Rood &amp; Dunbar Waste Receptacles</td>
<td>$50,000</td>
</tr>
<tr>
<td>Floor Replacement in Lounge Spaces (COEAS, Chemistry)</td>
<td>$62,000</td>
</tr>
<tr>
<td>Faucet/Fixture Replacement</td>
<td>$10,000</td>
</tr>
<tr>
<td>Moore Hall ADA Bathroom Renovation</td>
<td>$100,000</td>
</tr>
<tr>
<td>Rood Hall Classroom Improvements (1120, 1122, &amp; 1117)</td>
<td>$155,000</td>
</tr>
</tbody>
</table>

**Recommendation: $572,000**
Building Systems

Building Mechanical

- Building Envelope
- Elevators
- Building Interior
- Building Mechanical
- Building Electrical
- Direct Digital Control
## Building Mechanical

### Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rood Hall – Replace Steam Relief Valve (Mech Room)</td>
<td>$40,000</td>
</tr>
<tr>
<td>Rood Hall – Replace SF-4 Cooling Coil &amp; (5) Condensate Pans</td>
<td>$60,000</td>
</tr>
<tr>
<td>Kohrman/Miller – Domestic Water Heater Replacement</td>
<td>$20,000</td>
</tr>
<tr>
<td>Sprau Tower – Air Handler Repair</td>
<td>$60,000</td>
</tr>
<tr>
<td>Kohrman Hall – Air Separator Replacement</td>
<td>$100,000</td>
</tr>
<tr>
<td>Haenicke Hall – Replace Control Air Dryer</td>
<td>$5,000</td>
</tr>
<tr>
<td>Haenicke Hall – RO/DI System Upgrades</td>
<td>$50,000</td>
</tr>
<tr>
<td>SRC – Humidification for Racquet Ball</td>
<td>$27,000</td>
</tr>
<tr>
<td>Moore Hall – Unit Ventilators</td>
<td>$40,000</td>
</tr>
<tr>
<td>Trimpe – Unit Ventilators</td>
<td>$15,000</td>
</tr>
<tr>
<td>Walwood – Heat Pumps</td>
<td>$400,000</td>
</tr>
<tr>
<td>Sindenacuse AC-2 – Refurbish Air Handler</td>
<td>$15,000</td>
</tr>
</tbody>
</table>

**Recommendation: $832,000**
Building Electrical
## Building Electrical

### Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waldo Library Substation B Replacement</td>
<td>$260,000</td>
</tr>
<tr>
<td>Building Arc Flash Studies</td>
<td>$45,000</td>
</tr>
<tr>
<td>Moore Hall Substation Replacement</td>
<td>$350,000</td>
</tr>
<tr>
<td>Engineer IF 1 Substation Replacement (PCB Contaminated)</td>
<td>$60,000</td>
</tr>
<tr>
<td>Replace/Upgrade Kohrman Hall Protection Relays</td>
<td>$18,000</td>
</tr>
<tr>
<td>Replace/Upgrade Haenicke Hall Protection Relays</td>
<td>$18,000</td>
</tr>
<tr>
<td>Engineer Faunce Substation Equipment Replacement</td>
<td>$60,000</td>
</tr>
<tr>
<td>Replace IF-1 Substation</td>
<td>$600,000</td>
</tr>
</tbody>
</table>

**Recommendation: $1,411,000**
Direct Digital Control
# Direct Digital Control

## Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAS – Upgrade SRC</td>
<td>$120,000</td>
</tr>
<tr>
<td>Waldo Library – Replace dampers (AHU)</td>
<td>$107,000</td>
</tr>
<tr>
<td>Seibert Administration – Replace Radiant Valves</td>
<td>$46,000</td>
</tr>
<tr>
<td>Waldo Library – Upgrade Pneumatic VAV Controls to DDC</td>
<td>$100,000</td>
</tr>
<tr>
<td>Bill Brown – Upgrade/Replace Heat Pump Controls</td>
<td>$110,000</td>
</tr>
<tr>
<td>Faunce – BAS Upgrade</td>
<td>$40,000</td>
</tr>
<tr>
<td>Everett Tower – Complete BAS Control</td>
<td>$5,000</td>
</tr>
<tr>
<td>Fetzer – Complete BAS Control</td>
<td>$25,000</td>
</tr>
<tr>
<td>Campus Services - Upgrade Pneumatic VAV Controls to DDC</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

**Recommendation: $653,000**
# Landscape Recommendation Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Replacement Program</td>
<td>$15,000</td>
</tr>
<tr>
<td>Campus Wide Irrigation Upgrades</td>
<td>$50,000</td>
</tr>
<tr>
<td>Refurbish Plexus Baskets and Benches</td>
<td>$43,000</td>
</tr>
<tr>
<td>Lot 16 Traffic Island Re-Landscape</td>
<td>$15,000</td>
</tr>
<tr>
<td>Core of Campus Walk Replacement</td>
<td>$510,000</td>
</tr>
<tr>
<td>Campus Wide Curb Cuts</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $658,000
Risk Management

Life Safety

- Emergency Notification
- Emergency/Exit Lights
- Generators

Life Safety
Life Safety
Central Monitoring System Analysis

- Graphics available for 55 of the 76 buildings being monitored
- Emergency Notification messages available at 56 building locations
- Exterior speakers located on 14 buildings providing coverage of 80% of Campus
**Life Safety**

**Fire suppression System Analysis**

<table>
<thead>
<tr>
<th>Category</th>
<th>Sprinkled</th>
<th>Not Sprinkled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residence Halls &amp; Apartments</td>
<td>249,416</td>
<td>2,273,538</td>
</tr>
<tr>
<td>Conference Centers &amp; Places of Assembly</td>
<td>949,377</td>
<td>1,345,924</td>
</tr>
<tr>
<td>Office &amp; Classroom</td>
<td>2,430,576.4</td>
<td>4,105,131.4</td>
</tr>
</tbody>
</table>

**Sprinkled**  

**Not Sprinkled**
## Life Safety

### Fire Alarm System Analysis

#### 2013 Data Analysis

<table>
<thead>
<tr>
<th>Years</th>
<th>Fire Panels</th>
<th>GF</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>20</td>
<td>13</td>
<td>16%</td>
</tr>
<tr>
<td>6 to 10</td>
<td>12</td>
<td>12</td>
<td>15%</td>
</tr>
<tr>
<td>11 to 15</td>
<td>10</td>
<td>10</td>
<td>13%</td>
</tr>
<tr>
<td>16 to 20</td>
<td>14</td>
<td>12</td>
<td>15%</td>
</tr>
<tr>
<td>21 to 25</td>
<td>2</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>OVER 25</td>
<td>22</td>
<td>12</td>
<td>15%</td>
</tr>
</tbody>
</table>

#### GF Over 25 Years Old

<table>
<thead>
<tr>
<th>Buildings</th>
<th>Year Inst.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore Hall</td>
<td>1983/1962</td>
</tr>
<tr>
<td>Ellsworth Hall Recommend upgrade</td>
<td>1956</td>
</tr>
<tr>
<td>West Hills</td>
<td></td>
</tr>
<tr>
<td>Dunbar Hall Recommend for upgrade</td>
<td>1971</td>
</tr>
</tbody>
</table>

#### Percentage of Elevators per Age Range

![Bar Chart](chart.png)

<table>
<thead>
<tr>
<th>Age Range</th>
<th>2002</th>
<th>2007</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 to 10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11 to 15</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16 to 20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21 to 25</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OVER 25</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Buildings

- **Friedmann Hall**—recommend upgrade (1970)
- **Knauss Hall**—recommend upgrade (1971)
- **Aviation Facility**—1960
## Life Safety

### Master Plan Update

<table>
<thead>
<tr>
<th>Year 1 (2014)</th>
<th>Building</th>
<th>Sq. Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moore Hall</td>
<td>66,356</td>
<td></td>
</tr>
<tr>
<td>Ellsworth Hall</td>
<td>89,925</td>
<td></td>
</tr>
<tr>
<td>West Hills</td>
<td>114,740</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>271,021</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2 (2015)</th>
<th>Building</th>
<th>Sq. Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunbar</td>
<td>78,170</td>
<td></td>
</tr>
<tr>
<td>Knauss</td>
<td>25,924</td>
<td></td>
</tr>
<tr>
<td>Friedman Hall</td>
<td>67,187</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>183,871</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3 (2016)</th>
<th>Building</th>
<th>Sq. Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWB</td>
<td>35,697</td>
<td></td>
</tr>
<tr>
<td>Campus Services</td>
<td>34,148</td>
<td></td>
</tr>
<tr>
<td>John Gill</td>
<td>20,065</td>
<td></td>
</tr>
<tr>
<td>Walwood Union</td>
<td>61,224</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>151,134</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 4 (2017)</th>
<th>Building</th>
<th>Sq. Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanley Chapel</td>
<td>15,590</td>
<td></td>
</tr>
<tr>
<td>511 Monroe</td>
<td>18,123</td>
<td></td>
</tr>
<tr>
<td>Power Plant</td>
<td>49,001</td>
<td></td>
</tr>
<tr>
<td>Parking Services</td>
<td>2,938</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>85,652</strong></td>
<td></td>
</tr>
</tbody>
</table>
# Life Safety

## System Upgrade Recommendation

<table>
<thead>
<tr>
<th>Description</th>
<th>Square Footage</th>
<th>Total Budget</th>
<th>Design Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friedmann/Dunbar/Knuass</td>
<td>183,781</td>
<td>$308,000</td>
<td>$14,000</td>
</tr>
<tr>
<td>Moore Hall</td>
<td>66,356</td>
<td>$122,000</td>
<td>$5,500</td>
</tr>
<tr>
<td>West Hills</td>
<td>114,740</td>
<td>$62,000</td>
<td>$5,500</td>
</tr>
<tr>
<td>Ellsworth</td>
<td>89,925</td>
<td>$124,000</td>
<td>$5,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,400,620</strong></td>
<td><strong>$616,000</strong></td>
<td><strong>$30,500</strong></td>
</tr>
</tbody>
</table>

**Recommendation: $616,000**
## Life Safety

### Panel Upgrade Only Recommendation

<table>
<thead>
<tr>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sindecuse</td>
<td>$30,000</td>
</tr>
<tr>
<td>Student Recreation Center</td>
<td>$30,000</td>
</tr>
<tr>
<td>*SRC – Panel Relocation</td>
<td>$88,000</td>
</tr>
</tbody>
</table>

* Includes cost of new panel. Would be relocating panel from 2nd floor main office to loading dock. The loading dock would allow fire emergency personnel direct access to the panel in the event of an emergency.

**Recommendation: $148,000**
Risk Management

Life Safety
Emergency Notification
Emergency/Exit Lights
Generators

Emergency Notification
# Emergency Notification

## Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Waldo Library</td>
<td>$117,000</td>
</tr>
<tr>
<td>Service Gateway Software</td>
<td>$35,000</td>
</tr>
<tr>
<td>NOAA Weather Alert</td>
<td>$15,000</td>
</tr>
</tbody>
</table>

*Devices (Interior Speaker)

**Recommendation: $167,000**
Risk Management

Life Safety
Emergency Notification
Emergency/Exit Lights
Generators

Emergency/Exit Lights
# Emergency/Exit Lights

## Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Brown – Replace Exit Signs and Repair Emergency Fixtures</td>
<td>$30,000</td>
</tr>
<tr>
<td>Campus Wide – Emergency/Exit Light Audit</td>
<td></td>
</tr>
</tbody>
</table>

**Recommendation: $30,000**
Risk Management

- Life Safety
- Emergency Notification
- Emergency/Exit Lights
- Generators
Emergency Generators Analysis

Criteria:
- Housing Buildings
- Assembly Buildings
- Classroom Buildings
- Office/Administration Buildings

42 Buildings Covered
17 Buildings Need Generators
Emergency Generators

Generator Recommendation

- Read Arena Generator
  - Cost: $222,000

- SRC Emergency Generator
  - Cost: $282,000

- Lawson Ice Arena
  - Cost: $147,000

- Sindecuse Generator
  - Cost: $182,000

- Schneider Hall Generator
  - Cost: $172,000

Recommendation: $1,005,000
# Emergency Generators

## Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Arena Generator</td>
<td>$222,000</td>
</tr>
<tr>
<td>SRC Emergency Generator</td>
<td>$282,000</td>
</tr>
<tr>
<td>Lawson Ice Arena Emergency Generator</td>
<td>$147,000</td>
</tr>
<tr>
<td>Sindicuse Emergency Generator</td>
<td>$182,000</td>
</tr>
<tr>
<td>Schneider Hall Emergency Generator</td>
<td>$172,000</td>
</tr>
</tbody>
</table>

**Recommendation: $1,005,000**
Chilled Water
Electrical
Steam/Condensate
Sanitary Sewer
Storm Sewer
# Chilled Water

## Cooling Tower by Age and Location

<table>
<thead>
<tr>
<th>Building</th>
<th>Age</th>
<th>Installed</th>
<th>Ground/Roof Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCracken</td>
<td>29</td>
<td>1984</td>
<td>Ground (Decommissioned)</td>
</tr>
<tr>
<td>Miller Auditorium</td>
<td>23</td>
<td>1990</td>
<td>Ground</td>
</tr>
<tr>
<td>Waldo Library</td>
<td>22</td>
<td>1991</td>
<td>Roof</td>
</tr>
<tr>
<td>Lawson Ice Arena</td>
<td>20</td>
<td>1993</td>
<td>Ground</td>
</tr>
<tr>
<td>Walwood Union</td>
<td>17</td>
<td>1996</td>
<td>Ground</td>
</tr>
<tr>
<td>Kohrman Hall</td>
<td>16</td>
<td>1997</td>
<td>Ground</td>
</tr>
<tr>
<td>Health &amp; Human</td>
<td>8</td>
<td>2005</td>
<td>Ground</td>
</tr>
<tr>
<td>Rood Hall</td>
<td>5</td>
<td>2008</td>
<td>Roof</td>
</tr>
<tr>
<td>Bernhard Center</td>
<td>5</td>
<td>2008</td>
<td>Roof</td>
</tr>
<tr>
<td>Friedmann Hall</td>
<td>1</td>
<td>1997 (Refurbished 2013)</td>
<td>Ground</td>
</tr>
<tr>
<td>Schneider Hall</td>
<td>1</td>
<td>2012</td>
<td>Ground</td>
</tr>
<tr>
<td>Student Recreation Center</td>
<td>1</td>
<td>1993 (Refurbished 2013)</td>
<td>Roof</td>
</tr>
</tbody>
</table>

*Life Expectancy – 25 years*
Chilled Water
Age of Chiller Plants

*Life Expectancy – 25 years
<table>
<thead>
<tr>
<th>Building</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miller Cooling Tower Enclosure Replacement</td>
<td>$220,000</td>
</tr>
<tr>
<td>Miller Cooling Tower Replacement</td>
<td>$130,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $350,000
Utilities

Chilled Water
Electrical
Steam/Condensate
Sanitary Sewer
Storm Sewer

Electrical
Criteria for Conditional Analysis

- Age
- Location
- Capacity
- Past Operational Issues
17.75 Miles of Primary Cable

105 Substations

- 45% of cable is in good condition
- 38% of substations are in good condition
- 46% of cable is in fair condition
- 50% of substations are in fair condition
- 9% of cable is in poor condition or overhead
- 12% of substations are in poor condition
Electrical
Primary Electric Recommendations

Recommendations:
• Goldsworth Valley Overhead Line Replacement
• Elmwood Overhead Line Replacement
• Electrical Vault Maintenance
• Engineer NE Duct Bank under Stadium Drive
• Exterior Lighting

Additional Recommendations:
• Exterior Lighting Upgrades
• Main Campus Device Coordination Study
• Medium Voltage Switchgear Maintenance
## Electrical

**Recommendation Summary**

<table>
<thead>
<tr>
<th>Building Recommendation</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Vault Maintenance</td>
<td>$50,000</td>
</tr>
<tr>
<td>Exterior Lighting Upgrade</td>
<td>$50,000</td>
</tr>
<tr>
<td>Medium Voltage Switch Gear Maintenance</td>
<td>$50,000</td>
</tr>
<tr>
<td>Repair GV Apartments Overhead Electric</td>
<td>$165,000</td>
</tr>
<tr>
<td>Elmwood Overhead Electric Upgrade</td>
<td>$400,000</td>
</tr>
<tr>
<td>Main Campus Device Coordination Study</td>
<td>$30,000</td>
</tr>
<tr>
<td>Engineer New Duct Bank Under Stadium Drive</td>
<td>$60,000</td>
</tr>
<tr>
<td>Complete “C” Loop to Power Plant</td>
<td>$750,000</td>
</tr>
<tr>
<td>Complete “D” Loop from CHHS to Legacy</td>
<td>$690,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $2,245,000
Steam/Condensate

Chilled Water
Electrical
Steam/Condensate
Sanitary Sewer
Storm Sewer
Steam/Condensate Analysis

- 7.5 miles of steam mains
- 5 Cross Tied Zones
- Total Asset Value - $60M
Steam/Condensate Analysis

- Good – 42%
Steam/Condensate Analysis

- Fair 33%
**Steam/Condensate Analysis**

- Poor – 25%
**Recommendation Summary**

<table>
<thead>
<tr>
<th>Building</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sindecuse Feed Replacement</td>
<td>$150,000</td>
</tr>
<tr>
<td>North Pump House Infrastructure Upgrade</td>
<td>$35,000</td>
</tr>
<tr>
<td>Burnhams – Replace Condensate</td>
<td>$40,000</td>
</tr>
<tr>
<td>Steam Vault Repairs</td>
<td>$100,000</td>
</tr>
<tr>
<td>East Campus</td>
<td>$330,000 - $1.12M*</td>
</tr>
</tbody>
</table>

**Recommendation: $655,000 *
Utilities

Sanitary Sewer

Chilled Water
Electrical
Steam/Condensate
Sanitary Sewer
Storm Sewer
Sanitary Sewer Analysis

11.5 miles owned by WMU
Sanitary Sewer Recommendation

- Video a selection of the lines completed 5+ years ago to review for any significant deterioration
  - Cost: $15,000

Recommendation: $25,000
## Sanitary Sewer
### Recommendation Summary

<table>
<thead>
<tr>
<th>Building</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video of Lines</td>
<td>$15,000</td>
</tr>
</tbody>
</table>

**Recommendation:** $15,000
Storm Sewer

- Chilled Water
- Electrical
- Steam/Condensate
- Sanitary Sewer
- Storm Sewer
Storm Sewer Analysis

- 40 Miles of Storm Sewer Lines
- 5 BMP sites from 2013
  - Lawson – 3 areas
  - Power Plant
  - Schneider Hall
Storm Sewer
Goldsworth Valley Pond

- MDEQ 319 Grant Opportunity
- MDEQ Review WMU’s preliminary proposal and approved our plan to apply
- Construction costs and matching funds are being determined

Recommendation: Pending Grant Opportunity
**Storm Sewer**

**SAW Grant Opportunity**

- MDEQ – SAW Grant
  - Storm & Sanitary Sewer
- Match 10% - 50%
- End of Goal of creating a budget plan for renewal based on system life cycle
  - Any work done to obtain condition data since Jan 2013 is match eligible (Video work on Sewers)
  - Construction cost and match requirements are yet to be finalized

**Recommendation: Pending Grant Opportunity**
# Storm Sewer

## Recommendation Summary

<table>
<thead>
<tr>
<th>Building</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goldworth Valley Pond</td>
<td>Pending Grant Opportunity</td>
</tr>
<tr>
<td>MDEQ – Saw Grant Opportunity</td>
<td>Pending Grant Opportunity</td>
</tr>
</tbody>
</table>
Energy Conservation

Energy Management

Commissioning
# Energy Management

## Recommendation Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeley Center – Lighting Upgrade</td>
<td>$75,000</td>
</tr>
<tr>
<td>University Arena – Lighting Upgrade</td>
<td>$25,000</td>
</tr>
<tr>
<td>Campus Wide – Incandescent Phase Out</td>
<td>$25,000</td>
</tr>
<tr>
<td>Campus Wide – Various ECM’s</td>
<td>$25,000</td>
</tr>
<tr>
<td>Campus Wide – Street Light Upgrade</td>
<td>$100,000</td>
</tr>
<tr>
<td>Campus Wide – Stairwell Lighting Upgrade</td>
<td>$25,000</td>
</tr>
<tr>
<td>CHHS – Metal Halide Replacement</td>
<td>$25,000</td>
</tr>
<tr>
<td>Lawson – Ice Resurfacing Machine Room Door</td>
<td>$25,000</td>
</tr>
<tr>
<td>Haenicke – Water Upgrades</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

**Recommendation: $350,000**
Energy Conservation

Energy Management

Commissioning

Commissioning
Commissioning
History of Commissioning at WMU

• Building Performance Team started by Greg Roseboom in 1994, Retro-Cx
• Commissioning for new buildings started in 1996, Wood & Haenicke Halls
• Continuous Commissioning started in 2009 utilized building technology to maintain proper operation
New building commissioning ensures that buildings are:

- Designed with needs in mind
- Built to specifications
- Tested with performance documented
- In-house maintenance properly trained
- 14 buildings to date
Building Commissioned

- Haenicke/Wood
- CEAS, Paper Pilot, ERC
- Health & Human Services
- Brown Hall
- New Chemistry
- RCVA
- South/Central Kohrman
- Lee Honors
- Sangren Hall
- Western View Apartments – Phase 1

Buildings currently undergoing commissioning

- Zhang Legacy Collection Center
- Western View Apartments – Phase 2
• Ensures that buildings continue to operate properly throughout their life time
• Ensures that major changes in use of a building are accounted for
• Example of Continuous Commissioning efforts:
  • AHU Runtime
  • Chiller Optimization
  • Outside Air Accuracy
  • Exhaust Fan Schedules
Commissioning
Continuous Commissioning Analysis

<table>
<thead>
<tr>
<th>Project</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed AHU &amp; EF Runtime Monitoring</td>
<td>Complete, Ongoing Management</td>
</tr>
<tr>
<td>Defective Occupancy Sensors</td>
<td></td>
</tr>
<tr>
<td>Review/trend chiller plant efficiencies</td>
<td>Expanding</td>
</tr>
<tr>
<td>Review/trend outside air intake for air handlers</td>
<td>In-progress</td>
</tr>
</tbody>
</table>
Commissioning
Retro-Commissioning

- Systematic process applied to existing buildings for identifying and implementing O&M improvements and for ensuring their continued performance over time

- Objectives:
  - Improve equipment performance
  - Improve comfort level
  - Reduce energy and operational costs
  - Increase equipment life expectancy
  - Improve IAQ
  - Improve O&M
  - Reduce maintenance service calls
Building Systems Risk Management Roads/Infrastructure Utilities Energy Conservation

• Retro-commissioning existing buildings can produce significant cost savings, which are depended on the following:
  • Building Type
  • Location
  • Scope
• In accordance to a comprehensive study conducted by Lawrence Berkeley National Laboratory energy cost savings ranges from $0.11 - $0.72/sq. ft.
Selection process is primarily based on building age and EUI (Energy Use Intensity)

- EUI is a measuring factor used in comparing buildings of similar square-footage

<table>
<thead>
<tr>
<th>Building</th>
<th>Year Built</th>
<th>EUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalton Center</td>
<td>1982</td>
<td>69 kbtu/sq. ft.</td>
</tr>
<tr>
<td>Schneider Hall</td>
<td>1990</td>
<td>71 kbtu/sq. ft.</td>
</tr>
<tr>
<td>Dunbar Hall</td>
<td>1971</td>
<td>146 kbtu/sq. ft</td>
</tr>
<tr>
<td>North Kohrman Hall</td>
<td>1966</td>
<td>101 kbtu/sq. ft</td>
</tr>
</tbody>
</table>
# Commissioning
## Summary of Recommendations

<table>
<thead>
<tr>
<th>Project</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA Continuous Commissioning</td>
<td>$50,000</td>
</tr>
<tr>
<td>Retro-Commissioning</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

**Recommendation: $100,000**
Facility asset Reinvestment
Summary of Recommendations

Building Envelope: $6,948,000

Grounds/Landscape: $658,000

Risk Management: $1,966,000

Roads/Infrastructure:

Utilities: $3,265,000

Energy Conservation: $450,000

Total Recommendations: $13,287,000