

Facilities and Infrastructure Report

FISCAL YEAR 2017-18



Infrastructure Planning and Facilities
MICHIGAN STATE UNIVERSITY

Table of Contents

WELCOME	3
IPF PROFILE	4-5
PEOPLE	6-10
• Spartans Will: I Will	
• New Performance Excellence	
• IPF Learning and Development	
• IPF Mobile Project Makes its Mark in 2017-18	
• New Leadership	
PARTNERS	11-14
• Faculty Readiness Program	
• Engaging Academics in Classroom Redesign	
• Construction Leads to Research Opportunities	
• Winter Maintenance	
• IPF Assists in Flood Protection and Clean Up	
• Women in Skilled Trades Graduates First Cohort	
STEWARDSHIP	15-22
• Facilities Connect Update	
• ECMs Reduce Energy Usage While Keeping Campus Comfortable	
• New Fleet Additions Support Sustainability on Campus	
• Upgrading Campus Water System Infrastructure	
• Water Reduction Leads to Savings	
• Solar Carport Initiative Earns National Attention	
• Protecting Campus Trees	
• Surplus and Recycling: Hard Work Recognized	
• Custodial Services Innovation Team	
APPENDIX	
2017-18 Construction Report	
2017-18 MSU Facilities Report	
2017-18 IPF Metrics Report	
2017-18 Property Holdings Report	



WELCOME

A MESSAGE FROM THE ASSOCIATE VICE PRESIDENT

MSU Infrastructure Planning and Facilities is proud to have contributed to the university's mission over the past 150 years. Each year we provide an update on our progress made toward preserving, maintaining and expanding our physical campus and its beautiful grounds. We remain focused on our mission to "deliver facilities and services that help Spartans change the world."

We define our success through the success of the campus community. In order to provide the most meaningful contributions, we must maintain focus on our employees who bring limitless passion to their work each and every day. Additionally, we continue to focus our attention on being a trusted advisor to all who look to us for support.

In this report, you will see many partnerships, allowing us to support MSU's mission to advance knowledge and transform lives. Through these partnerships, we tell the story of our commitment to stewardship with all resources that you entrust us with.



We also highlight stories about IPF staff working with our partners to achieve the most effective, sustainable outcome for the university. Infrastructure Planning and Facilities proudly serves Michigan State University and the campus community, every single day.

Sincerely,

Dan Bollman



IPF PROFILE

The Michigan State University (MSU) Facilities and Infrastructure Report is compiled annually and shows the state of MSU's infrastructure and facilities. It was released by MSU Infrastructure Planning and Facilities (IPF) in November 2018.

ABOUT IPF

IPF is a service organization that provides utilities, design and construction, planning and campus services to MSU. These services are critical to MSU's mission of teaching, research and outreach. A full list of IPF services is available in the [IPF Service Guide](#).

VISION AND VALUES

The IPF vision is to be the most high-performing, innovative, leading-edge facilities organization in the nation. IPF follows these values to achieve this vision:

- **Stewardship:** IPF is fiscally responsible and accountable for the resources entrusted to us.
- **Service Excellence:** IPF exceeds customer expectations for enhanced teaching, learning and research.
- **Innovation:** IPF is willing to take risks, which creates value for our customers.

STRATEGIC OBJECTIVES

IPF has identified three strategic objectives to guide its work and culture and to ensure alignment with MSU's mission to advance knowledge and transform lives.

People

- Strengthen employee development by creating a comprehensive pipeline of T-shaped individuals.

Partners

- Improve the customer experience by strengthening key systems.

Stewardship

- Enhance MSU stewardship by improving efficiency and/or reducing costs.



IPF maintains...



1,315,000

pounds per hour
total steam capacity

7,700

gallon per minute
normal well capacity
from 15 wells

1,539

vehicle
transportation fleet



PEOPLE

SPARTANS WILL: I WILL

IPF has created a career mapping wall to help employees see what skills and abilities they need to acquire in the different classifications of jobs.

“The feedback we have received from the staff has been really excellent,” said Adam Lawver, Campus Services director. “They really appreciate the transparency the wall has provided for them, and they have clarity on expectations as they move up in their career.”

The wall also promotes information about downloading the Skillsoft mobile application so staff can access ElevateU on their devices. Additional information about industry certifications that are required for positions, and how to sign up for tests covering those certifications, are provided. Leadership qualities that IPF values can also be found on the wall.

Lastly, there is a floating Spartan plume on the career mapping wall that can be adjusted to any height. Next to the feature is a question that asks, “Who will grow their career to advance knowledge and transform lives?,” allowing IPF staff to affirm: “I Will.”



NEW PERFORMANCE EXCELLENCE

For the past two years, IPF has been recognized as a leader in Performance Excellence. Based on feedback from employees and supervisors, IPF Human Resources built on that momentum with updates to the Performance Excellence and professional development goals forms. The revised forms are specific to IPF’s mission, vision and values, incorporating IPF’s focus on diversity and inclusion with references to innovation and T-shaped competencies.

IPF officially transitioned to the new forms on July 1, 2018. While the new forms do not change the concept of Performance Excellence, they will help employees and supervisors develop more collaborative discussions about priorities specific to IPF.





**DANIELLE HOOK, DAVID ROBINSON
COORDINATING IPF LEARNING
AND DEVELOPMENT**

Staff in IPF are getting new Learning and Development opportunities thanks to the work of Danielle Hook and David Robinson, both learning and development specialists for IPF. Together they are assessing organizational learning needs to then develop a learning strategy for 2019.

Hook and Robinson are leading major projects in mobile implementation, leadership assessment and development, Promapp implementation and training, which all support IPF’s focus on employee engagement.

IPF Learning and Development 2017-2018

Mobile device handout and training:

822
employees

85
training sessions

30
office hours sessions

18
help videos produced

93%
employees satisfied with training

AppTree training

363
employees trained

18
training sessions

promapp

80
training attendees

35
training sessions

20
office hours sessions

8
presentations

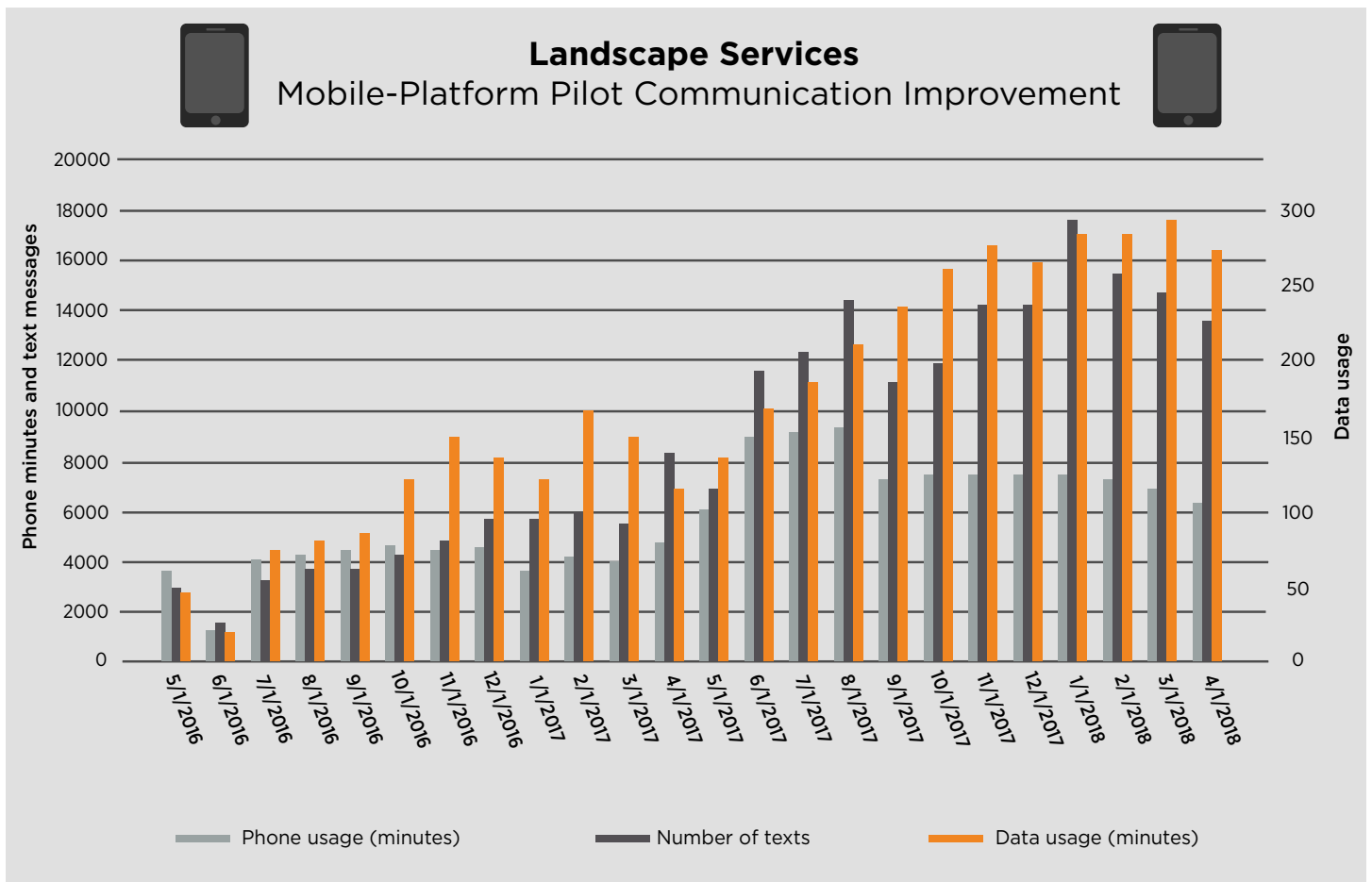
10
other trainings and presentations

IPF MOBILE PROJECT MAKES ITS MARK IN 2017-18

Over the past year, nearly all IPF employees have been assigned a range of mobile iOS devices to improve access to information at the point of decision-making, in turn reducing waste-in-process and increasing efficiency and productivity. IPF now leads the nation in facilities organizations deploying mobile devices to all staff, where most facilities organizations are limiting the deployment to skilled trades or a single crew.

“The distribution of devices allows IPF staff to record work on a campus map, which the crews are then able to access on their devices. When staff records work they completed, the information is uploaded on a minute-by-minute basis to a dashboard. In addition to seeing their tasks, they also have access to other team tasks, which has increased collaboration.

“Seeing the progress of the IPF unit provides instant gratification of viewing a completed job, but also provides motivation for the next day,” said Adam Lawver, IPF Campus Services director. “Crews no longer need to wait for their supervisor to assign work. The work order application is accessible from the mobile device and work crews are able to proceed with their digital work lists.”





NEW LEADERSHIP

JOHN LEFEVRE: NEW LEADER FOR IPF PLANNING, DESIGN AND CONSTRUCTION

John LeFevre, who previously served as design administrator for Planning, Design and Construction (PDC), was promoted to the leadership position earlier this year. Before returning to MSU in 2011, he was the senior associate and vice president of Fishbeck, Thompson, Carr and Huber, Inc. from 1989 - 2011.

An engineer by trade, LeFevre has a Master of Science degree in civil engineering from MSU. He worked as an engineering student and as a professional engineer on campus for several years after graduation.

LeFevre oversees PDC teams that deliver major projects. “All the projects here, we get to see and work around every day. We have that pride ownership,” LeFevre said. “It’s very tangible evidence of everything we do and that’s really cool.”

SHERRI JETT: NEW LEADER FOR IPF POWER AND WATER

Sherri Jett, who assumed the position of Director of Utilities July 23, has more than 25 years of domestic and international energy industry experience. She held various positions with Black & Veatch, most recently stationed in Jakarta, Indonesia leading their micro/hybrid renewable engineering services team in Asia. Prior to joining Black & Veatch in 2007, Jett held positions with ExxonMobil and Exxon as a chemical/facilities engineer.

Jett holds a Bachelor’s of Science degree in chemical engineering and is a Licensed Professional Engineer in the State of Michigan. She attended MSU for her freshman and sophomore years before transferring to the University of Virginia to finish her degree.

“We’ve got a great team here. I’m very lucky and I’m very impressed with everyone and how conscientious they are at being cost effective for the university,” Jett added. “People are very hard-working and act like it’s their own checkbook and that’s a great mindset to have.”





**SABRINA HEBELER:
IPF CHIEF OF STAFF**

Sabrina Hebler is the Chief of Staff for IPF. She is an advisor to the AVP and liaison to the entire organization through listening, connection and translation.

Additionally, a large portion of her time is spent managing the organization’s strategy cycle and continuous improvement processes. Using her MBA and background in employee learning and development, she specializes in facilitation, change management and organizational learning.

In her time at MSU, Hebler has helped to develop, implement, and evaluate several organizational programs and provide various recommended solutions saving time, money and providing employee engagement opportunities. She finds the most enjoyment out of connecting the work of employees to the purpose of not only the division of Infrastructure Planning and Facilities, but to the success of MSU.

Hebler previously worked for IPF for over three years in the Strategic Initiatives area. She has experience with project management, strategy development, change management and employee engagement. She holds a MBA from Northwood University.

NEW DIRECTORS OF BUILDING SERVICES AND CAMPUS SERVICES

Dave Brewer became the director of Building Services for IPF in August 2017. He oversees operations for Maintenance Services, Building Performance Services and Project Services.



Brewer has more than a decade of facilities experience, especially as assistant and interim director for housing operations at The University of Alabama.

Brewer’s bachelor’s degree in organizational communication is from Central Michigan University. His master’s degree in secondary, adult and higher education is from Grand Valley State University, while his Ph.D. in mass communication is from The University of Alabama.



Adam Lawver was named director of Campus Services for IPF in September 2017.

Lawver provides leadership and strategic vision for Campus Services including custodial, landscape, recycling and transportation, as well as oversees the MSU Surplus Store.

Lawver has held multiple roles at MSU, including interim director of landscape services. Prior to MSU, Lawver worked with landscaping firms in Michigan. Lawver has an MBA in integrative management, a master’s degree in construction management and a bachelor’s of landscape architecture, all from MSU.



PARTNERS

FACULTY READINESS PROGRAM

The Faculty Readiness Program (FRP) is a dedicated team from IPF and Facilities Planning and Space Management working together with colleges to proactively plan for potential new hires, using various delivery methods to shorten bid periods and construction timelines. Part of this planning includes meeting with researchers being considered for employment during the department’s recruitment phase, making sure the renovation budget is adequate in the job offer. This helps expedite the renovations and provides new researchers the space they need prior to their arrival on campus.

In the last four years, the FRP team has successfully completed over 50 projects with a collective value of approximately \$7.5 million. One of the most influential renovations includes a zebra fish lab supporting stem cell research at Giltner Hall, which involved two new faculty members recruited from Germany. The team is currently tasked with 16 active projects in various phases of estimating, design, construction and closeout.

Like all of IPF, the FRP creates a positive experience for colleges and a welcoming environment for new faculty by delivering an outstanding project that is high quality, time and cost efficient, and supports the advancement of the university’s research agenda.

Giltner Hall Renovations:





ENGAGING ACADEMICS IN CLASSROOM REDESIGN

The MSU Classroom Committee is a dedicated team comprised of individuals from IPF, Facilities Planning and Space Management, IT Services, and the Registrar's Office. Working in collaboration with faculty, they create high-impact educational environments that engage students in active learning and foster innovation through a technology rich environment. They also provide opportunities for research and opportunities for leadership in instructional methods.

Each year, approximately 30 to 40 of MSU's more than 330 university classrooms receive upgrades ranging from technology updates to complete renovations. The team has designed three main types of classrooms on campus. The first is the traditional classroom with rows of seating and projectors at the front. Second is the enhanced classroom, comprised of projection screens on multiple walls around the room, creating a more collaborative space. Third, is the REAL (Rooms for Engaged and Active Learning) classroom, with more enhanced technology and collaboration space adaptable to different curriculum.

Collaborating with students and faculty creates a better design process. This helps to better understand their needs and allows IPF to live out its mission of creating facilities to help Spartans change the world.



CONSTRUCTION LEADS TO RESEARCH OPPORTUNITIES

Cow remains, likely more than 100 years old, were unearthed during construction on the Wilson Road extension project. Campus Archaeologist Autumn Painter and other graduate students seized the opportunity to collect, identify and catalog the dozens of bones found at the site.

"The MSU Campus Archaeology Program (CAP) works in partnership with IPF to protect and mitigate below- and above-ground heritage on MSU's campus," Painter said.

IPF notifies CAP when construction will take place on campus so background research and, if necessary, archaeological survey and testing to identify and recover archaeological data can be conducted before construction. If artifacts are found during construction, IPF notifies CAP for study and analysis.

"Working with IPF gives our students an opportunity to learn what it is like to work with construction crews. One of the potential career paths archaeology students can pursue is in the field of cultural resource management, which involves doing mitigation work prior to and sometimes during construction projects in order to preserve and protect archaeological sites," said Stacey Camp, director of MSU Campus Archaeology Program. "IPF and CAP provide students with a hands-on experience in heritage management that is not offered at most universities in the world."





WINTER MAINTENANCE

Landscape Services maintains grounds in all seasons, under all conditions. March 12 brought more snow and slippery roads to campus. IPF crews begin preparing at 5 a.m. if not sooner depending on conditions.

Landscape Services at Work

During the 2017-2018 season...



45

inches of snow received

2,200

tons of salt used

99,908

gallons of brine used for pre-treatment



11,954

labor hours spent on snow and ice response

Landscape Services maintains...

82.88

lane miles of roadway

220

acres of parking lots

7

parking garages

28,254

parking spaces

124

miles of sidewalk

21.32

bike paths and lanes



IPF ASSISTS IN FLOOD PROTECTION AND CLEAN UP

In February 2018, heavy rain and melting snow caused the Red Cedar River to flood MSU's campus. This was the most significant flooding on campus in 43 years.

Lasting from February 19 to 23, the flood resulted in several closed roads, parking lots and sidewalks across campus. The normal depth of the Red Cedar is four to five feet, but begins overflowing its banks at the seven foot mark. During these floods, the river depth measured nine feet.

Along with installing HESCO flood wall barriers to protect buildings located near the river, IPF departments came together to close roadways and walkways, remove dangerous logs from the river and help restore the Beal Botanical Gardens that are located near the river. We also protected and maintained electrical vaults and utility tunnels in the flooded areas to maintain utility service across campus. There was significant cleanup after the water receded.

Campus Flooding Update



Campus Flooding: February 2018



WOMEN IN SKILLED TRADES GRADUATES FIRST COHORT

A burgeoning pre-apprenticeship program for women with a knack for tools, Women in Skilled Trades (WIST), is providing a life-changing opportunity for some women.

Carol Cool of IPF Planning Design and Construction and Tori Menold of SiteAware are the founders of WIST. Their goal was to use their construction industry knowledge to help women succeed in a hands-on field. The program started in Fall 2016 as an Apprenticeship Readiness Program. By July 2018, WIST had its first graduates move on to apprenticeship opportunities.

WIST's advisory committee consists of MSU's IPF, Capital Area Michigan Works, Associated General Contractors of Michigan, Michigan Department of Labor, and Women's Center of Greater Lansing. IPF provides space in its building for training and also has helped with the graduation ceremony, skilled trades demonstrations and other classes.



STEWARDSHIP

FACILITIES CONNECT UPDATE

The Facilities Connect project team, with the support of the Request for Proposal (RFP) Decision Team and the Facilities Connect Steering Committee, made the decision to partner with Planon as IPF's new terminology system for workplace management.

Planon garnered tremendous support during the project grilling sessions, demonstrating an integrated, modern, intelligently designed user interface and integrated mobile app to MSU subject matter experts.

The project team is now engaged with Planon in both contract and statement of work negotiations, and is engaging business and IT experts to help determine the scope and efforts required to make this project a success.

ECMs REDUCE ENERGY USAGE

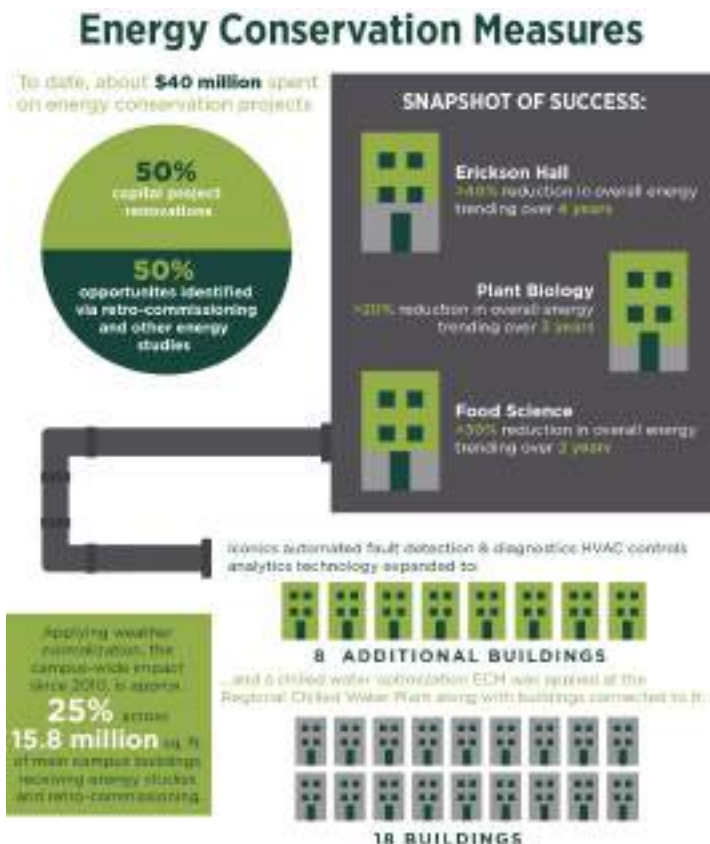
Living IPF's values means reducing energy usage while focusing on keeping campus comfortable. Teams from IPF Planning, Design and Construction and Building Services departments completed the implementation of three Energy Conservation Measures (ECMs) projects campus-wide in 2017-18.

"From an energy conservation standpoint, we live the IPF values of stewardship, innovation and service excellence on a day-to-day basis," said Jason Vallance, Building Performance services manager.

IPF implemented a chilled water optimization strategy to the Regional Chilled Water Plant and the 18 buildings connected to it. IPF also expanded the use of a fault detection analytics platform on HVAC control systems in eight additional buildings.

These projects join ECMs completed in 15 other buildings since 2012, and a steam trap management program now in its eighth year, which is continuously monitored to understand the impact on energy usage.

Through ECMs, energy consumption in Erickson Hall has been reduced by over 40 percent four years running, in the Plant Biology building by 20 percent across three years, and in the Food Science building by 30 percent over two years.



NEW FLEET ADDITIONS SUPPORT SUSTAINABILITY ON CAMPUS

Three zero-emission Chevy Bolts have joined Michigan State University's 1,500 vehicle fleet. The all-electric Bolts emit zero emissions, which promotes a green campus and limits air pollution, have a range of 230 miles, can travel on highways and are available to faculty and staff for daily rentals. The Bolts join 28 low-speed electric cars already in the university's fleet, giving MSU a relatively large pool of sustainable cars.

"It's really the right thing to do from the perspective of trying to have a green fleet initiative," said Brian Watts, assistant director of IPF Transportation Services. "Part of that initiative is being sustainable, and electric vehicles are more sustainable than the typical vehicles we are seeing out on the road today. Part of our mission is to promote these values at the university, and allow people to get an opportunity to see and try the electric vehicles."

Four hundred of the university's 1,539 vehicles are motor pool vehicles, which can be leased out through Infrastructure Planning and Facilities' Transportation Services. One of the Chevy Bolts is permanently leased to IPF. The other two are used by faculty and staff for daily tasks.



UPGRADING CAMPUS WATER SYSTEM INFRASTRUCTURE

Michigan State University will double its water storage capacity and improve the quality of water flowing through its distribution system with construction of a new water treatment plant and storage tank. The new plant will filter six million gallons of water daily, including chlorination, fluoridation and the removal of iron, a mineral that over time can clog plumbing and filters and leave rusty stains on fixtures and laundry.

"This campus is in great shape thanks to foresighted infrastructure investments over many years, but the high mineral content of the water was creating maintenance and appearance issues," said MSU Interim President John Engler. "To continue being a leader, we need to bring our water to a higher standard and today are celebrating breaking ground on a project that will do just that."

In addition to reducing system maintenance needs, the treatment plant will improve the taste of campus water by removing both iron and manganese, and will save MSU \$150,000 annually in pumping energy costs by using gravitational flow.

Project highlights:

11,500-gross-square-foot water treatment plant located at the southeast corner of Service Road and Recycling Drive

2-million-gallon, 150-foot-tall storage tank

Construction start: June 2018
Expected completion: Nov. 2019

Budget: \$21 million from general funds, including \$2.1 million contingency, approved by the Board of Trustees in February 2018





WATER REDUCTION LEADS TO SAVINGS

IPF has been hard at work improving how MSU uses water at the power plant in order to help the environment and promote IPF's value of stewardship.

The T.B. Simon Power Plant is in the process of replacing motor starters and pressure sustaining valves at the well houses. This has improved the electrical efficiency at each well house. Previously each well/pump achieved approximately 450 gallons of water per kilowatt of electricity consumed. The changes are achieving approximately 710 gallons of water per kilowatt, an increase in efficiency of 10 to 30 percent, depending on the specific well and how much it runs per month.

IPF also performed a reverse osmosis pilot study at the power plant. The study demonstrated that a considerable reduction in chemical use and consulting costs are achievable. For the year 2017, the reverse osmosis pilot study saved MSU approximately \$275,000. It has also taxed the power plant operations less by changing the water treatment equipment regeneration process from approximately every 16 hours to every six to eight weeks.



SOLAR CARPORT INITIATIVE EARNS NATIONAL ATTENTION

The solar carport initiative called for installation of solar photovoltaics (PV) arrays across five parking lots, covering 5,000 parking spaces on MSU's campus.

Construction started in March 2017 and was completed in December 2017. Since then, the project has received recognition around the country due to it being the largest carport solar array in North America.

On Feb. 27, 2018, Wolfgang Bauer, Associate Vice President for Administrative Services, and one of MSU's project leaders, accepted an award in Austin, Texas, at the Smart Energy Decisions Innovation Summit 2018. MSU was the co-recipient of the Onsite Renewable Energy award for the solar carport project.

On Oct. 10, 2018, Amy Butler, the campus sustainability director, received the EPA's Green Leadership Award on MSU's behalf in Houston, Texas. The award recognizes programs, individuals and organizations that have a large impact on developing green power sources.



MSU Utilities: Power & Water

MSU Solar Carport



**Largest non-utility
Carport Solar
Array in North
America**



**45
acres**



**5,000
parking
spots**



**Produces 10.5
MW AC at
its peak**

261,968
net megawatt-hours
produced

7,543
net megawatt-hours
generated by the
solar carports

2,111,108,000
pounds of steam
generated for campus
heating/cooling

1,202,473,000
gallons of water
produced by the
reservoir

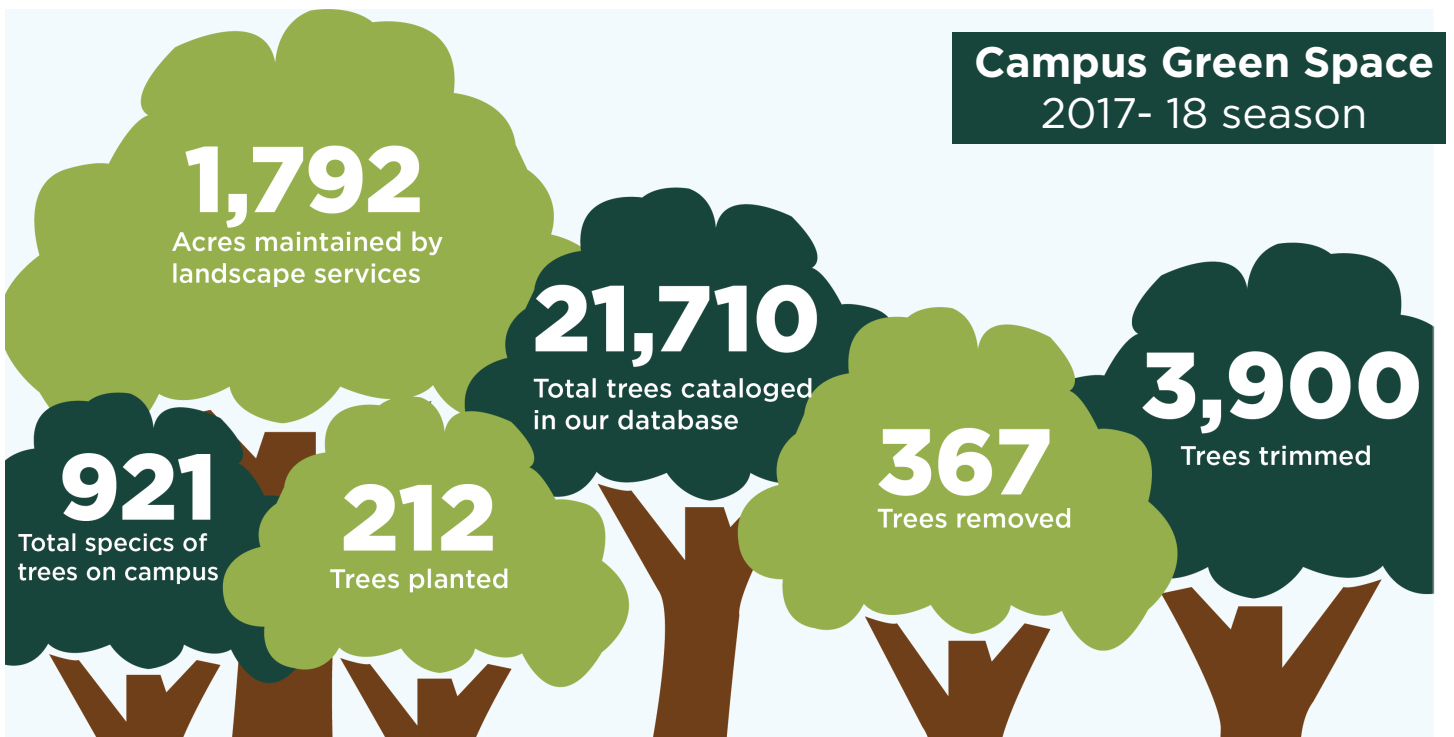
PROTECTING CAMPUS TREES

IPF Landscape Services planted 212 trees in fiscal year 2017-18, including a cherry tree in honor of Arbor Day on April 27, 2018. The new cherry tree replaced an old tree that once grew in the same spot next to the Halfway Rock outside the Union. It is the latest companion for the Halfway Rock, which was originally split by a cherry tree and has rested next to different cherry trees since being moved from its original resting place in 1924.

“Every tree on this campus has a story, some documented and some not,” said Jerry Wahl, campus arborist and

supervisor of the arborist crew. “A great example is a large white oak on the circle that was damaged in a wind storm a couple years ago. As it turns out, it was over 375 years old. Part of this tree is still living near the museum and has been dubbed ‘The Resilient Tree.’”

Wahl’s team of eight full-time arborists trim and fertilize what he calls the campus “living laboratory” that spans 1,792 acres. They also remove trees — 367 in 2017-18 — to maintain campus safety. Thanks to their hard work, MSU is a Tree Campus USA recognition award winner.



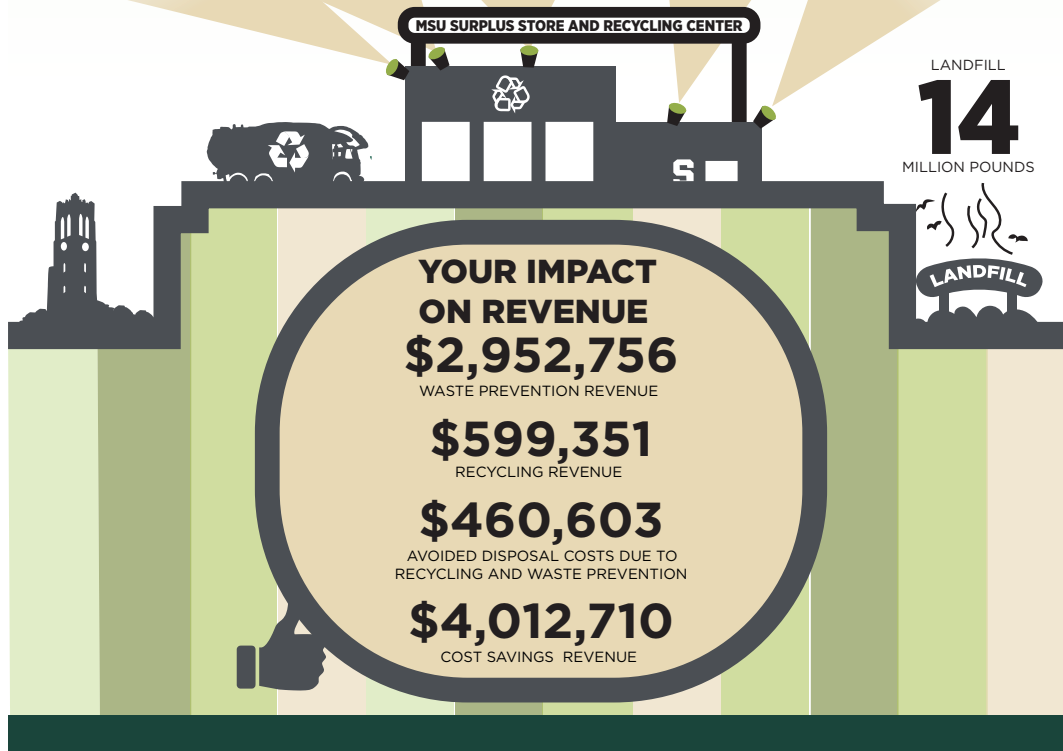
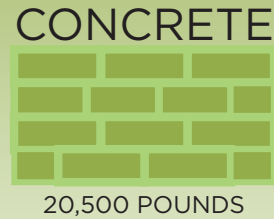
Surplus Store and Recycling

managing waste as a resource



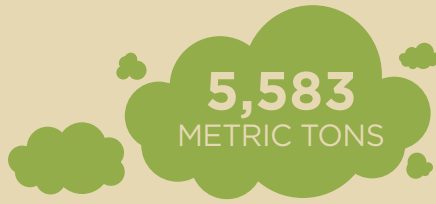
THROUGH YOUR EFFORTS WE REUSED RECYCLED AND COMPOSTED:

Because of you, thank you!

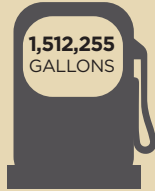


YOUR IMPACT ON THE ENVIRONMENT

BY RETHINKING, REUSING & RECYCLING WE HAVE DIVERTED ENOUGH GREENHOUSE GAS EMISSIONS TO REDUCE THE EQUIVALENT OF:

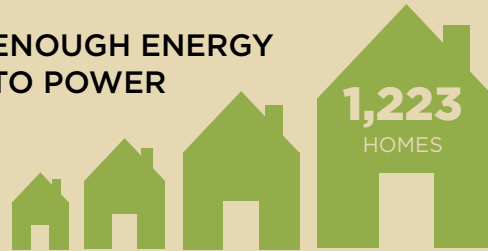


OF **CO2** FROM ENTERING EARTH'S ATMOSPHERE



OF GAS

ENOUGH ENERGY TO POWER



OF OIL

REMOVING **2,824** PASSENGER CARS FROM THE ROAD



Total Disposal Savings and Revenue returned to MSU:

\$4 MILLION



OUR GOAL IS TO DIVERT
60% BY 2019

We are currently at 47%





SURPLUS AND RECYCLING: HARD WORK RECOGNIZED

Surplus and Recycling recently received the Michigan Department of Environmental Quality's Excellence in Recycling Award alongside partners in the Regional Recycling Coordinating Committee (R2C2) for the second time in the past four years.

The MSU Surplus and Recycling Center has been a long-standing member of R2C2. The mission of R2C2 is to reduce waste and increase recycling opportunities in Ingham, Eaton and Clinton counties; cities of Lansing and East Lansing; Delhi, Delta and Meridian townships and others.

Surplus and Recycling provides support at community recycling and hazardous waste collection events hosted by the R2C2 group and has helped to divert hundreds of thousands of pounds of waste from landfills.

"We are excited that the hard work of the R2C2 was honored by the Michigan Department of Environmental Quality," said Recycling Coordinator Dave Smith. "We look forward to our continued relationship with R2C2 and helping the community find sustainable solutions to waste management."

In addition to earning the award, Surplus and Recycling collected over one million pounds of materials over move out week, marking the 21st year of efforts to reduce waste during this time. These materials, including clothing, carpet, household goods and furniture were collected, resold, donated or recycled.



CUSTODIAL SERVICES INNOVATION TEAM

Custodial Services created a group called the Innovation Team in 2015. Now in its third year, members of the Innovation Team are individuals who have been recognized by the supervisory team as Outstanding Cleaning Workers.

Outstanding Cleaning Workers are identified as high performing in all areas and particularly as a mentor to other workers. Once on the Innovation Team, members become a voice for all front line workers when the department considers process changes, new tools or products.

The Innovation Team is broadly represented, as some members of the team have since been promoted to supervisors. Cynthia Jones currently leads the Innovation Team.



IPF strives to be the most high-performing, innovative, leading-edge facilities organization in the nation, with a focus on quality, customer satisfaction and value in all we do.



We look forward to working with our partners to continue providing services and facilities that help Spartans **change the world.**



ANNUAL CONSTRUCTION REPORT: FISCAL YEAR 2017-18

Major capital projects are those that are \$1 million or greater and require Board approval. Minor capital projects are those that are greater than \$250,000 and less than 1 million.

The Board requests a listing of these projects on an annual basis. In addition to the annual report, the Board receives quarterly construction reports reflecting current construction projects.

The report highlights two areas for the 7 major capital projects that were closed during 2017-18. These areas include planned budget and actual cost of the project. The following table also includes data for the 35 minor capital projects that were closed during the fiscal year.

The approved budgets for the projects totaled nearly \$86 million. The final cost of these projects was above \$78 million, a difference of about \$7 million, or 8.2 percent, which was returned to the appropriate units.

Project Number	Project Name	Project Type	Close Date	Consultant	Contractor	Delivery Method	Authorized Budget	Actual Costs
CP12378	STEAM DISTRIBUTION - NORTH CAMPUS - INFRASTRUCTURE IMPROVEMENTS - WEST CIRCLE DRIVE 2015 (PH 4 OF 4)	Major	2/5/2018	FTC&H	Granger Construction	CM	\$9,075,000	\$8,039,294
CP16153	HUBBARD HALL - EXTERIOR MASONRY REPAIR AND WINDOW REPLACEMENT - PHASE II	Major	2/6/2018	WTA Architects	Nielsen Commercial Construction	CM	\$2,500,000	\$2,429,852
CP13223	ENGINEERING - CHILLER REPLACEMENT	Major	2/13/2018	Peter Basso Associates	Granger Construction	CM	\$14,100,000	\$11,447,197
CP15022	ENGINEERING - ADDITION 5 - ALTERATIONS TO SUITE 1515	Major	5/2/2018	Niagara Murano	The Christman Company	CM	\$7,800,000	\$7,280,613
CP14218	TB SIMON POWER PLANT - UPGRADE UTILITY SUBSTATION	Major	5/14/2018	Consumers Energy	Consumers Energy	CM	\$24,000,000	\$23,491,100
CP15220	MUSIC PRACTICE - WINDOW REPLACEMENT	Major	5/15/2018	IPF	Demaria Building Company, Inc.	CM	\$1,500,000	\$1,260,495
CP11295	CLINICAL CENTER - C-WING - HVAC RENOVATION AND ADDITION 1	Major	5/17/2018	Peter Basso Associates	Clark Construction Company	CM	\$8,500,000	\$8,500,001
7 major projects - subtotal							\$67,475,000	\$62,448,552
CP15300	Wells Hall - Alterations To Suite D101	Minor	7/6/2017	PDC	Nielsen Commercial Construction Co., Inc.	GC	\$830,000	\$724,797
CP11324	Communication Arts - Alterations To Rooms 148, 148a And 154	Minor	7/17/2017	C2AE	Nielsen Commercial Construction Co., Inc.	GC	\$915,000	\$883,534



Project Number	Project Name	Project Type	Close Date	Consultant	Contractor	Delivery Method	Authorized Budget	Actual Costs
CP16020	Erickson Hall - Alterations To Suite 300	Minor	7/19/2017	Pace Howe	Open Order - National Business Supply	GC	\$344,608	\$344,607
CP13332	Cowles House - Building Renovations	Minor	7/27/2017	IPF	Demaria Building Company Inc	CM	\$500,000	\$304,920
CP15262	Manly Miles - Replace Boilers	Minor	7/27/2017	IPF	IPF	DB	\$335,000	\$335,671
CP12399	Plant And Soil Science - Energy Conservation Measures - Phase 2	Minor	10/30/2017	Diclemente Siegel Design Inc	IPF	DB	\$290,000	\$239,157
CP13229	International Center - Implement Energy Conservation Measures	Minor	10/30/2017	Matrix Consulting Engineers Inc	IPF	GC	\$734,000	\$733,803
CP15297	Chemistry - Alterations To Rooms 29, 218, 235, 338, 387 And 387a	Minor	11/2/2017	Bernath-Coakley Assoc Architect Inc/Matrix Consulting Engineers Inc	Nielsen Commercial Construction Co., Inc.	GC	\$610,450	\$600,450
CP15073	Giltner Hall - Alterations To Rooms 39, 40, 41, 65, 67, 344a And 363	Minor	11/3/2017	Peter Basso Associates Inc	Nielsen Commercial Construction Co., Inc.	GC	\$997,000	\$929,713
CP15306	IM Sports-Circle - Alterations To Rooms 118 And 126	Minor	11/8/2017	CTRE Inc	Nielsen Commercial Construction Co., Inc.	GC	\$775,000	\$713,932
CP15241	Human Ecology - Replace Elevator	Minor	11/10/2017	Bernath-Coakley Assoc Architect Inc/Engineering Applications Inc	Nielsen Commercial Construction Co., Inc.	GC	\$365,000	\$351,134
CP15176	Parking Ramp 4-Kellogg - Restoration 2015	Minor	11/13/2017	Walker Parking Consultants	Orion Waterproofing Inc	GC	\$291,000	\$254,814
CP17131	Parking - Lots 207 And 209 - Reconstruction - Candlewood Suites And University Club	Minor	12/14/2017	Not Entered	IPF	IPF	\$331,386	\$259,080
CP15283	Water Distribution - Replace Deteriorating Cast Iron Water Main Along Red Cedar Rd From Central Serv	Minor	1/5/2018	IPF	IPF	DB	\$300,000	\$288,154
CP15248	Clinical Center-Office/Lab - Replace Elevators	Minor	1/8/2018	Bernath-Coakley Assoc Architect Inc/Engineering Applications Inc	Nielsen Commercial Construction Co., Inc.	GC	\$695,000	\$629,905
CP14137	Natural Resources - Alterations To Room 332 And Suite 334	Minor	1/9/2018	IPF	IPF	DB	\$275,150	\$112,593
CP15273	Music - Alterations To Rooms 135, 141, 145, 206 And 245	Minor	1/9/2018	IPF	J Perez Construction Inc	GC	\$429,000	\$361,397
CP15261	Giltner Hall - Replace Chiller No. 2	Minor	1/18/2018	IPF	IPF	DB	\$350,000	\$137,118
CP15278	Plant Biology - North Wing Energy Conservation Measures	Minor	1/23/2018	IPF	IPF	DB	\$430,837	\$429,626
CP13357	Plant Biology - South Wing Cooling Tower Replacement	Minor	2/6/2018	Diclemente Siegel Design Inc	Nielsen Commercial Construction Co., Inc.	GC	\$300,000	\$248,982
CP15269	Chemistry - Renovations To Room 138	Minor	2/13/2018	Mayotte Group Architects	Moore-Trosper Construction Co	GC	\$920,000	\$842,171
CP15233	Steam Distribution - Miscellaneous Repairs To Vaults, Pipe Supports And Mechanical - Greenhouse Area	Minor	2/16/2018	IPF	IPF	DB	\$425,000	\$423,268
CP16149	Kellogg Center - Replace Roofs 5, 6, 33 And 35	Minor	2/26/2018	Roofing Technology Associates, Ltd	Bornor Restoration Inc	GC	\$325,000	\$279,148



Project Number	Project Name	Project Type	Close Date	Consultant	Contractor	Delivery Method	Authorized Budget	Actual Costs
CP14254	Brody Hall - Replace Kitchen Grease Interceptor	Minor	3/9/2018	Peter Basso Associates Inc	Central Excavating Lic	GC	\$372,875	\$332,672
CP15242	Fee Hall - Replace Freight Elevator	Minor	3/9/2018	Bernath-Coakley Assoc Architect Inc/Engineering Applications Inc	Nielsen Commercial Construction Co., Inc.	GC	\$350,000	\$279,382
CP15217	Kellogg Center - Alterations To Rooms 61, 62 And Corniche Room	Minor	3/12/2018	IPF	Laux Construction Company	GC	\$530,000	\$487,479
CP16091	Tb Simon Power Plant - Alterations To Room 108, Break Room And Locker Room	Minor	3/12/2018	IPF	Moore-Trosper Construction Co	GC	\$269,999	\$244,622
CP16274	Spartan Village - Alterations To Units 1612e, 1616a, 1619a, 1619b, 1622b And 1622c	Minor	3/13/2018	IPF / Engineering Applications Inc	IPF	DB	\$550,000	\$516,623
CP14219	Tb Simon Power Plant - Natural Gas Meter Stand Replacement	Minor	3/19/2018	Consumers Energy	Consumers Energy	CM	\$990,000	\$628,896
CP16000	Secchia Center - Renovations To Seventh Floor	Minor	3/21/2018	Aecom Great Lakes Inc	Christman Company	CM	\$995,500	\$948,603
CP16002	Natural Science - Alterations To Rooms 137, 138 And 139	Minor	4/5/2018	IPF/Engineering Applications Inc	J Perez Construction Inc	GC	\$400,000	\$398,020
CP14319	Hubbard Hall - Replace Freight Elevator	Minor	4/6/2018	Bernath-Coakley Assoc Architect Inc/Engineering Applications Inc	Nielsen Commercial Construction Co., Inc.	GC	\$340,000	\$339,136
CP16187	Sewer Distribution - Modify Storm Sewer At Manly Miles Lot 86	Minor	4/10/2018	Fishbeck, Thompson, Carr & Huber	Central Excavating Lic	DB	\$650,000	\$649,991
CP16064	Case Hall - Replace Domestic Water Piping	Minor	4/13/2018	IPF	Nielsen Commercial Construction Co., Inc.	DB	\$400,000	\$363,587
CP13180	Clinical Center-Animal - Upgrades To Ular Cage Wash Area C124, C124a And C132	Minor	5/1/2018	Peter Basso Associates Inc	Clark Construction Company	CM	\$830,000	\$829,118
35 minor projects - subtotal							\$18,446,805	\$16,446,103
42 projects - total							\$85,921,805	\$78,894,655

Construction budget data - fiscal year summaries

Budget for Closed Projects	FY 11-12	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18
Authorized Budget:	\$52,410,475	\$236,944,478	\$244,564,890	\$149,759,600	\$154,275,164	\$53,759,011	\$85,921,805
Final Cost:	\$48,451,752	\$226,396,069	\$237,428,564	\$139,028,879	\$143,339,743	\$48,398,311	\$78,894,655
Total Returned:	\$3,958,723	\$10,548,409	\$7,136,326	\$10,730,721	\$10,935,421	\$5,360,700	\$7,027,150
Total % Returned:	7.6%	4.5%	2.9%	7.2%	7.1%	10.0%	8.2%
Contract:	\$33,789,257	\$155,668,557	\$164,735,416	\$102,757,439	\$95,518,261	\$38,531,616	\$69,367,959
Number of Projects Closed	41	44	47	47	46	35	42



MICHIGAN STATE UNIVERSITY - INFRASTRUCTURE PLANNING AND FACILITIES

FACILITIES DATA REPORT

BUILDING DATA SUMMARY

30 June 2018

	SQUARE FEET	NUMBER OF BUILDINGS	REPLACEMENT VALUE
GENERAL FUND FACILITIES			
ACADEMIC	9,543,478	94	\$2,193,260,294
ATHLETICS	1,134,594	7	\$284,914,601
FARMS	862,779	122	\$63,701,061
OTHER	16,328	5	\$1,498,930
PARKING	269,155	1	\$10,348,234
SUPPORT	1,364,292	77	\$522,593,772
ACADEMIC	345,915		\$59,617,555
SUBTOTAL - GENERAL FUND FACILITIES	13,536,541	306	\$3,135,934,447
SELF SUPPORTING FACILITIES			
ACADEMIC	592,670	11	\$148,117,129
ATHLETICS	904,809	42	\$229,106,739
FARMS	13,822	9	\$402,511
HOUSING	6,316,719	138	\$1,030,987,627
OTHER	218,840	15	\$30,478,946
PARKING	1,865,703	15	\$110,201,340
SUPPORT	782,671	22	\$184,086,307
TOTAL	24,231,776	558	\$4,869,315,046



INFRASTRUCTURE OVERVIEW**EAST LANSING CAMPUS (FY18)**

	<u>2017- 2018</u>
Total acres at East Lansing	5,467.29
Developed Park	1,792.17
Arboretum (approximate number of trees and shrubs)	N/A
University-owned roadways (lane miles)	82.88
Parking Spaces	28,254
Parking Ramps	7
Sidewalks (miles)	124
Bridges	8
Golf Courses	19.52
Bike Paths and Lanes (lane miles)	21.32
Roadway Turning Lanes (lane mile)	N/A
Irrigated Land (acres)	178.42
Irrigation Main Line (miles)	30.18
Irrigation Lateral Line (miles)	55.94



INFRASTRUCTURE OVERVIEW**LANDSCAPE SERVICES KEY INDICATORS**

	<u>2017-2018</u>			
Staff	52 FTEs	28 temps	53 on-calls	24 students
Trees Planted	212			
Shrubs Planted	15,772			
Perennials Planted	1,744			
Trees Taken Down	367			
Diesel Fuel Usage (gallons)	21,231			
Annual Irrigation Water Usage (gallons in millions)	23,481,894			

TRANSPORTATION AND FLEET SERVICES KEY INDICATORS**BUS SYSTEM**

	<u>2017-2018</u>
MSU Charters Only	626
All Charter Trips	752

MOTOR POOL

Vehicle Trips	3,365
Million Miles	2.91

GARAGE

Fuel Pumped (Gallons x 10 ³) ¹	369
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VEHICLES

	<u>Motor Pool</u>	<u>Departments</u>	<u>Total</u>
Sedans/Wagons/Minis (includes 79 Hybrids)	298		298
Vans, SUV's and Trucks	137	651	788
Buses	6		6
Trailers		301	301
Others		146	146
Total	441	1,098	1,539
Annual Mileage	2,902,816	3,255,000	6,157,816



UTILITY STATISTICS

UTILITY DISTRIBUTION SYSTEMS

	<u>PREVIOUS</u>	<u>CURRENT</u>	<u>Net Change</u>
Chilled Water Supply (miles)	3.84	3.8	-0.05
Chilled Water Return (miles)	3.64	3.59	-0.05
Street Light Cable (miles)	89.52	88.65	-0.87
Street Light Units	1,556	1,477	-79
Area Light Units	1,946	2,027	81
IM Light Units	91	91	0
Storm Sewer (miles)	113.92	115.63	1.7
Sanitary Sewer (miles)	42.83	42.69	-0.14
Steam Pipe - Tunnels (miles)	13.8	13.87	0.08
Steam Return - Tunnels (miles)	12.88	12.95	0.07
Steam Pipe- Buried (miles)	1.72	1.73	0.01
Steam Return- Buried (miles)	1.63	1.63	0.01
Water Distribution (miles)	72.57	72.77	0.2

UTILITY PRODUCTION CAPACITY

	<u>Steam- Klbs/hr</u>	<u>Electricity- Megawatts</u>
Unit 1	250	12.5
Unit 2	250	12.5
Unit 3	350	15
Unit 4	350	21
Unit 5	N/A	24
Unit 6	115	13.5
Total	1,315	98.5
CPCO Tie Line	N/A	100

WATER SYSTEM

	<u>2017- 2018</u>
# of Wells	15
Nominal Well Capacity (GPM)	7,700
Reservoir Storage Cap (Gallons)	1,000,000
Reservoir Pump Cap (GPM)	9,600

UTILITY SYSTEM PEAK DEMANDS

	<u>2017- 2018</u>
Electrical System (MW)	72.1
Campus Steam (1,000 pounds per hour)	516
Water (GPM)	5,000



UTILITY STATISTICS

UTILITY PRODUCTION AND CONSUMPTION

	<u>2016- 2017</u>	<u>2017- 2018</u>
Fuel Consumed (Trillions of BTU)	6.13	6.28
Campus Steam (1,000 Pounds)	1,984,000	2,111,000
Campus Electrical Demand (MWh)	295,986	315,056
Plant Generation (Gross MWh)	309,462	315,516
Plant Generation (Net MWh)	257, 374	261,968
Electrical Tie line Purchase (MWh)	42,286	48,951
Carport Solar Purchase (MWh)	0	7,542
Electrical Tie Line Sold (MWh)	3,598	3,344
Water- Reservoir (1,000 Gallons)	1,053,399	1,202,437
Water- Well Field (1,000 Gallons)	1,226,150	1,287,541

UTILITY EMISSIONS (TONS)

	<u>CY 2016</u>	<u>CY 2017</u>	<u>% Change</u>
NOx (tons)	309	315	1.9%

***CO2 Scope 1 and 2 numbers are based on Energy Transition Plan definition and include purchased electricity, all natural gas utilized in the power plant, on the farms and in buildings on main campus. These numbers are in fiscal year with 2009-10 listed as the baseline year defined by the ETP. Units are equivalent to Metric Tons.*

