

MIT Office of Sustainability

Mission and Methodology

The mission of the MIT Office of Sustainability (MITOS) is to transform MIT into a powerful model that adapts proven and generates new ways of responding to the unprecedented challenges of a changing planet through operational excellence, education, research, and innovation on our campus.

Since its inception, MITOS has worked to reimagine how a university sustainability office should be structured and operate. By viewing sustainability as a challenge to be grappled with at the level of the individual, campus, city, and globe, MITOS has established an innovative, comprehensive, and ever-evolving approach to addressing how an organization can transform in light of the biggest challenges of our time. The office applies a scientific methodology of inquiry, data analytics, and solution development in partnership with MIT researchers, staff, faculty and students, to engage in the work of addressing these global challenges at the local level.

Working in partnership with the city of Cambridge and other communities in greater Boston; campus departments, labs, and centers (DLCs); student groups; and peers across the region and globe, MITOS continues to accelerate and support innovative systems focused on a low-carbon campus, materials lifecycle, campus food systems, healthy people, sustainable mobility, and climate resiliency. MITOS also leverages MIT's campus as a test bed for ideas, enabling MIT to serve as a microcosm for global issues and solutions.

Solutions found at MIT are the result of collaboration with stakeholders and individuals across the Institute. In working with individuals and teams across campus, MITOS is able to keep focus on the people at the center of a sustainable campus—understanding their needs, motivations, and unique abilities to contribute to solving for sustainability at MIT.

The challenges of the COVID-19 pandemic resulted in adjustments to many projects and programs facilitated by MITOS in FY2020. However, as an office with a keen focus on resiliency, the unprecedented year has provided a test-in-progress of an adaptive campus and community.

Organizational Support

MITOS is supported by a team of seven full-time staff: director, assistant director, senior project manager, project manager, senior administrative assistant, data scientist, and communications specialist. The latter two joined the team in FY2020. This staffing model is organized around MITOS's areas of impact: low-carbon campus, climate resiliency, material lifecycles, healthy people, and thriving networks supported by subject matter experts. The data specialist role works hand-in-hand with the staff focused on each of the "areas of impact" to manage data collection of current conditions, enable predictive analytics, and to open sourcing data to the MIT community to solve for sustainability at MIT. The addition of the communications specialist position in 2019 was demonstrative of a commitment to MIT community engagement and activation through increased outreach via traditional and digital media channels.

Student Fellows

The crucial work of the MITOS team is also supported by the integration of student fellows who focus on annual priority areas, including design, waste, materials, greenhouse gas emissions, and more as needs evolve. These students—both undergraduate and graduate level—have contributed a tremendous amount of work to MITOS and MIT as a whole. MITOS student fellow projects to date include the development of a climate resiliency dashboard, design and implementation of MIT's first sustainability pollinator garden, and the analysis of MIT's parking and transportation trends. Each semester, MITOS is supported by six to eight student fellows, many of whom are jointly hosted between our office and another department on campus.

Areas of Impact

Zero-Carbon Campus

Greenhouse Gas Inventory and Reductions

With the support of MITOS, MIT annually measures the greenhouse gas emissions associated with the operation of our campus to better understand MIT's direct contribution to the heat-trapping gases in the atmosphere—the gases contributing to global climate change. These data inform our carbon-reduction strategies and allow for tracking progress over time. In 2019, MIT continued to advance towards its goal of achieving a 32% reduction in campus emissions by 2030. Since 2014, MIT has reduced its emissions by a total of 18% toward this 32% goal, taking into account the purchase of solar power from Summit Farms.

While MIT continues to explore strategies for achieving climate neutrality in the future, a core component remains scaling up campus energy efficiency. Working with MITOS, the Department of Facilities plays a deep and essential role in these efforts. One outcome of these collaborative efforts is significant planned efficiency gains from MIT's new central utility plant as well as new complementary approaches to increase energy efficiency gains in buildings, ranging from testing artificial intelligence to optimize building control systems, to installing wholesale mechanical systems, making changes in labs to reduce air exchange, and implementing requirements to create a more efficient and comfortable work environment.

Expanding to Scope 3 Emissions

In 2019, MITOS expanded upon work to source data and build a preliminary picture of the Institute's Scope 3, or "indirect", GHG emissions. This is done to inform MIT's total greenhouse gas emissions activities (Scopes 1 + 2 + 3) and explore where strategic opportunities may exist to reduce emissions. MITOS enlisted Jeremy Gregory, executive director and research scientist with the MIT Concrete Sustainability Hub, as a faculty fellow to build a preliminary estimate of Scope 3 GHG emissions activities. This estimate seeks available emissions data, including that relating to purchased goods and services, MIT-sponsored travel, and commuting and capital goods, using the World Resources Institute/World Business Council for Sustainable Development GHG Protocol for Scope 3—referred to by the organizations as "corporate value chain" framework.

Supporting Sustainable Mobility Choices Through Access MIT

In 2016, MIT set out to reduce parking demand on campus by 10% over 2 years with the launch of Access MIT. MITOS participated in the design process with researchers and decision makers on the development of the program, which combines pay-per-day parking with zero-cost access to the Massachusetts Bay Transportation Authority (MBTA) subway and local bus, among other benefits for employees. The team also launched a public awareness campaign to accompany the new benefits and reframe the commuting experience.

The investment in the program incentivizes the MIT community to rethink their commute on a daily basis. In 2020, the program impact to date contributed to a nearly 15% reduction in on-campus gated parking demand and consistent year-over-year increases in employee public transportation use, surpassing its initial goal. MITOS continues to work collaboratively with MIT Parking and Transportation, the Transit Lab, and student research fellows to analyze data and understand the current and potential impact of Access MIT. The data is being used to inform the next phase of Access MIT.

Climate Resiliency

Planning for a climate-resilient MIT involves understanding what risks and disruptions may impact the campus in order to prepare the campus community for the impacts of climate change. MITOS is leading a cross-campus effort, which includes researchers and operations staff, to understand and address the potential impacts, including:

- Flooding from more frequent and extreme rains
- Flooding from storm surges and rising sea levels
- Extreme heat events

MITOS views a climate-resilient MIT as an Institute that continues to fulfill its mission in the face of these impacts. Recent disruptive weather events, both localized and regional, have helped to raise the awareness of vulnerability to flooding in the region. To build a climate-resilient MIT, we seek to understand and prepare for the flood risk to campus as well as extreme heat events. Additionally, lessons learned from the COVID-19 pandemic are being applied to future resiliency planning.

Healthy People

The Hive Garden and Hive@Home

In 2019, the MIT Undergraduate Association committee (UA Sustain) envisioned a campus pollinator garden to engage students and support sustainable ecosystems. Working closely with both MITOS and MIT Grounds Services, that idea became a reality in fall 2019. Designed as a sustainability pollinator garden that is in part maintained by students, the Hive Garden hosts nearly 40 unique varieties of plants to attract and support pollinators like bees, birds, butterflies, and moths—essential contributors to sustainable ecosystems and food systems. The garden also serves as a test bed for codesigning outdoor spaces to connect to, and learn from, nature in an urban setting.

In spring 2020, the closure of campus due to the COVID-19 pandemic meant that many of those who put great effort into creating the Hive Garden would miss its first spring bloom. Working with MITOS, UA Sustain students hatched the idea for the [Hive@Home](#)—a project that empowers students and staff to try their hands at home gardening. Like the on-campus garden, the Hive@Home project links students and staff through gardening. With funding from UA Sustain and MindHandHeart, the Hive@Home pilot launched in April, 2020 with more than four dozen community members receiving vegetable seeds and growing supplies. The community shared their sprouts and lessons learned on Slack throughout the summer with guidance from MIT Grounds Services and one another.

Kendall Food Prize

In fall 2019, MIT Dining—and its food service management partner, Bon Appetit—in collaboration with MITOS was one of six winners of the Henry P. Kendall Foundation New England Food Vision Prize. MIT Dining was awarded \$250,000 to explore bold and innovative ideas that strengthen the region’s food system. MIT’s winning proposal—so-called “Food from Here”—set out to increase the amount of New England-grown food served on campus, while strengthening the capacity of local farm and processing partners to supply food to the region.

With the closure of campus and a changed dining landscape for fall 2020, stakeholders in the program sought to pivot the proposal to serve the needs of a “new normal” while still addressing original goals of the proposed program to meet the measurable, sustainable, and replicable goals of the Food Vision Prize while incorporating social justice, food security, and recommendations from the MIT Food and Sustainability Working Group.

Material Lifecycles

In fall 2019, MITOS, along with the Abdul Latif Jameel Water and Food Systems Lab (J-WAFS), the Environmental Solutions Initiative (ESI), MIT Dining, the Office of the First Year, and the MIT Water Club worked to encourage sustainable water use practices across MIT’s campus by advocating for the regular use of reusable bottles and other service ware throughout campus. To support this, MITOS offered branded, stainless steel water bottles to first-year students attending orientation. To get the water bottle, students simply had to take a pledge to use their bottle at least 10 times—the minimum amount of uses needed to provide a better environmental performance than a typical single-use water bottle.

Four months after the giveaway, MITOS sent a survey to all recipients to test the efficacy the giveaway. With over 145 respondents, the results were encouraging:

- After 4 months, 92% of recipients still had and were using the reusable bottle
- Over 81% of recipients stated that they fulfilled their pledged commitment to use the bottle at least 10 times instead of buying a single-use container beverage
- Over 52% of recipients reporting sparking at least one additional conversation with others about the importance of using reusable containers

The idea for the bottle giveaway was first raised by the Sustainability Leadership Steering Committee and the Water Stewardship Working Group. While welcoming new students, the aim was to introduce them to MITOS and MIT's commitment to building a sustainable future and educate them about the benefits of choosing tap water over single-use plastic bottles.

Waste Pilots

In recent years, the Office of Sustainability, in partnership with Institute DLCs, has worked to pilot a number of studies focused on waste disposal practices and specifically waste stream contamination. In 2019, these pilots continued across campus at the Media Lab, School of Architecture and Planning (SA+P), Baker Dining Hall, and the Howard Dining Hall at Maseeh Hall. The pilots contribute to an overall understanding of the issues of waste stream contamination on campus. The results of the pilots to date are shared on the MITOS website and provide a data-driven picture of campus waste challenges and the linkages among seemingly independent systems, helping to envision ways to contribute to broader campus solutions. As campus operations resume, so will the pilots in an effort to better understand efforts MITOS can take to address waste stream contamination and positively change behavior.

Governance and Committee Involvement

Sustainability Leadership Steering Committee

Published in 2018, the Campus Sustainability Task Force report, *Pathway to Sustainability Leadership by MIT: Incubation, Transformation, and Mobilization*, provided a vision and comprehensive framework for MIT's commitment to campus sustainability, now and into the future. With leadership from MITOS, the Sustainability Leadership Steering Committee of faculty and staff—reporting to the provost, executive vice president, and treasurer—continued to support implementation of actions to realize the vision of this report by making recommendations, reviewing progress, and determining priorities as sustainability benchmarks are set and achieved.

Climate Resiliency Committee

The MIT Climate Resiliency Committee, managed by the Office of Sustainability, is tasked with assessing, planning, and operationalizing a climate-resilient MIT. The committee is a collaboration among faculty, engineering and facility staff, risk, insurance, and climate science experts, emergency management personnel, and students; these contributors are individually and collectively driving efforts that grow a climate-resilient campus.

Water Stewardship Working Group

Comprised of faculty, staff, and students, the Water Stewardship Working Group developed and delivered preliminary recommendations to advance a water stewardship program on campus with a focus on water efficiency, outreach, and education, as well as research opportunities to use the campus as a test bed for new approaches.

Thriving Networks

City of Cambridge

In FY2020, MITOS continued to serve as an MIT representative on a number of city committees and teams focused on climate change mitigation and adaptation, as well as materials management, transportation, and water. MITOS has worked closely with the city of Cambridge as part of the Cambridge Compact for a Sustainable Future, the City of Cambridge Climate Change Preparedness and Resilience Plan, the Net Zero Action Plan, the City of Cambridge Climate Resilience Zoning Task Force, and more. MITOS has worked hard to forge new methods of collaboration that build trust, develop better solutions, and accelerate progress with diverse stakeholders. Strategies from these collaborations have direct impact on the campus and city level, while serving as a model for collaborative approach to other universities and municipalities.

International Sustainable Campus Network

MIT is an active member of the International Sustainable Campus Network (ISCN), working with peers across the globe to devise open-source solutions for campus sustainability. ISCN is a global forum supporting leading colleges, universities, and corporate campuses in the exchange of information, ideas, and best practices for achieving sustainable campus operations and integrating sustainability in research and teaching. MITOS director Julie Newman was a founding member of the network and now sits on its advisory board, which is creating a vision for the future.

International Visiting Scholars Program

In 2019, MITOS launched an international visiting scholars program to enable an open exchange of information and ideas between international partners. MITOS provided physical space and devised a schedule for the two different groups to join them. Because of its methodology, MITOS is uniquely positioned to be host to either operational staff, researchers, or a combination of both.

First to visit as part of the program was a cohort of researchers from the KTH Royal Institute of Technology in Stockholm, Sweden. With their visit, the researchers sought to gain a deeper understanding of MIT's sustainability framework and specifically how MITOS leverages the campus as a test bed. The KTH researchers also shared their work on a "live-in lab" model, where they had turned four apartments within a dormitory into a live-in-lab data collection model that is used to inform flexible design, and how to optimize resource use in housing.

The second cohort visited MITOS from the Pontificia Universidad Católica del Perú (PUCP), Lima, Peru, with financial support from the ISCN. Ideas from the exchange aided in the formalization of plans to launch an Office of Sustainability at PUCP in 2020. This exchange was also part of the development of an ISCN Latin America network to advance campus sustainability throughout the Americas by understanding what can be gained via cross-cultural exchanges and support a roadmap for Office of Sustainability implementation among ISCN university members in the Latin America region based on the success of PUCP.

Campus Sustainability Incubator Fund

As MIT sought to resume campus operations for fall 2020 for select researchers, faculty, students, and staff, the need for vast amounts of personal protective equipment (PPE) for these individuals became an opportunity for MITOS to support the development of a strategy and framework to guide sustainable campus PPE procurement.

Via a grant from the Sustainability Incubator Fund, campus researchers were invited to craft a research proposal to study the supply chain, lifecycle use, and disposal processes of PPE and the potential impact on the MIT campus. When complete, the findings will inform a plan for sustainable PPE procurement over the next one to two years. The study seeks to inform the entire PPE process, from procurement to use to reuse to disposal. The researcher team includes representation from MIT Sloan School of Management, the Concrete Sustainability Hub, the Center for Transportation and Logistics, and the MIT Humanitarian Supply Chain. The project commenced with a first-of-its-kind meeting between the research team and the MIT operational team managing all aspects of PPE on campus. The research will take place throughout FY2021 with a communication chain in place to inform those leading campus PPE procurement efforts.

Boston Green Ribbon Commission Higher Ed Working Groups

MITOS team members served on three separate working groups as part of the Boston Green Ribbon Commission Higher Ed Working Groups. The goal of the working groups is to building upon the significant accomplishments of the Higher Ed Working Group of the past decade. Team members share their subject matter expertise in these groups to advance the goals of transferring knowledge to other sectors to accelerate change for the equitable implementation of climate mitigation and resilience.

Communicating Impact

Sustainability DataPool

Since it first launched in 2016, MITOS's Sustainability DataPool has served as a collaborative project that provides the MIT community with access to campus sustainability data and visualizations. Using real-time data—from building energy use to campus water use—the tool empowers MIT community members by giving them the data they need to understand current performance and inform innovative sustainability solutions and ideas. The DataPool has been cited in FY2020 research and projects across campus including the DUSP Climate Action Plan, MIT Facts, and Town Gown Reports for the city of Cambridge. A signature data project of 2019 focused on working with the MBTA and other transportation data sources to better understand and communicate the commuting patterns and impacts of those traveling to and from the Institute.

Sustainability Digest

In an effort to engage and inform a larger audience, MITOS launched its first monthly newsletter with the support of the communications specialist position. With an audience of more than 1,000 subscribers at MIT and beyond, the *MITOS Digest* connects the audience with news, research, photos, and updates on sustainability projects to engage individuals and groups in solving global issues at the local level. The *MITOS Digest* is

also reflective of the responsive work of the MITOS team, sharing reading lists, podcasts, and videos that the team uses to support ongoing education and work.

Conclusion

Looking to FY2021, MITOS aims to build upon its strong track record of success, established partnerships, and innovative methodology to advance solving global problems at the local level. The added challenges of the COVID-19 pandemic have pushed the office to rely on its core strengths of agility, responsiveness, and collaboration.

MITOS is focused on an outcome-oriented vision—imagining MIT as an example of a state-of-the-art sustainable campus, and understanding the work we must do to get there. The ultimate goal of MITOS is an MIT where sustainability is embedded into the fiber of the Institute and considered in every decision that is made.

The coming year will see the update to MIT's Plan for Climate Action, which will engage the office in further addressing the challenges of climate change at the organizational level and laying the groundwork for a carbon neutral campus. MITOS will continue its work in moving from silos to systems to serve the campus, city, and globe, while also having special focus on the role of the individual in grappling with the challenges and opportunities in sustainability on campus.

Effectively and broadly communicating how community members can support the mission of MITOS is of increased importance for the future. Exciting and meaningful work launched in FY2020 provides the basis for our success going forward as we continue to engage the MIT community in:

- Moving toward a zero-carbon campus
- Supporting sustainable food systems
- Modeling and planning for a climate-resilient MIT
- Developing a research initiative that studies the intersection of public health and sustainability
- Managing the impact of the Institute's purchasing and waste systems in a manner that takes the full lifecycle costs and impacts of materials and products into consideration
- Broadening and deepening MIT's commitment to sustainable transportation and robust participation in Access MIT
- Expansion of data collection and accessibility of data sources and visualizations
- Advancing sustainability principles and practices for the future of MIT via Task Force 2021

Sustainability MIT News Features

- [MIT continues to advance toward greenhouse gas reduction goals](#), February 21, 2020
- [Students propose plans for a carbon-neutral campus](#), January 17, 2020
- [MIT Dining wins the New England Food Vision Prize](#), December 6, 2019
- [MIT's new sustainability garden creates a buzz](#), November 25, 2019
- [First-year students encouraged to "reuse, refill, replenish,"](#) September 25, 2019

Julie Newman
Director