

B R O W N U N I V E R S I T Y

**Annual
Sustainability
Report
FY20**





Mission

In order to develop sustainable and equitable patterns of global and local resource use, Brown University will minimize its energy use, reduce negative environmental impacts and promote environmental stewardship. Brown will use the opportunities created by these actions to further its educational, research and service missions.



Values

The Office of Sustainability is committed to achieving sustained energy and environmental performance. This requires an ongoing, integrated and systematic approach to resource management including assessing performance, setting goals, creating an action plan and tracking and communicating results.

Executive Summary



Fiscal Year 2020 was defined by uncertainty and tested our community, and our office, in ways we never imagined. But, as with most challenges, the year has also built resilience and enabled us to uncover new opportunities. I'm proud to say that the Office of Sustainability — and sustainability at Brown University overall — continue to grow and thrive even during these trying times.

Considerable progress was made in FY20 to lay the groundwork for major sustainability initiatives that have been at the forefront of the University's sustainability discussions and work over the past couple of years. We started FY20 focusing on two major undertakings that will transform sustainability at Brown. First was to develop a roadmap to reach our new net-zero and greenhouse gas reduction goals as well as formalize our greenhouse gas emissions inventory under The Climate Registry. In FY19, Brown committed to reach net-zero greenhouse gas emissions by 2040, with an interim goal of a 75% reduction by 2025. The second undertaking was to lay the foundation for a comprehensive University Sustainability Plan that will guide efforts well into the future. The plan defines and seeks to embed Brown's sustainability principles within University operations and academics and will provide a foundation from which we can prioritize our actions and resources.

Achievements and milestones in FY20 were numerous. In a major step toward achieving our net-zero goals, Brown's wind project, which will offset about 30% of campus usage, became operational in FY20. This project, in combination with Brown's solar project that is currently under development, will offset 100% of Brown's on-campus electricity use once in operation. Also in FY20, we focused efforts on reimagining energy efficiency programs, identifying a process to aggregate dining data that will be the foundation for setting food-related goals, and refocusing internship efforts on key priority areas. We hope you enjoy exploring all of these efforts and more in the following report and encourage you to contact our office at sustainability@brown.edu with any questions or comments.

Jessica Berry
Director, Office of Sustainability
Facilities Management

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Leaders



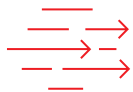
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Quick Facts FY20



89%

of Brown Dining's pork spend is gestation-crate-free.



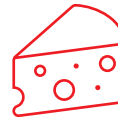
No. 1

ranked user of RIPTA was the Brown Community.



100%

of fluid dairy spend is local.



\$250,000

was awarded to Brown from Henry P. Kendall Foundation to support sustainable cheese production locally.



2.25

Brown-funded wind turbines are producing 8 megawatts of clean energy.



65

tons of leaf and yard waste was diverted from the landfill.



7

2-port EV stations were added to Brown's campus.



397

tons of plastic was diverted from the landfill through the Office Depot GreenerOffice Ink and Toner Recycling Program.

FY20 Milestones



Fall 2019:

The Office of Sustainability fills a critical new position — data scientist — and welcomes a new internship and project specialist

Sustainability Showdown panel series launched



Winter 2019-20:

Draft of Brown's first Sustainability Plan presented for community input and comment

Brown University awarded the Association of Physical Plant Administrators Sustainability Innovation Award for "Path to Net-Zero" submission

The office welcomes a new energy engineer to the team

Seven new two-port electric vehicle charging stations installed on campus

New senior energy engineer position created and filled



Spring 2020:

Brown and Green quarterly newsletter launched

Office of Sustainability hosts first virtual Earth Week program

Brown's wind turbines in Texas become operational

Site preparation begins on RI solar farm that is expected to start producing power for Brown in 2022

Brown hosts inaugural student-led Future of Sustainable Investing Conference



Educating Our Future Leaders



Brown continues to offer a variety of educational opportunities that focus on sustainability.

Institute at Brown for Environment and Society

The Institute at Brown for Environment and Society (IBES) supports research to understand the interaction between natural, human and social systems. Teaching programs prepare future leaders to envision and build a just and sustainable world, all while tackling urgent problems that face our world. IBES cultivates strong research in five disciplinary areas: conservation science, land change science, climate science, environmental health, and institutions and human behavior.

Climate and Development Lab

Founded in 2010 by Ittleson Professor of Environmental Studies and Sociology J. Timmons Roberts, Ph.D. candidate David Cipler and IBES research fellow Guy Edwards, the Climate and Development Lab (CDL) is a think tank based at IBES. The lab produces timely, accessible and influential research that informs a more just and effective climate change policy. The CDL provides students with learning opportunities to effectively shape policy and explore the intersections between climate change, development and global governance.

In FY20 the CDL published a 73-page report, titled “American Utilities and the Climate Change Countermovement: An Industry in Flux,” that highlights decades of policy interference and ineffective climate change planning on the part of 10 large utilities. Four

undergraduate researchers investigated investor-owned utility companies that have a history of collaboration with the climate change countermovement. The report finds that these companies all have climate action plans that appear ambitious while their future investments reside heavily with natural gas and not-yet-marketable technologies.

Program for Environmental Civic Engagement (PECE) Funding

PECE supports Brown students and faculty in creating real-world action that benefits Rhode Islanders and affords the ability to test scalable responses to global change. The program administers the Voss Undergraduate Research Fellowship — a selective program for rising seniors. Six students are awarded funding every year to pursue summer research. Fellows receive training in public communication, scientific writing, persuasive argument and other skills critical to success in the sciences that are often not explicitly addressed in science-based concentrations.

This year's fellows represented five different tracks within IBES' environmental science and studies concentration. Andrea Vega Troncoso researched the "vulnerability experienced and understood by coastal communities" in the Dominican Republic. Her work focused on small island solutions to climate change that do not exacerbate inequality and exploitation. Sawyer Balint quantified the impact of atmospheric nitrogen deposition in the Narragansett Bay, while Morgan Florsheim focused on understanding the role of naturalized populations in species' ability to track climate change.

Possibly

In 2017, IBES professor Stephen Porder teamed up with The Public's Radio in Rhode Island to create "Possibly," a radio show/podcast that explores the science behind sustainability. "Possibly" broadcasts every week on The Public's Radio 89.3FM and has been picked up on stations as far away as Alaska. Porder and producers Megan Hall (A.B. '04, MPH '15) and Fatima Husain (Sc.B. '17 and former Voss Fellow) provide guidance to Brown student reporters, who interview listeners about their submitted questions and track down experts to find the answers. Recent shows have tackled the life-cycle emissions of hybrid cars, which type of milk has the lowest greenhouse gas footprint and whether planting trees can solve climate change. Community members can subscribe on iTunes or Stitcher.

Academic Highlights

- Four professors joined the team at IBES in FY20: Myles Lennon, Laurence Smith, Rachel Wetts and Daniel Ibarra
- Professor Stephen Porder was named Fulbright-Tocqueville Distinguished Chair. The chair's objective is to create, develop and reinforce Franco-American cooperation in the disciplines essential to French and American society and to the mutual understanding of both peoples
- Undergraduate Melissa Lopez was awarded the Udall Scholarship. The scholarship recognizes students who combine academic achievements and leadership potential with a demonstrated commitment to pursuing careers in Native health care, tribal public policy or environmental issues
- Professor Bathsheba Demuth received a \$200,000 fellowship to pursue her research on the intersection of nature and politics

ENVIRONMENTAL STUDIES TRACKS



Air, Climate and Energy



Environment and
Inequality



Sustainability
in Development



Conservation Science
and Policy




Land, Water and
Food Security

“

Within IBES, I have been able to explore many different disciplines and pursue a variety of research interests. The department really pushes forward the idea of interdisciplinary research and how environmental science students like me can explore the different branches within the environmental field. Every semester in IBES is unique, as guest speakers and professors enthusiastically share their own perspectives and research expeditions.

— *Melissa Lopez*
Undergraduate Student

A photograph of students on a rocky shore. One student in a blue tank top is walking on a rock, while others in white shirts with a red 'B' are sitting on rocks. The background shows a body of water and a forested shore under a clear blue sky.

Students comb the shore along the Haffenreffer Estate looking for trash during a BELL class on plastics.

The Bell Program

The Brown Environmental Leadership Lab (BELL) is one of many programs offered by the Division of Pre-College and Summer Undergraduate Programs. The division provides educational opportunities for Brown undergraduate students and high schoolers to engage in coursework both on campus and online during the University's Summer Session through numerous pre-college program offerings. BELL combines concepts in environmental studies, ecology and leadership, with a mission of developing socially responsible leaders. During the program, high school students develop the knowledge, skills and attitudes necessary to create positive change on environmental issues facing their local communities and the planet as a whole.

During summer 2019, 135 students from nine countries and 32 states explored environmental sustainability, environmental justice and leadership development in three unique locations: West Greenwich, R.I.; Key Largo, Fla.; and South Central Alaska. In Florida, students investigated climate change through the lens of marine ecology and environmental action, and those in Alaska worked with community partners to learn how climate change has impacted cultural preservation and economic growth. Students at all BELL locations took part in outdoor labs, meaningful group discussions, presentations from guest speakers who are experts in their fields and field trips to sites that tied into the academic curriculum to bring the scientific content to life.

In response to the global pandemic, BELL shifted to an online environment for summer 2020, and 80 students signed up for the first summer. The new course, Applying Environmental Leadership to the Global Climate Crisis, developed throughout the spring in collaboration with faculty at Brown University and resources from dozens of environmental and social justice organizations, focused on the non-place-based components of the BELL program curriculum. This allowed for the content to be applicable to any student, anywhere in the world. One student lauded the course, stating, "Especially as student activists, we have had little to no experience on what steps are necessary to take for major, organized change. [...] I am enjoying learning about how to understand all stakeholders, communicate science, plan action projects and be inspired by the work of others simultaneously."

Whether taught online or in person, the division's environmental leadership curriculum not only invites students to explore their surroundings but also challenges them to understand their own positionalities and their place in the context of global climate change and environmental action. Through these programs, and many other Brown pre-college programs offered each summer, students can move into the university setting with a deeper, more personal understanding of how they can contribute to positive change.



Sustainability in Operations



Brown recognizes its role as a leader in global and local sustainability. As such, the University takes active steps to mitigate and help solve issues related to areas including waste, energy production, greenhouse gas emissions and environmental health. Brown aspires to divert 50% of its waste from Rhode Island's nearly full landfill and aims to reduce its greenhouse gas emissions to zero by 2040 with an interim goal of 75% reduction, from FY18 levels, by 2025. From the Facilities Structural and Lock Shop team donating used tools to the local Habitat for Humanity chapter to University Event and Conference Services partnering with Food Recovery Network to donate 200 pounds of food from events, we work across campus to promote and engage the community in building a more sustainable community.

Developing Brown's First Sustainability Plan

In FY20, Assistant Provost for Sustainability Stephen Porder, Director of Sustainability Jessica Berry and Dean of the School of Professional Studies Leah VanWey led the drafting of Brown's first Sustainability Plan — identifying the University's priorities when tackling sustainability issues. The draft plan arose from the understanding that without immediate, targeted action by Brown and other local and global stakeholders, accelerating climate change, pollution and biodiversity loss will define our 21st century. With countless concerns and issues related to climate change and sustainability, Brown needed a way to prioritize its efforts and resources — thus the rationale for creating a formal plan.

Development of the plan was a collaborative effort from the start, as the three co-writers sourced input, expertise and advice from faculty who are located primarily in IBES and the School of Public Health, as well as from the Brown community. The draft plan includes five priority areas: greenhouse gas emissions reduction, nutrient pollution reduction, safeguarding of human health, water use reduction and impacts, and curbing biodiversity loss. Furthermore, the plan recognizes the need for environmental justice considerations to be examined in all goal and programming decisions in the plan's second phase: operationalization.

To ensure the plan represents the perspectives and needs of the community as a whole, an initial draft was released to University students, staff and faculty for comment in the winter of FY20. Over a three-month comment period, nearly 100 community members provided critical input to be considered in the final iteration of the plan. A committee of students, staff and faculty, led by the assistant provost for sustainability, reviewed all comments and incorporated changes to arrive at a final plan.

Upon formal approval, the plan will move into Phase II - Operationalization. This phase will draw on stakeholder and subject-matter expertise to identify and implement how goals will be achieved and measured.



A facilities crew member walks the quad in front of Sayles hall.



Wind Farm Operational

In 2019 Brown entered a power purchase agreement to support the development of a wind farm in Fisher County, Texas. On June 11, 2020 the farm became operational. Assistant Provost of Sustainability Stephen Porder noted that “power we purchase from Mesquite Star [in the form of renewable energy credits] will offset about 30% of [the University’s] campus electricity.”

The wind farm is one of two renewable energy projects that will help Brown meet its greenhouse gas reduction goals. The other project is a 50-megawatt direct current solar facility that is being constructed on a former gravel pit in North Kingstown, R.I. This project is expected to be operational in early 2022.

Two wind turbines located in Texas are offsetting 30% of Brown’s electricity use.

Energy

Construction for Brown's three-year Thermal Efficiency Project hit its stride in FY20. The boilers in the central heating plant were converted from steam to hot water and the campus loop temperature was lowered from 345 F (peak) to 280 F (peak). Steam hubs were converted to hot water, leading the way for Brown's 2040 decarbonization goals by enabling lower temperature heating distribution on campus and future electrification.

In FY20 Brown accelerated its initiative to convert lighting across campus to LED, achieving 70% campus conversion. The switch to LEDs saves half of the electricity needed for campus lighting and reduces maintenance costs.

Brown is nearing completion on three studies related to the 2040 decarbonization goals. The University is compiling a detailed road map of action items and projects needed to achieve the 2025 and 2040 greenhouse gas reduction goals (75% reduction and 100% reduction respectively).

Previous to the University's new net-zero and interim 75% reduction goal, Brown set a target of 42% greenhouse gas emissions reduction below 2007 levels by 2020. While the goal was not fully met by FY20 due to circumstances beyond Brown's control, (including the delay of the Texas wind farm project), the 42% reduction is expected to be achieved in the calendar year 2020.

\$1.8M

in National Grid utility
incentive payments

2M

square feet converted to
LED lighting

\$310K

annual utility savings

Greenhouse Gas Inventory

To track toward its greenhouse gas reduction goals, Brown needs reliable data. In FY20 the University overhauled its greenhouse inventory methodology to be in line with national and international standards and to ensure sound metrics will be available year after year. These new changes mean that Brown's greenhouse gas numbers will be more comprehensive, reliable, timely and transparent. This modernized methodology offers many advantages:

1. MORE THAN JUST CAMPUS UTILITIES

The new greenhouse gas methodology tracks a wide variety of University activities to more completely measure Brown's Scope 1 and Scope 2 footprint. In addition to the historically reported campus building utilities, utilities consumed in all University real estate buildings*, as well as newly constructed and renovated buildings, will now be tracked and included. Beyond utilities, the new methodology also accounts for:

- fuels consumed by Brown's vehicle fleet;
- diesel consumed in campus generators;
- diesel consumed by grounds equipment (e.g., lawn mowers);
- lab gases purchased by departments;
- lab fuels purchased by departments;
- refrigerants;
- and liquid propane powering Facilities' forklifts.



CAMPUS UTILITIES

- Grid electricity
- Natural gas
- #2 fuel oil



REAL ESTATE UTILITIES

- Grid electricity
- Natural gas
- #2 fuel oil



LAB GASES

- CO₂
- CF₄
- CH₄
- SF₆



DIESEL

- Generators
- Grounds tank



REFRIGERANTS

- Vendor purchases
- Fleet estimations



VEHICLE FLEET

- Gasoline
- Diesel
- Biodiesel
- Ethanol



PROPANE FUEL



LAB FUELS

- Propane
- Diesel
- Acetylene
- Ethylene & more

*All Brown University real estate spaces are included in the inventory, except for those that are leased to external tenants.

2. MORE THAN JUST CO₂

Although carbon dioxide makes up more than 99% of Brown's greenhouse gas totals, the new methodology tracks emissions from additional types of greenhouse gases. Gases tracked in the new inventory include:

- carbon dioxide (CO₂)
- nitrous oxide (N₂O)
- methane (CH₄)
- carbon tetrafluoride (CF₄)
- sulfur hexafluoride (SF₆)
- hydrofluorocarbons (HFCs)

3. ALIGNED WITH RIGOROUS INTERNATIONAL STANDARDS

The new methodology follows the reporting process established by The Climate Registry, a nonprofit organization governed by U.S. states and Canadian provinces and territories. The Climate Registry offers a common framework that many North American organizations use to produce transparent and rigorous greenhouse gas inventories.

4. COMPLETE DOCUMENTATION

Along with following the procedures and protocols put forth by The Climate Registry, Brown has taken the additional step of developing an Inventory Management Plan. This plan explains how to prepare Brown's inventory. The Inventory Management Plan will help ensure consistency year over year and business continuity.

5. BETTER QUALITY ASSURANCE

To achieve full status through The Climate Registry, an independent third party will verify Brown's greenhouse gas numbers each year. Verification offers additional assurance that the inventory is complete, accurate and transparent.



6. BUILT WITH DATA SCIENCE PRINCIPLES IN MIND

Brown developed the latest methodology using modern data science programs and principles. Complex spreadsheets are notoriously difficult to interpret and maintain. Copying and pasting data creates opportunity for error and makes it difficult to track data back to its source. Brown's inventory numbers will be generated by computer scripts written in the R statistical programming language. Programming the inventory reduces the opportunity for error, helps to expedite annual updates and provides a written series of commands that documents how raw data transforms into final numbers. The computer scripts used to generate Brown's inventory will be available on GitHub.

Waste Operations and Programming

In FY20 the University continued to build upon its commitment to strategic waste management by improving programs that prioritize reduction and reuse first, and materials diversion from Rhode Island's landfill. Compost programs grew across campus, waste standards were adopted, and waste education continued to permeate all areas of our campus community.

The Office of Sustainability worked with the Office of Planning, Design and Construction to create formal waste standards that will inform all renovation and construction projects. These standards highlight the importance of recycling availability, regulation of waste bins across campus and inclusion of educational signage at every waste station. As part of this effort, the majority of staff and faculty deskside bins now reflect the new Trash Buddy system — a large recycling bin with an accompanying small, lidded trash bin, both of which have informational signage affixed. This change promotes thinking before taking action as the small waste bin will fill up quickly if recyclable material is sorted incorrectly.

CAMPUS-WIDE

OFFICE OF SUSTAINABILITY STAFF
AND STUDENTS AND CUSTODIAL
STAFF PLACED



3,240

Trash Buddies



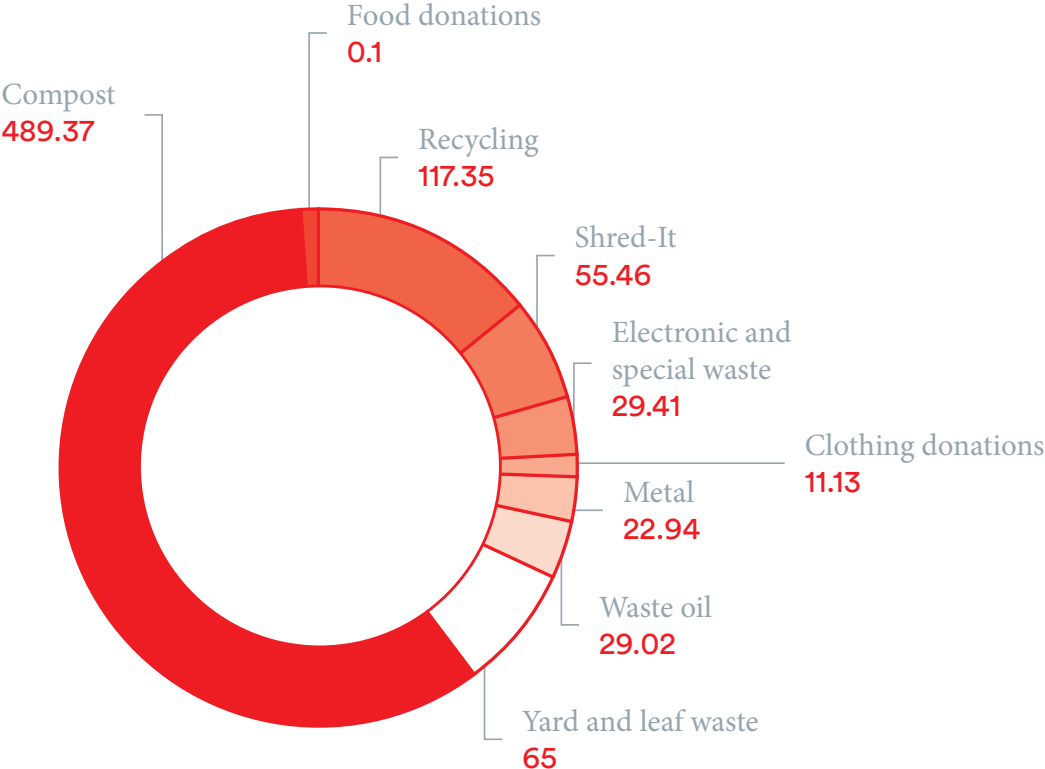
2,484

new recycling bins
across campus

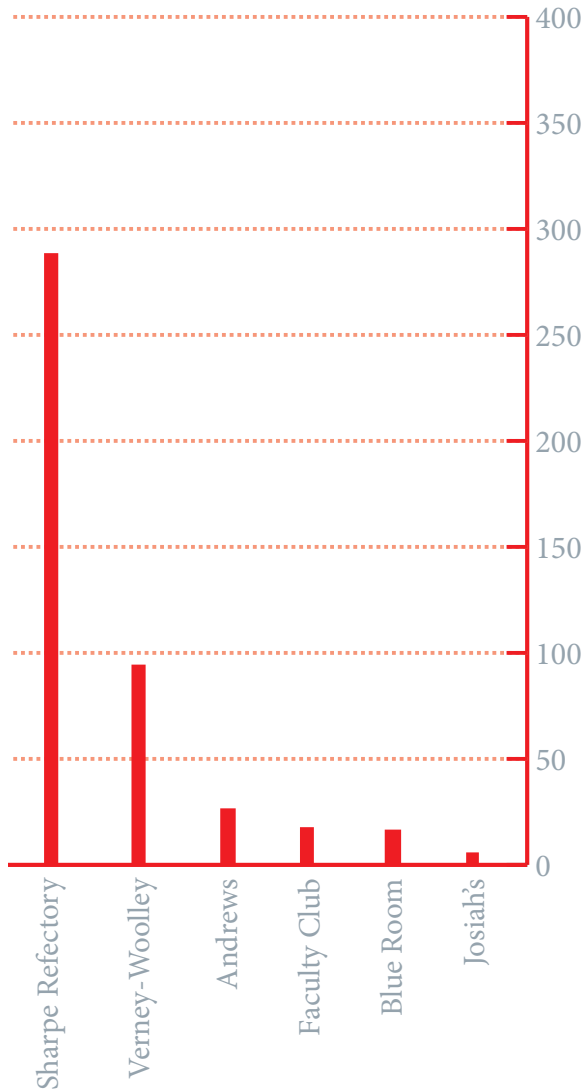
Organics Diversion at Brown

The majority of organics diversion at Brown is attributed to composting, the process of transforming organic materials such as food waste into a nutrient-rich fertilizer. Composting has many benefits, including enriched soils, reduced contributions to landfills and decreased release of greenhouse gases into the atmosphere. As such, composting is an essential part of Brown's commitment to sustainability.

BROWN'S WASTE STREAMS (IN TONS)



COMPOST BY DINING HALL (IN TONS)



When members of the Brown community divert the organic fraction of our material flows from the landfill to collection and transportation systems that allow those materials to be composted, they are playing a very important role in supporting a local, circular economy. While many materials diverted for recycling must be transported to more distant processing facilities, biodegradable organic materials — termed ‘putrescibles’ in the regulations — can be composted at nearby farms and facilities and returned to the soil locally. Brown is making important progress toward eliminating the concept and practice of waste. Through our organics diversion programs, Brown is supporting the growth of the infrastructure to metabolize these nutrients in our local and regional systems.

— Kurt Teichert
Senior Lecturer in Environment and Society

Dining Services Awarded Kendall Prize

In an average year, Brown Dining Services purchases just over 11,000 pounds of shredded mozzarella cheese for its pizzas. Brown currently sources cheese from Narragansett Creamery, a current Brown University supplier and a local family-owned operation that sources its milk from local dairy co-ops; however, cheese of the shredded variety is currently unavailable. Narragansett Creamery is currently unable to produce this product as they do not have the capital to invest in the equipment needed to shred or pack cheese.

Brown Dining Services submitted a proposal for funding to the Henry P. Kendall Foundation for the needed equipment for Narragansett Creamery. The proposal, which resulted in a

Henry P. Kendall
FOUNDATION



\$250,000 award for Brown University and Narragansett Creamery, will solve the production gap and allow the University to increase its support of the local creamery. The project as a whole will positively impact the New England regional food system by keeping regional dairy farms in business.

Partnership with Agri-Cycle

In FY20 the Office of Sustainability began a partnership with Agri-Cycle, a regional food waste collection service, to handle a portion of the University's compost portfolio. The company aggregates food waste at nearby transfer stations and then transports Brown's food waste to its headquarters — a fifth-generation dairy farm in Exeter, Maine. Agri-Cycle uses anaerobic digestion technology to create fertilizer and energy and heat that powers 100 local homes annually. As a closed-loop system, the company uses all excess material, including recovered solid material for animal bedding and recycled liquid for fertilizer on the farm, and it even collects manure from the thousands of cows on the farm for use in its digester. To date, Agri-Cycle has collected 60 tons of compost from Brown.



Dining Services

Brown Dining Services continued to improve its commitment to ethical, sustainable food sourcing in FY20 with a particular focus on local, humane and fair trade.

LOCAL

Brown partners with owner-operated farms that are located within 150 miles or less from Brown and that each have revenues of \$5 million or less. Of Brown Dining's FY20 produce spend, 29% was local, and 100% of fluid dairy spend was local.

On the right is a sampling of Brown's local partner farms:

HUMANE

Brown partners with meat and egg producers that are Animal Welfare-Certified by A Greener World, meeting a five-step rating:

- No cages, crates or crowding
- Enriched environment
- Enhanced outdoor access
- Pasture-centered
- Animal-centered — no physical alterations; entire life on one farm



HORSE LISTENERS ORCHARD

CONNECTICUT

Fruit, basil, apple cider, applesauce



BLACKBIRD FARM

RHODE ISLAND

Pork, beef



QUEENS GREENS

MASSACHUSETTS

Lettuce



NARRAGANSETT CREAMERY

RHODE ISLAND

Cheese



WINSOR DAIRY

RHODE ISLAND

Milk

FAIR TRADE

One hundred percent of coffee served on campus is certified fair trade.



32%

of Brown's red meat spend meets the five-step criteria



49%

of chicken spend is certified humane



100%

of eggs are cage-free



89%

of pork is gestation-crate-free



Taste preferences are highly personal. They change with the seasons, are particular to regions of the world, and are controlled by our biology. Dining Services satisfies thousands of taste preferences every day, a challenge in and of itself. But in a time when health and environmental concerns are on the rise, it is not our sole responsibility to satiate taste. It is also our job to serve menus that are careful to improve our health and the health of the environment.

— Jessie Curran
Assistant Director of Wellness and Nutrition

PD&C and Grounds

PLANNING, DESIGN AND CONSTRUCTION (PD&C)

Wellness Center

PD&C weighed sustainability considerations throughout the planning process and continues to do so during construction. High-performance, low-flow fixtures, bottle-filling stations and rainwater management systems will reduce water consumption and waste in the building. The site promotes sustainable transportation with both indoor and outdoor bike storage and safe pedestrian walkways that connect to central campus. Biodiversity protection and human health were also considered, including decisions to avoid the use of wood products from tropical areas, avoid flame retardants in all furnishings and use materials that have third-party-verified Environmental Product Declarations and Health Product Declarations.

Design of the Wellness Center corresponded with development of Brown's 2040 net-zero goals. Several HVAC options were examined, and Brown decided to make Wellness a 100% electric building to comply with net zero goals. Wellness is being constructed with the latest heating, ventilation and air conditioning technologies, including variable refrigerant flow systems for year-round heating and cooling.

GROUNDS DIVISION



26 new trees planted on campus



16 trees relocated from Wellness Center building site to other areas



65 tons of yard and leaf waste diverted from the landfill



3 collaborative projects with Providence departments and officials

- Organized a synthetic turf maintenance seminar with the Providence Parks Department
- Partnered with the city forester on street tree planting locations around the University
- Worked with Wendy Nilsson, head of Providence Parks, on park renovations

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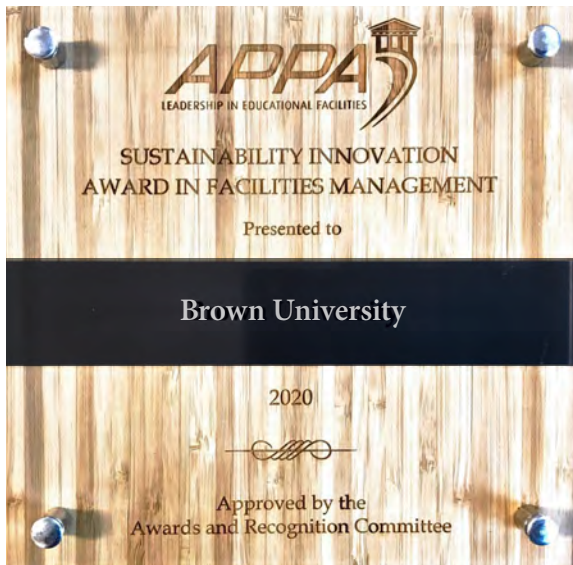
I am proud to have worked with so many great colleagues to put Brown on a path to net-zero emissions. This is important work, and it needs to continue and accelerate if we, as a society, are going to avoid the worst consequences of climate change. At the same time, society faces many sustainability challenges alongside the climate crisis, and we must work toward solutions in this broader realm even as we keep laser-focused on climate. Thus, I am thrilled that in FY20, Brown completed its first Campus Sustainability Plan, which articulates goals across several axes of critical concern: climate change, challenges to human health, nutrient pollution, water overuse and contamination, and biodiversity loss. Of course, these issues are intimately intertwined, but each requires consideration alone as well as in concert. The coming years will see us ramp up efforts to mitigate and reduce our impact in these vital areas, and I look forward to the rapid progress we will make as we strive for a more sustainable way of living in these challenging times.

— Stephen Porder
Assistant Provost for Sustainability



APPA Award

Every year institutes of higher education submit applications for consideration for the Association of Physical Plant Administrators' (APPA) Sustainability in Innovation Award, and this year Brown University claimed the prize. APPA, an organization promoting leadership in educational facilities management, chooses recipients based on their “unique and sustainable practices in educational facilities and campus environments, ultimately embedding them within the educational institution,” according to Anthony Guerrero, vice president of membership and community engagement for APPA.



Brown's winning submission highlighted the University's pathway to net-zero and its holistic approach to achieving its greenhouse gas emission goals. Instead of relying on a singular approach to emissions reduction, such as investing in renewables, the University has committed to a holistic approach that addresses campus building design and HVAC operations, as well as the what and the how of utility purchasing. The plan that wowed APPA consists of four pieces:

- renewable electricity power purchase agreements;
- building modifications to ensure enough heat can be delivered through the on-campus loop using lower-temperature hot water (This step will enable the University's eventual use of renewable electricity and recycled biofuel heating.);
- renewable natural gas power purchase agreement as an interim offset until heating plant electrification; and
- switching from on-site combustion of fuel to renewable electricity-powered heating to produce lower-temperature hot water.

This unique, innovate approach to energy and emissions management met all of the award's criteria, which included: project innovativeness, creativity and originality; sustainability demonstrated through economic, environmental and societal benefit; adaptability and transferability to other campuses; institutional and community benefit; and management commitment and employee/student involvement.



Shortly after I arrived at Brown in 2018, I became absolutely blown away by Brown University's bold, pioneering and exemplary efforts in the area of sustainability and climate change. Given my two decades of experience in the fields of facilities management and sustainability, I had a unique appreciation for Brown's accomplishments. Having observed and read about all the great work that Brown University and its Office of Sustainability has been doing to transform the world, it was my honor to work with the office to tell Brown's story, and it was a distinct honor and high privilege to learn that Brown University had been selected as a recipient of the 2020 APPA Sustainability Innovation Award in Facilities Management.

— Musa Pam
Director, Operations Logistics and Support



A bird's-eye view of the central heating plant.

Haffenreffer

Staff at the Haffenreffer Museum of Anthropology established a Sustainability Team in January 2020, in order to implement goals and projects that would reduce the museum's environmental impact. Beginning with a research project to highlight the importance of environmental sustainability across the museum field, the first initiative was a challenge to staff to reduce energy consumption by turning off unnecessary lights, computers and other electronics at the end of the day and work week.

At the museum, nitrile gloves are used to handle objects in the collection, protecting both objects and staff; however, changing gloves can create a large amount of waste. Focusing first on waste reduction, the Sustainability Team began recycling nitrile gloves through Kimberly-Clark Professional's RightCycle Program, which reuses personal protective equipment as raw materials for new consumer goods. Collection staff sent the first shipment in fall 2019, diverting 7 pounds of gloves from landfills and challenging staff to divert 25 pounds of gloves in 2020. The team hopes that this project will inspire other campus departments to recycle nitrile gloves and other materials.

The team's main accomplishment to date has been setting up a waste recycling program. Although the museum has a small gallery in Manning Hall at Brown University's campus in Providence, most of the staff are based at the Collection Research Center (CRC) on the Mt. Hope property in Bristol, R.I., 19 miles from campus. With the help of Brown's Real Estate and Auxiliary Housing Office and the Office of Sustainability, the CRC now has regularly scheduled mixed recycling removal. This practice replaces the previous system of sorting and accumulating



Between the museum's serious work of benchmarking, waste audits and research on the effects of indoor air pollutants on objects in the collection, we must also find ways to sustain beauty, imagination and enjoyment in our everyday lives. Objects like this birchbark treasure box inspire us to appreciate those moments.

— Dawn Kimbrel

Registrar, Haffenreffer Museum of Anthropology



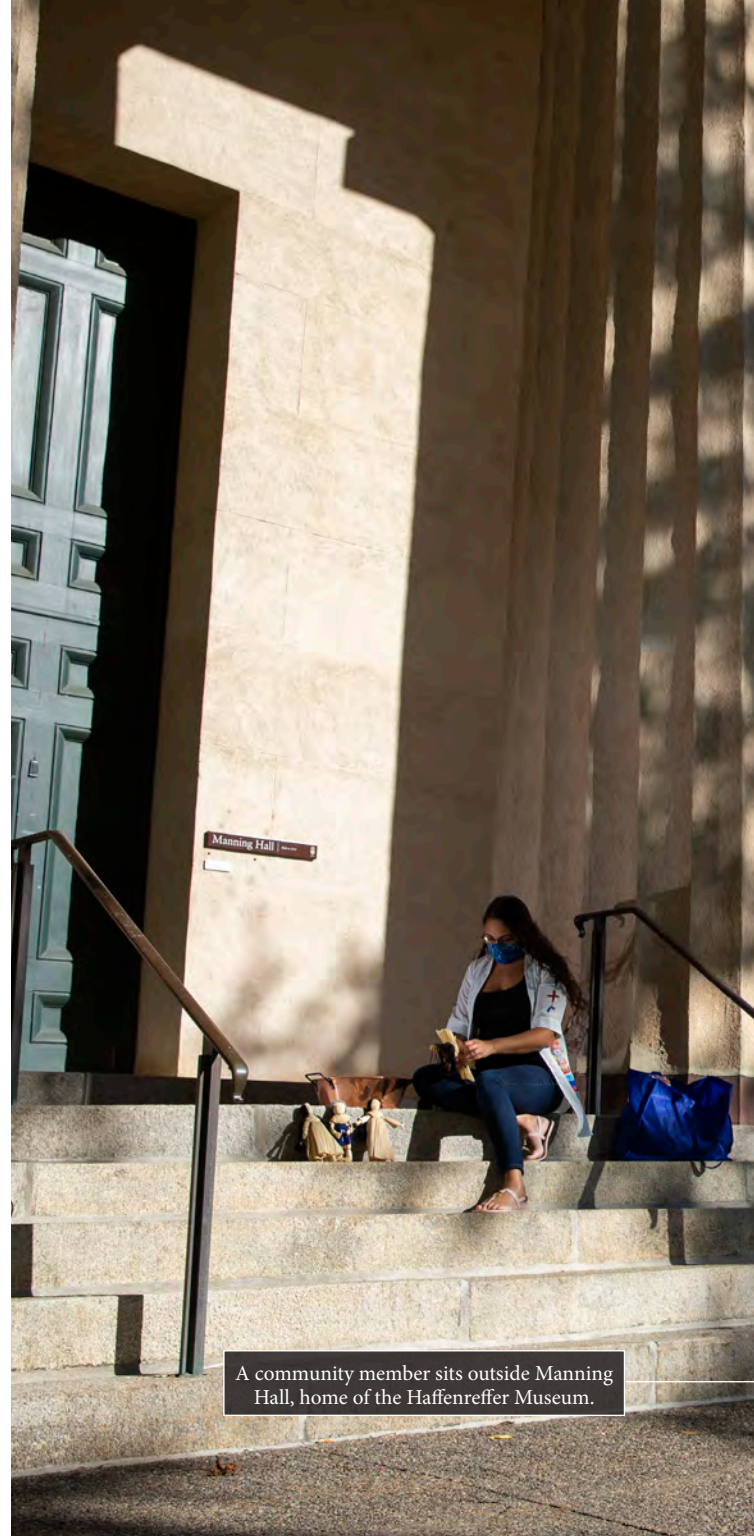
Birchbark treasure box
Huron, Great Lakes Region. Made 1850-1860
Birchbark, moose hair, cotton thread
Haffenreffer Special Fund Purchase
Courtesy of the Haffenreffer Museum of
Anthropology, Brown University (86-92)

recyclable materials until they could be removed, eliminating harborage sites for pests and creating much-needed space for other important functions.

While working from home due to COVID-19, the team drafted a sustainability statement to highlight the museum's commitment to environmental sustainability and to set goals for the future. Drafting this document and focusing on waste reduction lays the groundwork for the museum's upcoming relocation to Providence, where sustainable practices will be incorporated at every level of operation — from using locally-sourced materials to developing zoned climate control systems.

Conservation of cultural heritage and conservation of the environment [should happen] in tandem. Both approaches to conservation share the ideal of preserving the present on behalf of, and without compromising the needs of, the future.

— Megan de Silva & Jane Henderson (2011)
"Sustainability in conservation practice,"
Journal of the Institute of Conservation, 34:1, 5-15,
DOI: 10.1080/19455224.2011.566013, p.3



A community member sits outside Manning Hall, home of the Haffenreffer Museum.

Transportation

As COVID-19 hit in the middle of the spring semester, sending the majority of students, staff and faculty off campus, total shuttle numbers reflect lower ridership than in previous years. However, when considering the months prior to the pandemic's effect on campus operations, weekly shuttle rides averaged 6,031 in FY20 compared to 5,567 in FY19. This shows a positive trend of increased ridership as more routes became available to connect off-campus and the Jewelry District to College Hill and as more community members chose sustainable transportation options over driving or other means.

TOTAL SHUTTLE RIDES IN FY20

88,421

Daytime Shuttle Rides

3,017

SEAS Shuttle Rides

86,829

Evening Shuttle Rides

44,771

OnCall Shuttle Rides

125

Other (e.g., Parking Ban and Commencement)

RIPTA BUS RIDES



224,017 RIPTA rides for the year through the U-PASS Program



Study found the Brown community is the **No. 1** patron of bus service



RIPTA is **FREE** for the Brown community



CEREMONY

1602

KENNEDY PLZ

The RIPTA bus on Thayer Street



Seven new two-port electric vehicle stations were installed on campus in FY20.

EV Expansion

With the University's net-zero goal in mind, this year Transportation and Parking Services, Real Estate and the Office of Sustainability partnered to expand the electric vehicle (EV) charging station program. The expanded program will help Brown tackle its Scope 3 greenhouse emissions; these are indirect emissions that occur from the activities of the organization from sources it does not control or own (such as community members' personal vehicles). Seven new dual-port charging stations were installed in FY20, bringing the total EV charging capacity to nine charging stations and 18 ports.

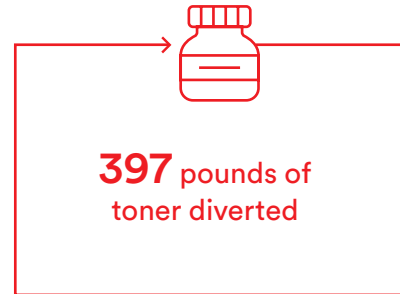
Charging station locations were chosen based on community feedback to ensure accessibility for all interested. Stations, which are free for the first hour and then \$0.05 for each additional minute, are located in the following areas:

- Facilities Management — Lot 90: 2 stations with 4 ports
- Minden Hall — Lot 44: 1 station with 2 ports
- Power Street Garage Upper Level — Lot 68: 3 stations with 6 ports
- 200 Dyer Street — Lot 200: 2 units with 4 ports
- Richmond Street Garage — Lot 222: 1 unit with 2 ports

Purchasing Services and Events Services

Strategic Purchasing, Contracts and Insurance (SPCI) stayed busy in FY20 supporting multiple waste diversion programs. Launched in February 2019, the Office Depot GreenerOffice Ink and Toner Recycling Program was responsible for the collection and diversion of 397 pounds of printer toner. Currently, 30 departments participate in the program. Additionally, in FY20 the department ran small bid auctions on a surplus site, which resulted in the donation and reuse of file cabinets, commercial kitchen mixers and microwaves.

SPCI and the Office of Sustainability have built a highly collaborative relationship that focuses on strategic sourcing while considering sustainability factors. SPCI has committed to weighing the environmental impact from purchasing decisions whenever possible and engages with the Office of Sustainability regularly on purchasing efforts. Conversations range from energy efficiency to shipping materials to the use of recycled content, and more. When establishing relationships with new vendors, the University now requires that vendors submit information about their sustainability policies and practices.



University Event and Conference Services (UECS) similarly increased its efforts to promote sustainability in its work. UECS helped plan the Brown Arts Initiative Terra Symposium, which featured a locally-sourced, farm-to-table menu, compostable and reusable dinnerware, native plants and reusable decor. The FY20 Family Weekend also promoted sustainability with reusable giveaways, a name tag recycling program and sustainable menu items.



Community Engagement



Brown is committed to supporting local institutions and organizations in Providence and surrounding areas while incorporating sustainability best practices. Efforts such as Brown's Grounds Division partnering with the Providence Parks Department to provide seminars and Facilities Management donating tools and fridges to organizations and students in need create a stronger and more resilient university and local community. Brown is proud to work alongside its many partners and will continue to expand its work to ensure a more sustainable future.

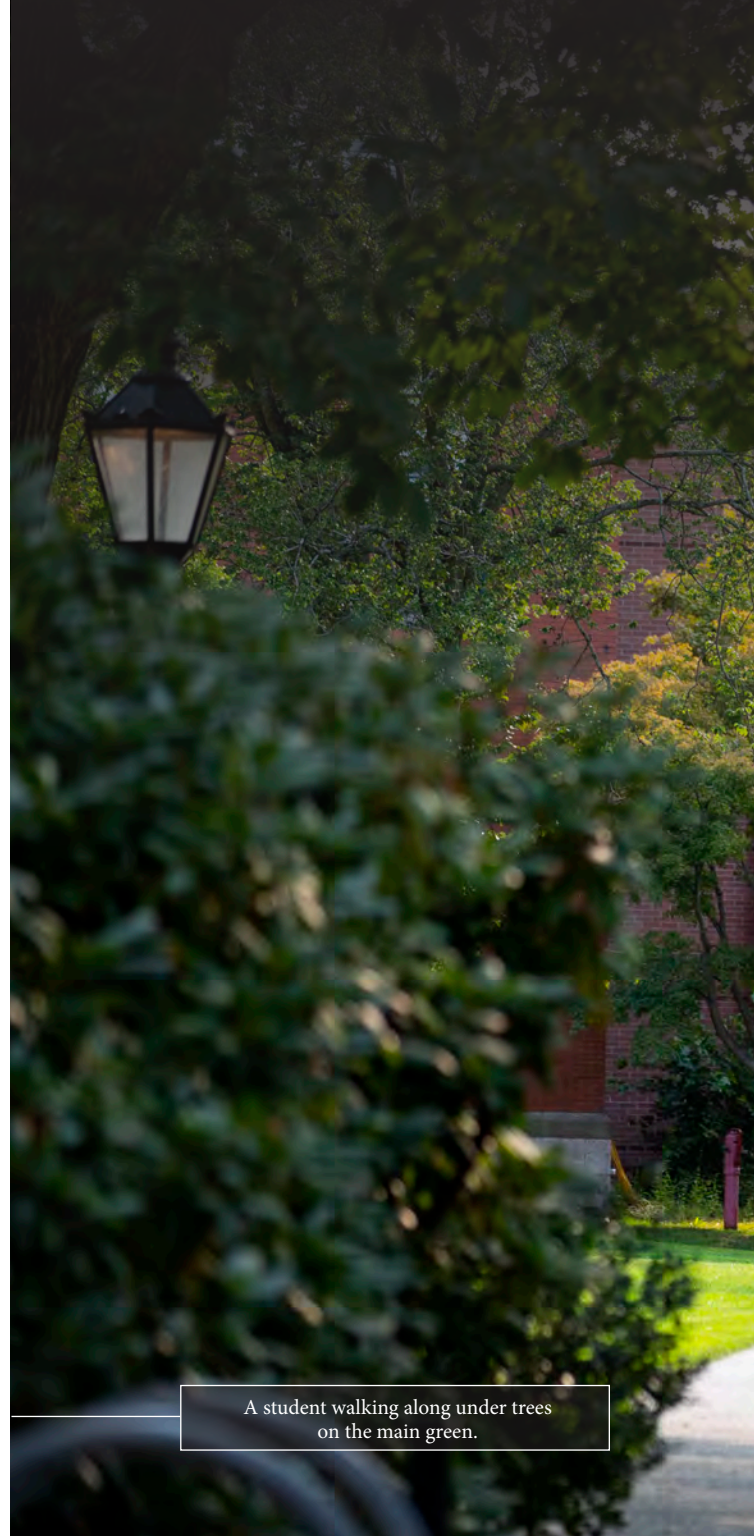
Community Highlights

VIRTUAL EARTH WEEK

As the COVID-19 pandemic halted on-campus events, the Office of Sustainability pivoted its Earth Week plans to virtual engagement. The weeklong Earth Week celebration was hosted on Facebook and Instagram and included a series of discussions about career options in sustainability from Brown alumni, a lecture from senior lecturer Kurt Tiechert and a plant-based cooking demonstration hosted by Brown Assistant Director of Wellness and Nutrition Jessie Curran. Additionally, daily sustainability challenges were posted to engage community members in sustainable action. In total, the virtual programs resulted in 571 unique views.

TREE MAP

Brown University is home to a unique collection of ornamental and native trees, including an impressive collection of American elm trees. Brown's new tree map is an interactive guide to over 20 trees of interest, such as a descendant of Isaac Newton's apple tree. The map can be used virtually or in-person and is interactive on computers and phones. It features the user's location on campus, pictures, identification markers, carbon sequestration factors and fun facts.



A student walking along under trees on the main green.

“

With Brown's bold net-zero pledge, we can demonstrate climate leadership and catalyze different approaches to address this climate crisis. One example is converting a gravel pit in North Kingstown into a 50-megawatt solar farm — the biggest in the state and something that the neighbors support wholeheartedly.

— Al Dahlberg
Assistant Vice President, Government and Community Relations



Environmental Student Groups at Brown

Environmental student groups at Brown work to address a variety of issues pertaining to sustainability, including climate change mitigation and adaptation, energy and water efficiency, food waste, transportation, and environmental justice and literacy.

Below are highlights from a few of the active environmental groups on campus.

SCRAP

Membership in SCRAP, a student group focused on campus-wide composting, grew this year and now totals 200 participating community members. The group collected a whopping 30 gallons of compost each week in FY20!

MARKET SHARES

Brown Market Shares, a student-run, campus-based food distribution program, had a successful year marked by over 7,000 share purchases, 2,800 of which were subsidized. The group worked with 19 local farms and 11 local businesses.

SUNRISE RHODE ISLAND

Sunrise, a youth-led movement fighting to stop climate change and create jobs, led two campus-wide climate strikes. The first strike was held in solidarity with the Global Climate Strike in September 2019 (over 4 million people participated worldwide on this day).

SUSTAINABLE FOOD INITIATIVE

Sustainable Food Initiative conducted vegan and vegetarian cooking workshops in the fall semester at Hillel, helping to educate members of the Brown community about plant-based lifestyles.

SCIENTISTS FOR A SUSTAINABLE WORLD

Scientists for a Sustainable World started work on creating a machine that can recycle 3D printer filament, reducing waste created during the 3D printing process.

STUDENT GROUP HIGHLIGHT: BOLT

BOLT is a program that brings together sophomores and new transfer/resumed undergraduate education students and provides them with a shared outdoor experience and continued group activities throughout the fall. BOLT is committed to leadership development, community, mentorship, the environment and education.

In fall 2019, BOLT led 17 trips throughout the White Mountains. In addition to the standard trips that BOLT has been running since 1987, BOLT offered a Womxn's Trip, a People of Color Trip, and a less physically strenuous Creative Trip focused on artistic expression in the outdoors. In total,

there were 135 BOLTers and 36 BOLT leaders that participated in 2019 programming.

In spring 2020, BOLT trained a group of 40 leaders, composed of both sophomores and juniors. A leader normally receives 120 to 180 hours of training during the spring to prepare them to lead and facilitate a BOLTer group in the fall. Despite the unprecedented interruption of COVID-19 and the switch to virtual Zoom training, all of the leaders continued and completed their training before the end of the spring 2020 semester.

As a program that values access to the outdoors, BOLT is open to all students regardless of experience or ability in the wilderness. Approximately half of the participants have little or no backpacking or camping experience. The group teaches leaders and BOLTers the basic skills they need. BOLT's ability to offer financial aid and to loan gear to students also supports the group's values of access to the outdoors and inclusive participation.



BOLTers on an overnight backpacking trip.

Community Donations

A though the end-of-year student donation program Clean Break was unable to take place this year due to the pandemic, various departments continued their commitment to the local community through donation of materials.



10 hand tools were donated from Facilities Management's carpentry team to Habitat for Humanity of Greater Providence.



40 minifridges were collected and serviced by Facilities' Grounds and HVAC teams for donation to students in res halls.



20 tons of leaf and yard waste were donated to local farms.



300 Brown faculty and staff gave over \$28,000 to 401Gives, a fundraising campaign for local nonprofits.



2,600 healthy, bagged lunches (200 per week) were donated to Dorcas International and other local organizations from Brown Dining Services during FY20 due to the pandemic.



Over **200** pounds of leftover food was donated to community organizations from Brown's Food Recovery Network.



The Office of Government and Community Relations coordinated donations of personal protective equipment, cleaning supplies and food to local health care providers and community organizations.



**Our Path
Forward**



We are excited and hopeful for a healthy year to come that is filled with progress and community collaboration. The foundations laid in FY20 paved the way for concrete action plans that will fulfill the mission of the Office of Sustainability and sustainability efforts across the University. Positioning stakeholders to implement the decarbonization roadmap and to further develop and operationalize the University Sustainability Plan will be at the forefront of the Office of Sustainability's efforts in FY21. As these major initiatives are underway, progress in other areas of sustainability will not stall. The office will expand energy efficiency programs, explore novel approaches such as battery storage and electric fleet vehicles, continue expanding waste reduction and diversion strategies and begin development of a robust interface for our community that will display campus-based sustainability data. We wish you and yours health and well-being in the year to come.

ChargePoint

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ONLY WHILE
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Acknowledgments





The Office of Sustainability would like to acknowledge, first and foremost, the contributions and efforts of the 16 Office of Sustainability interns who committed their summers and out-of-classroom time to advancing sustainability at Brown. We are grateful for the many environmental student groups at Brown, whose commitment to various sustainability initiatives provides the University with valuable insight and resources to elevate these initiatives across campus. The success of sustainability at Brown is reliant on collaboration with departments, staff, faculty and students across the University; we are thankful for the opportunity to engage with such a committed, diverse institution.

We would like to acknowledge and thank the following partners:

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- Office of University Communications
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- C.V. Starr Program in Business, Entrepreneurship and Organizations
- Office of Residential Life
- Strategic Purchasing, Contracts and Insurance
- Brown Real Estate and Auxiliary Housing Office
- Environmental Health and Safety
- Haffenreffer Museum of Anthropology
- Division of Pre-College and Summer Undergraduate Programs
- Institute at Brown for Environment and Society

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