

## Department of Facilities

### Introduction

The Operations and Campus Planning, Engineering, and Construction (CPEC) areas of the Department of Facilities continue to collaborate as one department, partnered with the academic community. This was especially important as we responded to the fiscal challenges that the entire Institute faced.

Facilities Operations performed a review of structure and services and has made many improvements as a result of this assessment. One of the crucial outcomes of the assessment was the foundation for a Facilities service-level agreement. The reorganization of Repair and Maintenance (R&M) was another critical outcome of this review.

Facilities hosted the Ivy Plus Facilities Management conference this spring. The conference was attended by senior facilities staff from Brown, Case Western, Columbia, Cornell, Dartmouth, Duke, Johns Hopkins, Harvard, Princeton, Stanford, and the University of Pennsylvania. This annual collaboration was designed with the intent of enabling better practices within each organization through benchmarking efforts and lively discussions/workshops on capital renewal processes and sustainability efforts, along with presentations regarding challenges faced by Facilities.

CPEC oversaw the completion of several capital projects including the Media Lab complex, the Sloan School of Management expansion, and an increase in chilled water capacity for the Central Utility Plant. The renovations of Buildings E60 and W1 continue on schedule. In addition, numerous selective renovation, capital renewal, and energy projects were completed or are in progress across the campus. Planning studies including MIT 2030 and the Main Group capacity study are ongoing. We continue to support the List Visual Arts Center in the conservation and installation of our public art pieces, including the Noland mural at Building E15, the Fleischner courtyard and plaza adjacent to the Media Lab complex, the Venet, the Cai Guo-Qiang sculptures at the new Sloan School building, the Henry Moore sculpture in Killian Court, and the Calder sculpture in McDermott Court.

### Administration

#### Communications

The Communications team continued to support sustainability efforts at the Institute. The team created a new series of three posters for the recycling program that introduced the expansion of the food waste collection. Team members designed the series, which includes compostables, single stream recycling, and trash, and worked with Custodial Services to hang the signs. In addition, the Communications manager worked with students from the Undergraduate Association Sustainability Group to create three-dimensional signs for two dining locations on campus and coordinated with R&M to have the signs hung.

The team also achieved great progress in making the Facilities web pages more vital and informative. Projects included changing the graphics and text on the homepage more frequently to inform the community of construction and services provided by the department. The team edited all of the text on the Commuting Options web pages, simplifying the elements and making it easier for users to find information. Most of the Sustainability web pages were written and a new navigation was created in collaboration with the department's Leadership in Energy and Environmental Design (LEED) coordinator. Imagery was added to better display energy-related projects. The Training web pages were revamped in collaboration with the business systems manager and Environmental Health and Safety (EHS) manager. New navigation was created, new text was written, and new images were added. Also, the images on these pages are the first to include captions, a new feature for the web pages and one that will better inform the community about Facilities' projects.

Goals for the coming year include adding more images to the web pages and enhancing the website directory listing by including images of the employees with their contact information.

### **Environmental Health and Safety**

Building on the success of the previous year's EHS/Facilities workgroups, four new teams were formed. These teams make recommendations related to our processes for air permits, contractor safety, the asbestos program, and Occupational Safety and Health Administration (OSHA) injury and illness initiatives. An additional team was formed to improve our overall electrical safety program with an emphasis on arc flash risks.

Ed Akerley, originally hired as the assistant EHS manager, was promoted to the manager position in March 2010. During Akerley's deployment with the Coast Guard in support of the Gulf of Mexico cleanup efforts, Joe MacLeod filled in as the Facilities EHS manager.

Several specific projects were completed to better protect our employees, including the installation of roof railings on Building 46 and the installation of a fall protection system in Building 50 for accessing the lighting system. Fall protection, and especially roofs, is an area that will continue to be a focus in the coming year with projects expected on several roofs, including the Building 10 dome. A significant effort has been made to update our safety equipment in support of our confined space program, fall protection, and vehicle safety. In addition to this focus on safety, many training opportunities were offered to both our workers and supervisors.

### **Finance and Accounting**

The Operations Finance and Accounting group continued to work with managers on financial issues and to provide greater access to financial data. In addition, the group continued to work with the Facilities Operations leadership team to chart the way through budget reductions.

Beginning in July 2009, responsibility for the planning, oversight, and direction of the Department of Facilities accounting, procurement, and disbursement functions was

transferred to Facilities from the Controller and Accounting Services unit in the Office of the Vice President for Finance. The Department of Facilities was able to incorporate the additional responsibilities utilizing the existing Finance and Administrative team.

### **Human Resources and Labor Relations**

In an effort to manage budget reductions through mechanisms other than workforce reductions, Facility Operations completed a detailed review of tasks, services, and organizational structure. The result is that we have a foundation for finalizing a service-level agreement in the upcoming fiscal year for the MIT community, and we have implemented a centralized model in the R&M organizational structure that will allow us to manage, communicate with, and coordinate resources more effectively. Therefore, the workforce changes within Operations included a number of vacant position eliminations, and the layoffs of five staff were more reflective of organizational design changes. This also means that Operations continues the trend of working with fewer people across the department at a time when the square footage of the campus is increasing.

The Department of Facilities continues to be committed to providing its employees, at all levels, with the skills training they need to perform their jobs well. Working in partnership with Northeastern University, the department offered all employees the opportunity to attend classes at MIT and to earn a Facilities Management Certificate. In the spring 14 employees, representing supervisory, support, and service staff, earned the certificate. The department has also supported offering English-as-a-second-language classes, which have been well attended. Management development has included internally designed progressive discipline and harassment classes. A cornerstone to professional development includes the performance appraisal and goal setting process.

The contract between the Service Employees' International Union (SEIU), Local 615, and MIT expired on June 30, 2010. The negotiation team met regularly with SEIU members to discuss union and management proposals. It was decided by mutual agreement between the union and management representatives that the SEIU contract would be extended through August 2010 as we seek resolution of a new contract.

### **Information Technology**

The Applications and Desktop Services (ADS) group continued to play an active role in both department and Institute-wide initiatives. The group participated in a project to pilot Xerox multifunction printing devices as a replacement for traditional laser printers. ADS implemented the pilot program within Facilities and worked with Xerox representatives and team members to enable functionality of existing machines for the pilot. In addition, the ADS group supported the reorganization of the R&M area by providing several services, including analysis of existing systems and implementation of changes to support the new organization. The group also provided support for physical moves of hardware and infrastructure support for redesigned spaces.

The ADS group worked with Information Services and Technology (IS&T) to complete the transition of the legacy system used to track keys at the Institute to a modern, supportable system. The group completed the process of transitioning users to Microsoft

Office 2007, including both hardware and software upgrades. In addition, the group migrated departmental calendaring from TechTime to Outlook.

## **Operations**

The Operations areas within Facilities continued to provide the same level of high-quality service to our customers despite a 5% budget reduction. Doing so required a comprehensive review of our services and structure to best adapt to constricting budgets. This back-to-basics review drew participation from supervisors and managers across all of Facilities Operations. Some of the highlights include a Repair and Maintenance reorganization, a new focus for the Customer Service Center, a reconfigured key distribution service, the purchase of new labor-saving equipment, and the development of a service-level agreement.

In addition to the aforementioned task review group, Operations also formed a team to review the findings of the Institute-wide Task Force. This group aims to ensure that Facilities is participating and facilitating the task force initiatives with the goal of being responsible stewards of the Institute's resources. Examples include several new campus-wide service contracts that previously were separate contracts through as many as five different campus organizations and the implementation of many energy efficiency projects.

Other initiatives focused on new technology (especially in the R&M area) and sustainability. New, more appropriately sized, fuel-efficient vehicles replaced some of our more outdated, oversized vehicles. Green equipment, which also saves labor, was purchased for both Custodial Services and Grounds Services.

Over the past year, the new Media Lab extension was integrated into our operations portfolio. Preparations are now in progress to integrate the new Sloan building, the Koch Institute for Integrated Cancer Research, and the chiller plant expansion. Operations continues to be involved in capital renewal planning and execution.

## **Custodial Services**

The primary accomplishment of Custodial Services during the past year was to continue to improve the appearance of the Institute despite two years of reduced budgets and the addition of more cleanable square footage. During the past year Custodial Services, like other areas in Facilities, experienced approximately a 5% percent budget reduction, and yet also began providing custodial services to two additional buildings.

Since the Stata Center opened, its cleaning had been performed by an outside contractor. On July 1, 2009, MIT Custodial Services brought cleaning services to the building back in house, improved the level of cleaning, and increased customer service. By bringing the building in house, Facilities also improved the processing of work requests for the building. Our Custodial Services supervisors input work requests on a daily basis, eliminating the delay that was experienced with contracted services. At a meeting hosted by Facilities Operations leaders with all of the key customers in the building, our customers indicated that they were very satisfied with Facilities' services.

In addition to the Stata Center, Custodial Services began cleaning the new Media Lab building (Building E14) when it opened midway through the fiscal year. Again we provided quality service with high customer satisfaction and stayed within our budgeted staff.

Custodial Services' sustainability efforts continue. We have fully implemented an Institute-wide green cleaning program that includes procedure, products, and equipment. Over the past year we continued to upgrade our equipment. As the repairs to our older auto scrubbers became too costly, we upgraded them to the H<sub>2</sub>O<sub>2</sub> technology. We also upgraded most of our vacuums to ProTeam upright vacuums, which are approved by the Carpet and Rug Institute as "green" vacuums primarily because they have high-efficiency particulate air (HEPA) exhaust filters and enough lift to get dirt out of carpet.

Custodial Services continued its partnership with EHS to develop the framework for a campus-wide integrated pest management program. Steering committee members include representatives from Custodial Services, EHS, Housing, the Campus Activities Complex, Dining Services, and Athletics. With assistance from Facilities' vendor management area, the committee agreed to an Institute-wide pest control contract. The contract was bid out, and we signed a contract with our pest control vendor for Institute-wide service. The Custodial Services manager will chair the program's operations committee, which will oversee the actual implementation of the program.

### **Customer Service Center**

The Customer Service Center has been a success both for Facilities operations and in the community. Building on this momentum, several new improvements are in the works. Renovations are under way to enable the center to move into a central location. The center is also planning to work in tandem with the Security and Emergency Management Office (SEMO) to improve the Institute's key distribution service.

### **Grounds Services**

Grounds Services continued its efforts to streamline all work processes, including daily cleaning, lawn mowing and renovation, leaf removal, pruning, snow removal, and vehicle maintenance, in order to make them more efficient and inexpensive in preparation for the 2011 budget reductions. Other efforts to reduce costs include the reduction of non-sales and non-emergency overtime by 50%. In addition, 80% of campus tree pruning and maintenance is now performed by in-house staff. This work is made possible because of newly purchased equipment.

A new garden designed to extend the flow of the Infinite Corridor was created by in-house staff. The garden is situated along Building W35. Other work includes upgrades to sidewalks around campus. Several areas on both the east and west sides of campus were completed, and more are scheduled for the coming year. Work planned for next year includes relocating overgrown rhododendrons from the south-side planting beds of Building 56 to Killian Court and replacing them with appropriate-sized shrubs.

Two Green Machine sweepers powered with biodiesel fuel and 17 electric walk-behind sweepers aim to save approximately 15 hours of labor per week through our

new campus sweeping plan. In addition, these machines will lessen our need for gas-powered leaf blowers.

### **Mail Services**

Mail Services continued to upgrade and replace collection boxes on campus (currently about 90% complete). A new Ford Transit vehicle, which is appropriately sized for multiple-drop deliveries across campus, was purchased to replace an aged larger van.

Mail Services has been involved with significant customer outreach for the new buildings by advising customers and by planning mail routes to accommodate the changes on campus. Other targeted Mail Services customer outreach efforts included the Vendor Fair, the Preferred Printers Fair, the Events Fair, and a postal rule change seminar. In the coming year, Mail Services will be implementing new tracking system technology blending scanning technology with MIT ID cards.

### **Off-Campus Facilities**

#### ***Bates Linear Accelerator***

The new high-performance computer facility at Bates is up and running. Computer racks have been installed and are now online with different users.

A new lease arrangement at the Bates Water Tower with Metro PCS was finalized. Site work for new antennas and base equipment was completed. The water tower currently leases space to five cell tenants in addition to accommodating the Middleton Fire Department.

The water tower overhaul project was successfully completed. Work included the restoration of both the interior and exterior of the tank, involving many OSHA compliance upgrades and various recommendations. The water tower's present condition has been declared as excellent, given that the structure was built in the 1930s.

Two new facilities maintenance mechanics were hired, replacing two long-term employees who retired during the past year. The new employees bring to Facilities a strong background in heating, ventilation, and air conditioning and electrical systems along with many skills in facility maintenance.

The feasibility of a wind turbine installation is being reviewed at the Bates site. Meetings with MIT, the town of Middleton, and the Middleton Light Department have been conducted. A schedule to erect a meteorological tower that will sample wind for a period of three months is in progress. All parties involved are extremely excited about the wind turbine possibility.

#### ***Wallace Astrophysical Observatory***

The Facilities group at Bates continues to support Department of Earth, Atmospheric and Planetary Science users at the Wallace Observatory. Overall, usage of the site has increased, with many night observation classes being conducted. Expansion of the site is being discussed.

### **Technology Square**

Facility support for the Center for Biomedical Engineering and the Institute for Soldier Nanotechnologies, located in Building NE47 (500 Technology Square), continues with a high level of satisfaction from the occupants of the space and users of the laboratories.

### **Katahdin Hill, Lexington**

The Department of Facilities recently acquired both the responsibility and budget for Annex 5 located at Lincoln Laboratory in Lexington, which is the residence for the MIT Medical Department health care facility and the Department of Athletics, Physical Education, and Recreation.

### **Parking and Transportation**

MIT is required by the Federal Clean Air Act of 1973 to provide parking to no more than 36% of the MIT commuting population. The Parking and Transportation Office issues over 7,000 parking stickers between August 15 and September 15 annually. It operates seven parking garages and 23 open parking lots consisting of 5,000 on-campus parking spaces.

The Parking and Transportation Office again offered alternative commuter programs to increase public transportation usage by the community and reduce the number of cars traveling to campus. As a result, the campus saw reductions in full-time parkers, student resident parkers, and student commuter parkers. In addition, there was an increase in occasional parking permits and in T-pass usage.

During the year, the office made significant enhancements for bicyclists, including the installation of three secure bike cages, five bike repair stations, and 300 additional bike racks. In addition, numerous bike racks throughout the campus were repaired or replaced.

The office implemented an alternative transit subsidy for employees who commute to work via a private bus company such as Peter Pan or P&B. Other initiatives included the use of biodiesel fuel in campus shuttles and the installation of a bus shelter on Amherst Alley. Work is proceeding with the MBTA and the MIT Department of Civil and Environmental Engineering on a trial U pass program using a “Charlie Chip” embedded in the MIT ID.

The office was recognized by the city of Cambridge with a “Go Green Award” for its efforts to provide environmentally friendly transportation programs.

### **Recycling**

Over the past year, Facilities made many enhancements to the Institute’s recycling program. Single stream recycling was piloted and subsequently implemented throughout the campus. The installation of several recycling and trash solar compactors has greatly reduced the frequency with which containers need to be emptied. A new contract for the disposal of universal waste simplifies what was previously a separate process. The Institute now has a growing composting program that reaches campus

food outlets and residence halls. A new packer truck and increased staffing for campus recycling support the additional efforts and volume. Through community outreach and increased participation, the overall recycling rate increased 17% campus-wide.

### **Repair and Maintenance**

After the manager of Repair and Maintenance moved to the Systems Engineering Group, the central and zone teams were restructured. The six zones were reconfigured into three, and several of the central teams were relocated to different buildings. In addition, a leadership team within R&M was created to focus on larger issues within the group.

Throughout the transition, R&M maintained its workload and its teams processed 36,500 repair work orders and 12,000 preventive maintenance orders, an increase of 3,500 work orders over last year. In order to better focus on preventative maintenance of building systems, R&M established a team dedicated to this function.

The new Media Lab extension opened, adding to the building portfolio, and the R&M teams began preparing for the opening of the new Sloan building.

Safety and training continued to be prominent in R&M during the year. R&M provided training opportunities for all supervisors in OSHA's 30-hour safety course. In addition, rooftop safety was improved in many buildings as railings were installed.

R&M was able to use capital renewal funds to make the following improvements: exterior lighting repairs for increased security and aesthetics; relamping and reballasting for improved lighting and energy efficiency; replacement of aged air handling dampers for improved operation, building comfort, and energy efficiency; replacement of failed window glass around campus to eliminate leakage; completion of exterior painting; and replacement of doors in the sailing pavilion.

### **Security and Emergency Management Office**

The Security and Emergency Management Office (SEMO) continues to oversee and enhance the dependability of MIT's emergency management resources by providing the members of the Emergency Operations Center with training, drills, table-top exercises, and operational reviews by outside individuals and agencies. Over the past year, the events in which Emergency Management was involved included the coordination of more than 7,000 H1N1 immunization vaccines to students, faculty, and staff; commencement ceremonies; and, most important, the safe and incident-free visit by President Obama.

The CCURE card access and alarm monitoring system continues to grow, with more than 275 alarmed offices and spaces and over 1,500 card access devices. The CCURE system currently delivers access clearances for more than 30,000 card access IDs.

This year SEMO oversaw a major upgrade, funded by the Department of Energy, to the Institute's Radiation Laboratories and Nuclear Reactor site. A comprehensive test and review of that installation is currently being planned. MIT is one of only 50 colleges and universities nationwide to be chosen for such a review.



The MIT Key Office will now become a part of SEMO in a joint enterprise with the Customer Service Center. They will initiate a new, efficient, and more convenient process for the distribution of keys.

Cameras have been installed to provide Facilities Operations with the ability to monitor the weather conditions on the grounds of MIT. This will be another way to more efficiently deploy snow and other weather-related resources. As a result of the joint operational and planning approach by IS&T and SEMO, progress continues toward a more robust, efficient, and effective platform to meet the community's video demands for today and the future.

SEMO provided in-house security consultation, design, and implementation of state-of-the-art security systems for the three new buildings at MIT, the Media Lab extension, the Sloan School of Management building, and the Koch Institute. This effort by members of SEMO realized a cost savings in excess of \$1 million, funds that had traditionally been used to hire a private consultant.

### **Vendor Management**

There are currently 170 different vendors for a wide range of Facilities services in the Vendor Management database. In the past year, 17 service contracts for a variety of Facilities services were fully executed.

Two examples of new service contracts that saved money by utilizing the request for payment process are the contract to haul and dispose of the Institute's recycling and trash and the contract to control pests on campus. Both saved money for Facilities as well as Housing.

Another new contract to dispose of MIT's electronic and universal waste reduced MIT's liability because of the vendor's responsible disposal practices. A feasibility study on vehicle fleet leasing and management is under way.

### **Utilities**

#### ***Central Utilities Plant***

The Central Utilities Plant (CUP) continued to provide reliable, low-cost, electrical, steam, and chilled water service to the majority of the Institute's buildings, labs, and centers in support of MIT's educational and research missions. The CUP distributed control system, which had been in place for 15 years, was replaced with a newer and more capable system. The new system allows the control room operator to operate most of the plant's equipment remotely and automatically. The system was installed without a plant-wide shutdown, which is unusual for this type of upgrade. Service to CUP customers continued without interruption.

As a means of improving the reliability and extending the life of the gas turbine, the turbine underwent maintenance at two different points during the year. The maintenance and upgrades performed should enhance the reliability of the gas turbine over the next several years.

During this fiscal year, the CUP management team was deeply involved in the installation (near completion) of a new cooling tower and chillers at the plant. These improvements to the campus chilled water supply will be online by midsummer 2010. This project includes several unique features designed to save energy, including ultra-efficient chillers, free cooling heat exchangers, automated pump sequences, rain water recovery, and utilization of boiler house waste heat to provide space heating.

A new exhaust stack was installed at the plant, allowing the gas turbine and boiler exhaust streams to be separated. As a result, we regained capacity in the conventional boilers that was lost when the gas turbine was installed and improved the efficiency of both the gas turbine and the boilers. Additionally, the new stack significantly lowered the back pressure on the boilers, which will reduce corrective maintenance and extend their life.

Temporary boiler 7 was re-permitted as a permanent boiler and will provide additional steam capacity for our growing campus.

Boiler 2, a 1950s-era boiler that had been abandoned in the plant since 1995, was abated and demolished to make room for a new de-aerator and condensate polishers, which will be the subject of separate capital renewal projects over the next year.

Finally, MIT entered into a new partnership with Ictec, a firm specializing in improving commodity purchasing strategies and dispatching production assets to maximize efficiency and minimize costs. Utilities is currently implementing this process.

### ***Electricity***

MIT Utilities designed and managed installation of a seventh high-voltage distribution loop to better serve the electrical supply needs of the campus. This effort was required to support the new buildings being added to the campus. In addition, joint actions are under way with NSTAR to bring two additional cables to the campus to further improve the electricity supply.

### ***Steam Production***

Funded by capital renewal and based on a detailed condition survey, Utilities initiated extensive repairs to approximately 15 of the 94 steam manholes on campus. These long overdue repairs will enhance steam delivery reliability and safety on campus. Further manhole and piping repairs will be undertaken over the next few years to further improve the condition of the campus steam distribution system.

Utilities replaced approximately 600 linear feet of defective steam and condensate piping on Amherst Street. This will substantially reduce energy losses in this section of piping and improve the reliability of the steam supply to the east campus.

During the course of the year, Utilities made numerous scheduled and unscheduled repairs to the steam and condensate system on the west campus. This section of the campus steam distribution system is in poor condition and Utilities is pursuing alternative approaches for replacing it.

## Campus Planning, Engineering, and Construction

The CPEC team continues to focus on improving the delivery of quality services to MIT around the planning and implementation of capital construction, renovation, and energy investment and improvement projects. Some of the major accomplishments during FY2010 include:

- Completion, turnover, and occupancy on schedule of Building E14, a 163,000-gross-square-foot facility at the corner of Ames and Amherst Streets that completed the Media Lab complex.
- Completion, turnover, and occupancy on schedule of Building E62, the new 217,000-gross-square-foot office/classroom building for the Sloan School of Management that includes a 430-car below-grade parking garage. We expect this building to be the most energy-efficient office/classroom building on campus.
- Continuation of progress on Building 76, the Koch Institute, a 357,000-gross-square-foot research building on Main Street between Vassar and Ames. The project remains on schedule with an expected turnover and occupancy by December 31, 2010. We expect this building to be the most energy-efficient laboratory building on campus.
- Chilled water capacity expansion as a result of the CUP chiller expansion project.
- Completion of the façade work on Building W1, the historic residence at the corner of Memorial Drive and Massachusetts Avenue, and continued progress in interior work. The façade project received a preservation award from the Cambridge Historical Society.
- Management of a consortium of five schools (MIT, Boston University, Harvard, Northeastern, and the University of Massachusetts) in planning and initiating the design of a new high-performance computing center in Holyoke.

Also, CPEC was presented with an award from the National Institutes of Health (NIH) as part of American Recovery and Reinvestment Act stimulus funding to renovate the large animal vivarium in Building E25. We received the maximum grant amount from NIH.

## Campus Planning and Design

Campus Planning and Design (CPD) continues to work on and communicate results from the MIT 2030 study (formerly Vision 2030) to the MIT community. This analysis of vision statements prepared by deans and other Institute leaders around the potential future of their disciplines will be synthesized into a potential physical plan for the future of the MIT campus. A presentation is scheduled for the MIT Corporation in October of 2010.

Examples of permitting and zoning activities during the past fiscal year include zoning support for the building permit for the renovation of Building W1, the Department of Conservation and Recreation boating license and Department of Environmental Protection Chapter 91 license for the Wood Sailing Pavilion and Pierce Boathouse, and the special permit conditions for the design and implementation of the intersection of Main Street and Broadway, which is associated with the construction of the new Sloan building.

CPD completed a Main Group technical capacity study as well as studies for Building 2.

Collaborations with the Project Management group included the completion of feasibility studies for Buildings E60 and E52 that incorporated programmatic analyses and detailed condition assessments. The two groups analyzed renovation options ranging from cosmetic to complete renovation, including building systems replacement. The Building E60 project was launched this spring.

CPD continues to work with the administration to establish the agendas for the meetings of the Committee for the Review of Space Planning and the Building Committee and to support the decision-making process through studies, research, and documentation of committee issues.

### **Engineering**

The Systems Engineering Group (SEG) continues to provide consulting engineering services to other Facilities business units as well as many departments, labs, and centers. The staff supports planning efforts, space change projects, and major capital projects. The group is also responsible for overall management of the capital renewal program.

In addition, SEG continues intensive efforts on three major capital projects: the new Sloan School of Management building, the Koch Institute for Integrated Cancer Research, and the Arthur D. Little Building (E60). The group is working to make these buildings' systems for heating, cooling, ventilation, and electrical capacity efficient and effective for the MIT community.

### **Energy Conservation Efforts**

The group had a landmark year in terms of its energy conservation efforts for the campus. This year we joined with the NSTAR Electric Company to create a new program to reduce MIT's energy consumption by 15% over the next three years. SEG will be implementing projects across the campus to yield reductions in energy consumption. These projects specifically target the large energy-consuming spaces on campus, including laboratories, libraries, and dormitories. As a result of the Institute's well-organized energy reduction program and our ground-breaking agreement with NSTAR, MIT has been asked to sign on to three commitments this year as well: the ISCN/GULF Sustainable Campus Charter, the Department of Energy Global Superior Energy Performance Initiative, and the Department of Energy/Lawrence Berkeley Lab Commercial Building Program Grant. These honors highlight MIT's energy reduction program as a new model for the large-scale building sector.

### **Facility Information Systems**

Facility Information Systems (FIS) continued processing and archiving information for MIT's projects. In FY2010, the backlog of documents was completed. New standards were developed to meet the needs of a changing industry, and new capabilities were rolled out for Facilities staff and the MIT community.

One such standard was building information modeling (BIM). A standard BIM execution plan was created and adopted to outline and record best practices for construction

projects. The execution plan was used for the Building W1, Building 2, and Building E60 projects and will be used in the future to ensure proper organization of digital information during a project.

In addition to updated standards, ongoing data development and mapping continued, and FIS created the first fully digital 3D model of the MIT campus. This model, based on MIT's archived records, was used for presentations, planning exercises, and other BIM-related activities. These models are provided to the MIT community through Google Earth and have already been utilized in a number of academic research projects.

Another data development project that was completed is the campus map. A collaboration among MIT, Harvard, and the city of Cambridge resulted in an updated base map and aerial photo that shows all new construction on campus. This information was used to update the Institute's mapping system, which is used for mapping efforts such as the MIT 2030 project.

In an effort to provide greater access of information to the MIT community, FIS teamed with IS&T to help deliver mapping capabilities to MIT's mobile applications. The iPhone application was deployed to the community in FY2010, and it utilizes the same mapping back end as the online campus map ([whereis.mit.edu](http://whereis.mit.edu)) and the MIT mobile application ([m.mit.edu](http://m.mit.edu)).

In an effort to be more efficient, FIS virtualized most of its server onto a VMware platform. This eliminated the need for physical machines and has reduced the administrative overhead for managing such machines. In addition, the physical FIS servers were moved out of NE49 and now utilize IS&T's co-location services in Building W91. FIS worked closely with IS&T during this migration, and the projects concluded with very little downtime for Facilities and the MIT community.

Finally, in an effort to go paperless, FIS has scanned and indexed many drawings, manuals, and microfilm rolls and put the records in its document management system. With the completion of the backlog of document processing (for projects from 1999 to 2005), new efforts were conducted to scan in historic data and to convert paper and film into a digital format. Hundreds of binders and microfilm rolls were scanned in, resulting in hundreds of thousands of pieces of paper being preserved digitally. At the conclusion of the scanning project, the manuals were properly recycled. The project has led to a better strategy for preserving MIT's institutional knowledge and increased efficiency in accessing this information.

### **Project Management and Construction**

The Project Management and Construction group worked to continually improve in the areas of customer service, speed, and quality during its second year as an area, with a focus on renovations, the Committee for the Review of Space Planning, and capital renewal. The emphasis on bundling projects for efficiencies in design and construction continued to expand with positive results. Projects are being delivered more quickly, less expensively, and with improved coordination. Several of the projects from the past year are highlighted below.

As a result of waterproofing repairs done as part of the Building 10 dome project, there were no leaks into the building for the first time in years. The library spaces below the dome have been reopened and are now in full use. The project team received the Associated General Contractors Aon Build America Award in Construction Management Renovation.

The Infinite Corridor received a new look with the completion of the Laboratory for Advanced Materials in Building 4.

Two projects in Building 66 included general repairs and upgrades and, on the second floor, the Novartis Lab for Continuous Manufacturing. This is the first pharmaceutical lab on campus that utilizes continuous manufacturing instead of batch manufacturing.

Several projects are under way in the original Bosworth buildings, including a window/ façade pilot project in Building 2, various repairs to the façades of Buildings 3 and 10, several classroom upgrades in Building 4, and various projects to improve the appearance of public spaces throughout the Main Group.

In Building E23, renovations were done to upgrade the fire alarm and electrical systems, and space improvements were completed.

Capital renewal projects included ongoing roof replacements, fire alarm upgrades, and elevator renewals.

## Summary

Significant changes have occurred in the past year that have improved our campus and enhanced our service to the community while maintaining our fiscal responsibility. Over the next year, Facilities will continue to strive to provide quality service to its customers and improve the appearance and functionality of the campus. Sustainability, maximization of resources, and safety will also be areas of focus as we prepare our campus for the Institute's 150th anniversary celebration.

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*More information about the Department of Facilities can be found at <http://web.mit.edu/facilities/>.*