
Office of Sustainability
2021 ANNUAL REPORT

CONTENT

MISSION AND METHODOLOGY

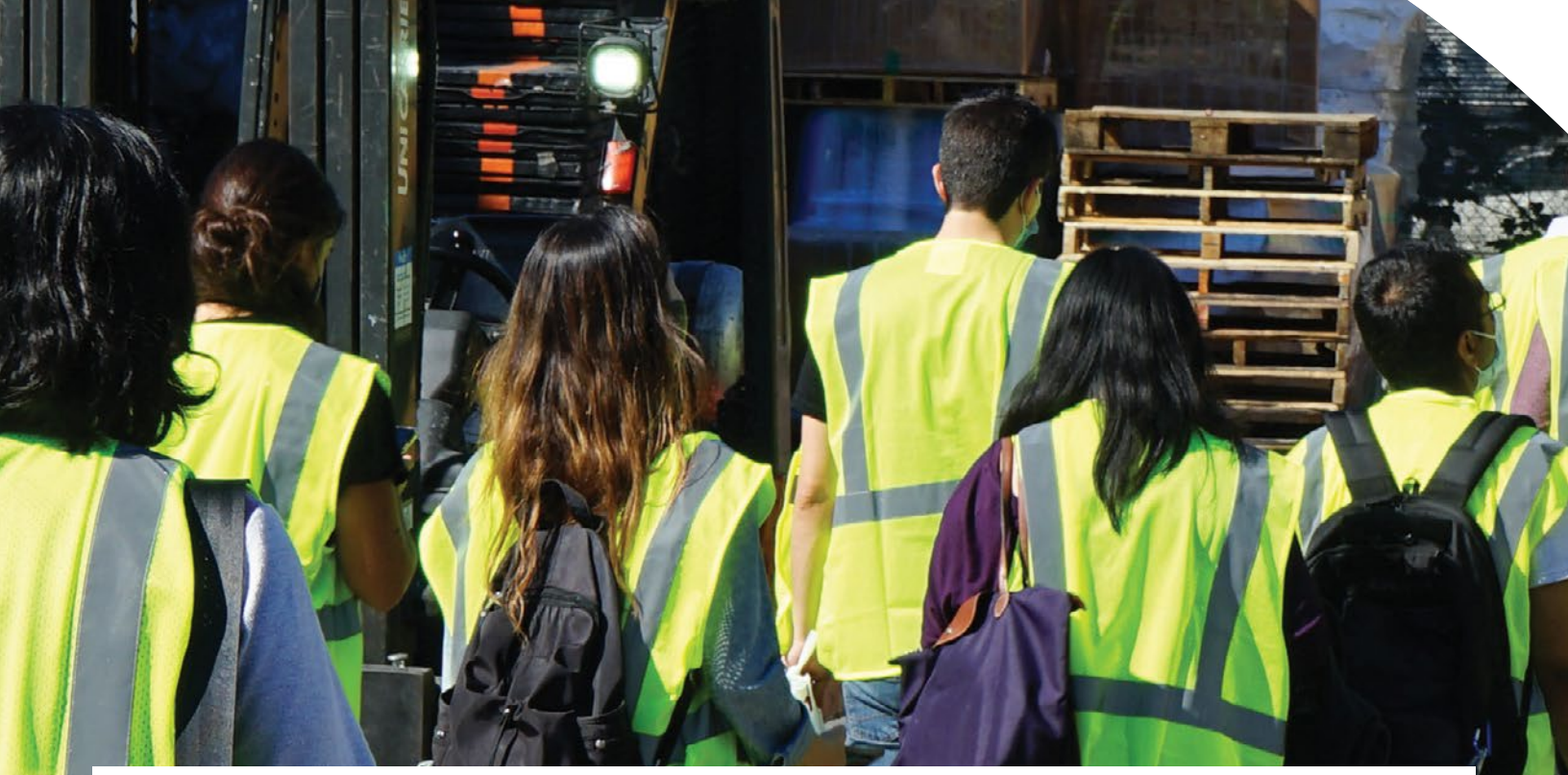
The mission of the MIT Office of Sustainability (MITOS) is to transform MIT into a powerful model — one that generates just, equitable, and scalable processes and solutions for responding to the unprecedented challenges of a changing planet. To achieve our mission, MITOS seeks to advance a collaborative process that engages and elevates a diverse set of voices to foster operational excellence, education, research and innovation on our campus. To do this, 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 global challenges at the local level, using a framework of the role of the individual, campus, city, state, and the globe.

In Fiscal Year 2021 (July 1, 2020–June 30, 2021), MITOS staff stepped up to respond to the impacts of the pandemic while continuing to fulfill the mission of the office. Despite the challenges of being away from campus, MITOS staff successfully advanced important work in campus climate mitigation and resiliency, procurement and waste, mobility, food systems, environmental justice, and sustainable building education. Staff also supported new priority projects relevant to the pandemic including research on the lifecycle, procurement and disposal trends of personal protective equipment (PPE). This comprehensive scope of work reflects the office's areas of impact as well as the overall focus on transforming MIT into a zero-carbon campus.

With respect to the office's role in advancing climate action on campus, MITOS has been historically guided by MIT's Plan for Action on Climate Change, released in 2015. With the publication of Fast Forward: MIT's Climate Action Plan for the Decade in May 2021, MITOS has a new set of campus commitments and metrics to inform and implement, including two ambitious greenhouse gas reduction targets: net-zero campus by 2026 goal and elimination of direct campus emissions goal by 2050. Additionally, several new commitments related to electric vehicle infrastructure, carbon offsets, and Scope 3 emissions were also announced.

Operating at the intersection of campus operations and research, MITOS is uniquely positioned to lead the Institute in the process of meeting the 2026 and 2050 greenhouse gas emission reduction goals. MITOS's past contributions to reducing campus emissions enables the office to scale efforts and support new strategies to meet these goals, building on previous work undertaken by MITOS from the first plan for climate action.

An essential facet of the success of MITOS is its strong partnerships across campus and beyond. In line with the MITOS commitment to solving for sustainability across scales, these partners include MIT campus departments, labs, and centers (DLCs); student groups; the cities of Cambridge and Boston; and higher education peers across the region and globe.



ORGANIZATIONAL AND COMMUNITY 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. This staffing model is organized around MITOS's five areas of impact supported by subject matter experts. The data scientist and communications specialist roles work as partners to each program manager with regards to their specific portfolio of areas of impact.

STUDENT FELLOWS

The crucial work of the MITOS team is supported by the integration of Student Sustainability Researchers who focus on annual priority areas such as designing out waste, materials, greenhouse gas emissions, and more. These students — both undergraduate and graduate level — have contributed a tremendous amount of work to MITOS and MIT as a whole. Each semester, MITOS hires eight student researchers, many of whom are often jointly hosted between our office and another department on campus. In 2020, MITOS partnered with the Department of Urban Studies and Planning (DUSP) to support multiple fellows who contributed to the foundation of their emerging Sustainability and Climate Action Plan for the School of Architecture and Planning (SA+P). Despite the impacts of the pandemic, MITOS continued to virtually support a full cohort of Student Sustainability Researchers in the 2020–2021 academic year, engaging students on projects focused on topics including environmental justice, sustainability data, and campus resiliency. As the impacts of the pandemic limited departmental budgets, the Experiential Learning Opportunities program enabled MITOS to fund three additional fellows.

AREAS OF IMPACT

The Office of Sustainability is organized around five areas of impact: zero-carbon campus, climate resiliency, materials lifecycle, healthy people, and thriving networks.

ZERO-CARBON CAMPUS

MITOS has a unique role in activating and leveraging the campus as a test bed to reduce emissions. Through cross departmental committee engagement, coursework, community forums, and support of student projects and research, MITOS works to address the challenges of accelerating the reduction of campus greenhouse gas emissions.

Campus Climate Action Forum

Ahead of the release of the new climate action plan, several public input sessions were held to help inform the plan. MITOS worked with the Office of the Vice President for Research and the Vice President for Campus Services and Stewardship to host a public forum aimed at engaging the MIT community for their insight on campus specific climate goals and issues via an online Campus Climate Action Forum. This event drew nearly 200 unique members of the MIT community representing staff, students, researchers, and faculty. The attendees received an update on current campus climate actions and were invited to share their ideas for the next climate action plan both through chat and interactive Zoom breakout rooms. The event resulted in a series of recommendations from the community delivered to Vice President for Research, Maria Zuber, to be taken into consideration as the new climate action plan was finalized. A number of themes shared by the community at the event were reflected in the final plan, giving a sense of ownership and buy-in for the new plan.

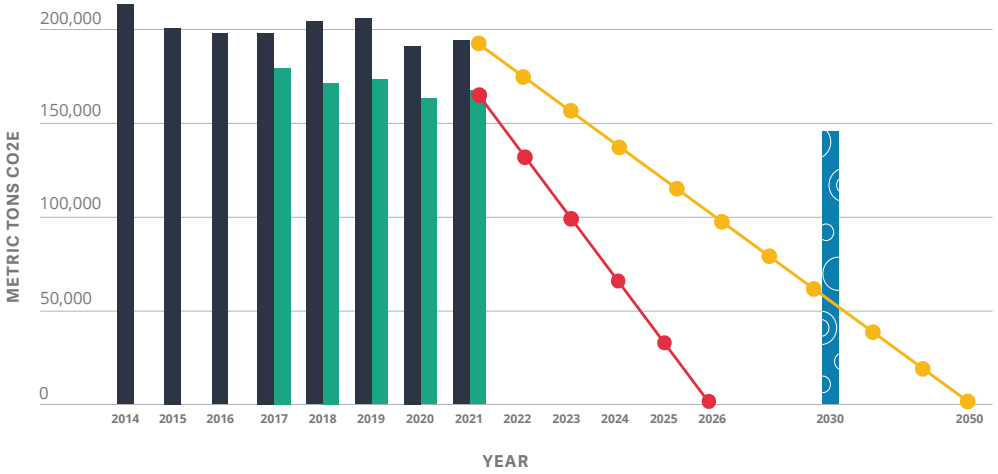


FIGURE 1 MIT CAMPUS GREENHOUSE GAS EMISSIONS*

In 2021, MIT's greenhouse gas (GHG) emissions remained relatively flat, with emissions rising approximately 2% from 2020 levels. This slight increase was driven in part by the addition of new buildings and pandemic-related building safety measures which ultimately required higher energy consumption. However, these higher emissions were offset through building-level energy efficiency investments, operational efficiency of the Central Utilities Plant (CUP), and improvements in the New England regional electricity grid. Since 2014, MIT has reduced its net emissions by approximately 22%. Of that net reduction achieved to date, approximately 12% is attributed to our solar power purchase agreement, 8% to on-campus mitigation measures, and less than 1% to carbon improvements to the local electricity grid. This sets MIT on the path toward the newly announced 2026 goal of net-zero emissions.

* Net-zero emissions goal and trend line is inclusive of off campus offsets including PPA.

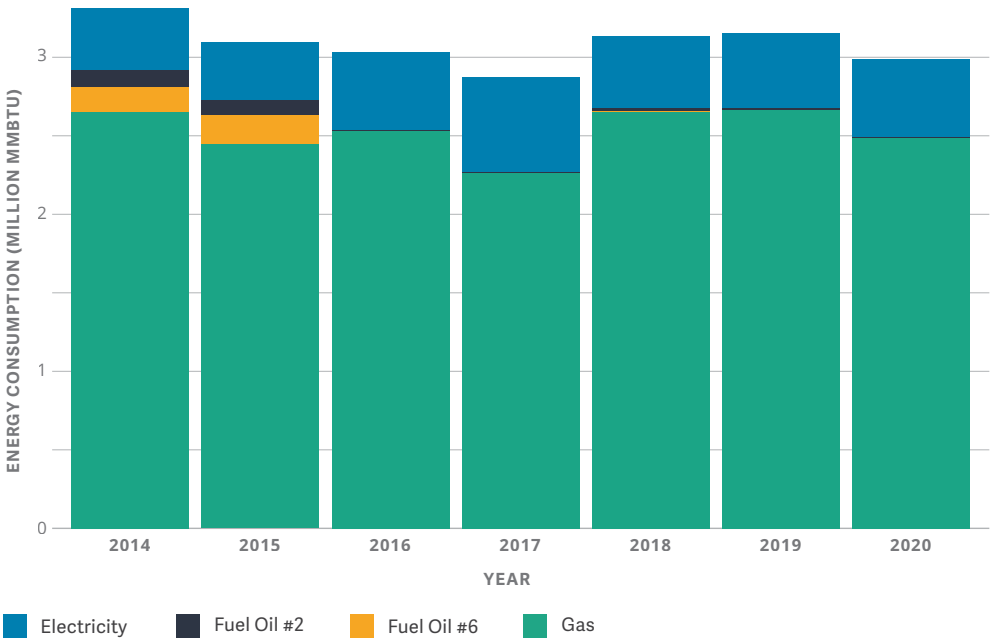


FIGURE 2 TREND IN BUILDING ENERGY CONSUMPTION BY FUEL SOURCE (FY2014–2020)

There was a decrease in building energy consumption over fiscal years 2014–2020; this trend is somewhat more pronounced when normalizing by gross building area (not pictured). Breaking this trend down by fuel reveals that the decrease is due in part to a phasing-out of Fuel Oils #2 and #6 as well as decreased consumption of natural gas.

Accounting for Scope 3 Greenhouse Gas Emissions

As designated by the Environmental Protection Agency (EPA), Scope 3 emissions are emissions that are "the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain." Scope 3 emissions include all sources that are not already within Scope 1 and Scope 2 boundaries as defined above.

Since 2018, MITOS has enlisted Jeremy Gregory, a research scientist specializing in lifecycle assessment and Executive Director of the MIT Climate & Sustainability Consortium, as a MITOS Faculty Fellow to build a preliminary estimate of MIT Scope 3 greenhouse gas emissions activities. In this phase of the project, the team has been collecting available operational data targeting MIT-sponsored travel, commuting, waste, and capital goods. The researchers use the World Resources Institute/World Business Council for Sustainable Development Greenhouse Gas Protocol for Scope 3 framework to the calculate the emissions profile related to these activities. Gregory, along with the support of students, has developed a beta version reporting platform that accounts for Scope 3 emissions for MIT-sponsored travel. Highlighted in the Fast Forward, MITOS aims to publicly launch this business travel emissions platform in 2022 to empower MIT entities with data for reducing greenhouse gas emissions from travel. The Scope 3 data platform will expand to report additional MIT greenhouse gas emission categories in the coming years.

Greenhouse Gas Mitigation Performance

This past year marked the seventh full year of MITOS working closely with the Department of Facilities and other partners to track performance and publicly report on progress towards reducing campus greenhouse gas emissions, working in close collaboration with Facilities to identify and develop mitigation measures across campus. One outcome of these collaborative efforts is significant efficiency gains from MIT's updated Central Utilities Plant as well as new complementary approaches to scale-up energy efficiency gains in buildings. Examples of these scaled up efforts include testing artificial intelligence to optimize building control systems, wholesale mechanical systems, changes in labs to reduce air change rates, and requirements creating a more efficient, and comfortable work environment.

These tracking, reporting, planning, and mitigation efforts enable MIT to better understand our direct contribution to greenhouse gas emissions that contribute to global climate change, inform our carbon reduction strategies, and measure progress over time against the Institute's previous commitment to a 32% reduction in campus emissions by 2030.

Since 2014, MIT has reduced its net emissions by approximately 21% towards this 32% goal **(SEE FIGURE 1)**, taking into account the purchase of solar power from Summit Farms. Of the 21% net reduction achieved to date, approximately 12% is attributed to our solar power purchase agreement, 8% to on-campus mitigation measures, and less than 1% to carbon improvements to the local electricity grid. This progress to date establishes a strong foundation for meeting MIT's new goals of a net-zero campus by 2026 and elimination of direct campus emissions by 2050. This experience to date will help

inform the necessary new and expanded strategies needed to reach net zero in the near term and zero carbon emission goals no later than 2050.

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Supporting School and Department Level Climate Action

Guided in part by Director of Sustainability Julie Newman, and in collaboration with faculty and specifically Professors Caroline Jones and David Hsu, SA+P debuted the first school-level climate action plan at MIT in 2020. The school-wide climate action plan is designed to advance Institute efforts to address climate change and model local level steps that could be taken throughout MIT.

The plan presents detailed analysis of SA+P carbon emissions for a single calendar year (2019), and outlines steps to reduce these through changes in procurement, waste tracking, airline travel, and other areas of operation. The plan originated in research undertaken by graduate students in DUSP with assistance from faculty and MITOS. Past MITOS Students Fellows Yael Nidam MCP '19, Mary Hannah Smith MCP '20, and Julia Field MCP '20, were part of the DUSP climate group that began a series of conversations and workshops with faculty, students, staff, alumni, and others to explore what DUSP could do as a department to address climate change.

Informing Sustainable Mobility Choices

Earlier this year, MITOS launched Commuting at the Institute: The Story of Access MIT, **(SEE FIGURES 5 AND 6)** a new data dashboard in the Sustainability DataPool that shares aggregate data on employee commuting choices — enabling Institute leaders to identify patterns and best practices for continuing to support low-carbon commutes.

Access MIT launched in 2016 with the goal of reducing parking demand on campus by 10 percent over two years through local free bus and subway for eligible employees, among other benefits. Between 2016 and 2019, Access MIT drove a nearly 15 percent reduction in on-campus parking in gated lots, and increased public transportation use by employees.

While the original intent of the data collection and sharing was to understand employee behaviors to continue to adjust the program to support low-carbon commutes, the pandemic changed that. The dashboard has been additionally used to inform return to work decisions, balancing parking demands with incentives for safe and sustainable commutes.

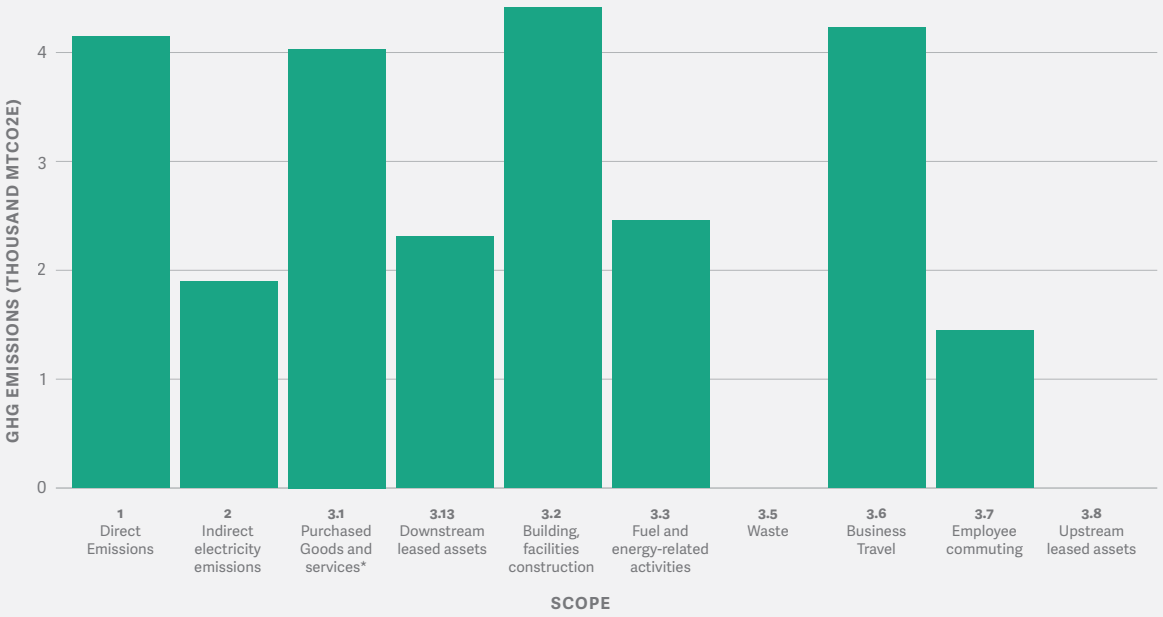


FIGURE 3 TOTAL SA+P GREENHOUSE GAS EMISSIONS BY SCOPE
Data at the sub-campus level—such as these greenhouse gas data for MIT's School of Architecture and Planning (SA+P)—provide additional insights beyond campus-level trends and can help to inform future sustainability action. These data show the relative magnitude of Scope 3 emissions—such as those from business travel—and highlight the potential impact of interventions in Scope 3 areas.

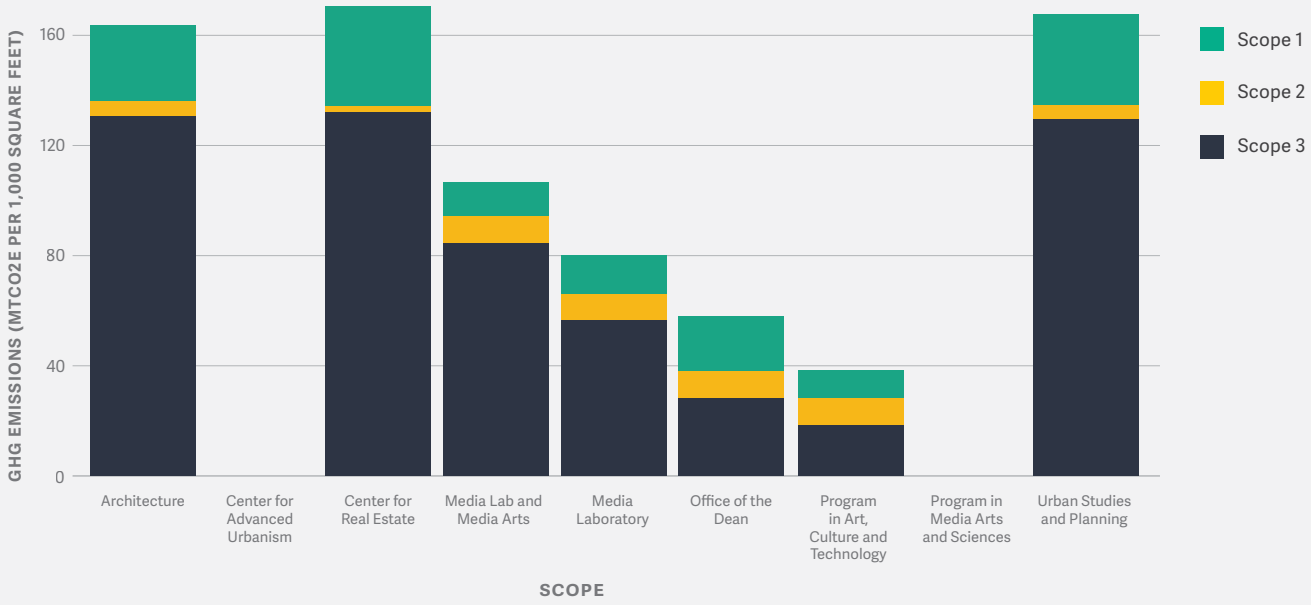


FIGURE 4 SA+P DEPARTMENTS, LABS, AND CENTERS, GREENHOUSE GAS EMISSIONS BY SCOPE
These data also illustrate the differences in GHG emissions among SA+P's departments, labs, and centers, both in absolute numbers and when normalized by building square footages and number of people.

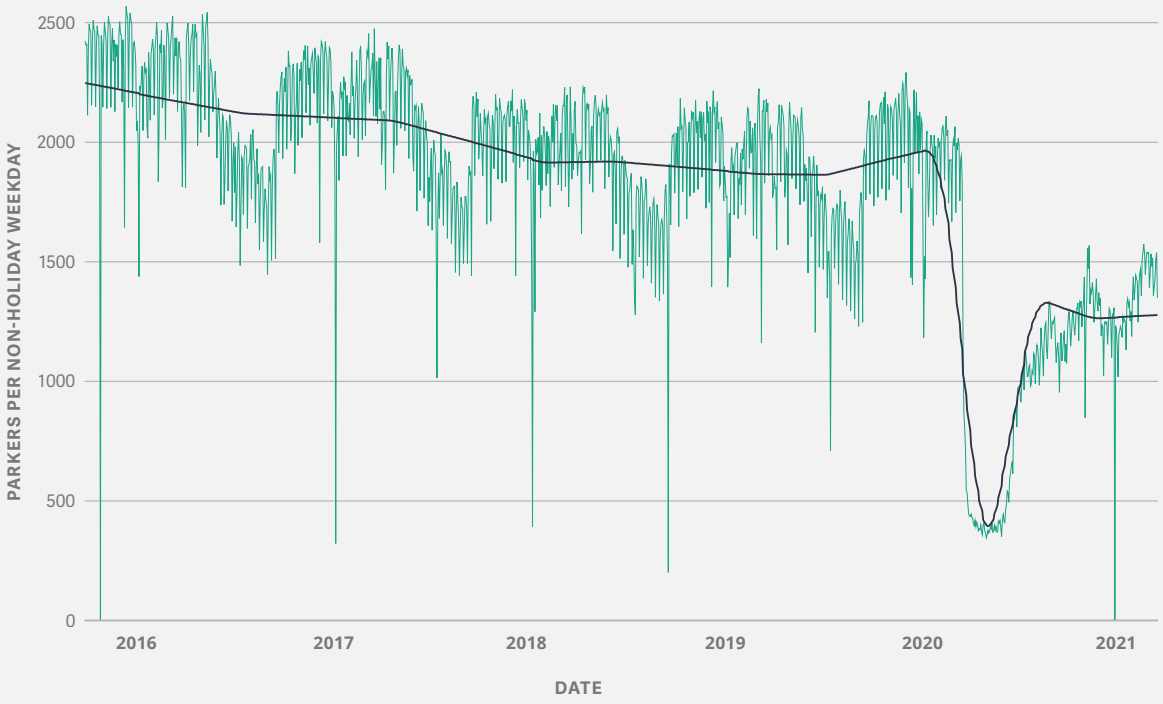


FIGURE 5 MIT DAILY GATED PARKING USAGE (NON-HOLIDAY WEEKDAYS, 2015–2021)
Access MIT contributed to a nearly 15-percent reduction in on-campus gated parking demand over its first two years, surpassing its initial goal of 10 percent. On-campus gated parking demand dropped significantly when the campus shut down due to the COVID-19 pandemic; as of March 2021, parking usage had returned to about two-thirds of its pre-pandemic level.

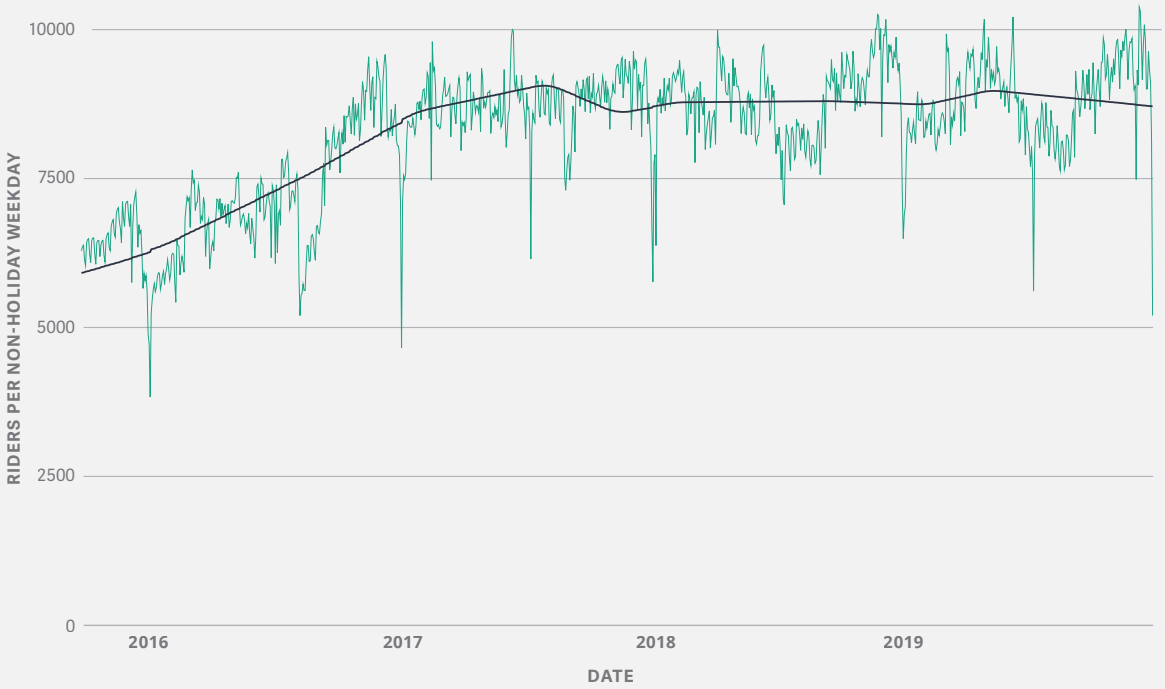


FIGURE 6 ACCESS MIT DAILY SUBWAY AND LOCAL BUS RIDERSHIP (NON-HOLIDAY WEEKDAYS, 2015–2019)
In addition to a decrease in on-campus parking, the Access MIT program also contributed to an increase in public transit (subway and local bus) ridership.

CLIMATE RESILIENCY

The year 2021 was the second hottest on record with a record number of severe weather events striking around the globe. These records highlight the increasing importance of MIT's climate resiliency work, which seeks to develop and support an MIT that continues to fulfill its mission in the face of the impacts of a changing climate. The newly released Climate Resiliency Dashboard enables the MIT community to understand projected potential risk to the campus from flooding. This resiliency work led by MITOS is also reflected in the new climate action plan, which calls for a continued focus on this work and forthcoming adaptation roadmap.

Climate Resiliency Dashboard

The Sustainability DataPool, powered by MITOS, gives the MIT community the opportunity to understand data on important sustainability metrics such as energy, water use, greenhouse gas emissions, and hazardous waste and recycling rates. While many visualizations share data from past events, the MIT Climate Resiliency Dashboard is a predictive model that illustrates potential future events in the form of flooding on campus **(SEE FIGURE 7)**. The dashboard, which went live as a beta version in November 2020, enables the MIT community to visualize and understand projected potential risk to the campus from flooding under both today's climate and a future changed climate.

The tool displays projected flooding data laid over a campus map of MIT, allowing users to zoom in on a portion of campus under a specific scenario and see the projected potential peak rain or storm surge water depth at that location.

The dashboard has already informed new building designs, such as the MIT Schwarzman College of Computing, which is designed to be resilient to a 100-year flood event anticipated under a changed climate 50 years from today. The underlying flood risk model visualized in the dashboard is harmonized with the City of Cambridge flood risk model.

HEALTHY PEOPLE

The Healthy People area of impact focuses on well-being and sustainability for both individuals and the community. In the past year, this area has supported work in environmental justice as well as food systems on campus. Working with operational and research partners in these areas has helped to drive success and transformation over the past year.

Environmental Justice

In FY2021, MITOS took the initiative to explicitly outline commitments and past work related to environmental justice. MITOS is working to take an approach to sustainability that promotes environmental justice and centers the values of diversity, equity, belonging, and inclusion in all levels of work, in line with the strategic priorities of the Institute Community and Equity Office (ICEO) and MIT's Campus Services and Stewardship units.

This work includes developing a deep understanding of the racial injustices that contribute to the unequal distribution of environmental costs, benefits, and conditions in communities. We also seek to advance an inclusive process, recognizing that the sustainability field has often marginalized groups who are the closest to pollution, most impacted by climate change, and who have the knowledge to contribute to innovative solutions.

FIGURE 7 RISK TO MIT CAMPUS BUILDINGS FROM A 100-YEAR STORM UNDER CURRENT CONDITIONS

Flood modeling helps the MIT community and MIT decision-makers understand projected risk to the Cambridge campus from flooding under both today's climate and a future, changed climate. Ongoing research aims to incorporate heat risk into MIT's climate resiliency tools to provide a fuller picture of climate risks to the campus.

In these efforts, MITOS hosted a session at the Day of Dialogue on climate, sustainability, and justice at MIT; co-hosted with ICEO Community Dialogues: Exploring Climate & Environmental Justice; and dedicated a track to the office's annual conference, Sustainability Connect, to "Exploring the Social Justice and Sustainability Nexus in Colombia, the U.S., and Campus." Additionally, MITOS worked in a unique collaboration with Princeton University and Emory University to leverage collective resources for a series of guided dialogues with peers that enabled the teams to explore their own work through a lens of equity and environmental justice.

Looking ahead, MITOS staff will continue to focus on integrating an environmental justice lens into day-to-day work as well as act on the "imperative of justice" as outlined in the Fast Forward Climate Action Plan.

Sustainability Education Signage

As the new E37/E38 neared completion in 2020 and worked toward LEED Gold certification, a Green Building Education credit was pursued as part of the sustainable design and construction plan. A team made up of representation from MITOS, Campus Construction, Systems Performance and Turnover, and in partnership with an external designer, developed a signage program to educate building occupants and visitors on the benefits and features of E37/E38's innovative design. The resulting display in the lobbies of E37 and E38 highlight topics ranging from community connection to climate resiliency to health and well-being. Each floor of E38 also contains more detailed information on an occupant relevant sustainability topic such as transportation and waste, with artwork designed by an MIT Architecture student. The same team is supporting additional building education projects, such as the renovated Hayden Library and New Vassar dormitory to communicate and educate visitors and residents on the unique sustainability features of those buildings.

Food Systems

FY2021 was a challenging—and illuminating—year for local food systems. MITOS supported MIT Dining and the Food Security Solutions Action team to shape campus food programming that prioritizes accessible, affordability, nutritious, culturally-relevant, and sustainably-sourced food for students and the MIT community.

One recent outcome of this work is the Launchpad, a non-profit food business incubator created by CommonWealth Kitchen (CWK) and located in the Lobdell Food Court in W20. The Launchpad offers the MIT community more variety and healthy food options, while also advancing CWK's and MIT's mutual goal to support diverse, local start-up food businesses and to create a more just, equitable, and sustainable food economy.

Work on the Launchpad began in 2018, bringing together the Student Center Dining Concepts Working Group, comprising students from the Undergraduate Association, Graduate Student Council, DormCon, house dining chairs, and other students interested in dining as well as staff from the MITOS and the Division of Student Life (DSL) to re-envision dining options available in Lobdell to support local, diverse, and sustainable menus.

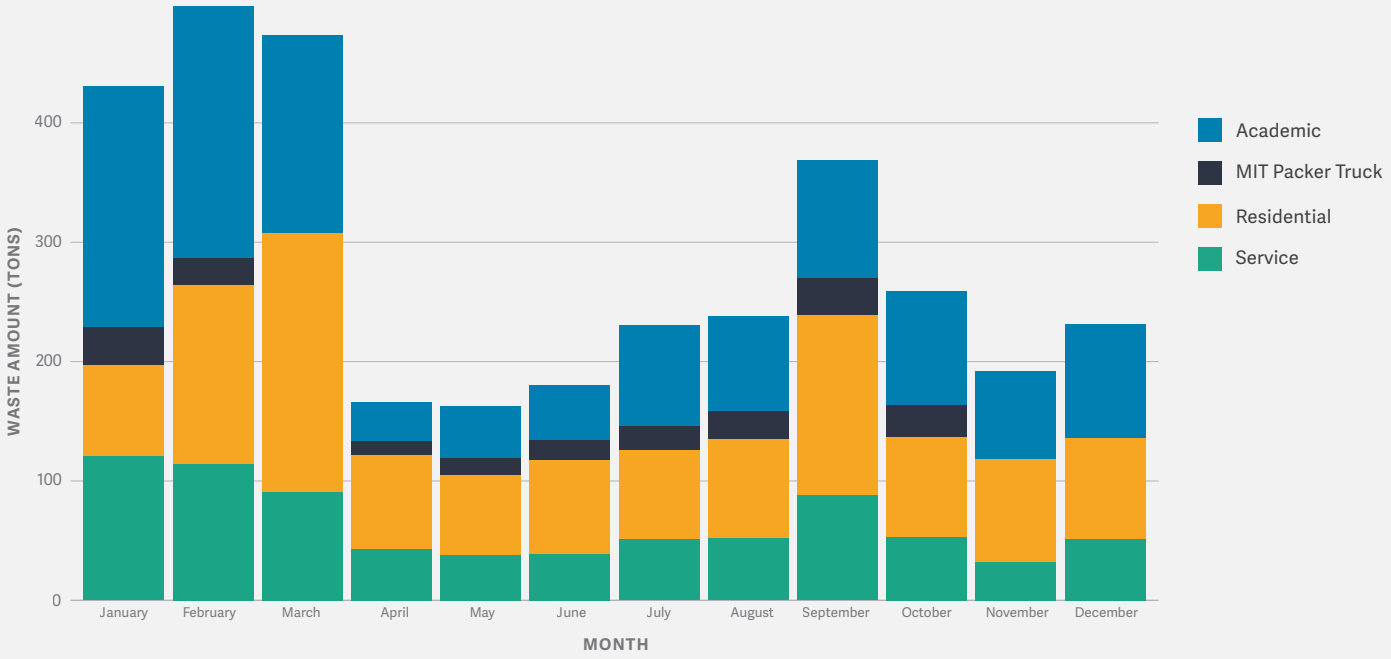


FIGURE 8 2020 MONTHLY WASTE TONNAGES BY BUILDING TYPE

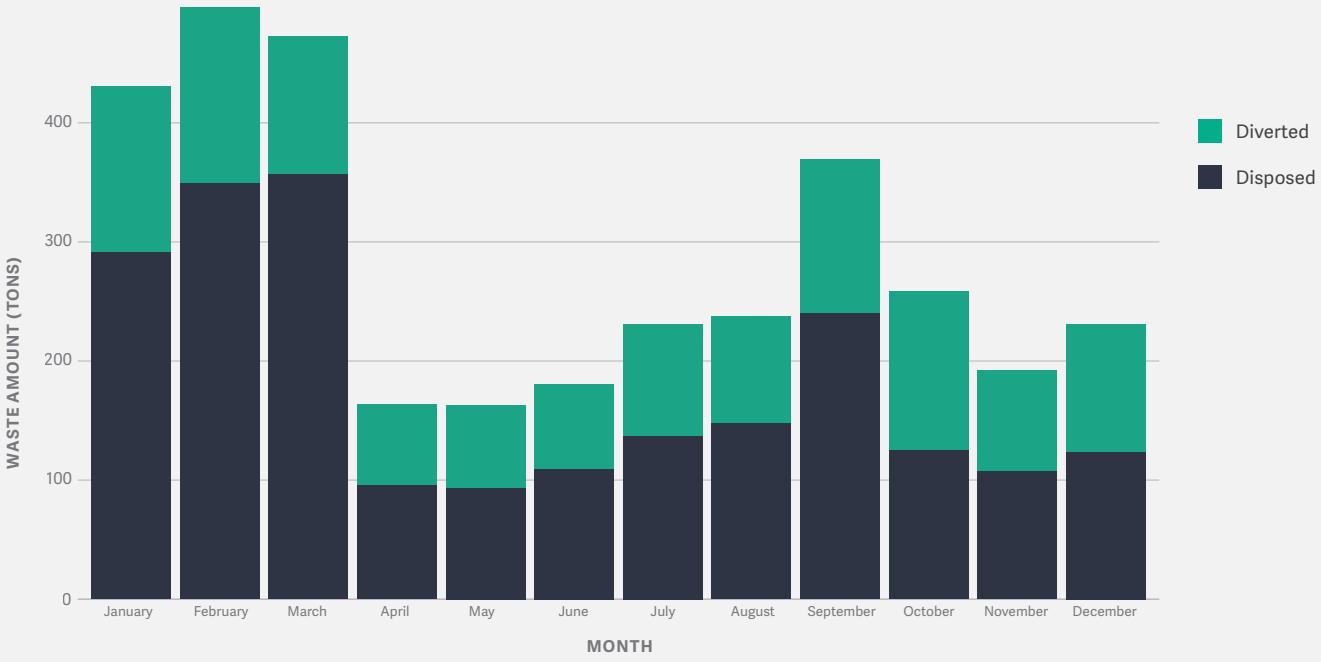


FIGURE 9 2020 MONTHLY WASTE TONNAGES DIVERTED AND DISPOSED

There was a decrease in the amount of waste (by weight) removed from the MIT campus over the period 2014–2019, especially during the years 2017–2019; this trend remains present when normalizing by the total student population in each year. There was a marked decrease in waste removed from campus beginning with the onset of the pandemic and the campus shutdown in March 2020.

MATERIAL LIFECYCLE

Despite less waste being generated on campus due to a lower campus population over the past year **(SEE FIGURE 10)**, 2021 proved to be a pivotal year for improving waste collection processes and sustainable procurement strategies. Spurred by data collected in past waste audits, MITOS facilitated the debut of standardized waste signage and centralized bins in E37/E38, with more buildings anticipated. The need for PPE also drove centralized procurement initiatives on campus in efforts to reduce waste. Courses and events reflected the increased student interest and engagement in this area and the new climate action plan calls for setting a waste reduction goal for MIT.

IAP Course: "Waste" Iap With Us! Understanding Waste At MIT

In response to increasing student interest and questions about MIT waste practices, MITOS hosted a two-part series on waste for IAP 2021. The course drew more than 80 registrants made up of students and staff. Over the IAP course, MITOS and partners from MIT Recycling & Materials Management, Waste Watchers, researchers, and campus waste hauler RTS, discussed MIT's waste management strategies, the role of data, and general challenges in waste across the country. Attendees left with a better understanding of MIT's waste practices, efforts to design out waste from MIT, and how individuals and teams can be engaged in this work.

Waste Pilots

In recent years, MITOS has worked with partners across campus to conduct a series of waste audits to identify waste stream contamination (the wrong item going in the wrong bin) and overall data around specific types of waste like food, plastics, and polystyrene. Versions of these pilots were able to continue during the COVID-19 pandemic and data from all previous waste audits **(SEE FIGURE 10)** has been used to inform waste systems in buildings on campus including the new E37/E38. In 2021, the data behind these studies drove decisions for behavioral signage, directing users to choose the correct bin, as well as centralized bin systems to decrease stream contamination and increase recycling rates. Additionally, a standardized waste signage approach has been chosen to enable community members traveling from building to building to more seamlessly understand how to properly separate and dispose of waste materials.

THRIVING NETWORKS

MITOS recognizes that solving for sustainability and climate change must take place across the scales of the campus, city, state, country, and beyond **(SEE FIGURE 11)**. With that in mind, MITOS staff deliberately participate in a number of thriving networks to advance and inform our work.

City of Cambridge

In 2021, MITOS continued to serve as an MIT representative on a number of city committees including: the Cambridge Compact for a Sustainable Future, the City of Cambridge Climate Change Preparedness and Resilience Plan, the Net Zero Task Force, the City of Cambridge Climate Resilience Zoning Task Force, and the Recycling Committee.

International Sustainable Campus Network

MIT is an active member of the International Sustainable Campus Network (ISCN), working with peers across the globe to devise and 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 is a founding member of the network and now sits on the Advisory Board which is creating a vision for the future of the Network.

At the 2021 annual (virtual) meeting Director of Sustainability Julie Newman organized the opening plenary keynote, and drew on methodology of MIT scales of impact, featuring MIT along with the National Autonomous University of Mexico, University of Edinburgh, and Hong Kong University of Science and Technology.

Boston Green Ribbon Commission Higher Ed Working Groups

MITOS team members continue to serve 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.

Ivy Plus Sustainability Working Group

The Ivy Plus Sustainability Working Group is committed to the ongoing exchange of campus sustainability solutions common to all of our campuses. Participants agree that a unified effort on the part of the leading institutions of higher education to respond to one of the most pressing issues of our time, climate change, is essential. The Ivy Plus group is faced with the opportunity and responsibility to develop cutting edge model operations, engage top scholars, and educate the future leaders on issues of sustainable development and climate change. The group was initially convened in 2007 and continues to meet on an annual basis at one of the participating institutions.

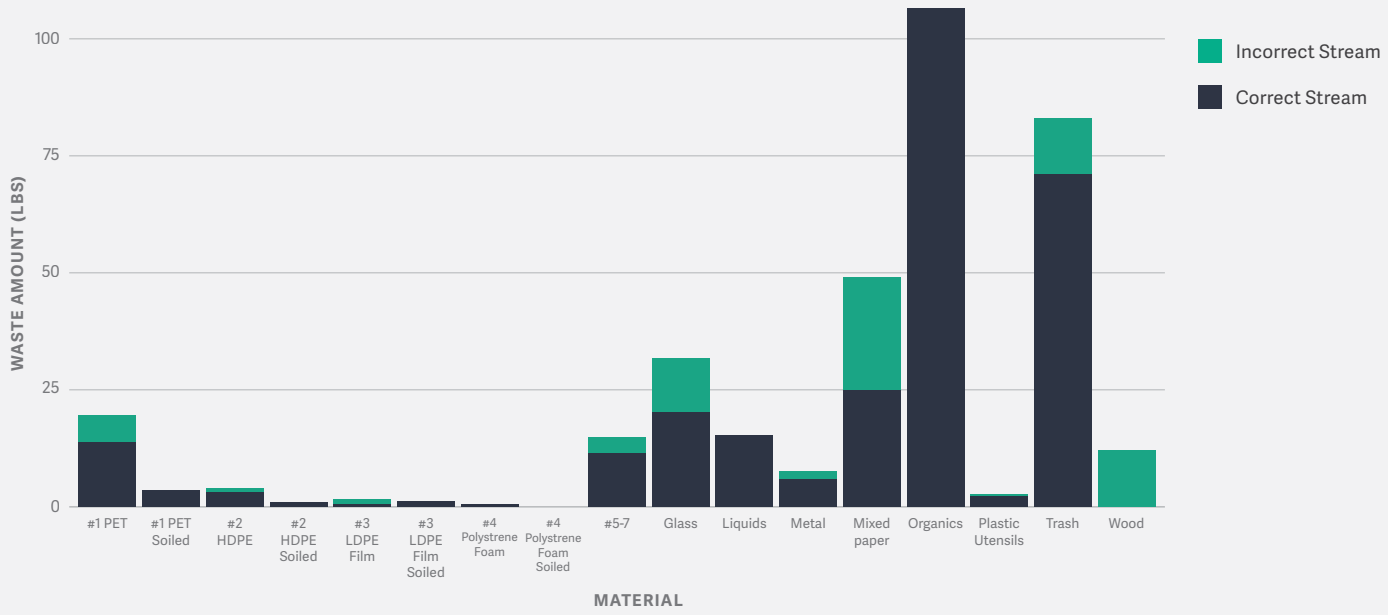


FIGURE 10 WEIGHTS OF CORRECTLY/INCORRECTLY DISPOSED MATERIAL BY DETAILED MATERIAL CATEGORY
(RTS Waste Audit 11/16/20) As with previous waste audits on the MIT campus, the RTS waste audit conducted on November 16, 2020 revealed a substantial level of contamination in both the recycling and trash streams that were audited. The materials that were incorrectly disposed of most frequently (in terms of the relative weights of the material in the correct versus incorrect stream) included #1 and #5-#7 plastics, glass, metal, mixed paper, and wood.

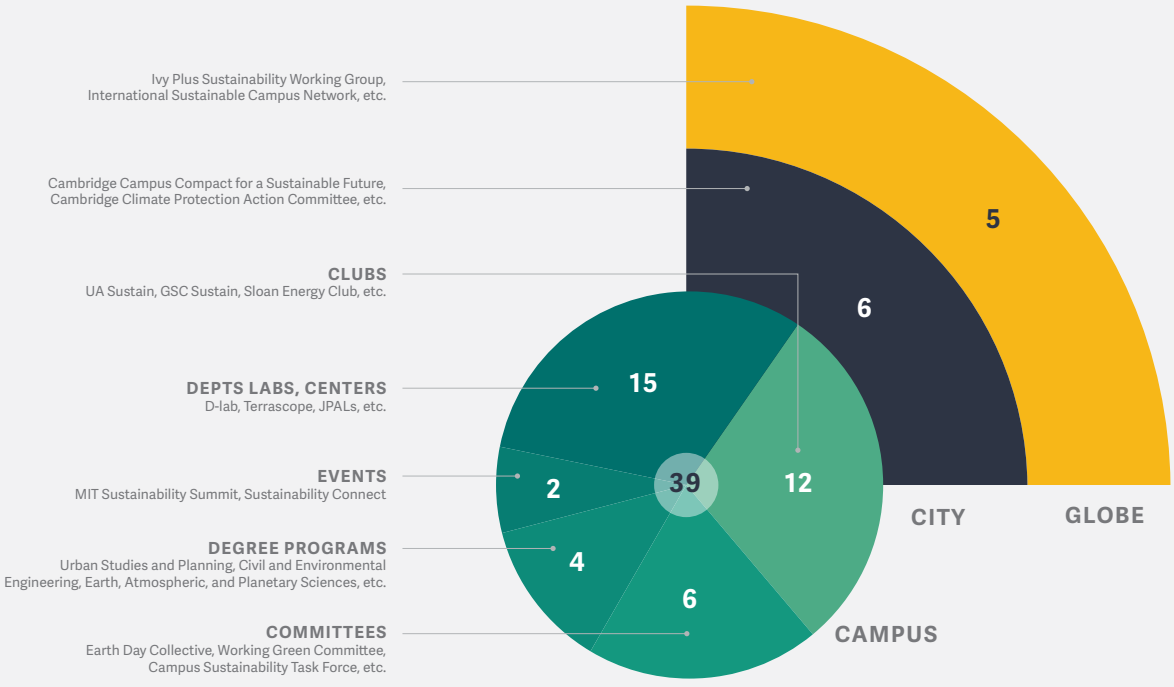


FIGURE 11 NUMBER OF SUSTAINABILITY PARTNERSHIPS AT THE CAMPUS, CITY, AND REGIONAL/GLOBAL LEVELS
The MIT Office of Sustainability works with partners at the campus, city, and regional/global levels to advance sustainability at MIT and beyond. This includes facilitating working groups and task forces around specific subject areas on campus; participating on committees within the City of Cambridge and Boston; hosting meetings and conferences for audiences local and global; and building networks with partners across the region and world.

CAMPUS AS A TEST BED

MITOS is a formative partner in leveraging the campus as a test bed to advance our understanding of how to achieve, build, and manage a sustainable campus and, more recently, how to enable a research and residential institute to become net-zero. MITOS manages a methodology that brings together faculty, researchers, and students with operational experts to inform current and future practices. Examples of this work range from course development and student projects to research to data collection to merely finding space on campus for researchers to test new innovations on the campus.

COURSE: SOLVING FOR CARBON NEUTRALITY AT MIT

With a focus on designing solution scenarios for MIT for the short and long term, Solving for Carbon Neutrality at MIT, led by instructors Director of Sustainability and DUSP lecturer Julie Newman, and Professor of Mechanical Engineering Tim Gutowski, engages students in project-based learning leveraging the campus as a test bed for ideas. The Spring 2021 cohort of students crafted plans to reach net-zero by 2050.

COURSE: EXPLORING SUSTAINABILITY AT DIFFERENT SCALES

Also led by Newman and Gutowski, Exploring Sustainability at Different Scales provided an introduction to the concept of sustainable development from the perspectives of different disciplines, including, business and economics, science, engineering, social sciences and the humanities. The course used the UN framework on Sustainable Development Goals to emphasize the breadth of this concept, and the MIT campus and research and education missions to focus these broad perspectives onto a specific example that is close to home. The class emphasized critical analysis and thinking, readings, discussion, and community action and met with various experts and identify team projects with final reports.

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 inform 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. The selected research team included representation from MIT Sloan, the Concrete Sustainability Hub, the Center for Transportation and Logistics, and the MIT Humanitarian Supply Chain program. CTL integrated its master's student capstone project with this PPE study so that students could directly leverage the campus as their case study for PPE supply chain context and sustainability opportunities.

The study concluded in June 2021 with key findings including that the market for sustainable PPE products is not yet developed to a scale offering reliable performance with sustainability benefits and that MIT's best opportunity for driving sustainability through campus PPE procurement is to focus on right-sized ordering. The research team developed a PPE Demand Calculator for use by any entity seeking to right-size PPE ordering through the newly launched MIT COVID-19 Store. The centralized procurement and distribution of PPE materials via the COVID-19 Store proved to be a highly efficient mechanism for ensuring that the MIT community has the PPE needed while optimizing sustainability benefits. During the later months of COVID-19 Store operation, this mechanism nearly eliminated over-ordering and established a reliable method for PPE access by campus labs.

MEASURING 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 equitable access to campus sustainability data and visualizations. Using real time data, the tool empowers MIT community members by giving them the data they need to understand current performance and inform innovative sustainability solutions and ideas. In 2021, multiple new data sets and visualizations went live in the DataPool, including the previously mentioned Commuting at the Institute: The Story of Access MIT and the Climate Resiliency Dashboard. With an expanded focus on waste and materials at the Institute level, the Material Matters and Campus Waste Audit visualizations dashboards are important tools for research and decision making, while Energize_MIT — an open energy data tracking tool—continues to support operational decision making and research essential to achieving the goals of the new climate action plan.

STARS

In 2018, MIT earned a STARS Gold rating in recognition of its sustainability achievements from the Association for the Advancement of Sustainability in Higher Education (AASHE). STARS, the Sustainability Tracking, Assessment & Rating System measures and encourages sustainability in all aspects of higher education. The Gold rating placed MIT among its peers, such as Princeton, Columbia, and the University of Pennsylvania. In order the retain this rating or achieve a higher one, MITOS — led by the data scientist role — worked to once again collect data from across the Institute, engaging dozens of staff, faculty, and students in these efforts. The results of this updated data collection were submitted in August 2021, to await acceptance and rating.

TIMES HIGHER EDUCATION IMPACT RANKINGS

The Times Higher Education Impact Rankings are the only global performance tables that assess universities against the United Nations' Sustainable Development Goals (SDGs). The ranking carefully calibrates indicators to provide comprehensive and balanced comparison across four broad areas: research, stewardship, outreach, and teaching. MIT participated in the 2021 rankings and the 2020 rankings, reporting out on 8 out of 17 SDGs: Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Industry, Innovation, and Infrastructure, Reduced Inequalities, Sustainable Cities and Communities, Climate Action, and Partnership for the Goals. MIT ranked 76th in the 2021 rankings, climbing from its previous rank in the range 101-200 for the 2020 rankings.

COMMUNICATING IMPACT

Communications and outreach are essential tools for engaging the broader MIT community in the work and mission of MITOS. Digital, print, and video channels are used to deliver the message, impact, and calls to action from MITOS to support solving for sustainability.

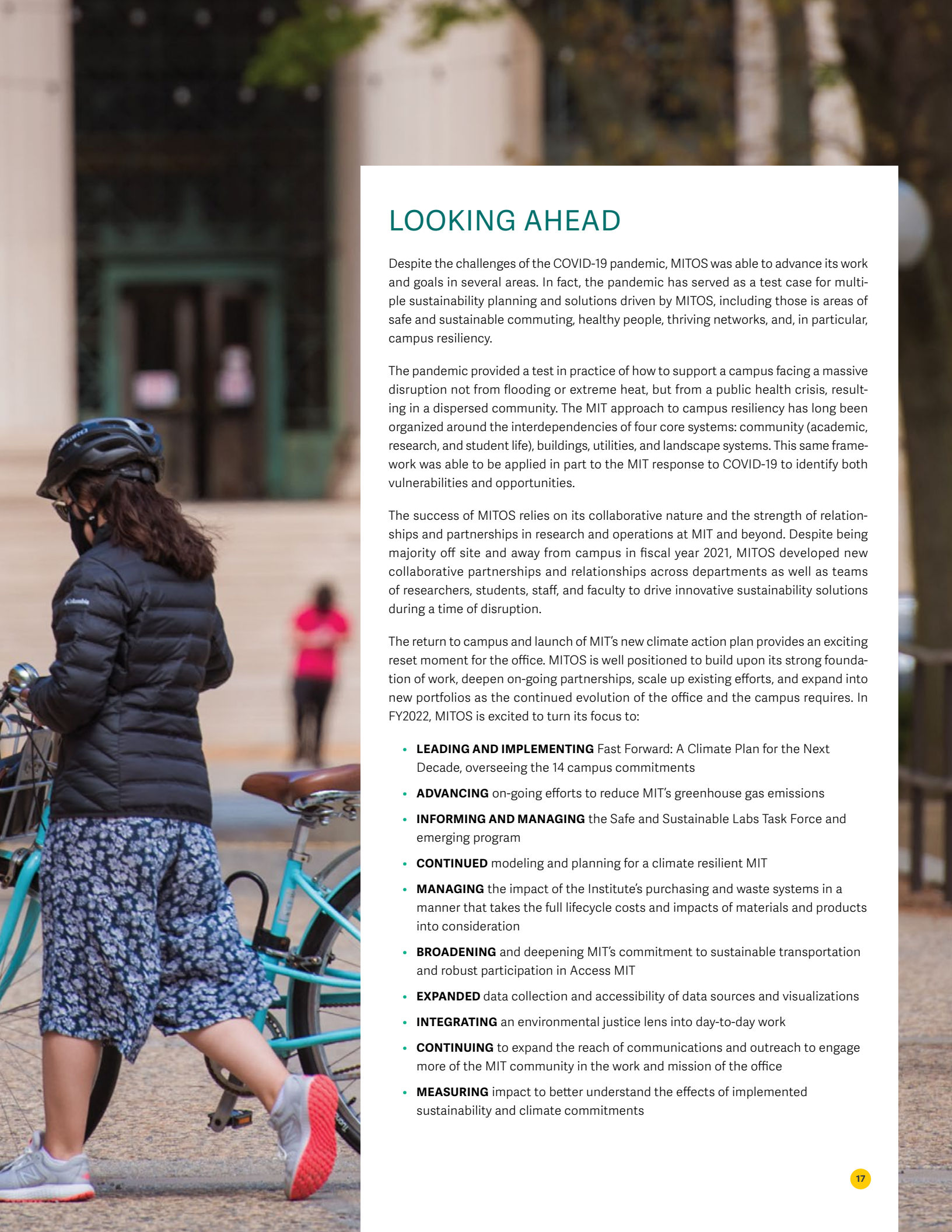
SUSTAINABILITY DIGEST

In an effort to engage and inform a large audience, MITOS continued to deliver its newsletter monthly to a broad range of subscribers. With an audience of more than 1,000 subscribers, the MITOS Digest connects the audience with news, research, photos, and updates on sustainability projects centered around the MITOS areas of impact to engage individuals and groups in solving global issues at the local level.

VIDEO

Responding to the varying ways the sustainability community accesses information and news online, MITOS continues to build out its video portfolio. In 2021 MITOS launched a short explainer video enabling viewers to learn about the office and its methodology in an easy to understand two-minute video. To support the launch of the Climate Resiliency Dashboard and help users navigate the tool, MITOS developed a short video tutorial showcasing how the tool works and the science and methodology behind it. With all MITOS events held on Zoom in 2021, this also allowed an easy opportunity to share event videos on YouTube and our website, to reach a larger audience beyond those who could attend in real time.

> The success of MITOS relies on its collaborative nature and the strength of relationships and partnerships in research and operations at MIT and beyond.



LOOKING AHEAD

Despite the challenges of the COVID-19 pandemic, MITOS was able to advance its work and goals in several areas. In fact, the pandemic has served as a test case for multiple sustainability planning and solutions driven by MITOS, including those is areas of safe and sustainable commuting, healthy people, thriving networks, and, in particular, campus resiliency.

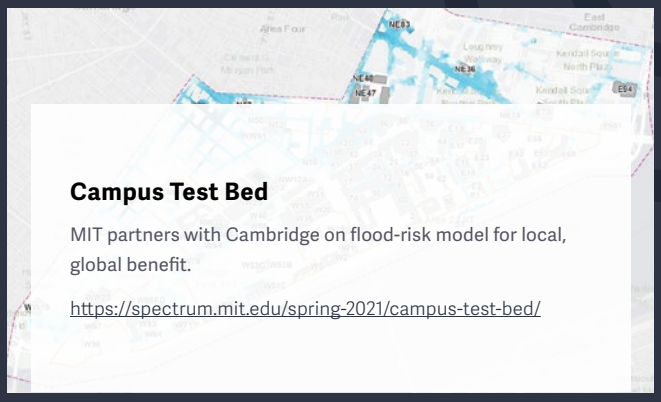
The pandemic provided a test in practice of how to support a campus facing a massive disruption not from flooding or extreme heat, but from a public health crisis, resulting in a dispersed community. The MIT approach to campus resiliency has long been organized around the interdependencies of four core systems: community (academic, research, and student life), buildings, utilities, and landscape systems. This same framework was able to be applied in part to the MIT response to COVID-19 to identify both vulnerabilities and opportunities.

The success of MITOS relies on its collaborative nature and the strength of relationships and partnerships in research and operations at MIT and beyond. Despite being majority off site and away from campus in fiscal year 2021, MITOS developed new collaborative partnerships and relationships across departments as well as teams of researchers, students, staff, and faculty to drive innovative sustainability solutions during a time of disruption.

The return to campus and launch of MIT's new climate action plan provides an exciting reset moment for the office. MITOS is well positioned to build upon its strong foundation of work, deepen on-going partnerships, scale up existing efforts, and expand into new portfolios as the continued evolution of the office and the campus requires. In FY2022, MITOS is excited to turn its focus to:

- **LEADING AND IMPLEMENTING** Fast Forward: A Climate Plan for the Next Decade, overseeing the 14 campus commitments
- **ADVANCING** on-going efforts to reduce MIT's greenhouse gas emissions
- **INFORMING AND MANAGING** the Safe and Sustainable Labs Task Force and emerging program
- **CONTINUED** modeling and planning for a climate resilient MIT
- **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
- **EXPANDED** data collection and accessibility of data sources and visualizations
- **INTEGRATING** an environmental justice lens into day-to-day work
- **CONTINUING** to expand the reach of communications and outreach to engage more of the MIT community in the work and mission of the office
- **MEASURING** impact to better understand the effects of implemented sustainability and climate commitments

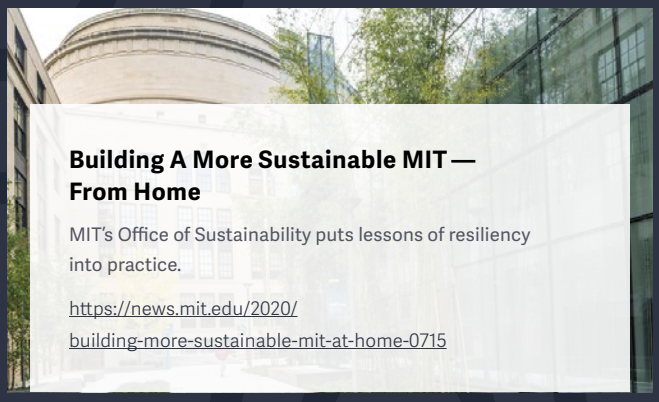
SUSTAINABILITY MIT NEWS FEATURES



Campus Test Bed

MIT partners with Cambridge on flood-risk model for local, global benefit.

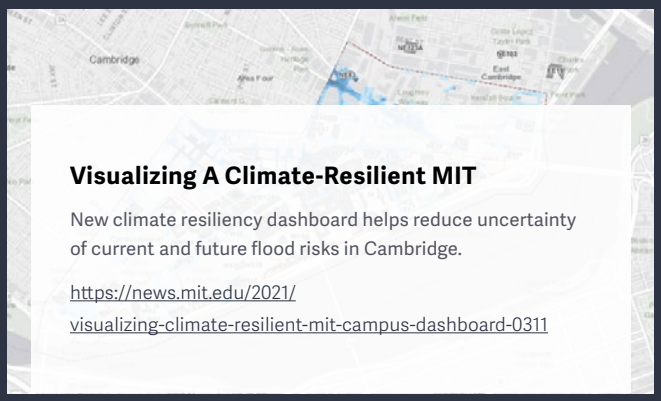
https://spectrum.mit.edu/spring-2021/campus-test-bed/



Building A More Sustainable MIT — From Home

MIT's Office of Sustainability puts lessons of resiliency into practice.

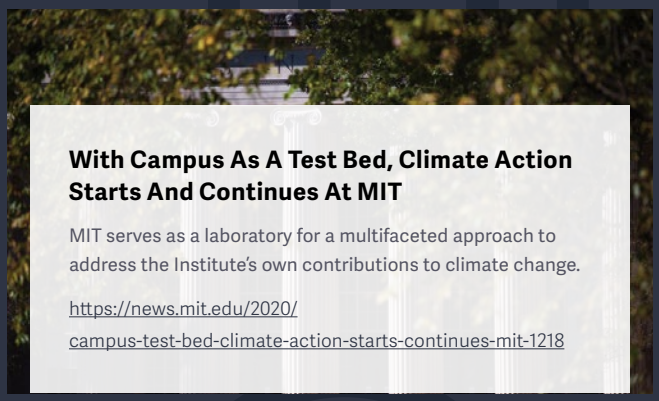
https://news.mit.edu/2020/building-more-sustainable-mit-at-home-0715



Visualizing A Climate-Resilient MIT

New climate resiliency dashboard helps reduce uncertainty of current and future flood risks in Cambridge.

https://news.mit.edu/2021/visualizing-climate-resilient-mit-campus-dashboard-0311



With Campus As A Test Bed, Climate Action Starts And Continues At MIT

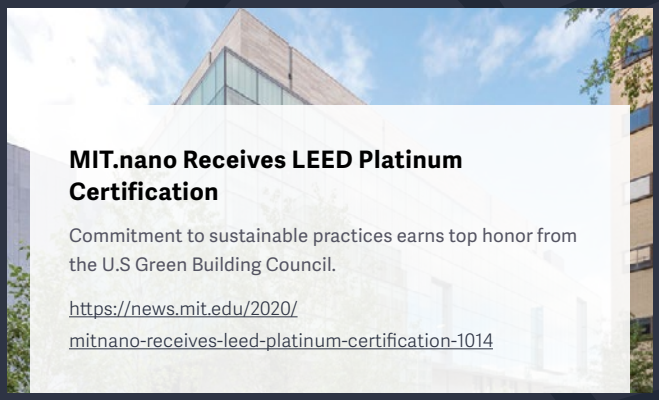
MIT serves as a laboratory for a multifaceted approach to address the Institute's own contributions to climate change.

https://news.mit.edu/2020/campus-test-bed-climate-action-starts-continues-mit-1218

An Interdisciplinary Approach To Sustainable PPE

United under the Sustainability Incubator Fund, researchers strategize sustainable sourcing solution for crises at the local and global level.

https://news.mit.edu/2020/interdisciplinary-approach-sustainable-ppe-1029



MIT.nano Receives LEED Platinum Certification

Commitment to sustainable practices earns top honor from the U.S Green Building Council.

https://news.mit.edu/2020/mitnano-receives-leed-platinum-certification-1014

For Campus "Porosity Hunters," Climate Resilience Is The Goal

With the MIT campus as a test bed, a citizen science effort provides lessons well beyond MIT.

https://news.mit.edu/2021/campus-porosity-hunt-climate-resiliency-goal-1003

APPENDIX A

GOVERNANCE AND COMMITTEE INVOLVEMENT

All of the planning and implementation work depicted in our updates is managed and informed via a multi stakeholder committee process. Additionally, MITOS staff participate on several MIT wide committees to inform and integrate sustainability commitments across the campus.

MITOS SUSTAINABILITY COMMITTEES

Climate Resiliency Committee

The MIT Climate Resiliency Committee, managed by MITOS 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; and students individually and collectively driving efforts that build a climate resilient campus.

Site 4 Planning Committee

The construction and renovation of new office space in E38 provided a unique opportunity to design and support a sustainable shared workspace from scratch. Motivated by this, MITOS convened a group of representatives from departments moving to E38 to collaboratively select ideas and design a workspace that supported sustainability throughout the building. The committee has met consistently since 2019 and made collective decisions around sustainable interior materials, waste systems, design features, and more.

Sustainability Communicators Working Group

Launched in fall of 2020 by MITOS, the Sustainability Communicators Working Group (SCWG) seeks to connect those in communications roles that touch on climate and sustainability. Meeting monthly, the SCWG allows for collaboration and coordination on events, news stories, and updates to support unified messaging around sustainability and climate from all corners of the Institute.

Safe and Sustainable Labs Task Force

The Safe and Sustainable Labs Task Force is managed via a partnership with the Office of Environmental Health & Safety in collaboration with the Department of Facilities, Office of Procurement, and many research PIs across the institute. The members of the task force are evaluating current practices framed by the long-standing Green Labs program to inform the evolution and development of a new Safe and Sustainable Labs Program that integrates and institutionalizes compliance, safety, and sustainability as a best practice.

APPENDIX B

INSTITUTIONAL INVOLVEMENT

CLIMATE COMMUNICATIONS TABLE

Launched from the Office of Communications, the Climate Communications Table seeks to bring together communicators from across the Institute to an effort to align work around the new climate action plan and climate communications in general. This group formed as the result of an Institute communications priority around climate. With representatives from several DLCs, MITOS serves as an important communications partner in this work.

TASK FORCE 2021 AND BEYOND

Task Force 2021 and Beyond was established to use lessons from the pandemic to explore how the Institute might invent a new future in which it and others can thrive. By drawing on expertise and experience from across the community, Task Force 2021 and Beyond was charged with developing the blueprints for building a better MIT. MITOS staff served as members of several work streams in the task force.

COMMITTEE FOR PARKING AND TRANSPORTATION

The Committee for Transportation and Parking reviews and advises on policy governing the operation of the transportation and parking system at MIT. It further serves to monitor and make recommendations concerning transportation and parking related issues that affect the MIT community. With representation from MITOS on the committee, a sustainability lens is consistently applied to this work.

PERSONAL PROTECTIVE EQUIPMENT TEAM

The PPE Team is made up of staff and faculty from across the Institute representing myriad departments and roles from procurement to communications. The team worked beginning in March 2020 to facilitate donations of PPE from campus, purchase available PPE, and facilitating distribution of both to area hospitals and nursing homes. The 27 members of the PPE team came from Mail Services, Facilities, the Office of Sustainability, Campus Services, EHS, MIT Sloan, Mechanical Engineering, Resource Development, Civil Engineering, and many other areas of campus to collaborate toward a single critical goal: round up PPE and get it out to first responders.

COUNCIL ON THE UNCERTAIN HUMAN FUTURE

The Council on the Uncertain Human Future (CUHF) is a series of small, intentional conversations to consider and reflect on the climate crisis and its implications for our lives, our work, our relationships, and our commitments. Without predetermined outcomes or product, the emergent nature of the conversation brings forth new solidarity, momentum, creative insights and collaborations.

Office of Sustainability

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