



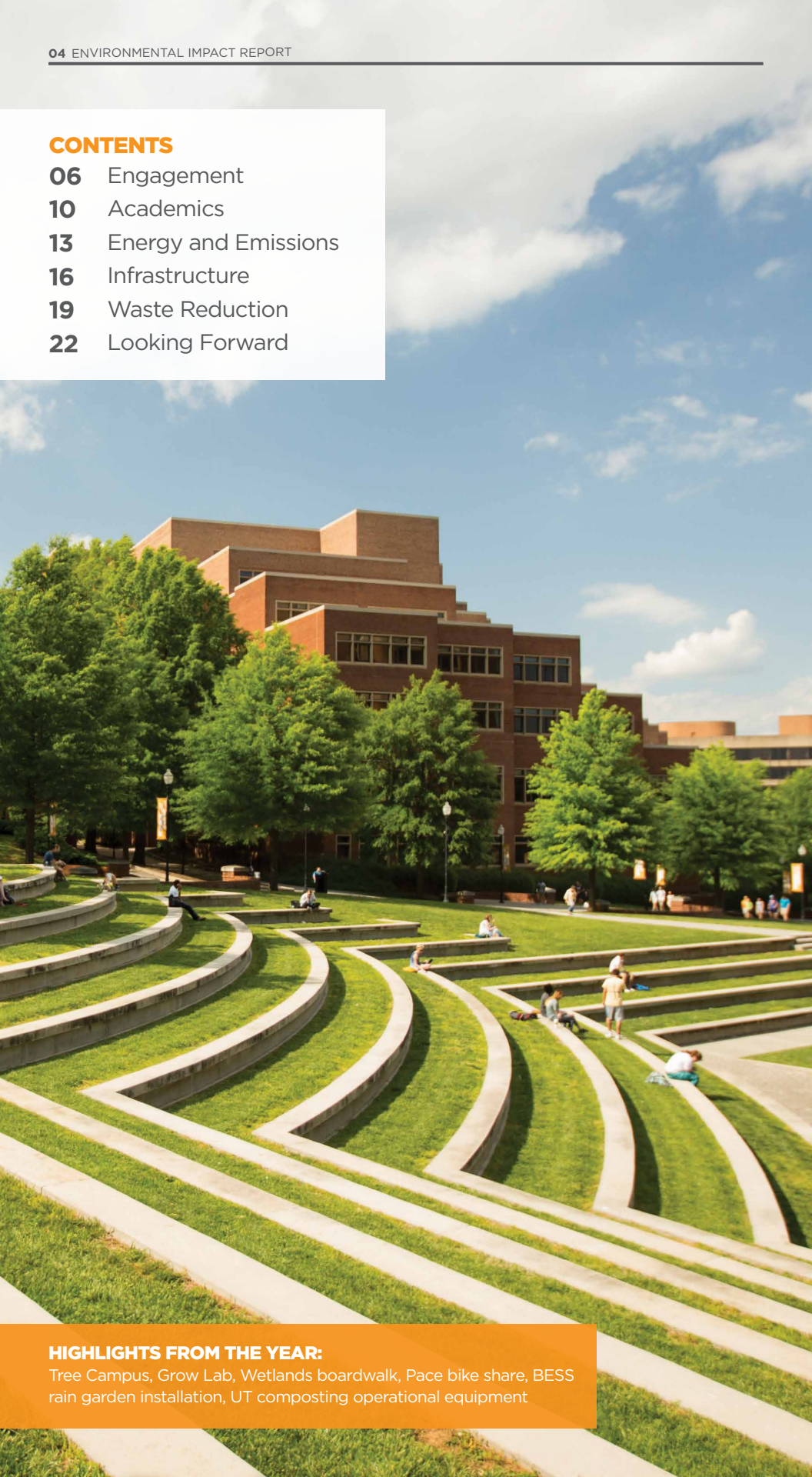
THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

OFFICE OF SUSTAINABILITY
**ENVIRONMENTAL
IMPACT REPORT**
2018-19



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HIGHLIGHTS FROM THE YEAR:

Tree Campus, Grow Lab, Wetlands boardwalk, Pace bike share, BESS rain garden installation, UT composting operational equipment

FROM THE CHANCELLOR



Take a stroll across our campus and it's easy to see the investments we're making in our future. You'll find beautiful new academic and student life buildings, more green space, and less asphalt. We have more students on our campus than any time since the 1980s, and we're working hard to make sure they have the resources they need to succeed. To invest in the future of UT is to invest in sustainability.

As we construct new buildings, we are committed to making them energy efficient by adhering to LEED standards. A wind turbine installed at the Facilities Services Complex and a geothermal

energy offset at Sorority Village are helping to offset our consumption. We have purchased seven new electric cars to replace gas-powered vehicles in our campus fleet and installed six new vehicle charging stations with solar panels, allowing cars to run on sunshine.

We've enhanced our stormwater system with rain gardens on the agriculture campus, an expansion of the Volunteer Boulevard streetscape, and wetlands management at UT Gardens. We've installed rainwater capture capacity for irrigation, laundry, and other uses at the new Student Union, Strong Hall, and Dogwood and Magnolia Residence Halls.

We have been steadily reducing our environmental impact while also saving the campus hundreds of thousands of dollars every year. We take pride in our role as the state's flagship land-grant university, and we take seriously our responsibility to be good stewards. By investing in new technologies, looking for efficiencies, and reducing waste, we are living up to the mission of providing a better life for Tennesseans.

Wayne T. Davis
Interim Chancellor

All qualified applicants will receive equal consideration for employment and admission without regard to race, color, national origin, religion, sex, pregnancy, marital status, sexual orientation, gender identity, age, physical or mental disability, genetic information, veteran status, and parental status, or any other characteristic protected by federal or state law. In accordance with the requirements of Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990, the University of Tennessee affirmatively states that it does not discriminate on the basis of race, sex, or disability in its education programs and activities, and this policy extends to employment by the university. Inquiries and charges of violation of Title VI (race, color, and national origin), Title IX (sex), Section 504 (disability), the ADA (disability), the Age Discrimination in Employment Act (age), sexual orientation, or veteran status should be directed to the Office of Equity and Diversity, 1840 Melrose Avenue, Knoxville, TN 37996-3560, telephone 865-974-2498. Requests for accommodation of a disability should be directed to the ADA Coordinator at the Office of Equity and Diversity. A project of the Office of Sustainability with assistance from the UT Office of Communications and Marketing. Job 483852.

Engagement



Student involvement is a vital part of sustainability on our campus.

Between tree plantings, informational fairs, volunteering on game days, and a myriad of other events, the UT sustainability community gives everyone at the university the opportunity to learn about their own environment and help preserve it for future generations.”

—Emma Heins, SGA Sustainability Chair

OUTREACH EVENTS

POWER Challenge
Campus Sustainability Day
Blackout Bash
Grow Lab Work Day
Yoga on the Quad
Dining Events
E&S Career Mingle
Earth Month Celebration
Sustainability Day of Service
River Cleanup
Environmental Leadership Awards
Bike to Work Day

POWER CHALLENGE

The 15th annual POWER (Programs of Water, Energy, and Recycling) Challenge is an annual competition between the residence halls to see who can reduce their water and energy usage, and increase recycling throughout October.

Three POWER Challenge-specific events: Blackout Bash, Grow Lab Work Day, and Yoga on the Quad

1st

Massey Hall

2nd

Hess Hall

3rd

Brown Hall

748.72

tons of materials recycled

39,982

fewer gallons used

\$68,000

avoided in power costs

CAMPUS ENGAGEMENT

117

volunteers completed over

300

hours of service

Educated over

300

students directly

Interacted with thousands of students

who came to events throughout the year

400

additional social media following

Over

20,000

views on website since February 2018

30

people nominated for Sustainability Champions

Winners include: Joanne Logan, Christy Hickman, Katie Carpenter, and others

STUDENT GROUPS AND HIGHLIGHTS

EcoVols

The group is a peer-to-peer environmental education program aimed at reducing energy and water usage, reducing waste, increasing recycling, and promoting other sustainable living habits.

Highlights: Sponsored a cleanup in the town of Louisville

SPEAK

Students Promoting Environmental Action in Knoxville works to increase awareness and seek creative solutions to local, regional, and national environmental issues.

Highlights: Celebrated its 26th anniversary by cosigning the Rohm and Haas Hazardous Waste Permit, maintained its student garden, and volunteered at local events like Campus Sustainability Day

Food Recovery Network

The network fights food waste and hunger by recovering surplus perishable food from campus and surrounding communities. All recovered food is redirected to Smokey's Pantry, KARM, and Second Harvest Food Bank of East Tennessee.

Highlights: Recovered more than 11,000 pounds of food from UT football games, voted 2017-18 Environmental Student Group of the Year

SGA Environment and Sustainability Committee

A group of students who are part of the Student Government Association and are passionate about promoting a more sustainable campus environment through advocacy and the implementation of policy on a wide range of issues.

Highlights: Passed the Removal of Straw and Styrofoam (RAFA) bill, implemented Big Green Friday, and conducted litter cleanups

Hydrolunteers

The group creates a platform for community involvement, networking, and learning for students interested in all things related to water and environment.

Highlights: Sponsored river cleanups, hosted panel discussions, and participated in campus-wide sustainability campaigns

Society for Ecological Restoration

A nationwide society dedicated to the preservation and conservation of natural

lands and ecosystems, the club aims to help reverse the degrading effects of unsustainable activity in the Knoxville area.

Highlights: Hosted several stream cleanups

UT Alliance for Geographers and Sustainers

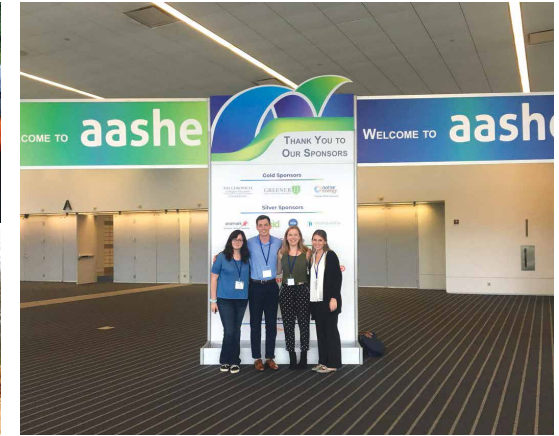
The alliance is the official student organization that works to unify and strengthen the body of geography and sustainability majors within the Department of Geography by providing students resources for networking, and academic and professional development.

Highlights: Planned events to build unity amongst the majors and the department and provide them with networking and socializing opportunities

Vols for Veggies

The club shows students how to eat sustainably on campus and around Knoxville.

Highlights: Hosted a vegan BBQ at World's Fair Park, participated in Earth Month events



FUNDING OPPORTUNITIES

Student Green Fee

Every month, the Student Environmental Initiatives Committee meets to review, vote, and implement proposals from the campus committee.

Design and Research

This \$100,000 annual fund is for faculty and staff to provide design and research opportunities for sustainable ideas that can be applied to campus.

Conference Funding

Each fiscal year, \$25,000 is available to send students and a faculty/staff advisor to a sustainable or environmentally focused conference, workshop, or summit.



Alternative Fuel Vehicle Program

In an effort to reduce the consumption of gasoline and increase vehicle efficiency, this program offers supplemental assistance to college departments or university fleets. \$100,000 is available each fiscal year.

7 new Nissan Leafs replaced gas-powered vehicles

6 new charging stations

Volunteer First Impressions

Facilities Services sponsors this contest in which entries are judged on overall impact to the campus community, ease of delivery, and scope is within the limit of \$10,000 or less to complete.



GREEN FEE FUNDED PROJECTS

Tree inventory & community-viewer software

Wood chipper waste reduction

Campus-wide hand dryer installation

Compost heavy equipment

Clockwise from top left: Students attending the 2018 Student Engagement Fair | Students attending the 2018 AASHE conference in Pittsburgh, PA | Current electric vehicle fleet—11 Nissan Leafs | Green Fee-funded trackhoe at the UT compost site



The networking opportunities found at conferences provide the dissemination of ideas and insight into our ever evolving field of work that can be directly applied here on campus.”

—Preston Jacobsen, Sustainability Manager



Academics

CURRICULUM

The sustainability major and minor engage students in a systems approach to understanding the connections between society, economics, and the environment.

Focused courses

145

Undergraduate

112

Graduate

Related courses

169

Undergraduate

156

Graduate

Directly interacted with more than

20 classes and

800 students

A 200 percent increase in interactions from previous years

ALTERNATIVE BREAKS/ VOLBREAKS

The Center for Leadership and Service offers alternative break trips to students to complete needed service projects in various locations.

This year trips were offered to study environmental sustainability with a focus on national parks and a second on food injustice, focusing on the United States Department of Agriculture.

INTERNSHIPS

UT Recycling Research Internship Program

This program provides students with the opportunity to conduct research on a UT Recycling program or initiative of their choice. Student interns benefit from hands-on experience in an environmental organization as well as professional development training in these unpaid positions.

Office of Sustainability Internships

The Office of Sustainability offers several internships, providing students with real-life experience in data collection, outreach and communications, and graphic design.

PROJECTS FROM THE CLASSROOM

Sustainability students take a capstone course in which they spend the semester designing and collecting data for a sustainability project. In fall 2018, students designed, collected data, and conducted a preliminary analysis on the following projects:

Knoxville sustainable transportation alternatives: a case study of PACE bike share

Assessing the environmental and social impact of urban agriculture: a case study of Beardsley Community Farm

Assessment of zero-waste initiatives through UT student grocery purchases

Green space and the urban heat island effect on the UT campus

Using GIS land cover and asset analysis as a lens to measure Knoxville sustainability

Comparative analysis of diesel and electric buses for Knoxville Area Transit, including GHG inventory

Cost-benefit analysis of UT compost facility



The science of sustainability is arguably the most important academic pursuit in any university curriculum.

The survival of our species and planet literally depend on it.”

—Michael McKinney, Department Head of Earth and Planetary Sciences

**RESEARCH
ISSE**

The Institute for a Secure and Sustainable Environment focuses on sustainability science for global solutions.

Highlights: Supported dozens of externally funded research projects, won multiple awards for its work

CURENT

The Center for Ultra-wide-area-Resilient-Electric-Energy Transmission Networks is an engineering research center at UT jointly supported by the National

Science Foundation and the US Department of Energy.

Highlights: Conducts research in the integration of renewable energy sources, including adaptive control for intermittent wind energy, ocean thermal energy conversion dynamic study, and multilevel converters interface with solar panels and grids

LEVER

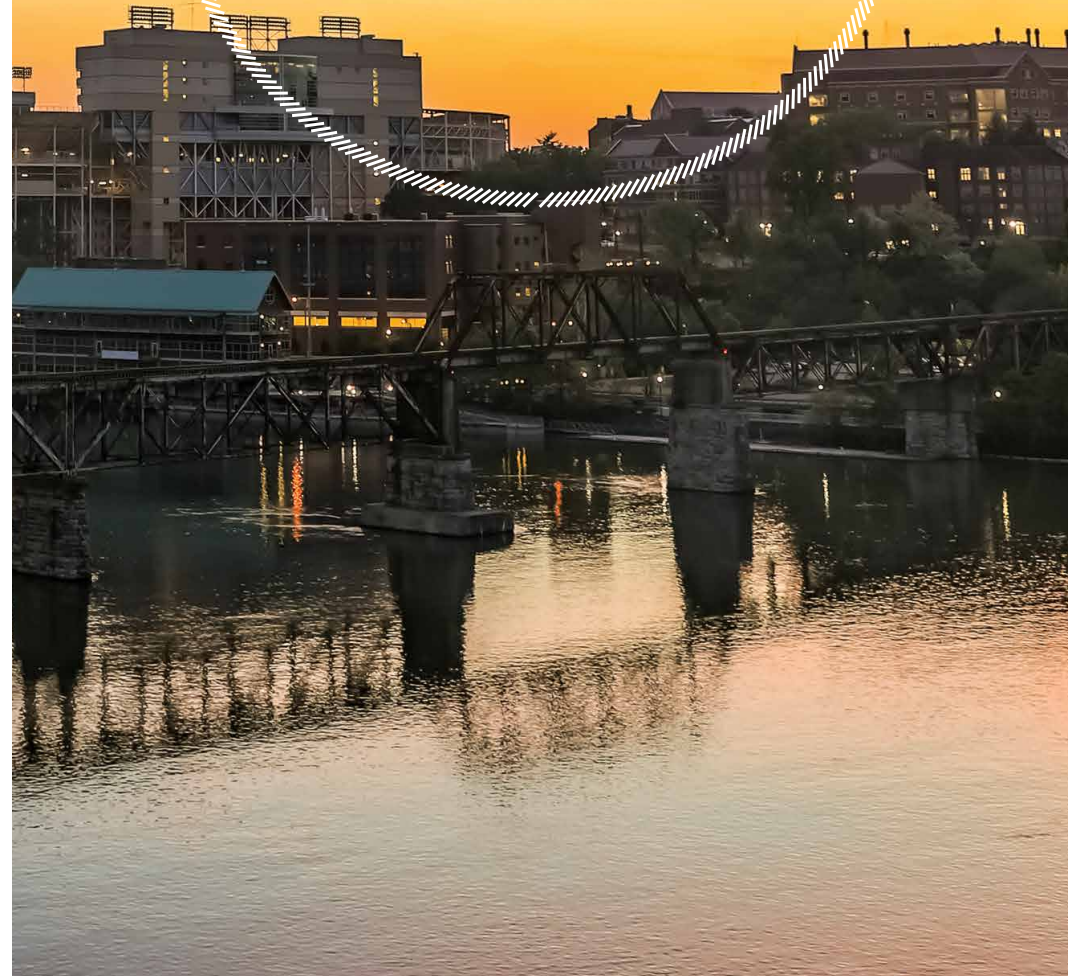
The Light Electric Vehicle Education and Research Initiative works to find more sustainable transportation options for UT.

Highlights: Focused on e-bike research since the early growth in Asia as well as recent new technologies that enable more widespread access to e-bikes through bike-sharing systems

Students in Geography 200 collecting data in the Great Smoky Mountains National Park as part of a long-term study at the park

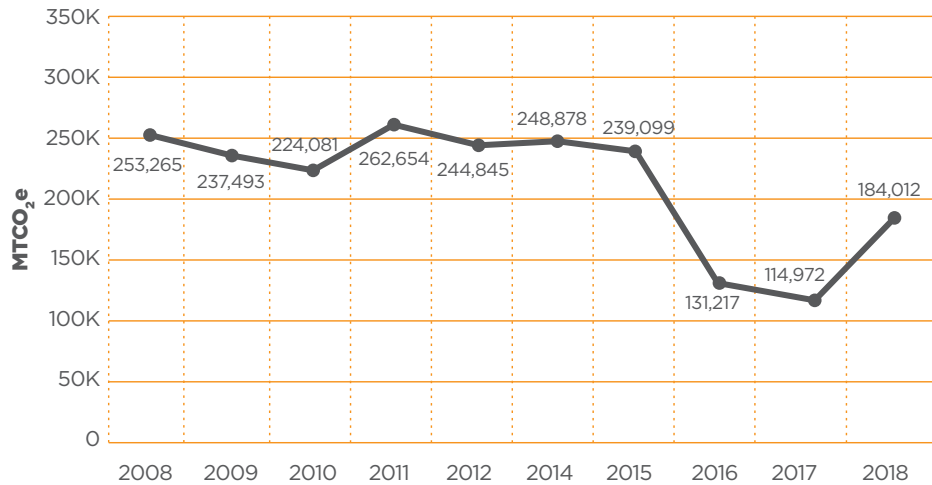


Energy & Emissions



GREENHOUSE GASES CHART

CHANGE IN METRIC TONS OF eCO₂ OVER TIME




— net emissions


Due to improved GHG reports, there may be some discrepancies.

year over year change: 69,040

% of reduction since 2008: 27%

CLEAN ENERGY ON CAMPUS

 In April 2018 a **wind turbine** was installed at the Facilities Services Complex. The turbine will soon have a live-time online energy dashboard.

 **Solar panels** placed around campus charge electric vehicle stations, so cars can run on sunshine.

These produce 150,000 kWh/yr.

Geothermal placed at sorority village helps reduce energy consumption and provides the majority of heating and cooling for the village.

GREEN REVOLVING FUND

This program was enacted in the fall of 2013, and through the years, the project fund has grown from \$100,000 to \$450,000 as of FY 18 due to its proven successes. These funds are used for retrofitting and energy-saving projects in campus buildings. The cost savings from each project over a five-year period is placed back into the Revolving Fund to continue funding additional projects.

Fund highlights:

Completed 9 projects last FY, yearly savings of **\$92,800**

Replaced 6,500 lights with LEDs for a yearly savings at the Conference Center of over **\$72,000**

40 percent completed Hodges Library lighting upgrade, **\$229,000** in lighting cost savings

CLIMATE ACTION PLAN

UT's Climate Action Plan was developed in 2010 by the Office of Sustainability, the Committee on the Campus Environment, UT Recycling, and the Office of the Chancellor. The document presents technical and physical infrastructure projects the university can adopt in order to achieve climate neutrality by 2061, as well as integrating sustainability and climate change into the curriculum and educational experience of all UT students.



Energy consumption is the largest contributor to our greenhouse gas profile, accounting for roughly 30 percent of the campus carbon footprint. In addition, it remains one of the most controllable and, at the same time, most fleeting contributors as we work to build a more energy-efficient campus, all the while working to educate, inspire, and incentivize behavior change to reduce consumption.”

—Preston Jacobsen, Sustainability Manager



Opposite page: (top) Student Union (bottom) Office of Sustainability staff in front of UT's electric vehicle fleet



Infrastructure



By designing and constructing projects with sustainability and efficiency in mind, the University of Tennessee, Knoxville, **limits economic and environmental impacts now and for decades to come.**

—Dan Smith, Project Manager, Facilities Services

THE GROW LAB

The Grow Lab is a new campus garden that is a living laboratory to promote experiential and service-learning. The Grow Lab demonstrates ecological food production methods and encourages community engagement.

310 pounds donated to Smokey's Pantry in the fall 2018 semester

Partnered with

5 courses and

3 campus organizations in its first semester

Completed

2 new research projects: cover crop research and paleoethnobotany garden

NEW CONSTRUCTION HIGHLIGHTS

Strong Hall, Student Union, and Mossman all feature high-efficiency insulation, LED lighting, rainwater catchment systems, substantial natural lighting coupled with interior lighting control systems, and air economizers.

Signed in 2007, the **Sustainability Building Policy** states that, "All new buildings constructed on the UT campus at a cost of more than \$5 million and any major renovations would be required to follow LEED standards under the policy."

Green Roof at the Student Union is a 10,461-square-foot space for students to enjoy, along with the completion of Phase II.

Baker Center Green Space features Eastern US plants with Asian-inspired character in honor of Howard Baker's service as US Ambassador to Japan.

STORMWATER HIGHLIGHTS

Rain garden installed at BESS Storage building

Wetlands boardwalk & management at UT Gardens

A 78-foot-long boardwalk now spans the middle wetland at UT Gardens. The wetlands provide a natural filter for water moving through the landscape.

Volunteer Boulevard Phase II expansion

43 bioswales were installed, increasing filtration and management of stormwater along the road.

Installed 42,000 gallons of rainwater capture and reuse at **Dogwood and Magnolia residence halls**.

WATER BOTTLE REFILL STATION UPDATES

9 new bottle-filling stations installed

6.7 million plastic bottles avoided since 2012

PACE BIKE SHARE

Environmental Impact:
To date (since February 1, 2018):
~44,700 Miles ridden

2.7 miles Average trip distance

~4,200 Car trips eliminated

~6 tons CO₂ emissions eliminated

44% of all Pace rides in Knoxville start or end on campus

Students working at the Grow Lab in fall 2018 | Pace bike-share program



Waste Reduction



For us, recycling and our zero-waste goals at UT, are about so much more than simply keeping waste out of the landfill.

Our mission is to maximize the value of the resources that come to campus and engage others, especially students, in assessing and solving resource allocation issues right here on our campus.”

—Jay Price, Recycling Manager

UT RECYCLING STATS

3,175

tons recycled/composted/
donated during FY 2018

33%

diversion rate

130

students volunteered for
zero-waste game days

25

team members

RECYCLED MATERIALS

Recycled materials make
money for the university:
\$9,156.75 Wooden pallets

\$8,704.20 Mixed paper

\$46,475.08 Cardboard

\$18,133.94 Sorted office
paper

\$39,647.73 Scrap metal

\$6,534 Cooking oil

PROGRAMS

Zero Waste Game Day

UT Recycling partners with Athletics, Aramark, the Office of Sustainability, and Eastman's Good Sports Always Recycle program to make game days at Neyland Stadium zero waste.

Composting

Expanded to more buildings on campus, including Phase II of the Student Union.

In 2018, UT Recycling composted more than 1,100 tons of food and landscaping waste.

UT Public Drop Off

New containers and signs placed at the drop off make it easier and more effective to recycle.

Located at 2121 Stephenson Drive, Dock 24 is open 24 hours a day, seven days a week.

Recycled over 80 tons of cardboard and over 61 tons of glass from our Public Recycling Drop-Off during FY 2018.

RecycleMania

Each year, UT takes part in the nationwide RecycleMania tournament, hosting competitions between residence halls to see who can increase their recycling and composting the most.

100+ volunteers throughout the campaign

Zero Waste events

UT Recycling expanded its Zero Waste events to the all-campus event request form.

The events had over 4,000 attendees and a 91 percent diversion rate.

My Tiny Trash

My Tiny Trash is a waste-reduction initiative implemented in offices on campus in an effort to bring awareness of the waste we produce and how to recycle properly.

28 buildings completed with over 2,800 offices participating through March 2019 and will continue to roll out to all of campus.

DONATIONS/WASTE AVOIDANCE

In addition to diverting waste from the landfill, UT Recycling aims at overall waste avoidance. This year the group was able to help UT reduce its waste intake.

Approximately 6,600 lbs. of theater material donated to four local high schools were donated from Clarence Brown Theatre with the help of UT Recycling.

26,592.2 tons of construction and demolition materials recycled, donated, or otherwise recovered.

Free Store

UT Recycling helps divert usable goods from the landfill by giving them out for free to the campus community in pop-up shops throughout the year.

Donations are accepted all year in residence halls and donations bins throughout campus.

Over 1,000 lbs. of clothing, shoes, housewares, kitchen wares, athletic, and other gear donated to students through the Free Store during 2018-19 school year.

Food Recovery

The Food Recovery Network, with assistance from UT Recycling, recovered 11,293 pounds of food from Neyland Stadium after all home football games during the 2018 season.

22,820 lbs. of food donated to local organizations feeding the hungry during FY 2018.

Over 77,000 lbs. of clothing, mattresses, and housewares donated to Goodwill and Angelic Ministries to support community needs during FY 2018.

From top: Operations coordinator Marlee Jennings at a zero-waste game day | Students in the Food Recovery Network after a game-day food recovery



We're just starting to scratch the surface with initiatives like move-out collections, the Grow Lab, and Free Store, where we're providing food, clothing, and other items to people in need.”

—Jay Price, Recycling Manager



Looking Forward

DRONES

Initially created to conduct thermal scans of buildings for energy audits, the program expanded to cloud point modeling and visual project inspections, all of which will save Facilities Services an estimated \$40,000 each fiscal year.

GREEN ROOF AT ENGINEERING

The 6,500-square-foot space will be an extensive vegetated roof, which will partially achieve the project's requirement to reduce and filter its own stormwater run-off, in perpetuity. It will be viewable from the fifth floor of the new Engineering Complex and from the East Club in Neyland Stadium.

STUDY ABROAD

Similar to the Student Conference Fund, this program is designed to assist students in attending sustainability-focused study abroad programs. They will report their findings to the SEIC on how to make campus a more sustainable place to live, learn, and work.

CAP 2.0

The first Climate Action Plan was published and approved in 2010, and during the past nine years, we have accomplished many of the goals originally laid out in the first version. In addition to replacing or expanding upon previous goals, new technologies are available that will enable UT to reach its carbon neutrality goal of 2061, years in advance.

ZERO WASTE POLICY

The goal is to achieve a campus-wide 90 percent landfill diversion rate. Currently at 33 percent, this policy will solidify our desire to reduce annual waste cost, contributions to the landfill, and move toward a more efficient and streamlined material workplace.

OFFICE OF SUSTAINABILITY

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