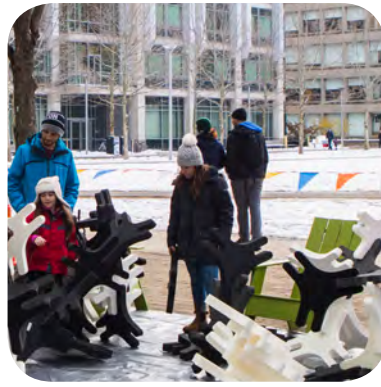


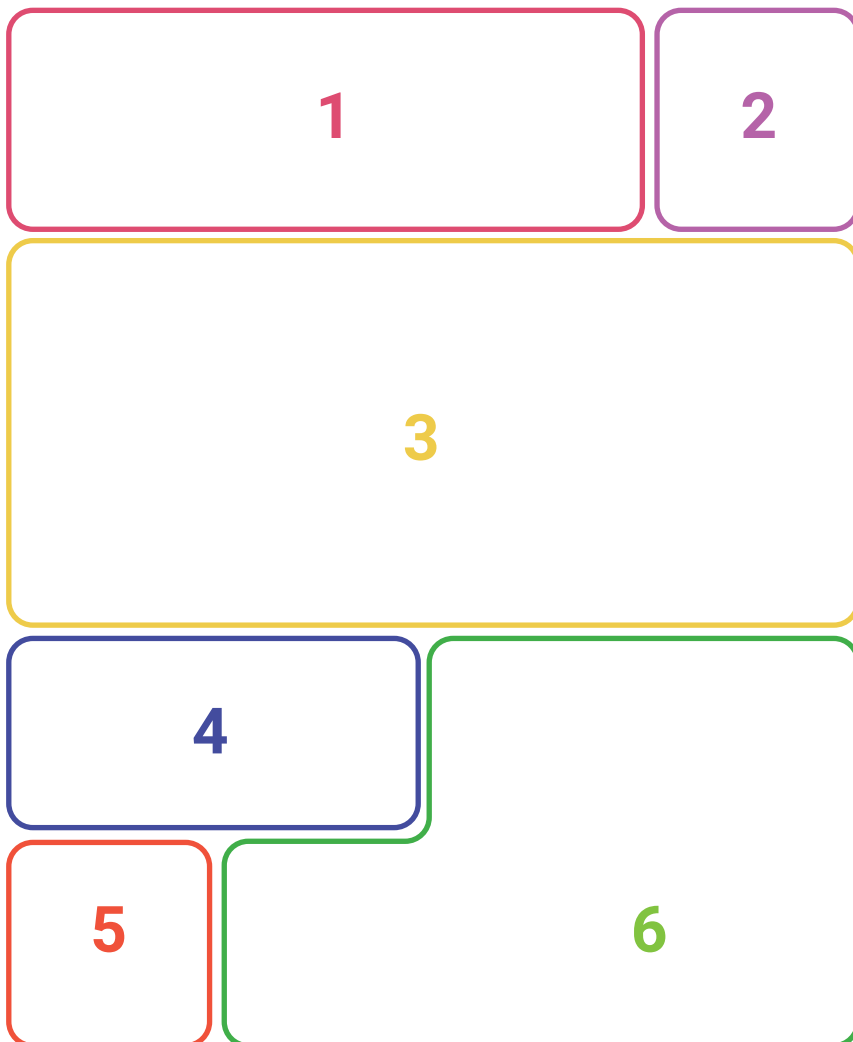


2019



# Town Gown Report to the City of Cambridge





## On the Cover

The cover photos are a collection of Cambridge residents enjoying MIT's open spaces

1. Residents bundled up to enjoy Hockfield Court on Winter Family Day, which included playful activities like curling with the MIT Curling Club and art making with the Community Art Center. Photo credit: Jake Belcher.

2. A resident visiting the Volpe Block Party writes down her hope of how MIT's open spaces could be used in the future.

3. People crossing the street at 77 Massachusetts Avenue next to "The Alchemist" by Jaume Plensa.

4. MIT employees participate in the Kendall Square Challenge, completing physical challenges set up on Hockfield Court by the Kendall Square Association.

5. A student from MIT Spinning Arts performs at an open space programming pilot. Photo credit: Jake Belcher.

6. A group passes through the North Corridor, or "outfinite" space, from Vassar Street to Building 13.

# 2019 Town Gown Report

MIT's 2019 Town Gown report provides updates on the Institute's planning and development activities, and features key initiatives such as the Kendall Square development, the Volpe project, the Vassar Street undergraduate residence hall, the Access MIT mobility campaign, and the Institute's comprehensive sustainability and resiliency programs. Every activity reported in these pages serves to advance MIT's mission of teaching and research as the Institute strives to address local and global challenges that impact society and the planet.

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# Students, Faculty, & Staff

## Student Population

Over the course of the last 40 years, the undergraduate population at MIT has remained within the range of 4,000-4,600 students. MIT's undergraduate student population was 4,577 in 1981. During the next 25 years, the population dropped until 2006, when the undergraduate population was 4,053. Since then, it has grown slowly until reaching 4,550 students in this Town-Gown reporting period.

Enrollment of graduate students and the number of post-doctoral employees 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. During the first five years after the recession in 2009, graduate enrollment increased at an average rate of 2.0%. Over the last five years, the average annual growth rate for graduate students has dropped to less than one-third of the earlier rate, just 0.6% annually.

With the opening of the Schwarzman College of Computing, MIT expects its student population to increase over the next decade, matching the expanded teaching and research facilities and faculty to serve them.

Student Body	2015	2016	2017	2018	2019	2029
Total Undergraduate Students	4,476	4,474	4,489	4,489	<b>4,550</b>	4,600
Day	4,476	4,474	4,489	4,489	<b>4,550</b>	
Evening	N/A	N/A	N/A	N/A	<b>N/A</b>	
Full Time	4,442	4,440	4,444	4,456	<b>4,506</b>	
Part Time	34	34	45	33	<b>44</b>	
Total Graduate Students	6,560	6,537	6,599	6,695	<b>6,742*</b>	6,500-6,800
Day	6,560	6,537	6,599	6,695	<b>6,742</b>	
Evening	N/A	N/A	N/A	N/A	<b>N/A</b>	
Full Time	6,509	6,523	6,592	6,571	<b>6,740</b>	
Part Time	51	14	7	124	<b>2</b>	
Non-Degree Students	204	226	191	197	<b>195</b>	
Day	204	226	191	197	<b>195</b>	
Evening	N/A	N/A	N/A	N/A	<b>N/A</b>	
Total Students Attending Classes in Cambridge	11,240	11,237	11,279	11,381	<b>11,487</b>	11,100-11,500
Non-resident students not included	79	94	97	85	<b>87</b>	

\* International students account for 42% of the 2019 graduate student population.



### Faculty and Staff

MIT's faculty and staff employment is largely based on the needs and strategies developed at the department, laboratory, and center (DLC) unit level, rather than through a central Institute-wide planning process.

Approximately 105 DLCs manage their own staffing in support of their objectives with funding that is assembled from a variety of sources. There was a reduction of more than 900 employees in the recession a decade ago. Staff population recovered to prerecession levels by 2015 and has grown since that time at an annual rate of 2.2%. This past year, employee growth was

just 0.1%, for a total of 10,813, about a quarter of which are Cambridge residents.

The post-doctoral employee growth rate averaged 5.6% in the post-recession period (2009 -2014) but has dropped to an annual rate of 0.2% over the last five years, with absolute reductions in the number of post-doctoral employees in each of the last two years.

The number of faculty members has been growing 0.4% annually since 2010. The Schwarzman College of Computing is expected to increase the faculty head count by 50 over the next several years.

Faculty & Staff	2015	2016	2017	2018	2019	2029
<b>Cambridge-based Staff</b>						
Head Count	10,039	10,234	10,596	10,801	<b>10,813</b>	10,000-11,000
FTEs	8,599	8,743 <sup>‡</sup>	9,009	9,148	<b>9,217</b>	
Post-Doctoral Staff**	1,515	1,486	1,488	1,442	<b>1,434</b>	
<b>Cambridge-based Faculty</b>						
Head Count	1,004	1,019	1,020	1,027	<b>1,037</b>	1,100
FTEs	999	1,010 <sup>‡</sup>	1,013	1,020	<b>1,028</b>	
Number of Cambridge Residents Employed at Cambridge Facilities	2,391	2,494	2,552	2,575	<b>2,560</b>	2,500-2,750

\*\* Post-doctoral employees are included in the headcount for Cambridge-based staff.

‡ Starting in 2016, FTEs are calculated using "part time equals 1/3 full time" methodology instead of "percent effort."

# Housing

## Undergraduate Housing

MIT houses 96.8% of its undergraduates in MIT-approved housing, primarily in on-campus residence halls but also in fraternities, sororities and independent living groups in Cambridge, Brookline, and Boston. MIT offers four years of housing to all undergraduates and requires all first-year students to live on campus. According to City of Boston statistics, MIT houses a higher percentage of its undergraduate population than any institution in Boston with enrollment over 500.

MIT is constructing 450 new beds of undergraduate housing on Vassar Street for occupancy in the fall of 2020. This will provide flexibility in renovating the existing undergraduate housing stock.

## Graduate Housing

Recent MIT reports recommended between 500-1,100 new beds for graduate students. MIT has responded by making a commitment to deliver a total of 950 graduate beds. There will be 450 beds of graduate housing opening in Kendall Square next fall, with 201 beds being retired

at Eastgate (E55). MIT will produce 500-550 new beds, planned for permitting next year, and convert 150-200 additional beds.

Even before these major gains in graduate housing, MIT has been a leader in the provision of graduate student housing. In Boston, only 12.5% of its more than 25,000 graduate students are in university-provided housing, compared with MIT providing 34% of its graduate students with housing.

In addition to these big commitments to increase housing on campus, MIT has made several successful adjustments to its management policies for graduate students. These changes are intended to make the best use of existing resources and be responsive to graduate student needs:

- Setting rental periods in closer alignment with housing market practices for greater convenience and improved choices.
- Improving communication and simplifying the housing allocation process resulting in

Housing	Tax Exempt		Taxable	
	MIT-Owned & Managed Housing	Other Housing	MIT-Owned & Managed Housing*	Other Housing
<b>2015</b>				
Units	0	0	164	930
Buildings	0	0	13	7
<b>2016</b>				
Units	0	0	164	930
Buildings	0	0	12	7
<b>2017</b>				
Units	0	0	163	930
Buildings	0	0	12	7
<b>2018</b>				
Units	0	0	163	939
Buildings	0	0	12	7
<b>2019</b>				
Units	0	0	163	939
Buildings	0	0	11	7
<b>2029</b>				
Units	0	0	163	939
Buildings	0	0	11	7

more beds being committed to graduate students earlier in the process, reducing uncertainty and improving the student experience.

- Guaranteeing a second year of housing in all facilities has given greater housing security for campus residents, particularly master-degree students who desire dependable housing for their full two-year program;
- Permitting roommates to sign up for housing as a group allowed 49 groups to be accommodated;
- Allowing couples in buildings previously reserved for single students and opening up

some efficiencies and 1-bedroom units to singles in previously family-only buildings has been a success. More choices allow greater efficiency and satisfaction and is responsive to the high demand seen for couples.

These measures have resulted in accommodating more graduate students in existing housing on campus. While no estimate has been made of the expected impact of the new graduate student housing and the management policy changes on the Cambridge housing market, the Institute anticipates that additional and optimized on-campus housing for MIT graduate students will ease some pressure in the local housing market.



## Faculty and Staff

To assist with the high cost of housing in the regional area, MIT provides flexible, tax efficient, low interest mortgage programs for its faculty. The overall program has proven to be an important recruiting and retention tool and is similar to ones offered by MIT's peers. The program enrolls approximately 75% of eligible faculty. Over 500 faculty members have participated in these programs, of whom 146 participants lived in Cambridge. An important goal of the program is to promote the ability for faculty to choose where they would like to live in the region.

## MIT & Housing in Cambridge

Like every employer in Greater Boston, MIT is impacted by high housing costs. The housing shortage imposes a burden on existing and prospective employees at all levels of the organization, including service and professional staff, and academic employees like post-doctoral researchers and faculty. High housing costs can turn into transportation and quality of life is-

suues, as employees find they must search further from campus to find suitable housing they can afford.

However, MIT is taking major steps to build housing that will be available to all families in Cambridge and the region, including its own employees. MIT has begun the building of approximately 1,700 units of family housing in Kendall and at Volpe, of which approximately 300 will be permanently affordable units. According to the Envision Cambridge housing production figures, Cambridge has been producing 614 new units per year or 7,400 at that rate by 2030. MIT's production expected over this time period will be 23% of the Cambridge total. Similarly, Cambridge has been producing about 100 affordable units per year, or 1,200 by 2030 at the current rate. (Envision Cambridge targets 3,175 new affordable units over this period.) MIT expects to produce 300 affordable units in this period or about 25% of all of Cambridge's new affordable housing units at current City rates of production.

Student Residences	2015	2016	2017	2018	2019	2029
<b>Undergraduate Students Residing in Cambridge</b>						
In Institute-approved housing	3,543	3,654	3,652	3,555	<b>3,626</b>	3,600-3,700
In off-campus housing owned & managed by MIT	0	0	1	0	<b>0</b>	
In off-campus non-MIT housing	77	109	107	159	<b>146</b>	
<b>Graduate Students Residing in Cambridge</b>						
In Institute-approved housing	2,384	2,044	2,221	2,262	<b>2,348</b>	3,200-3,500
In off-campus housing owned & managed by MIT	44	35	27	22	<b>32</b>	
In off-campus non-MIT housing	1,876	2,610	2,468	2,500	<b>2,415</b>	
<b>Student Parking</b>						
Number of student parking permits issued (including resident and commuter parking)*	--	294	194	219	<b>364</b>	

\*Reporting on permits rather than spaces as we have done in previous years allows MIT to more accurately reflect the number of students driving on or around campus.





## Kendall Square at MIT Site 4 Project

Responding to the need for additional graduate student housing, MIT has embarked on a project in Kendall Square that addresses this need and also creates a vibrant new innovation center as well as a new home for MIT Admissions.

The Site 4 project incorporates two existing buildings on Main Street. E38 will be completely renovated to accommodate ground-floor retail space and MIT Admissions on the second floor. Above these, the building's five upper floors will be transformed into a new Innovation and Entrepreneurship Hub: open, multi-use spaces for student makers and entrepreneurs, researchers, and staff, and a new home for the MIT Innovation Initiative.

Next door, E39 will be renovated to include ground-floor retail, two floors of academic office space, and 450 housing units (2-bedroom, 1-bedroom, and efficiencies) for MIT graduate students. The housing will be anchored by a three-level podium housing a childcare facility, common space for the residents, and an active community and academic space — the MIT

Welcome Center — featuring a 200-seat auditorium and movable walls for flexibility in configuration.

In a variety of ways, Site 4 is designed to serve as a bridge between the MIT campus and the City of Cambridge. The entire ground floor of the MIT Welcome Center will feature floor-to-ceiling windows that offer a view of the activity within. When not serving to introduce student applicants to the campus, the auditorium will be available to other MIT groups and to the broader Cambridge community. Along its southern side, Site 4 will border a welcoming open space designed to encourage pedestrian traffic, providing trees, landscaping, and seating as well as space for special and seasonal events.

Given its location, the Site 4 project will help power the exchange of ideas by situating MIT problem solvers among industry innovators, and its active ground floor uses are expected to create a dynamic and engaging environment that will add vitality to Kendall Square and MIT's east campus.

# Transportation

By connecting programs, education, modes of transportation, and personal decision-making, MIT strives to create a new awareness and shared understanding of transportation choices and their impacts. To that end, MIT launched the Access MIT program in the fall of 2016 with the goal of reducing parking demand on campus through new commuting incentives and a shift from annual to daily parking fees for employees.

Employees at MIT have a no-cost transit pass embedded in their ID cards, enabling them greater flexibility to choose how they get to work every day. MBTA pay-per-use billing has allowed MIT to offer this benefit to its full-time employees. These efforts are designed to help mitigate traffic congestion in and around MIT and advance a culture of low carbon commuting.

MIT has expanded the reach of Access MIT by retooling and transforming its parking system. Previously, the infrastructure of MIT's "ungated" lots prohibited its parkers from taking advantage of the daily parking rate, which launched as part of Access MIT in the regular gated parking lots. In the ungated lots, there was

no way to charge parkers on a daily basis without a gate. Now, using new technology, parkers in MIT's ungated lots have their license plates scanned every day, enabling the daily rate across all MIT-owned lots. These parkers have been unlocked from the annual financial commitment of the traditional year-long parking pass. They can opt to commute via bike, subway, bus, or another method on days that they can, without being charged for parking.

Access MIT Program benefits include:

- Free, unrestricted use of the MBTA subway and local bus systems for benefits-eligible Cambridge campus MIT faculty and staff;
- A 60% commuter rail subsidy;
- A 50% subsidy for parking at MBTA stations, up to \$100 per month;
- A shift from annual to daily pay-per-day parking.

The Institute encourages the use of sustainable transportation methods, but also recognizes that it is necessary for many people to drive to campus. To serve its students, faculty, staff and visi-



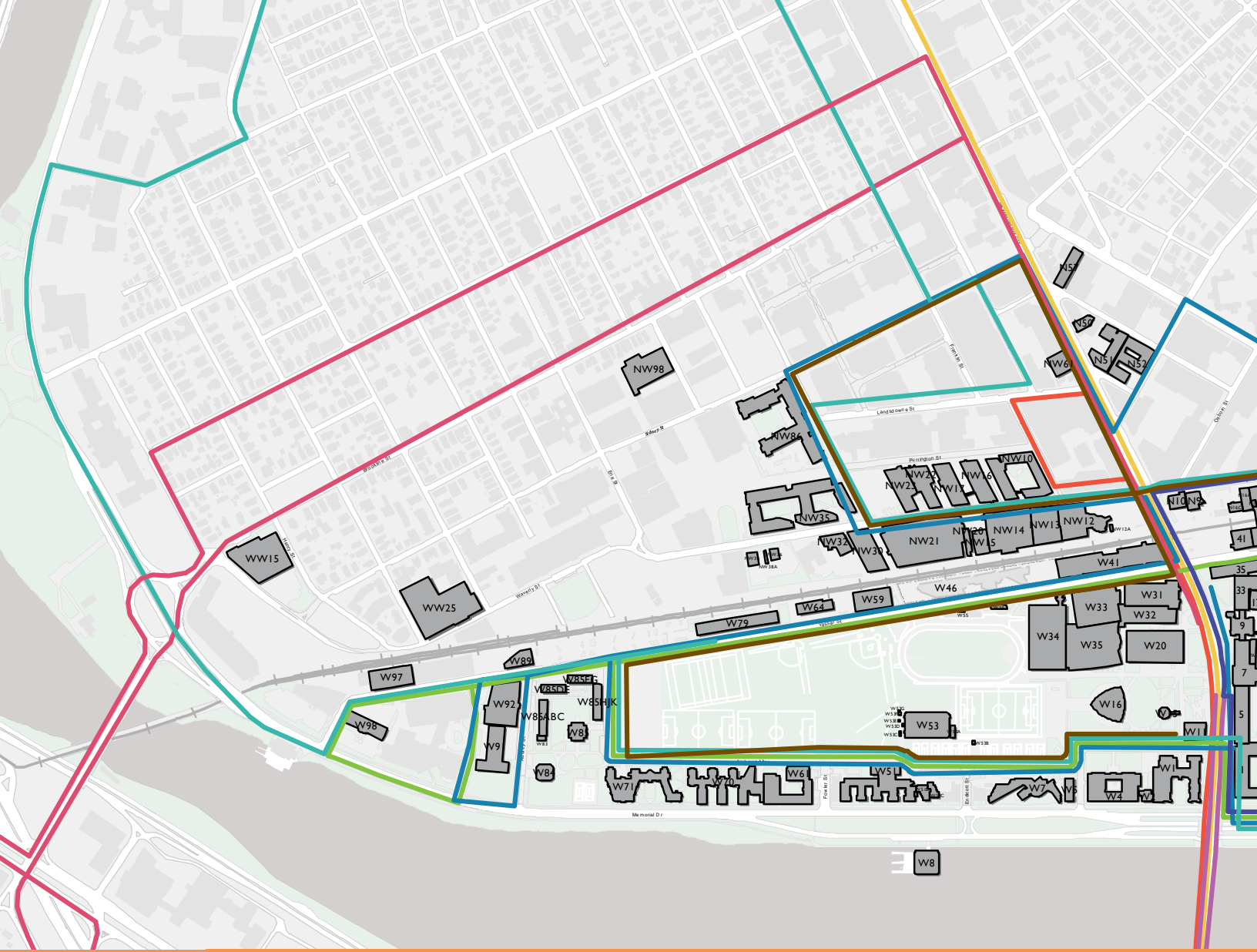
tors, MIT maintains a campus-wide inventory of vehicular parking spaces. MIT community members with parking permits are assigned to areas of campus based upon where they primarily live or work, as well as their preferences.

Access MIT and other programs for supporting carpooling, cycling and walking have mitigated demand for parking, but MIT must be able to accommodate a peak weekday demand. Transportation demand management programs and shifting travel patterns have allowed MIT to operate effectively while the Kendall development program removed more than 300 spaces and the construction of the new Central Utilities Plant and the Vassar Street residence hall removed 500 parking spaces. This has been done by maintaining over 250 parking spaces associated with office and laboratory leases and an attendant-assist parking program at Stata Garage that can accommodate 162 spaces. Approximately 550 academic parking spaces will be returned for use when these projects are completed.

Parking spaces maintained in Cambridge	
Number of parking spaces maintained on campus as reported in the annual MIT Parking Inventory	3,426

Point of Origin for Commuter Trips to Cambridge		
Home Location	Count	Percentage
Cambridge	2,575	21.8%
Boston	1,659	14.0%
Somerville	921	7.8%
Arlington	430	3.6%
Brookline	399	3.4%
Newton	306	2.6%
Medford	286	2.4%
Belmont	261	2.2%
Lexington	236	2.0%
Quincy	227	1.9%
Watertown	185	1.6%
Malden	149	1.3%
Winchester	119	1.0%
Waltham	113	1.0%
Melrose	95	0.8%
North of Boston	624	5.3%
West of Boston	128	1.1%
South of Boston	87	0.7%
Outside Route 128	1,737	14.7%
Outside Interstate 495	383	3.2%
Connecticut	20	0.2%
Maine	26	0.2%
New Hampshire	141	1.2%
Rhode Island	73	0.6%
Vermont	10	0.1%
Outside New England	385	3.3%
Outside US	253	2.1%
<b>Grand Total</b>	<b>11,828</b>	<b>100.0%</b>

Commuting Mode of Choice					
Commuting Mode	2010	2012	2014	2016	2018
Drove alone entire way	20%	22%	21%	18%	18%
Took public transportation	42%	41%	39%	42%	43%
Carpooled	7%	6%	6%	5%	5%
Bicycled	14%	15%	15%	16%	16%
Walked	15%	13%	14%	15%	15%
Other	3%	3%	5%	3%	3%














## MIT Shuttle Routes

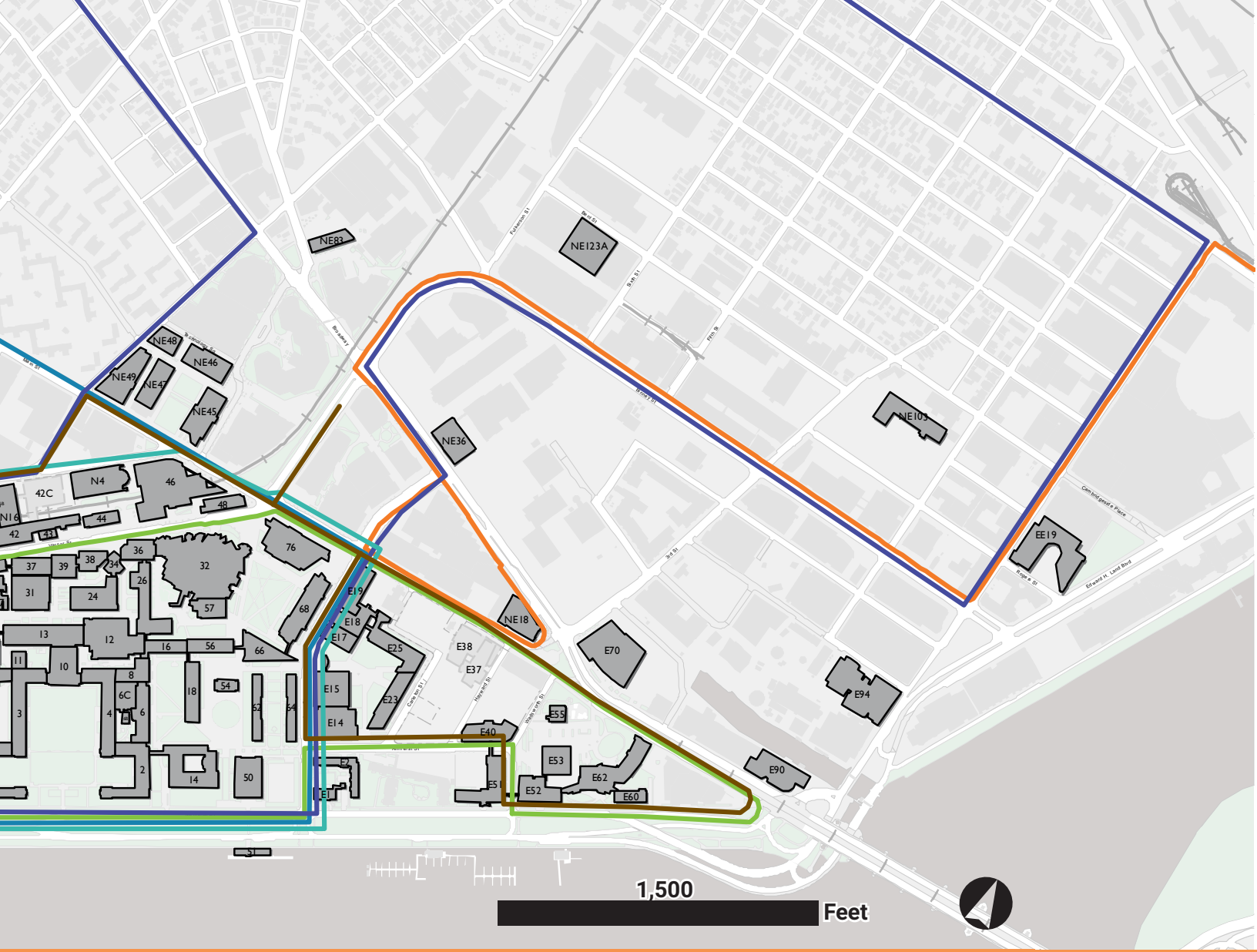
(Data as of June 30, 2019)

Buildings with academic occupancy shown

Route Name

Vehicle Type

	Tech Shuttle	Mid-size transit, biodiesel
	Boston Daytime Shuttle (May-Sept)	Mid-size transit, biodiesel
	SafeRide Cambridge East/Somerville	Mid-size transit, biodiesel
	SafeRide Cambridge West/Brookline	Mini-bus, gas
	SafeRide Boston East	Mid-size transit, biodiesel
	SafeRide Campus Route	Mid-size transit, biodiesel
	EZ Ride by CRTMA	---
	M2 Shuttle	---
	Trader Joe's Shuttle (Sundays)	Mid-size transit, biodiesel
	Costco Shuttle (3 Sundays a month)	Mid-size transit, biodiesel
	OnDemand Shuttle	Mini-bus, gas



Capacity	Frequency of Operation		Weekday Hours of Operation	Weekend Hours of Operation
	Peak	Off-Peak		
30 seats	10 min	20 min	6:15AM-11:00PM	---
30 seats	30 min	30 min	8:00AM-5:54PM	---
30 seats	40 min	30 min	6:00PM-11:00PM	6:00PM-11:00PM
14 seats	40 min	30 min	6:00PM-11:00PM	6:00PM-11:00PM
30 seats	20 min	30 min	6:00PM-1:00AM	6:00PM-1:00AM
30 seats	35 min	35 min	6:00PM-11:00PM	6:00PM-11:00PM
---	---	---	---	---
---	---	---	---	---
30 seats	45 min	45 min	---	11:30AM-4:30PM
30 seats	60 min	60 min	---	11:00AM-3:05PM
14 seats	On Demand		11:00PM-2:30AM	11:00PM-3:30AM

## Transportation Policy & Advocacy

MIT has been a major supporter of improvements to local and regional transportation, including working closely with Transport Kendall, co-chaired by the City of Cambridge and the Kendall Square Association. Working with leaders like the Cambridge Redevelopment Authority, the Cambridge Innovation Center and other local companies, Transport Kendall is advocating for solutions to Greater Boston's transportation challenges.

Transport Kendall focus areas include:

- Grand Junction Corridor: Maximizing transportation benefits for pedestrians, cyclists, and transit riders.

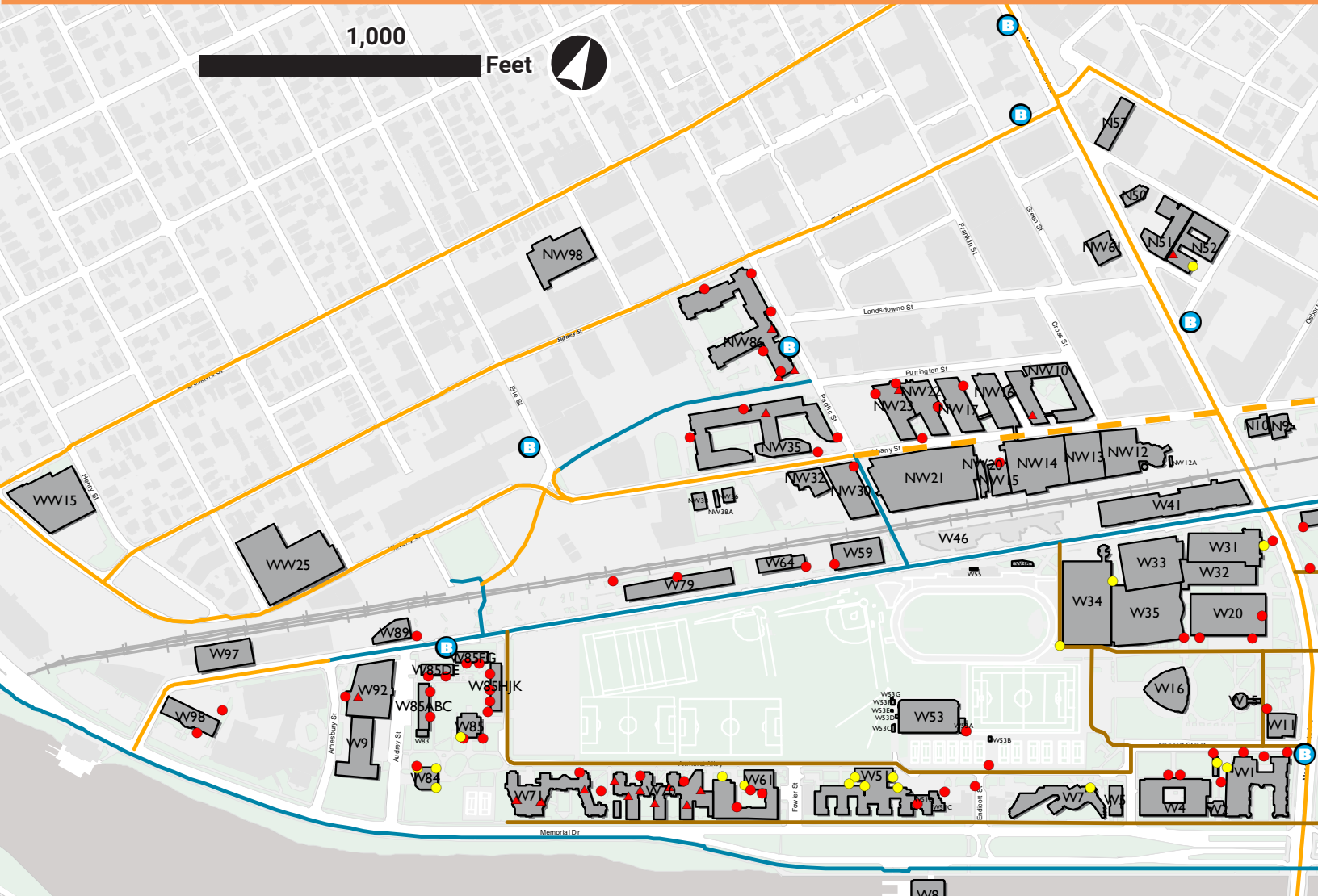
- Red Line: Improving operational capacity and reliability to meet current and future demands.
- Bus Connections: Improving and increasing direct connections to and from Kendall Square.

Additionally, MIT has advocated for a Grand Junction transit and multi-use path connection to the proposed West Station as part of the I-90 interchange project. The Institute has committed to provide \$8.5 million for the design and construction of the multi-use path in Cambridge and has provided \$500,000 for design and plans to construct the path on MIT property.

## MIT Bicycle Infrastructure

(Data as of June 30, 2019)

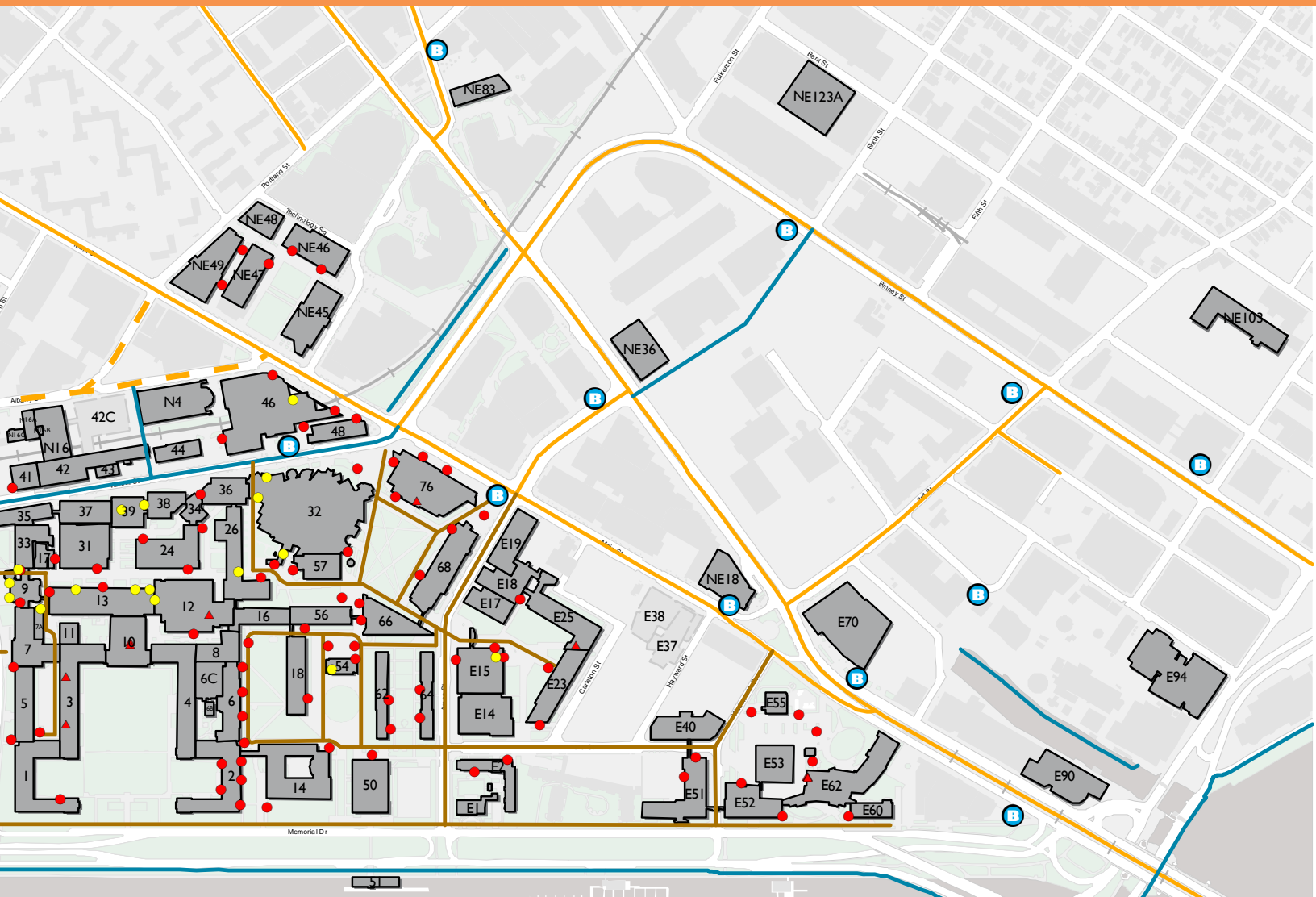
- Outdoor bike racks
- ▲ Indoor bike racks



Most recently, MIT has joined with 18 other large employers in Kendall for the Transportation ADVANCE initiative, sponsored by the Kendall Square Association. The ADVANCE concept is to engage Kendall employers, generate near-term pilot projects for companies to participate in, and tell the story of that experience in a summit to be held in spring 2021. MIT hopes to share its experience with Access MIT as an improved employee transit subsidy program with a switch from a parking pass to a daily parking fee. The kickoff meeting was held in November 2019, bringing together 40 senior leaders, pilot partners, and community stakeholders like the City of Cambridge.

MIT has joined with Kendall Square Association members and other businesses across the Commonwealth calling for a robust program of new transportation revenue and reforms to ensure that the transportation system the Commonwealth needs can be delivered. This work goes substantially beyond accelerated achievement of the “state-of-good-repair” policy of the MBTA — though also critical — to include a transformation of commuter rail and roadway pricing to reduce the highway congestion crisis that threatens the regional economy.

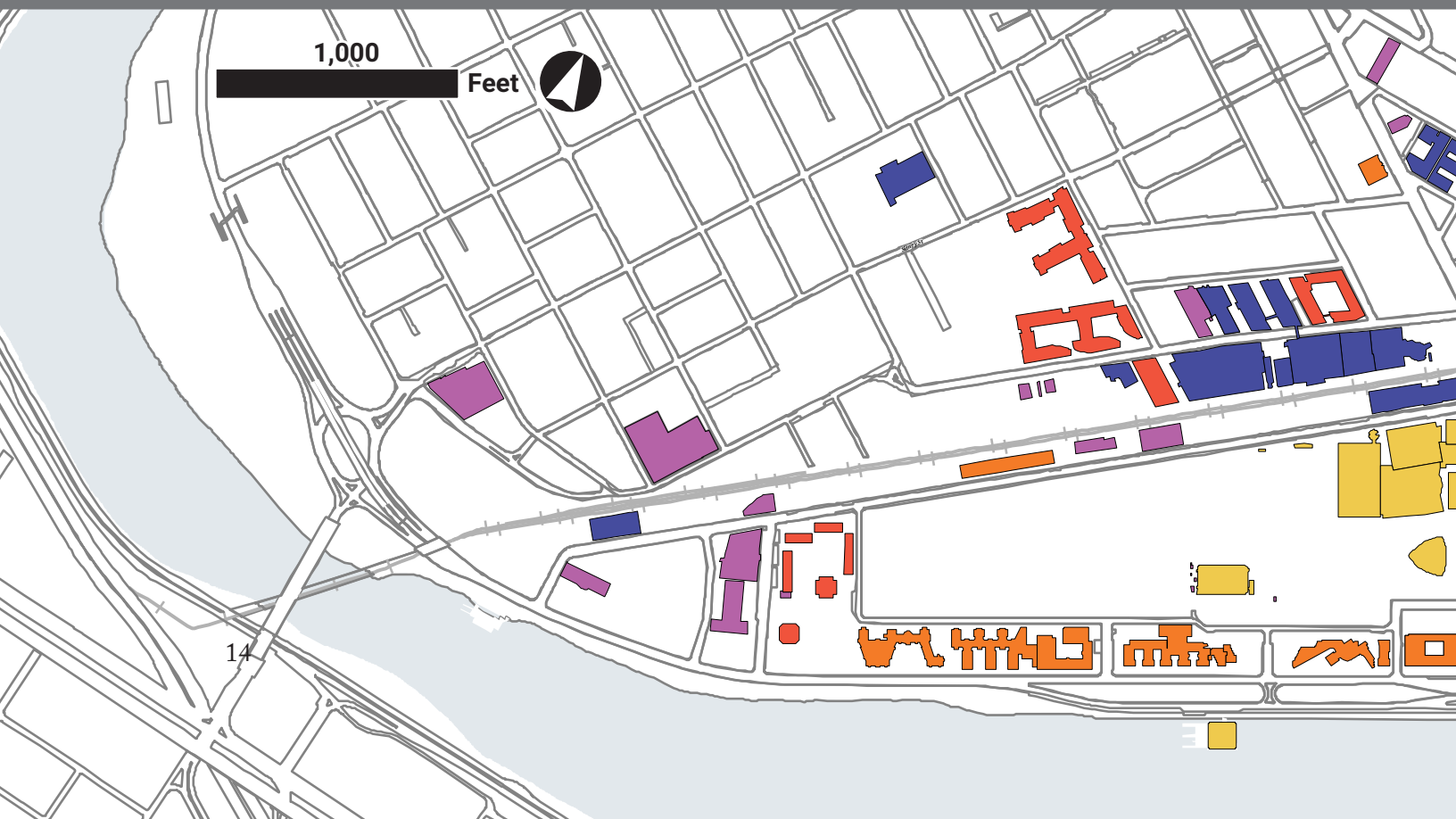
- Outdoor, covered bike racks
- Major campus pathways
- On-street bike routes
- B Bluebikes Stations
- Off-street bike routes
- On-street planned bike routes



Facilities and Land Owned	2015	2016	2017	2018	2019
<b>Acres</b>					
Tax Exempt	163	166	166	166	<b>168</b>
Taxable	95	92	92	92	<b>90</b>
Number of Buildings (academic)	108	111	114	114	<b>115</b>
<b>Dormitories</b>					
Number of Buildings	28	27	28	28	<b>28</b>
Number of Beds	5,739	5,422	5,898	5,662	<b>5,997</b>
<b>Size of Buildings (gross square feet unless otherwise noted)</b>					
Institutional/Academic	6,927,275	7,036,694	7,235,839	6,985,293	<b>7,223,070</b>
Student Activities/Athletic/Service	2,195,897	2,247,058	2,243,358	2,068,551	<b>2,063,599</b>
Dormitory/Nontaxable Residential	2,922,128	2,866,373	2,882,602	2,882,602	<b>2,882,602</b>
Commercial (in square feet)	5,356,423	6,109,827	6,337,516	6,403,144	<b>6,408,948</b>
Taxable Residential (in rental units)	164	163	163	163	<b>163</b>

## MIT Buildings and Occupied Spaces by Use

(Data as of June 30, 2019)





## Real Estate Leased

Use	Leased Location*	Sq Ft**
Institutional/Academic	1 Cambridge	35,594
Institutional/Academic	1 Kendall	22,506
Institutional/Academic	1 Main St	63,407
Institutional/Academic	1 Rogers	24,046
Institutional/Academic	105 Broadway	47,488
Institutional/Academic	222 Third Street	2,584
Institutional/Academic	245 First St	19,805
Institutional/Academic	300 Tech Sq	6,451
Institutional/Academic	400 Tech Sq	10,901
Institutional/Academic	500 Tech Sq	93,108
Institutional/Academic	600 Tech Sq	108,907
Institutional/Academic	700 Tech Sq	14,253
<b>Total</b>		<b>449,050</b>

\* Leased by MIT from third-party landlords.

\*\*The Sq Ft may only be a portion of the entire building.

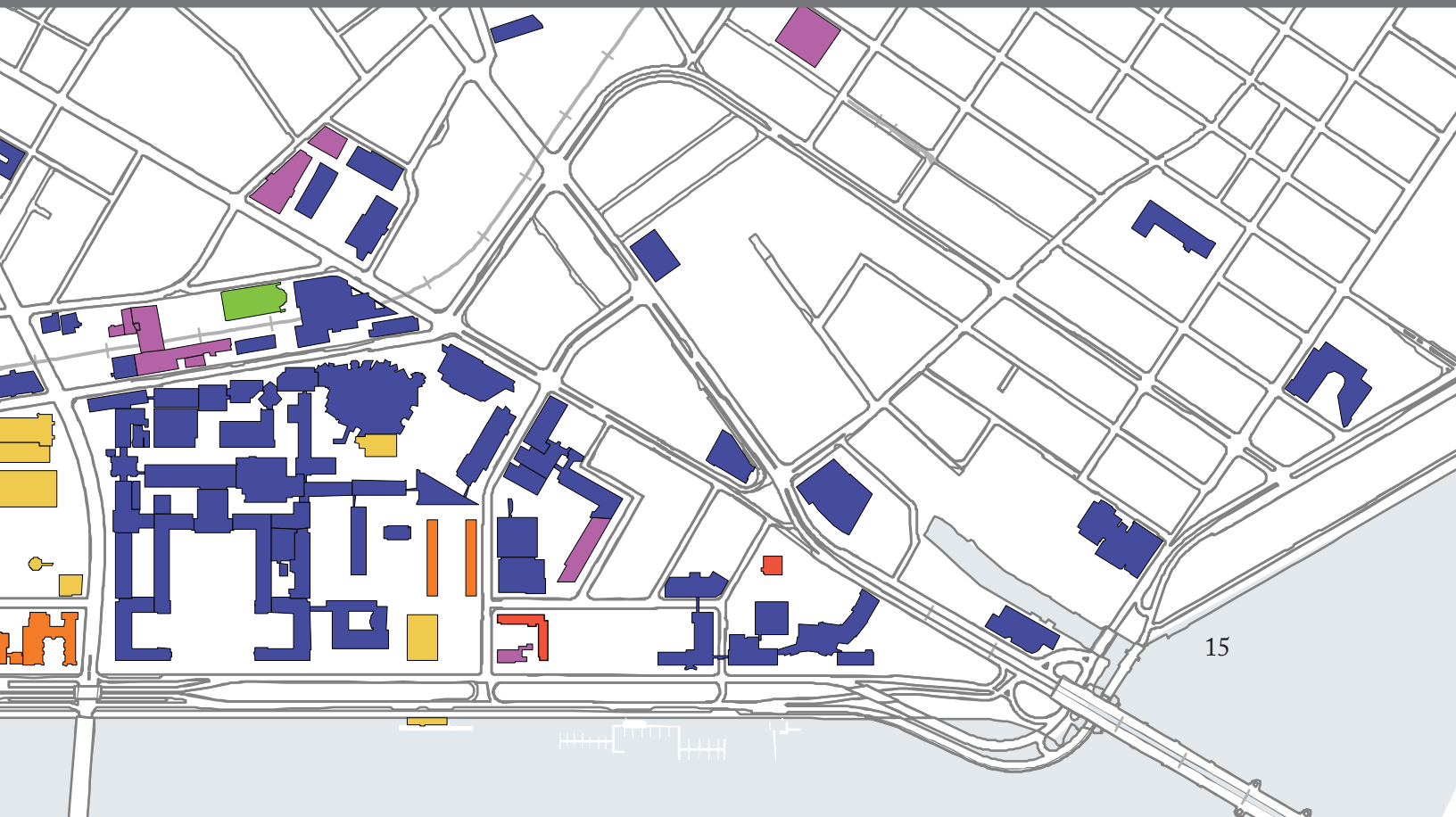
## Property Transfers

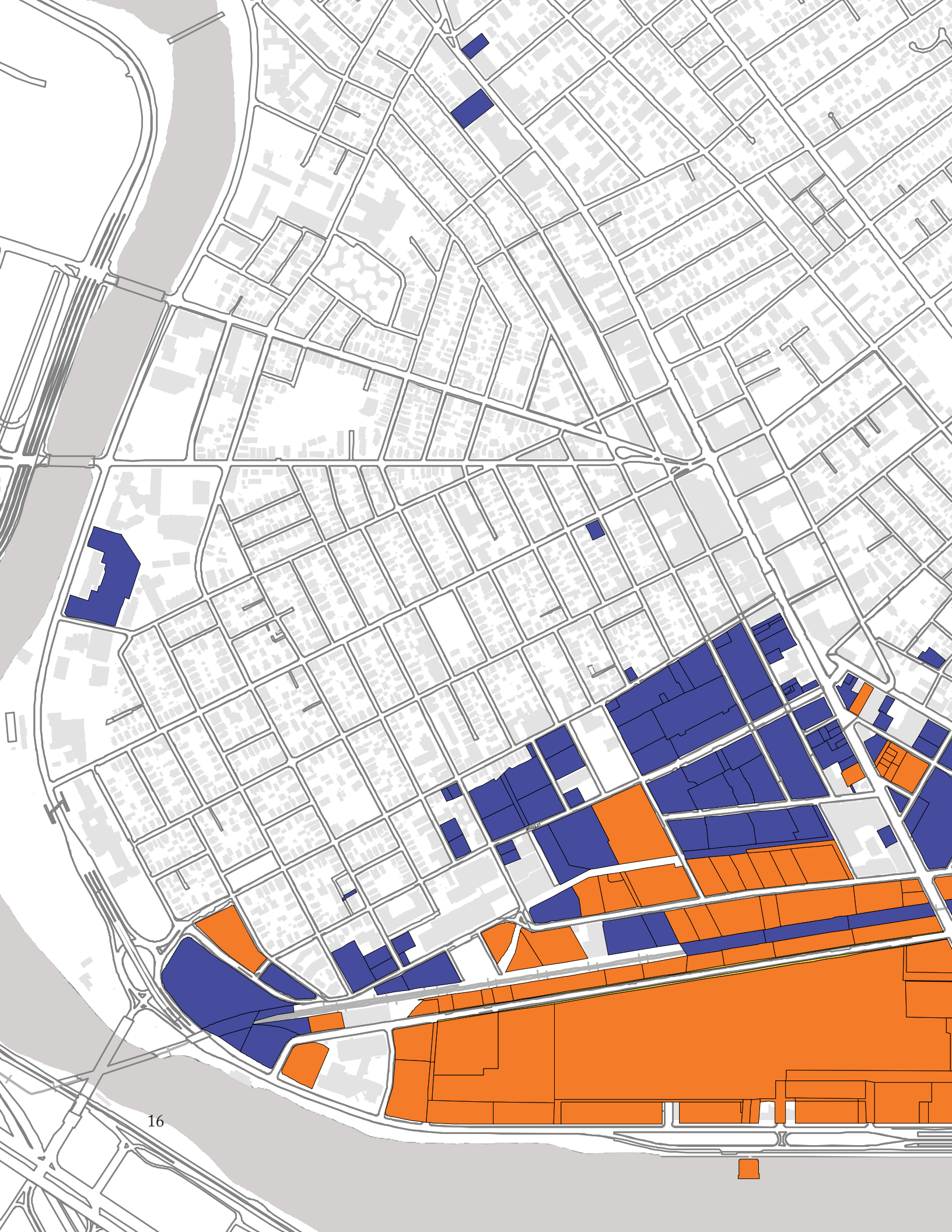
**Cambridge properties purchased since filing previous Town Gown Report: None**

**Cambridge properties sold since filing previous Town Gown Report: None**

**Planned dispositions or acquisitions: None**

Athletics & Student Life
  Residential - Undergraduate
  Parking Garage





# MIT Property in Cambridge

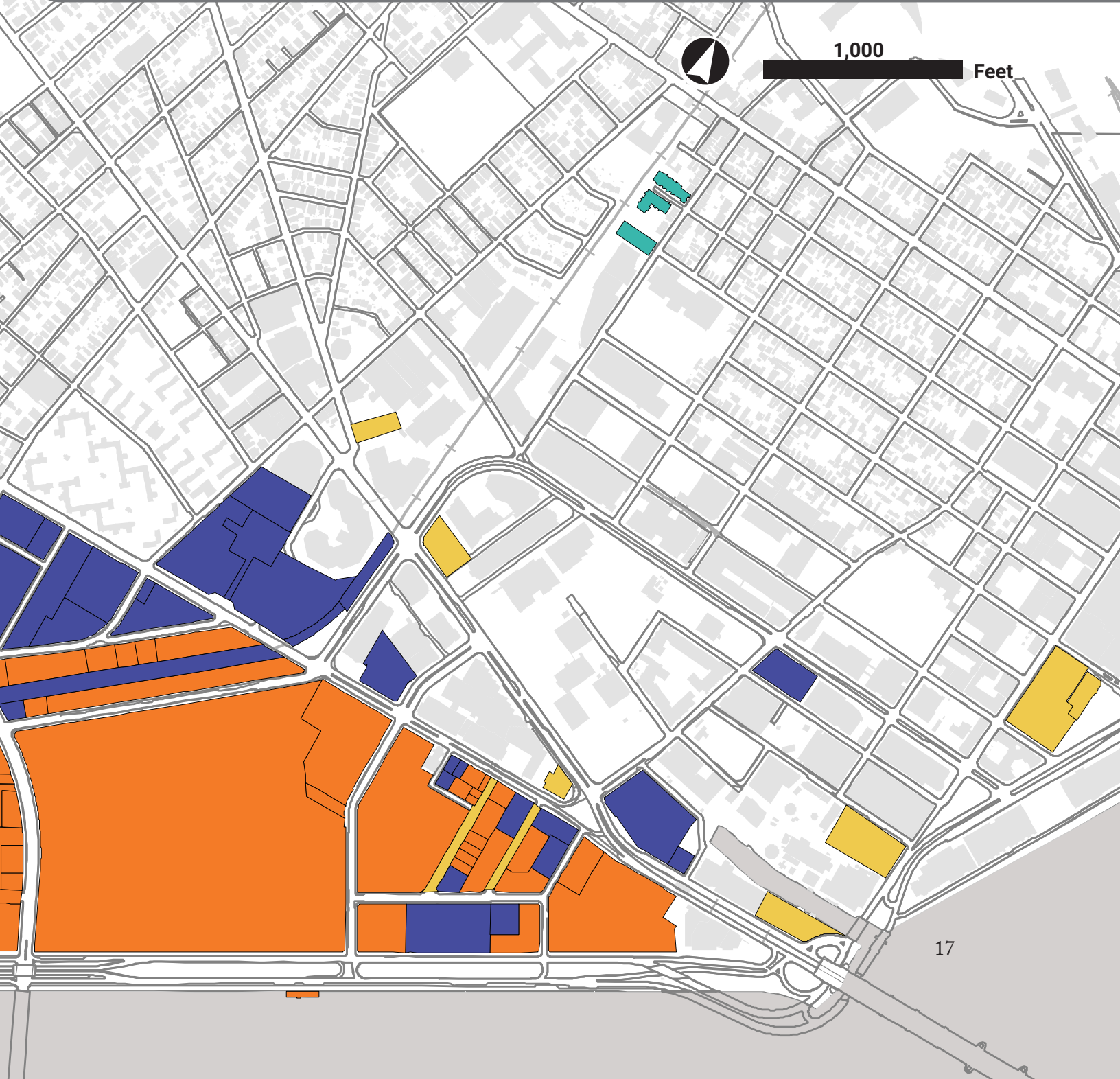
Data as of June 30, 2019

Academic Plant

Academic Leased

Investment Property

Investment Property - Condominium Only



# Campus Planning

## Major projects integrate the campus with the community

The many projects that will be completed in 2020 are building blocks for the Institute's strategy of providing infrastructure and initiating key renovations to create welcoming and active places for people. These projects will greatly improve energy resiliency and efficiency and will unlock the opportunity for large-scale residential renovations over several years.

The Kendall Square projects being completed in 2020 will create a greater sense of place for both the Institute and its neighbors and more seamlessly integrate academic pursuits with industry. The aim is to convey the Institute's "MIT-ness" by highlighting innovation in its many forms so that Cambridge residents and visitors from around the world can experience the fast-paced

excitement that is characteristic of MIT and Kendall Square.

Even as the initial set of Kendall projects open, other projects in Kendall and at Volpe are in planning, design or construction. All these projects will create and extend open space and a renewed streetscape, enlivening Kendall Square, Volpe and the campus.

There are also a new set of campus projects – Music, Burton-Conner House renovation, Metropolitan Warehouse, the Schwarzman College of Computing, the Grand Junction multi-use path, and graduate housing – that will provide new streetscape and placemaking opportunities, and extend transportation infrastructure.





## 2020 Projects

### MIT Museum

A new purpose-designed building will provide 200% more programmatic space for the museum, including galleries, classrooms, and meeting rooms. The building which will house the MIT Museum will also include the MIT Press Bookstore, ground floor retail, and commercial office space. The building will welcome the public as a literal and figurative entranceway to the Institute, framing a vibrant crossroads in Kendall.

### MIT Admissions

A modernized MIT Admissions, housed beneath the graduate tower in Kendall, will be the new face of the Institute for prospective students. Within the same building, the MIT Forum will provide a gathering space for admissions programming, as well as for a range of presentations from the wider MIT and Cambridge community.

### Innovation and entrepreneurship hub

This new hub will house the MIT Innovation Initiative and other key partners in the Institute-wide innovation ecosystem. The top four floors will become open, multiuse spaces for makers and students, researchers and staff; powering the exchange of ideas between the problem solvers of MIT and the broader innovation community of Kendall Square.

### Open spaces

Two acres of new and repurposed open space will invite the MIT and the Cambridge communities to come together and unwind, connect, and discover. Pockets of activity programmed by MIT — such as pop up performances, hands-on science activities, and outdoor movies — will draw in passersby and infuse the Kendall area with a vibrant energy.

### Graduate residence

As mentioned in the Housing section, a new residential space will give MIT's graduate students, including those with families, a campus home at the nexus of academia and industry. The new residence will feature roughly 450 living units; a host of common areas including study spaces, a playroom, and a terrace; and a childcare center to benefit the entire MIT community.

### Central Utilities Plant Expansion

The upgraded Central Utilities Plant will conserve energy and lower emissions while also improving the resiliency of the campus. By upgrading the cogeneration plant, MIT is creating a flexible power system that positions the Institute to explore emerging sustainability and efficiency measures. Able to adapt and evolve in response to advances in the energy field, the

new plant is central to MIT's commitment to reduce greenhouse gas emissions by at least 32% by 2030.

### **Vassar Street Undergraduate Residence Hall**

As part of its mission to enhance the student experience, MIT is developing a new undergraduate residence hall on Vassar Street. In addition

to contributing to the student life experience at MIT, the new residence will provide MIT with flexibility and capacity as it continues with its comprehensive renewal of campus housing.

In and around these projects, MIT has new opportunities for making campus improvements to public and private streets, plazas and green spaces.

## **Campus Streetscapes and Open Space**

### **Vassar Street**

Vassar Street is celebrated for its first-in-the-nation bicycle track that transformed a drab, industrial service corridor by burying utilities underground and creating a cohesive streetscape of trees with attractive paving and street lighting. While the trees on the western end of Vassar Street have fared well, many of the trees on the eastern end of Vassar have not.

MIT will be reestablishing the structural soil and planting more than 50 new trees from Mass Ave. to Main Street. The plan is to carefully coordinate with ongoing utility and building construction along Vassar Street, including the planned Schwarzman College of Computing building (Building 45). Most of the new trees will be planted in the spring of 2020, with the balance to follow as other building and utility projects unfold.

The proposed use of the Metropolitan Storage Warehouse for the School of Architecture & Planning and the Project Manus makerspace will bring new life to this historic structure, dramatically altering this section of Vassar Street and enlivening the Massachusetts Avenue corner. This project provides an opportunity to create an improved and expanded sidewalk and

landscape space by reclaiming an area previously used as a loading zone.

The new undergraduate residence on Vassar Street will improve the Vassar streetscape with new planting, creative architecture, bike parking, and benches. It will also improve the pedestrian and bicycle crossing of the railroad tracks at Pacific Street by enlarging and transforming the space south of the tracks into a lively urban plaza that will improve the pedestrian environment and properly connect cyclists to and from the Vassar Street cycle tracks.

### **Grand Junction**

The Grand Junction bicycle and pedestrian path passes through the northern edge of the main campus. MIT contributed \$500,000 for the design and construction of a pathway for bicyclists and pedestrians alongside the rail line between Main Street and Broadway and contributed another \$500,000 in 2017 for the design of a multiuse pathway that would run on MIT property in the railroad corridor west of Main Street.

MIT will construct the pathway on MIT property for an estimated additional \$8 million and provide an easement through its property for

## Open Space Programming

MIT's Kendall Square Initiative — which includes innovation space, housing, childcare, retail, lab and office space, and a new home for the MIT Museum — includes almost two acres of green, outdoor space. This open space, which includes an area for outdoor movies, pedestrian pathways, and a stage, will feature active, vibrant programming designed to engage the MIT, Cambridge, and Kendall Square communities.

Warm, quirky, playful, and inclusive, these free programs will create connections and energize open spaces in creative and enduring ways. Participants can expect a wide range of offerings in the Kendall open spaces, including fitness and wellness activities; arts and culture programming; events geared towards families and children; networking and social events; and events that will showcase MIT innovations with the public.

Jessie Schlosser Smith, who was hired in 2018 as director of Open Space Programming, began her work by gathering input from potential collaborators across the Cambridge, MIT, and Kendall Square communities. While the Kendall open spaces have been under construction, she has presented pilot programs in outdoor spaces on MIT's campus, experimenting with a range of events and activities.



One such program was a Winter Family Day, which took place on MIT's North Court (now Hockfield Court) and on the first floor of the Koch Institute For Integrative Cancer Research. An estimated 800 visitors enjoyed indoor and outdoor activities with a range of collaborators including the Community Art Center, MIT's Curling Club, the Department of Play, Peter DiMuro/Public Displays of Motion and friends from the Dance Complex Community, and a yo-yo performance by Alexander Hattori, MIT senior in Mechanical Engineering and six-time national yo-yo champion.

The open space team will continue to work with collaborators to produce pilot programs on open spaces around MIT's campus, preparing for programming to begin in Kendall in 2021.

As part of the community planning process for the Kendall Square Initiative, the importance of activating the outdoor open spaces through vibrant programs and activities came up again and again. MIT is delighted to respond to this desire with open space programming.



the path. The 2014 MIT feasibility study demonstrated that while a pathway is possible, it would not be without its own challenges and compromises. Unlike most areas on the Grand Junction, long abandoned by industrial customers, the right-of-way is an everyday part of MIT's service and utilities network. MIT is working closely with the City-managed design team to overcome these challenges and deliver a key component of bicycle and pedestrian connections within Cambridge and, in the future, to key nodes of activity in Allston and North Station.

While transit use in the corridor has been contemplated for some time, the Kendall Square Mobility Task Force report confirmed that the desired 10-15 minute headway service will require two-track service, now available only in a portion of the corridor. MIT believes that the transformation of the Grand Junction will fur-

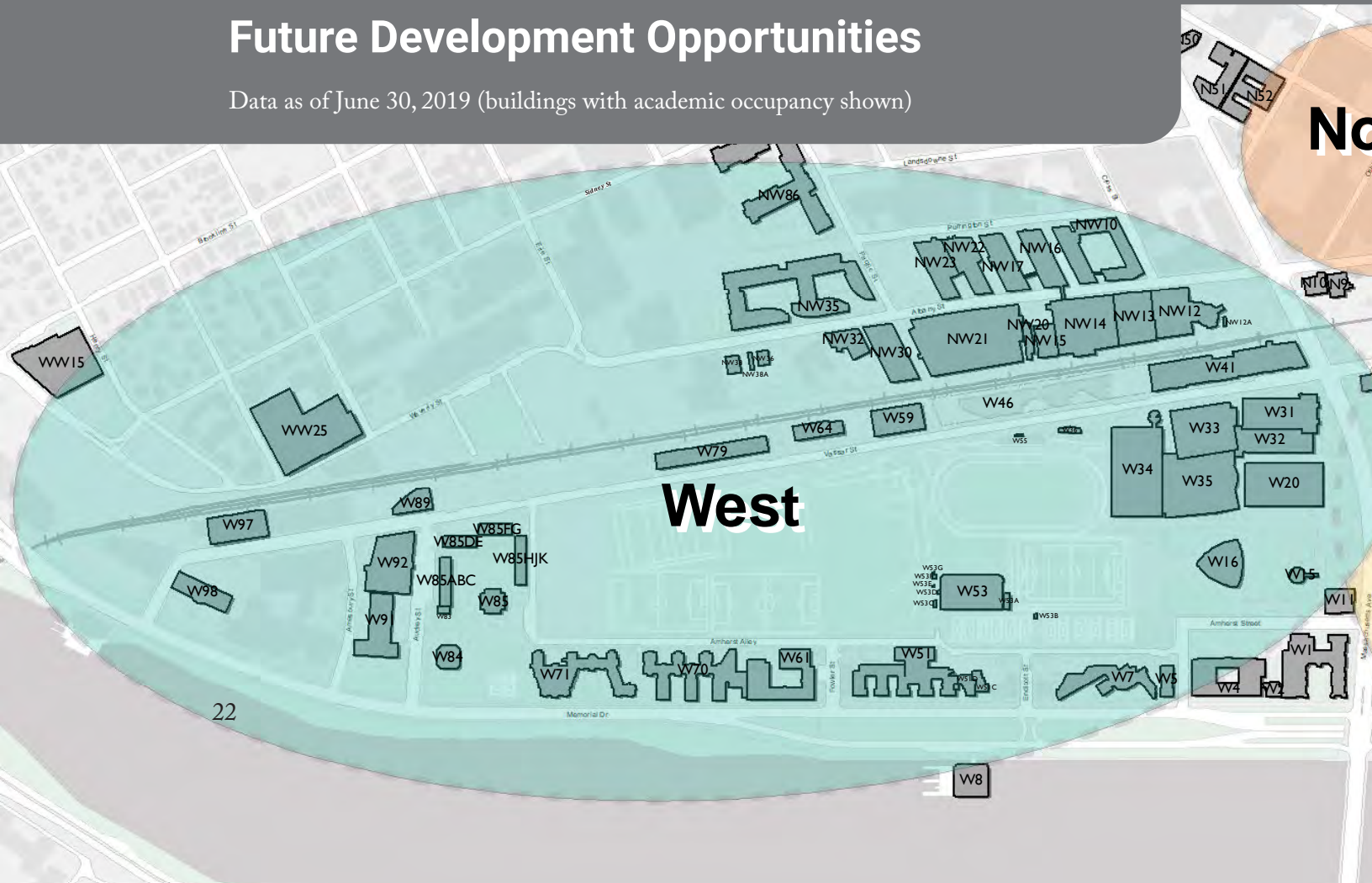
ther knit the Cambridge and MIT communities together. The Commonwealth's Rail Vision study and its recent policy initiatives acting on this vision have placed the Grand Junction firmly on the transportation horizon. Cambridge and MIT will be poised to take advantage of new connections to North Station, Allston and beyond.

### Ames Street and Memorial Drive

One of the biggest opportunities to improve open space is by making safe and inviting connections between existing open spaces in the City. MIT is building a two-way at-grade cycle track on Ames Street from Main Street to Memorial Drive, extending the improvements made to the 6th Street landscaped walkway and the two-way cycle track on Ames Street from Broadway to Main Street. MIT is also constructing a new signalized crossing to the

## Future Development Opportunities

Data as of June 30, 2019 (buildings with academic occupancy shown)





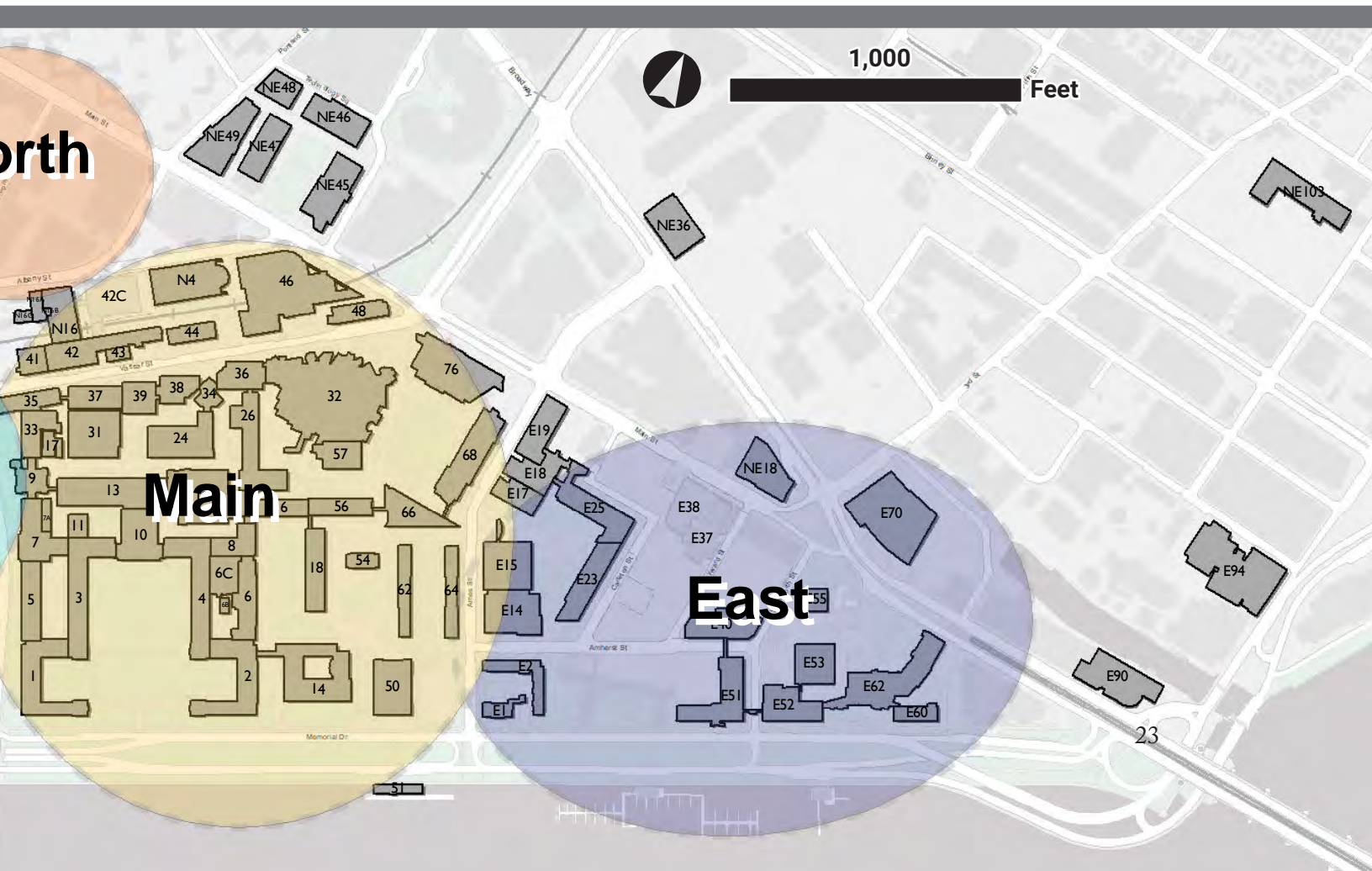
Paul Dudley White multi-use path along the Charles River. This new signal would continue MIT's practice of installing key traffic signals along Memorial Drive in front of the campus to create safe crossing points for everyone in the Cambridge community. These include the traffic signals at Wadsworth Street, Massachusetts Avenue and at Endicott Street. Most recently, MIT partnered with DCR for the installation of a speed feedback sign on the eastbound lane of Memorial Drive to slow vehicles emerging from the Massachusetts Avenue underpass.

### Commercial Corridors

Areas of campus that border major commercial corridors also provide opportunities to improve connections between the campus and the City. The 730-750 Main Street block (in the "North" area of the Future Development Opportunities map) had long been identified as an optimal

size and dimension for a research & development building. Renovation of these buildings for The Engine will create an additional 200,000 square feet of shared office, fabrication, and lab space for The Engine with the capacity to accommodate approximately 100 companies and 800 entrepreneurs to further foster "tough tech," transformative technology that takes the long view, solving the world's important challenges through the convergence of breakthrough science, engineering, and leadership.

Another key step will be the redevelopment of the triangular-shaped 600 Main Street block. This site is relatively close to the core campus and its scale makes it an attractive site for research uses. The site also provides an opportunity to complete the street frontage along Main Street opposite Technology Square with retail and restaurant space.



## Capital Renewal

Stewardship of our campus requires continued investment to preserve iconic buildings and to renew systems that support the teaching, research and student life mission of MIT. Many of the large building renovation projects initiated through the MIT 2030 capital plan have created modern spaces with updated energy efficient systems needed to meet the challenging demands of contemporary research. Additionally, it has enhanced community and residential spaces essential for the thousands of people who work, play and live in this vibrant community. The Institute recognizes this is a long-term effort, which requires careful planning of resources and attention to mitigation of construction disruption. The ambitions for the renewal program are high and, with perseverance, progress will continue in retiring deferred maintenance and sustaining MIT's position as a global leader in teaching and research. A few of the renewal projects initiated over the past year are highlighted here.

### Building 1 Ziggurat

Architect William Wells Bosworth integrated four ziggurats into the original Main Group complex in 1913. These stepped towers, accentuating four corners of Killian Court, are iconic elements of MIT's largest and most public green space overlooking the Charles River. MIT has embarked on the renewal of the Building 1 Ziggurat after its 100+ year old asphalt waterproofing failed, causing damaging leaks that disrupted the teaching space in the building. Led by a restoration team of Simpson, Gumpertz and Hager, Inc. and executed by Tishman Construction, the Ziggurat limestone will be carefully measured and disassembled, a new waterproofing will be installed over the original concrete structure, and the ziggurat will be rebuilt within a 12-month period. Careful planning, engineering and construction logistics are key elements to preserve the historic architectural details, minimize disruption in Killian Court and, most of all, ensure the repairs will extend the life of this legacy building.



### **Kendall/East Campus Steam Project**

MIT has an intricate system for distribution and delivery of steam generated at the Central Utilities Plant and delivered to buildings for heating, creating domestic hot water and in some cases, to support process needs in research labs. There are approximately 2.7 miles of pipes below grade in dedicated tunnels and in basements, transporting pressurized steam and returning condensate to the Central Utilities Plant, and much like our buildings, this system requires periodic renewal. Annually, MIT completes surveys of the steam lines to ensure integrity and plan renewal projects. In 2019, a renewal of aged steam pipes was initiated near the Sloan School of Management to correct a section of pipe where the insulation had failed. Typically, this piping will last for 40-50 years, however, this life can be reduced when pipes are buried in areas of adverse environmental conditions (e.g. ground water). Replacement of 360 linear feet of steam and condensate pipe is underway, requiring ongoing coordination with the City of Cambridge where our utilities cross public rights of way. Harnessing our internal knowledge, MIT engineers began the development of the design plans which were then completed by Vanderweil Engineers, and work is being executed on the Main Campus and West Campus by Bond Brothers, D'Allessandro Corp, and Beacon Piping.

### **NW14 Electrical, Accessibility, & IS&T Upgrades**

Building NW14 (Francis Bitter Magnet Lab) on Albany Street was constructed in 1913 for the Ward Baking Company. The 37,500 square foot building was purchased in 1962 by MIT and is now occupied by the Francis Bitter National Magnet Lab. Renewal of the electrical system in this brick-clad steel and concrete structure was needed to enable innovative research by MIT faculty. Over time, there has been growth in MIT's research with super cooled magnets in NW14 and other buildings in this area of the campus. This new research has required increased electrical power needs that the building was unable to support and necessitated a renewal of the building's primary electric service. In addition, the Institute recognized a need to improve access (ADA ramps and restroom accommodations) and upgrade/expand the capacity of the telephone and data network for the occupants. This full renewal will enhance the research capacity for the building and ensure universal access needs for the MIT community. Investments in priority systems is a first step in a longer-term renewal intended to recognize the viability of these older buildings to support high tech research needs of new and existing programs.



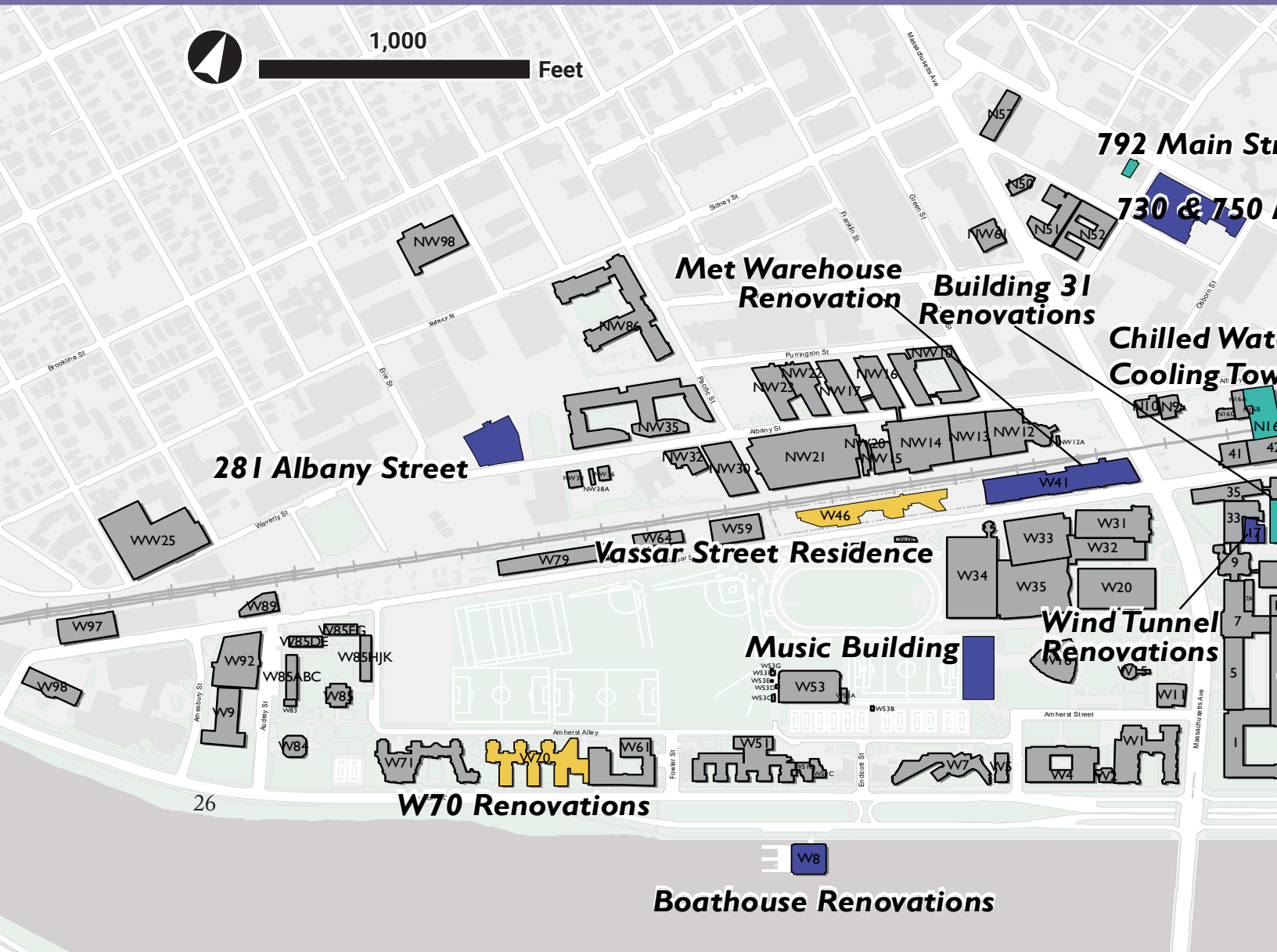


# Projects

## Completed in Reporting Period

### 139 Main Street

MIT completed the comprehensive restoration of this historic 37,600 square foot building in 2019. Working closely with Cambridge Historic Commission staff, the team rebuilt the building foundations, restored the exterior masonry, and replaced all mechanical, electrical, and plumbing systems. The Institute completed the build-out of interior spaces into small and mid-size office suites and have fully leased the entire building to several tenants.



1,000 Feet

**Met Warehouse Renovation**  
**Building 31 Renovations**

**792 Main Street**  
**730 & 750 Main Street**

**Chilled Water Cooling Tower**

**281 Albany Street**

**Vassar Street Residence**

**Music Building**

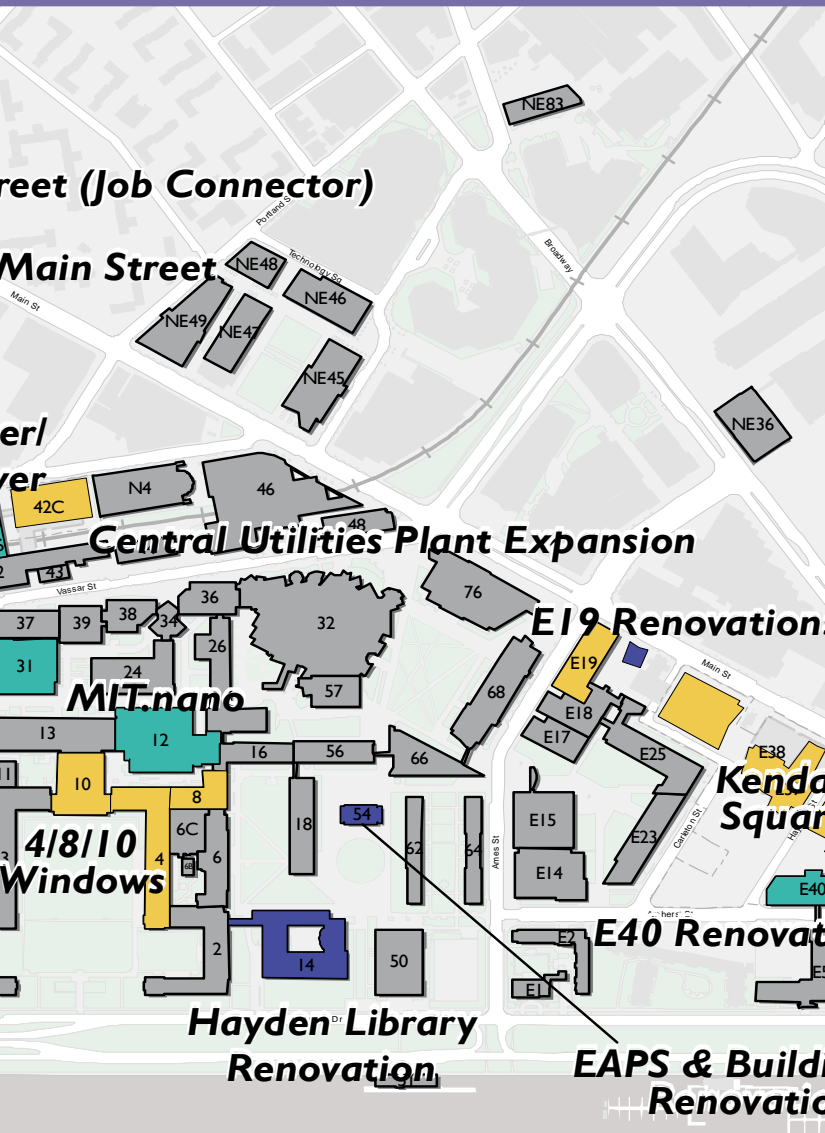
**Wind Tunnel Renovations**

**W70 Renovations**

**Boathouse Renovations**

### 792 Main Street (Job Connector)

In conjunction with its Volpe site zoning approval, MIT committed to creating a Job Connector program for Cambridge residents. MIT spent the past year working with a consultant to collect input from public officials, residents, and neighborhood representatives about what kinds of workforce development and job readiness programs and support are most needed in the community. Earlier this year MIT opened the Job Connector at 792 Main Street in a new, fully renovated space near The Port neighborhood, and is beginning to roll out programs to serve Cambridge residents.



## MIT Major Projects

Data as of June 30, 2019 (buildings with academic occupancy shown)

- Planning/Design
- Construction
- Completed
- Developed by others

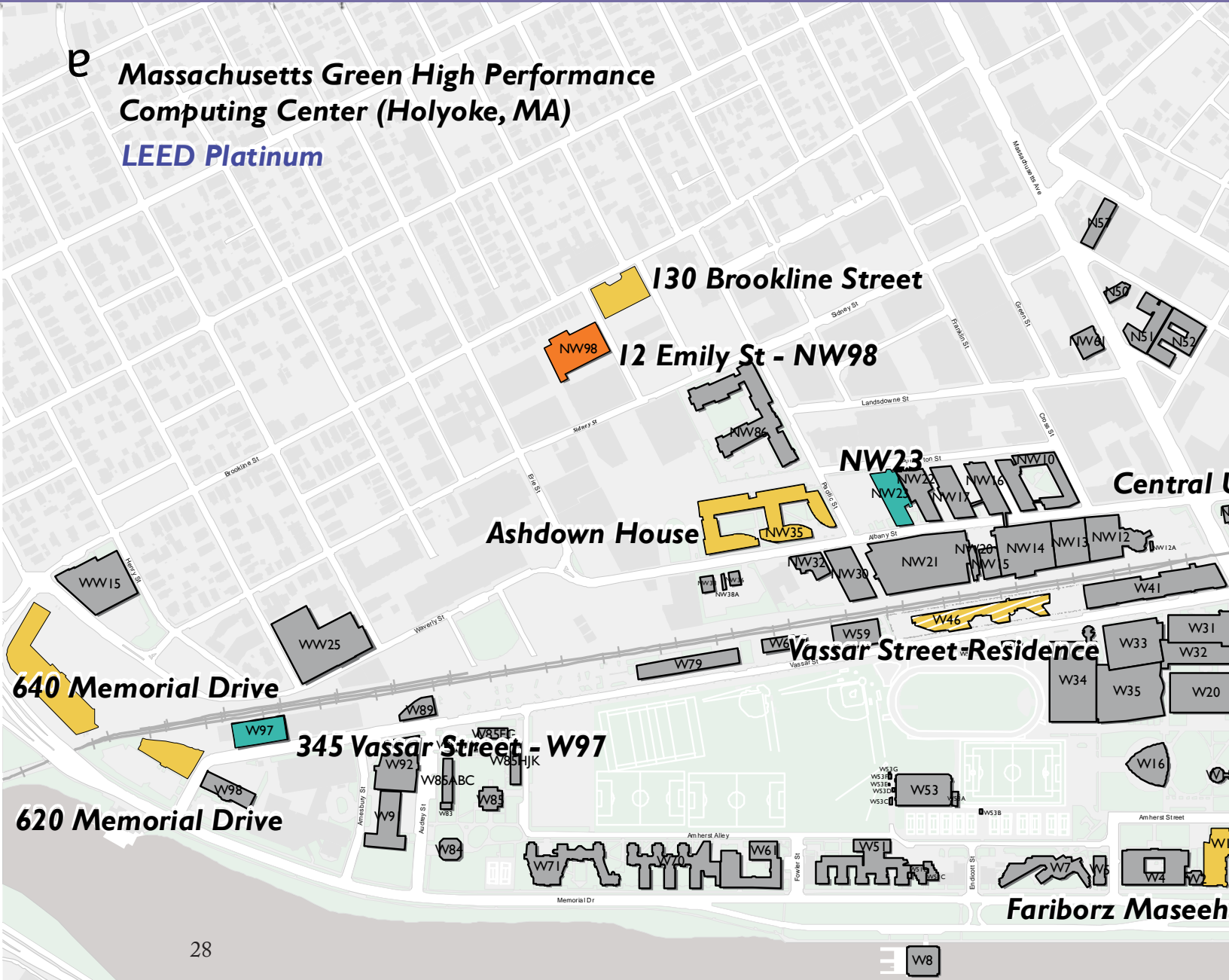


## In Construction

### Wright Brothers Wind Tunnel

Since it first opened in September 1938, MIT's Wright Brothers Wind Tunnel has been an instrumental tool in the development of aerospace, architectural, vehicular, sports, and other engineering systems. Testing at the facility has ranged from aircraft and ground structure aeroelasticity to the aerodynamics of subway station entrances, space suits, racing bicycles, and Olympic ski suits. After 80 years of service, the

**e Massachusetts Green High Performance Computing Center (Holyoke, MA)**  
**LEED Platinum**



landmark facility is now undergoing a renovation and modernization project.

The new tunnel will incorporate state-of-the-art technologies and equipment that will expand its capacity while lowering its fan motor power consumption. With a planned test area volume of 1700 cubic feet and the ability to test speeds up to 200 mph, it is expected to be the largest and most advanced academic wind tunnel in the nation. Located at Building 17 on the site of

the current tunnel (which has been dismantled), the new facility will retain the Wright Brothers Wind Tunnel name.

Renovation plans include updated control facilities, a full rehabilitation of Building 17, and infrastructure updates in Building 37 and in the Building 33 Hangar. The project will also create direct connections between the tunnel and AeroAstro workshops. Imai Keller Moore Architects are the designers of the renovation.



## In Construction

### Building 4 Laboratory Renovation

The Chemistry Undergraduate Teaching Laboratory has relocated from Building 4 to the new MIT.nano building, vacating approximately 20,000 gross square feet on the 4th floor. The relocation of this major teaching laboratory presents the opportunity to fully renovate 12,000 square feet of space for the Department of Earth, Atmospheric & Planetary Sciences (EAPS). EAPS plans to establish world-class

wet lab facilities in support of the department's research in the fields of climate science and atmospheric chemistry. The remaining quarter of the space will be reserved for future wet labs. The project is designed by Payette Associates and will be constructed by Columbia Construction. The project is targeting LEED Gold in the Commercial Interiors program with completion planned for 2020.

### Central Utilities Plant Upgrade

Work continues to upgrade MIT's Central Utilities Plant (CUP), a distributed energy resource (DER) that powers the campus microgrid with thermal and electric energy. The CUP upgrade is essential to the Institute's sustainability goals and will improve campus resiliency by creating an enhanced, more efficient, more flexible power system. The CUP's efficiency and environmental gains will result from the installation of new and upgraded equipment as well as the switch to natural gas and the elimination of No.6 oil use. Regulated pollutants will be reduced 25% from 2014 levels. Starting in 2020, greenhouse gas emissions are expected to be 10% lower than 2014 levels, offsetting a projected 10% increase in greenhouse gas emissions due to energy demands created by new buildings and program growth.

Two new gas turbines will provide up to 44 MW 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. In most situations when outside power is lost, the new turbines will maintain or restore heat and electricity for most of the campus, safeguarding residences and protecting vital research. Construction of the new cogeneration plant housing the turbines commenced in the summer of 2017. Both new turbines are expected to be in operation in 2020.



The new plant building is located in a former 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 engineer for the project is Vanderweil Engineers' Power Group. The architect for the building is Ellenzweig, the firm that has led the architectural design for MIT's CUP for the past 20+ years.





### Vassar Street Residence

As part of its current Capital Renewal program, MIT is formulating a long-term plan to renew its undergraduate residences. This process will require vacating one residence at a time as each is renovated. This new undergraduate residence hall will create a capacity of 450 beds located on Vassar Street at the former sites of the West Garage (W45) and the Grounds Services facilities (W56/W57).

The residence hall's design (influenced by the Architectural Principles Document developed by a team of MIT students, faculty heads of house, and staff) includes rooms arranged in "clusters" of 35-38 students in a mix of singles and doubles with shared community spaces such as lounges and study rooms. Throughout the building, stairways have been located and designed to encourage communication and travel between the clusters. Residents will also enjoy larger shared community spaces such as study lounges, music rooms, a private courtyard, and

other flexible spaces. A dining facility on the first floor, open to the MIT community, will include a kitchen area where students will have the opportunity to cook for themselves.

The sustainability goals of the project include meeting a minimum LEED v4 Gold certification under the Homes and Multifamily Mid-rise program, as well as being solar-ready and Net Zero Ready. Outside the building, inviting benches will be located along the edge of Vassar Street, and a tree-filled entry courtyard and a plaza area will provide green space and gathering opportunities.

The design architect is Michael Maltzan Architecture and the executive architect is DiMella Shaffer. Construction, managed by Walsh Brothers, is scheduled to be completed by summer 2020 for fall semester occupancy.

### Construction Mitigation

MIT recognizes that construction projects can be disruptive and strives to minimize the inconvenience construction work creates. The Institute works closely with city staff to develop construction mitigation plans for all projects to ensure that truck routes, location of access gates, and hours of construction operation have the least possible impact on neighbors. MIT provides periodic online updates on construction activities using the coUrbanize platform, conducts frequent meetings with abutters, and

provides detailed responses to all questions received via email. The Institute also works closely with individual retailers that may be affected by the construction activities to ensure that their patrons know they are open for business. This includes helping tenants with additional signage and sending notices to tenant lists. Many retail tenants have experienced sales growth as a result of all the construction workers in Kendall Square.

## In Construction: Kendall Square Initiative

The Kendall Square Initiative includes six buildings: three sites will house office and/or R&D uses, one site will provide graduate student housing, an MIT Welcome Center, and other administrative office uses, and one site is proposed as a small retail building. Each building will include retail and/or active uses on the ground floor. The development also includes a significant publicly-accessible open space south of Main Street, and other landscape improvements throughout.

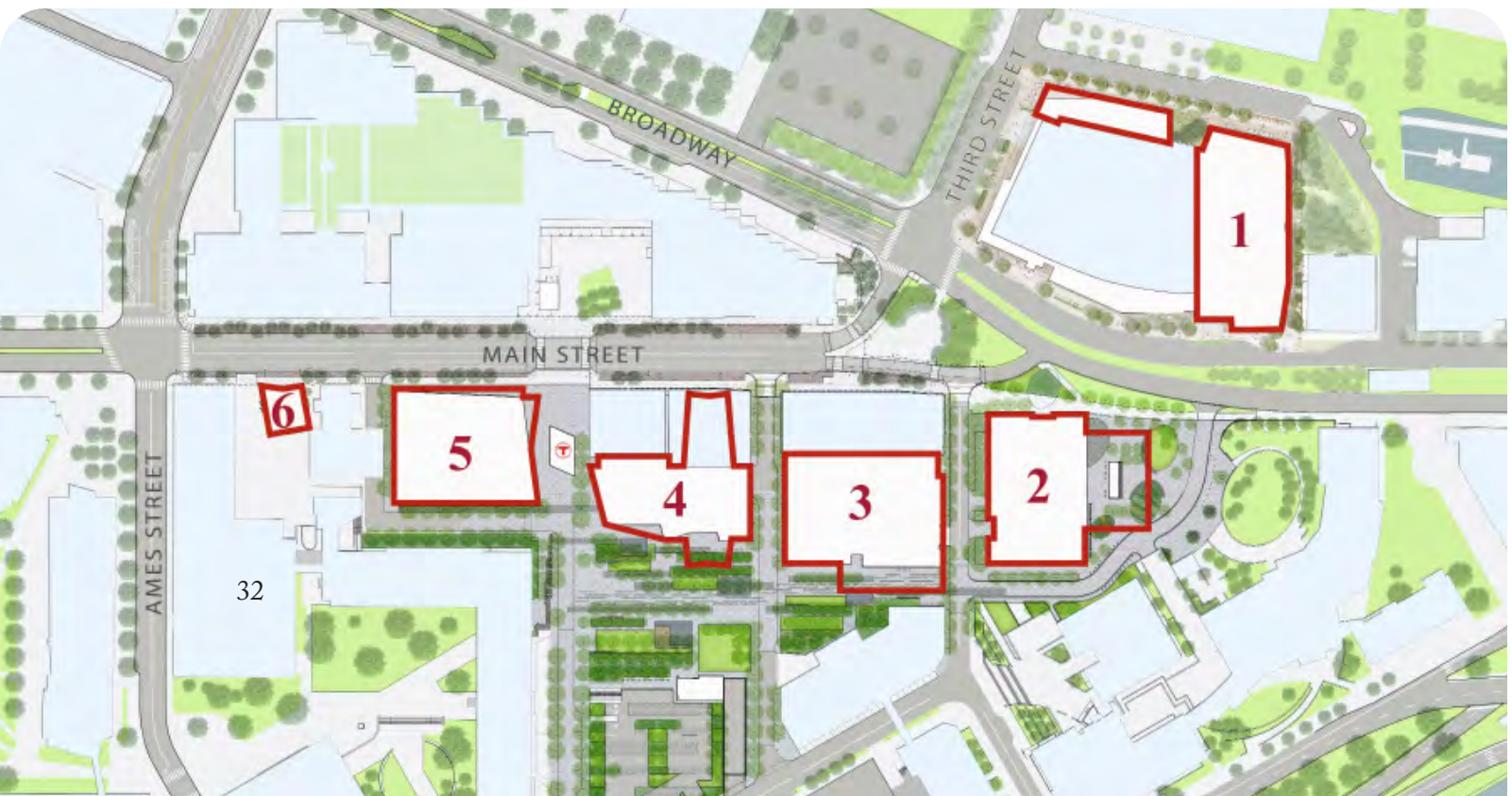
The project retains and incorporates the three historic buildings along Main Street: the Kendall Building (238 Main Street); the J.L. Hammett Building (264 Main Street) and the Suffolk Building (292 Main Street). Construction of the utility infrastructure started in late summer 2016, and includes new municipal water, sewer, and drain lines; private utility electric, gas, and telephone/data lines; and MIT electric, telephone/data, steam, and chilled water lines.

Construction of the below-grade garage and loading facilities south of Main Street started in early 2017 and is expected to be completed in 2020.

Construction on Site 4 (290 Main Street) continued through 2019. The contractor completed structural steel, concrete, and exterior façade construction earlier this year, and work has now moved to the interior spaces. The building is scheduled to open to new graduate students in the fall of 2020.

Construction on Site 5 (314 Main Street) broke ground on October 9, 2018 and the contractor completed the structure and exterior façade this summer. Interior work for the MIT Museum is about to commence, and will be followed by the installation of exhibits. The upper floors of the building are almost fully leased out to Boeing, Capital One, Cambridge Mobile Telematics and other companies performing research in information technology and artificial intelligence. MIT expects to complete the base building in the summer of 2020.

Construction on Site 3 (238 Main Street) started earlier this year. The work has progressed through steel erection up to the 7th floor, including the installation of the 10 place girders – each weighing over 90 tons – that support the cantilevered upper floors of the building.



MIT has made major progress on improvements on the north side of Main Street. The initial phase, completed earlier this year, included the relocation of the One Broadway lobby and the addition of new retail space on Third Street and Broadway, including Shy Bird and a relocated Dunkin' Donuts. This fall MIT welcomed Brothers Marketplace, the long-awaited and much needed grocery store. Located on the Main Street side of the building, the store offers prepared foods made in-store, baked goods, fresh produce, local seafood, meats, and local and international cheeses.

The second phase includes the retail addition on the north side of One Broadway on Broad Canal Way. MIT has completed the base building work and landscape improvements, and interior tenant work has started in two of the three spaces.

Construction of the final phase – the 300-unit apartment building with ground floor retail – is expected to commence later this fall.



## In Planning & Design

### MIT Stephen A. Schwarzman College of Computing

Announced in October 2018, the MIT Schwarzman College of Computing represents a \$1 billion commitment by MIT, enabled by a \$350 million gift from Stephen Schwarzman, chairman, CEO, and co-founder of global asset manager Blackstone.

The college aims to:

- Connect advances in computer science and machine learning with advances in MIT's other academic disciplines;
- Create 50 new faculty positions within the college and jointly with existing academic departments;
- Give MIT's five schools a shared structure for collaborative education, research, and innovation in computing and artificial intelligence;
- Educate all students to responsibly use and develop computing technologies to address pressing societal and global resource challenges; and

- Focus on public policy and ethical considerations relevant to computing, when applied to human-machine interfaces, autonomous operations, and data analytics.

MIT has identified a preferred location for the new MIT Stephen A. Schwarzman College of Computing headquarters: the current site of Building 44. The new building, which will require permitting and approvals from the City of Cambridge, will sit in a centralized location that promises to unite the many MIT departments, centers, and labs that integrate computing into their work.

Scheduled for completion in late 2022, the new building will serve as an interdisciplinary hub for research and innovation in computer science, AI, data science, and related fields that deal with computing advances, including how new computing methods can both address and pose societal challenges. The designer is Skidmore, Owings and Merrill LLP (SOM).





### **Metropolitan Storage Warehouse**

Designed by Peabody & Stearns and built in 1895, the Metropolitan Storage Warehouse is one of the oldest buildings on the MIT campus and is listed on the National Register of Historic Places. With its square brick tower and crenellated corbelled cornice, it resembles a medieval castle on a city street corner.

MIT is proposing to redevelop the Metropolitan Warehouse building as a center of interdisciplinary design research and education as well as a new home for the School of Architecture and Planning (SA+P). Elements under consideration include new classroom and design studio space that would significantly increase MIT's exhibition capacity for arts and design programming, new faculty offices, and new areas for meetings and collaborative activities. The building might also feature a new center for the arts and an independent community maker-space that would expand the design and fabrication facilities available to the campus.

The proposed redevelopment of the structure would endeavor to preserve the historic architecture while creating spaces that enhance the interdisciplinary interactions between SA+P and other schools at MIT. Retail space and a theater might also be included on the ground floor.

Diller Scofidio + Renfro is the designer for the Metropolitan Warehouse project.

### **Building 54 Renewal and Expansion**

The Cecil and Ida Green Building (Building 54) is the headquarters of MIT's Department of Earth, Atmospheric and Planetary Sciences (EAPS). Plans are now underway to give Building 54 a major facelift, including a new LEED-certified addition that will offer a window into the important work taking place inside. The upgrade will allow construction of an Earth and Environment Pavilion designed to be a vital center for environmental and climate research on MIT's campus. The project will yield about 12,000 square feet of additional space, providing new meeting places, classrooms, and study areas. The enlarged and revamped Green Building is expected to help EAPS attract and retain top faculty and students. But the more ambitious objective is to enhance the research undertaken within the department by co-locating EAPS and the MIT-Woods Hole Oceanographic Institution Joint Program with the MIT Environmental Solutions Initiative, affording greater opportunities for interaction and the cross-pollination of ideas.

## In Planning & Design

### Hayden Library

Originally designed by Voorhees, Walker, Foley & Smith, Hayden Library (Building 14) first opened in 1951 and has served for nearly 70 years as a central element of the campus. MIT is undertaking a project to renew and restore the Library's first two floors and mezzanine levels, updating the main reading rooms and office spaces to reflect the changing nature of the research library for today's students and faculty. Kennedy & Violich Architecture is the designer for the Hayden Library renovation.

The program includes new interactive spaces such as a café and a multipurpose event and teaching space, improved office spaces, and a variety of quiet and collaborative study and work-spaces for both individuals and groups.

Building 14 will also receive a range of infrastructure upgrades including systems improvements to support the new program, required code and accessibility upgrades, enlarged and renovated restrooms, and updates to improve energy performance. Exterior work will include restoration of the north and south windows, repairs to sections of the limestone walls, and refurbishment of the northeast entrance. The project is targeting LEED Gold v4 certification.

### Burton-Conner House

MIT's goals for renewal of Burton-Conner include providing a structurally sound and weather-tight building envelope, renewing or renovating plumbing, electrical and mechanical systems, as needed, to support the existing program. Life safety systems and devices to meet current codes will be installed. All accessibility requirements under the Massachusetts Architectural Access Board regulations will be met. Within the context of this project, MIT plans to advance its sustainability and GHG reduction goals and, where feasible, strengthen Burton-Conner's ability to withstand extreme heat and flood events, consistent with MIT climate resiliency efforts.

Goody Clancy is the designer for this renovation which is scheduled to begin in 2020.

### New Graduate Housing

As part of its commitment to expand the stock of graduate student housing, MIT is planning for 500-550 new graduate student beds. The siting process is underway and has focused on locations in the West and Northwest campus areas. Consistent with MIT's commitment, this project is on track to file for permits by the end of 2020.



### 750 Main

This summer, MIT announced the expansion of The Engine, the entity launched by MIT that invests in early-stage tough tech companies, to 750 Main Street, a property MIT previously identified as an optimal size for a research & development building. The renovation of this building and the expansion and renovation of the adjacent 730 Main Street building will further support the innovation ecosystem extending from Kendall Square. Interior enabling work has commenced, and construction is expected to start shortly.



### Pierce Boathouse

Originally designed by Anderson, Beckwith & Haible and dedicated in 1966, MIT's Harold W. Pierce Boathouse began as the home of a single crew team. The Institute's rowing program has grown considerably since then and now consists of four Division 1 varsity squads (80 men and 90 women). MIT club rowers also use the boathouse's storage and launch space, as do several public and community groups.

After conducting feasibility studies, MIT determined that a substantial renovation of the boathouse would support the Institute's Division 1 student-athletes and enhance the experience of the teams and the community. The building — to be renamed the Richard J. Resch Boat-

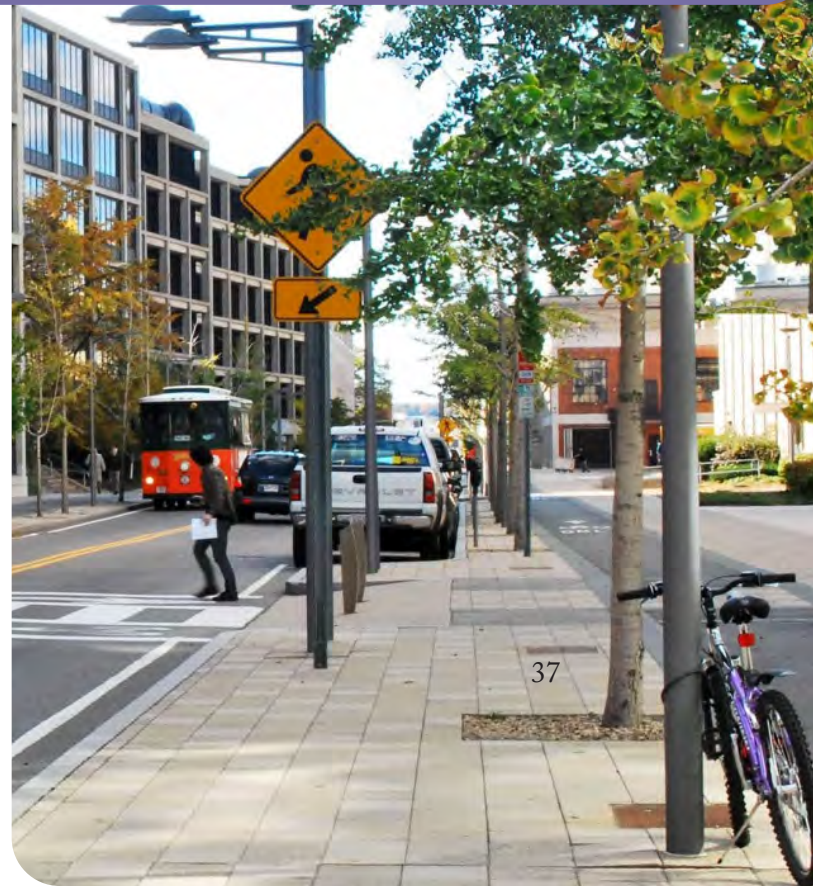
house in recognition of a cornerstone gift from Richard Resch '61 — is expected to receive new windows, updates to docks and launching areas, and a deck extension to add a second means of egress. Inside, the renovation will include multiple building updates, including larger men's and women's locker rooms, expanded boat storage, new offices, and increased training spaces as well as a meeting area and other building upgrades. Construction is set to begin soon and the project will be completed for the fall 2020 rowing season.

Peterson Architects and Bruner/Cott Architects are the designers of the Pierce Boathouse renovation.

### Vassar Street (East of Massachusetts Avenue)

A 2016 conditions assessment and a 2017 infrastructure study suggested a Vassar Street rehabilitation project between Massachusetts Avenue and Main Street. The project will result in a revitalized streetscape, including aeration, irrigation, and the replanting of street trees.

The landscape architect CRJA-IBI is the designer for this project. Work is planned for spring 2020. The project will defer planting around the site of the Schwarzman College of Computing to provide a successful integration with that project.



# In Planning & Design

## Music

MIT's conservatory-level music program, offering performance, composition, music technology, and scholarship, is a popular choice; more than 1,500 students enroll in music courses each year, and a variety of ensembles and chamber groups thrive on campus. With the current and future needs of the music program in mind, the Institute is building a new state-of-the-art Music Building that will support the program's curricular requirements.

Sited adjacent to Kresge Auditorium, the building will include spaces for performance, rehearsal, professional-level recording, research, and instruction, as well as a large-scale, purpose-built performance lab that will enable experimentation with various formats. The construction is expected to incorporate acoustical design elements for optimal listening, playing, and re-

ording. The Music Building project is moving forward thanks to a cornerstone gift from Joyce Linde, a longtime supporter of MIT and the arts. Planning and design activities are underway, with a target completion date of 2022. SA-NAA and Perry Dean Rogers Partners Architects are the designers for the Music Building.

The new building's location sites it within an illustrious context, steps away from Kresge Auditorium and the MIT Chapel, both designed by Eero Saarinen, and close to Baker House, designed by Alvar Aalto. Given this location – also adjacent to the Johnson Athletic Center, the Zesiger Sports & Fitness Center, the Stratton Student Center, and several residential buildings – the project team expects to create a music building that will contribute to the vibrancy and diversity of MIT's evolving West Campus sector.

# MIT Cellular Antenna Installations

Data as of June 30, 2019





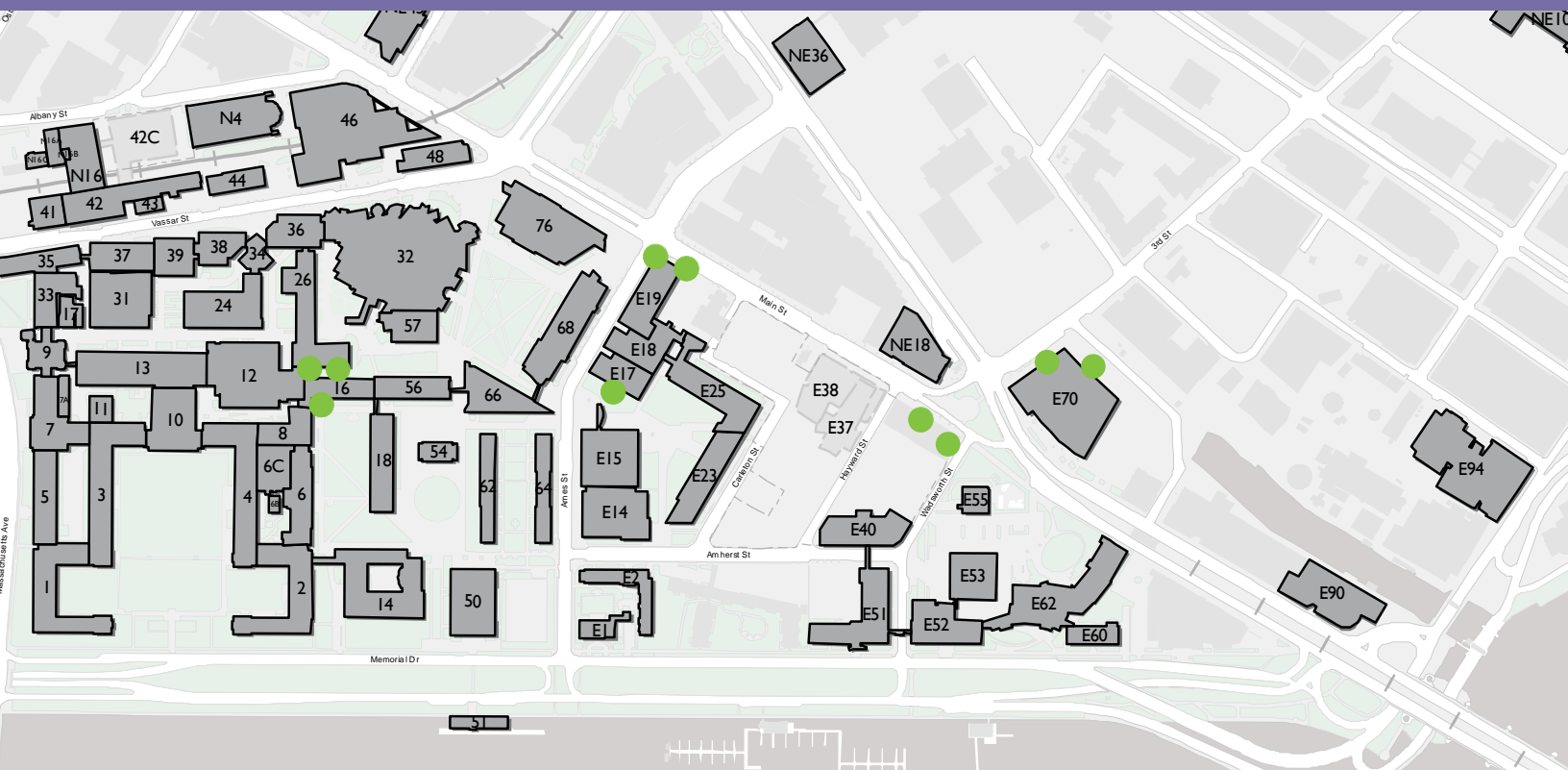
## Volpe

In 2018, MIT, working on behalf of the federal government, commenced utility enabling work on the Volpe parcel. This work included the construction of temporary utilities infrastructure to enable the demolition of the existing central utilities plant. Earlier this year, the contractor commenced work on the below-grade parking garage and foundations for the new Volpe government facility, with above-grade construction of the building expected to start next year.

Now that construction is underway on the new government facility, MIT can turn its attention to the planning of the remaining land. The Institute has commenced early preparatory work and expects to begin the special permit process in 2020.



## Cellular Antenna Locations



# Sustainability

MIT is deeply committed to developing and testing solutions that advance our commitment to solving for climate change and sustainability. This is done through considering and understanding solutions at the individual, campus, city, and global scales. Our methodology calls for the campus to be leveraged as a test bed to advance this commitment. In this work, MIT actively collaborates with the City of Cambridge on the shared goals of climate and sustainability leadership.

MIT, and specifically the Office of Sustainability (MITOS), executes on its mission through collecting and analyzing sustainability data, developing greenhouse gas mitigation strategies, modeling climate resiliency at the campus level,

reassessing waste reduction and disposal strategies, advancing food systems and food security, and reevaluating commuter choice through Access MIT.

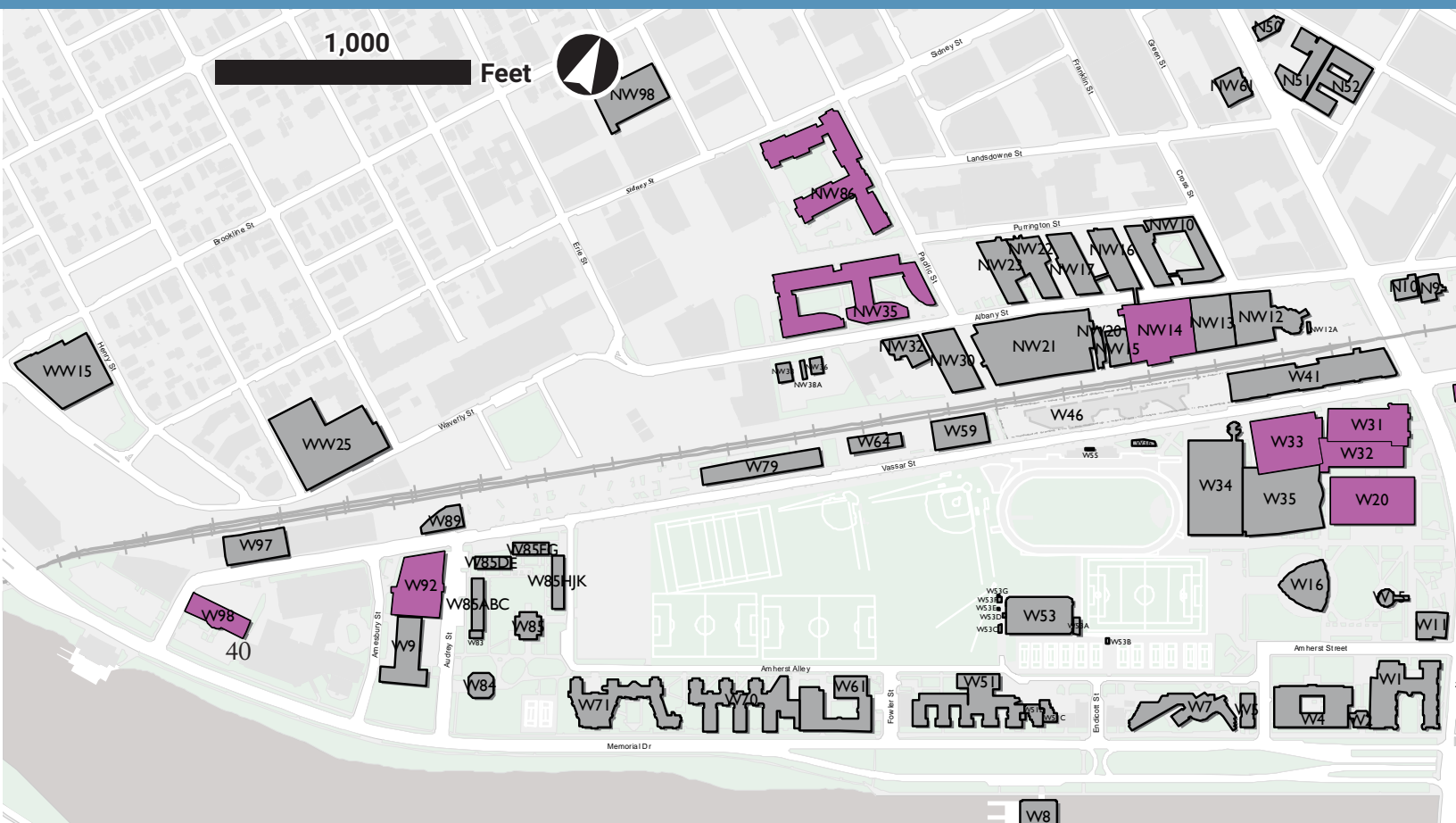
## Highlights

In 2019, MITOS worked to expand the MIT Sustainability Data Pool — MIT's central portal to campus sustainability data — to include new dashboards displaying data for bike share usage, campus tree inventory, greenhouse gas emissions, and water usage. These data visualizations aid MIT community members in understanding past trends, identifying solutions, and preparing for future sustainability challenges.

## MIT Energy Efficiency Upgrade Projects

Data as of June 30, 2019  
(buildings with academic occupancy shown)

 In Construction or Planned for 2019/2020  Completed in 2018/2019



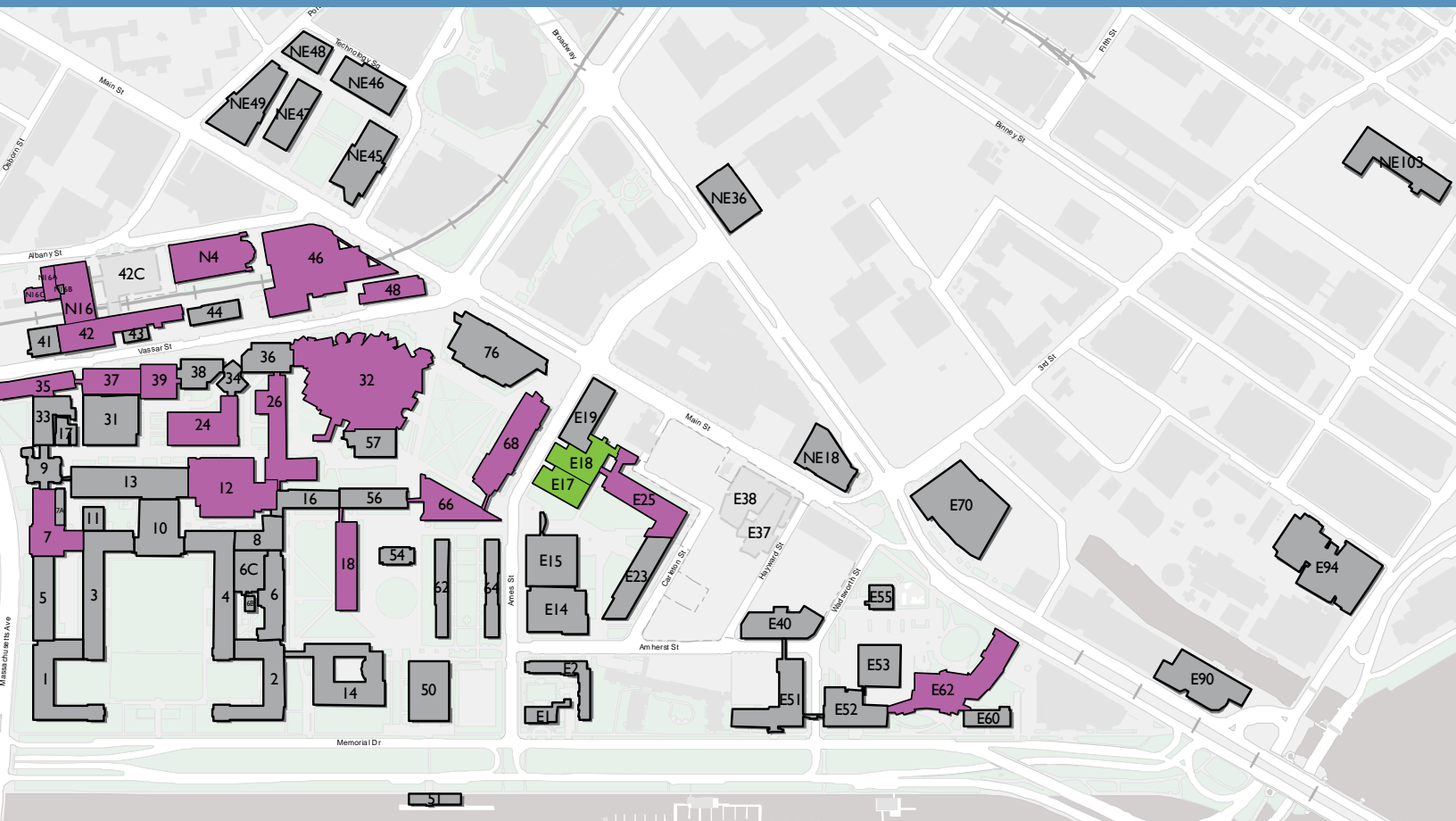
This past year also saw the creation of a first-of-its-kind pollinator garden on campus known as The Hive. The collaboratively designed garden features native, pollinator-attracting plants to support birds, bees, moths, and butterflies that are beneficial to our local ecosystems. The Hive now serves as a gathering space for the community, with plans to expand its use as an educational landscape. The Hive aims to be a model for collaborative design at MIT and beyond; bringing students, staff, faculty, and community partners together from ideation to construction.

Following recommendations from the MIT Food and Sustainability Working Group, MIT began implementing several strategies to create more sustainable food systems on campus. These

included working with students to advance the use of reusables, working with MIT Dining to expand food recovery efforts, and integrating sustainable food options into catering contracts.

MIT continued its efforts around procurement and managing materials used across campus to understand both campus-wide procurement processes and waste collections systems in order to systemically design out waste across campus.

Additionally, MIT launched a new campus-wide effort to study and make recommendations on how MIT can integrate municipal water stewardship practices such as efficient use, resiliency, equity, and quality.



## Moving Toward Climate Neutrality

Throughout 2019, MIT undertook collaborations focused on helping shape the implementation of the City's Net Zero Action Plan adopted in 2015. The Action Plan identified a path forward for moving the City toward net zero greenhouse gas emissions. MIT offices, including the Department of Facilities; the Environment, Health, and Safety Office; MITOS; and MITIMCo, participated in numerous working groups organized by the City to provide stakeholder input on various components of the plan including new construction requirements, existing building energy efficiency, renewable energy procurement and generation, lab energy use, and local low-carbon energy supply.

Since 2015, MIT has been working aggressively toward the goal of a 32% reduction in greenhouse gas emissions by 2030 as called for in the MIT Plan for Action on Climate Change. In 2019, MIT's greenhouse gas emissions increased slightly over 2018 levels, due to factors including weather impacts requiring additional heating and cooling on campus and campus growth, including the new MIT.nano facility coming online. Overall net emissions are at 18% below the 2014 baseline. Thanks in part to energy efficiency projects and renewable energy production, MIT continues to track toward meeting its 2030 goal while concurrently looking to advance us toward climate neutrality.

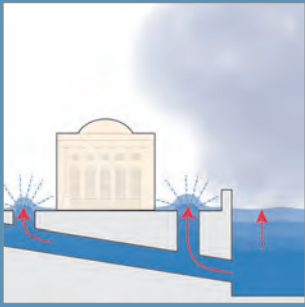
Over the past year, MIT developed and rolled out a governance structure to push forward the greenhouse gas and energy reduction objectives of the MIT Plan for Action on Climate Change. Committees comprised of cross-functional teams will work to create new standards and policies, identify opportunities, develop projects, and assess progress toward these goals.

Campus energy efficiency remains a core component of MIT's strategy to reach climate neutrality. This includes the continuation of the Efficiency Forward Program, a first-of-its-kind agreement between a local utility (Eversource) and a large end-use customer to incentivize energy reduction projects. The program is in the second year of the third three-year Memorandum of Understanding agreement between MIT and Eversource.

Efficiency-related projects over the past year have included upgrading lighting, mechanical systems, and equipment; and fixing and replacing steam insulation and steam traps at locations on campus. One of the lighting projects conducted this past year involved replacing more than 2,000 lighting fixtures and outdated ballasts in the offices, laboratories, and common spaces of Building 18 with energy efficient LED fixtures, as well as the installation of an advanced lighting controls system that will allow the facility to schedule and dim the fixtures based on events or classes, occupancy, and daylight harvesting. In addition to reducing facility energy use, the new lighting has a longer lifespan and will improve light levels for both students and faculty.

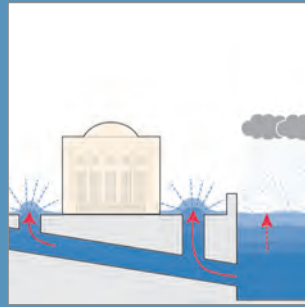
An additional focus area is lab facilities, where energy consumption is traditionally high. MIT's teams are constantly evaluating and developing strategies for energy conservation in these contexts. The conditioning of outside air for ventilation purposes, coupled with high air change rates, is the main driver for heavy energy consumption in most lab facilities. A current top energy reduction priority is the development of a laboratory ventilation procedure program that addresses both the safety of the lab occupants and the degree of energy consumption.





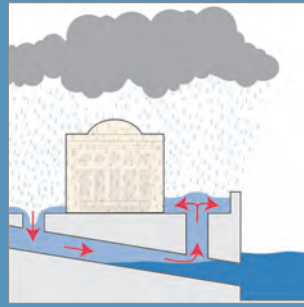
### Storm Surge + SLR

*Probable after 2050--a hurricane or nor'easter that blows a surge of water from the ocean into Boston Harbor and around or over-top the Charles river dam.*



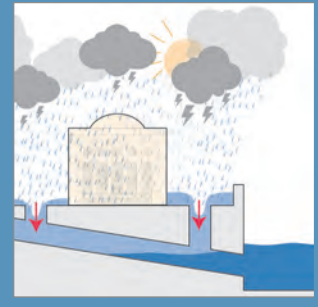
### Upriver Rain

*A rain event upstream in the Charles River watershed, up to 3 days of rain.*



### Day of Rain

*A 24 hour rain event over Cambridge, likely covering the entire region.*



### Flash Floods

*A 1-3 hour intense rain event, covering a portion of campus.*

## Climate Resiliency

The MIT Climate Resiliency Committee, managed by MITOS, works to collaboratively assess, plan, and operationalize a climate resilient MIT. It seeks to ensure a campus community that continues to fulfill its mission in the face of current and future climate risks and disruptions due to flooding from more frequent and extreme rains, storm surges and rising sea-levels, as well as extreme heat events.

Managing the uncertainty of these climate risks requires understanding challenges and identifying adaptive opportunities through integrated "layers of resilience": community, buildings, infrastructure, and site. These layers are both interdependent and collectively critical to supporting MIT's mission.

Experts from the MIT Joint Program on the Science and Policy of Global Change are collaboration partners contributing new research to reduce the uncertainty for operational decision-making.

This resiliency collaboration evaluates probabilities and modelling campus exposure to 1) flash flood 1-3 hour intense rains; 2) day-long rain events from tropical storms, hurricanes and nor'easters; and 3) storm surge and sea level rise. Flood risk modelling is also "stress testing" probable campus impacts to predict potential consequences to the community, campus buildings, infrastructure, and landscape. Outcomes include prioritization of campus systems and locations in need of adaptation.

MIT is exploring potential adaptation strategies for mitigating risks at campus and city scales through the MIT Climate Resiliency Committee, Cambridge Compact for a Sustainable Future, the City of Cambridge Climate Change Preparedness and Resilience Plan, and the City of Cambridge Climate Resilience Zoning Task Force. Strategies being advanced across campus and city scales include:

- Integration of modeled 2070 peak flood depths into new construction and major renovation design criteria (2070 1% probability rain event)
- Collaborative flood risk mapping at campus, city, and regional scales
- Business continuity planning across campus and City-wide systems to ensure continuity before, during, and after major climate disruptions
- Construction of surface and underground stormwater management systems
- Planning, zoning, and design standards for protecting people and buildings

Campus outcomes of resiliency work to date include demonstration of the campus as a test bed through engaging research and operations experts, strengthened resiliency collaboration with the City of Cambridge, reduced uncertainty about campus flood risks, seasonality and joint probability of events, identification of building-scale flood vulnerability, informed major renovations and capital projects, as well as engaging MIT's steering committee and senior leadership, and working with students.

## Open Sourcing Solutions

MIT's current climate resiliency engagements with the City are already helping to inform resiliency planning for the City, beyond the campus. These current activities include:

- Participation in the City's advisory committee for informing the City's Climate Change Preparedness and Resilience Plan for The Port neighborhood
- Representative members on the Cambridge Climate Resilience Zoning Task Force which is seeking to develop and advance zoning recommendations for creating a more resilient Cambridge
- Partnership through the Cambridge Compact for a Sustainable Future to explore opportunities for collaborative business and research continuity planning and vendor engagements

- Collaboratively modelling and researching campus and City flood risks

MIT is currently researching several climate change risks to the campus and Cambridge. MIT looks forward to establishing a quarterly research and modeling collaborative meeting with City staff and modeling experts. Once this research reaches a level of confidence in findings, MIT will share these findings via this MIT-City Flood Risk Collaboration including:

- Up-river Charles River Basin flow risks to Cambridge
- Scale and intensity of convective storms in Cambridge under a changed climate
- Joint probability of different flooding events

## Tree Resources

- Tree Locations

MIT has been pleased to participate in the Cambridge Urban Forest Master Plan (UFMP) Task Force work throughout 2019. Building on the findings of the Cambridge Climate Vulnerability Assessment (CCVA), the UFMP recognizes the collective role of City-owned public rights-of-ways and publicly accessible private-owned lands to provide "cool corridors." These open space networks and gathering places pro-



## Looking Forward

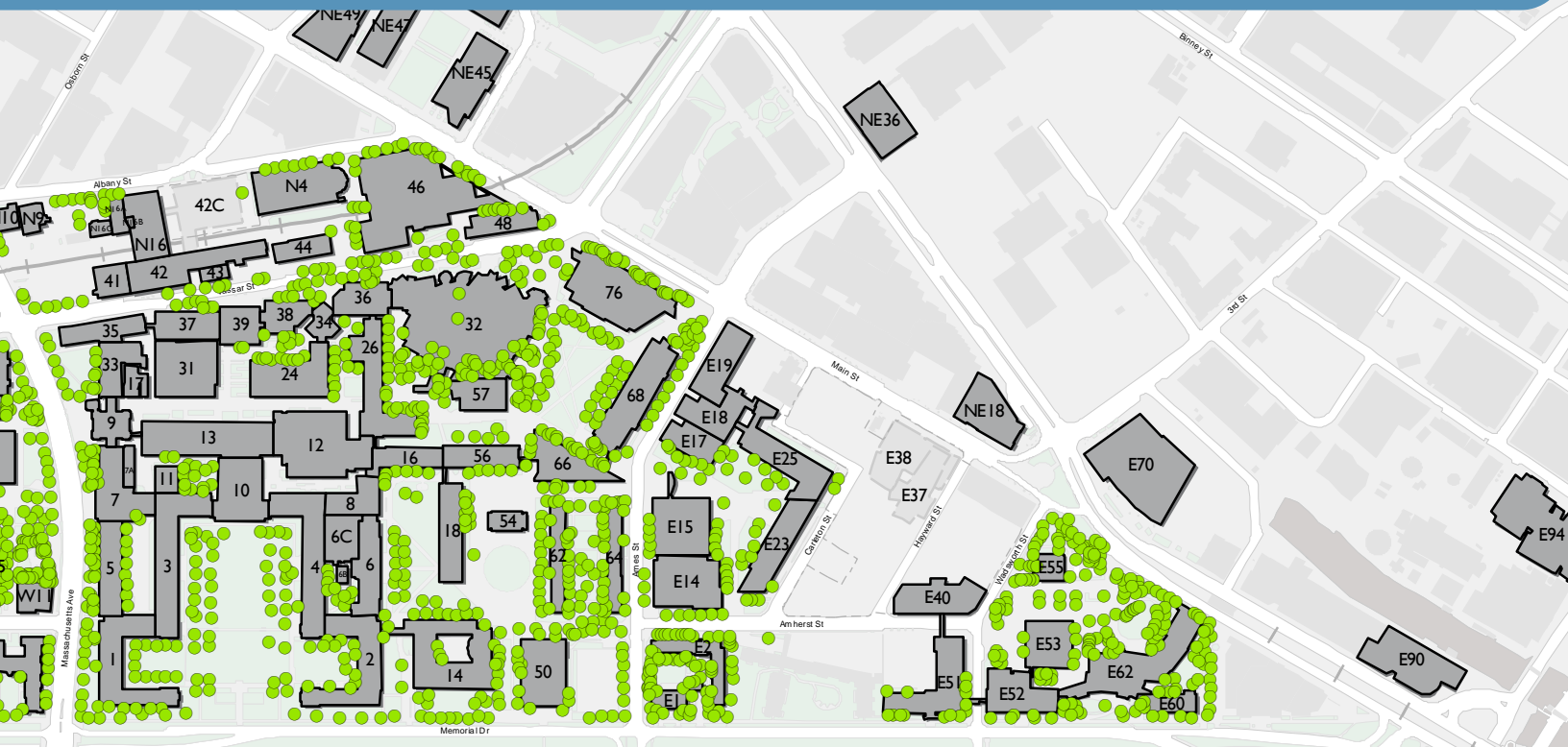
Looking ahead to 2020, MIT will continue to apply knowledge, empower people to act, and pioneer solutions in sustainability to continue to meet aggressive goals. MIT will continue to seek collective engagement and action on priority areas that include:

- Climate change and net zero action planning, including modeling and planning for climate adaptation and investments for a resilient campus;
- Utilization of both new and established strategies to mitigate campus emissions;
- Managing the impact of the Institute's purchasing, materials use, and waste systems;
- Working collaboratively to transform the campus food system to promote health and system and individual sustainability;
- Seeking a comprehensive understanding of our water use patterns in an effort to reduce overall demand and consumption across campus;
- Sustainable transportation, broadening and deepening MIT's commitment and robust participation in Access MIT.

vide City dwellers with shade, comfort, and better air quality along key urban transit corridors. Trees and soils are characterized as a “living infrastructure” system that can increase resilience and mitigate the effects of climate change for the community.

This focus correlates with MIT's efforts over the past few years to reinvigorate or provide

new tree planting along key campus and public streetscape corridors. In each location, best practices such as the use of structural soils under paving, irrigation, and connected tree beds or tree trenches undergirds growing conditions where trees can survive and flourish despite urban stresses.



# MIT & Cambridge Public Schools

MIT extends its mission to advance knowledge through a variety of academic enrichment opportunities for Cambridge students, and continues to work with Cambridge Public Schools to deepen engagement and participation.

## The Tech Experience

With the hiring of MIT's K-12 Community Outreach Administrator, teachers and administrators in the Cambridge Public School District have a dedicated point person to help connect unique K-12 needs to MIT program offerings. This resource was particularly effective when two CRLS Instructional Technology Specialists were tasked with creating a tech-focused experience for 9th grade students while their 10th grade peers underwent Massachusetts Comprehensive Assessment System (MCAS) testing. Working in close collaboration, MIT and CRLS developed programming for the Tech Experience.

The programming started one week before the event, when juniors and seniors from CRLS visited MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) for training on MIT App Inventor, a block-based programming language designed to empower people of all ages to build fully functional applications for

smartphones and tablets. These upperclassmen students received training to serve as near-peer mentors for first-year students during the testing sessions.

During the two day session, 9th grade students put technologies developed by MIT to the test, rotating through sessions playing Shadowspect, a 3-D geometry puzzle game designed by the MIT Playful Journey Lab to assess learning, and MIT App Inventor, in conjunction with their near-peer mentors, to make apps for their phones. The program was a success and left a diverse array of students eager to learn more.

Computational literacy has been a focus for CRLS, and the Tech Experience provided the perfect opportunity for MIT to engage students in hands-on sessions that introduce computer science concepts, provide students future-ready skills, and expose students to potential career paths.







## MIT Impact Scholarship

Now in its third year, the Impact Scholarship was awarded to ten phenomenal students (6 Cambridge Rindge and Latin School students, 2 Prospect Hill Academy students, and 2 Community Charter School of Cambridge students) from a range of backgrounds. Instead of focusing on traditional academic markers, students are selected for the scholarship based on the impact they have on their community; all awardees have compelling personal narratives, describing their personal impact on the larger community. After a full review by school and MIT staff, ten \$10,000 scholarships were awarded pending confirmation of continuing full-time college enrollment, bringing the current total amount of scholarships awarded to \$300,000.

## Selected K-12 Educational Offerings

### MIT Sea Grant

Supporting the next generation of ocean stewards with hands-on educational programs in marine ecology, underwater robotics, and more!  
<https://seagrant.mit.edu/education>

### Open Learning

Leading MIT's effort to provide universal access to quality education through online platforms.  
<https://openlearning.mit.edu>

### Broadening Engagement through Engineering At MIT (BEEAM)

A year-round high school science education and internship program designed for budding CRLS research scientists  
<https://ebics.net/diversity-outreach/about-beeam>

## Pathways to Invention

The Pathways to Invention program continues to have success with a multi-pronged approach to educational enrichment. It sponsored the work of Sisters With a Dream, a mentorship program that encourages young girls to learn coding, which introduced third through fifth grade girls at Fletcher Maynard Academy to entry-level coding platforms like MIT Scratch. At one event, pictured above, the girls met and heard from Shirley Ann Jackson; the first African American woman to have earned a doctorate at MIT and the current president of Rensselaer Polytechnic Institute.

### MIT Museum

Hands-on STEAM workshops and opportunities for students and educators.  
<https://mitmuseum.mit.edu/>

### Edgerton Center

Fun, 3-hour hands-on STEM workshops that reach over 500 Cambridge students a year.  
<https://edgerton.mit.edu/>

### KeyPals and NetPals

Cambridge School Volunteers mentorship program pairing MIT staff and graduate students with CPS students for one-on-one engagement.  
<https://www.csvinc.org/category/keypals/>

# Direct Economic Impact

Payments to the City of Cambridge					
	FY 15	FY 16	FY 17	FY 18	FY19
Real Estate Taxes Paid*	\$44,900,590	\$50,185,924	\$54,891,906	\$56,971,040	<b>\$60,291,173</b>
Payment in Lieu of Taxes (PILOT)**	\$2,019,677	\$2,020,593	\$2,080,717	\$2,211,875	<b>\$2,150,218</b>
Water & Sewer Fees Paid	\$6,99,916	\$8,898,350	\$8,315,850	\$7,937,273	<b>\$8,536,068</b>
Other Fees & Permits Paid	\$3,765,563	\$6,754,417	\$5,644,924	\$11,483,296	<b>\$5,006,735</b>
<b>Total Payments</b>	<b>\$57,685,746</b>	<b>\$67,859,284</b>	<b>\$70,933,397</b>	<b>\$78,603,484</b>	<b>\$75,984,194</b>

\* 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.

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

## Cambridge First Purchasing Program

MIT's Cambridge First Purchasing Program resulted in the additional investment of over \$49.9 million in Cambridge businesses in FY 19. This program, together with taxes paid, payments in lieu of taxes, and municipal fees, brought MIT's 2019 direct economic contribution to the City to more than \$125 million. This figure does not include MIT's indirect investment in Cambridge such as student spending and the salaries of more than 2,500 residents employed by the Institute.

MIT's FY19 real estate tax payment represents 14.8% of the City's total tax revenue stream.

#1 Taxpayer in Cambridge

## Opportunity in the Innovation Economy

### The Foundry Consortium

In April 2018, the Cambridge Redevelopment Authority unanimously passed a motion to recommend the Foundry Consortium, led by Lemelson-MIT, as the operator of the Foundry Building at 101 Rogers Street. After a \$30 million renovation, the 10,000 square foot space is scheduled to open in 2021 as a community space

for programs in arts, entrepreneurship, technology, and workforce education. The goal of the Foundry is to facilitate access for residents, especially underrepresented communities and adjacent neighborhoods, to the dynamic working and learning environment of Kendall Square.

### Summer Youth Employment Program

MIT's annual Summer Youth Employment Program (SYEP) offers Cambridge youth work opportunities to explore career interests and gain experience in a professional environment. MIT Human Resources coordinates the Program in partnership with the City's Office of Workforce Development Summer Jobs Campaign, Cambridge Housing Authority Work Force, and

Just-A-Start. In 2019, 15 youth were supervised and mentored across 14 MIT departments. As part of the Program, the youth participated in a mid-summer lunch & learn where they discussed their work experiences and practiced resume writing. The Program concluded with a breakfast where students presented on their learning, projects, and skills gained.

### The Job Connector by MIT

MIT introduced a new outreach program called the Job Connector by MIT, a career development center located across the street from Newtowne Court. Created as part of the community benefits package of the Volpe redevelopment plan, the Job Connector was established to connect City residents with local opportunities in the innovation economy. With classroom and meeting space in close proximity to area residents, the Job Connector by MIT is well positioned to support and expand Cambridge's workforce development ecosystem.

An October Open House introduced community members to the space and to the Job Connector's three initial programs – Cambridge hiring days for positions at the new Brothers Marketplace in Kendall; the Building Pathways pre-apprenticeship program; and a partnership with Just-A-Start to offer IT training at the Job Connector. Job Connector staff are working to create additional offerings as connections are advanced with existing workforce development programs and local companies.

