



HARVARD UNIVERSITY

2017

Town Gown Report

for the
City of Cambridge

Submitted by:
Harvard Planning Office



Cover Image: Gore Hall, Winthrop House
Photo: Peter Vanderwarker

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I. EXISTING CONDITIONS

To meet the City of Cambridge's Town Gown reporting requirements, Harvard University annually provides data which characterize the University's population, land and buildings, and payments to the City over the past five years. The data also includes future projections of Harvard's student enrollments, faculty and staffing levels, student housing, and campus facilities. Making meaningful projections or forecasts in these areas is difficult as future change is highly dependent upon a large number of interrelated factors. These factors include:

- **Priorities established by University leadership** including the President, Provost, Academic and Administrative Deans, the Harvard Corporation and central administrative leadership.
- **Priorities established at the School and Unit level** such as the creation of new academic programs or initiatives, or re-focusing or re-orienting existing programs.
- **The fiscal capacity of the University, and individual schools and units** including endowment performance, unforeseen economic changes, and levels of donor and philanthropic support.
- **Trends in higher education** such as the growth of on-line and distance learning, continuing education and executive education programs, and technological and pedagogical changes.

Given the complex interrelated nature of these factors, the projections included in the Town Gown Report are not to be considered confirmed plans for future growth or change at Harvard, but rather present an estimated range of possible change in key reporting areas based on data trends over the past five years. A projection period of five years has been selected as it presents a more realistic time horizon for estimating future change, and is also aligned with the five-year capital planning cycle utilized by all of Harvard's schools and administrative units.

A. FACULTY AND STAFF ¹

	2013	2014	2015	2016	2017	2022
Cambridge Based Staff						
Head Count	12,173	12,358	12,343	12,695	12,781	12,500 - 13,400
FTEs	9,549	9,744	10,160	10,434	10,404	10,100 - 10,900
Cambridge Based Faculty						
Head Count	1,938	2,010	2,072	2,102	2,100	2,000 - 2,300
FTEs	1,749	1,778	1,836	1,870	1,884	1,800 - 2,000
Number of Cambridge Residents Employed at Cambridge Facilities	4,039	4,088	3,982	4,146	4,190	
Number of Cambridge Residents Employed at Boston Facilities	815	768	754	806	793	

¹ Employment figures are as of May 30, 2017 and June 30, 2017 and includes TA's, graduate students, postdoctoral scholars, interns and other staff.

B. STUDENTS AND POSTDOCTORAL SCHOLARS ²

	2013	2014	2015	2016	2017	2022
Total Undergraduate Degree Students	7,256	7,265	7,237	7,333	7,447	<i>7,300 - 7,500</i>
Day	6,659	6,671	6,636	6,634	6,645	
Evening	[597]	[594]	[601]	[699]	[802]	
Full Time	6,899 [248]	6,906 [247]	6,874 [244]	6,893 [259]	6,391 [286]	
Part Time	357 [349]	359 [347]	363 [357]	440 [440]	516 [516]	
Total Graduate Degree Students	10,328	10,205	10,254	10,487	10,948	<i>10,400 - 11,500</i>
Day	8,983	8,999	8,967	9,015	9,231	
Evening	[1,281]	[1,206]	[1,287]	[1,472]	[1,717]	
Full Time	9,139 [264]	9,128 [230]	9,131 [262]	9,200 [290]	9,470 [366]	
Part Time	1,125 [1,017]	1,077 [976]	1,123 [1,025]	1,287 [1,182]	1,478 [1,351]	
Total Non-degree Students	6,675	6,887	7,336	7,727	7,417	<i>7,300 - 8,200</i>
Day	274	331	362	349	351	
Evening	[6,401]	[6,556]	[6,974]	[7,378]	[7,066]	
Total Number of Students in Cambridge	24,259	24,357	24,827	25,547	25,821	<i>25,000 - 27,200</i>
Total Number of Postdoctoral Scholars ³	1,030	990	1,063	1,193	1,093	<i>1,000 - 1,200</i>

Note:

Numbers in brackets represent students at the Extension School and are a subset of the total number of Full and Part Time students indicated.

² Counts as of October 15, 2016 for 2017. Includes all non-degree students enrolled in day or evening classes, such as persons taking classes at Harvard Extension School.

³ Postdoctoral scholars are considered staff; therefore they are included in staff totals reported in Section A.

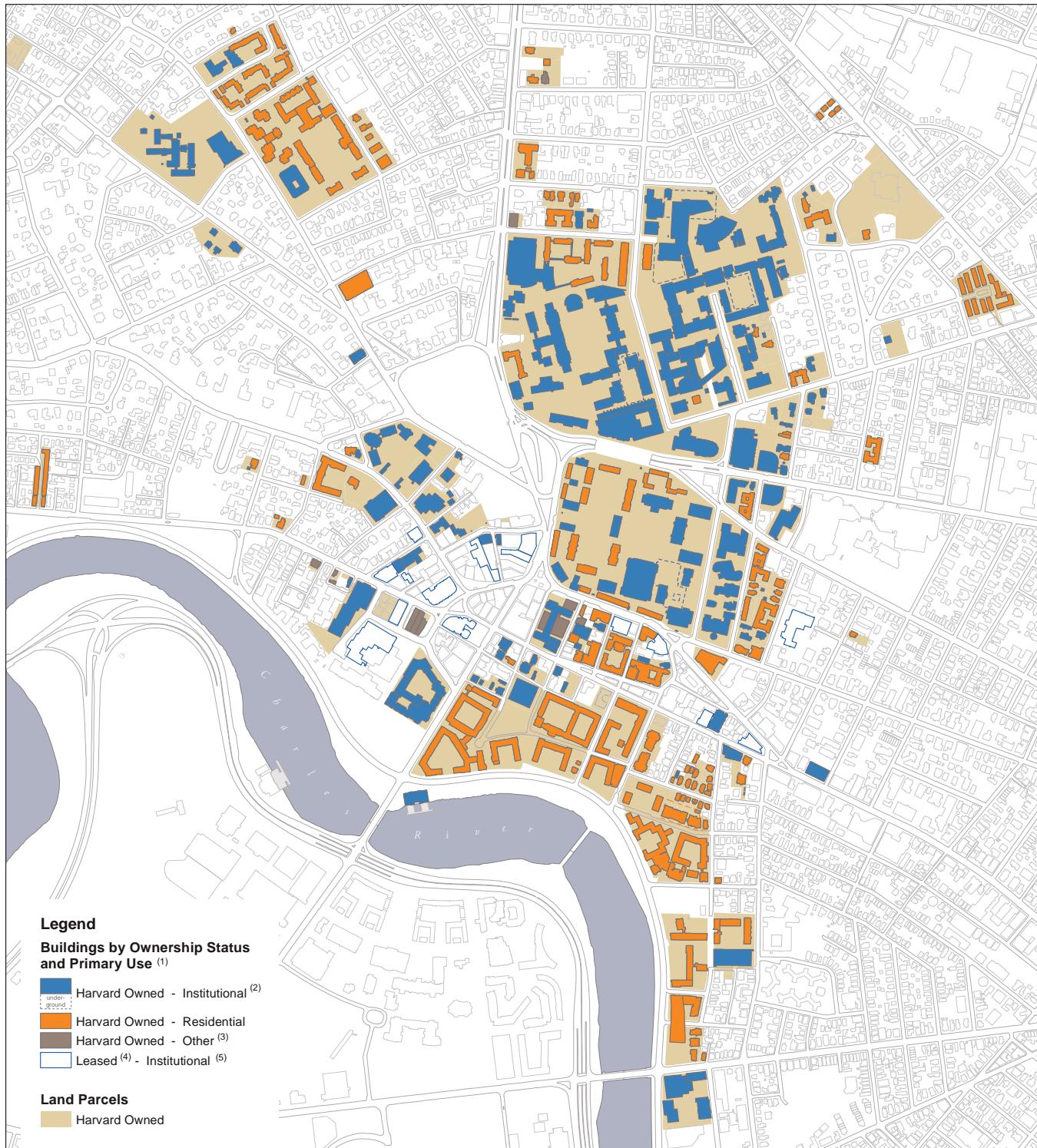
C. STUDENT RESIDENCES

	2013	2014	2015	2016	2017	2022
Number of Undergraduate Students Residing in Cambridge						
In dormitories	6,113 ⁴	6,200	6,164	6,368	6,023	6,000 - 6,300
With cars garaged in Cambridge	8	7	10	5	6	
In Harvard affiliate housing ⁵	440	398	386	304	650	400 - 700
In non-affiliate housing	128	99	92	68	99	
Number of Graduate Students Residing in Cambridge						
In dormitories	1,054	1,259	1,162	1,390	1,338	1,200 - 1,400
With cars garaged in Cambridge	134	117	152	139	99	
In Harvard affiliate housing	1,574	1,551	1,437	1,367	1,355	1,400 - 1,600
In non-affiliate housing	3,749	3,476	3,767	3,326	3,290	

⁴ Beginning in 2013, the number of students residing in dormitories is reduced due to the construction of House Renewal projects that temporarily take some dormitory beds off-line.

⁵ Beginning in 2013, the number of undergraduate students residing in Harvard affiliate housing includes 10-20 DeWolfe Street and students temporarily residing in “swing housing” to accommodate the House Renewal program.

Real Estate Owned and Leased by Harvard University



Notes:

- Primary Use reflects predominant building use
- The Rowland Institute located at 100 Edwin Land Boulevard is located outside the map coverage area
- Includes real estate that is vacant or leased to third party
- Buildings may be leased by Harvard in whole or in part
- The following buildings leased by Harvard for institutional use are located outside the map coverage area:
 - 155 Fawcett Street
 - 625 Massachusetts Avenue
 - 784 Memorial Drive

D. FACILITIES AND LAND OWNED⁶

	2013	2014	2015	2016	2017	2022
Acres (Tax Exempt)	190.4	190.4	192.7	191.8	191.8	191.8
Acres (Taxable)	23.1	23.1	22.4	22.1	22.1	22.1
Number of Buildings	391	392 ⁷	392	391 ⁸	391	392
Dormitories						
Number of Buildings	75	75	75	75	75	75
Number of Beds	8,222	8,160	8,238	7,954	8,099	8,000
Size of Buildings (SF)	15.9M	15.9M	16.0M	16.0M	16.1M	16.1 - 16.3M
Assembly/Museum	972,554	976,088	1,084,879 ⁹	1,026,278 ¹⁰	1,026,278	
Athletic	210,780	210,780	210,780	210,780	210,780	
Classroom	877,524	877,524	877,524	877,524	877,524	
Commercial	185,453	185,453	185,453	185,453	185,453	
Healthcare	77,155	77,155	77,155	77,155	77,155	
Laboratory	2,587,479	2,587,479	2,587,479	2,587,479	2,587,479	
Library	1,091,084	1,100,839 ¹¹	1,097,644	1,097,644	1,097,644	
Office	3,121,737	3,085,661 ¹²	3,087,995	3,164,256 ¹³	3,164,256	
Residential	5,766,765 ¹⁴	5,766,765	5,772,934	5,908,866 ¹⁵	5,908,866	
Support	1,071,830	1,071,830	1,071,830	915,070 ¹⁵	915,070	

⁶ All space data as of June 30, 2017.

⁷ Increase in building count reflects 32 Quincy Street returning to service.

⁸ Decrease reflects the demolition of a small garage.

⁹ Increase reflects new area of 32 Quincy Street.

¹⁰ Decrease reflects re-classification of former Sackler Museum building as office space.

¹¹ Increase reflects Tozzer Anthropology Building renovation and addition.

¹² Reduction reflects partial Pound Hall demolition.

¹³ Increase reflects re-classification of former Sackler Museum building and 40 and 42 Kirkland Street as office space.

¹⁴ Change in area reflects the conversion of 1201 Massachusetts Avenue to dormitory use.

¹⁵ Change in area due to correction of previous space data.

Parking Facilities

Harvard University owns and maintains 4,576 non-commercial parking spaces in the City of Cambridge. These spaces constitute the University's parking inventory and are used to support University operations and accommodate faculty, staff, student, and visitor parking. The inventory is updated and approved each December as part of Harvard's annual PTDM Progress Report.

Housing (*This table does not include information about dormitories.*)

	2013	2014	2015	2016	2017
Affiliate Housing - Tax Exempt					
Number of Units:	1,043	1,037	1,037	1,036 ¹⁶	1,035
Number of Buildings:	12	12	12	12	12
Affiliate Housing - Taxable					
Number of Units:	892	892	892	889 ¹⁶	889
Number of Buildings:	55	55	55	54	54
Other Housing - Tax Exempt					
Number of Units:	None	None	None	None	None
Number of Buildings:	None	None	None	None	None
Other Housing - Taxable					
Number of Units:	None	None	None	None	None
Number of Buildings:	None	None	None	None	None

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

¹⁶ The 2016 decrease of four units reflects the conversion of 1 unit at Peabody Terrace for Graduate Commons common space programming (tax-exempt) and the transfer of 3 units at 101-103 Plympton St. to FAS (taxable).

E. REAL ESTATE LEASED

Real Estate Leased by Harvard	Sq Feet	Use
One Bow Street	23,490	Office
One Brattle Square	40,599	Office
One Story Street	6,125	Classroom
10 Ware Street	1,738	Office
104 Mt. Auburn Street	24,638	Office
114 Mt. Auburn Street	65,107	Office Healthcare
125 Mt. Auburn Street	36,564	Office
1100 Massachusetts Avenue	17,989	Office
1280 Massachusetts Avenue	18,285	Office
1408-1414 Massachusetts Avenue	50,000	Office
1430 Massachusetts Avenue	11,265	Office
155 Fawcett Street	37,500	Warehouse
20 University Road	32,086	Office
25 Mt. Auburn Street	7,732	Office
44R Brattle Street	8,417	Office
50 Church Street	31,975	Office
625 Massachusetts Avenue	35,295	Office
TOTAL	448,805	

Note:

Harvard University plans to occupy leased space at 784 Memorial Drive beginning in early 2018.

F. PAYMENTS TO CITY OF CAMBRIDGE

	2013	2014	2015	2016	2017
Total Payments	\$15,285,524	\$16,140,324	\$16,858,585	\$18,472,321	\$18,677,526
Real Estate Taxes Paid	\$5,662,893	\$5,829,731	\$5,582,340	\$5,672,860	\$5,834,926
Payment in Lieu of Taxes (PILOT)	\$2,845,406	\$2,968,227	\$3,646,380	\$3,850,071	\$3,955,056
Water & Sewer Fees Paid	\$4,919,274	\$4,623,286	\$5,425,369 ¹⁷	\$5,078,739	\$6,157,131
Other Fees & Permits Paid ¹⁸	\$1,857,951	\$2,719,080	\$2,204,496	\$3,870,651	\$2,730,413

Note:

In 2005 Harvard University and the City of Cambridge renewed the PILOT agreement for a fifty-year period with annual escalators.

¹⁷ Increase includes abatements that expired in FY15.

¹⁸ Amounts previously reported for years 2013 – 2015 have been revised to include building permit and other construction related fees based on available permit data. The amount reported in subsequent years does not include all building permit and other construction related fees paid by Harvard to the City of Cambridge.

G. INSTITUTIONAL SHUTTLE INFORMATION

The Harvard Shuttle, operated by Harvard Transit, offers a number of safe, reliable and convenient shuttle options across Harvard's Cambridge and Allston campuses. Harvard Transit continually tracks ridership on all of its routes in order to maximize efficiency and align ridership with the size of shuttle vehicles used, and the frequency of service during different times of the day.

Harvard's Shuttle fleet includes seven 35-foot buses and five 29-foot buses, each with a capacity of 37 passengers. During the academic year, two buses provide service for the River Houses area; three buses serve the Radcliffe Quad area; and two buses operate between Cambridge and Allston. A shuttle service between Harvard Square and Barry's Corner in Allston began operation in December 2015. In the summer, limited weekday Shuttle service is provided on the Allston Express route. Additionally, Harvard Transit's Van fleet includes five, ten-seat passenger vans equipped with two wheelchair spaces. On weekdays, two of the vans run from 7:30 am – 7:00 pm; on weekends the vans run from 12:00 pm – 7:00 pm. These vans provide service to individuals with mobility impairments or medical conditions on an as-needed basis. On weeknights, an evening van service is designed to transport faculty, staff and students safely around campus as a supplement to the shuttle bus system. The service operates between 7:00 pm and 3:00 am, seven days a week throughout the academic year and 7:00 pm – 12:30 am during the summer.

All of the shuttle vehicles operate on B-20 biodiesel. Using biodiesel is considered a best practice in the industry and has reduced emissions by 15 percent. On an annual basis, emissions are reduced by approximately 96,725 lbs per bus fleet and 43,091 lbs per van fleet. In addition, Shuttle schedules are very precise and do not allow for more than three minutes of idling, less than the five minutes allowed by anti-idling regulations. Harvard Transit keeps the fleet on a 7–10 year life cycle to ensure that the best technology available is being used and practices proactive maintenance on all vehicles.

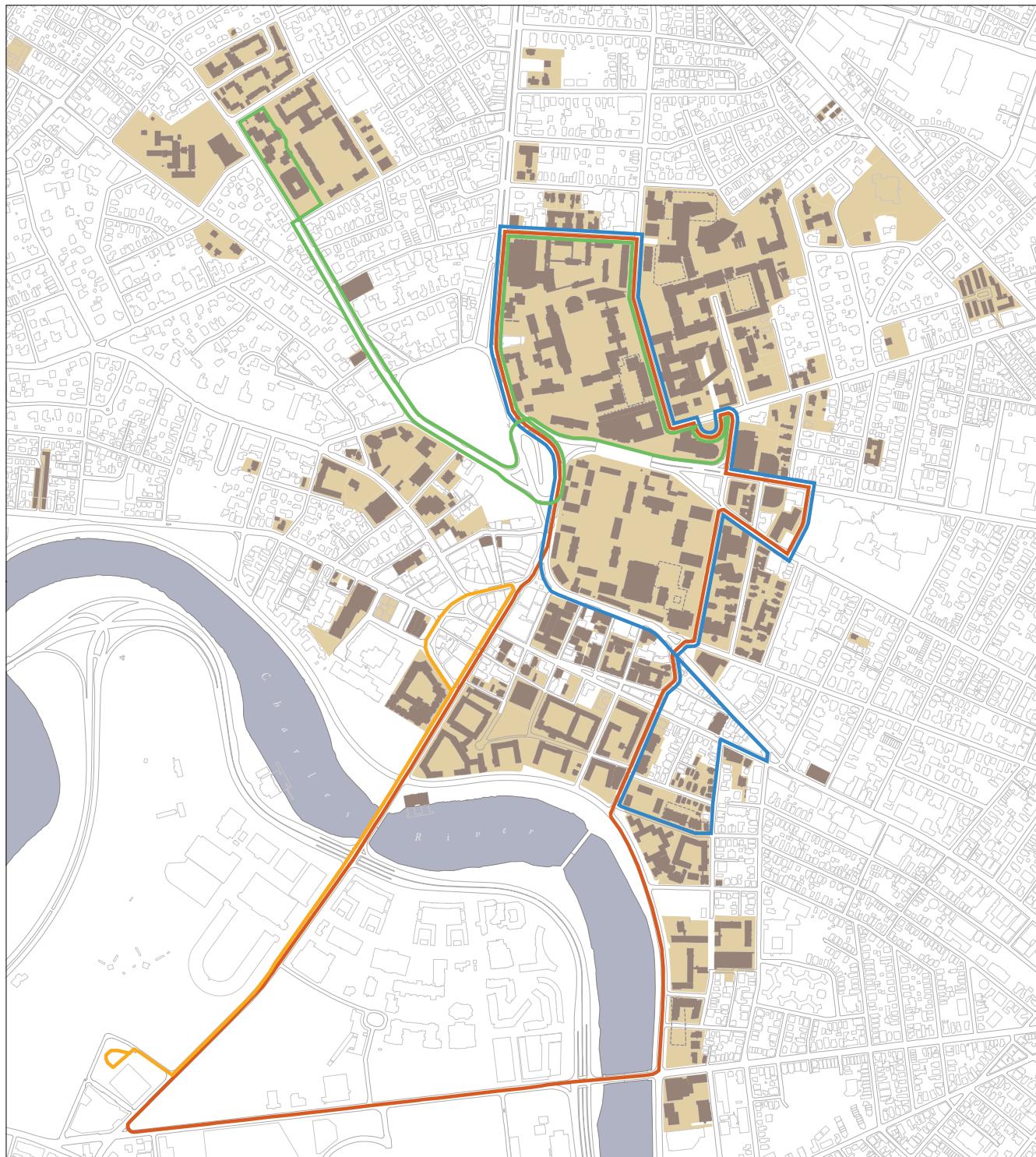
Ridership data and efforts both to coordinate shuttle system with other institutions and to streamline shuttle services.

Total passenger ridership for all Harvard shuttle routes in FY2017 remained steady at approximately 700,000. Harvard Transit collaborates with the Cambridge Traffic, Parking and Transportation Department in planning University shuttle routes. Harvard also works closely with the Cambridge Department of Public Works during construction and events that may require re-routing of Harvard Shuttles.

Harvard has developed a productive working relationship with the Cambridge Police Department in dealing with the safety needs of the streets that we share and have been partners in mitigating issues such as over-crowding caused by tourist buses on Massachusetts Avenue.

The University also partners with the MASCO shuttle bus, providing financial support for this system, and sharing ShuttleTracker technology (which shows the real-time location of buses on routes). This coordination has reduced service overlap within Cambridge and eliminates the need for a dedicated Harvard shuttle traveling to the Medical Area in Boston. The M2 Cambridge-Harvard Shuttle primarily serves Harvard University Longwood students, faculty and staff. The shuttle is available to others, including members of the public, with the pre-purchase of a ticket (see: www.masco.org/directions/m2-cambridge-harvard-shuttle).

Harvard Campus Shuttle Routes



Legend

- Mather Express
- Quad Express
- Allston Campus Express
- Barry's Corner

Notes:

This map shows the four principal academic year day-time shuttle bus routes. Harvard also runs evening and weekend shuttle services that cover these same routes but on a different schedule.

Route Name	Description	Frequency	Hours of Operation
Weekday Service - Morning			
Radcliffe Quad (Stadium)	Quad, Square, River Houses, Allston Campus	30 minutes	5:30 am – 7:15 am
Quad, Square, River Houses, Allston			
Mather Express	River Houses through Square to Kirkland St.	10 minutes	7:30 am – 4:30 pm
Quad Express	Quad, Square, to Kirkland St.	10 minutes	7:30 am – 5:00 pm
Allston Campus Express	Allston Campus, Square, Mass. Ave., Oxford St., Square, Allston Campus	15 minutes	7:00 am – 4:00 pm
Barry's Corner (AM)	Square, JFK St., North Harvard St., Barry's Corner	20 minutes	7:00 am – 10:00 am
Weekday Service - Evenings			
Extended Overnight	River Houses through Square, up Garden St. to Kirkland St. to River Houses	30 minutes	7:30 pm – 4:00 am
Radcliffe Quad-Yard Express	Quad, Square, Quad (up Garden St.)	25 minutes	4:15 pm – 1:00 am
River Houses A, B, & C	River Houses through Square, up Garden St., to Kirkland St., to River Houses	35 minutes	4:15 pm – 1:00 am
Allston Campus Express	Allston Campus, Square, Mass. Ave., Oxford St., Square, Allston Campus	15 minutes	4:00 pm – 12:30 am
Barry's Corner (PM)	Square, JFK St., North Harvard St., Barry's Corner	20 minutes	4:30 pm – 7:30 pm
Weekend Service			
Crimson Campus Cruiser	River Houses through Square, up Garden St. to Kirkland St. to River Houses	35 minutes	8:30 am – 4:30 pm
1636'er	River Houses through Square, up Garden St., to Kirkland St., to River Houses	20 minutes	4:00 pm – 1:00 am
Allston Campus Weekend Express	Allston campus, Square, Quad, Square, Allston Campus	30 minutes	5:00 pm – 8:00 pm
Extended Overnight	River Houses thru Square, up Garden St., to Kirkland St., to River Houses	30 minutes	12:00 am – 5:00 am

II. FUTURE PLANS

Harvard's planning and development activities continue to be informed by several key programmatic drivers. Current objectives within these drivers will influence how the University will meet its diverse facility and space needs over the coming years.

Supporting Academic Programs and Research

Harvard continues to strengthen its core academic and research mission through projects that support cross-disciplinary research, respond to changing pedagogies and technological innovations, and foster collaborative teaching and learning. Harvard is upgrading, and in some cases re-inventing existing facilities and spaces to respond to the evolving landscape of higher education.

At the Science Center, the Faculty of Arts and Sciences recently completed a project that has transformed the Cabot Science Library from a traditional collections-based library into an innovative digital teaching and learning hub for all disciplines.

Newly constructed facilities such as the recently completed expansion at the Harvard Kennedy School campus also incorporate innovative spaces that foster collaboration on research projects that cross disciplines.



Photo: Peter Vanderwarker

Housing Harvard's Affiliates

Ranging from dormitories to fully furnished apartments, the University's housing portfolio contains over 13,000 beds in 8,000 units. Harvard is continuing the system-wide renewal of its undergraduate houses and making ongoing improvements across the affiliate housing portfolio.

With the completion of renewal projects at four undergraduate houses the University is making considerable progress on the system-wide renewal of facilities that form the core of student life and learning at Harvard College. The completed comprehensive renewal projects have created 21st century residential and academic environments within a context of historically and architecturally significant buildings. To date the completed projects have renewed over 530,000 sq. ft. of space, containing over 1,000 undergraduate student beds.



Photo: Dr. Charles Anderson

Enhancing the Campus Experience

Recognizing that the quality of campus life is greatly enhanced by its landscape, common spaces, and cultural amenities, Harvard supports projects, programs and events that enrich the lives of students, affiliates and visitors to its campus.

Since its inception in 2008, Harvard Common Spaces has continued to transform key physical spaces on the Cambridge campus through events programming with partners from across the University, and facilitating activities that foster connection, nourish a sense of place, and inspire new encounters. Common Spaces initiatives encompass a wide range of activities including on-going music and dance performances, the Harvard Farmers' Market and Zumba on the Plaza.

Harvard's academic units are also major contributors to the enrichment of campus life. The Radcliffe Institute for Advanced Study sponsors a biennial student competition to design and construct a site-specific installation for prominent display in the Susan S. and Kenneth L. Wallach Garden at Radcliffe Yard. The third installation in the program, installed this summer, is entitled "*100+ Years at 73 Brattle.*" This landscape work by Harvard student John Wang creatively illustrates the complex development history of the site.



Photo: Kevin Grady, courtesy of the Radcliffe Institute for Advanced Study

Modeling a Sustainable Campus

To promote broad campus sustainability, Harvard continues its multi-pronged approach to achieve lower carbon emissions, energy efficiency, and climate change preparedness. Recently the University has introduced its Healthier Building Materials Program which focuses on planning for building occupants' long-term health by making it easier to identify and purchase healthier building materials and products. This program has been piloted in a number of capital project on campus, and has provided the Harvard Office for Sustainability with the opportunity to collaborate with more than 50 manufacturers to promote transparency and change material ingredients of certain product purchases. This program advances the goals of Harvard's Green Building Standards, which set a clear framework for designing and building campus spaces that avoid the use of harmful chemicals of concern in building products and materials.



Improving Campus Infrastructure

Harvard is continually making improvements to critical campus infrastructure to support ongoing University operations and campus development. Harvard recently completed a major electric station modernization project, replacing the nearly 50 year old equipment that supplies electricity to Harvard facilities in the Oxford Street area.

Chilled water infrastructure in the Science Center area (Oxford Street/ Kirkland Street) will be upgraded beginning in late 2017. The existing water lines date back nearly 50 years and the upgrade allows Harvard to better interconnect its two chilled water production facilities for enhanced reliability and operational flexibility.

In addition, Harvard continues to renew its utility tunnel infrastructure, with some sections of the system dating back almost 100 years. Construction activities on the tunnels in the Mill Street / Plympton Street area will be starting in late 2017. Improvements to these tunnels safeguards the University's systems and supports the campus distribution systems of supplies and deliveries.



A. CAPITAL PROJECTS

Winthrop House – *House Renewal*

(Renovation and New Construction)



Photo: Peter Vanderwarker

Architect: Beyer Blinder Belle

Total Square Feet: 203,000 GSF (renovation), 26,000 GSF (addition)

Programmatic Driver: Renew undergraduate House life

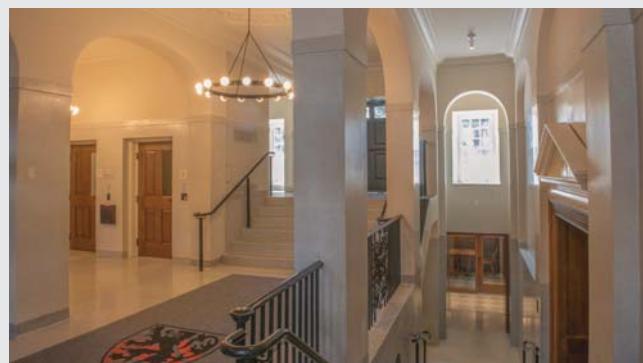
Green Attributes: Targeting LEED Gold

Harvard has recently completed the renewal and expansion of Winthrop House, the second full House to be renovated as part of Harvard’s House Renewal program. Located between Mill Street and Memorial Drive, Standish Hall and Gore Hall were originally constructed in 1914 as freshman dormitories; later, they were programmatically unified to become Winthrop House in 1931.

Consistent with recent House Renewal projects, this project was a comprehensive renovation that focused on restoring the buildings’ historic character while updating them to contemporary requirements. The project preserved and rehabilitated the two adjacent wood-frame buildings, 101 and 111 Plympton Street, as part of Winthrop House. This project also included the construction of Beren Hall, a new five-story east wing for Gore Hall at the corner of Mill and Plympton Streets. A low rise extension provides a connection to 111 Plympton Street. The addition provides much needed residential and common space for this undergraduate residence. The new addition was carefully designed to ensure that its massing, materials and overall expression are sympathetic to its context within the Harvard Houses National Register Historic District. This project received approval from the Board of Zoning Appeal.

Winthrop House

The recently renewed Winthrop House seamlessly blends the original neo-Georgian aesthetic with new spaces to serve today's students. Most notably, the new 5-story Beren Hall located on the corner of Plympton and Mill Streets provides 50 new student beds formerly located in overflow housing. Beren Hall also offers new academic and social spaces that include a student-run grill, a smart seminar room, and a striking top floor common space with river views. The project preserved the House's historic features and traditional spaces in Standish and Gore Halls such as the Dining Hall and Library, while updating student residential spaces extensively and improving the overall House life experience. New accessible hallways, lower-level connectors, and elevators supplement the vertical entry system to dramatically improve accessibility in the building.



Clockwise from top left:

Top Floor of Beren Hall, Student Room in Gore Hall, Student Suite in Beren Hall, H Entry at Gore Hall.

Photos: Peter Vanderwarker

House Renewal

Harvard has now fully completed the first four projects to renew its undergraduate Houses as part of a broader system-wide renewal. The House system forms one of the most distinctive and important features of a Harvard College education. In the late 1920's, President A. Lawrence Lowell envisioned a House system that would serve students of different backgrounds, resulting in learning that extended beyond the classroom. Today, more than 98 percent of Harvard College students live on campus. First-year students live in freshman dorms, located in and around Harvard Yard. The overwhelming majority of sophomores, juniors, and seniors live in one of twelve undergraduate Houses, which are located alongside the Charles River or at the Radcliffe Quad, along Garden Street.

The House Renewal program's first focus is on the original neo-Georgian Houses along the Charles River, most of which were constructed in the 1920s and 30s and have had only modest upgrades over the ensuing years. The Houses were also built at a time when building standards and the needs of the student body were very different. The intent of the House Renewal program is to preserve the historic character of these buildings and to sustain President Lowell's original vision of the Houses, while simultaneously transforming them to support a twenty first-century intergenerational learning community that meets the needs of today's students.

Construction at Winthrop House was completed in summer 2017, Lowell House is under construction, and planning is underway for Adams House. The pace and sequence of House Renewal is subject to periodic review.



Winthrop House Library, Standish Hall

Photo: Peter Vanderwarker

Harvard Kennedy School (New Construction)



Architect: Robert A.M. Stern Architects

Total Square Feet: 91,000 GSF (new construction), 7,000 GSF (renovation)

Programmatic Driver: Foster interaction and collaboration; improve physical campus and facility functionality

Green Attributes: Targeting LEED Gold

Construction recently finished at the Harvard Kennedy School (HKS) on a significant transformation of the School's Cambridge campus. The project, which broke ground in the spring of 2015, provides additional and improved teaching and study space, and creates a physical environment that supports greater collaboration and active learning. Physically, the project creates a more cohesive campus, improves the central courtyard as a campus amenity, and enhances circulation and pedestrian connections to Harvard Square and the Charles River.

The project, which was approved by the Cambridge Planning Board and Board of Zoning Appeal, includes infill construction at the perimeter of the campus, maintaining an open landscaped courtyard at its center. New construction connects the campus's four existing buildings, adding approximately 91,000 gross square feet of new indoor space in four locations:

- The Ofer Building, a two-level addition connecting the existing Taubman Building and Belfer Building at the 3rd and 4th Floors, contains faculty offices, meeting space, and a new student lounge. A two-story opening beneath this addition creates a significantly improved and welcoming pedestrian access point to the HKS campus from Eliot Street;

- A four-level expansion of the Rubenstein Building, extending the existing Rubenstein Building and connecting it with the Taubman Building. It contains classrooms, meeting spaces, faculty offices, and building support spaces. This addition also creates a new pedestrian access point to the campus from the JFK Park pedestrian connector;
- The Wexner Building, a four-level building connecting the existing Littauer Building and the expanded Rubenstein Building. This building contains classrooms, meeting spaces, new campus dining facilities, and building support space;
- The Wexner Commons, a glass-enclosed atrium abutting the new Wexner Building, will serve as a year-round multi-functional space for dining, meetings, and events.

In addition to construction of new infill buildings and Wexner Commons, the project has raised the level of the central courtyard to generally align with the grade level of adjacent streets at key pedestrian access points (at Eliot Street beneath the Ofer Building and at the west side from the JFK Park pedestrian connector). The raised courtyard enhances the central campus green space while also creating a new lower level that contains a below-grade loading facility, and additional program space including a classroom and a new campus kitchen.

The project was completed in late 2017 with full occupancy in the new buildings scheduled for January 2018.



Wexner Building

Cabot Science Library (Renovation)



Photo: Peter Vanderwarker

Architect: Mack Scogin and Merrill Elam

Total Square Feet: 28,500 GSF (renovation)

Programmatic Driver: Transform existing space into a collaborative learning environment

Green Attributes: Targeting LEED Silver

The Faculty of Arts and Sciences has completed the transformational redesign of the Cabot Science Library and key public spaces within the Harvard Science Center. The completed project leverages and enhances the building's function as a campus crossroads of undergraduate life, and responds to changing learning activities, collaborative work patterns, and related social interactions of the contemporary academic community. The project has also re-imagined the Cabot Science Library from a traditional collections-based library into an innovative digital teaching and learning hub for all disciplines.

The main floor of the library includes new social areas, study spaces, and a cafe which combine to create an environment that fosters collaboration among students, faculty, and staff utilizing the Science Center. Innovative features include a "Discovery Bar" which anchors a flexible presentation and exploration space that supports a variety of programs and showcases new technologies and learning tools.

The library's lower level features some of its most advanced technology, including two new media studios where users can create and edit their own videos and multimedia presentations. This level also includes a large flexible classroom, seven group study rooms featuring large monitors and writable walls, and consolidated collections in mathematics and sciences.



Photo: Peter Vanderwarker

The project's architects Mack Scogin and Merrill Elam have designed the new spaces to be more open, colorful and high-tech, providing students and scholars a lively and vibrant setting for study and relaxation. Additionally, the building's renovated public spaces have greater openness and transparency, visually connecting to the building's courtyard and the adjacent Plaza space.

Memorial Church (Renovation)



Photo: Jeffrey Blackwell

Architect: Payette

Total Square Feet: 33,171 GSF (renovation)

Programmatic Driver: Renew building systems, make accessibility improvements and accommodate new uses

Green Attributes: Certified LEED Gold

Memorial Church has undergone an eight month renovation designed to upgrade the 85-year-old building into a more accessible, comfortable and versatile space. The project included the installation of a new HVAC system, improved access for persons with disabilities and renovated ground floor space for new programmatic uses.

In addition to the major building system improvements, the project included significant accessibility upgrades, most notably the creation of two new fully accessible entrances on the building's west and north sides. The project also included a complete redesign of the Church's ground floor level into a contemporary space featuring a new student oasis, meeting rooms, new offices for clergy and staff and a music rehearsal suite.

Memorial Church was dedicated in 1932 as a religious worship space and memorial to Harvard soldiers, originally those who fought in World War I. Designed by Coolidge Shepley Bulfinch and Abbott of Boston, the Colonial Revival style building is a major landmark on the Harvard campus. As part of the project, the historic bell that once hung in the spire of Memorial Church and had been previously replaced was restored and is now on display on the west portico.

40 Concord Avenue

(Renovation and New Construction)



Architect:	Austin Architects
Total Square Feet:	5,793 GSF (renovation), 1,377 GSF (addition)
Programmatic Driver:	Address deferred maintenance and improve accessibility
Green Attributes:	Certified LEED Gold

The Radcliffe Institute for Advanced Study has completed the renovation of 40 Concord Avenue for continued institutional use. The renovated building houses processing and office space for the Schlesinger Library. The project included upgrades of building systems and infrastructure, modifications required for building code compliance, and the reorganization and renovation of interior spaces. The completed project also significantly improves access for persons with disabilities through the creation of a new accessible entrance, new toilet rooms and the installation of a new passenger elevator serving all floors of the building. The project included a small addition at the south side of the building in keeping with the architectural character of the existing building which accommodates several of the required building improvements. As part of the renovation, 40 Concord Avenue also received a new exterior paint scheme developed in consultation with the Cambridge Historical Commission.

Grays Hall (Renovation)



Credit: Kennedy & Violich Architecture

Architect:	Kennedy & Violich Architecture
Total Square Feet:	5,350 SF (renovation)
Programmatic Driver:	Accommodate new programmatic use and improve access for persons with disabilities.
Green Attributes:	Energy and water-efficient lighting, mechanical, and plumbing systems, FAS Healthy Materials pilot project

Harvard College has completed a project to renovate the lower level of Grays Hall, located in Harvard Yard, to accommodate new programmatic uses. Grays Hall was constructed in 1863 and is one of the College's freshman dormitories. The building's lower level has been renovated to provide new program space for the Harvard College Office for Equity, Diversity and Inclusion and BGLTQ Student Life. A major component of the project was the creation of a new sloped walkway providing direct access to the lower level of the building.

Construction of the walkway involved re-grading the south side of the building and exposing its original granite foundation. These modifications were reviewed and approved by the Cambridge Historical Commission in spring 2017. In addition to providing significantly improved accessibility, the new landscaped walkway provides a unique glimpse of seldomly seen mid-19th century construction details.

**Richard A. and Susan F. Smith Campus Center - Facade Restoration
(Renovation)**



Architect: Bruner/Cott

Total Square Feet: N/A (building exterior)

Programmatic Driver: Building repair and maintenance

Green Attributes: Improved energy efficiency

Harvard University is completing a comprehensive building envelope repair project at the Richard A. and Susan F. Smith Campus Center. This project coincides with the campus center renovation project described on the following page.

The scope of the facade restoration project addresses long-term maintenance issues of the concrete and glass exterior while also restoring the visual quality of the original elevations with their colorful accents and tonal variation. The project includes the repair of cracked and spalling concrete and damaged precast concrete; the cleaning of the concrete and the aluminum spandrels and fins; and sealant replacements. The window repairs will include the replacement of solar films, the restoration of original architect Josep Lluis Sert's colored 'scale bars', and replacement of failed translucent panels.

The project received approval from the Cambridge Historical Commission. Construction on the facade restoration began in 2015 and is anticipated to be completed in fall 2018.

Richard A. and Susan F. Smith Campus Center (Renovation)



Architect:	Hopkins Architects (Design) Bruner/Cott (Executive Architect)
Total Square Feet:	95,000 GSF (renovation), 2,943 GSF (net new addition)
Programmatic Driver:	Interior Common Spaces
Green Attributes:	Targeting LEED Gold

Work continues at the Smith Campus Center (SCC) to create a campus center that builds community with an emphasis on connectivity, transparency, and engagement with Harvard Square. The project, located primarily on the two lower floors of the building, aims to provide flexible, accessible and sustainable spaces that permit a wide range of uses such as eating, gathering, meeting, studying, performing and exhibiting the arts. The heart of the SCC will include a large, open plan interior “living room,” as a companion to the exterior “living room” of Harvard Yard. It will also establish a welcoming and vibrant entrance to Harvard University for visitors, current and prospective Harvard affiliates, and the Cambridge community. Throughout the first floor, the project will maintain food venues, a number of which have been recently permitted by the City. The project will result in a transformational improvement of the public realm, with enhanced amenities and unique spaces that do not exist elsewhere in Harvard Square.

To achieve this vision for the campus center, Harvard is renovating and selectively reconstructing portions of the building. The proposed design respects original architect Josep Lluis Sert’s planning and design principles relating to connectivity, scale, massing, light, facade and roofscape. The project received approvals from the Cambridge Historical Commission, Harvard Square Advisory Committee, and Board of Zoning Appeal in 2015. Construction on the campus center renovation is anticipated to be completed in fall 2018.

Lowell House – *House Renewal*
(Renovation)



Architect: KieranTimberlake

Total Square Feet: 218,000 GSF (renovation)

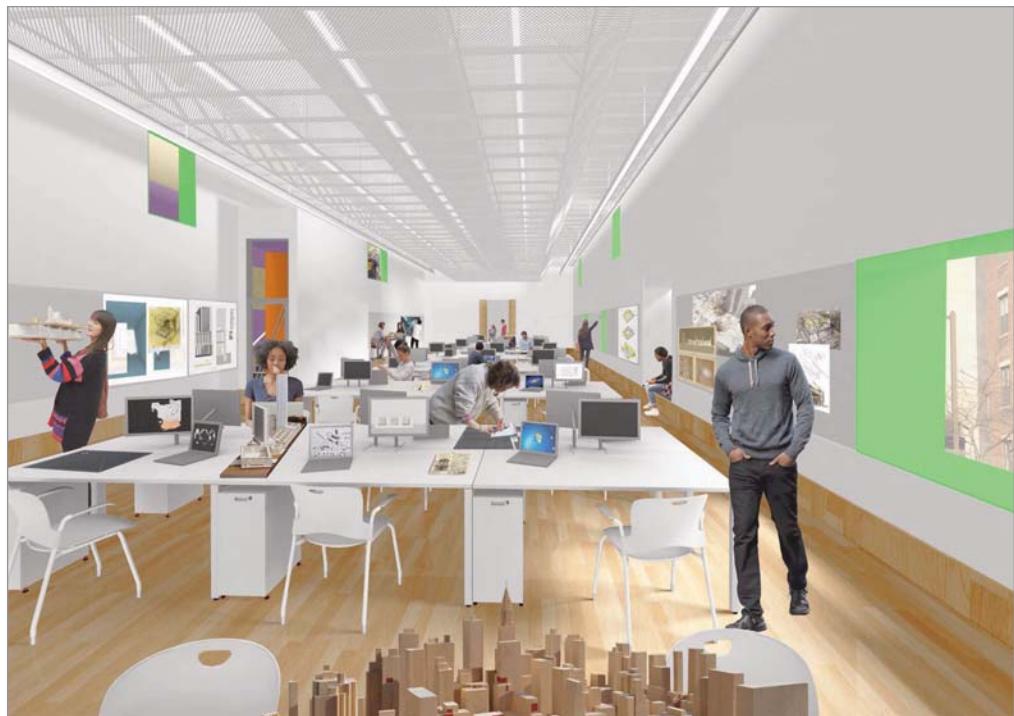
Programmatic Driver: Renew undergraduate House life

Green Attributes: Targeting LEED Gold

Harvard recently began the renewal of Lowell House, an undergraduate dormitory built in 1930 as one of the first two purpose-built Harvard Houses. Situated in the center of the River House district, Lowell House is widely recognized by its distinctive bell tower, and is noteworthy for its two landscaped courtyards, both fully enclosed by the dormitory's brick neo-Georgian structure.

Consistent with the other House Renewal projects, the renovation of Lowell House has been designed to respect the historic building and House culture while upgrading it to support a twenty-first century living and learning environment. The project calls for a major renovation of the building, including new interior room layouts, enhanced circulation, new building systems, and significant improvements to accessibility while maintaining the historic and architectural character of the building. The lower level, formerly used as squash courts, will be re-purposed to create new social and academic spaces. Construction on the project is scheduled to be complete in 2019.

Arthur M. Sackler Building (Renovation)



Credit: designLAB

Architect: designLAB

Total Square Feet: 52,500 GSF (renovation)

Programmatic Driver: Address deferred maintenance and accommodate new programmatic uses

Green Attributes: Targeting LEED Gold

Harvard Real Estate has begun the renovation of the Sackler Building to address deferred maintenance, improve building systems, and re-purpose the building for new academic use. The project includes the renewal of key building envelope and mechanical systems, including roof replacement and HVAC upgrades.

The Arthur M. Sackler Building, designed by noted British architects James Stirling and Michael Wilford, opened in 1985. The building originally housed collections of the Harvard Art Museums, which were re-located to 32 Quincy Street upon completion of that building's renovation in 2014. The building's former gallery spaces are being re-purposed to provide new program space for the Faculty of Arts and Science's History of Art and Architecture Department, the Graduate School of Design, and the arts program currently known as Arts@29 Garden. The project will include new common spaces, classroom and meeting spaces, design studios, art-making space and offices.

Recognizing the Sackler Building's design significance, the character of the building's key design elements, including the entry lobby which features murals by the artist Sol LeWitt, the monumental main stair, and primary building facades will be retained and expanded upon to support new uses. Construction on the project began in the Spring of 2017, and completion is anticipated late in 2018.

20 Sumner Road (Renovation)



Architect: Snøhetta

Total Square Feet: 4,600 GSF (renovation)

Programmatic Driver: Pilot sustainable retrofit of residential wood-frame building

Green Attributes: Comprehensive sustainability measures

The wood frame building at 20 Sumner Road is home to the Harvard Center for Green Buildings and Cities (CGBC), a program affiliated with the Harvard Graduate School of Design. The CGBC is a research center focused on creating and improving sustainable, high performance buildings and cities. The project underway at 20 Sumner Road offers the opportunity to study and pilot innovative ideas for retrofitting a residential wood-frame structure, a predominant building form in the U.S., in an environmentally sustainable manner. The project establishes very unique and ambitious goals, including close to zero heating and cooling, 100% natural ventilation, 100% daylight autonomy and zero carbon emissions, all of which make the building a net positive energy structure. The building will feature an improved envelope, a solar chimney for ventilation, geothermal heating, and the transformation of an existing surface parking lot to greenspace with a rain garden in a possible next phase.

This project received approvals from the Mid Cambridge Neighborhood Conservation District Commission and the Cambridge Board of Zoning Appeal. The project is anticipated for completion in late 2017.

Biological Laboratories (Renovation)



Architect: Perkins + Will

Total Square Feet: 219,498 GSF (entire building)

Programmatic Driver: Infrastructure to support laboratory research space

Green Attributes: Energy efficient equipment and energy recovery systems

The Faculty of Arts and Sciences has started construction on the replacement of the HVAC and exhaust systems in the Biological Laboratories. Constructed in 1931, the building is one of Harvard's key teaching and research facilities for the life sciences. The building has five main HVAC systems and 150 exhaust fans that have outlived their useful lives and are unable to provide the adequate capacity and stable environment required by modern biological research labs.

The project will replace these systems with new HVAC and exhaust equipment, resulting in improved environmental conditions for teaching and research. The new systems will be more energy efficient, have the ability to better direct and control ventilation and feature energy recovery systems, all of which will combine to reduce the cost of building operation.

The project began construction in summer 2017 with completion targeted in 2019.

1607 - 1615 Massachusetts Avenue
(New Construction)



Architect: NBBJ

Total Square Feet: 20,925 GSF (new construction)

Programmatic Driver: Improve pedestrian environment, create space for HLS public service programs

Green Attributes: Targeting LEED Gold

Harvard Law School has begun redevelopment of a site on the corner of Massachusetts Avenue and Everett Street. The existing vacant one-story structure has been demolished and a four-story, 21,000 square foot building will be constructed in its place. The new building's ground floor will have retail use and the upper three floors of office space will be occupied by Harvard Law School clinical and research programs. Construction will continue through next summer and the building will be occupied during the fall of 2018.

Adams House - *House Renewal*
(Renovation)



Architect: Beyer Blinder Belle

Total Square Feet: Approximately 250,000 GSF (renovation)

Programmatic Driver: Renew undergraduate House life

Green Attributes: Targeting LEED Gold

Harvard is in the early planning phases for the renewal of Adams House. This undergraduate dormitory is comprised of five separate and architecturally distinct buildings located along Bow and Mount Auburn Streets in Harvard Square. The core of Adams House consists of former private dormitories from the 1890s, which were later united in 1931 when Adams House was founded.

In keeping with Harvard's approach to the renewal of the historic Harvard Houses, the intent will be to respect the historic buildings and House culture while upgrading it to support a twenty-first century living and learning environment. The project is anticipated to begin construction in 2019.

Robinson Hall (Renovation)



Architect: Symmes Maini & McKee Associates

Total Square Feet: N/A

Programmatic Driver: Improved access for persons with disabilities, life safety

Green Attributes: TBD

The Faculty of Arts and Sciences is planning a project at Robinson Hall that will significantly improve access for persons with disabilities. The building was constructed in 1904 as the home of Harvard's Department of Architecture, and today houses the Department of History.

The project's primary component is the installation of a new passenger elevator serving all levels of the building and a sprinkler fire-suppression system. Other accessibility improvements will include renovated accessible toilet rooms, an improved accessible egress, and new handrails at the existing entrance ramp and stairs. The project also includes the renovation of existing spaces necessary to accommodate construction of the new elevator.

The project is planned to begin construction in June 2018, with completion expected by the end of the year.

Schlesinger Library (Renovation)



Architect:	Kennedy & Violich Architecture
Total Square Feet:	16,0000 (GSF)
Programmatic Driver:	Improve library facilities to foster interactive access to collections, comprehensive exterior restoration
Green Attributes:	Reducing use of six classes of chemicals of concern

The Radcliffe Institute for Advanced Study is planning a project at Schlesinger Library that is designed to position the library as a continued leader in special collections libraries. The project's planned interior renovations will re-imagine existing library spaces to foster interactive access to library collections, including an enlarged exhibit/lobby space and a technology-enhanced seminar room.

The project also includes a comprehensive restoration of the library exterior that will undertake needed repairs to the building envelope, and window restoration and replacement where necessary. The project is expected to begin construction late in 2018, with anticipated completion late in the fall of 2019.

Massachusetts Hall (Renovation)



Architect: Baker/Wohl Architects

Total Square Feet: N/A

Programmatic Driver: Exterior restoration, HVAC, and building systems upgrades

Green Attributes: TBD

Constructed in 1720, Massachusetts Hall is Harvard's oldest surviving building, and among its most architecturally and historically significant. Over the span of almost three centuries of use, the building has seen multiple renovations and changes in use. Originally constructed as a dormitory, the building was converted to use as a lecture hall in 1870; it was renovated and converted back to dormitory use in 1924; and in 1939 again underwent a major renovation resulting in its current configuration and use as offices for the University's President and other administrative leadership, while retaining student dormitory rooms on the building's topmost floor.

The current project being planned by Harvard Real Estate will include a comprehensive restoration of the building's Georgian exterior, replacement of central HVAC systems and significant code and life safety upgrades. The scope of exterior restoration work is being carefully coordinated with the Cambridge Historical Commission and will require the Commission's review and approval.

The renovation project at Massachusetts Hall is planned to be undertaken during the summer of 2018.

Gutman Conference Center (Renovation)



Architect: Shepley Bulfinch

Total Square Feet: 16,500 GSF (renovation)

Programmatic Driver: Need for additional convening space, improve layout and function of existing conference center space

Green Attributes: TBD

The Harvard Graduate School of Education (HGSE) is planning a renovation of the Gutman Conference Center located on the lower level of the Gutman Library building. The project is designed to materially improve the school's ability to convene practitioners, policy makers, and researchers to further its academic mission.

The HGSE campus is extremely space constrained and additional convening space is required to support the school's goal of developing closer working relationships with the education sector. The renovated Gutman Conference Center will also provide additional teaching and collaboration space which supports HGSE degree and professional education programs.

The project is planned to start construction in May 2018 with substantial completion approximately one year later.

Lewis International Law Center
(Renovation)



Architect: Deborah Berke Partners

Total Square Feet: TBD

Programmatic Driver: Address deferred maintenance, reduce library stack space and create additional faculty offices and meeting space

Green Attributes: TBD

Harvard Law School has begun planning a project at the Lewis International Law Center which will include a redesign and renovation of the building's interior spaces, exterior envelope repairs, major building systems improvements and upgrading of all utility infrastructure. The project will incorporate new office and institutional spaces, changing the use of the building from library use to office/institutional use.

The Lewis International Law Center was built in 1957 and was designed by Shepley Bulfinch Richardson & Abbott. The building is connected to Areeda Hall via a bridge, which connects to Langdell Library and Griswold Hall.

Gund Hall Renovation and Addition (Renovation and New Construction)



Architect: TBD

Total Square Feet: 162,000 GSF (renovation), 20,000 GSF (new construction)

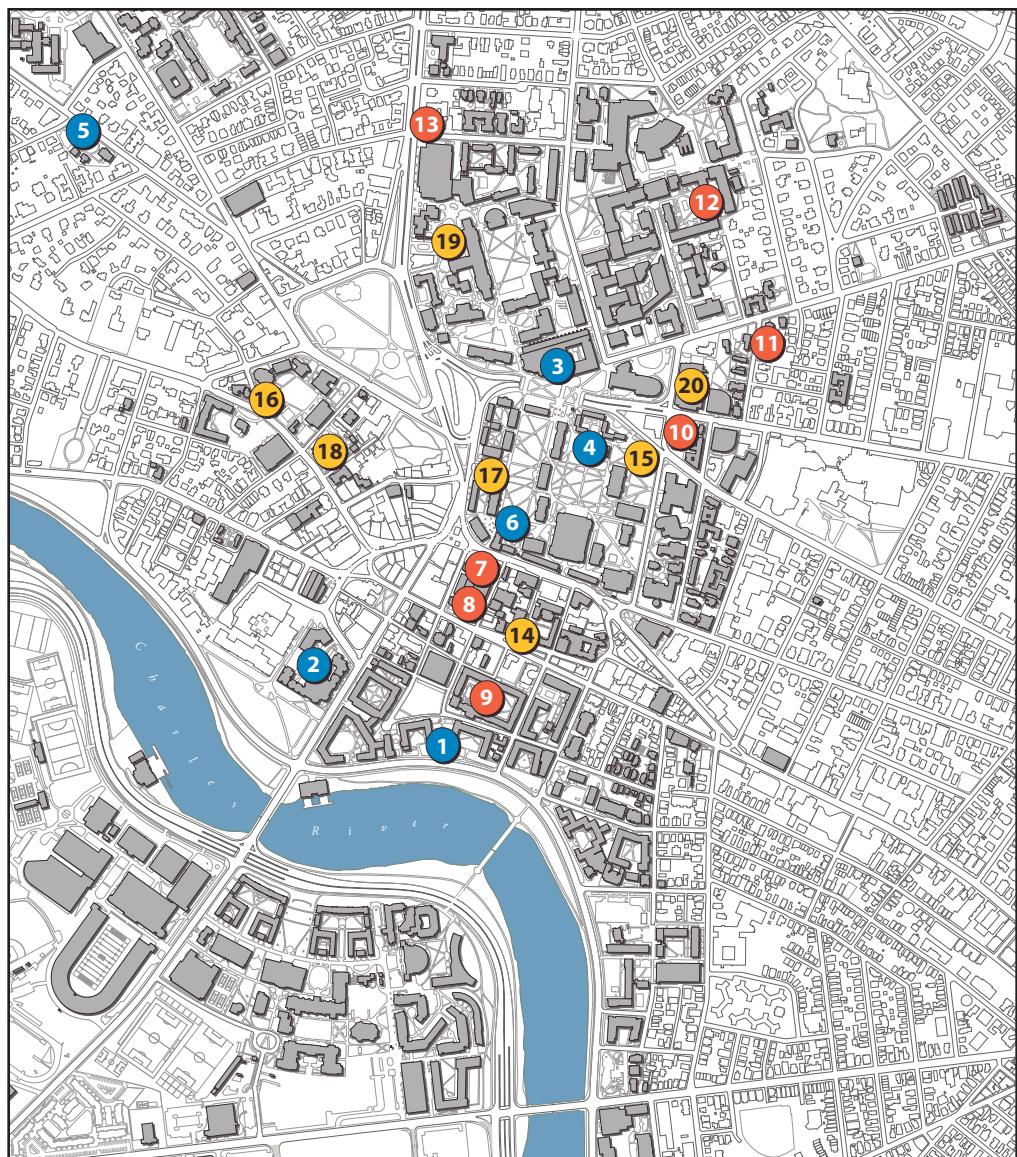
Programmatic Driver: Foster collaboration and innovative teaching; expand teaching facilities

Green Attributes: TBD

The Harvard Graduate School of Design has recently announced its plans to renovate and expand Gund Hall, the school's predominate facility originally built in 1972. As architecture, urban planning, and their related disciplines continue to innovate, the GSD is looking to reflect the evolving approaches in design and design pedagogy in its physical campus. This includes spaces that will foster more collaboration among the students, faculty and researchers across the design disciplines and embrace new technologies including robotics and 3-D printing. In addition, the project will expand teaching and studio space to better accommodate the existing student body. Planning for this project will begin in 2018.

1. PROJECT MAP

*Projects Completed,
in Construction,
and in Planning*



Recently Completed

1. Winthrop House
2. Harvard Kennedy School
3. Cabot Science Library
4. Memorial Church
5. 40 Concord Avenue
6. Grays Hall

Currently in Construction

7. Smith Campus Center (Facade restoration)
8. Smith Campus Center (Interior renovation)
9. Lowell House
10. Sackler Building
11. 20 Sumner Road
12. Biological Labs HVAC
13. 1607-1615 Mass. Ave.

Projects in Planning

14. Adams House
15. Robinson Hall
16. Schlesinger Library
17. Massachusetts Hall
18. Gutman Conference Center
19. Lewis International Law Center
20. Gund Hall

2. PROJECT LIST

Project	Programmatic Goal	Green Attributes
Recently Completed		
1. Winthrop House	Renew undergraduate House life	Targeting LEED Gold
2. Harvard Kennedy School	Foster interaction and collaboration; improve physical campus and facility function	Water use reduction (35%); Optimize energy performance; Construction waste management, divert 75% from landfill; Low VOC emitting adhesives, sealants, paints, coatings and flooring systems; Daylighting of 75% of spaces
3. Cabot Science Library	Transform existing science library and adjacent space into collaborative learning environment	Targeting LEED Silver
4. Memorial Church	Renew building systems, make accessibility improvements and accommodate new uses	Targeting LEED Gold
5. 40 Concord Avenue	Address deferred maintenance and improve accessibility	Certified LEED Gold
6. Grays Hall	Address deferred maintenance and improve accessibility	Energy and water-efficient lighting, mechanical, and plumbing systems, FAS Healthy Materials pilot project
Currently in Construction		
7. Smith Campus Center (Facade restoration)	Building repair and maintenance	Improved energy efficiency
8. Smith Campus Center (Interior renovation)	Foster collegial interaction; improve physical campus and facility function	Targeting LEED Gold
9. Lowell House	Renew undergraduate House life	Targeting LEED Gold
10. Sackler Building	Building renewal and accommodate new program	Targeting LEED Gold
11. 20 Sumner Road	Pilot sustainable retrofit of residential wood-frame building	Exceed net zero
12. Biological Laboratories	HVAC and exhaust upgrades to support research labs	Energy efficient equipment and energy recovery systems
13. 1607-1615 Massachusetts Ave.	Improve pedestrian environment, create space for HLS public service programs	Targeting LEED Gold
Projects in Planning		
14. Adams House	Renew undergraduate House life	Targeting LEED Gold
15. Robinson Hall	Improve accessibility for persons with disabilities	TBD
16. Schlesinger Library	Improve library facility, exterior restoration	Reducing use of six-classes of chemicals of concern
17. Massachusetts Hall	Exterior restoration, HVAC upgrades	TBD
18. Gutman Conference Center	Provide additional convening space and Improve layout and function of existing conference center	TBD
19. Lewis International Law Center	Address deferred maintenance, reduce library stack space and create additional faculty offices and meeting space.	TBD
20. Gund Hall	Foster collaboration and innovative teaching; expand teaching facilities	TBD

B. TRANSPORTATION

Transportation Demand Management

CommuterChoice Program

Parking and Transportation Demand Management Plan

Planning for Bicycle Facilities

Harvard University remains a leader among Cambridge's large employers for consistently reducing its exceptionally low Single Occupancy Vehicle (SOV) rate. According to the latest PTDM survey results, Harvard's SOV rate has continued to remain low and is now at 11.8 % for Cambridge-based employees and graduate students. Harvard's proactive Transportation Demand Management programs and incentives offered by the CommuterChoice Program continue to provide the incentive necessary to encourage commuters to leave their cars at home.

CommuterChoice Program offerings include:

- 50% MBTA monthly pass subsidy and pre-tax savings.
- 50-75% Carpool and vanpool subsidy and partner matching.
- Preferential parking for carpools and low-emission vehicles.
- Emergency Ride Home Program for green commuters.
- Discounted annual Zipcar membership.
- Discounted annual Hubway membership.
- Bicycle Commuter Benefit.

Highlights from the past year include:

- Sold an average of over 7,450 subsidized MBTA monthly passes each month.
- 564 bicyclists were reimbursed over \$88,500 for bike commuting expenses.

Harvard's Parking and Transportation Demand Management (PTDM) Plan, approved by the City of Cambridge in 2003, provides a baseline assessment of Harvard's parking supply and management of vehicle trips through the transportation demand measures and strategies offered by the CommuterChoice Program.

The PTDM Plan describes the transportation services and financial incentives that Harvard offers its students, staff, and other affiliates. Harvard's PTDM programs, which are administered by CommuterChoice, generate a direct positive effect on greenhouse gas emissions by reducing employee and student automobile trips to campus.

A copy of Harvard University's PTDM Plan is available at: <http://home.hppm.harvard.edu/pages/reports>. Harvard submits annual PTDM updates which are on file with the City's Community Development Department.

In recent years, biking has become a more popular means of transportation, both nationally and locally. Following publication of the 2015 Bicycle Network Plan, the City of Cambridge has spent the last two years implementing additional bike infrastructure in recognition of cycling's growing role in the City's transportation network. Cycling is also recognized as an integral component of the Harvard's transportation system and is part of Harvard's commitment to building a healthy, more sustainable campus. The University continues to make significant investments in new bicycle facilities on campus and in the collaborative planning and implementation of local and regional cycling initiatives.

New Bicycle Facilities

Over the past several years Harvard has made considerable improvements and enhancements to bike facilities on the Cambridge campus. Recent investments include:

- **Sheltered bike parking:** Harvard provides more than 400 sheltered parking spaces in facilities across its campus. Most recently, the Harvard Kennedy School added 51 long-term, sheltered, secure parking spaces as part of its recent campus expansion project.
- **Bike rack improvements:** Bike racks at several locations on the Cambridge campus have been upgraded or replaced. The Faculty of Arts and Sciences continues to upgrade existing outdated racks serving its facilities to "U" Racks, which reflect the City of Cambridge standards for bicycle parking.
- **Bicycle repair stations:** There are a total of eight repair stations on the Cambridge campus.
- **Abandoned bike removal:** Abandoned bikes pose a challenge to bicyclists by reducing the number of available bike parking spaces in addition to causing safety and accessibility problems. This year, CommuterChoice created a consistent mechanism for abandoned bike removal and donation and has removed abandoned bikes in the Science Center Plaza, the Francis Ave Bike Shelter, and the Harvard Kennedy School.

An interactive map of all existing bike facilities on Harvard's Cambridge campus is available on the CommuterChoice website (www.commuterchoice.harvard.edu). The map provides locational information on bike routes, parking areas, and key attributes such as rack type and whether parking is sheltered.

Bike Sharing Programs

Harvard continues to collaborate closely with the cities of Cambridge and Boston to support the regional bike-sharing program, Hubway, around its main campuses. The University supports seven Cambridge stations, at Peabody Terrace, the River Houses, the Kennedy School, the Law School, the School of Engineering and Applied Sciences, Gund Hall and the Radcliffe Quad.

Hubway provides an alternative to driving between the Cambridge, Allston, and Longwood campuses, enhances transit options for areas of the Harvard campus not as well served by existing transit facilities, and improves connections between existing public and private transit modes. The system also contributes to the University's sustainability goals by reducing inter- and intra-campus vehicle trips. Harvard's support for Hubway includes offering its affiliates a 30% discount on annual membership. As of October 2017, Harvard had 950 active Hubway members.

CommuterChoice Cycling Initiatives

The University's CommuterChoice Program also sponsors several initiatives that promote cycling at Harvard. These efforts include:

- **Bike Week** – During Bike Week activities in 2017, 118 Harvard cyclists rode 5,846 miles as part of the Mass Commute Challenge, which encourages bike commuting during the week. Other events included the CommuterChoice Bike Breakfast, which attracted over 250 cyclists, featured free bike safety checks, free bike registration with HUPD, and an interactive raffle for cycling equipment, and giveaways including Hubway memberships. The event also provided an opportunity for participants to meet with representatives from key cycling

stakeholder groups including the City of Cambridge, Harvard Construction Mitigation, Bike Harvard, Hubway, and MassRIDES.

- **LOOK Campaign** – This initiative, launched in Spring 2014 by HUPD and the Harvard Transportation Department, works to remind motorists, bicyclists and pedestrians to be alert and aware of their surroundings. As part of promotional events, free helmet certificates are distributed to bicyclists, and side mirror stickers designed to combat “dooring” and increase awareness of cyclists were distributed to motorists throughout the Harvard community.
- **Bicycle Safety and Repair** – CommuterChoice offers reimbursement to employees for expenses associated with taking bicycle safety or repair classes at local bike shops. It also encourages affiliates to participate in classes held through the City of Cambridge focused on urban cycling, bike repair and maintenance techniques, and women-powered cycling.
- **Discounted Helmets** – Harvard offers \$10 helmets for sale at the CommuterChoice office. Over 1,500 of these helmets have been sold over the past four years.
- **Bike Benefit Program** – This initiative, established in 2013, provides a benefit of up to \$240/year for the purchase, repair, maintenance or storage of a bicycle for eligible employees. The benefit has proven to be extremely popular, with 564 bicyclists being reimbursed over \$88,000 in 2016.
- **Bike Workshops** – In 2017, CommuterChoice sponsored an Intro to Bike Commuting workshop, an instructor-led lunchtime bike ride to nearby Park&Pedal locations; bike repair clinics pairing one-on-one mechanic safety tune-ups and guided DIY bike repair; and a Winter Bike Commuting workshop. Additionally, Harvard University hosted a Traffic Skills 101 class for area bike commuters and community leaders as the first step to becoming a League Cycling Instructor through the League of American Bicyclists.

Planning for Cycling Networks

- Examining Harvard’s existing bicycle network on the central campus and identifying areas for potential improvements.
- Collaborating with the City of Cambridge on municipal bicycle planning initiatives.
- Working with the City of Boston on the installation of bike lanes on Allston roadways to connect the Allston and Cambridge campuses and extend the bike network to the south and west.
- Advocating for the inclusion of new bike lanes on the river bridges that connect Boston and Cambridge as part of planning for MassDOT bridge renovation projects.
- Working with MassDOT to plan for new bike facilities as part of the Allston Interchange project.

C. ANTENNA INSTALLATIONS

Harvard, like all institutions of higher education in the 21st century, must continue to provide and upgrade the technological infrastructure that supports its teaching and research mission. The increasing use of wireless, web-based, and remote platforms for instruction and collaborative research across the University has led to growing demand for cellular and wireless services, and the need for improved coverage, signal strength and capacity.

Because cellular and wireless services are provided by individual service providers, each with their own communication networks and technologies, the University faces an ongoing need to improve coverage and expand capacity across multiple carriers. This has resulted in a growing number of antenna installations required to meet the communication needs of cellular and wireless users who are served by different carriers.

Distributed Antenna System (DAS)

Harvard continues to implement its neutral host Distributed Antenna System or DAS that will enable the University to not only provide better coverage within its buildings and immediately surrounding campus areas, but also to coordinate antenna installations and system improvements among multiple service providers.

The DAS establishes a network of strategically located antenna nodes connected to a common signal source, which accommodates multiple service providers. Each antenna node or “host site” distributes carrier signals to clusters of campus buildings, providing high quality micro level coverage to the University’s end users. To date Harvard has completed five DAS installations in Cambridge, with several other sites currently in planning.

The DAS network allows the University to limit exterior equipment installations to a smaller number of campus nodes that can serve multiple carriers. This significantly reduces the number of antenna installations that are typically required to provide high-quality coverage across multiple wireless communications providers’ systems.

Minimizing Visual Impacts

Where exterior antenna and equipment installations are required, Harvard and its DAS consultants have worked to minimize their visual impacts to the greatest extent possible. As a general rule, Harvard has sought to exclude antenna installations from its most architecturally significant and iconic campus buildings. Where possible, existing building elements are used to conceal or minimize the visibility of exterior equipment. This can include mounting antennas against mechanical penthouses, chimneys, vents or other existing rooftop elements. For such installations, equipment is usually painted to match the background location as closely as possible.

In some instances, antennas and other required equipment utilize a “stealth” treatment that camouflages the equipment to better visually blend in with its surroundings. This can include creating the appearance of brick or other desired background material on antenna panels; enclosing equipment in false chimneys, vents or other roof top elements that simulate those already present on the building; or screening the equipment in visual extensions of existing mechanical penthouses.

In meeting its regulatory obligations for antenna installations, Harvard and its consultants work with City of Cambridge planning and design staff to review proposed installations to identify appropriate locations and visual treatment options. Where applicable, installations proposed within historic districts or neighborhood conservation districts are reviewed with the staff of the Cambridge Historical Commission.

D. CAMPUS TREE RESOURCES

A key physical element of Harvard's Cambridge campus is the existence of many mature trees that contribute to a campus landscape that serves as a unique space within the urban context of Cambridge.



The types of trees on the campus and their placement help to define campus spaces through their canopy, spacial structure and visual characteristics. Different tree species in four major categories (shade, evergreen, ornamental and fruit) have historically been utilized in specific landscape typologies across the campus.

Shade Trees

Deciduous shade trees with relatively dense and overarching canopies are found throughout the campus, and are the primary trees in the major yards and greens. Shade trees on campus include American Elm, Northern Red Oak, Kentucky Coffee Tree, and Norway Maple.

Evergreen Trees

Evergreens are used as specimens, hedges, screens, or backdrops for ornamental trees, and are scattered throughout the campus, mostly along frontages of buildings or in the interstitial spaces along pedestrian paths. Very few evergreen trees are located in yards, greens, gardens, and courtyard areas. Evergreen species on campus include White Fir, Eastern Hemlock, Colorado Spruce, and Eastern Red Cedar.

Ornamental Trees

Ornamental trees are primarily planted for their color, flowers, leaves, or bark and are often planted with evergreen and shade trees as an accent. Ornamental trees are interspersed throughout the campus but occur mostly in gardens/courtyards and in interstitial spaces along routes. Ornamental trees on campus include Japanese Tree Lilac, Flowering Dogwood, Japanese Maple, Magnolia, and Serviceberry.

Fruit Trees

Fruit trees are a subset of ornamental trees found extensively throughout campus. They are usually found in short rows in gardens and courts, yards, frontages, and in interstitial spaces along pedestrian routes. When located in gardens and courtyards, they are often commingled with shade and ornamental trees. Fruit trees found on campus include Apple, Crabapple, and Pear.

Planning for Tree Resources

Harvard has long recognized the importance of preserving its tree resources as a principle physical element of the Cambridge campus. As part of its comprehensive assessment of the built and non-built components that comprise the campus, Harvard maintains a database that contains information on over 5,000 campus trees. The inventory provides a valuable planning tool for assessing and managing tree resources at Harvard.

Harvard's Landscape Services has a team of professional arborists and horticulturists who maintain campus trees, shrubs and other plantings. Their work includes scheduled pruning and other tree maintenance, as well as the ongoing assessment of tree condition and health. When disease or damage require tree removal, the arborists coordinate tree replacement with appropriate schools and units and confirm that new plantings are consistent with existing landscape plans.

In addition to maintaining its existing tree resources, the University seeks to increase the number of trees on the campus as part of ongoing planning and development activities. Harvard continues to make significant improvements to the campus landscape with projects that include new tree planting. Recent projects include the landscaped quadrangle at the Harvard Divinity School, new street trees along Divinity Avenue, site and street trees at 32 Quincy Street, the sumac grove at the Plaza, and restoration of the tree canopy in Radcliffe Yard.

In instances where tree removal is necessary due to damage, poor condition, or construction impacts, Harvard carefully plans for replacement trees that will contribute to the overall landscape design and are well suited to their environment. Harvard evaluates new landscape designs to ensure that they advance the University's sustainability goals by incorporating tree and plant species that are more adaptive to future environmental change, foster biodiversity, further stormwater management, and contribute to the reduction of the urban heat island effect.

E. SUSTAINABILITY

1. MODELING A HEALTHIER, LOWER CARBON COMMUNITY

Harvard University's Sustainability Plan (2015–2020) aligns Harvard's Schools and departments around a holistic vision and sets clear University-wide goals and priorities focused on climate change, health and well-being, and using the campus as a living lab.

Harvard collaborates with the City on sustainability issues in many ways, both through staff partnerships and in partnership with faculty advisors and centers. A few examples include:

- The Harvard Office for Sustainability (OFS) serves as Vice Co-Chair leading the Cambridge Compact for a Sustainable Future, as well as serving on the Board and Executive Committee. Membership includes 20 members from the business and higher education sectors.
- OFS chairs the Net Zero Labs Working Group, and this year led the development of an innovative corporate and higher education lab benchmarking study to assess energy use and contribute to generating solutions for lab operations.
- OFS also worked to recruit Harvard student interns in cutting-edge research projects to support the City's Net Zero goals. This year's student projects include the study of market-based incentives for new construction to dramatically reduce energy use, one of the priority policy areas the City is exploring as part of the Net Zero Action Plan. Another Harvard student was engaged to study innovative energy storage opportunities on behalf of the Cambridge Compact members.
- Harvard participated as a member of the Net Zero Task Force and continues to serve in advisory roles in many areas, including the Low Carbon Energy supply working group and the Low Carbon Offsets project.
- In 2018 Harvard will be hosting a risk management tabletop exercise focused on climate resiliency planning, in partnership with Novartis, MIT and others, as part of our commitment to the Cambridge Compact.
- Harvard faculty and researchers from the Harvard Law School Emmett Environmental Law and Policy Clinic have also continued to advise city staff on vulnerability planning and Net Zero Action Planning.

Acting on Climate

Harvard has achieved its most ambitious sustainability commitment to date, a science-based climate goal set in 2008 to reduce absolute greenhouse gas emissions 30 percent by 2016 from a 2006 baseline, including a growth in square footage of 12 percent. A Task Force compromised of faculty, students, and staff has been convened to make recommendations on the next stage of Harvard's aggressive climate commitment, and an announcement of new goals is expected this academic year.

Projects undertaken to improve air quality and enhance the efficiency and performance of the Blackstone Steam Plant and two chilled water facilities account for the largest portion of on-site emissions reduction. These enhancements included fuel switching to natural gas, an expanded combined heat and power system, high efficiency boilers, and additional utility efficiency upgrades that resulted in a reduction of 20,500 metric tons of carbon dioxide equivalent, equal to taking over 4,300 cars off the road.

Campus as a Living Lab

Teaching and research across Harvard—in climate science, engineering, law, public health, policy, design, and business—is helping to accelerate the progression to renewable sources of energy. The university is bringing students, faculty, and staff together to use the campus and our surrounding community as a test site to incubate exciting ideas and pilot promising new solutions to real-world challenges. Working on-the-ground and across disciplines, the University community is generating new discoveries that can be used to inform the implementation of Harvard’s Sustainability Plan in ways that can be replicated and applied on the local, regional, and global level.

- The \$700,000 Campus Sustainability Innovation Fund, established in October 2016 and managed by the Office for Sustainability (OFS), supports projects that use Harvard’s campus or the neighboring community as a testing ground for envisioning and piloting innovative solutions to sustainability challenges, including, but not limited to, climate and health.
- A new three-year interactive, multi-disciplinary Climate Solutions Living Lab Course led by Harvard Law School’s Emmett Environmental Law and Policy Clinic was launched in January 2017. The Course focuses on studying and designing practical solutions for off-site emissions reduction mechanisms, such as renewable energy, in support of climate neutrality goals.
- The Healthier Building Materials Academy, a partnership between OFS and Harvard faculty, was launched to apply the latest science to address the use of chemicals of concern in building products and materials that are purchased across Harvard for renovations and new construction.



2. MAXIMIZING ENERGY EFFICIENCY AND EXPLORING FOSSIL FUEL-FREE ENERGY SOURCES

Harvard has more LEED certified building projects than any other higher education institution in the world. Aggressive Green Building Standards, updated most recently in 2017, drive the design and construction of higher performing buildings to deliver on the University’s primary research and teaching mission. Project teams seek to maximize the use of energy efficient technology and prioritize opportunities to reduce the emissions footprint using a first-of-its-kind Life Cycle Cost calculator that is tailored to Harvard’s energy prices.



Neutralizing Energy Intensive Uses with Energy Conservation

Throughout the University, building managers and facility departments are saving money and cutting emissions by reducing the energy used by campus buildings. Increasingly, these teams are achieving deeper reductions by implementing innovative energy efficiency measures and undertaking widespread on-going commissioning projects to optimize building performance.

From 2006-2016 Harvard’s energy use initially increased, from the addition of new buildings and the conversion of existing square footage to more energy intensive spaces, and ultimately decreased, from a focused push to implement conservation measures in

Accelerating Transition to Renewable Energy on Campus Buildings

existing and new buildings. The result of these two competing trends is that for most of the years from 2006-2016 Harvard's building energy trend was flat or slightly up. In 2016 the net measured building energy reduction was 7 percent below 2006 levels, including growth and not normalized for weather. Total campus energy use was reduced 10 percent over the same time period.

Ninety-seven percent of the University's emissions are from building electricity use, heating, and cooling. As a first step in meeting its 2006–2016 climate goal, Harvard focused on increasing the energy efficiency of more than 600 buildings. Harvard's schools and departments implemented more than 1,000 net present value positive (NPV+) energy conservation measures with a project payback ranging from one to 16 years. The most common types of improvements were HVAC (heating and cooling) and lighting upgrades. While laboratory buildings only account for 22 percent of building area, they make up 46 percent of overall campus energy use. Although the majority of space types have seen reductions in energy use, overall the total energy reductions were driven primarily by efficiency measures in the lab spaces.

Harvard was an early adopter of renewable energy, piloting emerging technologies including rooftop wind, assessing wind energy potential along the Charles River, and investing in solar and wind projects to accelerate the transition to clean energy. On-site solar PV, solar thermal, biomass, and geothermal installations play an important role diversifying Harvard's energy supply and serving as a testing ground to inform future action. The University has over 2MW of solar PV capacity that has been installed or is in the process of being installed on the roofs of its campus buildings, the most of any higher education institution in the region. This is equivalent to installing rooftop solar on 400 average homes. Harvard was an early leader in investing in renewable energy and off-site emissions reduction through the long-term Power Purchasing Agreement signed in 2009 for 12MW of power and Renewable Energy Credits from the Stetson II wind project in Maine.





3. LEADING HIGHER EDUCATION ON HEALTHIER BUILDING MATERIALS

Harvard University is partnering with its own researchers, as well as businesses, manufacturers, and non-profit organizations to reduce exposure to harmful chemicals by making it easier to identify and purchase healthier building materials and products. Harvard's Healthier Building Materials Program is focused on planning for building occupants' long-term health by assessing chemicals of concern and building product categories based on the best available science.

More than twenty pilot projects are underway across the University through Harvard's Healthier Building Materials Academy, a partnership between the Office for Sustainability and researchers at the Harvard Center for Health and the Global Environment. This includes many major new construction and renovation projects currently in progress on campus. Over the past year, these pilot projects provided OFS with the opportunity to collaborate with more than 50 manufacturers to promote transparency and change material ingredients of certain product purchases.

Harvard's Green Building Standards set a clear framework for designing and building campus spaces that avoid the use of harmful chemicals of concern in building products and materials. The standards were updated in October 2017 to reflect the very latest in science and research, building upon existing Harvard requirements for product transparency through Health Product Declarations (HPDs) and the avoidance of chemical flame retardants in furniture. The new standards include requirements for all furniture as well as carpets and other building materials.

Harvard also signed a partnership agreement to use and co-develop a building materials database, Portico, created by Healthy Building Network (HBN) and Google in order to develop a system for easily identifying and scaling the usage of healthier materials in building projects (similar to how LEED has driven adoption of green building techniques).

4. PREPARING OUR CAMPUS FOR THE IMPACTS OF CLIMATE CHANGE

Regional Coordination

Harvard has been actively collaborating with its neighboring cities of Boston and Cambridge, as well as regional partners, to develop a common set of projections, assess vulnerabilities, and create climate resiliency plans that lay out a roadmap for proactive action. Harvard provided input on the City of Cambridge's Climate Change Vulnerability Assessment, which will serve as the technical foundation for the City's forthcoming Climate Change Preparedness and Resilience Plan. The University also weighed in on the Climate Ready Boston report released in 2016, which provided updated climate projections; vulnerabilities assessment for risks to residents, buildings, infrastructure, and the economy; and recommended policy, planning, programmatic, and financial initiatives to address those risks.

In 2013, Harvard hosted one of the first regional climate preparedness summits to highlight the long-term risks to our region and mobilize planners to start thinking about solutions. The event, which brought federal, state, and local officials together with representatives from area higher education institutions, featured lectures from faculty experts and policy leaders on the science and current city and state approaches to climate preparedness. The University is planning to host a second table-top planning exercise this winter in partnership with Cambridge Compact members MIT, Novartis, and others.

Institutional Action

The Harvard University Sustainability Plan includes commitments to develop a University-wide Preparedness Plan and Climate Resiliency and Preparedness Standards. In 2014, a cross-functional Climate Preparedness Working Group was established to explore and develop the University's strategy by focusing on vulnerability assessment, building and infrastructure resiliency, and severe weather emergency preparedness, in consultation with faculty members.

As an initial pilot, the Working Group recommended a climate resiliency pilot study of the Allston Campus be performed by the Harvard Planning Office. The goal of this independent assessment was to evaluate the long-term risks and vulnerabilities to proposed facilities in Allston; deliver site-specific resiliency design strategies and recommendations to augment informal guidelines that are now in place; and inform the development of University-wide Climate Resiliency and Preparedness goals for new construction and major renovations. The primary vulnerability identified by the pilot study was the significant risk that future flooding posed for the basement location of the district energy facility (DEF) included in the original design of the Science and Engineering Complex (SEC). In response, Harvard filed an Institutional Master Plan Amendment with the Boston Redevelopment Authority to re-locate the DEF to an alternative above-grade location that will improve resiliency and reliability.

On the Cambridge campus, Harvard project teams have incorporated resiliency strategies in major capital projects including House Renewal and the Harvard Kennedy School transformation project.

Faculty and Student Engagement

Harvard faculty have served as formal advisors to resiliency planning and preparedness activities on the local, regional, and national level. For example:

- The Harvard Graduate School of Design (GSD) and the City of Miami are partnering on a multi-year study of the impacts of and potential responses to sea level rise for coastal communities in South Florida.
- The Harvard Humanitarian Initiative conducts research to develop a community-centric disaster resilience network, bringing interdisciplinary experts together to advance strategies and practices, including vulnerability to climate change-related disasters.
- GSD's Jesse M. Keenan served as the editorial co-lead for the Built Environment section of the U.S. Climate Resiliency Toolkit and Stephen Gray serves as a co-chairman for Boston's 100 Resilient Cities Resilience Collaborative.
- Professors Daniel Schrag, John Spengler, and Joyce Rosenthal served on Cambridge's Expert Advisory Panel, while Professors Carling Hay and Zhiming Kuang served on the Boston Research Advisory Group that developed projections for sea level rise and coastal storms.

III. RELATIONSHIP WITH CAMBRIDGE PUBLIC SCHOOLS

Harvard University is committed to partnerships and programs designed to ensure that all Cambridge Public School (CPS) students achieve academic success. Harvard programs are available in every public school in Cambridge – elementary schools, upper school and Cambridge Rindge and Latin School. Its programming ranges from curriculum based programs, to summer school, to enrichment programs for all grade levels and interests. Students from elementary, upper, and CRLS engage in learning through visits to the Harvard Museums of Science and Culture, the Harvard Art Museums and the American Repertory Theater. Every 5th, 6th, 7th and 8th grader participates in a program that brings together Harvard and CPS resources, including curriculum-based visits to museums, Project Teach, Harvard's college readiness program and the Annual 8th grade Science and Engineering Showcase.

In addition to student programs, Harvard also seeks to leverage University-wide resources and create opportunities for CPS educators to access training, academic coursework, and workshops. Cambridge educators participate in professional development with Harvard faculty and staff that cover a variety of topics in support of CPS priorities. Through the Harvard Graduate School of Education's (HGSE) James Bryant Conant Fellowship, CPS teachers and administrators admitted to HGSE receive full-funding for a master's degree. Recognizing the important role that families play in a child's educational success, CPS and Harvard also collaborate on programs that integrate family engagement.

2017 Highlights of Harvard's Engagement with Cambridge Public Schools

Harvard programs are available in every public school in Cambridge. The list below highlights the many programs that Harvard Supports with CPS.

Crimson Summer Academy

The Crimson Summer Academy is a rigorous enrichment program that provides academically talented high school students with skills and financial support to thrive and excel in college. To date, 85% of the Academy's nearly 300 graduates have gone on to attend four-year universities.

Cambridge Harvard Summer Academy

The Cambridge-Harvard Summer Academy (CHSA) is a partnership between CRLS and the Teacher Education Program at Harvard University. As the official summer school for Cambridge high school students, CHSA offers students both enrichment and remedial classes to address the achievement and opportunity gaps.

8th Grade Science & Engineering Showcase

Co-developed by Cambridge Public Schools Science Department and the John A. Paulson School of Engineering and Applied Sciences' at Harvard University, this program benefits all 8th grade student in CPS. Students develop a science project culminating in a spring showcase on campus for CPS, families, and Harvard faculty and staff.

Project TEACH

Harvard's Project Teach program seeks to develop a college-going identity amongst all CPS 7th graders. By working with teachers, students, and families, Project Teach demonstrates that college can be an affordable, accessible, and attainable opportunity. A cornerstone of the program includes an on campus college visit for all CPS 7th graders where they participate in a program tailored to their academic interests.

CRLS & Harvard Marine Science Internships

CRLS marine biology students can apply to be placed in Harvard research labs as an intern. The program, which was co-developed by CRLS biology teacher Paul McGuinness and Harvard University faculty, allows students to be trained and mentored by Harvard faculty and graduate students. This program has also included science career exploration opportunities for 800 CRLS students.

Harvard Museums of Science and Culture and CPS 6th Grade

All CPS 6th graders attend the Foragers to Farmers school program about the rise of agriculture at the Peabody and Semitic Museums. This include using a classroom kit of artifacts developed by the Museums.

American Repertory Theater (A.R.T.)

Since the fall of 2015, more than 900 CPS students have attended performances at the A.R.T. In addition, the A.R.T. collaborated with CRLS Advanced Photography class for "In Our Bodies," a program focusing on the theme of self-care and the body to express the relationship between identity and the physical self.

EcoMUV

This curriculum developed by the Harvard Graduate School of Education is utilized as part of the CPS sixth-grade science studies and uses immersive virtual environments to teach students about ecosystems and causal patterns.

Alewife Stormwater Wetland field study

The Cambridge Public Schools' Alewife Stormwater Wetland field study is an exciting opportunity for all fifth grade CPS students to use mobile devices to deepen their understanding of scientific concepts that are simultaneously being learned in their classrooms. In recent years Harvard Graduate School of Education researchers began collaborating with the CPS Maynard Ecology Center to develop virtual science experiences for students, based on Harvard's EcoMOBILE program. The new technology allows students to explore an engineered wetland that addresses polluted stormwater in Cambridge. Previous Harvard research has shown an increase in student learning and engagement as a result of using virtual and mobile technologies prior to, or during, outdoor field experiences, allowing them to become more active and self-directed learners, rather than merely passive receivers of information. Additionally, Harvard provided 30 Apple iPods to CPS in order to allow more students to experience this interactive study.

Harvard Smithsonian Center for Astrophysics (CfA)

CfA partners with CPS in developing programs for a variety of grade levels. This past fall, the CfA experts designed the ThinkSpace (Thinking Spatially about the Universe) which blend of hands-on and computer-based tools in a classroom. CfA scientists visited both the Putnam Avenue Upper School and Rindge Avenue Upper School to work with students, and shared the complete ThinkSpace curriculum with all eighth-grade science teachers and students in CPS. Additionally, the CfA began a new program aimed at enabling high school students to get involved in STEM research fields and increasing the number and diversity of students who participate in STEM research by pairing students with astrophysicists who advise them in year-long, independent research projects.

CRLS Harvard Art Museums Partnership

Through a partnership teaching program with CRLS, students from the Harvard Graduate School of Education are hired as Graduate Student Teachers at the Harvard Art Museums for a yearlong museum education training program. Each Graduate Student Teacher is paired with a CRLS teacher and curates 3-4 gallery visits and lessons that incorporate artwork in the museum with high school class curricula. The program reaches approximately 250 CRLS students annually.

Harvard Life Sciences/ABE Outreach

Each year, through a partnership with the Life Sciences Outreach (LSO) Program and CRLS, more than 500 juniors learn in Harvard's teaching labs. CRLS biology teachers utilize Harvard space, equipment, and expertise to lead the students through the wet lab portion of the University's mtDNA PCR lab, which is supported by the Amgen Biotech Experience (ABE) Program.

Harvard Museums of Science and Culture

During the 2016-17 school year, nearly 4,200 Cambridge students and teachers visited the Harvard Museums of Science and Culture.

Harvard Museum of Natural History Curriculum Support

All CPS fourth grade students participate in programming at the Harvard Museum of Natural History as part of the CPS curriculum.

Harvard Extension School Scholarships

Harvard offers CPS students scholarships for advanced courses at the Harvard Extension School that are not available at CRLS or that help them earn future college credit.

Cambridge Students Attending Harvard

Twenty-nine students from Cambridge, including 17 from the Cambridge Rindge and Latin School, were among those receiving acceptance emails from Harvard College for this past academic year. Cambridge schools have historically been pipelines to Harvard, as 99 Cambridge residents, 60 of them CRLS graduates, were admitted during the last five years.

Mind Matters: Families Make a Difference

Developed by Harvard University, Mind Matters uses cutting-edge research on early child development to equip families with practical skills and understanding related to the growth of the whole child. With a particular focus on children ages three to eight, this program provides families with the resources to support their children emotionally, socially, and academically. This program is currently offered to families throughout CPS.

Professional Development for Classroom Educators

The Harvard Graduate School of Education supports CPS educators in identifying and accessing various professional development classes on campus.

James Bryant Conant Fellowship

Cambridge educators participate in professional development opportunities with Harvard faculty and staff that cover a variety of topics in support of CPS priorities. Through the Harvard Graduate School of Education's (HGSE) James Bryant Conant Fellowship, CPS teachers and administrators admitted to HGSE receive full-funding for their master's degree.

Support of Superintendent

Harvard funded two doctoral students from the Harvard Graduate School of Education to work in the office of Cambridge Superintendent Kenneth Salim to assist him with research, data collection, and with the Superintendent of CPS to offer a variety of professional development opportunities for educators and school administrators.

IV. INSTITUTION SPECIFIC INFORMATION REQUESTS

1. Provide an update on plans for Harvard's Allston campus and any potential or anticipated impacts on the City of Cambridge.

Institutional Projects

- **Science and Engineering Complex/114 Western Avenue/District Energy Facility**

Construction is underway with steel erected for Harvard's Science and Engineering Complex, which is expected to open in the fall of 2020. The new facility, located at 130-140 Western Avenue, will include laboratory and teaching space for the School of Engineering and Applied Sciences. Renovation of the existing building at 114 Western Avenue for office and classroom use is also part of the project. Site improvements will include new streets, parking, and upgrades to bicycle facilities on Western Avenue. The complex will be used by more than 900 undergraduates on any given day. In addition, it will be used by more than 400 SEAS graduate students, more than 450 researchers, and initially, as many as 80 faculty members.

An above-grade District Energy Facility (DEF) will come online in 2019 to supply the SEC with hot water for heating, chilled water for cooling, and electricity for power. Construction of the DEF has begun on a site just west of the existing Genzyme building and north of the on-ramp to I-90.

- **Klarman Hall (Harvard Business School)**

Klarman Hall will replace Burden Hall just south of the existing building. It will serve as a large-scale conference center, a performance space, and a community forum. Construction is underway with an opening expected in 2018.

- **Art Lab**

The Harvard ArtLab will provide experimental working space for faculty and student artists fostering new connections and creative enterprises. A building of approximately 9,000 SF is being designed along North Harvard Street just southwest of Ohiri Field. The University began discussing plans for the Art Lab with the Boston Planning and Development Agency and North Allston neighborhood during the fall of 2017.

Other Planning Activities

- **Enterprise Research Campus**

Harvard property south of Western Avenue is envisioned to become a non-institutional center for various companies, incubators, startups, and social enterprises. In December the University submitted a Planned Development Area (PDA) Master Plan for approximately 14 acres to the Boston Planning and Development Agency. The mixed-use program of this initial phase totals

900,000 SF and will be inclusive of office/lab (400,000 SF), residential (250,000 SF) and a hotel and conference center (250,000 SF). The hotel and conference center was previously included in the Institutional Master Plan.

2. Provide an update on planning with the Massachusetts Department of Transportation for the I-90 Interchange Project, for commuter rail and for the West Station.

After years of planning and deliberation, the Massachusetts Department of Transportation (MassDOT) filed the Draft Environmental Impact Report (DEIR) for the I-90 Allston Interchange Project on November 29, 2017. Harvard has been pleased to participate along with many others in the extensive planning process leading up to this filing, including the University's participation on a public task force made up of residents, business owners, and other regional stakeholders.

MassDOT is soliciting public comment on the document through a series of public meetings and an official comment period. Harvard is assessing the 6,000 page DEIR document and has met with the cities of Cambridge and Boston and other stakeholders as we consider submission of comments. Harvard has consistently advocated for the importance of West Station, including the University's agreement to contribute to one third of its cost, and will look forward to participating in further discussions throughout the comment period and beyond about the implementation and timing of this project element as well as the service it provides.

3. What is Harvard's strategy in selecting tenants for retail sites? How is retail used to enhance the urban experience? Provide information on vacancies and the vacancy rate in retail properties. Particular attention should be paid to a description of the uses on the ground floor of these sites, as they relate to community concerns about maintaining an active retail environment.

Harvard shares the community's interest in maintaining a unique retail environment in Harvard Square. When retail spaces become available, Harvard seeks tenants that will have active ground floor uses, offer goods or services that complement the retail mix in Harvard Square, and are compatible with other University uses in the building. Harvard's ongoing commitment to maintaining a vibrant Harvard Square is illustrated by its leases with over 30 businesses in the Square, including long-time independent retailers such as the Grolier Poetry Book Shop, Leavitt & Peirce, and Harvard Bookstore.

Most of Harvard's properties located in the commercial areas of Harvard Square (for example those across Massachusetts Avenue from Harvard Yard) contain ground floor retail uses. Harvard's general approach is to seek active retail or service uses in ground floor spaces in these buildings. As the Smith Campus Center construction enters its final year, Harvard is carefully choosing the portfolio of food venues that will be a key component of a welcoming and vibrant Smith Campus Center. The prospective food tenants, which include swissbäkers, Pavement Coffeehouse, and Bon Me, are experienced and locally-based food operators with varied cuisine that will complement each other and work well in the context of Harvard Square. The intent is for a casual and comfortable format with affordable price points.

- 4. Provide updates about short term and long term plans to address undergraduate and graduate student housing needs, the timeline for action, and the physical planning related to those actions. Specifically include a discussion of the House Renewal Program and how it affects on other housing, including the Inn at Harvard, that has been converted to temporary undergraduate housing. The response should address the following questions:**
 - a. What is the timeframe for the House Renewal Program and will it incorporate the old Radcliffe Quad houses?**
 - b. Discuss the effects of the program on current housing options and choices for graduate students, as well as impacts on affiliate housing owned by Harvard, and potential to add student beds through the House Renewal Program.**
 - c. Does Harvard plan to convert any housing back to graduate student or affiliate use after completion of the House Renewal Program?**
 - d. Discuss the long term plans for undergraduate housing facilities after the House Renewal Program is complete. Are there plans under consideration to add new undergraduate housing in Allston, freeing up housing in Cambridge for graduate student use?**
 - e. How does Harvard plan to address ongoing housing needs of graduate students so as to reduce pressure on market rate prices? Has Harvard studied graduate student housing needs, particularly in light of escalating prices for market rate housing? Does Harvard have any plans to add graduate student housing, either in Cambridge or in Boston?**

Harvard University is engaged in a multiyear effort to renew the undergraduate Houses as part of a system-wide renewal. The House Renewal program's initial focus is on the original neo-Georgian Houses along the Charles River, most of which were constructed in the 1920s and 30s and have had only modest upgrades over the ensuing years. The intent of the House Renewal program is to preserve the historic character of these buildings and to sustain the original vision of the Houses, while transforming them to meet the needs of today's students. Planning for this program began nearly 10 years ago. To date, five House renewal projects have been either completed or are in construction, and planning for the sixth House project is underway. The timeline for renewal of the remaining undergraduate Houses along the River and at the Radcliffe Quadrangle is not yet determined. The pace and sequence of House Renewal is subject to periodic review.

Harvard is using existing University-owned buildings in and around Harvard Square to provide temporary accommodations to students displaced by House Renewal construction. 1201 Massachusetts Avenue, the former Inn at Harvard, now serves as the central hub of the "swing house" and accommodates the dining, meeting, social, academic, and a portion of the residential spaces for the House under renewal. The building is particularly well suited to this role given its pre-existing layout as a hotel and its location adjacent to Harvard Yard and close to the other Harvard Houses. Several Harvard-owned residential buildings in the area supplement 1201

Massachusetts Avenue, by providing additional residential space for displaced students: 8 Plympton Street, 1306 Massachusetts Avenue, 65 Mt. Auburn Street, 20-20A and 22-24 Prescott Street. The Faculty Dean's temporary accommodations are located at 8 Prescott Street. Together these properties meet the program needs of all the Houses, even those with the largest student populations. During academic years when these buildings are not needed for swing use, they will be used as residences for other Harvard affiliates. Upon completion of the House Renewal program, the five Harvard-owned residential buildings will continue their long-standing role in providing housing to Harvard's graduate students and other affiliates. The long term use of 1201 Massachusetts Avenue has not yet been determined, but it is anticipated to remain in institutional use.

Harvard houses more than 98% of its undergraduate population on campus, promoting a residential campus as part of its core educational mission. With the House Renewal program, Harvard is striving to maintain the same or greater bed capacity within the Houses while accommodating the many building upgrades that require the allocation of additional space. The recent addition of Beren Hall to Gore Hall added approximately 50 student beds to Winthrop House, which will ultimately free up beds in overflow housing for other affiliates including graduate students. The long term vision for undergraduate housing at Harvard remains centered at the Freshmen dorms in Harvard Yard and the Harvard Houses along the River and the Radcliffe Quadrangle. Harvard has no plans at this time to add new undergraduate housing in Allston.

By 2008 Harvard University's housing initiative had added nearly 1,000 beds in Cambridge and Boston to increase housing for graduate students. Harvard has also made changes to how certain units are leased in order to encourage apartment sharing, and this has resulted in a more efficient utilization of its housing inventory, and full occupancy of our inventory in recent years. The University continues to re-invest in existing graduate student housing stock, improving systems, safety, and finishes and enhancing programmatic amenities. The multi-year, phased renovation of Soldiers Field Park in Allston is a current example of the ongoing effort to ensure that University-owned housing continues to be an attractive alternative to the private market for University affiliates. Harvard remains open to new opportunities and partnerships with private developers to expand housing offerings on and close to campus.

See Page 18 for additional information on the House Renewal program.

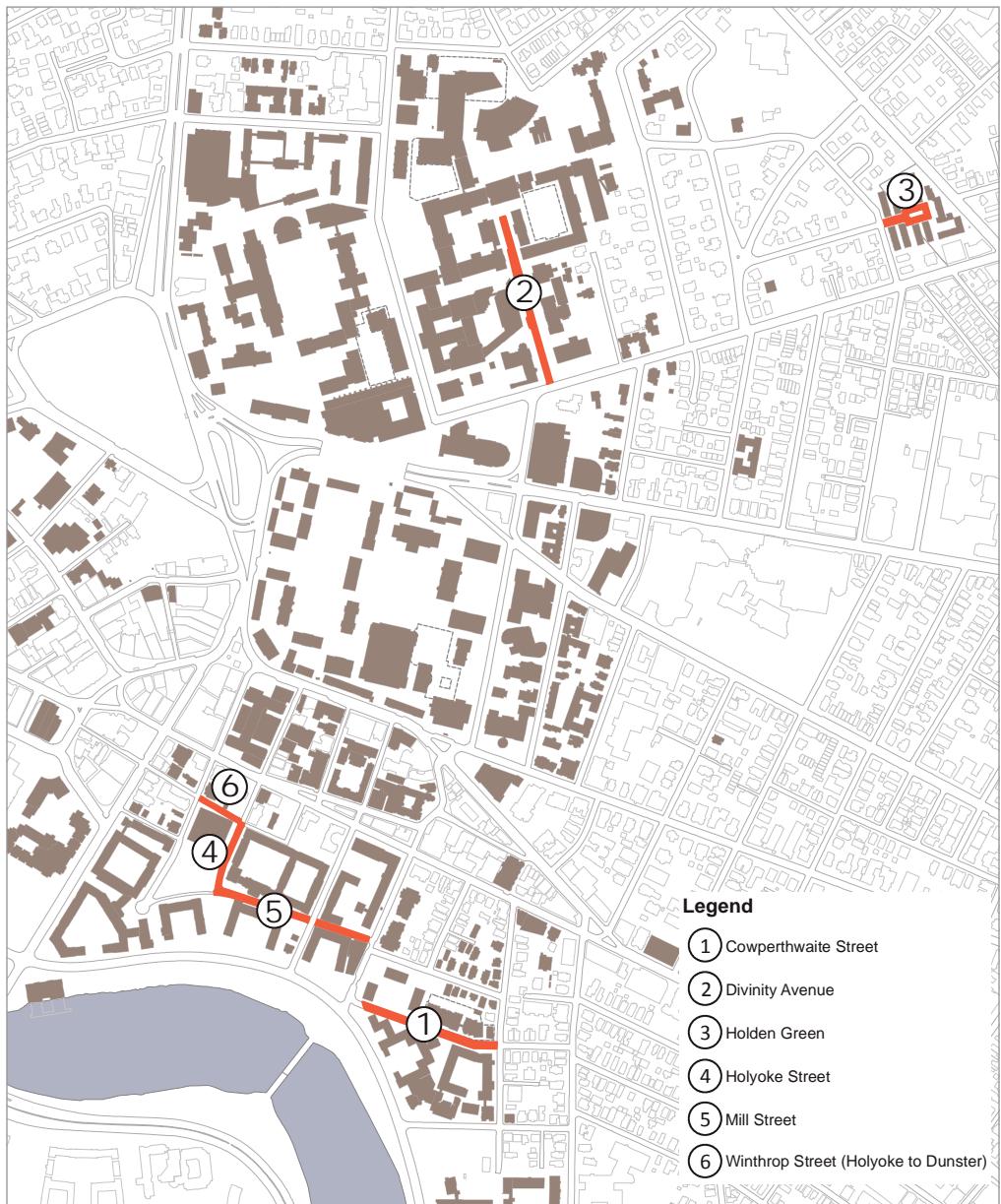
5. Provide an update on the plans for the commercial parcel at Everett Street and Massachusetts Avenue.

See Page 32 for project update.

- 6. Provide a map of Harvard-owned streets and sidewalks, their condition, and any planned repairs or improvements. How does Harvard coordinate management of streets and sidewalks with the Cambridge Department of Public Works?**

The map below highlights the Cambridge streets and sidewalks that are owned by Harvard University.

Harvard-owned Streets



1. Cowperthwaite Street

Cowperthwaite Street is a one way private way connecting DeWolfe Street to Banks Street from west to east. Pedestrian improvements, including new sidewalks and a raised crosswalk, were added when 5 Cowperthwaite Street was built in 2007. As part of the Dunster House renewal, Harvard repaved the western half of Cowperthwaite Street in summer 2015, extending from DeWolfe Street up to the first pedestrian crossing near the 5 Cowperthwaite garage entry.

2. Divinity Avenue

Divinity Avenue is located on Harvard's north campus, beginning at Kirkland Street and continuing north until it reaches the University Herbaria. This street and its sidewalks are in excellent condition, having been repaved in 2014. Over the last several years Harvard has undertaken repairs and improvements to the street including the installation of new brick sidewalks, street trees and lighting.

3. Holden Green

The entry drive into Harvard's affiliate apartment complex at Holden Green is a Harvard-owned private way with the same name. This cul-de-sac is fully surrounded by Harvard's residential buildings, and is located partially in Cambridge and partially in Somerville. As this street is in need of repairs, Harvard has plans to repave it over the next several years. The sidewalks are in good condition.

4. Holyoke Street

The portion of Holyoke Street between Winthrop Street and Mill Street is owned by Harvard University. This section of the street is one-way and in generally good condition. New sidewalks and curb cuts were installed at the intersection with South Street as part of the reconfiguration of the parking area adjacent to the Malkin Athletic Center. The southerly portion is currently off-line due to the Lowell House renewal project.

5. Mill Street

Mill Street is a one-directional private way located between Holyoke and Dewolfe Streets. One section of Mill Street has been off-line since 2016 due to construction activity at the adjacent Winthrop and Lowell Houses. Upon the conclusion of construction in 2019, Mill Street will be repaved with rebuilt brick sidewalks.

6. Winthrop Street

The portion of Winthrop Street between Holyoke Street and Dunster Street is owned by Harvard University. This one-directional private way is in excellent condition. In 2014 the University repaved the street and rebuilt the sidewalks, replacing concrete with brick paving. New lighting was also installed at that time.

Harvard Campus Services performs maintenance, repairs and snow removal on Harvard-owned streets, or subcontracts out this work as necessary. Temporary street closures (for maintenance or other activities including Student Move-In/Out or Commencement events) are coordinated with the City of Cambridge DPW through the Harvard Parking Office.

As part of Harvard construction projects, adjacent streets and sidewalks are often improved. Harvard also contributes to the ongoing maintenance and improvement of both private and public streets and sidewalks adjacent to Harvard properties across the Cambridge campus. In addition Harvard has contributed financial support to recent Harvard Square infrastructure improvement projects undertaken by the City of Cambridge.

The University works closely with the DPW Commissioner and staff to coordinate on public realm improvement projects. When possible, Harvard provides the city's contractors with laydown areas to facilitate public realm construction projects. During winter snow events, Harvard makes off-street parking available to residents and has also provided space for the City to unload plowed snow.

7. Given the accomplishments described in the 2016 report, what are the next generation goals for campus sustainability?

See Sustainability section Page 48.

8. How does the university address questions of equity and equality as it relates to education and jobs in the community? *

As a research institution with a mission of promoting teaching, research, and learning, Harvard University is engaged in work to advance equity and promote equality in a wide range of contexts. The University's mission is also meaningfully connected to the City of Cambridge and its residents through educational programs, economic development, housing initiatives, and community partnerships.

Harvard and Cambridge are inextricably linked through their history and commitment to education. Each year, the University strives to strengthen connections to neighbors through education resources for children, families, teachers, schools, and life-long learners.

Harvard works closely with the Cambridge Public Schools (CPS) to provide comprehensive programs for students at all stages of their schooling. Many of Harvard's student programs are specifically designed to address equity and promote access to educational opportunity. The Crimson Summer Academy supports academically talented high school students from economically disadvantaged backgrounds. Upon completion of the three year program, Harvard provides the students a scholarship to use at a college or university of their choice. Harvard's Project Teach program seeks to develop a college-going identity among all CPS 7th graders. By working with teachers, students, and families, Project Teach demonstrates that college can be an affordable, accessible, and attainable opportunity. A cornerstone of the program includes an on-campus Harvard visit where students participate in a program tailored to their individual academic interests. Harvard also partners with CRLS on the Cambridge Harvard Summer Academy, which offers both enrichment and remedial programs for local students.

Harvard offers various STEM initiatives for students of all ages—including, but not limited to, programs that explore neuroscience, outer space, marine biology, biotechnology, and even the history of hip hop. Every CPS 8th grader works with Harvard students on a science project of their choosing, and presents their findings at a showcase on Harvard's campus. In May 2017, Harvard hosted 400 students their teachers, and families for the seventh year of this annual event.

Harvard's commitment to the children and families of Cambridge extends to out-of-school time through summer programs (including camps) and as the largest provider of summer jobs for Cambridge teens with the Mayor's Summer Youth Employment Program. Harvard also offers Cambridge residents free admission to the Harvard Art Museums, and CPS classes can often be found enhancing classroom learning at the Harvard Museum of Natural History.

Twenty-nine students from Cambridge, including 17 from CRLS, were accepted to Harvard College for this past academic year. Cambridge schools have historically been pipelines to Harvard, as 99 Cambridge residents, 60 of them CRLS graduates, were admitted during the last five years. Recognizing the profound importance of bringing together students with different life experiences and backgrounds, Harvard College's commitment to financial aid extends to every student accepted. One in five undergraduate families are not required to contribute to the full cost of their child's education, as they have annual incomes of less than \$65,000. More than 80% percent of Harvard College's Class of 2017 graduated debt free. Harvard awards grants only and never requires students to take out loans to cover the cost of their education. As part of its financial aid program, Harvard spent over \$4.8 million in 2017 to help low-income students pay for health insurance, travel costs home, fees for events and performances, and more so every student can equitably engage in the Harvard experience.

In support of expanding access to education for learners of all ages, Harvard joined forces with MIT in 2012 to form edX, a not-for-profit, open-source online learning platform that features interactive and innovative tools for teaching and studying via the web. Backed by a shared \$60 million commitment, edX allows over 95 educational partners to distribute course content and other academic materials through 80+ open courses. As of the summer of 2017, there were over 58,000 course participants in Massachusetts and over 128,000 Massachusetts course registrations.

Harvard's efforts to address equity extend beyond the University's core educational mission as well. Harvard is committed to working with its host communities to preserve and create quality affordable housing in response to high regional housing costs. Harvard houses 98% of its undergraduates, which relieves pressure on the local housing market. Since 2000, Harvard has partnered with the City of Cambridge alongside other non-profit lending organizations to finance the development or renovation of over 1600 units of affordable housing--the locations of which span every neighborhood in Cambridge.

Harvard also provides support to nonprofit organizations that serve the most vulnerable and needy residents of the city. One particularly close partnership has been with Food for Free. Recognizing that nearly 10 percent of Massachusetts families experience chronic hunger, Harvard University Dining Services helps address the crisis through a partnership with the Cambridge-based organization, Food for

Free. Since it was started in 2014, the Harvard Food Program has donated an average of 40,000 of pounds of bulk food donations per year, translating into roughly 30,700 meals per year.

The Harvard community teaches, learns, works, and lives in Cambridge and the discoveries and knowledge it produces fuel the local economy—providing jobs, generating purchasing, and supporting local businesses. For the past 18 years, Harvard has consistently been the largest employer in the City of Cambridge, and employs approximately 5,000 Cambridge residents across the University at all levels of employment.

In FY16, the University attracted over \$840 million in research funding, fueling science, medical discoveries, health improvements, and spending in the local economy. Harvard is the largest purchaser of goods and services in the city, further contributing to job creation and the strength of the local economy. The majority of Harvard spending went to purchase supplies, maintain and expand the University's physical plant, and run the University. In FY16, \$146 million was spent on construction and to purchase supplies and services in Cambridge. The University also attracts hundreds of thousands of visitors annually, adding to the vitality of Harvard Square and supporting its many local, small businesses.

** Note this question has been modified to reflect the Planning Board discussion at the Town Gown presentation meeting held February 7, 2017.*



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