

UNIVERSITY OF MISSOURI

2015 CAMPUS MASTER PLAN & CLIMATE ACTION PLAN UPDATE

DRAFT, APRIL 2015

Shared Governance Defines Annual Plan

While faculty, staff and students have always played an important role in master planning and sustainability planning, this past year has seen a renewed interest in appointing faculty chairs with an interest in a more robust shared governance structure to head the Campus Facilities Planning Committee (CFPC) and the Campus Space Utilization Committee (CSUC). Committee's roles are now clearly defined, and the openness with which the committee members and administrators operate is much more conducive to making real progress toward goals. (See page 8.)

"Since fall of 2014, most requests for moving department offices or other spaces within existing or new space has had the oversight of the new Campus Space Utilization Committee. This extra step considers faculty, staff, and student concerns and input in the decision making process," Michael Goldschmidt, faculty chair, CSUC.

First on the Campus Facilities Planning Committee's agenda last fall was to review, comment and approve the infill study as well as work with MU's master planner Linda Eastley on this year's master plan map. (See pages 2-7, 10-11.)

"With guidance from the master planner, committee members visited sites and buildings reviewed by the Infill Study Working Group and discussed their potential for new and enhanced uses that would support the principles of the Master Plan. The committee provided additional insights and suggestions on priorities and opportunities," Brian Dabson, faculty chair, CFPC.

Finally, the Environmental Affairs and Sustainability Committee (EASC) was instrumental in assisting with the completion of the Sustainability Tracking and Rating System (STARS) report and monitors MU's climate action planning process as it relates to the American College and University Presidents' Climate Commitment.

"We helped guide the staff in preparation of the STARS report, pooling our combined knowledge of the resources available around campus, resulting in the most thorough submission we have had to date. This demonstrates the outstanding teamwork in our group," David Beversdorf, faculty chair, EASC.

Vice Chancellor Operations Gary Ward, EASC chair David Beversdorf, the MU sustainability manager and MU's sustainability consultant Meredith Elbaum will work in 2015 to clearly define the role of the EASC.

MISSOURI BY THE NUMBERS

#7 IN ON-SITE GREEN ENERGY GENERATION
ONLY BEHIND WALMART, BMW, APPLE, U.S. DEPARTMENT OF ENERGY, THE CITY OF PHILADELPHIA, AND COCA-COLA

35,441
STUDENTS FOR FALL 2014 ENROLLED

357 BUILDINGS
ON 1,262 ACRES
ON THE MAIN CAMPUS

LANDSCAPE SERVICES PLANTED
THAT WHEN MATURE, WILL RELEASE ENOUGH OXYGEN TO SUPPORT

232 TREES
464 PEOPLE

SPACE PLANNING AND MANAGEMENT
COORDINATED ABOUT
600 FACULTY AND STAFF MOVES

\$1.14 BILLION
ECONOMIC IMPACT* FROM
PLANNING, DESIGN & CONSTRUCTION'S
FY 2014 PROJECTS



16% OF CAMPUS DINING SERVICES
FOOD AND BEVERAGE EXPENDITURES
LOCAL AND COMMUNITY-BASED

*The total economic impact a particular project had on the gross state product. The direct spending for development and operations generates additional jobs and increases payroll. These dollars are re-spent within the local, state and national economies, generating additional economic benefits



ONGOING PLANNING AT MIZZOU

COMPLEMENTARY PLANS ARE INTEGRATED INTO CAMPUS MASTER PLAN

Stormwater Master Plan

Geosyntec in 2012 assisted MU staff with developing a stormwater master plan that provides an adaptable framework for designing and planning future stormwater improvements across campus. The goal of the plan is to protect the waters surrounding our campus through sustainable controls and green infrastructure. As new stormwater improvements or Best Management Practices (BMPs) are installed, MU researchers are monitoring stormwater properties to determine their effectiveness. As research data is collected and analyzed, the design guidelines for stormwater BMPs are adjusted to maximize their treatment potential. The stormwater baseline map identifies the best opportunities across campus for

“Society is more complex than ever before and so is managing water resources. The University of Missouri is progressively advancing understanding of floodplain and stormwater management at the landscape level, advancing sustainability and stewardship of the resource and improving human health on and off campus.”

- Jason Hubbard, professor of forest hydrology

stormwater improvements. This plan is integrated into the overall campus master planning effort to ensure that future planning provides space for stormwater improvements. In

addition, the baseline map is adjusted annually to take advantage of new opportunities for stormwater treatment or to improve stormwater conditions near new campus projects.

Landscape Master Plan

In the summer of 2014, the University began its first landscape master plan (LAMP). The LAMP is grounded in the campus stewardship model and will focus on how the outdoor environment can directly support the learning and social environment of the university.

The purposes of the LAMP are:

- Continue the growth of the Mizzou Botanic Garden as a University resource for education, research and extension opportunities.
- To identify important landscape resources on the campus today.
- To establish a menu of landscape spaces (quadrangles, courtyards, streets, campus entries, etc.) and provide guidelines for how and where these spaces will be built over time.

- To create recommendations for phasing key landscape projects.

A cross-sectional group of staff and faculty provide their perspectives and expertise to this study, and the group will meet with the Campus Facilities Planning Committee at key milestones.



Utilities Master Plan

In 2014 MU Energy Management began working with Confluenc, a utility master planning consultant, to forecast necessary changes to the campus power plant along with additional renewable energy options. Confluenc uses a unique customizable, analytical modeling tool to evaluate the best solutions to meet the energy needs of the campus. The Utility Master Plan will help ensure the campus continues to be served with reliable, efficient and sustainable utilities. Integrating the utility master planning effort with overall campus master planning will make sure necessary utility services will be available when new space is added.

Coffin Promoted to Energy Management Director

Gregg Coffin helped Paul Hoemann build MU Campus Facilities-Energy Management into a national leader among colleges and universities, so it's only fitting that Coffin should take the helm as Paul Hoemann retires after 28 years at MU.

"From my perspective, as part of his staff for 28 years, Paul is an incredibly innovative guy," said Coffin, who was promoted to the director of Energy Management on Jan. 1.

“If Paul didn't have the idea himself, he spurred others on to come up with ways to improve utility reliability, conserve energy, and use more sustainable energy sources.”

- Gregg Coffin,
director of Energy Management

Energy Management's nationally recognized energy conservation program has reduced energy use by 19 percent per square foot in academic buildings and has created an annual cost avoidance of \$8.4 million. Mizzou

has the lowest building energy use per square foot compared to its peers as benchmarked by Sightlines, an independent facilities benchmarking firm; and MU has the lowest electric consumption per square foot of 10 SEC universities in the Sightlines database.

MU also has one of the most efficient combined heat and power plants in the nation as recognized by the EPA Energy Star partnership and recently added biomass energy to its renewable energy portfolio which reached 24 percent of all energy for campus last year. Coffin will carry the torch, as MU continues to expand its renewable energy portfolio when it makes economic, social and environmental sense.

"We have currently reduced our greenhouse gas emissions by 36 percent from our 2008 baseline, which is one year earlier than our projections," Coffin said. "It's exciting to lead a forward-thinking team. We intend to continue to improve the campus utility services through the innovation of our staff."



Gregg Coffin, left, and Paul Hoemann

Infill Study

For the past two years, a cross-sectional campus group began studying where future development might occur on MU's core campus. Beginning in 2014, the University's Campus Facilities Planning Committee reviewed the work of the group and refined recommendations for campus growth. The product of the study is a series of working documents that will be referenced and updated annually and reviewed more extensively every five years.

As part of the study, both groups collectively identified available campus sites, overlaid important circulation routes and open spaces networks, campus resources and utility corridors, and made recommendations for project sites that could be further studied when funded projects go through their planning processes.

Particular focus was placed on the appropriateness of building or open space scale and massing relative to a site's context. No use or user group was identified for each project intentionally; rather, the goal is to identify an intentional framework of setbacks, view corridors, height ranges and energy demands that works comprehensively for the campus.

Pages 4 through 7 of this document highlight these future possibilities by these four core-campus areas: north of Rollins Street, south of Rollins Street, south of Stadium Boulevard and east of College Avenue. A diagram showing the compilation of all districts is located in the centerfold of this publication. While many project sites are shown on the infill diagram, it is unlikely that all sites will be needed to accommodate future University growth.

INFILL STUDY NORTH OF ROLLINS STREET

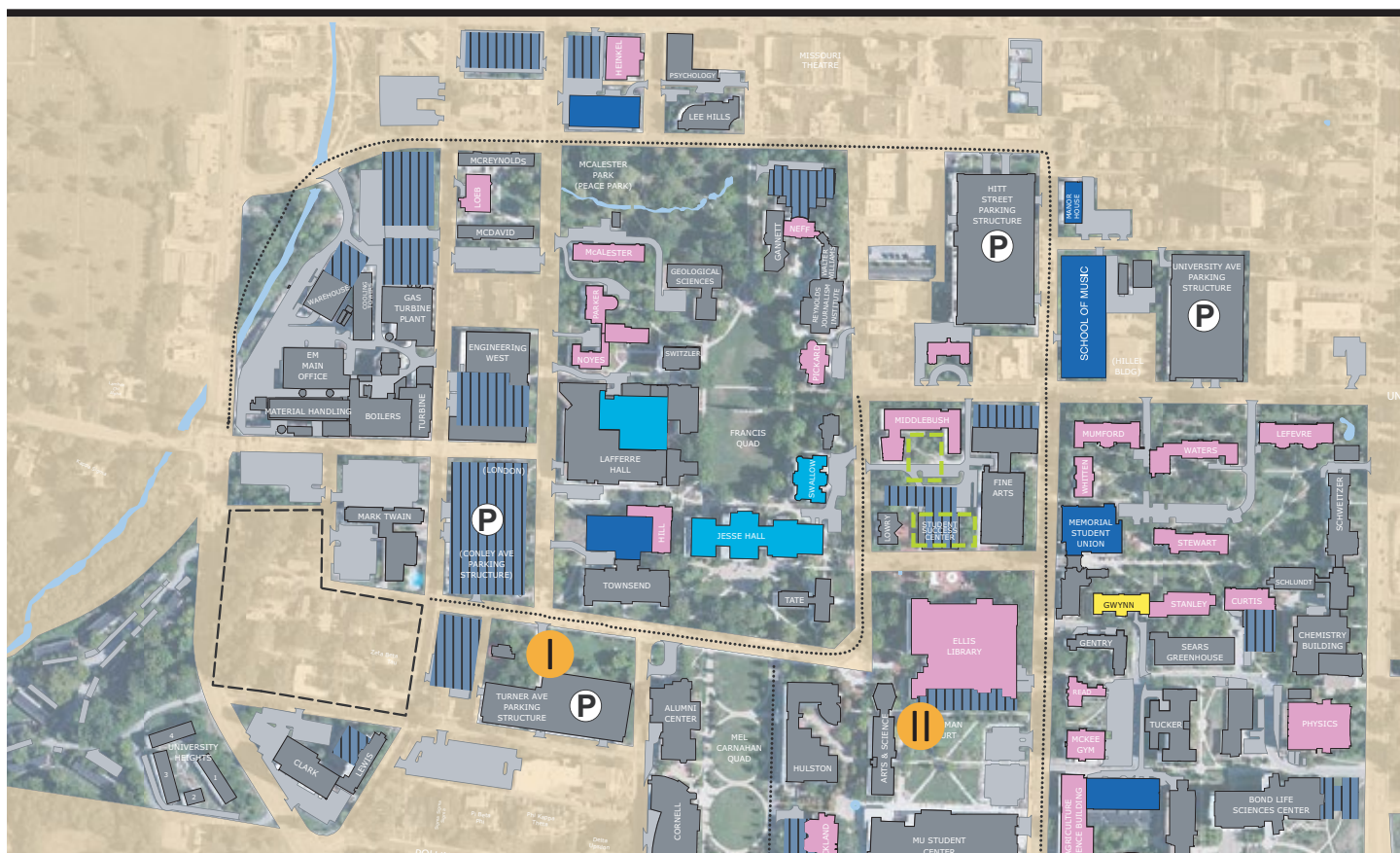
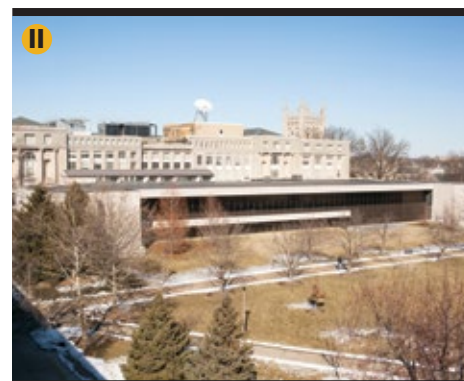
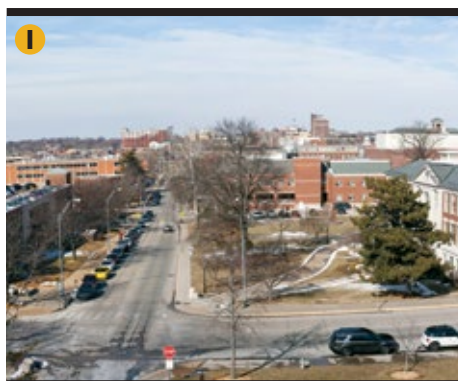
This area highlights the historic Red and White Campuses, as well as the important seam where the campus and city land comes together. Potential building sites are drawn in map view and rendered in blue with black hatching. Photographs help orient the viewer to some of these potential sites.

“The MU master plan Infill Study data is helping to develop the potential long-term impact to the campus utility system as part of a utility master planning effort.”

-Mike Walter, MU's utility master planner

BASIC MAP LEGEND

- Recently Completed Construction
- In Design or Construction
- In Planning
- E&G Buildings Requiring Renovation
- Possible Future Structures
- Existing University Buildings
- Streams and Ponds
- Featured Building/Area
- P University Parking Structures
- ... Major Bikeways
- Future Open

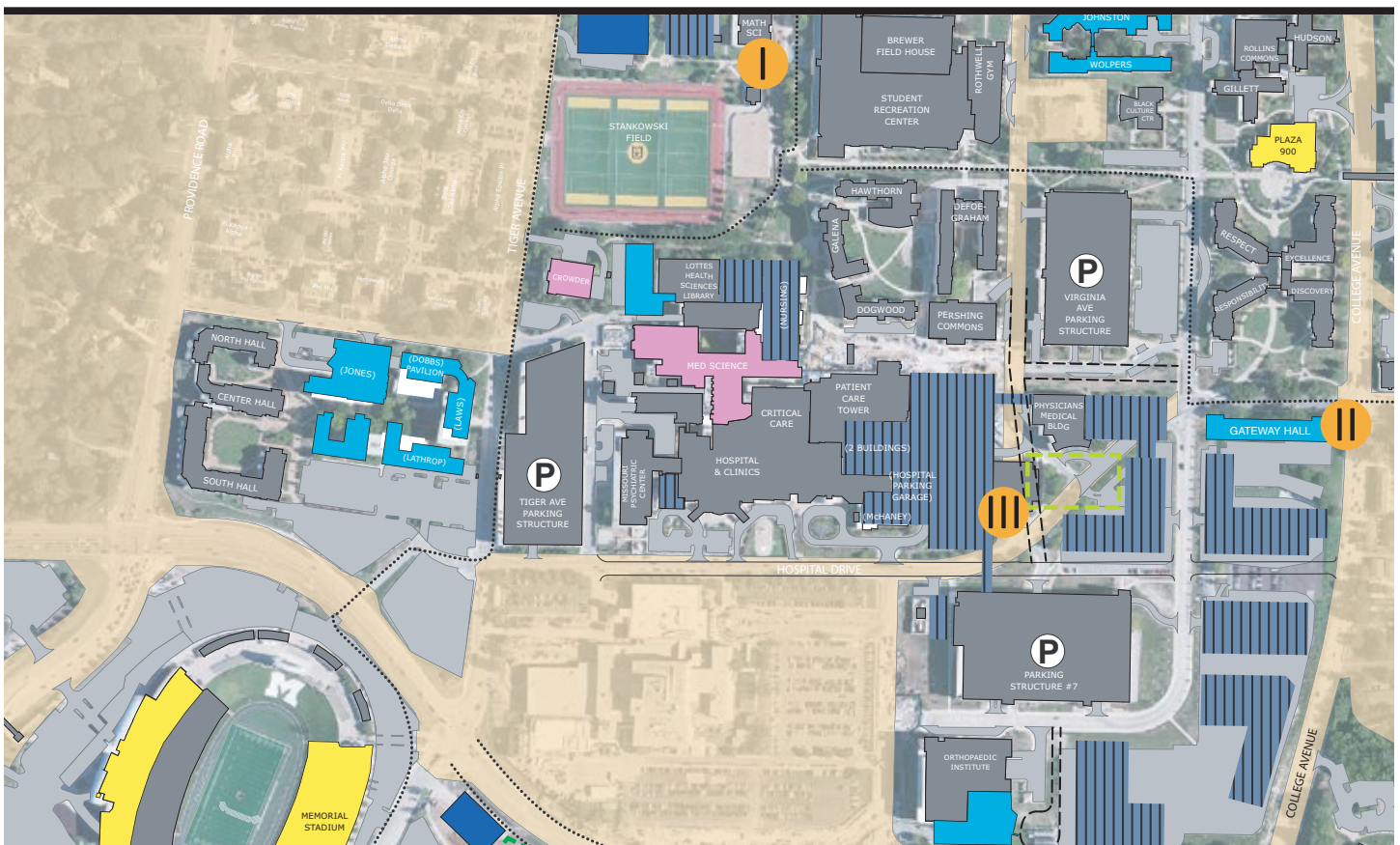
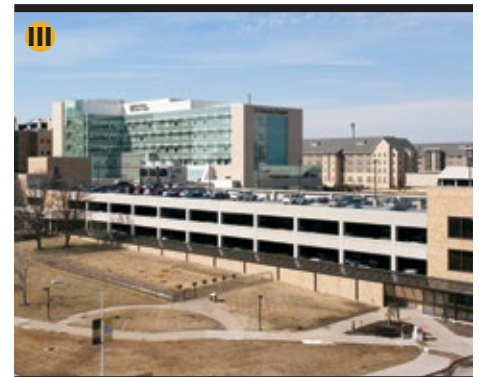
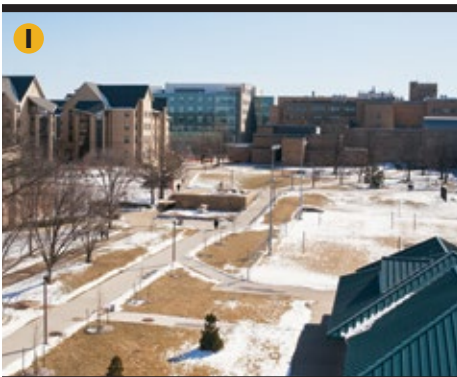


INFILL STUDY SOUTH OF ROLLINS STREET

Academic, health care, residential and student life, and support buildings are reflected in this part of campus. The map identifies opportunities to allow expansion of these existing uses, and also shows a proposed future realignment of Hitt Street's southern block.

“The MUHS master plan elevates the patient experience of the adult hospital and clinics, while accommodating growth and facility renewal for all academic and research programs.”

- John Reeve, MU's health system master planner



INFILL STUDY SOUTH OF STADIUM BOULEVARD

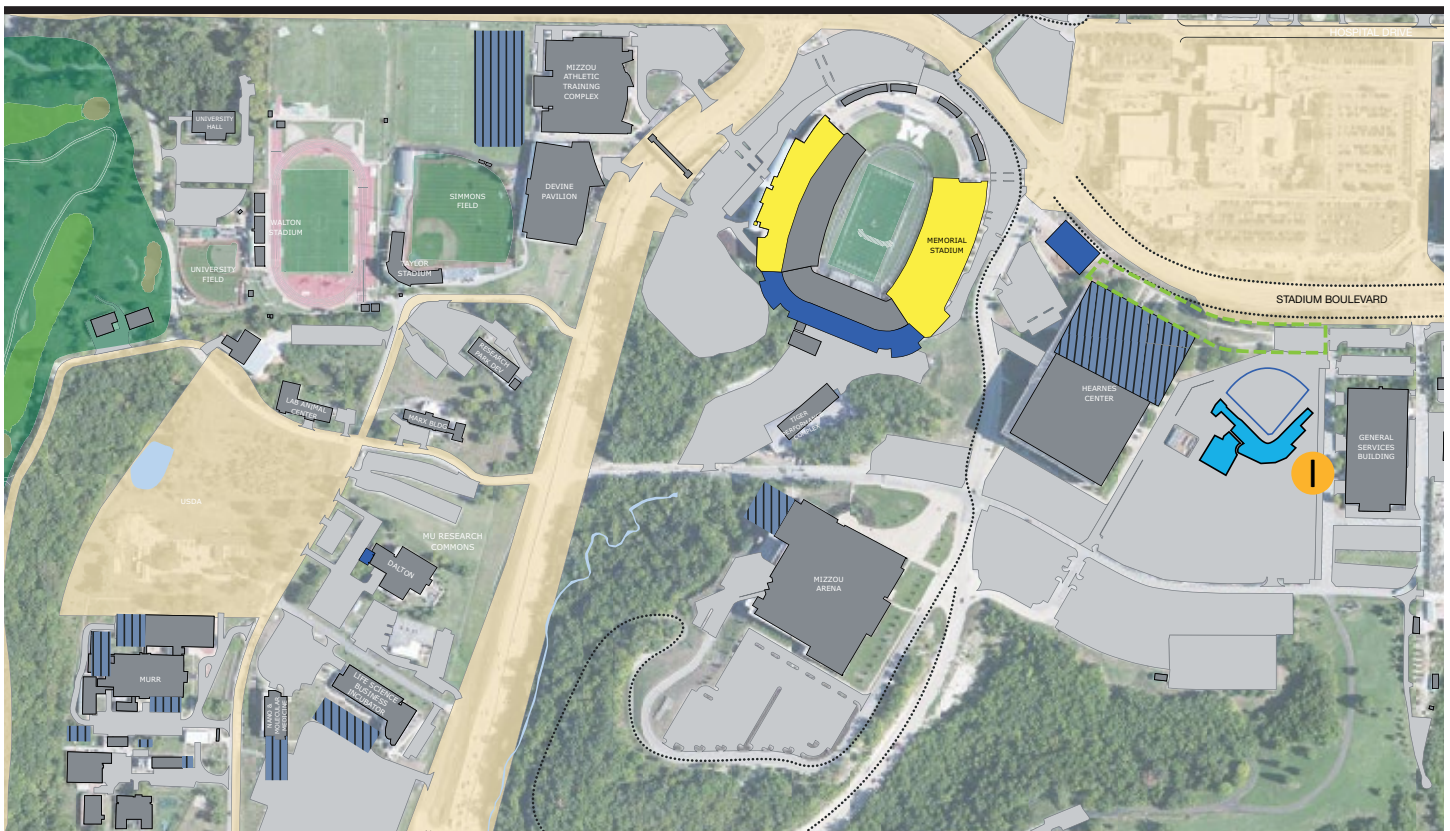
Intercollegiate Athletics, recreation uses, the Research Commons, surface parking and support buildings are located in this area of campus, and Stadium Boulevard has an important function as one of the primary gateways to campus.

“Mizzou Athletics remains committed to providing the highest quality training and competition venues for student-athletes, coaches and fans while contributing to the vitality and connectivity of the overall campus environment.”

- Tom Waggoner,
MU's Intercollegiate Athletics' master planner

BASIC MAP LEGEND

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INFILL STUDY EAST OF COLLEGE AVENUE

The Infill Study concentrates larger academic projects around East Campus Drive, with support buildings recommended along the eastern perimeter and minimal development advised for east of the East Campus Loop Road.



“MU's master plan reflects a 35-year legacy of strategic vision, physical planning and flexible implementation that reinforces the university's mission.”

- Linda Eastley, MU's master planner

“MU's climate action and sustainability initiatives extend the university's teaching and research beyond the classroom and lab. They support MU's academic mission by demonstrating environmental stewardship, fiscal responsibility and human well being.”

- Meredith Elbaum,
MU's sustainability planner



SHARED GOVERNANCE STRUCTURE

CLEARLY DEFINED COMMITTEES AND OPEN COMMUNICATION IMPROVES MASTER PLANNING PROCESS



Chancellor



Capital Review Committee

The Capital Review Committee (CRC) is an advisory committee for the Chancellor on issues concerning land utilization, space allocation and assignments, and architectural changes to the campus.

Membership

Vice Chancellor for Operations and Chief Operating Officer (chair)
Deputy Provost (co-chair)
Vice Chancellor of Communications and Marketing representative
Vice Chancellor—Research representative

Vice Chancellor—Student Affairs representative
Vice Chancellor—Chief Financial Officer
3 - Faculty Council appointed faculty members
1 - Staff Advisory Council representative
1 - MSA student representative
1 - GPC student representative

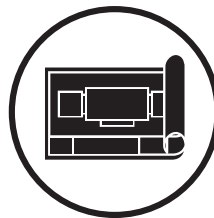


Campus Facilities Planning Committee

The Campus Facilities Planning Committee is an advisory committee for the Provost and Vice Chancellor for Operations to provide recommendations concerning campus land use related to capital projects following MU Campus Planning Principles.

Membership

Faculty Council appointed Chair (three-year term)
Vice Chancellor for Operations and Chief Operating Officer
Chief Financial Officer representative
Vice Chancellor—Advancement representative
2 - Faculty Council appointed faculty members
1 - Staff Advisory Council representative
1 - MSA student representative
1 - GPC student representative



Campus Space Utilization Committee

The Campus Space Utilization Committee is an advisory committee for the Provost and Vice Chancellor—Operations to provide recommendations concerning campus space use following MU Space Planning Principles.

Membership

Faculty Council appointed chair (three-year term)
Vice Provost—Undergraduate Studies
Vice Provost—Advanced Studies
CF Director—Space Planning and Management
2 - Faculty Council appointed faculty members
1 - Staff Advisory Council representative
1 - MSA student representative
1 - GPC student representative

MASTER PLAN PRINCIPLES

Diversity with Unity

Create and maintain campus settings that bring together the diversity of people, heritages and culture.

Natural & Architectural Heritage

Design facilities to respect the scale, materials and textures embodied in the historic architecture and natural landscape of the campus.

Create Positive Multi-Transit Environment

Remain mindful of providing optimal access to all persons and modes of transportation on a primarily pedestrian-dominant campus.

Planning & Design Integrity

Provide facilities and grounds that meet the functional needs of the institution and that comply with the intent of the Design Principles to provide an overall aesthetic and pleasing campus experience.

Environmental Sustainability

Embrace suitable strategies in promoting sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality.

Prudent Expansion of Campus Functions

Provide for facilities expansion in ways that respect neighbors and effectively utilize limited land resources, while conserving and protecting natural resources.

Facilities and Grounds Stewardship

Preserve the quality and utility of existing facilities for sustainable use of established resources.

Pride of State

Express the importance of the campus to the state, nation and world.

Community Spirit

Locate campus functions in close proximity to enhance scholarly activities and social interaction within a safe and secure campus.

Recruitment-Retention

Emphasize the qualities of the campus that help attract and keep students, faculty and staff.

Strong 'Sense of Place'

Make the campus a distinctively meaningful and memorable place for all members of the University community and for the citizens of Missouri.

University Mission & Values

Organize facilities and places to promote MU's mission and values.

SWALLOW HALL

1893

Originally built as the zoological/geological building; later became the School of Business and Commerce and then the anthropology department.

2000

Exterior repairs protected interior systems and included restoring the building to its original architectural glory, including restoring the witches' hats.

Current

Reconstruct to house the departments of anthropology and art and archaeology. Replace wood structure, allowing space reconfiguration, a third floor and basement improvements.

\$16.9

MILLION PROJECT COST

8,349

GROSS SQUARE FEET ADDED

100

SEAT LECTURE HALL ADDED

\$5.5

MILLION IN FACILITY NEEDS ELIMINATED

MAY 2016

ESTIMATED COMPLETION DATE





CAMPUS MASTER PLAN

MAIN CAMPUS

MAP LEGEND

PROJECTS RECENTLY COMPLETED

- 1: Memorial Stadium – East Addition
- 2: Memorial Stadium – West Renovation
- 3: Plaza 900 Renovation & Addition
- 4: Gwynn Hall Renovation
- 5: South Providence Medical Park Building
- 6: Mizzou Tennis Center
- 7: Replace Steam Lines at College Ave & Rollins St

IN DESIGN OR CONSTRUCTION

- 8: Jesse Hall
- 9: Swallow Hall Renovation & Reconstruction
- 10: Dobbs Group Replacement
- 11: Gateway Hall
- 12: Missouri Orthopaedic Institute Addition & Renovation
- 13: East Campus Chiller Plant Phase 2
- 14: Johnston/Wolpers Renovation
- 15: Patient Centered Care Learning Center
- 16: Lafferre Hall Renovation (1935/1944 Additions)
- 17: Veterinary Ambulatory Teaching Facility
- 18: Softball Stadium

IN PLANNING

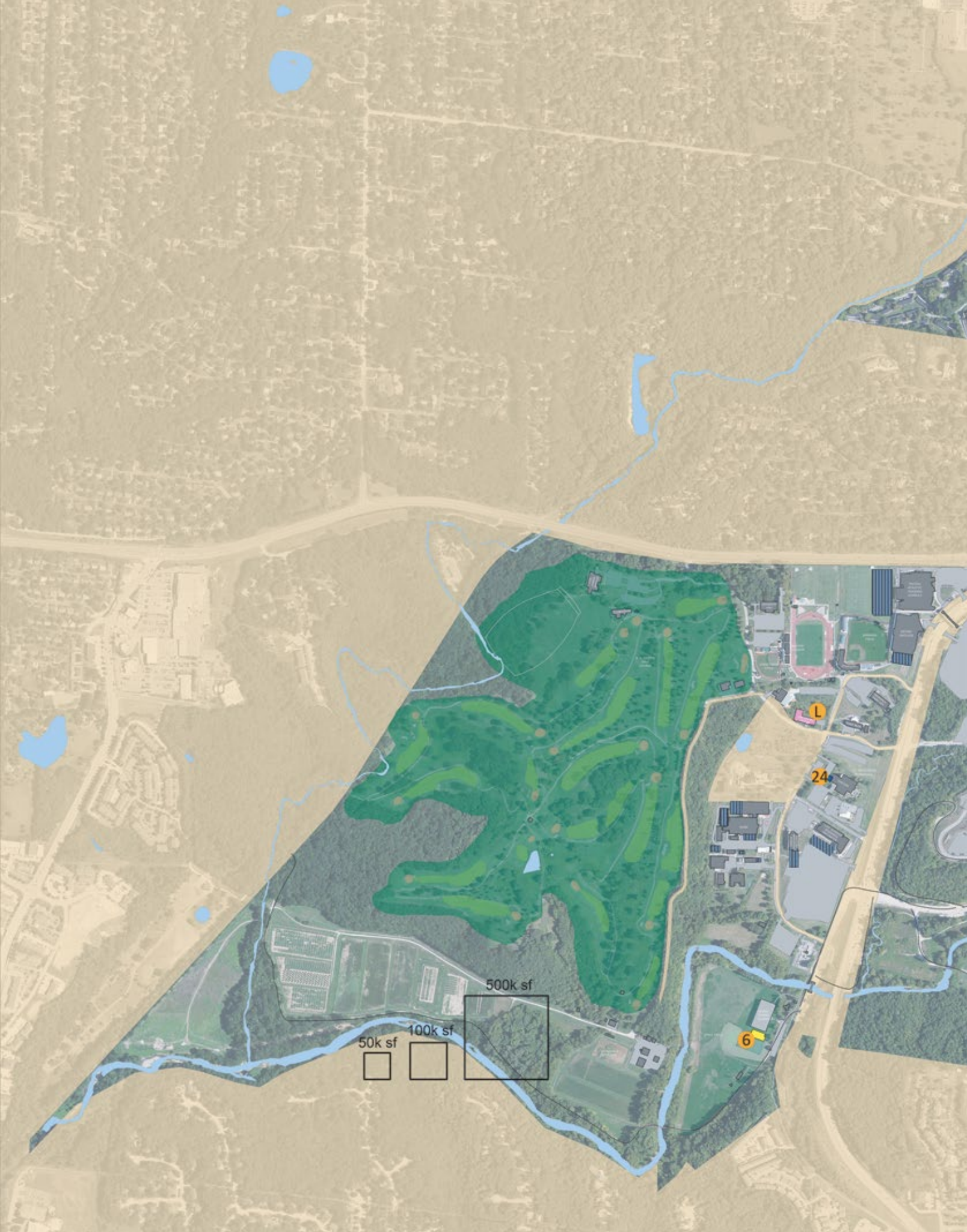
- 19: State Historical Society
- 20: School of Music Building
- 21: Trulaske College of Business Applied Learning Center
- 22: Veterinary Medicine Addition
- 23: Tiger Welcome Center
- 24: Dalton Cardiovascular Research Center Addition
- 25: Center for Translational Plant Sciences
- 26: Teaching & Research Winery Addition
- 27: Discovery Ridge Data Center
- 28: Meats Education & Training Center
- 29: Manor House
- 30: eLearning and Innovation Center
- 31: Memorial Union Vertical Addition & Facility Improvements
- 32: Memorial Stadium South Expansion

EDUCATION & GENERAL BUILDINGS REQUIRING RENOVATIONS

- A: A.P. Green Building
- B: Agriculture Building
- C: Allton Building
- D: Arvarh E. Strickland Hall
- E: Columbia Professional Building
- F: Crowder Hall
- G: Curtis Hall
- H: Mizzou North
- I: Ellis Library
- J: Heinkel Building
- K: Hill Hall
- L: Laboratory Animal Center
- M: Lefevre Hall
- N: Loeb Hall
- O: McAlester Hall
- P: McKee Gym
- Q: Medical Science
- R: Middlebush Hall
- S: Mumford Hall
- T: Neff Hall
- U: Neff Hall Addition
- V: Noyes Hall
- W: Old Student Health Center
- X: Parker Hall
- Y: Physics Building
- Z: Pickard Hall
- AA: Read Hall
- AB: Stanley Hall & Addition
- AC: Stewart Hall
- AD: Veterinary Diagnostics
- AE: Veterinary Medicine – West
- AF: Veterinary Science
- AG: Waters Hall
- AH: Whitten Hall

BASIC MAP LEGEND

- ▤ Possible Future Structures
- Existing University Buildings
- Streams & Ponds
- Ⓟ University Parking Structures
- Major Bikeways
- Future Open Space
- Seeking LEED Certification
- ◆ E&G Building
- Ⓜ Auxiliary Building
- ⚡ Utility Project



50k sf

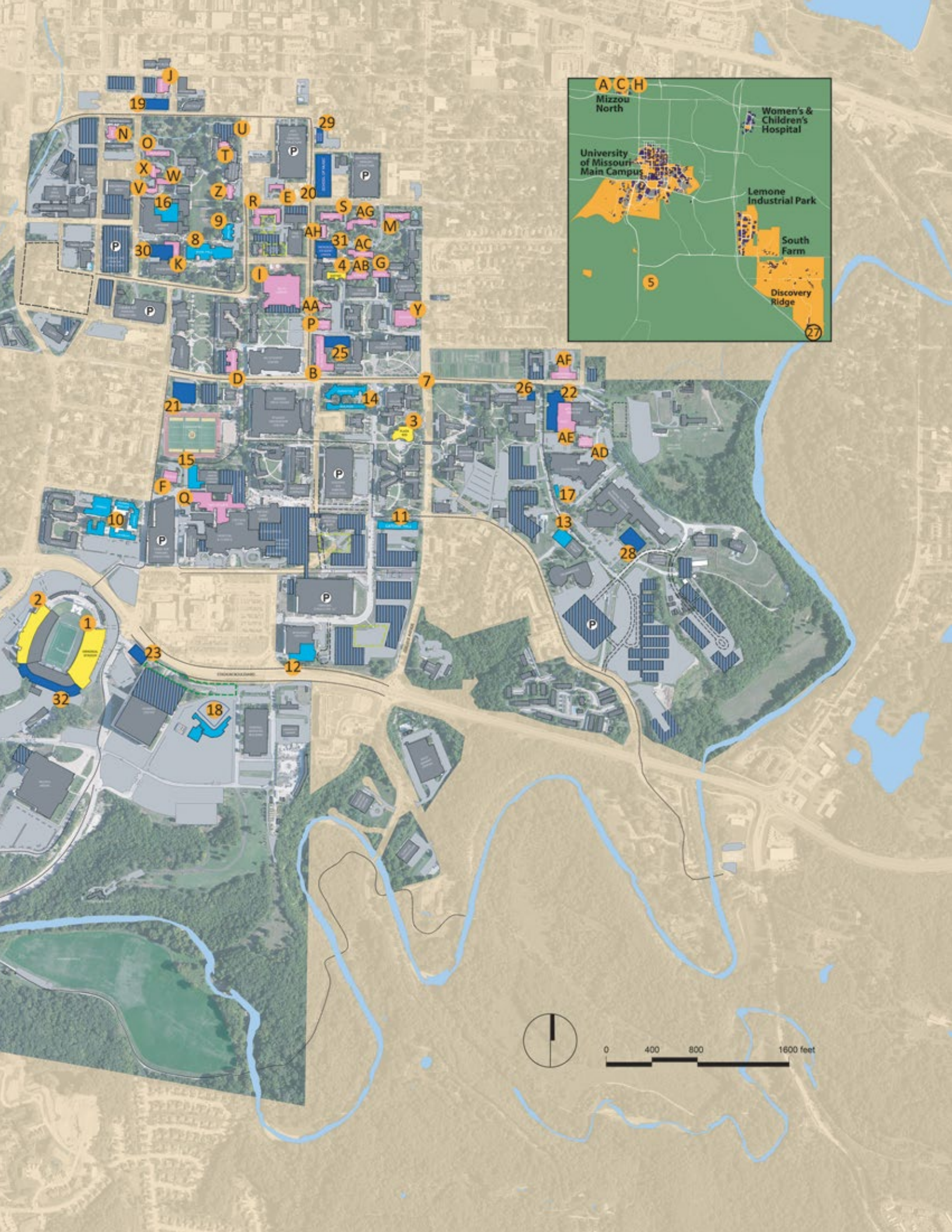
100k sf

500k sf

24

L

6



0 400 800 1600 feet

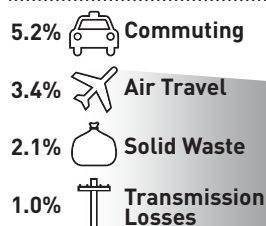
CLIMATE ACTION PLAN UPDATE

2008

Emissions Baseline:
384,908 MtCO₂e*

Other Indirect Emissions

39,562 MtCO₂e*



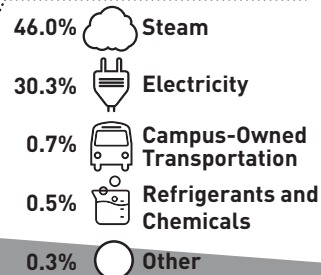
Indirect Emissions

33,860 MtCO₂e*



Direct Emissions

311,486 MtCO₂e*



36% Red
in Greenho
Emissi
FY20

* Greenhouse Gas Emissions are measured in metric tons of carbon dioxide equivalents (MtCO₂e)

Recent Accomplishments

As of July 2014, the campus already has achieved a 36 percent reduction in greenhouse gas emissions from the 2008 emissions baseline.

Renewable Energy: MU's renewable energy portfolio, including biomass, wind and solar energy, reached 24 percent in FY2014.

Energy Conservation Projects: Converted heating, ventilation and air conditioning controls from pneumatic to the campus electronic building automation system in the Medical Sciences Building. Completed additional projects

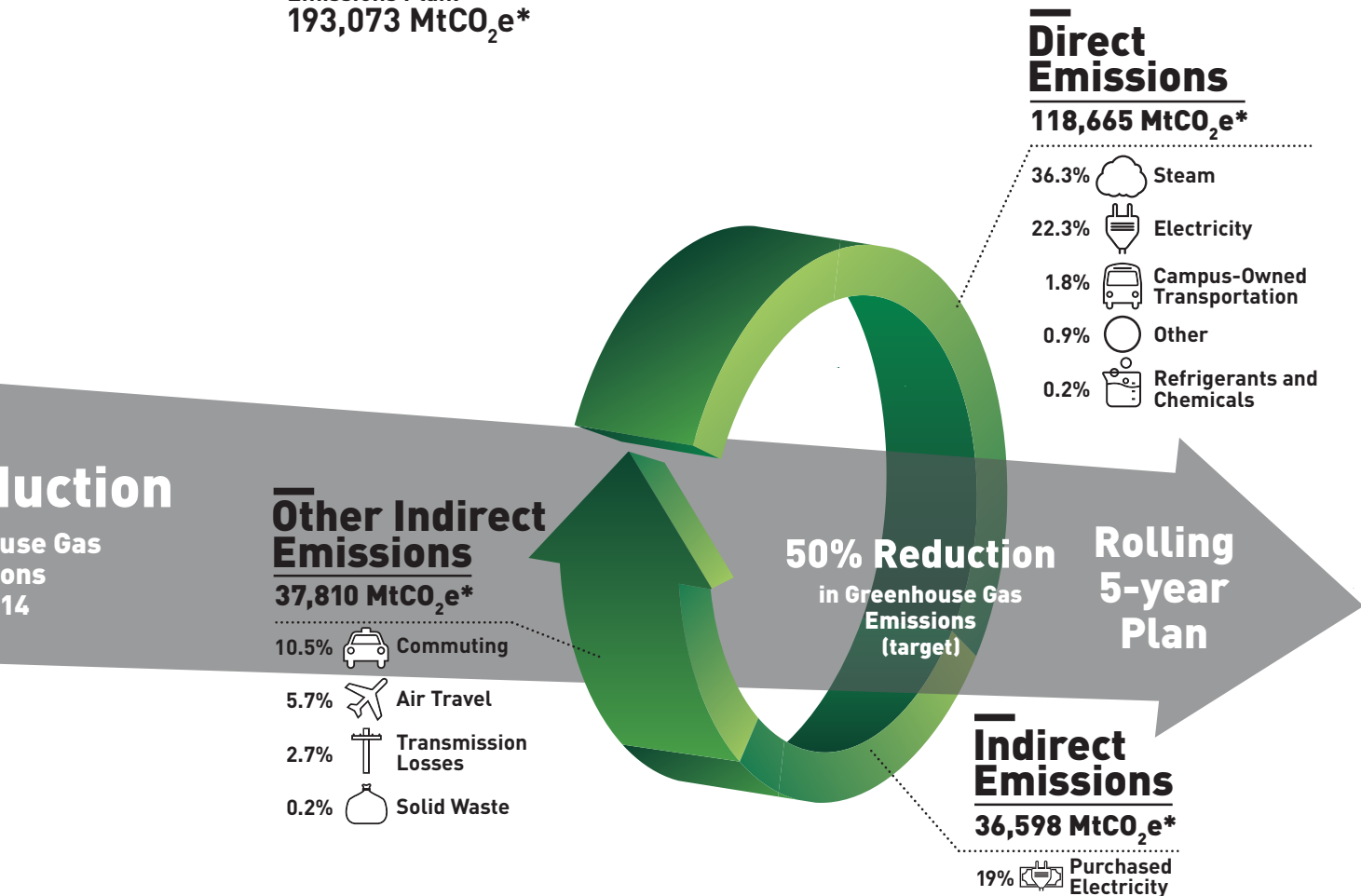
that reduced energy use in Mizzou North and Research Animal Diagnostic and Investigative Laboratory.

Energy Conservation Savings: Energy conservation saves MU \$8.4 million annually, which is equivalent to \$243 annual reduction in tuition per student. Since the program started, the total cumulative cost avoidance has reached \$66.7 million.

Solar Thermal: A new solar thermal heating system using evacuated tube technology was completed and placed into service at the power plant to preheat boiler water from solar energy.

2019

Emissions Plan:
193,073 MtCO₂e*



2015-2019 Plan

Target a 50 percent carbon-emission reduction from the 2008 emissions baseline, based on the following assumptions:

Fuel mix: Target a 75 percent reduction of coal use and increased use of biomass and natural gas from the fiscal year 2008 baseline.

Renewable Energy: MU will continue to purchase wind power and explore other renewable technologies for its renewable energy portfolio.

Utility Master Planning: MU has started a utility master planning effort to prepare for future utility needs for the campus. See page 2.

Energy Conservation Projects: A project is in design to convert pneumatic controls in Clark Hall and a project to convert Jesse Hall to variable air volume is nearing completion.

Energy Conservation Savings Target: Reduce campus energy cost by 1 percent annually.

SUSTAINABILITY HIGHLIGHTS

Sustainability Statement

The University of Missouri embraces its role in providing a healthy and safe learning environment for its students, staff, and faculty. Consistent with MU's mission and values, we are committed to leadership in demonstrating local and global environmental stewardship. MU recognizes the increasing need for policies and practices that reduce greenhouse gas emissions and has signed the American College and University President's Climate Commitment with the goal of making the MU campus carbon neutral. Each unit or department within the University is expected to evaluate current policies and practices on a regular basis with the goal of adopting and improving environmentally sustainable practices.

Adopted March 2010.

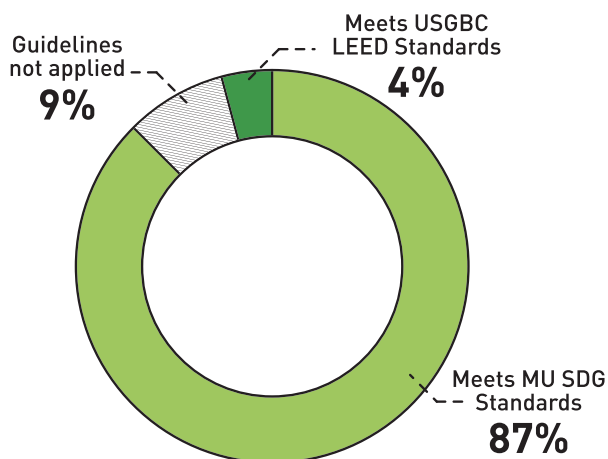
Sustainable Building Portfolio Improves

Mizzou continues to increase the sustainability of its building portfolio using MU's Sustainable Building Design Guidelines (SDG). To be considered sustainable a project must make economic sense, be environmentally responsible and be good for people. This approach is known as the Triple Bottom Line of Sustainability. MU's SDG, first issued in 2012, is based on the US Green Building Council's (USGBC) LEED Green Building Rating System for New Construction and Major Renovation. This past year the USGBC launched a new version of LEED (LEED v4) that raises the bar for green buildings. The major changes include selecting materials based on human health and environmental impacts, taking a performance based approach to indoor

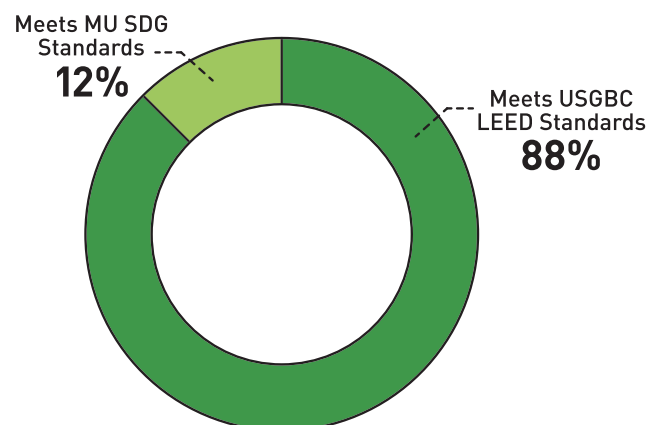
environmental quality and evaluating water efficiency of an entire building. Representatives of Campus Facilities-Planning Design and Construction, led by the group's new sustainable building program manager, evaluated LEED v4 in November 2014 and are revising MU's SDG to incorporate the new requirements while keeping the Triple Bottom Line of Sustainability in mind. While earning LEED certification is not a requirement, the campus estimates that 100 percent of projected building development in the next five years will meet LEED standards or MU SDG requirements, with 88 percent expected to achieve both. To date, including the hospital, MU has three LEED certified buildings with 10 more in process of certification.

By 2020, Most Buildings will meet LEED Standards

Past 5 years of development: Building floor area designed and constructed in accordance with green building policies or guidelines



Next 5 years of development: Projected building floor area designed and constructed in accordance with green building policies or guidelines



Gateway Hall Features Sustainable Design

The University of Missouri's new Gateway Hall will provide a living-learning environment for 330 students. The hall, located near the intersection of Hospital Drive and Virginia Avenue, is scheduled to open in 2015 and incorporates a variety of sustainable design strategies established early in the design process.

Solar thermal collector provides up to 25% of hot water demand



Bioswale area filters and reduces stormwater runoff and pollution

Green roof on entry canopy reduces heat-island effect and stormwater runoff while improving water quality



East-angled bedroom windows increase visibility while reducing afternoon glare

Large floor-to-ceiling windows in common areas increase views and natural daylight, while decreasing the need for artificial lighting

SUSTAINABILITY HIGHLIGHTS

Wirkus Tackles Sustainability for Intercollegiate Athletics

Tony Wirkus, assistant director of event management for Intercollegiate Athletics, was hired in summer 2013 to assist in overseeing game management for home sporting events. Though space is a premium at sporting venues, Wirkus saw opportunities to improve ICA's recycling and sustainability efforts and began to study what other universities were doing.

Using the Ohio State University and the University of Colorado Boulder as his role models, Wirkus fully embraced recycling and sustainability efforts, and has quickly made Mizzou an emerging leader when it comes to "greening" the college sports world.

Wirkus collaborated with the MU

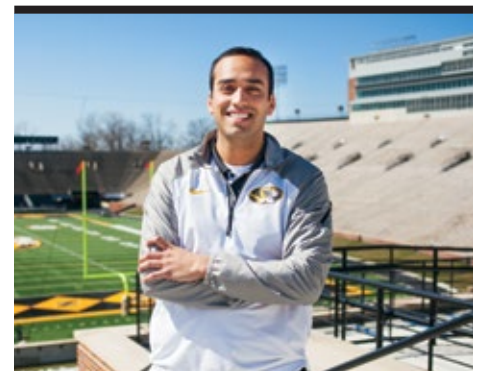
Sustainability Office to increase recycling by 300 percent at home football games. ICA parking lot attendants handed out tailgate recycling bags, while student volunteers moved inside the stadium to collect recyclables row-by-row and conduct a fan behavior study.

Wirkus also partnered with faculty and undergraduate students to audit trash generated on game days.

"Previously, we had no data on game-day waste. We had to infer based on statistics from other schools, such as Ohio State. This study will help us see what's actually in our stream," he said.

Wirkus serves on Mizzou's Environmental Affairs and

Sustainability Committee and is serving on the new softball stadium construction committee hoping to incorporate sustainable building practices and recycling from the beginning instead of an afterthought.



Waste Services Study

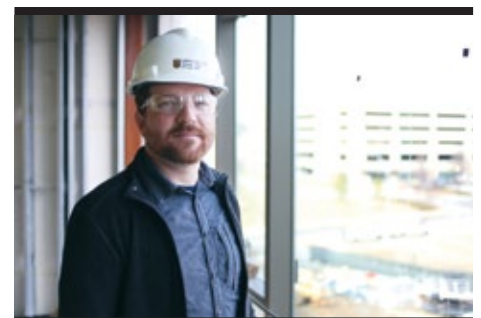
Alec Page, an undergraduate in Industrial and Manufacturing Systems Engineering, presented at Mizzou's annual Undergraduate Research & Creative Achievements Forum during the spring of 2014. The forum showcases student research and scholarly and creative achievements to the Mizzou community. Alec worked alongside faculty member Ron McGarvey. Ron uses real-life problems as lessons regarding areas that engineering analysis can (and cannot) help support the decision-making process. The aim of their research is to analyze the location and utilization of receptacles across the University of Missouri campus in order to identify a strategy that minimizes operational expenses required to accommodate waste services. An additional objective, for aesthetic purposes, is to identify strategies that could eliminate the use of dumpsters and other containers on the Francis Quadrangle.

Wilson Coordinates Green Building Efforts

In response to the growing demand for oversight of Mizzou's increasing portfolio of energy efficient and sustainable projects, the campus appointed a full-time manager for sustainable design and construction. Chris Wilson, an alumni and frequent lecturer at the University of Missouri's School of Environmental Design, and graduate of the Taubman College of Architecture and Urban Planning at the University of Michigan, accepted the newly created position early in 2014.

Chris brings his design and technical interests to further the development of the university's sustainable standards and practices. He intends to expand the portfolio of campus buildings practicing sustainable standards beyond newly constructed and renovated building.

"It is important for us to capitalize on established sustainable strategies to benefit student, faculty, and staff health and wellbeing across the majority of buildings on campus. These practices, coupled with innovative design and engineering, decrease the long-term operating cost of the university's facilities, all while benefiting the campus and environment," Wilson said.



Faculty Audit Game Day Trash Flow

This football season researchers Christine Costello (CAFNR) and Ron McGarvey (COE) and a team of undergraduate students, with the support of a Mizzou Advantage grant, completed an audit of the trash flow generated at the stadium on game day. Detailed information provided by the trash audit will be used to identify opportunities to divert more waste from the landfill, an increasingly common goal of large venues across the country. The data will be used to evaluate the engineering and economic feasibility of treating the organic (e.g., food, compostable packaging materials) portion of the waste stream.

Morgan Studies Fan Behavior

During the 2014 home football season, CAFNR's Mark Morgan and Sustainability Office graduate assistant Hannah Peterson conducted a pilot study inside the stadium that looked at fan behavior regarding source separation of game-day waste. The bins were wrapped and labeled (recycling, compost, and landfill) and four different treatments were conducted, including messages above the receptacles and volunteers helping fans with their choices. Results of the study will be useful to MU Athletics and other university departments wanting to improve the rate of landfill waste diversion.

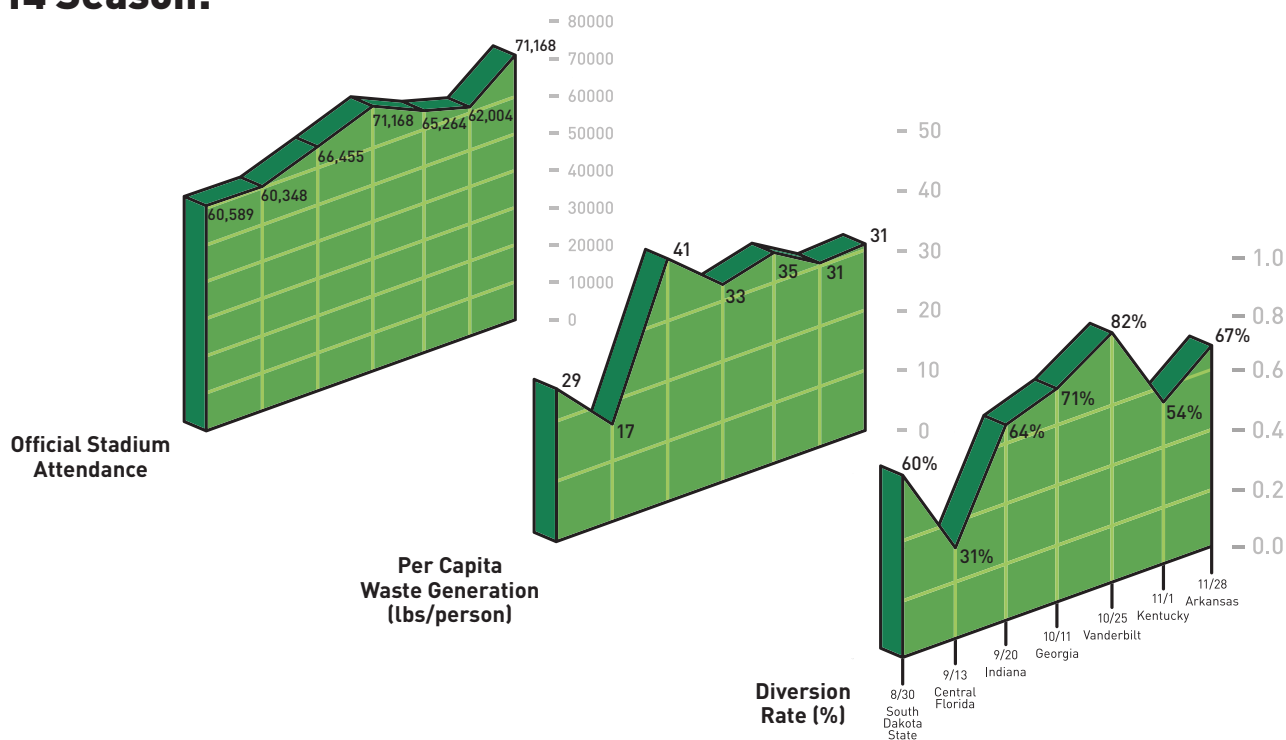
Gameday Challenge

Intercollegiate Athletics saw an all-time high in its sustainability and recycling efforts during the 2014 football season as Mizzou recycled 46.1 tons of waste, nearly quadrupling the 2013 efforts of 11.9 tons. Because of the athletic department's event management and facility operations team effort, Mizzou diverted 32.2 percent from the landfill, up from 10.2 percent in 2013.

After setting all-time highs in recycling and diversion rate, Mizzou ranked high on the national scene as well, participating in the GameDay Recycling Challenge. During the challenge, colleges and universities implement waste reduction programs at home football games. Schools track and report waste reduction and disposal data. Mizzou ranked 15th nationally

in total pounds recycled and 26th nationally in diversion rate. Among schools in the SEC, Mizzou was second in greenhouse gas reduction, third in total recycling and fourth in both the waste minimization and diversion rate categories.

2014 Season:



SUSTAINABILITY HIGHLIGHTS

Adaptive Stone Reuse Across Campus

Stafford and Cramer halls were built post-World War II when many soldiers and sailors returned from war and took advantage of the GI bill, filling campuses across the nation. Fast forward 50 years, to care for an influx of baby boomers, MU Health Care was planning the Patient Care Tower and needed additional space.

Through master planning efforts, it was decided that the land that Cramer and Stafford sat on was more essential than the residence halls that had fallen into disrepair and could not meet today's students' needs. They were closed and demolished in 2008, but in order to preserve this part of Mizzou's history, stone from Cramer and Stafford was saved for reuse elsewhere on campus.

Patient Care Tower



Stone was salvaged and recut for louvers on the exterior walls of the Patient Care Tower

Pershing Commons



Stone is stored for future building projects

Gateway Residence Hall



The project architects sketched and photographed each stone that would be used in Gateway Hall



Cramer Hall - University Archives, Collection C:1/83/9



Stone was reused and repurposed as a wall of the Healing Garden



Additional stone was reused as retaining walls on the Pershing Commons renovation and Patient Care Tower



Stone will be used as a feature element in Gateway Hall

Farm to Table Dinner

On May 3, 2014, 86 students and 30 faculty and staff members attended the first Tiger Farm to Table Dinner. The Environmental Leadership Office, Tigers for Community Agriculture, the Wellness Resource Center, Campus Dining Services, the University Club, the Missouri Wine and Grape Board, the Children's Learning Garden, and the Parent Leadership Council sponsored a four-course meal made entirely from Missouri food.



Seniors get EPA grant

Bioengineering seniors Austin Davis, Jeremy Davis, Amanda Prescott, and Sami Tellatin, along with Assistant Research Professor Christine Costello, were one of 42 phase one grant recipients selected by the Environmental Protection Agency as part of its People, Prosperity and the Planet (P3) grant competition to receive \$15,000. The team's project, entitled "Feasibility and Life Cycle Assessment of Anaerobic Co-Digestion of Campus Food Waste and Swine Manure," will study mixing swine manure with food waste as a practical way of creating energy and recovering nutrients.

Group Polls Students

At the beginning of the winter semester, the Energy Strategies Student Advisory Group worked with the Assessment Resource Center to survey a population of the student body to gauge their awareness of MU's current energy practices, as well as their own interest in energy issues. Results will be presented to Chancellor Loftin and his staff in May. ESSAG explores coal-free alternatives for the MU Power Plant, and its primary mission is to advise MU in advancing its energy portfolio in an environmentally, fiscally, and socially responsible way.

↓ CONSERVATION EFFORTS
HAVE REDUCED ENERGY USE **19%**

TIGER TREASURES, SURPLUS PROPERTY AND
ENVIRONMENTAL HEALTH AND SAFETY RECYCLED
249.04 TONS OF MATERIALS
IN 2014

↑ MIZZOU'S ADMINISTRATION AND
CLASSROOM SPACE HAS GROWN **42%** SINCE
1990

🔧 **170 STUDENTS** HAD BIKE REPAIRS MADE
FOR FREE THROUGH MU'S BIKE
RESOURCE CENTER

**MIZZOU BIKE
SHARE MADE
2,720** BICYCLE CHECK OUTS

CAMPUS DINING SERVICES,
UNIVERSITY CLUB AND LAND-
SCAPE SERVICES COMPOSTED **86 TONS** OF ORGANIC
WASTE

🎬 **156** STUDENTS, FACULTY, AND STAFF
ATTENDED ONE OF SIX FILM SCREENINGS
ON ENVIRONMENTAL TOPICS

412 ATTENDED ONE OF
22 PRESENTATIONS
STUDENTS BY ELO AMBASSADORS

HOW CAN I HELP?

Volunteer on campus or in the community.

<http://sustainability.cf.missouri.edu/involved/volunteer.html>

Become an Environmental Leadership Office Ambassador or join a sustainable student organization.

<http://environmentalleadership.missouri.edu/get-involved/>

Live Sustainably

Shop at the farmer's market.

Carry a reusable bag and a reusable water bottle.

Use less energy. Dress for the weather. (Think layers.)

Take shorter showers.

Use alternative transportation, bike or walk.

Learn More

<http://libraryguides.missouri.edu/sustainability/>

<http://buildingdashboard.com/clients/umissouri/>

<http://environmentalleadership.missouri.edu>

<http://sustainability.missouri.edu>

<http://www.cf.missouri.edu/energy/>

Share

Mizzou's master plan and climate action plan

<http://masterplan.missouri.edu>

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ENVIRONMENTAL STATEMENT

The University of Missouri saved these valuable resources by using 100% recycled paper containing 60% post-consumer waste, processed chlorine free and manufactured with electricity that is offset with Green-e® certified renewable energy:

TREES
7
fully grown

WATER
3,023
gallons

ENERGY
3 million
BTU

**SOLID
WASTE**
202
pounds

**GREENHOUSE
GASES**
557
pounds of CO₂

Calculations based on research by Environmental Defense
and other members of the Paper Task Force

