

Town Gown Report to the City of Cambridge



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Town Gown Report

to the City of Cambridge

2013-2014 Term (7/1/13 - 6/30/14)

Submitted December 15, 2014

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I. Existing Conditions

A. Faculty & Staff

	2010	2011	2012	2013	2014	2024 (projected)
Cambridge-based Staff						
Head Count	8,857	8,893	9,124	9,329	9,692	9,000-10,000
FTEs	7,461	7,483	7,707	7,954	8,294	
Post-Doctoral Staff ¹				1,402	1,421	
Cambridge-based Faculty						
Head Count	1,012	1,002	1,003	1,007	1,012	~1,100
FTEs	1,009	997	997	1,002	1,005	
Number of Cambridge Residents Employed at Cambridge Facilities						
	2,170	2,258	2,359	2,305	2,347	~2,400

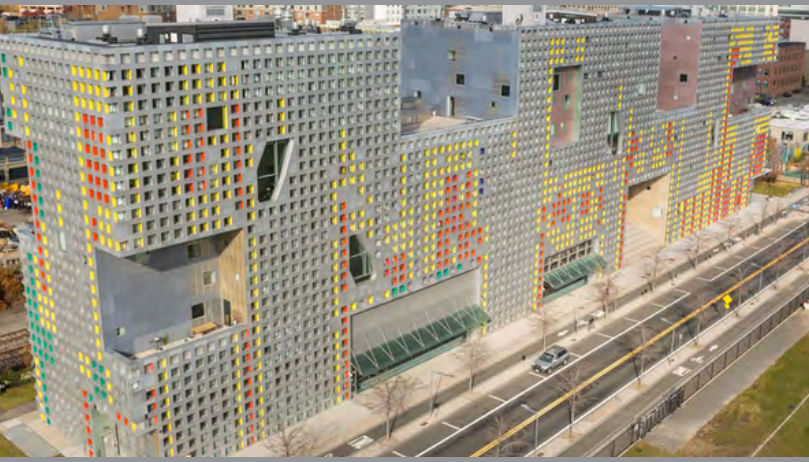
¹ Post-Doctorals are classified as staff and included in the headcount for Cambridge-based Staff.



B. Student Body

	2010	2011	2012	2013	2014	2024 (projected)
Total Undergraduate Students	4,218	4,285	4,363	4,477	4,510	4,500
Day	4,218	4,285	4,363	4,477	4,510	
Evening	N/A	N/A	N/A	N/A	N/A	
Full Time	4,190	4,241	4,335	4,456	4,485	
Part Time	28	44	28	21	25	
Total Graduate Students	5,960	6,040	6,259	6,431	6,528	6,400-6,600 ²
Day	5,960	6,040	6,259	6,431	6,528	
Evening	N/A	N/A	N/A	N/A	NA	
Full Time	5,940	6,017	6,229	6,417	6,514	
Part Time	20	23	30	14	14	
Non-Degree Students	134	153	173	163	182	
Day	134	153	173	163	182	
Evening	N/A	N/A	N/A	N/A	N/A	
Total Students Attending Classes in Cambridge	10,312	10,478	10,795	11,097	11,220	10,900-11,100
Non-resident students not included	72	88	99	92	81	

² There is not an overall plan to make changes to the graduate student population. Enrollment fluctuates depending on the independent decisions of academic departments. These decisions are governed by a variety of factors including the availability of research funding and the ability of international students to obtain visas. International students account for approximately 41% of the graduate student population.



C. Student Residences

	2010	2011	2012	2013	2014	2024 (projected)
Number of Undergraduate Students residing in Cambridge						
In Institute-approved housing (includes dormitories, fraternities, sororities and independent living groups)	3,328	3,410	3,503	3,589	3,577	3,500-3,600
In off-campus housing owned and managed by MIT	3	14	22	7	0	
In off-campus non-MIT housing	101	92	71	66	71	
Number of Graduate Students residing in Cambridge						
In Institute-approved housing (includes dormitories, fraternities, sororities and independent living groups)	2,313	2,286	2,352	2,392	2,430	2,800-2,900
In off-campus housing owned and managed by MIT	129	96	111	123	59	
In off-campus non-MIT housing	1,690	1,903	1,736	1,779	1,884	
Student Parking						
Number of parking spaces maintained for undergraduate and graduate students (including resident and commuter parking)	1,103	1,103	1,103	1,103	1,103	



D. Facilities & Land Owned³

	2010	2011	2012	2013	2014	2024 (projected)
Acres						
Tax Exempt	160	160	161 ⁴	161	163	
Taxable	94	93	93	93	93	
Number of Buildings (academic)	107	110	110	109	111	
Dormitories						
Number of Buildings	26	28	28	28	28	
Number of Beds	5,524	5,491	5,940	5,940	5,800	
Size of Buildings (gross floor area)						
Institutional/Academic	6,401,422	6,766,465	6,800,368	6,808,234	6,811,817	
Student Activities/Athletic/Service	2,443,534	2,462,281	2,469,050	2,418,825	2,366,093	
Dormitory/Nontaxable Residential	2,930,215	2,919,890 ⁵	2,924,151	2,921,880	2,921,880	
Commercial ⁶	5,138,431	5,096,716	4,962,958	4,962,958	5,344,990	
Taxable Residential ⁷	175	171	164	164	164	

Parking spaces maintained in Cambridge

Number of parking spaces maintained for students:	1,103
Number of parking spaces maintained for faculty, staff and visitors:	3,249

³ MIT and the City agreed that sub-area divisions are unnecessary in this section.

⁴ This figure was erroneously reported in last year's report as 160 rather than 161

⁵ The decrease in the gross floor area of Dormitory/Nontaxable Residential is due to a correction in space plans for NW86. In 2010 the gross floor area should have been reported as 2,903,504 gsf.

⁶ MIT's commercial properties are measured by rentable square feet.

⁷ MIT's taxable residential properties are measured by rental units.



Housing

	Tax Exempt: MIT-Owned and Managed Housing	Tax Exempt: Other Housing	Taxable: MIT-Owned and Managed Housing ⁸	Taxable: Other Housing (Univ. Park & 100 Mem. Dr. Ground Leases)
2010				
Number of Units	none	none	175	1,105
Number of Buildings	none	none	15	7
2011				
Number of Units	none	none	171	1,101
Number of Buildings	none	none	15	7
2012				
Number of Units	none	none	164	930 ⁹
Number of Buildings	none	none	15	7
2013				
Number of Units	none	none	164	930
Number of Buildings	none	none	15	7
2014				
Number of Units	none	none	164	930
Number of Buildings	none	none	13	7
2024 (Projected)				
Number of Units	none	none	164	930
Number of Buildings	none	none	13	7

Property Transfers

Cambridge properties purchased since filing previous Town Gown Report:

351-353 Vassar Street and 620 Memorial Drive

Cambridge properties sold since filing previous Town Gown Report:

122-124 Brookline Street, Parcel #95-51, deeded to the City of Cambridge

Planned dispositions or acquisitions:

None

⁸ Occupied by both MIT and Non-MIT residents.

⁹ Change in the number of units from previous years is the result of a change in reporting methodology

E. Real Estate Leased

Use	Leased Location ¹⁰	Square Feet ¹¹
Institutional/Academic	1 Cambridge Center	35,594
Institutional/Academic	5 Cambridge Center	17,705
Institutional/Academic	7 Cambridge Center	231,028
Institutional/Academic	11 Cambridge Center	10,940
Institutional/Academic	300 Tech Square	6,451
Institutional/Academic	400 Tech Square	10,901
Institutional/Academic	500 Tech Square	93,108
Institutional/Academic	600 Tech Square	83,561
Institutional/Academic	700 Tech Square	8,876
Institutional/Academic	One Hampshire Street	23,378
Institutional/Academic	One Charles Street	36,228
Institutional/Academic	One Main Street	17,274
Institutional/Academic	One Rogers Street	24,046
Institutional/Academic	One Kendall, Building 300	22,506
TOTAL		621,596

F. Payments to City of Cambridge

	FY 10	FY 11	FY 12	FY 13	FY 14
Real Estate Taxes Paid ¹²	\$32,978,289	\$34,926,204	\$36,524,580	\$38,656,349	\$41,878,455*
Payment in Lieu of Taxes (PILOT) ¹³	\$1,701,638	\$1,744,179	\$2,354,917	\$2,210,567	\$2,208,979
Water & Sewer Fees Paid	\$5,403,736	\$5,938,689	\$5,997,575	\$5,658,543	\$5,993,315
Other Fees & Permits Paid	\$851,810	\$2,163,013	\$1,218,687	\$2,003,749	\$6,042,590
Total Payments**	\$40,801,473	\$44,772,085	\$46,095,759	\$48,529,208	\$56,123,339

* MIT's FY 14 real estate tax payment represents 12.8% of the City's total tax revenue stream.

** MIT's Cambridge First Purchasing Program resulted in the additional investment of over \$64.9 million in Cambridge businesses in FY 14. This program, together with taxes paid, payments in lieu of taxes, and municipal fees, brought MIT's 2014 economic contribution to the City to more than \$121 million.

10 Leased by MIT from third-party landlords.

11 The square footage will, in most cases, only be a portion of the entire building.

12 Includes real estate taxes paid by MIT, taxes paid on MIT-owned property through ground leases, and real estate taxes generated by Independent Living Groups.

13 The amount of MIT's PILOT payment is governed by the 2004 agreement between MIT and the City of Cambridge.

G. Institutional Shuttle Information

Route Name	Vehicle Type and Capacity	Frequency of Operation	Weekday Hours of Operation	Weekend Hours of Operation
Tech Shuttle	Mid-size transit 28 seats	10 minute peak 20 minute offpeak	6:15AM-7:10PM	none
Boston Daytime Shuttle	Mid-size transit 28 seats	25 minute (Sept-May)	8:00AM-5:54PM	none
Cambridge East Saferide	Mid-size transit 28 seats	30 minute	6:00PM-2:25AM	6:00PM-3:25AM
Cambridge West Saferide	Mid-size transit 28 seats	30 minute	6:00PM-2:31AM	6:00PM-3:31AM
Boston East Saferide	Mid-size transit 28 seats	20 minute	6:00PM-2:37AM	6:00PM-3:14AM
Boston West Saferide	Mini-bus 14 seats	30 minute	6:05PM-2:31AM	6:05PM-3:31AM
Grocery Shuttle	Mid-size transit 28 seats	45 minute	none	11:30AM-4:30PM

Ridership Data

Route Name	Annual Ridership
Tech Shuttle	333,000
Combined Saferide Shuttles	240,000
Boston Daytime Shuttle	95,000
Grocery Shuttle	6,000
EZRide (Northwest Shuttle) ¹⁴	260,000



Shuttle Coordination Efforts

MIT's shuttle service is designed to ensure safety and meet the demands of faculty, staff, and student users. As the demand for services changes, the Institute adjusts its shuttle services to best serve the community. There is very little overlap of MIT shuttle service with other public or private bus and shuttle services. The MIT Northwest Campus is serviced by the EZ-Ride shuttle which is operated by the Charles River TMA.

The Parking and Transportation Office in cooperation with the Graduate Student Council and the Undergraduate Association operates a Sunday afternoon Grocery shuttle with service to Trader Joe's and Whole Foods Market from campus residences. This has resulted in better service with fewer vehicles on the road.

All MIT shuttles require riders to show their MIT ID.

¹⁴ Operated by CRTMA.

II. Future Plans Narrative

A. Moving Ideas into Action

In last year's Town-Gown report, MIT discussed two major initiatives, the Future of MIT Education and the Innovation Initiative, each of which could have a profound effect on how MIT organizes space and develops its campus. The full implications of these initiatives on physical development are not yet known, but we do know they will be important drivers of space needs and organization of the Institute's operations over time.

The Future of MIT Education

President L. Rafael Reif convened the Institute-Wide Task Force on the Future of MIT Education in February 2012 to envision the MIT of 2020 and beyond. In its final report, the Task Force concluded that the MIT education of the future is likely to be more global in its orientation and engagement, more modular and flexible in its offerings, and more open to experiments with new modes of learning.

Among other priorities, the Task Force's report urges the establishment of an MIT Initiative for Educational Innovation to foster ongoing experimentation and research in teaching and learning, and recommends that MIT engage with teachers and learners worldwide to broadcast this educational innovation well beyond its own campus.

The report also suggests that MIT consider offering different levels of certification through its online learning ventures, MITx and edX, and recommends that the Institute redouble its commitment to access and affordability. The suggested means to accomplish this include increasing MIT's undergraduate population, which has remained stable for decades despite increasing demand, and providing flexibility to allow students to complete a traditional undergraduate degree in less than four years.

In its final report, the Task Force organizes its 16 recommendations around four themes: laying a foundation for the future, by creating a proposed Initiative for Educational Innovation; transforming pedagogy, largely through "bold experiments" sponsored by the proposed new initiative; extending MIT's educational impact, to teachers and learners well beyond its own campus; and enabling the future of MIT education, by cultivating new revenue streams and envisioning new spaces to support learning at MIT.

Transforming Pedagogy

In proposing the creation of an MIT Initiative for Educational Innovation, the report recommends establishing "an ecosystem that promotes educational connections across the Institute and provides an educational innovation hub, or a 'sandbox,' for conducting the experiments envisioned by the Task Force."

"We must engage in bold experiments that will help us learn about both the positive and negative aspects of pedagogical and curricular innovations," the report says. "This is critical to ensuring MIT's leadership position at a time of disruptive change."

Such experiments, the report notes, may both enhance students' learning and render an MIT education more affordable. Specific areas for investigation might include the expanded use of project-based learning and a blending of traditional and online learning; the addition of greater modularity to the curriculum; and new approaches to the assessment of students.

Extending MIT's Educational Impact

The Task Force makes five recommendations that are intended to strengthen MIT's educational impact on the world. Broadly, its report encourages the Institute to share worldwide the results of its own on-campus teaching innovation, "to set the tone for a new generation of learners, teachers, and institutions."

The report recommends that MIT explore more modular approaches to teaching — both online and on-campus. Data from the first 17 MITx and HarvardX courses indicate that only about 5 percent of registrants earn a certificate of completion.

These edX results are in keeping with surveys of MIT's own faculty and students: In a 2013 survey, 25 percent of MIT faculty and 40 percent of MIT students indicated that some of the Institute's course offerings might benefit from being broken up into smaller modules.

"The way in which students are accessing material points to the need for modularization of online classes whenever possible," the report says. "The very notion of a 'class' may be outdated. This in many ways mirrors the preferences

of students on campus. The unbundling of classes also reflects a larger trend in society — a number of other media offerings have become available in modules, whether it is a song from an album, an article from a newspaper, or a chapter from a textbook.”

The Task Force notes that educational modules could be shared not only among MIT’s own departments and schools, but also across institutions. For this reason, its report recommends that MIT explore options for developing a “module repository” for storing and sharing these materials. The report also recommends that MIT explore the role that game-based learning can play; partnerships with other institutions to encourage blended learning using MITx content; using global problems to foster global engagement between members of the MIT community and others around the world; and developing strategies to increase the diversity of MITx registrants, who are primarily male and educated.

As an extension of this focus on modular learning, the Task Force recommends that MIT proceed with consideration of the types of certification that can be supported by MITx and edX, developing pricing strategies and revenue-sharing arrangements for these credentials.

“Increasingly, employers are focusing on certifying an employee’s or potential employee’s competencies rather than relying on his or her formal degree,” the report says. “These new ways of thinking about certification tie in with the opportunities created by MITx.”

To further bolster engagement beyond campus, the Task Force also recommends that MIT define a K-12 strategy, under the auspices of the Initiative for Educational Innovation, to better coordinate the activities of MIT’s more than 80 existing K-12 educational programs, which have developed over time in grassroots fashion.



Enabling the Future of MIT Education

While MIT’s faculty, undergraduate population, and administrative staff have remained stable in size since the early 1980s, the rapid growth of MIT’s research enterprise has meant that the numbers of graduate students, postdocs, and laboratory technicians on campus have all grown substantially.

The report notes: “In a market that focuses on excellence, MIT incurs high costs. These costs result from the Institute’s need to attract and retain the best faculty and brightest students, to provide premier research and educational facilities, and to perform the unparalleled research that is integral to the research university model. Providing the facilities required for our exceptional faculty, students, and researchers to advance research discovery and innovation is inherently expensive.”

But, the Task Force adds: “The investment pays off in terms of educational outcomes. The MIT model produces outstanding students and advances knowledge in remarkable ways. MIT contributes significantly to educating some of the brightest engineers, scientists, and business people of our time.”

The report paints a picture of an institution on a sound financial footing, but it also notes that two of MIT’s five major sources of revenue — research funding, which supplies 29 percent of current income, and tuition, which supplies 14 percent — are under pressure. “Preserving and enhancing MIT’s exceptional research and educational environment will require both a strengthening of existing income sources and consideration of new revenue opportunities,” the report says.

The Task Force observes that 43,000 students applied for undergraduate and graduate admission to MIT in 2013; only 10 percent were successful. Some 19,000 of these were undergraduate applicants, only 8.2 percent of whom were admitted.

“Clearly there is a vast unmet need for high-quality education,” the report says. “The Task Force encourages MIT to evaluate possibilities to achieve increases in undergraduate class size so that more students can experience the rich magic of an MIT residential education. Over time, it is possible that experiments with flexibility in time to degree might present opportunities to relieve housing pressure, which is one of the primary barriers to increasing class size.”

The MIT Innovation Initiative

The MIT Innovation Initiative is an Institute-wide, multi-year agenda lead by Associate Deans Vladimir Bulović from the School of Engineering and Fiona Murray from the Sloan School of Management. The purpose of this initiative is to transform the Institute's innovation ecosystem – internally, around the globe and with its partners – for accelerated impact well into the 21st century. It builds upon MIT's foundation of fundamental research excellence and supports the aspirations for impact through innovation of all members of the MIT community. It supports MIT's focus on solving a range of critical challenges in energy, the health of the planet, human health and beyond.

MIT's Innovation Initiative has special relevance to the City of Cambridge. The older concept of “technology transfer” has evolved into a system of moving innovation out to the marketplace through the convergence of academic disciplines and the collaboration between academia and industry. The resulting “innovation ecology” that exists in Cambridge today reflects the organic process of turning basic scientific and engineering research into viable commercial products that new companies can develop and bring to the market.

The Innovation Initiative builds upon this highly successful strategy in a deliberative and integrated manner. Accelerating innovation on campus will expand the commercial opportunities that have so often been available in Cambridge. Currently, the speed of innovation compels firms to seek proximity to MIT, and systematizing the innovation process further will elevate the desire of companies to locate or remain in Cambridge, and particularly Kendall Square — close to the wellspring of innovation in research conducted at MIT.

The Initiative advances four tightly connected parts designed to focus the Institute's efforts on scalable innovation with impact:

Focus on enhancing capabilities for idea-to-impact education and research. MIT strives to become the world leader in fostering idea-to-impact education – an approach to teaching and learning that doesn't simply expand knowledge of an academic discipline, but contributes to our culture and economy. In addition, research is supplemented with activities and programs designed to extend the endpoint beyond publication to practical solutions to real world challenges.

Foster innovation communities. In order to enable students, faculty and external partners to maximize impact on the innovation economy, MIT is fostering vibrant in-

novation communities that connect stakeholders across industries and sectors. These innovation communities bring together the five major stakeholder groups – entrepreneurs, academics, corporates, risk capitalists and government officials – to dive deeply into problem exploration, research and implementation of solutions at scale.

Rewire our human capital, physical and digital infrastructure to accelerate innovation. MIT is creating new labs, new spaces for scale up, new funding mechanisms and new human capital roles on campus to foster innovation on a global scale. Through changes on campus as well as a global network of “innovation embassies” MIT is putting in place the foundations that provide the knowledge, tools and networks that empower its community to turn ideas into important solutions worldwide.

Develop the science of innovation to inform action and policy. While the practice of innovation is an art, the innovation process – its drivers and outcomes – can be the subject of rigorous, multi-disciplinary analysis. The world is MIT's laboratory, and so as we strive to increase our impact, the Innovation Initiative seeks to develop the science of innovation and understand how innovation is generated more constructively, efficiently and effectively. By evaluating MIT's successes and failures, MIT is pioneering this new discipline, increasing our convening power in the global innovation economy and developing key evidence-based policy recommendations.

Today, MIT's students, researchers and faculty are more inspired than ever to innovate in service to the world. Students aspire to have a global impact and to do so with a sense of urgency and immediacy. They arrive with the goal of solving real-world problems (not just problem-sets), and strive to contribute to the invention of vaccines, robots, new materials, and solutions to other global challenges. And they are not alone: many faculty are driven to meet our founding vision of creating practical knowledge by leading their discoveries closer to real-world impact while partnering with students, research teams and external stakeholders on that journey.

Enhancing MIT's innovation engine entails new ideas for education and research, new ways to develop the character and values that our students need to become effective leaders, new ways to build community and engagement with industry, government and other organizations, and new innovation infrastructure. Combining new ideas with existing strengths will position all stakeholders in the MIT community to work together to deeply understand problems, move innovations from idea through to scale and understand the organizational, political and social complexities of achieving impact locally and globally.

MIT 2030: MIT's Planning Framework

MIT continues to be engaged in and served by MIT 2030, a planning tool for the physical campus (<http://mit.edu/mit2030/>).

MIT 2030 is not a fixed plan. Rather, it's an ongoing process, a tool for envisioning — and inventing — a vibrant future for our physical campus and the nearby innovation cluster. The MIT 2030 framework provides principles that help focus and clarify this process. The objectives of MIT 2030 are to:

- Align campus renewal priorities with current and future academic needs and opportunities;
- Pursue an overall development approach that integrates campus planning objectives and MIT real estate activity to continue creating and supporting an innovation ecosystem while fostering fruitful collaborations between MIT and its surrounding community; and
- Provide thoughtful guidance for the ongoing physical stewardship of the Institute, to ensure the continuation and integrity of its mission.

In carrying out these objectives, MIT is guided by the following principles:

- Where possible, address facilities requirements through renewal and renovation;
- Accelerate systematic capital renewal programs (renewal of roofs, elevators, other systems); and
- Create flexible science and technology research space that responds to innovative academic and collaborative initiatives

The emerging West Campus Framework study is a good example of how the objectives of MIT 2030 continue to be fulfilled. The intent of the study is to create a long-range development framework to accommodate future academic and residential uses on the MIT campus west of Massachusetts Avenue. Goals for the study include:

- Establish a planning framework and guidelines for future development;
- Maximize opportunities for greater efficiencies; and
- Develop options for a number of immediate or short term needs.

Among the short term needs is consideration of student housing, replacement parking and improving emerging open spaces.



B. Capital Planning, Renewal and Comprehensive Stewardship

The renewal and stewardship of our physical assets on campus are critical elements of MIT's plans for the future. To ensure that its buildings are able to support the educational, research, and student life activities essential to our mission, the Institute will continue to pursue a program of renovation, renewal, and comprehensive stewardship, guided by a continuous assessment of building condition, program needs and Institute priorities. The considerations in the investment strategy for academic and research programs include adding to and upgrading academic space, providing swing space for academic and research projects, and developing the Northwest sector for research or administrative needs. In student life, key investment considerations include addressing capital renovation need in residence halls, providing swing residency capacity, adding graduate student housing capacity, and upgrading the student center complex. The near term infrastructure investment is for replacement parking.

Overall investment priorities include capital renewal (systems), comprehensive upgrades, and new construction divided between academic/research, student life, and infrastructure needs. Approximately half of the investment

dollars are devoted to capital renewal and the balance is split between comprehensive upgrades and new construction. Capital renewal focuses on building systems, including roofs, mechanical equipment, utilities, major building components (facades), plazas and roadways. One of the features of the capital renewal program is the improvement of the resilience of MIT's assets through its work on building systems. A long-term strategy is in place to provide funding to reduce deferred maintenance on the campus by 50% by 2030.

Another major component of the overall program is to ensure that the regular maintenance of MIT's buildings reflects higher standards of asset management. Starting with a collection of new or substantially renovated buildings on campus, the Comprehensive Stewardship Group is moving MIT's existing maintenance level of effort to one of proactive stewardship. This includes not only a higher day-to-day maintenance effort, but also scheduled upgrades of building systems and equipment. The Comprehensive Stewardship portfolio includes 13 buildings and 3.1 million square feet, which is almost 25% of the campus.

C. MIT Students, Faculty, and Staff

The number of undergraduates at MIT dropped by 524 over 25 years, reaching a low point of 4,109 in 2004. The restoration of the undergraduate population to a target of 4,500 students was effectively complete with a 2012-2013 undergraduate population of 4,477. The undergraduate population for 2013-2014 is 4,510, an increase of less than 1%.

The 2000-2010 decade featured a fairly stable number of graduate students at MIT, with enrollment hovering just below 6,000 students each year in this period. The graduate student population is now growing, though at very modest rates. In 2012, the growth rate was approximately 3% and in 2013 it was just 1.5%. The total graduate student population for 2013-2014 is 6,528. The graduate student population is contingent on a large number of factors, including research funding levels, international student access to visas, and overall economic conditions.

For more than 25 years, the number of tenured faculty members has remained stable at around 1,000. In 2013-2014, the staff population increased by about 4% to 9,692, of which 1,421 are postdoctoral scholars. Post-



doctoral scholars are staff who typically serve short-term appointments that are tied directly to the availability of research funding.

D. Housing

Undergraduate Housing

MIT provides housing for its undergraduate students in 11 residence halls. In addition, students may choose to live in one of 36 residential fraternities, sororities, or independent living groups (FSILGs) in Boston and Cambridge. Housing is guaranteed for all four years of the undergraduate experience; therefore over 98% of MIT's 4,477 undergraduates live in residence halls or FSILGs. Consideration of undergraduate housing needs and opportunities are being formulated, including creation of undergraduate beds to allow for capital renewal of existing residences.

Graduate Housing

Graduate housing is provided in seven residence halls and apartment buildings on the MIT campus. Currently, MIT houses 38% of its total graduate student population. 57% of MIT's students who live in Cambridge are housed in graduate residences on campus. Since 1997, the number of MIT graduate students housed on campus has risen from 1,660 to 2,489. During that time, MIT has invested significantly in the creation of a graduate resident community in the northwest sector of the campus that has brought on line over 1,300 new graduate beds in three new or renovated facilities:

- The Warehouse, 224 Albany Street (2001): 120 beds
- Sidney-Pacific, 70 Pacific Street (2002): 681 beds
- Ashdown, 235 Albany Street (2008): 541 beds

Graduate Student Housing Study

Based on recommendations from the Faculty Task Force on Community Engagement in 2030 Planning, former Provost Chris A. Kaiser and Chancellor W. Eric Grimson created the Graduate Student Housing Working Group and charged them with the following:

“1. Evaluate the ways in which the graduate student housing needs are currently met, and identify strengths and weaknesses in our current approach in the context of graduate student recruiting and satisfaction.

2. Recommend ways by which the graduate student housing needs might be best served into the future in order to maintain competitiveness. Any recommendations which require new resources should be weighed against the need

for other resources to support the graduate student population.”

The Working Group prepared a report with a number of recommendations and submitted that report to the Provost and Chancellor in May 2014. The Group reviewed past committee reports, analyzed existing and new data, consulted broadly with graduate students, faculty, and the Cambridge community, and reviewed the experience of peer institutions. The committee addressed five sub-topics: graduate students' attitudes toward their current housing situation; the Boston-area housing market; the utilization, adequacy, quality and sustainability of the graduate housing inventory; future graduate enrollment; and graduate housing at peer institutions.

What they found was that MIT graduate students express high levels of satisfaction with the housing choices they have made. Housing is not a critical factor in their decision to attend MIT, but cost is a major concern. Graduate families and international students face special challenges in finding housing; these groups also express more desire to live on campus than single students do, and they represent a disproportionate share of demand.

The Working Group estimated unmet on-campus housing demand using two measures: the number of students who live off campus but would rather live on campus, and the durable size of the wait list. Using these two measures, the Working Group concluded that there is significant unmet demand for on-campus graduate housing.

In the Cambridge housing market, rents have been increasing steeply, condo conversions have been reducing the supply of affordable rental housing, and new housing



Student relaxing in a common area of Ashdown House

construction consists mostly of luxury units. The 62% of MIT graduate students living off campus will likely be negatively affected further by these trends.

Although graduate students living on campus express high levels of satisfaction with their housing, there is some dissatisfaction with deferred maintenance and operational issues in three of the graduate residences. The Institute has already committed to capital renewal that will ensure the continuance of existing housing resources.

A survey of housing opportunities for graduate students at peer institutions revealed that MIT is a leader in supporting on-campus graduate housing.

The Working Group ultimately recommended that MIT build housing for 500 – 600 graduate students to meet current demand. Further, it recommended that these housing units be configured not in traditional dormitory-style facilities but in buildings that can accommodate a variety of housing types, ranging from studios and multi-bedroom suites to apartments. Finally, the Working Group said that these housing units should be capable of accommodating both married and unmarried students and families.

Mindful of the resource constraints faced by the Institute, the Working Group urged consideration of a range of development options for this new housing instead of the traditional, costly, and inflexible dormitory development models of the past. These include partnerships with developers, long-term leases on new housing, adding space in already-planned capital renewal in existing graduate housing, and incorporation of housing into nonresidential building on campus and nearby. The Working Group provided no specific recommendation regarding potential locations for these projects.

MIT senior administration carefully reviewed the report's findings and agreed that there is a need for new housing, and that the recommended number (500 – 600) is a reasonable estimate of this need. The administration noted that achieving the addition of this much housing will require time and new resources. However, MIT would like to begin a plan to add new housing, with the recognition that it will need to continuously evaluate this need as the Institute evolves.

As a first step, the senior administration asked the East Campus Steering Committee to assess the feasibility of addressing some of this need in its planning for the Ken-

dall area, as well as addressing the renewal need for the Eastgate graduate residence. In addition, the administration proposed to initiate a West Campus planning effort, now underway, which will, among other things, consider locations for new graduate housing in that area. The West Campus planning effort is being modeled after the process recently used for East Campus planning.

The report also recommends that 'swing housing' consisting of approximately 400 beds be created to facilitate capital renewal, and that this housing should ultimately be assigned for graduate students after the capital renewal is complete. The administration acknowledged that MIT does not yet have a plan for 'swing housing', but that one is needed and it should be a part of the West Campus planning.



Entrance to the Warehouse on Albany Street



Entrance to Sidney Pacific

E. Looking Ahead at MIT Planning & Development

Development Opportunities

As identified on Map 3, several areas in and around the MIT campus provide development opportunities, but, in most cases, no specific site has been selected for any particular building. Parking lots, buildings that are not appropriate for contemporary academic requirements, obsolete commercial buildings and aging parking garages are all possibilities for rehabilitation or redevelopment in the future.

The areas outlined on Map 3 support the narrative describing some of the development opportunities in and around MIT. The borders are fully permeable and are not meant to be mutually exclusive. Although some major rehabilitation projects are referenced, the focus is on development and redevelopment that substantially alters the built form around the campus. It is also an attempt to more broadly include all MIT-affiliated projects, including academic, MIT-managed investment projects and investment projects on MIT land being managed by others, such as Forest City Enterprises and Novartis.

Recently MIT real estate investment activity has been near the core campus. These real estate investment activities provide a platform for educational and research collaborations between MIT and industry, help build and sustain Cambridge's powerful innovation cluster and improve the urban environment for the academic campus and our neighbors.

Far West Campus

These lots could be used for administrative, support, or residential uses, but their unusual shapes, and low density zoning make them less attractive. However, over time the perception of this area could be altered by transportation improvements and the provision of new zoning that better supports transit-oriented development than the existing low-density zoning.

West Campus

The Westgate Lot is a very large site with potential to accommodate a great deal of space. The relocation of the MIT Police to W89 on Vassar Street a few years ago, the use of W98 (600 Memorial Drive) for administrative uses, and the consolidation of many functions of Information Services and Technology (IS&T) in W91 and W92 demonstrate that the west end of campus is a viable location for a variety of activities.

The David H. Koch Childcare Center was finished and occupied in October 2013. The Grounds Services group was relocated from Massachusetts Avenue and placed in temporary facilities in the West Annex parking lot. A permanent location for this function has not yet been selected. These uses fulfill immediate needs, but are built at a much lower density than their sites can support.

Northwest Buildings

The existing research buildings along Albany Street in the Northwest Sector of MIT's campus comprise 7.2% of MIT's academic and research space. Though these buildings have capacity to support additional users, the location has not been attractive for researchers from the main MIT campus. The common perception among these researchers is that the location is too remote from their colleagues working at MIT's main campus and from other campus amenities. MIT has completed a utilization study of the research buildings in the Northwest Sector and is currently looking at ways to consolidate existing users in order to free up larger areas of available space. Next steps include matching researchers in need of more space with the space available in these buildings. We will also look at ways of strengthening connections to the main campus.

Massachusetts Avenue Corridor

Just to the south of the new Novartis buildings there are parcels on the east side of Massachusetts Avenue, stretching from Albany Street, across the railroad tracks to Vassar Street which are underutilized and could provide a site for a variety of academic uses, in close proximity to the core academic campus. The unique design of the new Novartis building will provide a great opportunity to extend the urban quality of Massachusetts Avenue, eventually closing the gap on the street between Lafayette Square and the main block of MIT's historic campus. The frontage on three streets would allow for ground floor uses that would further contribute to the activation of the street.

Further up Massachusetts Avenue towards Lafayette Square, MIT entered into an agreement with Forest City to redevelop part of the block between Blanche Street and Landsdowne Street. This agreement is resulting in the creation of an office/laboratory facility with ground floor retail at 300 Massachusetts Avenue. The office and lab space in the building is fully leased to Takeda/Millennium Pharmaceuticals, and construction started on the site in the fall of 2013.

Through these initiatives, MIT hopes to continue the transformation of this section of Massachusetts Avenue into a vibrant and attractive corridor connecting the Institute to Lafayette Square and beyond.

MIT was an active participant in the City's Central Square (C2) Advisory Committee. The Institute looks forward to continuing to work constructively and cooperatively with the City and business and residential neighbors to implement some of the ideas and recommendations that emerged from this process.

Main Street Corridor

The 730-750 Main Street block is an optimal size for an academic or commercial research building. In addition, future redevelopment of this site would allow for the continuation of the emerging retail corridor along Main Street.

The triangular-shaped 600 Main Street block is relatively close to the core campus. Its location and scale make it an attractive site for academic or administrative uses. The site provides an opportunity to improve street frontage in an area with retail and restaurant space at Tech Square and new retail planned for the north building on the 610 Main Street site, now under construction.

North and Main Campus

The Albany Street Garage could provide an important academic site in proximity to the core campus, but, just as with the West Garage, the burden of accommodating parking relocation would be significant. There are continuing needs to build utility infrastructure to support the campus. MIT will be expanding the Central Utility Plant (CUP) commencing in 2015 to replace the existing Cogeneration unit that is at the end of its useful life, adding a second cogeneration unit, increasing the chilled water capacity as well as updating some older equipment in the CUP. This new facility is planned to be located on the parking lot in between the Albany Garage and the existing chiller plant/cooling towers. The project focus will be to improve the resiliency of the campus utilities while reducing MIT's environmental impact and improving overall efficiency. The work is being accomplished in partnership with the existing utility providers and will result in some improvements to the public utility systems in the area of MIT's campus.

Upon completion, MIT will be well positioned for its overall campus utility generation for the next 20-40 years. Continued investment as existing equipment ages is part

of the overall planning effort, along with improvements to the campus distribution systems for electricity, steam, hot water and chilled water. MIT will continue to make needed investments to make the campus more resilient as well as to reduce the impact on greenhouse gases through improvements in efficiency and selective equipment replacement.

Planning on the MIT core academic campus is centered on renovation and revitalization. For example, a multi-phased renovation of program space and building infrastructure upgrades for Building 66 is underway and is expected to be complete in 2015. In addition, a major renovation is ongoing for Building 2 of the original Main Group buildings. MIT.nano is the most significant redevelopment on campus. The MIT.nano building will be a unique, world-class research facility. It consists of a five-story 216,000 GSF structure with high-performance environments. MIT.nano will offer shared research clean-room spaces as well as high resolution imaging spaces and engineering research labs. The fifth level of the building will contain the new home for the Undergraduate Chemistry Teaching Lab currently located in Building 4.

To accommodate the new MIT.nano facility, a major utility relocation program is well underway and demolition of Building 12 is planned for 2015. A proposed renovation of Building 31 for Aero/Astro and Mechanical Engineering is being designed within the same sector.

The anticipated level of construction disturbance and the temporary re-routing of traffic patterns provide an opportunity to re-imagine the character of the urban open space around the northwest Main Block, enhance campus entries, control vehicular traffic and the deliveries of goods and services, and create a sense of campus identity and fabric; essentially to transform an existing fragmented landscape in a heavily congested area of campus.

East Campus and Kendall Square

Following three years of community engagement with city officials and business and residential neighbors, including the Kendall Square (K2) planning process and two rounds of zoning petitions, the City Council approved new zoning for One Broadway and East Campus (PUD-5) in April 2013. The new zoning for PUD-5 retains the current allowed capacity for academic buildings in East Campus while permitting additional capacity for commercial development, including residential, retail, and office/lab uses. The new zoning also embraces the dimensional framework recommended through the K2

process, requires a minimum of 240 housing units, (with a mix of low, market-rate, and micro units), provides for innovation space, sets LEED Gold as a standard for all commercial buildings, and establishes a community fund.

The East Campus/Kendall Square Gateway area represents a tremendous opportunity to create a vibrant cluster of activity. The blending of an array of uses — including innovation space, housing, childcare, retail, commercial, and space for the MIT Museum — has the unique potential to convey MIT’s and Kendall Square’s unparalleled innovative energy. Now, MIT has reached a point where architectural teams have been identified and design work, which will build on previous efforts, has commenced.

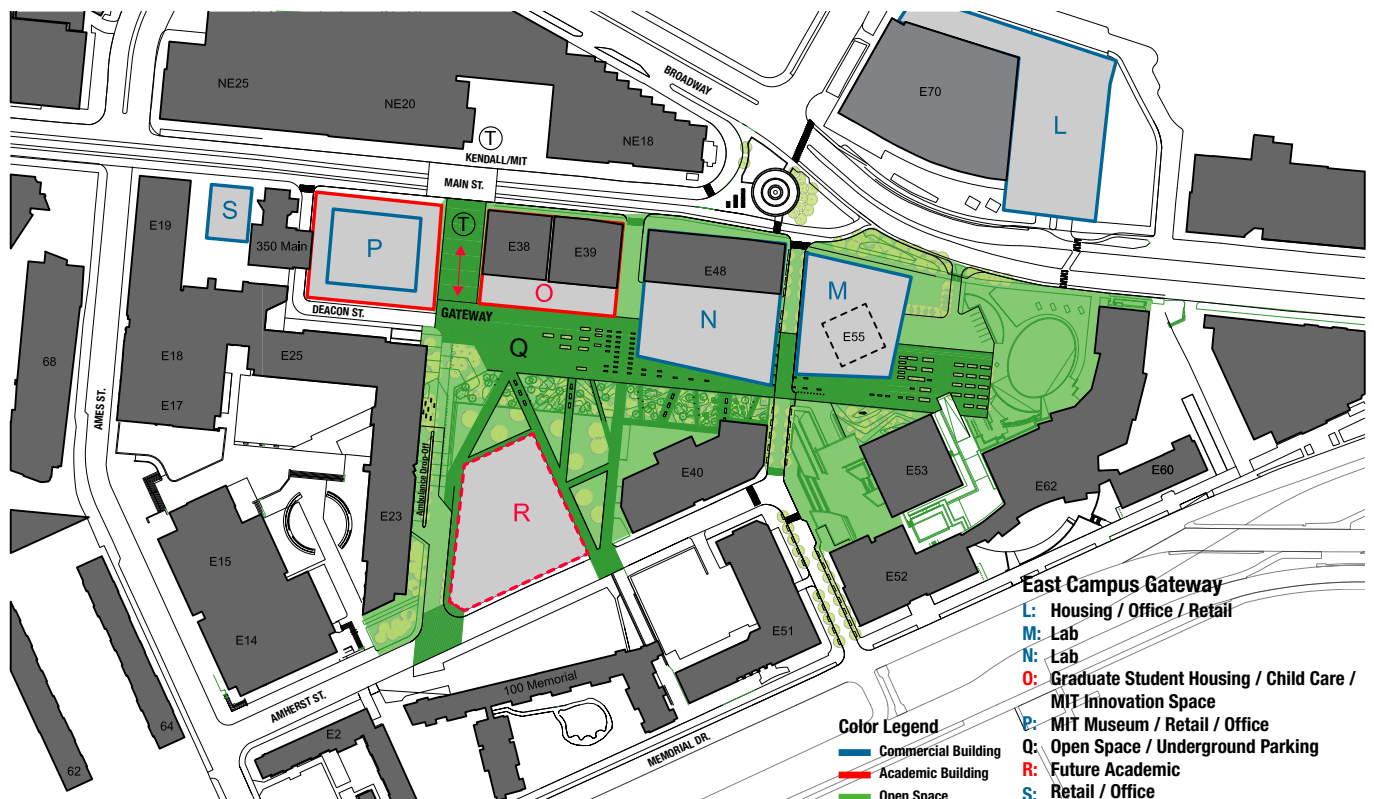
Site-Specific Design Firms

MIT has launched the formal design process by focusing on Sites L, N, O, P, Q, and S. The programming and design for Site M, which will serve as future lab space, and Site R, which will be the site of a future academic building, will be defined later.

Elkus|Manfredi Architects is designing the building at Site L, which will be a high-rise residential building with ground floor retail space. The building will include a mix of units, including innovation units and affordable units, to meet the diverse housing needs of the Cambridge community. Perkins+Will is designing the building at Site N, which will be a high-rise commercial office/lab facility

designed to provide space for science and technology companies seeking to locate or expand in the innovation cluster around MIT. NADAAA (design architect) and Perkins+Will (architect of record) are serving as the design team for the building at Site O, which will include graduate student housing, a child-care facility, academic space, and retail space on the ground floor. Weiss/Manfredi is designing the facility at Site P, which is a commercial office building that will include space for the MIT Museum on two of the lower floors, as well as ground floor retail space. The area designated as Q represents open space and underground parking. The landscape architecture firm Hargreaves Associates is designing the open space and Perkins+Will is designing the underground parking garage. Finally, nARCHITECTS is designing the small building at Site S, which will include office space and ground floor retail.

As with other parts of the campus, aging or obsolete buildings in the East Campus are subject to consideration for rehabilitation, expansion, or replacement. The first building in rehabilitation is Building E52, the Sloan Building, occupied by the Department of Economics, Sloan School of Management and the MIT Faculty Club. This project started construction in fall 2013 and should be completed by the end of 2015. In addition to a complete rehabilitation, the project includes an additional floor for expanded meeting and conference facilities supporting the entire MIT community.



F. Transportation

Bicycle Planning and Improvements

MIT is committed to providing amenities to support and encourage students, faculty, and staff to commute to campus by bicycle. The Institute maintains over 5,000 bike parking spaces across campus. Just within the past year, MIT created a total of 384 new and replacement bike parking spaces at existing high demand locations and as part of an ongoing program to meet demand for bike parking on campus. All bike racks have been located with a focus on providing secure, accessible, well-lit spaces close to building entrances and placed indoors or in covered areas where possible. MIT plans to continue to provide additional parking spaces and other bicycle infrastructure to meet the needs of our growing and enthusiastic cycling community.

MIT created a Bicycle Commuter Benefit Program in 2009 for full-time employees. The program provides a reimbursement of \$20/month (\$240/year) for the purchase, improvements, repair or storage of a bicycle used for commuting to MIT. Additionally, bicycle commuters who need to drive to campus a few times per month have the option of purchasing an occasional parking permit. 145 cyclists took advantage of the program this year.

MIT released an updated version of the annual “Getting around MIT by Bicycle” map and information pamphlet (<http://bit.ly/MITBike>). The map provides information on bike lanes, bike parking areas, and bike repair stations. The brochure also educates the community on bike safety, etiquette, security, and communicates the need to “share the road” with pedestrians, vehicles, and other roadway users.

MIT is proud to sponsor two Hubway stations on campus. One is located near 77 Massachusetts Avenue and the other was recently moved across Vassar Street from the



Hubway station installed at Mass Ave. and Amherst St.

Stata Center to the Brain and Cognitive Science Center to accommodate the Collier Memorial now under construction. These stations are some of the busiest in Cambridge, and MIT worked with the City of Cambridge and the operator Alta to expand both of them last year, increasing the total to 52 Hubway docks at MIT-sponsored stations. Additionally, the Institute has committed to sponsoring two additional stations in the west portion of its campus at 70 Pacific Street and 300 Vassar Street. MIT also participated in the City’s successful pilot program to extend Hubway services through the last winter and will take part in the winter operations again this year.

In addition to sponsoring Hubway stations, MIT subsidizes annual Hubway memberships for all MIT students, staff, and faculty, offering memberships at \$25/year (regularly \$85/year). The subsidy has been very well received, and there are currently approximately 1,400 MIT Hubway members.

As a means of assessing its bike infrastructure and programs, MIT applied to the League of American Bicyclists Bicycle Friendly University program this past summer and was recognized with a silver award in October of 2014. MIT will now have access to a variety of tools and technical assistance from the League of American Bicyclists to become even more bicycle-friendly.

Grand Junction Community Path

This proposed multi-use trail would be part of the network including the existing Minuteman Path and the Somerville Community Path and potentially connecting with Boston in Allston. In Cambridge, the plans for the path include use of MIT property along the Grand Junction corridor. The path is proposed to run in the loading, construction and service corridor behind MIT’s buildings for approximately 2,700 feet between Main Street and 230 Albany Street.

In October 2014, MIT completed and submitted a study to the City that evaluated the feasibility of having the multi-use path on its property. The study committee was comprised of City of Cambridge staff, advocacy groups and MIT staff, faculty and students. The study concluded that while a multi-use trail could fit on MIT property along the Grand Junction, it relied on an easement concession from MassDOT west of Mass Ave., would be interrupted by a substantial series of MIT construction activities, and would have a few “pinch points” to work with existing conditions. Resolution of a number of operational issues and regional connections would be necessary for a successful path.

G. Sustainability

MIT fosters a rich network of academic and administrative departments and initiatives committed to advancing sustainability on campus, locally, and around the world. Students, staff, faculty, and a multitude of institutional and community-based partners are working across disciplines and continents to discover innovative solutions that improve the well being of people and the environment. The initiatives span a range of topics, from the development of clean energy systems to the optimization of urban food production. Maintaining a highly collaborative relationship with the City of Cambridge is an important component of this endeavor – as it provides an opportunity to achieve sustainability goals at the local level, as well as to develop a powerful model for shared problem-solving that serves the world.

To reimagine, fortify, and focus its collaborative approach to campus sustainability, MIT established the Office of Sustainability in the fall of 2013, led by its new Director of Sustainability, Julie Newman. The Office began with a charge to build strong connections across MIT’s administrative, research, and educational units in order to:

- Ensure that MIT’s campus growth, development, and renewal reflect the highest commitment to sustainability while demonstrating leading practices and advancing the pursuit of innovation;
- Embed the principles of sustainability into all operational functions of the Institute and to promote overarching systems that are adaptive to continuous improvement;
- Seek shared solutions to common sustainability challenges with the Cities of Cambridge, Boston and partners beyond; and,
- Enable the campus as a living and learning laboratory for sustainability that brings new knowledge and action to bear.

During its first year, the Office of Sustainability developed an action framework for campus sustainability organized around three major focus areas: “sustainable systems,” “living laboratory,” and “collaborative communities.” The new Office seeks to instill a spirit of inquiry and innovation within each of these focus areas in order to create a campus sustainability model that uniquely leverages the power of higher education to respond to the challenges of a changing planet. Below are highlights of actions taken during 2014 within these three focus areas, as well as a look ahead to future actions:

Sustainable Systems

Designing and managing integrated systems on campus that protect, enhance, and restore the well being of people and the environment.

Buildings: Buildings are the largest consumers of energy on campus, accounting for over 90% of MIT’s greenhouse gas emissions. The campus continues to make strides to minimize the energy use of both its new and existing buildings.

The design of MIT’s new nano research facility, which is currently under construction, integrates energy efficiency as a core design objective and will deploy cutting-edge strategies for heating, ventilation, air conditioning and more. These strategies are intended to deliver one of the most energy efficient facilities of its kind along with robust LEED program performance. Through this design, MIT intends to set a new standard for energy performance in cleanroom laboratory facilities.

For existing buildings, MIT continues to make progress in the implementation of the second phase of its energy efficiency program, Efficiency Forward, in partnership with NSTAR. In the past year, MIT reduced its electricity use by an additional 5 million kilowatt hours and over 100,000 therms of natural gas – enough electricity to power over 700 homes in Massachusetts and enough gas to fuel over 130 homes (EIA, 2009).

Alternative Transportation: MIT has recently scaled up its electric vehicle charging capacity by adding 16 Level 2 charging stations on campus, with an additional 4 stations currently being installed. Charging stations are now in or near Buildings E62, 32, 44/46, and WW15. Future stations will be located at Albany Garage and W92 Garage.

Materials Management: As the State of Massachusetts rolls out its Commercial Organics Waste Ban in 2014, MIT continues to expand its capacity to divert organic waste from the landfill by expanding the collection and composting of food waste. Currently thirteen residence halls and six administrative buildings with food services have an organics collection system on campus.

Sustainability Metrics: MIT’s Office of Sustainability coordinated a campus-wide sustainability metrics collection initiative to gather key data on energy, materials management, food, buildings and mobility to facilitate rigorous, fact-based analysis, decision-making and communication.

Living Laboratory

Faculty, staff, and students working together to apply research on sustainability's most pressing challenges to the campus and surrounding communities.

Campuses are ideal environments in which to test and apply new ideas to address community sustainability challenges. By harnessing the power of on-site learning, living laboratory projects take ideas and solutions from concept to integration faster and more efficiently. Examples of two projects are below.

As the City of Cambridge and its partners explored issues of net zero energy at the municipal level, students in Professor Christoph Reinhart's Spring 2014 course *Modeling Urban Energy Flows Towards Sustainable Cities and Neighborhoods* studied energy flows in and around groups of buildings. As part of the class, students explored a "net zero growth concept" for the MIT Campus, which considered the question: can future energy growth on campus be compensated by realizing energy savings in existing MIT buildings?

Students in Professor John Fernandez's Spring 2014 course *Design for Sustainable Urban Futures* explored the question "Can a city be resource efficient?" Students sought to answer this question in a campus-context by developing a comprehensive material flow analysis of MIT to better understand the relationship between the materials entering campus and those that leave campus. This "urban metabolism" concept is a useful, scalable framework for both understanding and addressing the challenges associated with the resource consumption of cities.

Collaborative Communities

Advancing collective problem-solving and strategic partnerships across local, regional, and global communities to find scalable solutions to shared challenges

In June of 2014, MIT and Harvard University partnered to plan and host the annual International Sustainability Campus Network (ISCN), drawing 120 attendees from 34 countries around the world to explore the theme "Pushing Boundaries: Leveraging Collective Action for Global Impact." The conference featured a panel highlighting the City of Cambridge as a model for university/city collaboration, featuring Cambridge's Deputy City Manager, Lisa Peterson; MIT's Executive Vice President and Treasurer, Israel Ruiz; and Harvard's Executive Vice President, Katie Lapp.

MIT partners closely with the Cities of Boston and Cambridge on several committees seeking joint solutions to climate and sustainability issues, including:

- Cambridge Compact for a Sustainable Future
- Cambridge Climate Protection Action Committee (CPAC)
- Cambridge Net Zero Energy Task Force
- Kendall Square EcoDistrict
- Boston Green Ribbon Commission

Looking Forward

Campus sustainability continues to advance quickly at MIT. Current and future highlights include:

- Establishing a sustainability governance structure with the creation of a new institute-wide Campus Sustainability Task Force;
- Launching a series of Sustainability Working Groups to develop recommendations for reshaping MIT's approaches to key operational areas including building design and construction, materials management, laboratory design and practices, student engagement, campus-oriented research and learning models, communication strategies, and data and metrics;
- Developing and deploying new methods of outreach activities and materials that will seek to engage, inform, and activate MIT faculty, students, and staff (as well as broader audiences) to create a culture of sustainability; and,
- Supporting and informing the launch of new Institute-wide sustainability efforts, including the cross-disciplinary MIT Environment Initiative and the MIT Climate Conversation.



Rendering of the MIT.nano building, which is on track to achieve LEED Gold certification.

III. List of Projects

A. Completed in Reporting Period

610 Main Street South

A breakthrough leader in the fight against Alzheimer's disease, diabetes, and other major illnesses, the pharmaceutical firm Pfizer Inc. now occupies a multidisciplinary research facility in the Kendall Square neighborhood. Consistent with MIT's philosophy of supporting innovation and collaboration, the new center — just steps away from several MIT biomedical labs conducting research relevant to Pfizer's interests — will facilitate current and future MIT-Pfizer collaborations.

The first of two buildings to occupy the 610 Main Street complex, the 230,000 square foot South building houses dynamic workspaces that promote collaborative problem-solving. Two major research units housing over 1,000 Pfizer employees will reside at this location: the Neuroscience Research unit and the Cardiovascular, Metabolic, and Endocrine Diseases (CVMED) unit.

B. In Construction

Building 2 – Chemistry and Mathematics Departments

There is a pressing need to continue renewing the Main Group buildings for state-of-the-art education and research. In furtherance of this goal, construction continues in Building 2, home to MIT's Department of Mathematics and portions of MIT's Department of Chemistry. The chemistry portion of the Building 2 project started construction in 2013 and is largely complete. The project will be completed using sustainable design and construction initiatives and is currently on track to achieve a LEED Gold certification.

E52 – Sloan and Economics Department

MIT is now renovating the building to accommodate a conference center, the Department of Economics, and other administrative units of the Sloan School of Management. Building E52 began construction in September 2013 and is expected to be completed by the end of 2015. The building is on track for LEED certification at the Gold level.



610 Main Street South

700 Main Street

The property at 700 Main Street is currently fully leased to Lab|Central, a local laboratory incubator company, and two global pharmaceutical companies, Novartis and Pfizer. In 2017 Pfizer will move out of this building into 610 Main Street North as it grows its research activities. Lab|Central will expand its operations into the entire space vacated by Pfizer, significantly expanding the space available to small life science companies.

610 Main Street North

Now that Pfizer has moved into its new home at 610 Main Street South, construction is beginning at 610 Main Street North, where Pfizer will also be a tenant. The 280,000 square foot multidisciplinary laboratory facility will include retail frontage along Main Street. It is being constructed above the three story underground garage completed in the first phase of development. The building will enhance the growing life-science cluster which includes industry leaders such as Pfizer and Novartis, along with innovation centers like Lab|Central in the Osborn Triangle and Kendall Square area. It is scheduled to be completed in 2016 and is tracking on LEED Silver certification.

The new retail space along Main Street will bring added vitality to the streetscape and support MIT's goal of enhancing the innovation environment. The new Watson Courtyard will also provide outdoor space for all to enjoy.

MIT.nano

This new building, located in the interior of MIT's main campus block, will support materials research at the nanoscale and will accommodate top programmatic priorities expressed by the deans of the School of Science and the School of Engineering. A major utility relocation program is now underway, including Vassar Street utility work, and the demolition of Building 12 is planned to take place early in 2015. MIT.nano will be five stories and 216,000 gross square feet. Construction is projected to be completed by 2018. The project is currently tracking to achieve LEED Gold certification.

Building 66 – Chemical Engineering

Designed by I.M. Pei and built in 1976, Building 66 houses a majority of MIT's Department of Chemical Engineering faculty in 134,000 gross square feet. The Building 66 renovation project will make improvements to nearly 50% of the space in the building and provide upgrades to select components of the building infrastructure that aim to support the research and space needs of the Chemical Engineering Department over the next 15 to 20 years. Upgrades are planned for air handlers and other parts of the HVAC system, a new fire alarm system and selected upgrades to the sprinkler, electrical, plumbing, steam, wastewater systems, building controls and building envelope. The renovation project is on track for certification at the LEED Silver level.

MIT Chapel

The scope of the work is to renew the MIT Chapel. The building was designed by the Finnish American architect Eero Saarinen and is an iconic example of mid-twentieth century modern architecture. The non-denominational chapel was completed in 1955 and is on the state register of historic buildings. The intention of the project is to strategically invest in the physical renewal of existing building systems, building envelope and life safety systems.



Exterior view of the MIT Chapel



Rendering of the Collier Memorial

Collier Memorial

In October, MIT began to prepare a site for the installation of a permanent memorial to Officer Sean Collier, who was killed in active service to the MIT community in April 2013. The memorial was conceived and designed by J. Meejin Yoon, professor and head of the Department of Architecture at MIT, and is expected to be completed by April 2015.

Constructed like a complex puzzle around a central keystone, the Collier Memorial will comprise five archways in the shape of a protective, yet open, hand. As Yoon has designed it, the structure is built of solid granite to embody strength and encompasses a void at the center that evokes the absence of a large figure.

The memorial will stand at the intersection of Vassar and Main Streets, where there is now a small garden between the Stata Center and the David H. Koch Institute for Integrative Cancer Research. This site is very close to where Collier lost his life. While the structure's open center creates a sheltered space for reflection and contemplation, the five "fingers" radiate outward and frame significant views.

By Others

181 Massachusetts Avenue (Novartis)

Novartis Institutes for BioMedical Research leased a four-acre parcel of MIT land at 181 Massachusetts Avenue (corner of Albany Street) to augment the Novartis Cambridge Campus, where its global research headquarters are located. By expanding in proximity to MIT and other research institutions, Novartis will create an ideal environment for interdisciplinary collaboration, open communication, and exchange of knowledge.

The Novartis Cambridge Campus serves as an important connection between Kendall and Central Squares. Its expansion will add vibrancy to the area with ample green space, pedestrian connections, and street-level retail space.

The project encompasses the construction of two new buildings with 550,000 square feet of laboratory, office, and retail space, and the renovation of the parcel's remaining existing structure. Novartis is seeking LEED Gold certification for the new buildings. Per MIT's lease requirements, the buildings Novartis is constructing will include active ground floor uses on Massachusetts Av-

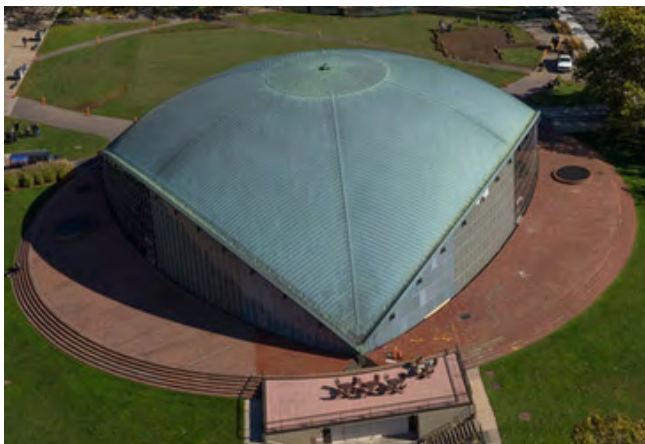


Stone facade construction at 181 Massachusetts Avenue

C. In Planning & Design

Music and Theater Arts

The Music and Theater Arts (MTA) section at MIT has grown and is in need of teaching and performance spaces for its academic program. Investigation of how best to accommodate the programmatic needs of Music and Theater Art is continuing.



Aerial View of Kresge Auditorium

enue, improving this important commercial corridor. Construction is ongoing and is scheduled for completion in 2015.

300 Massachusetts Avenue (Forest City)

MIT has an agreement with longtime development partner Forest City on a collaboration to redevelop a portion of Massachusetts Avenue – part of the 300 Mass Ave block adjacent to MIT's Random Hall dormitory. This project involves the construction of a new mixed-use building designed to bring significant new retail vitality to the area and provide research space to enable further growth of the Cambridge Innovation Cluster.

Construction is continuing at 300 Mass Ave, with completion and occupancy anticipated in early 2016. The research and office portions of the building – all but 15,000 square feet that has been designated for retail uses – will be occupied by Millennium/Takeda, a life science company that is currently in University Park at MIT and will be expanding its footprint to support a more extensive research program. Retail shops and restaurants will occupy nearly the entire frontage of the building along Massachusetts Avenue, and will be identified when construction of the project is further along.

Earth, Atmospheric, and Planetary Sciences

MIT is planning to enhance its growing set of environmental research activities and will first focus on the needs of the Earth, Atmospheric and Planetary Sciences Department. MIT is evaluating the space needs of this department to support evolving teaching and research needs for environmental research at MIT. Options for renovating Building 54 are under consideration.

Kresge Auditorium

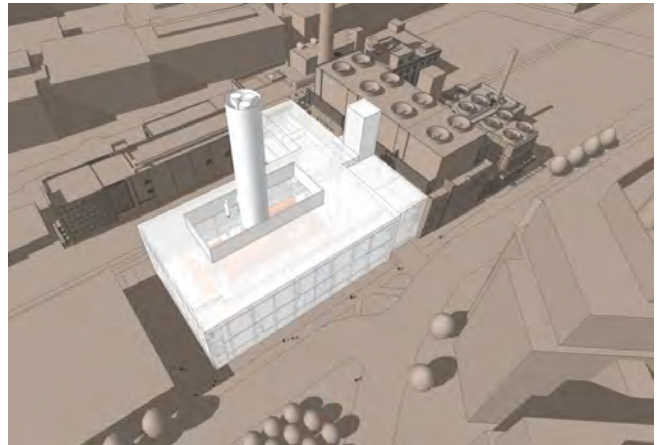
Completed in 1955 and designed by architect Eero Saarinen, Kresge is an internationally recognized icon of mid-century modern architecture. Kresge Auditorium is the largest auditorium facility on campus and seats 1,200 people. The building is a very heavily used Institute resource that also provides facilities for major Institute and student events, as well as the Music and Theater Arts Department academic program. The exact scope of this important renovation project is still being planned.

Building 31

Mechanical Engineering and Aeronautics and Astronautics occupy Building 31. It is one of the highest ranked buildings for deferred maintenance. The planned scope includes reconstructing structural bays, creating new high bay area, and renewing offices, labs and common spaces. The net additional space is planned to be approximately 15,000 gross square feet.

Central Utility Plant (CUP) Expansion

The CUP expansion will replace one gas turbine and add a second one. The two new gas turbines will provide up to 44mw of power to the campus. The turbines will allow MIT buildings that are served by the CUP to be self-sufficient should there be an extended utility outage. Additionally, five older cooling towers will be replaced with three more efficient and quieter towers and two new 2,500 ton chillers will complete the chilled water plant expansion started in 2009. All of this new equipment will be housed in a three-story building to be constructed in the existing parking lot south of Albany Street adjacent to the existing Plant and next to MIT's Albany Street parking garage. The building will serve as a new entrance to the MIT CUP. The architect for the building is Ellenzeig Associates, the firm that has led the architectural design for MIT's CUP for the past 20+ years.



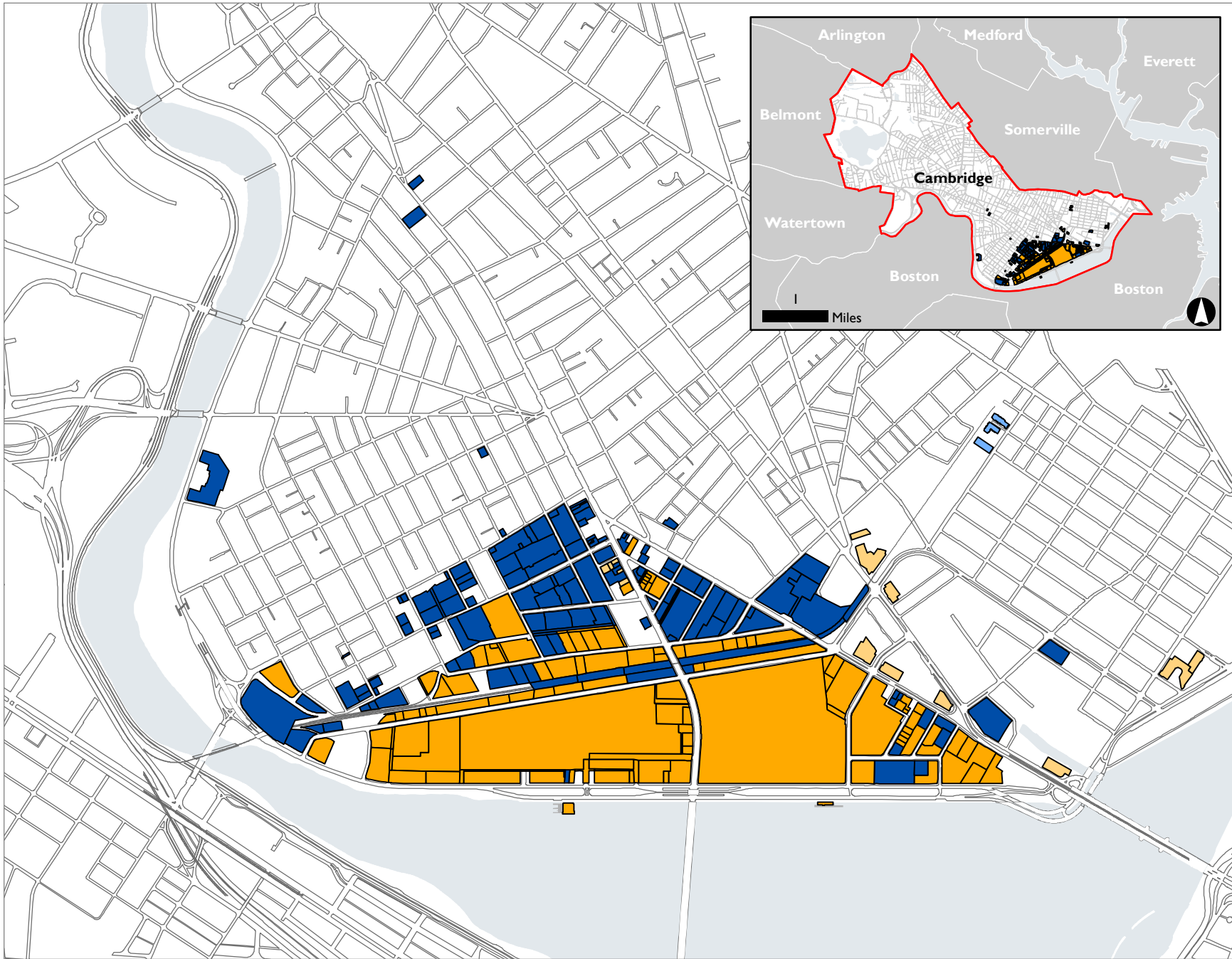
Rendering of the expansion of the Central Utility Plant

Replacement of West Garage, N10 Parking Lot and Main Campus Parking Reduction

The elimination of approximately 625 permanent parking spaces with the retirement of the West Garage, the replacement of the N10 parking lot by the CUP expansion and elimination of some parking in the Main parking lot will require a new structured garage. Planning is just getting underway for this facility and no location has been selected.

IV. Mapping Requirements

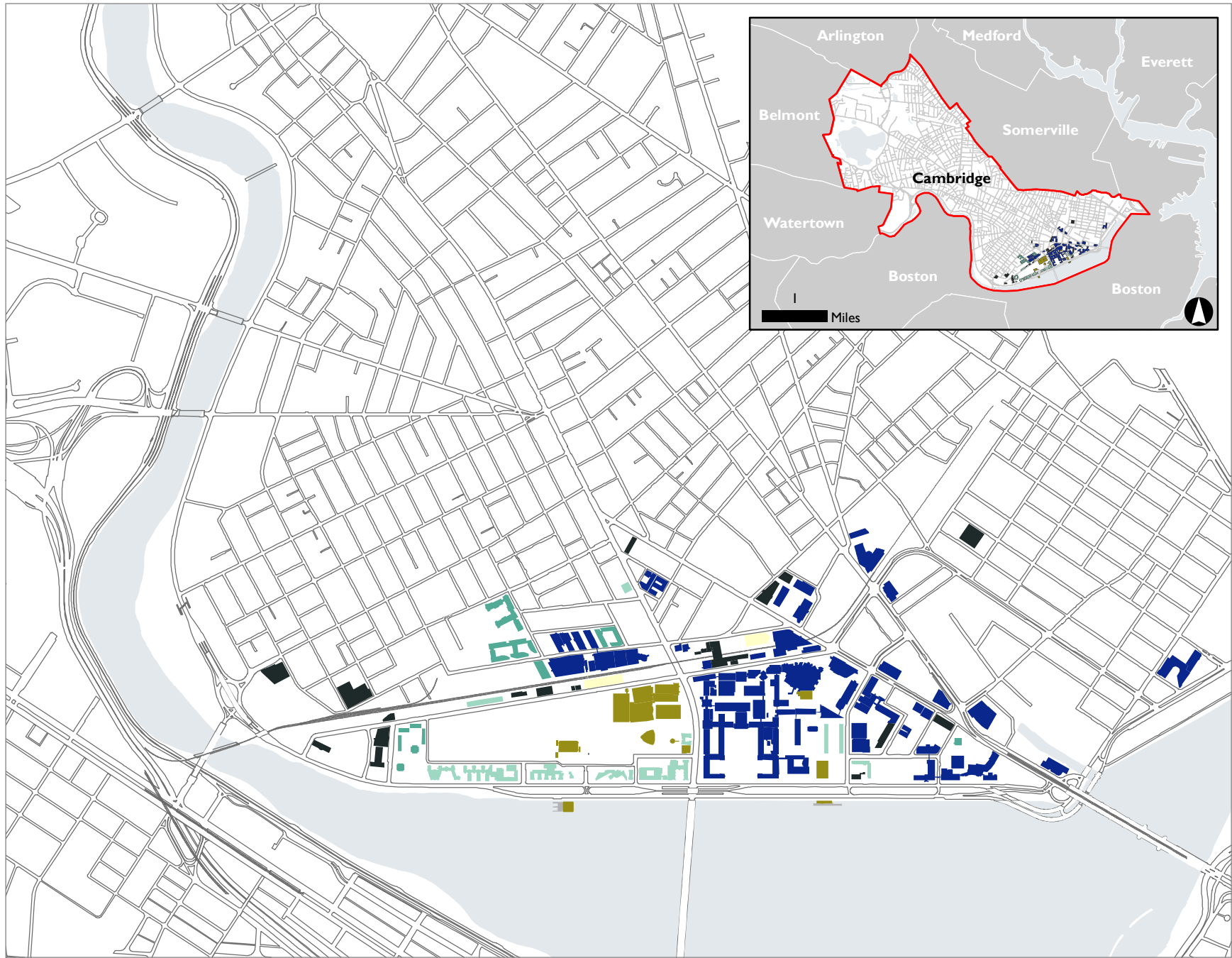
- Map 1: MIT Property in Cambridge**
- Map 1a: MIT Buildings by Use**
- Map 2: MIT Projects**
- Map 3: Future Development Opportunities**
- Map 4: MIT Shuttle Routes**
- Map 5: MIT LEED Certified Buildings**
- Map 6: MIT Energy Efficiency Upgrade Projects**



Map 1: MIT Property in Cambridge
 December 2014 (Data as of June 30, 2014)

- Academic Plant
- Investment Property
- Academic Leased
- Investment Property - Condominium Only

1,000 Feet



Map 1a: MIT Buildings and Occupied Spaces by Use

- Academic Research
- Athletics & Student Life
- Residential - Graduate
- Residential - Undergraduate
- Service & Administration
- Parking Garage

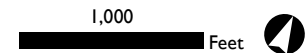
1,000 Feet

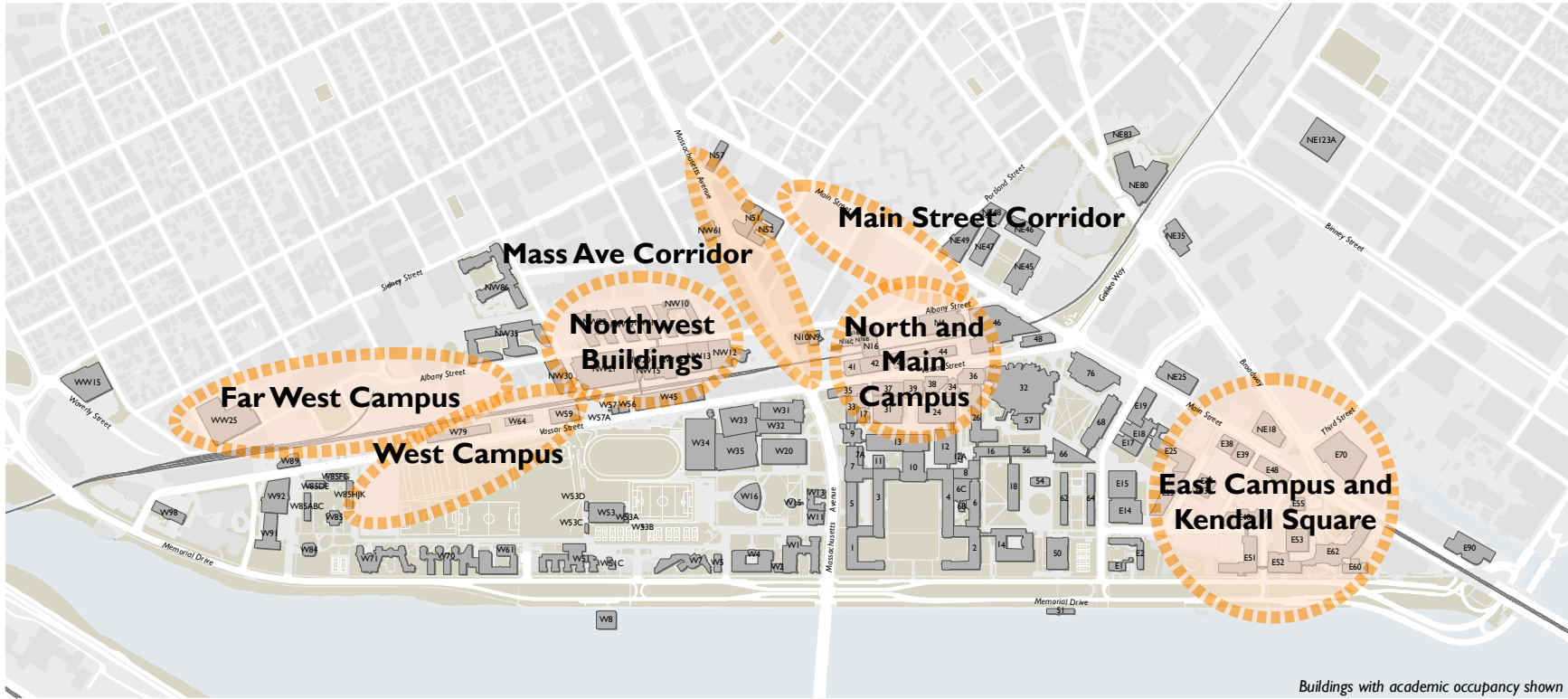


Buildings with academic occupancy shown

Map 2: MIT Major Projects
 December 2014 (Data as of June 30, 2014)

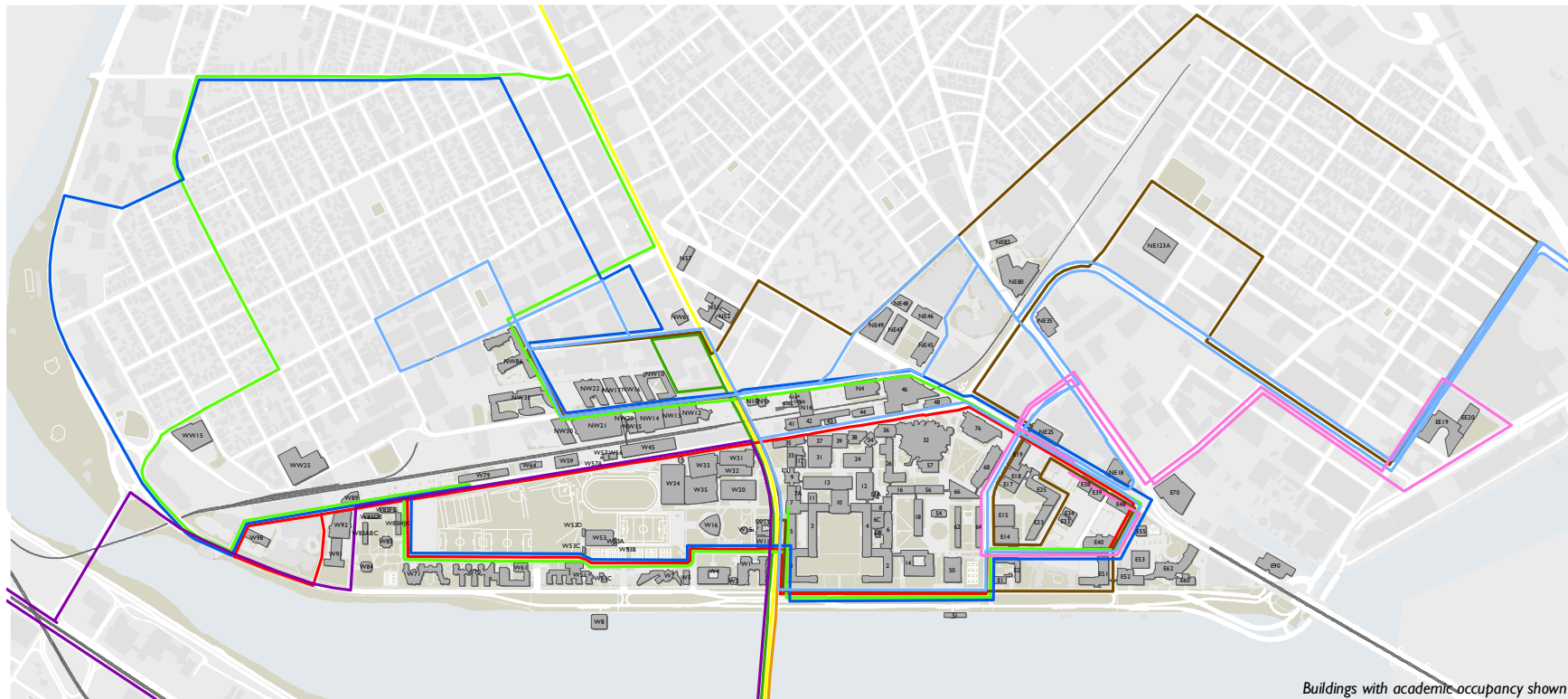
- Planning/Design
- Construction
- Completed
- Development By Others





Map 3: Future Development Opportunities
December 2014 (Data as of June 30, 2014)

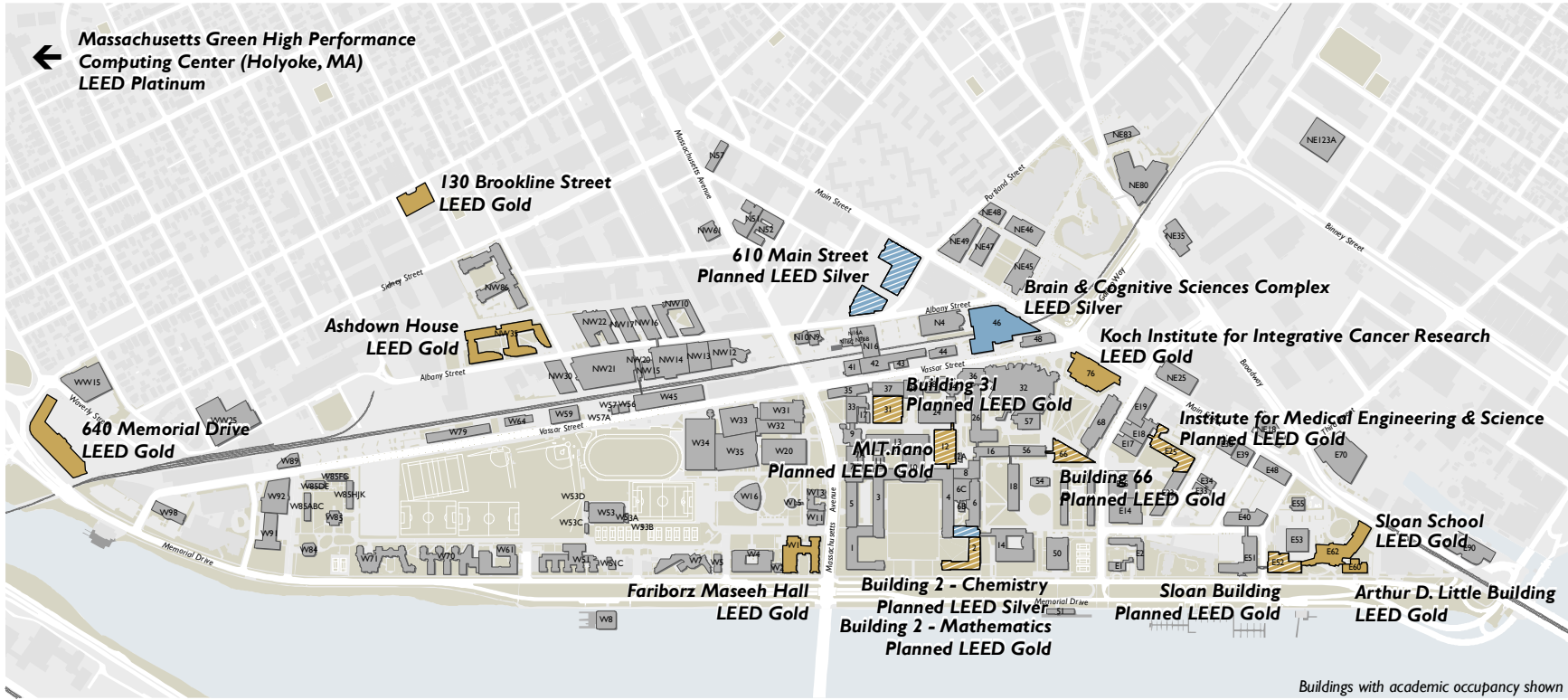
Buildings with academic occupancy shown
1,000 Feet



Map 4: MIT Shuttle Routes
 December 2014 (Data as of June 30, 2014)

- MIT Shuttle TECH
- Boston Daytime
- Weekend Shuttle
- M2 Shuttle
- EZ Ride
- Saferide Shuttle Cambridge East
- Saferide Shuttle Cambridge West
- Saferide Shuttle Boston East
- Saferide Shuttle Boston West
- Kendall to Charles Park

Buildings with academic occupancy shown
 1,500
 Feet

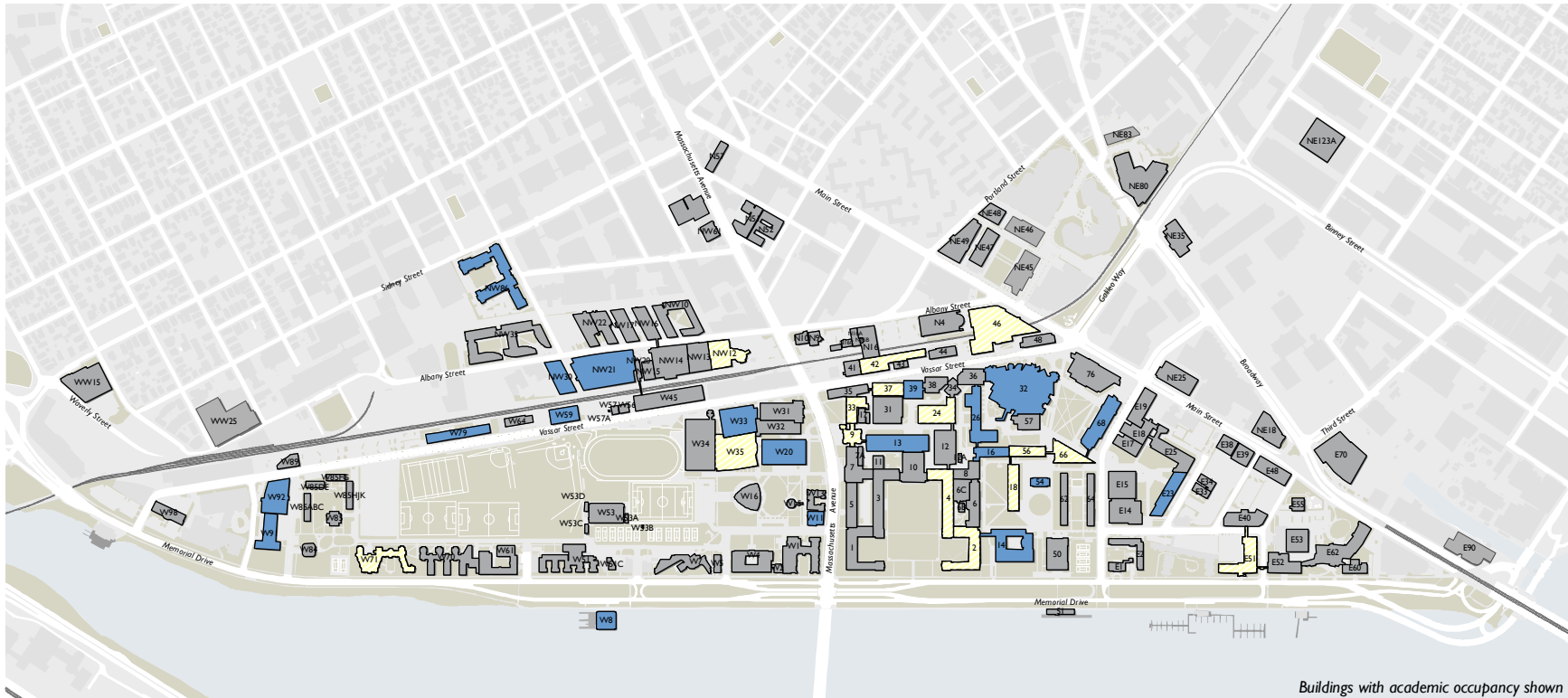


Map 5: MIT LEED Certified Buildings
 December 2014 (Data as of June 30, 2014)

LEED Certified
 LEED Gold (orange square) LEED Silver (blue square)

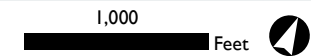
Planned LEED Certified
 Planned LEED Gold (yellow square with diagonal lines) Planned LEED Silver (blue square with diagonal lines)

Buildings with academic occupancy shown
 1,000 Feet



Map 6: MIT Energy Efficiency Upgrade Projects
 December 2014 (Data as of June 30, 2014)

Buildings with Energy Efficiency Upgrade Projects
 ■ Completed in 2013/2014 ■ In Construction or Planned for 2014/2015



V. Transportation Demand Management

A. Commuting Mode of Choice

Commuting Mode	2006	2008	2010	2012	2014
Drove alone entire way	26%	21%	20%	22%	21%
Took public transportation	37%	39%	42%	41%	39%
Carpooled	6%	7%	7%	6%	6%
Bicycled	12%	13%	14%	15%	15%
Walked	14%	16%	15%	13%	13%
Other	5%	4%	3%	3%	5%

B. Point of Origin for Commuter Trips to Cambridge

Home Location	Number of People working on the MIT Main Campus	Percentage
Cambridge	2,347	21.9%
Boston	1,448	13.5%
Somerville	791	7.4%
Arlington	383	3.6%
Brookline	335	3.1%
Newton	296	2.8%
Belmont	255	2.4%
Medford	244	2.3%
Lexington	242	2.3%
Quincy	192	1.8%
Watertown	184	1.7%
Malden	142	1.3%
Waltham	117	1.1%
Acton	63	0.6%
Bedford	35	0.3%
North Of Boston	767	7.2%
South Of Boston	65	0.6%
West of Boston	123	1.1%

B. Point of Origin for Commuter Trips to Cambridge (continued)

Home Location	Number of People working on the MIT Main Campus	Percentage
Outside 128	1,573	14.7%
Outside 495	348	3.3%
Out of State - Connecticut	14	0.1%
Out of State - Maine	17	0.2%
Out of State - New Hampshire	116	1.1%
Out of State - Rhode Island	57	0.5%
Out of State - Vermont	4	0.0%
Outside New England	329	3.1%
Outside US	216	2.0%
Unknown	1	0.0%
Total	10,704	100%

C. TDM Strategy Updates

In cooperation with VRide, MIT offers a monthly subsidy to employees who commute to work by vanpool. Three Cambridge vans were added resulting in 13 fewer vehicles commuting to campus daily. Currently 47 MIT employees take advantage of the vanpool subsidy.

The Hubway bike share stations at building W11 on Mass Ave and building 32 on Vassar Street were expanded by adding additional bikes and docks. Orders were placed for 2 new Hubway Stations to be installed in the MIT west campus and northwest campus.

384 new bike parking spaces were added to campus and our eighth bike fixit station was installed in west campus.

MIT added 16 additional Electric Vehicle Charging Spaces in two garages to bring our campus total to 21 Chargepoint stations. Equipment is on order for 4 additional EV charging spaces procured under the Massachusetts Electric Vehicles Incentive Program grant offered by the Department of Environmental Protection.

VI. Institution Specific Information Requests

1. Review the conclusions of the study evaluating the need for and feasibility of providing additional housing for graduate students, visiting students, and post-doctoral fellows. Discuss steps MIT plans to take to address housing needs, the timeline for action, and physical planning related to those actions. Review the expansion in enrollment of graduate students, visiting students, and post-doctoral fellows since 2008. Discuss the reasons for this increase in enrollment and discuss the prospects for further changes in enrollment in coming years.

See II C and D

2. Provide an update on long term academic and non-academic planning for the main campus, with a particular focus on all potential locations for academic uses and plans for green space and edges along Massachusetts Avenue, particularly near the railroad crossing, and edges adjacent to Area 4.

See II E

3. Provide an update on MIT's Kendall Square planning efforts.

See II E

4. Provide information on MIT's plans for ground floor retail along Main Street and in both Kendall Square and Central Square. What strategy does MIT follow in selecting tenants for retail sites? How is retail used to enhance the urban experience?

Working closely with experienced retail specialists who have intimate knowledge of the local Cambridge market, MIT prefers to select tenants for retail spaces based on the expressed needs of members of the MIT and Cambridge communities. We focus primarily on small operators that help enhance the urban experience with a diversity of uses. This strategy requires frequent re-evaluation of the tenant mix as small operators develop over time. Currently, nearly all of MIT's retail space is fully leased. MIT plans to continue including ground floor retail space and other active uses in new developments along the Main Street and Massachusetts Avenue corridors

6. Discuss planning for bicycle facilities on campus, including Hubway stations.

See II F

7. Provide an update on the feasibility study being conducted for a multi-use path along the Grand Junction railroad right-of-way.

See II F

8. Report on planning for the "far west" sector of campus, such as the area adjacent to Fort Washington Park.

See II E



About the Cover Photo

The 2014 cover photo is a rendering of the MIT.nano building, currently under construction. The view is from the front of Building 13 looking east toward Building 26, as conceived by Wilson Architects. The edge of the Great Dome is visible in the upper-right corner. The 200,000-square-foot building will house state-of-the-art cleanroom, imaging, and prototyping facilities supporting research with nanoscale materials and processes — in fields including energy, health, life sciences, quantum sciences, electronics, and manufacturing. An estimated 2,000 MIT researchers may ultimately make use of the building.

Photography Credit

Cover, Page 20, Page 35 - MIT.Nano, Wilson Architects

Page 21 - 610 Main Street, Steve Dunwell

Page 22 - Collier Memorial, Höweler + Yoon Architecture

Photographs not credited appear courtesy of MIT Communications Production Services.