GRADUATE STUDENT HOUSING WORKING GROUP

Report to the Chancellor

AUGUST 2018

Massachusetts Institute of Technology

TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**

TIMELINE AND PROGRESS TO DATE **2**

FINAL RECOMMENDATIONS **4**

KEY FINDINGS 4

RECOMMENDATIONS 4

DETAILED ANALYSIS **5**

GRADUATE STUDENT HOUSING WORKING GROUP — 3-YEAR REVIEW SUGGESTED PROCESS **56**

GRADUATE STUDENT HOUSING WORKING GROUP

REPORT TO THE CHANCELLOR | AUGUST 2018

The faculty and staff members of the working group were selected by the Chancellor, Provost, and Executive Vice President and Treasurer in August 2017. The Graduate Student Council nominated six graduate students to serve on the group.

- Ian Waitz, Vice Chancellor (Chair)
- Jon Alvarez, Director of Campus Planning
- Adam Berinsky, Mitsui Professor of Political Science
- Kelly Blynn G, Urban Studies and Planning
- Lauren Chai G, Mechanical Engineering
- Orpheus Chatzivasileiou G, Chemical Engineering; Secretary, Graduate Student Council
- David Friedrich, Senior Director, Housing Operations and Renewal Planning, Division of Student Life
- Stephen Graves, Chair, Faculty Committee on Campus Planning; Abraham Siegel Professor of Management, Sloan School of Management
- Will Kimball G, Sloan School of Management; Eastgate President
- Suzy Nelson, Vice President and Dean for Student Life
- Abigail Regitsky G, Materials Science and Engineering; Co-Chair, State and Local Affairs Committee
- Nicholas Triantafillou G, Mathematics; Co-Chair, Housing and Community Affairs Committee
- Krystyn Van Vliet, Associate Provost; Professor, Department of Materials Science and Engineering and Biological Engineering

Several other MIT community members made important contributions to the working group report including Peter Cummings, Sarah Gallop, Jennifer Hapgood-White, Amy Kaiser, Jag Patel, Lauren Pouchak, and Melissa Shakro.

EXECUTIVE SUMMARY

In August 2017, Chancellor Cynthia Barnhart charged the **Graduate Student Housing Working Group** (the "working group") with assessing how housing availability and graduate student housing needs have changed since the completion of the 2014 **Clay Report**.

Based on this, the group was asked to explore options for matching graduate student housing demand with different housing types, locations, costs, and timelines for bringing new units online. The exploration considered expected costs and benefits to graduate students and to MIT, while also taking into account the 250-net new graduate student units under construction in Kendall Square.

The interim findings, including recommendations for periodic review, evaluation, and engagement processes, were presented to the Chancellor, Provost, Executive Vice President and Treasurer, Dean of the School of Architecture and Planning, and other community members on October 13, 2017.

This final report from the working group builds upon the interim report, integrating comments from key stake-holders, updated analyses, and data.

TIMELINE AND PROGRESS TO DATE

AUGUST 2017	Graduate Student Housing Working Group charged, begins work
SEPTEMBER 29 TO OCTOBER 9 2017	Graduate Housing Needs Survey open
OCTOBER 13, 2017	Interim report delivered to senior administrators and others in the community
OCTOBER 16, 2017	Graduate student housing expansion plan announced
FALL 2017	Working group continued analyses
NOVEMBER 2017	MIT Office of Campus Planning conducted detailed analyses with the Division of Student Life to begin exploring potential sites and unit mixes
APRIL 2018	Suzy Nelson, Vice President and Dean for Student Life, emailed all graduate students regarding two new pilots for Couples Housing and Roommate Selection

Beginning in August 2017, the graduate housing working group documented historical changes to the Cambridge housing market and evaluated how changes in different segments of MIT's graduate student population have varied with research funding and other drivers.

The group provided cost accounting of current housing options, normalized for comparison across current MIT residence halls, the upcoming Site 4 Tower, new commercial housing in the Kendall Square area, housing in nearby suburbs with transportation benefits, and potential future options.

The group also conducted the Graduate Housing Needs Survey which enabled conjoint analysis to understand how different characteristics of housing options would be valued by different population segments. The survey was open from September 29 to October 9, 2017, with 1,228 graduate students responding (a 19% response rate).

Based upon the above, the working group delivered an **interim report** to senior administrators and others in the community on October 13, 2017 and, in collaboration with the Graduate Student Council (GSC), convened a meeting with senior officials to hear their response to the working group's interim findings on October 16, 2017.

In this meeting, and in a **letter** to all graduate students that followed, the Chancellor, Provost, and Executive Vice President and Treasurer announced a graduate student housing expansion plan. The plan consisted of the following key commitments:

- The new **450-unit graduate student residence hall** currently under construction in Kendall Square will net 250 new units. It is planned to come online in 2020;
- MIT will create new residences with at least 500 units. MIT will apply for a discretionary or building permit no later than the end of 2020; and
- Before the end of 2020, MIT will work to add or apply for a discretionary, alteration or building permit to increase by 200 the number of permanent graduate units by converting existing units (for example, 70 Amherst Street) and/or establishing new units on MIT's campus or properties owned by MIT.

The working group continued to meet throughout fall 2017 and spring 2018, conducting additional analyses. In November 2017, a Graduate Housing Implementation Team including graduate students, Heads of House, and housing staff, was formed to consider ways of implementing the working group's recommendations to enhance graduate student residential life at MIT. As part of this effort, in April 2018 Suzy Nelson, Vice President and Dean for Student Life, **emailed all graduate students** regarding resources for graduate students seeking housing, including two new pilots for Couples Housing and Roommate Selection. The Implementation Team will continue to meet in order to assess the effectiveness of the pilots, as well as consider additional improvements and changes based on the recommendations of the working group.

Beginning in the fall 2017 semester and continuing throughout spring 2018, the MIT Office of Campus Planning conducted detailed analyses of siting options for new graduate housing and worked with the Division of Student Life to begin exploring potential unit mixes. This exploration considered current and anticipated future demand among single students, students living as couples, and students with children; maximizing flexibility of future housing to address shifts in demand from across these groups over time; and likely cost implications of different unit mixes.

Following the release of the interim report and the initial pilots based upon some of the recommendations by the working group, this final report has been issued. The findings herein use the results of the conjoint analysis, initial planning for how MIT might expand on campus graduate housing offerings, and policy recommendations to inform MIT's strategy for graduate student housing.

FINAL RECOMMENDATIONS FROM THE 2017–2018 GRADUATE STUDENT HOUSING WORKING GROUP

KEY FINDINGS

- The Cambridge rental market has rising rents and low vacancy rates; both trends are anticipated to continue.
- MIT's graduate student population has grown in the last several decades due to changes in research volume and educational programs.
- MIT has a strong history of addressing both graduate student housing needs and Cambridge housing needs.
- Despite the graduate residences that MIT has added over the last 20 years, the student population has also grown, and there remains a need for additional housing capacity.
- The majority of students (~85%) are satisfied with their current housing situation. Many students are dissatisfied with the cost (62%) and availability (33%) of housing. High housing costs relative to graduate student incomes contribute to reported financial stress. Graduate students have also voiced other concerns about housing including dissatisfaction with aspects of the assignment process and housing quality.
- Estimating graduate student housing preferences is complex. We estimate additional preference for on campus housing to be between 1,000 and 1,100 students relative to the number we have the capacity to house today (2,424 AY17).
- Some of MIT's current housing stock has features and amenities that do not fully align with what some of our students value. In general, students value price and proximity to campus over all other amenities.

RECOMMENDATIONS

- MIT should increase on campus graduate housing capacity with an optimal mix of unit types aligning with the evolving needs of students and families over time. The Institute should assess the feasibility of doing so in a way that breaks-even financially at 30 years with comprehensive stewardship.
- The Institute should identify ways to operate our housing differently. Currently our revenue falls short of what is required for comprehensive stewardship. This leads to lower quality housing and creates an impediment to adding more housing.
- The Institute should develop a process for evaluating the benefits and detriments of changes to our housing policies.
- A detailed evaluation of graduate student housing should be conducted by a similar working group every three years, with a report to Academic Council and the MIT Faculty. This should also include a short yearly update to assess progress relative to the last detailed evaluation.

A more detailed presentation of the key findings and recommendations follows.

DETAILED ANALYSIS

The Cambridge rental market has rising rents and low vacancy rates; both trends are anticipated to continue.

The growing demand for housing combined with the flat supply of rental units has caused added pressure for graduate students looking for affordable housing in the Cambridge area. Additionally, the increase in commercial development has led to a higher number of residents living and working in Cambridge.

ESTIMATES OF CHANGE OF RENTAL COSTS

A combination of methods was used for estimating the change in off-campus rental costs and Cambridge housing market pressures including off-campus housing listings, local consumer price indices, Zillow rental data, and United States Housing and Urban Development (HUD) fair market rental data.

The Zillow rental data used in this report includes a range of measures including county level, volatile month-to-month, market median, and weighted average of graduate student housing types in popular zip codes.

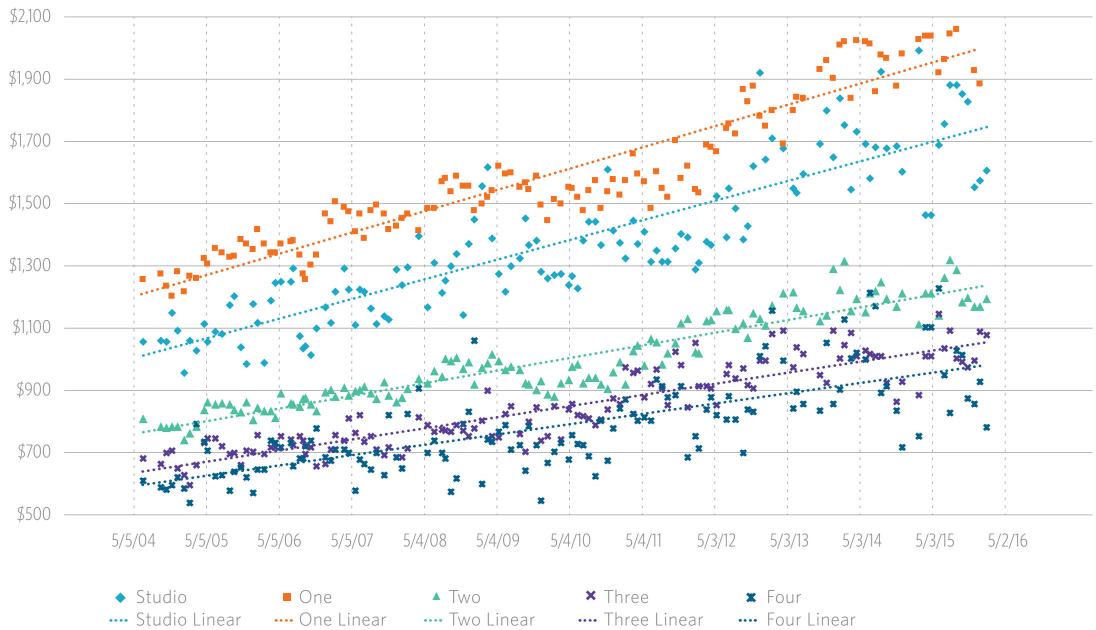
HOUSING COST TRENDS

Housing cost trends since 2013 have shown rents stabilize in 2013–2014, with 0 to 2% growth typical in graduate student zip codes. Then rents outpaced inflation in 2015–2017 with 3.5 to 4.5% growth typical in graduate student zip codes. Even in a relatively stable period, rents rose ~3.1% annually over 5 years. A *Boston Globe* article from April 2018 indicates that rents increased in Boston in January–March 2018 after slow growth in the past several years, with broker fees shifting to owners. The following three charts show the diversity of estimates for housing cost trends.

CAMBRIDGE MONTHLY RENT COST PER OCCUPANT TREND BY SIZE OF UNIT 2004–2016

The data below provided by the Off-Campus Housing Office suggest rents are increasing at a consistent level across all apartment types. However, there are issues using the off-campus housing listings including the lack of data for the last two years. In contrast, the data sources used by the GSC to estimate changes in cost of living show a wider variation in estimates of rental rates in Cambridge.

Cambridge monthly rent cost per occupant trend by size of unit

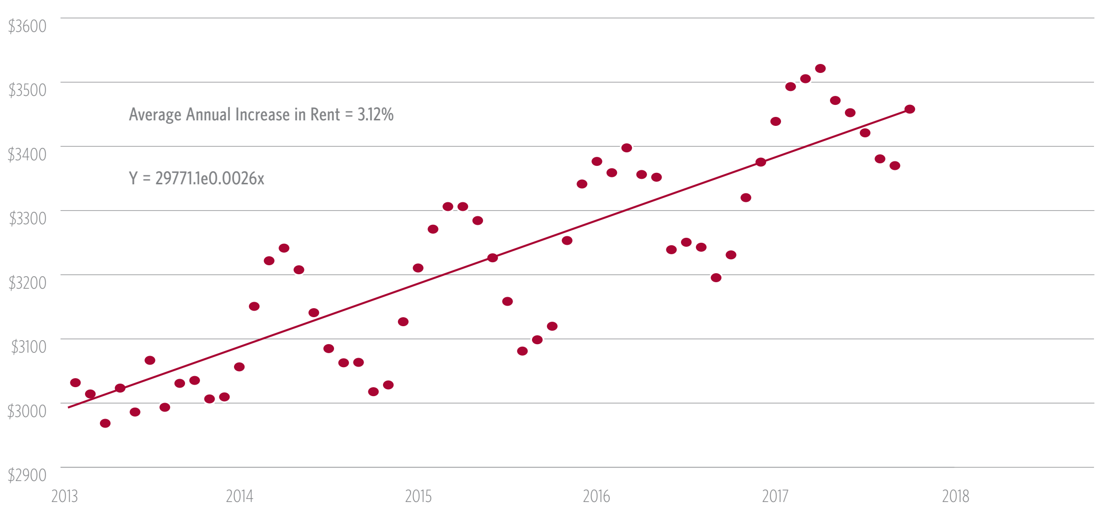


Source: MIT Off-Campus Housing Office

AVERAGE MONTHLY RENT

The average listed monthly rent for a 3-bedroom apartment in the top seven zip codes for graduate students includes an average annual increase in rent of 3.1%. The average monthly rental change is captured best by the 3-bedroom apartment data, as it is a common off-campus apartment type rented by our graduate students.

Average listed monthly rent for a 3-bedroom apartment in 7 top graduate student zip codes

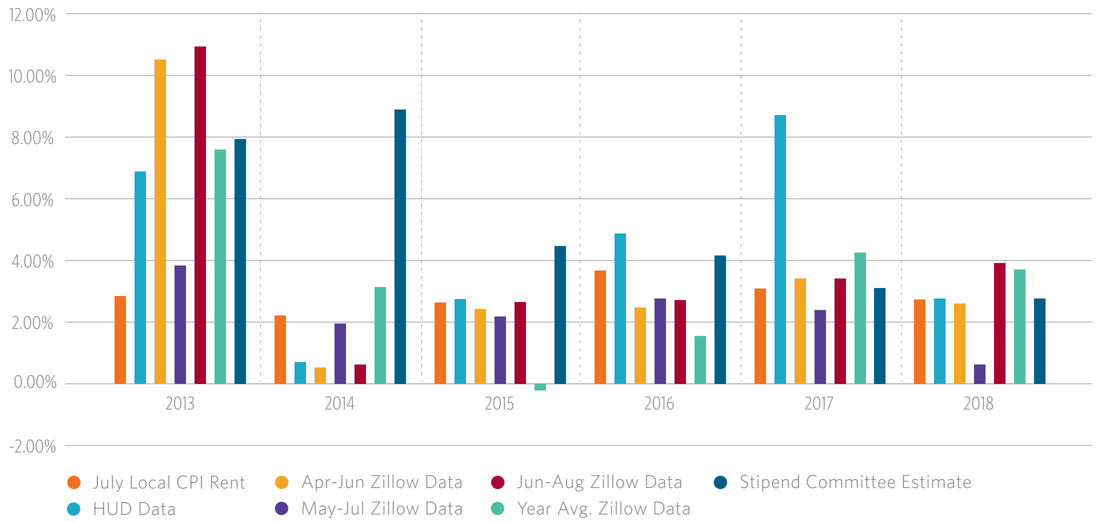


Source: Zillow median list prices by property type
https://www.zillow.com/research/data/

CAMBRIDGE MONTHLY RENT COST PER OCCUPANT TREND BY SIZE OF UNIT

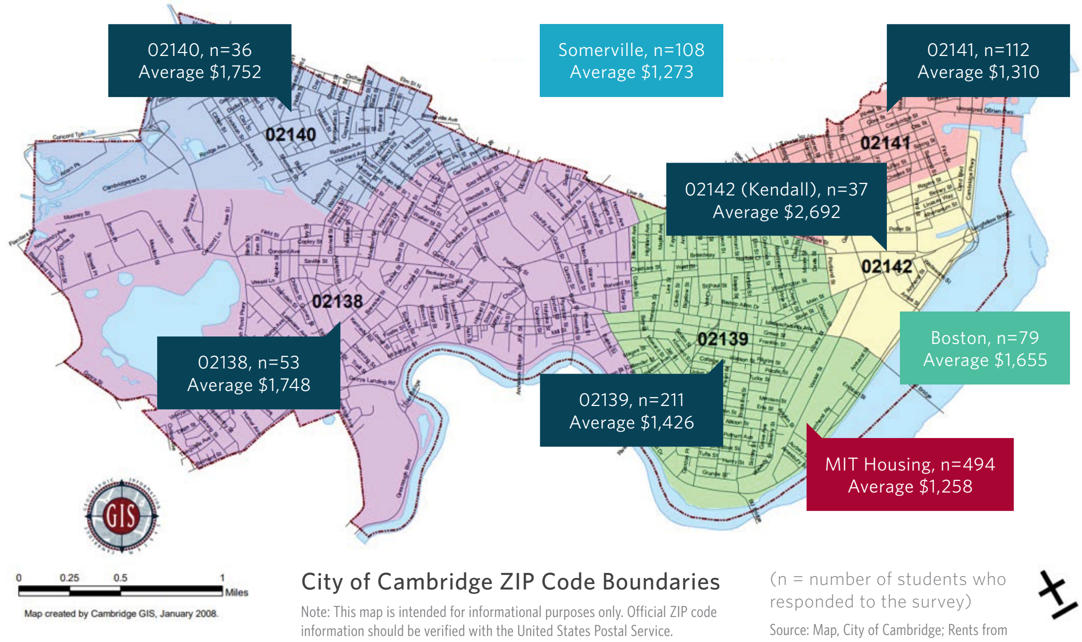
The following chart shows a summary of rental cost increases by using local consumer price indices, Zillow rental data, and US HUD fair market rental data.

Estimates of change of rental costs



Sources: Graduate Student Council Stipend Committee Estimates
MIT Off-Campus Housing Office
U.S. Department of Housing and Urban Development Fair Market Rents History https://www.huduser.gov/portal/datasets/fmr.html
Zillow median list prices by property type. https://www.zillow.com/research/data/

Average monthly housing cost per person by location



(n = number of students who responded to the survey)

Source: Map, City of Cambridge; Rents from Fall 2017 Graduate Housing Needs Survey

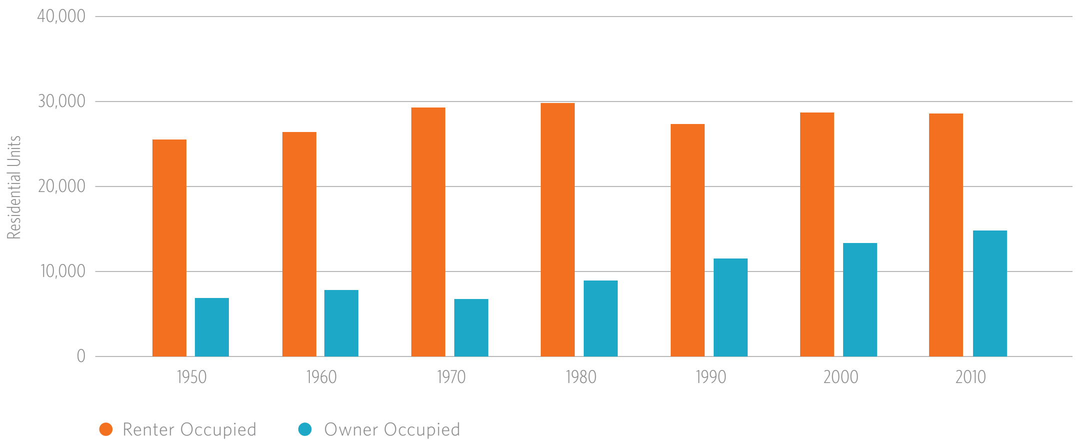
RENTAL SUPPLY

The increases in rental rates are being driven by increased demand for housing and a flat supply of rental units. We found the supply of rental units to be flat over 50 years, and now declining due to conversions of existing stock from renter-occupied to owner-occupied status (condo conversions).

RENT STABILIZATION

The Clay Report quoted that rents tend to stabilize at vacancy rates above 5.5%, and below that the market tends to become extremely competitive for renters, with landlords being able to raise rents more substantially. Rental vacancy rates have been below this level for the last two decades.

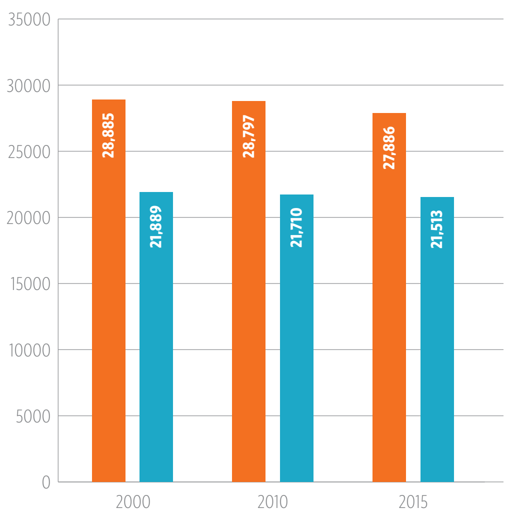
Cambridge housing markets



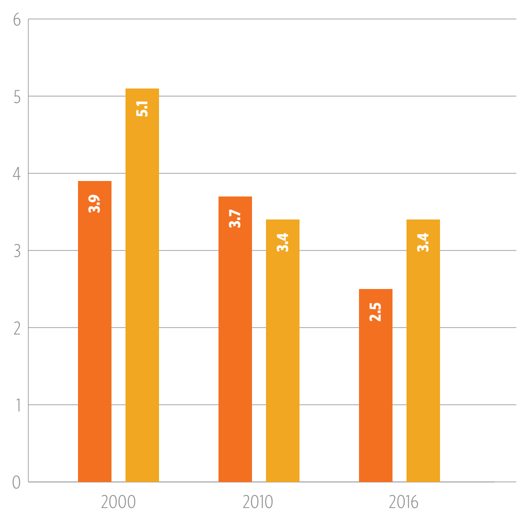
Source: 2016 Cambridge Housing Profile, MIT 2016 Town Gown Report to the City of Cambridge

Fewer rental units, vacancies declining

Renter occupied units, 2000–2015



Rental Vacancy Rate* (%), 2010–2016



- Cambridge City, Middlesex County, Massachusetts
- Somerville City, Middlesex County, Massachusetts
- Boston Region

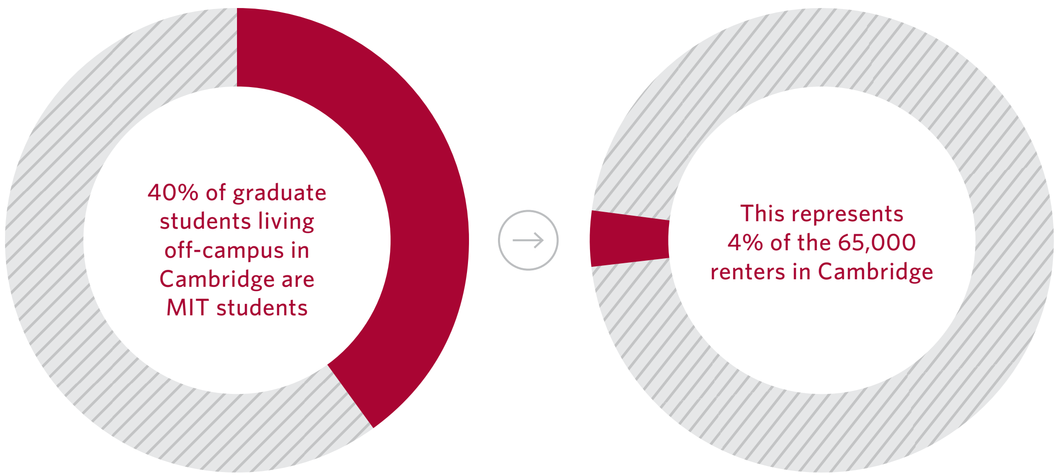
*Rents tend to stabilize at vacancy rates > 5.5%, and that below that the market tended to become extremely competitive for renters and landlords were able to raise rents more substantially. (Greater Boston Housing Report Card)

Sources: 2016 Cambridge Housing Profile, American Community Survey, 2010 Census

GRADUATE STUDENTS LIVING OFF-CAMPUS

In 2017, the City of Cambridge indicated 6,300 graduate students living off-campus in non-affiliate housing in Cambridge, representing ~10% of the 65,000 renters in the City. About 40% of the graduate students are registered at MIT. The others are from other universities, the largest number being associated with Harvard.

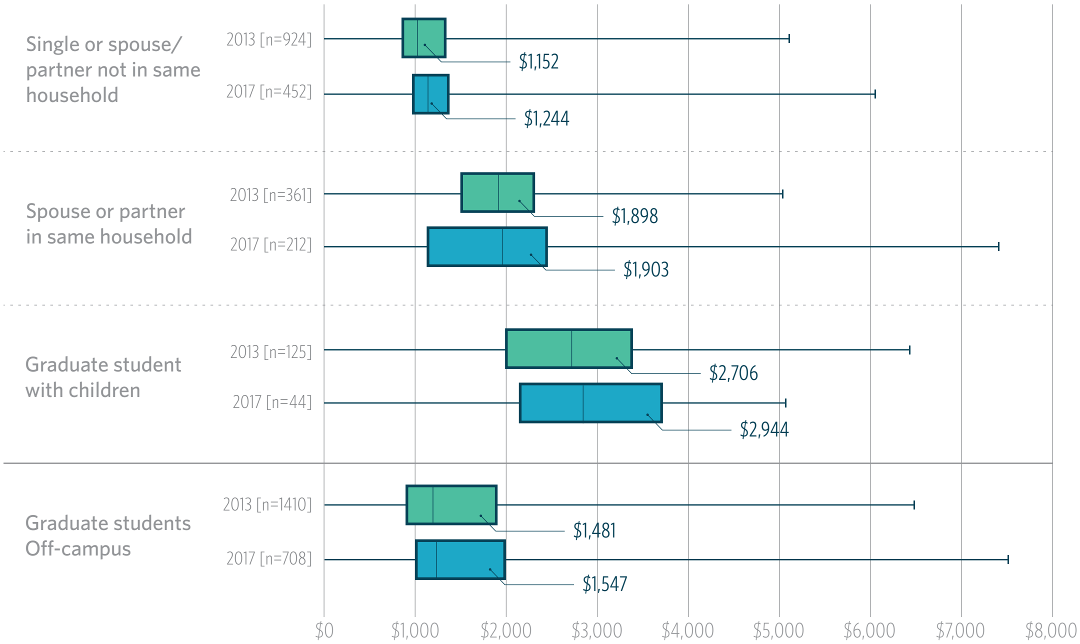
Graduate students living off-campus in Cambridge



Source: 2016 Cambridge Housing Profile, MIT 2016 Town Gown Report to the City of Cambridge

OFF-CAMPUS MONTHLY HOUSING EXPENSES

Off-campus monthly housing expenses have risen by ~9% for single students and students with children since 2013



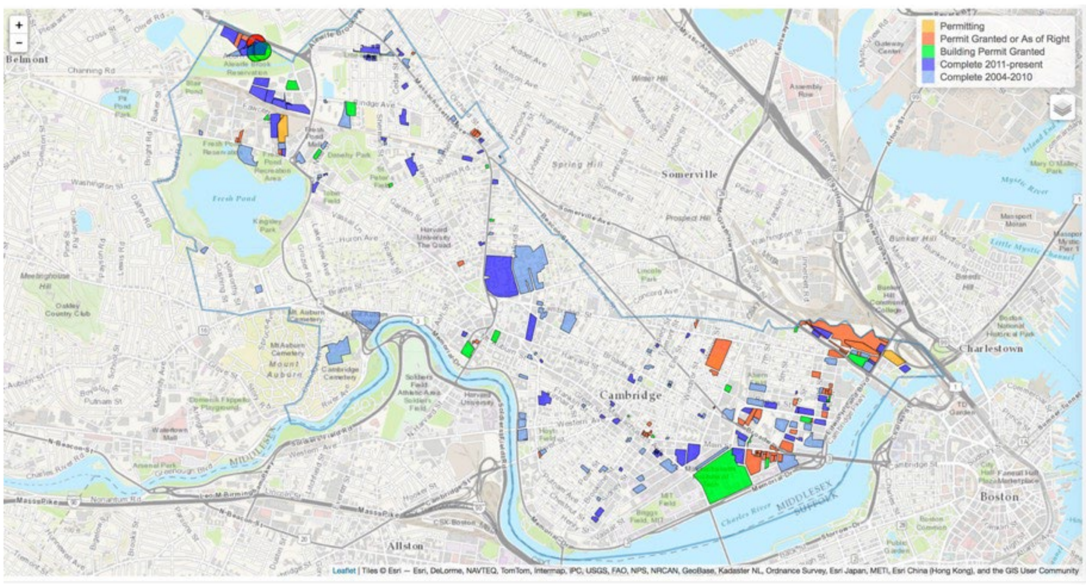
2013	2017	% rise
$1,481	$1,547	4.5%

Note: Monthly housing expense estimates in nominal dollars
Sources: 2013 Student Quality of Life Survey — http://web.mit.edu/ir/surveys/pdf/MITSQL2013-survey.pdf
Fall 2017 Graduate Housing Needs Survey

DEVELOPMENT PROJECTS IN CAMBRIDGE

Given continued commercial development which is expected to drive an increase in number of residents, we anticipate continued low vacancy rates and rising rents. (See next page)

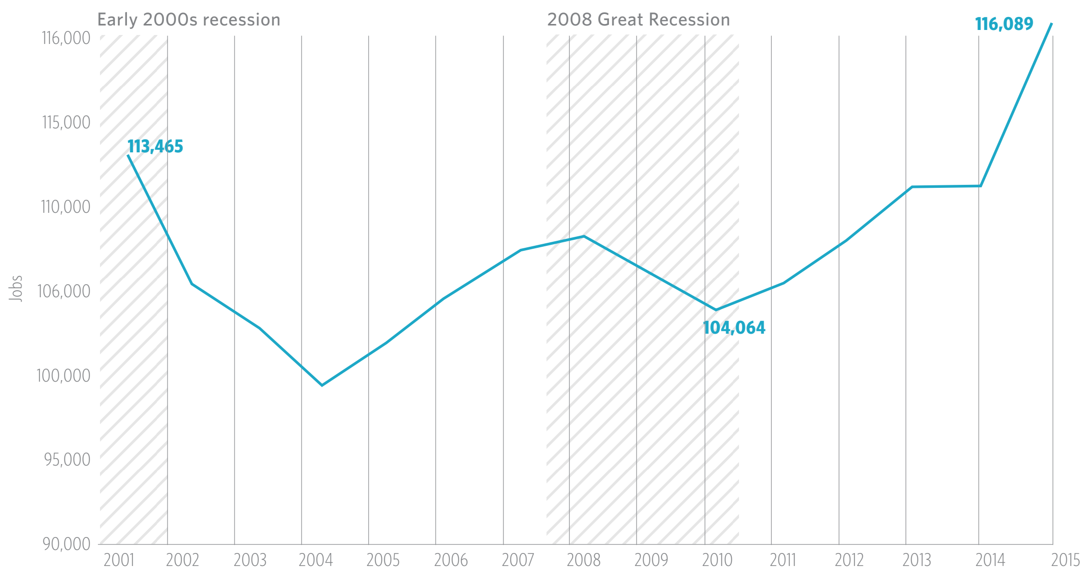
Development projects in Cambridge, 2004–present



NUMBER OF EMPLOYEES IN CAMBRIDGE, 2001–2015

High-tech jobs have become an increasingly important component of Cambridge's employment growth, accounting for 42% of the city's total job growth since 2010. From 2001 to 2014, employment in the life sciences in Cambridge grew 54%.[1]

Number of employees in Cambridge, 2001–2015



Source: Massachusetts Executive Office of Labor and Workforce Development, 2001-2015

1. Massachusetts Executive Office of Labor and Workforce Development

OFFICE AND RESEARCH & DEVELOPMENT SPACE IN CAMBRIDGE

In fall 2017 Cambridge reported about 4,500,000 GFA (gross floor area) of new Office/R&D development either recently completed or well on its way through the pipeline, about half a million SF more than was under development at the time of the Clay Report.

Office and R&D development in Cambridge

<table>
<tr><th>PROJECT NAME</th><th>ADDRESS</th><th>PROJECT STAGE</th><th>YEAR COMPLETE</th><th>PROJECT TYPE</th><th>TOTAL GFA</th></tr>
<tr><td rowspan="2">Binney St. Alexandria Master Plan</td><td>41 Linskey Way</td><td rowspan="3">Permit Granted or As of Right</td><td></td><td>Addition/ Alteration</td><td>16,189</td></tr>
<tr><td>57 JFK Street</td><td></td><td>Addition</td><td>18,351</td></tr>
<tr><td>Courthouse Redevelopment</td><td>40 Thorndike Street</td><td></td><td>Addition/ Alteration</td><td>476,303</td></tr>
<tr><td>Binney St. Alexandria Master Plan</td><td>50/60 Binney Street</td><td>Complete</td><td>2017</td><td rowspan="3">New Construction</td><td>467,512</td></tr>
<tr><td>1 Kendall Square Addition</td><td>399 Binney Street</td><td rowspan="5">Building Permit Granted</td><td></td><td>172,500</td></tr>
<tr><td rowspan="2">500 Discovery Park/ Discovery Park Master Plan</td><td>20 Acorn Park</td><td></td><td>132,000</td></tr>
<tr><td>35 Cambridgepark Drive</td><td></td><td>Alteration/ Enlargement</td><td>184,774</td></tr>
<tr><td>North Point Master Plan Bldg J/K</td><td>24 East Street</td><td></td><td rowspan="10">New Construction</td><td>371,433</td></tr>
<tr><td>400 Discovery Park/ Discovery Park Master Plan</td><td>30 Acorn Park</td><td></td><td>126,618</td></tr>
<tr><td>MIT Kendall Square Building 2</td><td>84 Wadsworth Street</td><td rowspan="2">Permit Granted or As of Right</td><td></td><td>318,000</td></tr>
<tr><td>MIT Kendall Square Building 3</td><td>238 Main Street</td><td></td><td>380,201</td></tr>
<tr><td>Binney St. Alexandria Master Plan</td><td>100 Binney Street</td><td>Complete</td><td>2017</td><td>356,941</td></tr>
<tr><td>MXD Infill</td><td>145 Broadway</td><td>Building Permit Granted</td><td></td><td>453,768</td></tr>
<tr><td>NoMa - Original Building Phase 3-5</td><td>1 Broadway</td><td>Permit Granted or As of Right</td><td></td><td>313,269</td></tr>
<tr><td>First Street Assemblage Parcel A</td><td>121 First Street</td><td>Building Permit Granted</td><td></td><td>56,691</td></tr>
<tr><td>MIT Kendall Square Building 5</td><td>314 Main Street</td><td rowspan="2">Permit Granted or As of Right</td><td></td><td>372,110</td></tr>
<tr><td>MXD Infill</td><td>250 Binney Street</td><td></td><td>318,644</td></tr>
</table>

Source: City of Cambridge quarterly Development Log, July-Sept 2017; issued by CDD

WHERE CAMBRIDGE RESIDENTS WORK

Based on the Clay Report methodology for estimating total number of workers (250–500 SF per employee) and the development data above, once these new office/R&D spaces are complete, somewhere between 9,000–18,000 additional workers might be employed in the City of Cambridge. Assuming 12% of future employees at these developments live in Cambridge (similar to the current proportion of the Cambridge workforce that currently lives in the City), we might anticipate roughly 1,100–2,200 additional resident employees looking for housing in the City over the next decade. This analysis is supported by a recent study that places the number of new Cambridge employees seeking housing in the City over the next decade at approximately 1,800 people.* Cambridge is likely to experience additional housing demand from those who may work elsewhere but seek to live in the City.

*2015 Cambridge Incentive Zoning Ordinance Nexus Study, p.20 **www.cambridgema.gov/cdd/news/~/media/3724267a45024dcbb17f1ed7682faf4b.ashx**

Where Cambridge residents work: 1970–2009

	1970[1]	1980[2]	1990[3]	2000[3]	2007-9
Cambridge Residents Employed in Cambridge	22,074	25,512	25,730	25,554	27,774
As % of Employed Residents	53.9%	53.4%	48.9%	46.5%	45.7%
As % of All Persons Working in Cambridge	29.0%	28.8%	23.5%	22.4%	23.5%
Cambridge Residents Working Elsewhere	18,910	22,306	26,858	29,405	33,053
As % of Employed Residents	46.1%	46.6%	51.1%	53.5%	54.3%
Cambridge Residents Reporting Place of Work	40,984	47,818	52,588	54,959	60,827
All Persons Reporting Place of Work in Cambridge[4]	76,112	88,594	109,490	114,133	117,991

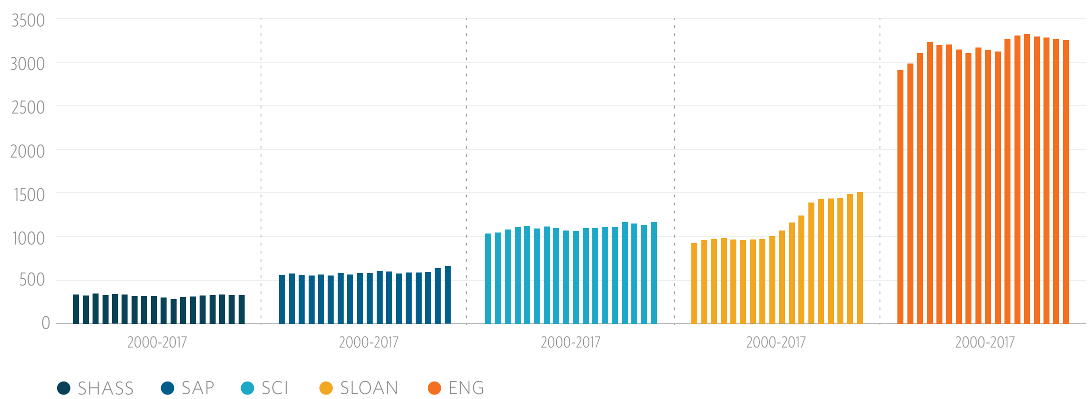
Source: Envision Cambridge/2016 Census Data

1. Figures for workers 16 and older. Figures reported elsewhere may include workers 14 and older. Employed persons not reporting place of work not included in table. 4,873 employed Cambridge residents did not report a place of work.
2. Figures for workers 16 and older. Reflects Cambridge residents employed only in New England states. Nonreporters allocated by Census Bureau Journey to Work branch rather than by 1980 Census operations.
3. Figures for workers 16 and older. Allocation of nonreporters by Census Bureau as part of 1990 and 2000 Census data processing.
4. This figure consists of all persons reporting a workplace in Cambridge, regardless of place of residence. These figures are reported by the U.S. Census, and they do not match either the labor force figures generated by the Census Bureau of the annual employment figures generated by the MA EOLWD.

MIT's graduate student population has grown in the last several decades due to changes in research volume and educational programs.

Over a period of 18 years, since 2000, the number of MIT graduate students increased a little over 20% in total. The number of doctoral and master's students grew at about the same rate. Enrollments in the Sloan School of Management grew by 63%, Architecture and Planning by 18%, Science by 13%, and Engineering by 12%, with a 2% reduction in Humanities, Arts and Social Sciences. Of the total number of new students in the last 18 years (1155), 50% are associated with Sloan, 30% with Engineering, 12% with Science, and 9% with Architecture and Planning. The changes in student enrollments in the Sloan School of Management have resulted from new programs in Business Analytics, Master in Finance, and a non-residential executive MBA. The total graduate student population in Science and Engineering correlates well with research volume over the long run.

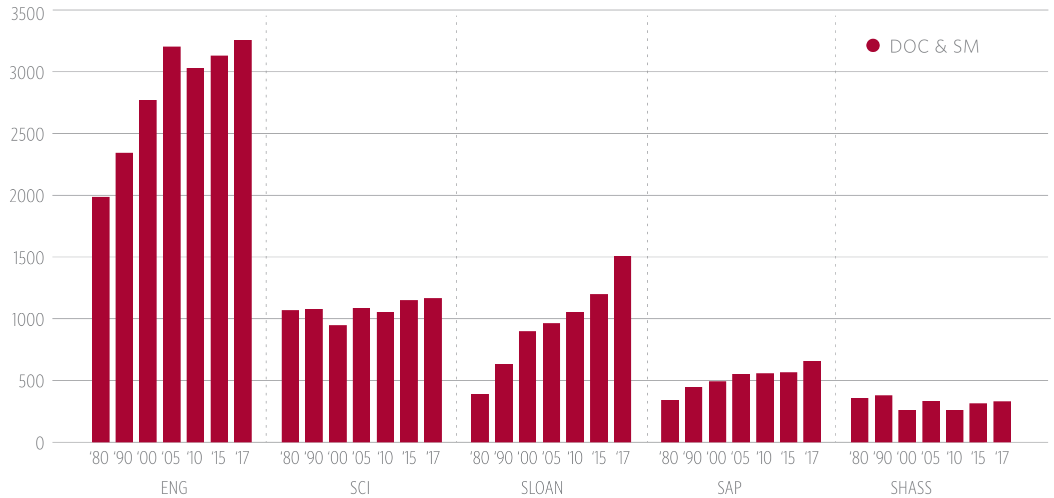
Trends in graduate student fall enrollment by level



Source: MIT Housing data

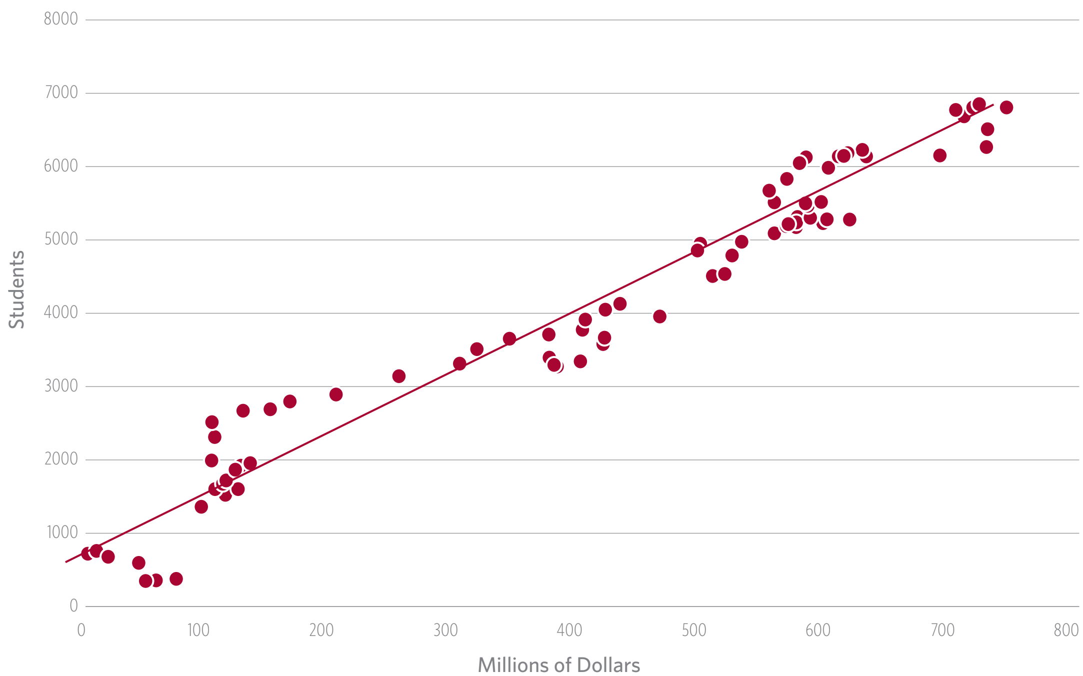
LONGER TERM TRENDS IN GRADUATE STUDENT POPULATION

Graduate student growth driven by School of Engineering and Sloan



Note: Includes regular resident Doctoral and Masters students. Sloan EMBA students not included.
Source: IR, 8/19/2017, updated 10/11/2017 with Y-Report data from mit.edu/registrar/stats/yrpts/

Graduate students and campus research expenditures in constant dollars (1940–2017)



Source: IR Campus Research Expenditures, constant dollars
(Correlation Coefficient = .977) 1940–2017

MIT has a strong history of addressing both graduate student housing needs and Cambridge housing needs.

In the 1980s and 1990s, as part of the University Park development, MIT built 674 units of housing, including 114 low- and 50 middle-income units of affordable housing. Between 1997 and 2017, MIT added 1,470 units of graduate student housing. As part of its 2014 Kendall Square Initiative rezoning and development, MIT committed to 18% affordable housing in its residential building — the highest percentage committed through a development project at that time. The One Broadway facility will create 300 new units of housing, including 50 low- and 5-10 middle-income affordable units.

In 2014, MIT committed to build a new 450-unit graduate student residence hall, which is now under construction in Kendall Square. MIT's current proposed Volpe development is slated to include 1,400 units of housing, of which 20% (280 units) will be designated as permanently subsidized affordable housing. The Kendall Square Initiative rezoning and the Volpe rezoning will contribute $40 million dollars to the Cambridge Affordable Housing Trust as part of the City's commercial linkage ordinance that serves to increase the City's supply of affordable housing. MIT on campus graduate housing project costs total $702.5M (FY17$) in the last two decades.

MIT'S IMPACT ON AFFORDABLE HOUSING IN CAMBRIDGE

- MIT's additions to the City's low-income and middle-income affordable housing stock (University Park, CASPAR, Kendall Square Initiative, and Volpe, if approved): approximately 615 units — an approximate $247 million investment in today's dollars.
- MIT's direct financial contributions to the City's Affordable Housing Trust (Kendall Square Initiative, and Volpe, if approved): $40 million
  - **Total MIT investment in the creation of affordable low-income and moderate-income housing in Cambridge: $287 million**

MIT also makes annual financial contributions to local nonprofit organizations that provide or build affordable housing, including the Cambridge Housing Assistance Fund (CHAF), Salvation Army, On the Rise, Just-A-Start, Transition House, Cambridge Affordable Housing Trust, Cambridge Housing Authority, New Community Services, and Hildebrand Family Self Help Center, among others. In addition, many faculty, staff, and students volunteer in a variety of capacities at these organizations, and on city-wide advisory and policy committees — sharing their time, talent, and expertise to address the City's housing needs.

Despite the graduate residences that MIT has added over the last 20 years, the student population has also grown, and there remains a need for additional housing capacity.

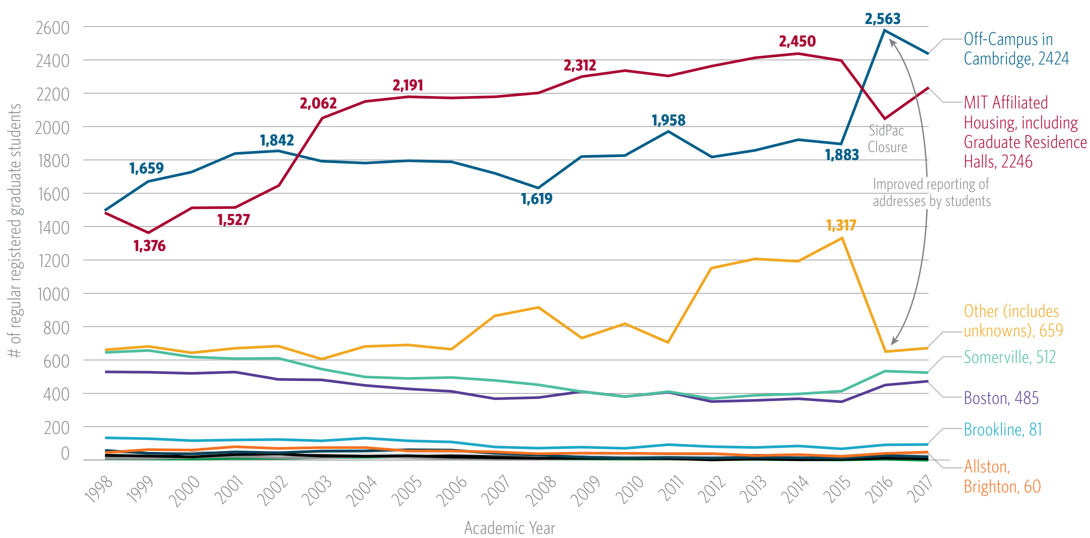
MIT GRADUATE STUDENT HOUSING CONTEXT

MIT currently has 6,400 residential graduate students, of which it houses 39% or approximately 2,500 on campus. Approximately 2,400 of the off-campus students live in Cambridge with the remainder residing in the surrounding municipalities.

On campus students live in one of MIT's eight graduate residence halls. These facilities include 410 family units in the Eastgate and Westgate residences, and a total of 2,043 single units in the Warehouse, Edgerton, Ashdown, Sidney-Pacific, Tang, and 70 Amherst residences. Housing is assigned by a lottery system and unit types range from efficiencies to 4-bedroom apartments. 70 Amherst, added as a graduate housing option in the fall of 2017, offers traditional dorm-style units. On campus rents are below market rate and include all utilities, Wi-Fi and cable. The 2017-2018 monthly rates for family housing ranged from $1,403 for an efficiency to $2,075 for a 2-bedroom apartment. For single units, the range was $700 for a single dorm-style room to $1,926 for a private 1-bedroom apartment.

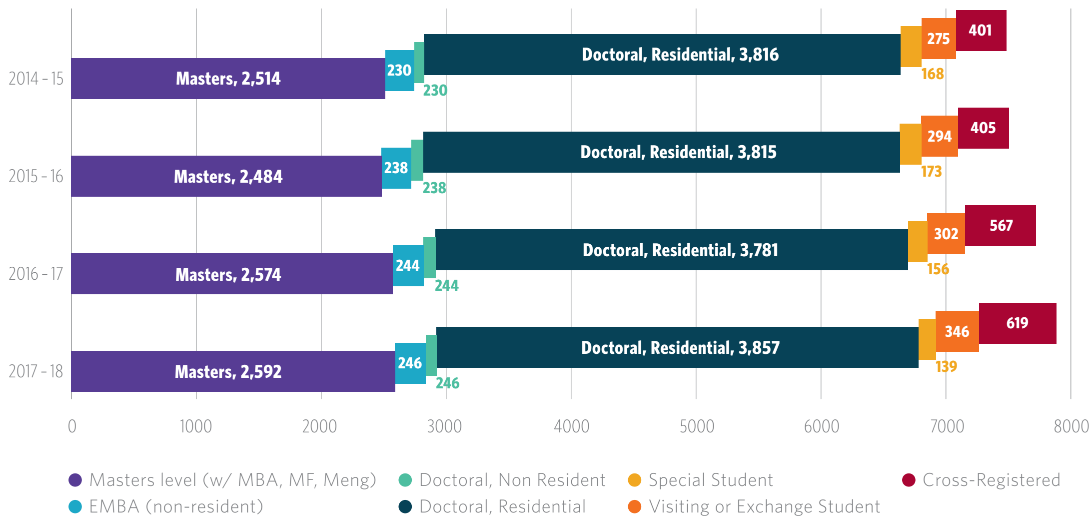
Over the last two decades the MIT graduate student population has grown by about 2,000 students. The on campus population over this time as well as the number of students housed off-campus in Cambridge have each grown by about 1,000 students. During the same period, students have moved from outlying areas into Cambridge.

Where MIT graduate students live



Source: Registrar Enrollment Statistics, Y-Report data

Graduate student enrollments including visiting and cross-registered students

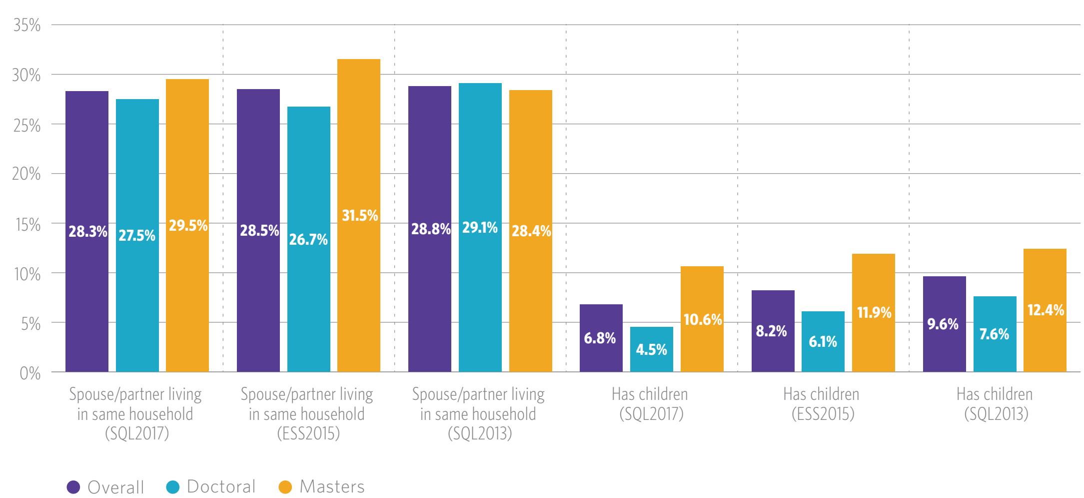


Source: Registrar Enrollment Statistics, web.mit.edu/registrar/stats/yrpts/

GRADUATE STUDENT FAMILY STATUS

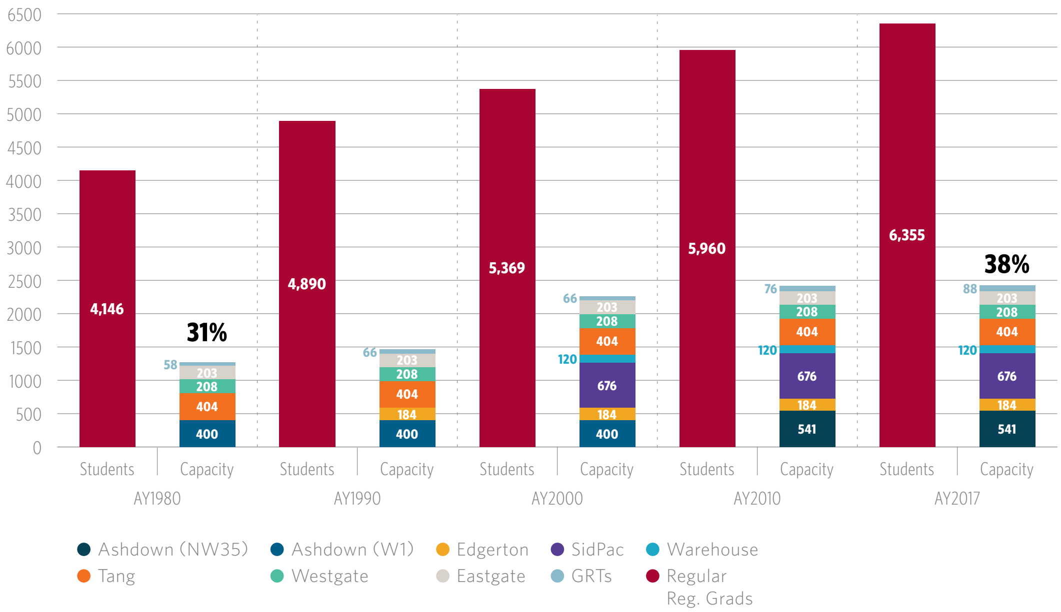
About 30% of our master's and doctoral level students report having a spouse or partner living in the same household with them at this time. Multiple surveys estimate between 7%-10% of graduate students have at least 1 child, with more master's-level students reporting they have children than doctoral students. A few of our enrolled graduate students also report caring for and living with a legal dependent who is not their child.

Graduate student family status



Sources: 2013 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2013-survey.pdf
2015 Enrolled Student Survey
http://web.mit.edu/ir/surveys/gradess.html
2017 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2017-survey.pdf

Graduate student housing capacity growth (number of units)



Source: IR and Y-Report data; studentlife.mit.edu/housing/graduate-family-housing/graduate-residences

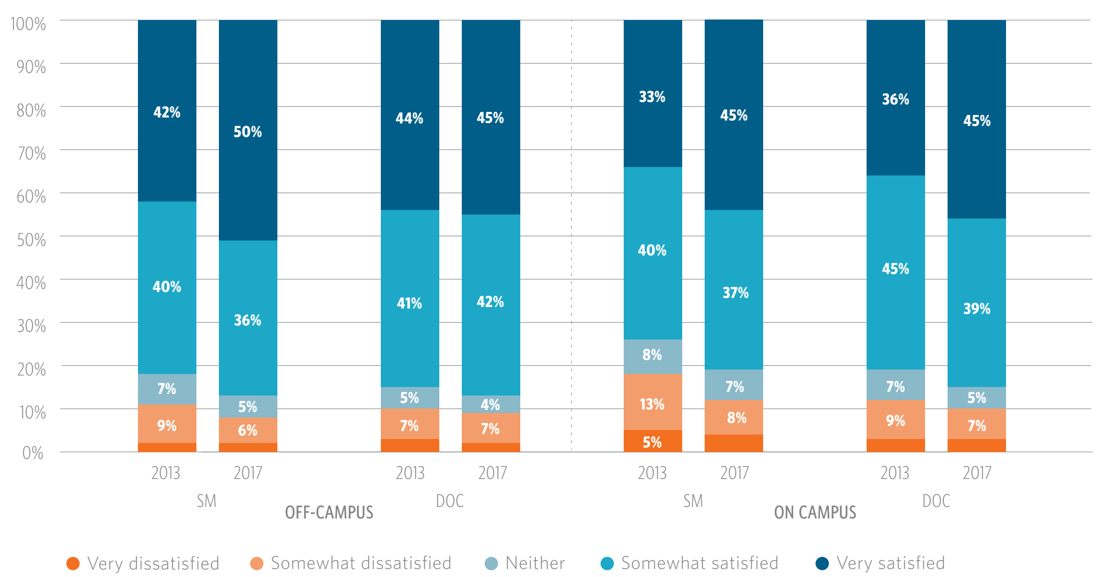
The majority of respondents (~85%) are satisfied with their current housing situation. Many respondents are dissatisfied with the cost (62%) and availability (33%) of housing. High housing costs relative to graduate student incomes contribute to reported financial stress. Graduate students have also voiced other concerns about housing including dissatisfaction with aspects of the assignment process and housing quality.

Satisfaction with current housing options is generally high (~85%), but respondents report dissatisfaction within certain residences: Eastgate is the only building to report increasing dissatisfaction over the last several years.

STUDENT HOUSING SATISFACTION

The majority of our students (typically about 85%), both on campus and off, are satisfied with their housing situation, up for most groups from 2013.

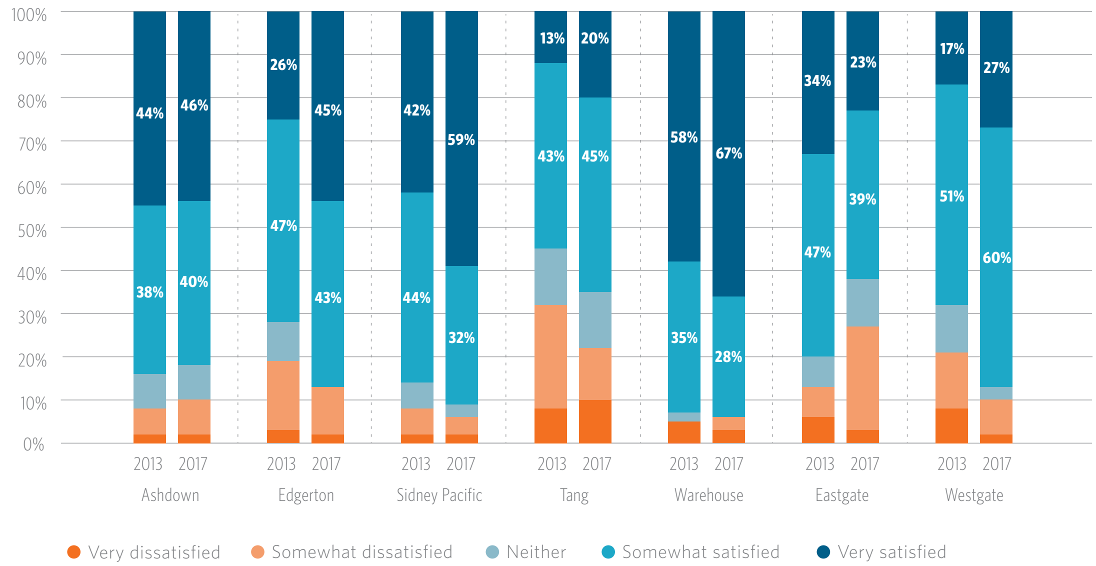
At the moment, how satisfied are you with your housing situation?



Sources: 2013 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2013-survey.pdf
2017 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2017-survey.pdf

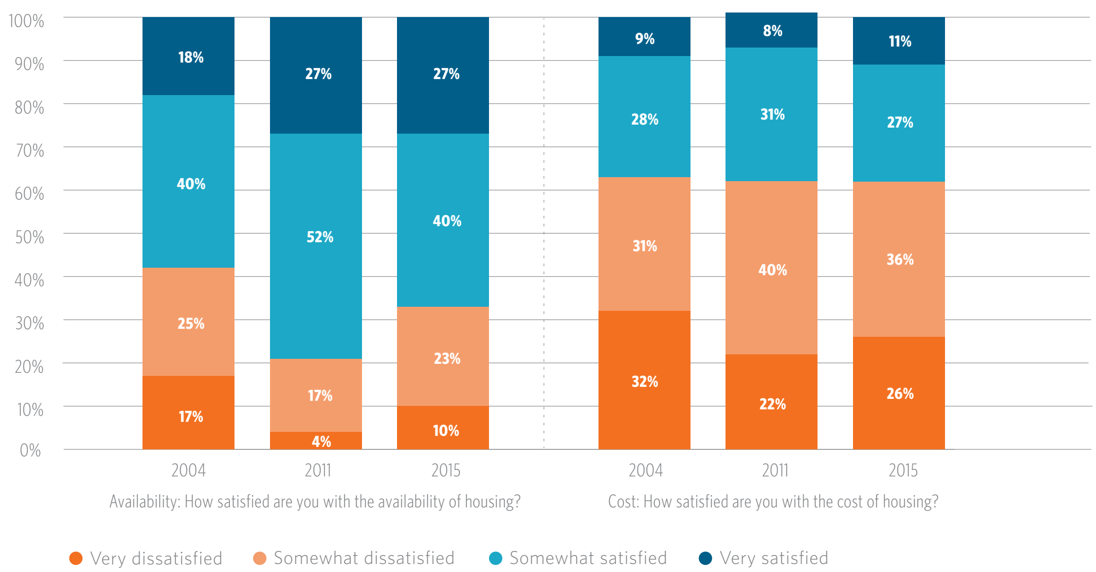
We see some differences by specific graduate buildings, and changes in satisfaction between 2013 and 2017 for some — increased satisfaction in Edgerton, Tang, the Warehouse, and Westgate; while satisfaction ratings among Eastgate residents decreased.

At the moment, how satisfied are you with your housing situation?



Sources: 2013 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2013-survey.pdf
2017 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2017-survey.pdf

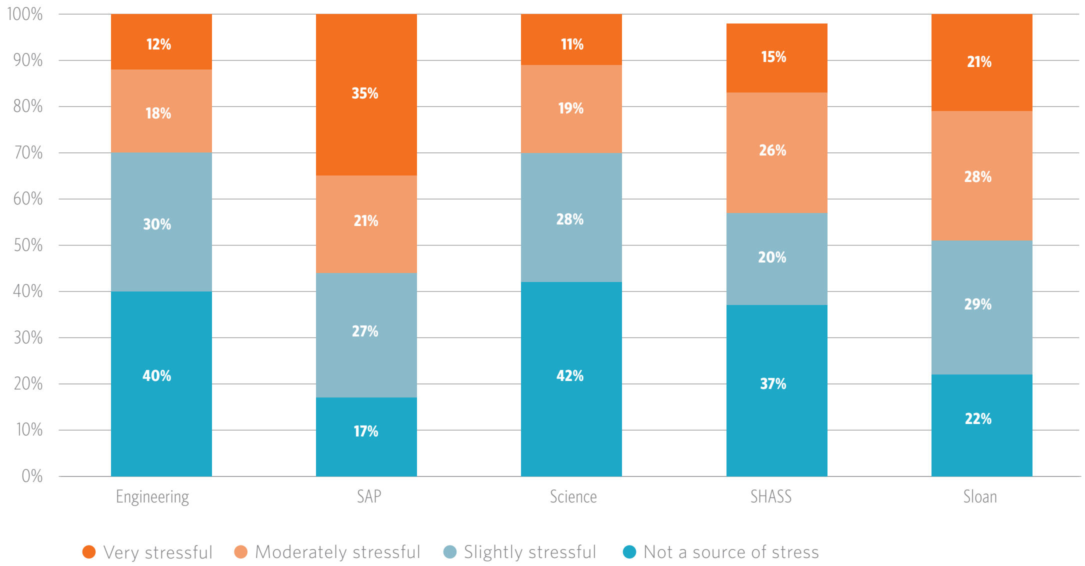
Satisfaction with availability and cost of housing



Source: IR - Enrolled Graduate Student Surveys
http://web.mit.edu/ir/surveys/gradess.html

The working group also reviewed the results of the 2017 Student Quality of Life Survey, and noted a high proportion of respondents indicated finances were a source of stress, and how that varied by school at MIT.

Sources of stress: finances



Source: 2017 Student Quality of Life Survey, Graduate Student Responses
http://web.mit.edu/ir/surveys/pdf/MITSQL2017-survey.pdf

DISTRIBUTION OF SINGLE GRADUATE STUDENTS' EXPENDITURES

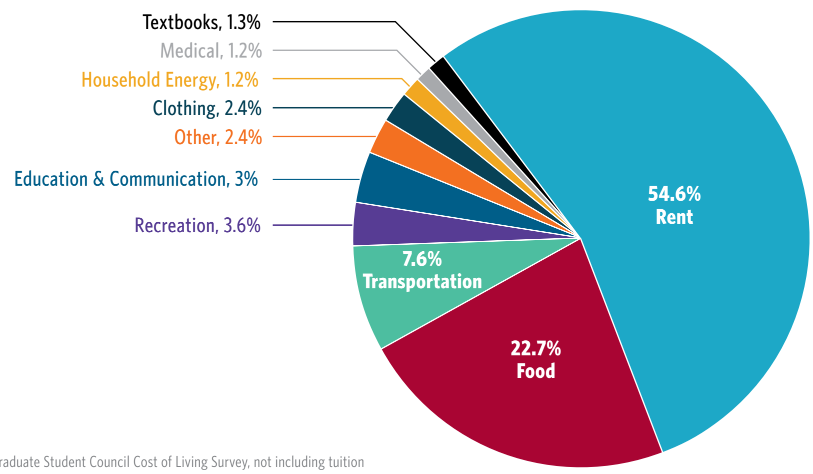
From the 2017 Cost of Living Survey, the working group learned rent and food account for 75% of the non-tuition out-of-pocket expenses for most graduate students. Rent is the dominant expense and the driver of changes in the cost of living. This analysis only concerns single graduate students without partners or children.

The 2017 Graduate student expense estimate chart attempts to capture minimum expenditures of a "typical" single graduate student. It assumes the following:

- No savings or debt payment and minimal discretionary budget
- Living on or near campus, reflecting increased preference for living in Cambridge over time
- A budget that prioritizes time-saving over maximum thrift (e.g. eat in student center and get back to lab rather than cooking)

Additionally, the transportation estimates are lower than for the standard population, viewing cars as a "luxury item" for a graduate student living in Cambridge.

Distribution of single graduate students expenditures



Source: 2017 Graduate Student Council Cost of Living Survey, not including tuition

2017 MIT Graduate student expenses estimate

ANNUAL EXPENSES	ANNUAL COST	COST IN TYPICAL UNITS	NOTES
Food	$5,850	$16/day	Two meals on campus. Cover breakfast with savings from a free meal or two a week.
Medical	$3,650		MIT Extended + MIT Dental + $250 for medicine and off-campus treatment.
Housing + Basic Utilities + Renter's Insurance	$15,800	$1300/month + $200/year	2 bed – 1 bath in SP or Ashdown "Most typical". Similar to off-campus costs w/ broker fee.
Local Transportation	$500	$42/month	Monthly T-pass or occasional T + Uber.
Non-local Transport	$800		2 peak-season domestic tickets or one off-season international.
Textbooks/ Software/ Supplies + Student Fees	$550	$400 + $150/year	Mean reported expense, representative of overall experience.
Other	$3,350		See next slide
Taxes	$4,850		Aiming for $30,500 post-tax — no FICA or Medicare
Total	**$35,350**		(Includes insurance subsidy)

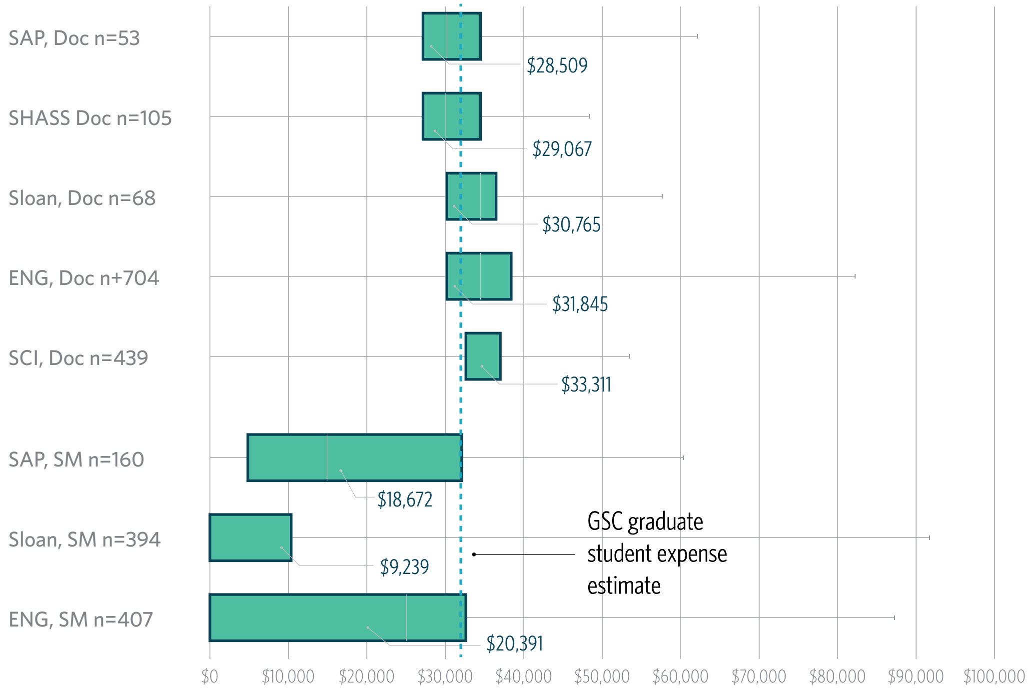
2017 MIT Graduate student expenses estimate

ANNUAL EXPENSES	ANNUAL COST	COST IN TYPICAL UNITS	NOTES
Phone	$720	$60/month	Assumes a major carrier with an international-capable plan (for collaborations)
Clothing	$600		~1/3 of national average. ~25th percentile of survey respondents on 2017 Cost of Living survey
Personal Hygiene & Toiletries	$500		May be highly variable.
Laundry	$230	$4/week + detergent	Split difference of on/off-campus costs
Other Cleaning	$150		
Furniture/Dishes	$250	$1500/PhD	Low-budget costs amortized over a 5 year PhD
Recreation & Fitness	$500	$42/month	Occasional Z-Center classes + a movie or two a month
Computer	$400	$2000/PhD	Simulation-capable, amortized over 5 years
Savings & Loan Repayment	**$0**		**Students don't contribute to future FICA and Medicare benefits, so this is particularly significant**
Total	**$3,350**		~40% of EPI number ~125% of MIT Living Wage Number

TOTAL INCOME FROM RA, TA, MIT FELLOWSHIPS OR OUTSIDE FELLOWSHIPS

To illustrate how student support differs by school and program, the working group looked at the range of self-reported income on the 2017 Cost of Living Survey. For example, in master's-level programs in the School of Architecture and Planning, the 25th percentile reported $5,000 in income, and the 75th percentile reported $32,750 in income. It is more typical for professional master's degree programs for students to be self-supported or partially supported.

Total income from RA, TA, MIT fellowships or outside fellowships



Source: 2017 Graduate Student Council Cost of Living Survey

Estimating graduate student housing preferences is complex. We estimate additional preference for on campus housing to be between 1,000 and 1,100 students relative to the number we have the capacity to house today (2,424 AY17).

THE CHALLENGE OF ESTIMATING DEMAND FOR NEW UNITS

"Rents in Greater Boston climbed in the second quarter at their slowest pace in two years, according to new figures out Wednesday, while the vacancy rate among apartments hit a six-year high."

— Boston Globe, July 2016

"After years of going up, rents in Boston's superheated real estate market may have finally reached a peak... Data released Thursday show that apartment rental prices fell slightly at the end of 2016 — the first drop since 2010 — amid a surge of new buildings that have opened in Boston and neighboring cities such as Cambridge, Chelsea, and Somerville... The decline was modest, just 1.7 percent — or $36 a month on the average lease of $2,038, according to the rental-tracking firm Reis Inc. But it was the latest and clearest sign that the flood of construction in Boston is putting a lid on prices, at least at the upper end of the market."

—Boston Globe, January 2017

"With the spring real estate market blooming, rents in Greater Boston are again accelerating, though it's not yet clear if that's a blip or a longer-term trend."

—Boston Globe, April 2018

STUDENT HOUSING PREFERENCES

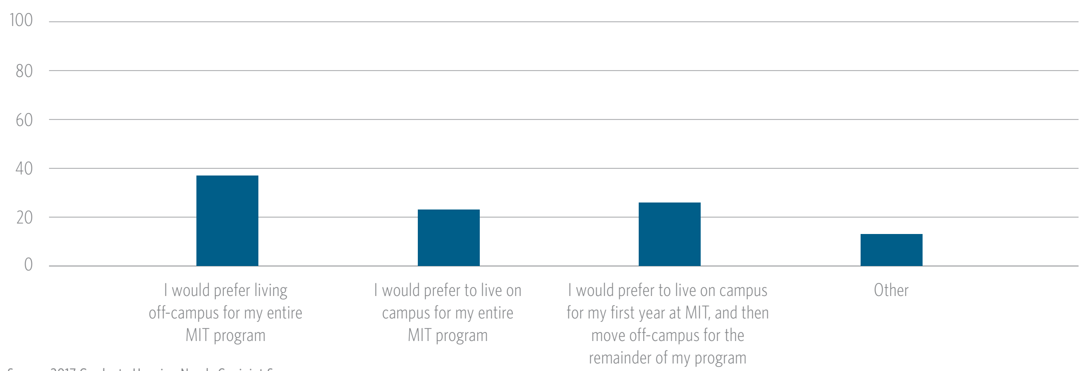
As part of our housing survey we asked students, "All things considered, which of the following best describes your feelings?" *(Same question as 2013)*

- I would prefer living off-campus for my entire MIT program
- I would prefer to live on campus for my entire MIT program
- I would prefer to live on campus for my first year at MIT, and then move off-campus for the remainder of my program
- Other: please describe

1,228 graduate students completed the survey sent by the working group (a 19% response rate). Of the 700 students living off-campus who responded, 23% would prefer to live on campus for their entire program. An additional 8% would prefer to live on campus for their first year, but did not get a chance to do so. As was done in the Clay report, this number was scaled assuming that those who responded to the survey were representative of the entire graduate student population.

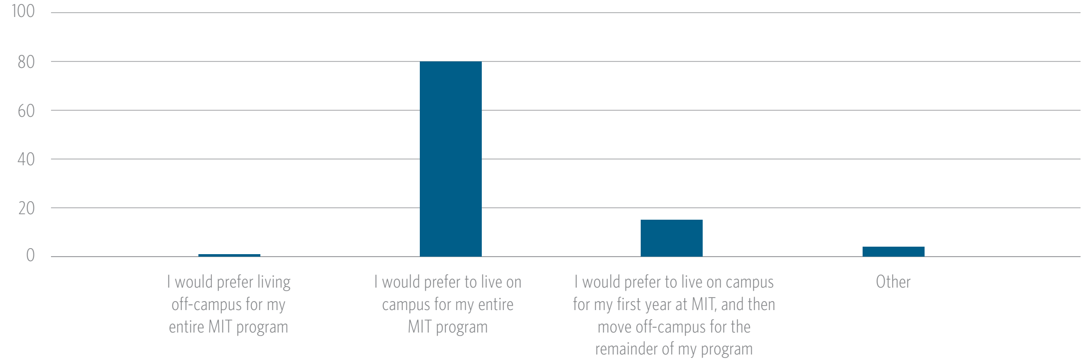
Of the ~500 students living on campus who responded, 80% would prefer to live on campus for their entire MIT program and 15% would prefer to live on campus for their first year at MIT, and then move off-campus for the remainder of their program.

Students currently living off-campus



Source: 2017 Graduate Housing Needs Conjoint Survey

Students currently living on campus



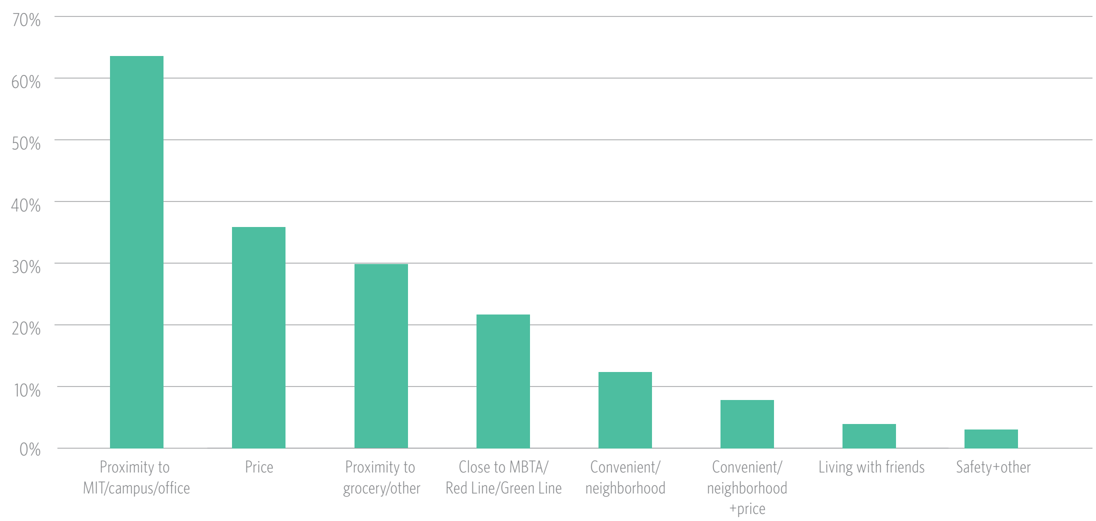
Source: 2017 Graduate Housing Needs Conjoint Survey

The top five reasons for living off-campus included affordability, MIT separation, flexibility/independence, spouse/family, and the quality of apartments.

The top five reasons for living on campus included proximity/convenience to MIT, meet MIT people/community, affordability, ease of dealing with MIT, and the amenities offered.

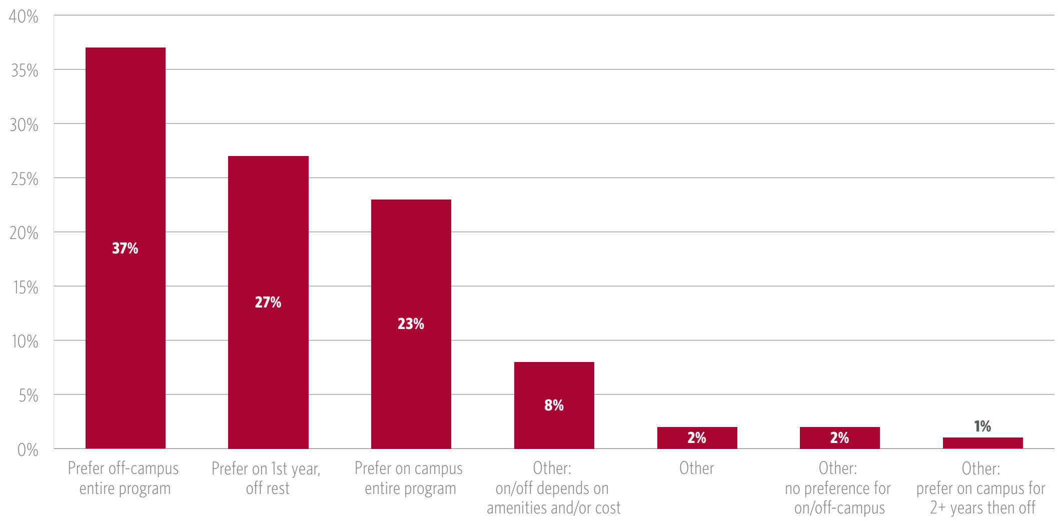
The top five reasons to live on campus, then move off-campus include the initial ease of dealing with MIT, making friends/community on campus, unfamiliarity with area, more affordable off-campus and independence/freedom.

Why did you choose to live where you do in Cambridge and not elsewhere?



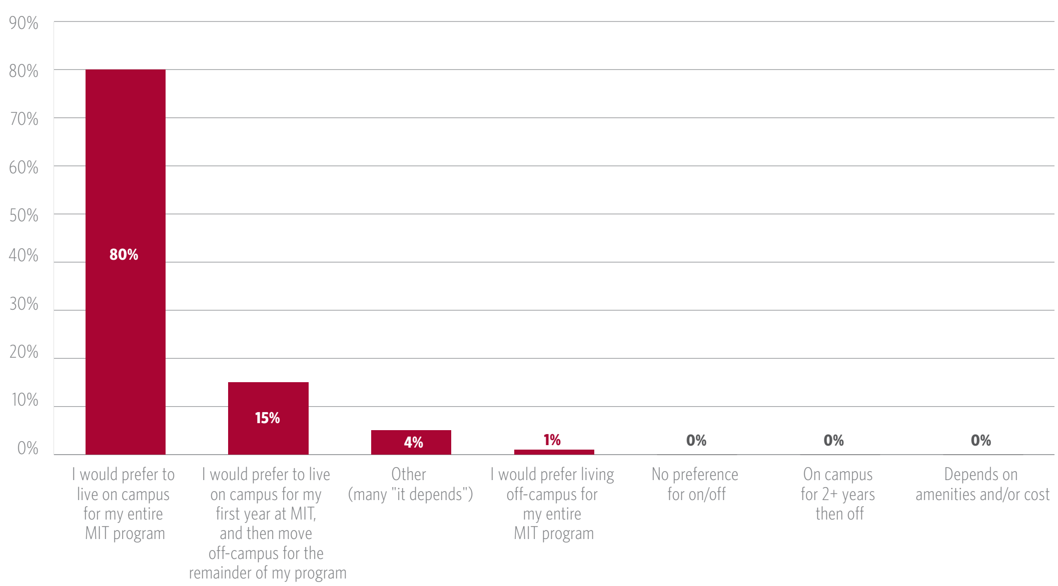
Source: Fall 2017 Graduate Housing Needs Survey

Graduate student housing preferences — lives off-campus now



Source: Fall 2017 Graduate Housing Needs Survey

Graduate student housing preference — lives on campus now



Source: Fall 2017 Graduate Housing Needs Survey

Response bias is expected in almost any voluntary survey. We only had limited information to assess the extent to which response bias may have influenced our results. In addition to looking at response rates by school, program, citizenship and housing location, we used data collected on earlier surveys about satisfaction with housing availability, cost or situation to assess response bias. One of the source questions was on the 2017 Student Quality of Life survey, on which 87% of graduate respondents living off-campus and 84% of graduate respondents living on campus indicated being "somewhat satisfied" or "very satisfied" with their housing situation. A roughly similar proportion of respondents who previously reported being dissatisfied (27%) or satisfied (33%) with housing responded to the recent survey.

The extrapolated numbers presented below represent one potential measure of preference for housing among the MIT student population to be considered along with estimates of preference from other sources.

We recommend that if future conjoint studies are done, non-response bias studies be built into the research.

Understanding who responded to the survey*

SCHOOL	INVITED	RESPONDING	% RESPONDING
Architecture	642	111	17%
Engineering	3,119	624	20%
Humanities	287	59	21%
Sloan	1,253	159	13%
Science	1,161	275	24%
PROGRAM	**INVITED**	**RESPONDING**	**% RESPONDING**
Doctoral	3,871	814	21%
Any Sloan Masters	1,069	122	11%
Other SM	1,522	292	19%
CITIZENSHIP	**INVITED**	**RESPONDING**	**% RESPONDING**
US Citizen	3,464	733	21%
International/Perm. Resident	2,998	495	17%
HOUSING LOCATION	**INVITED**	**RESPONDING**	**% RESPONDING**
Lives On Campus	2,184	490	22%
Lives Off-campus	4,278	738	17%
SENTIMENT (FOR WHO IS AVAILABLE)	**INVITED**	**RESPONDING**	**% RESPONDING**
Dissatisfied with housing	397	108	27%
Neither satisfied or dissatisfied	62	19	31%
Satisfied with housing	1,459	478	33%
First year, no sentiment available	2,092	410	20%
No sentiment available	2,452	213	9%

*From 1,228 students who completed our 2017 survey.

Source: Fall 2017 Graduate Housing Needs Survey

SCALED ESTIMATES OF PREFERENCE FOR ON CAMPUS HOUSING IN 2017

We determined a need for 1,020-1,129 new units based on a scaled estimate of number of AY18 students who would prefer to live on campus:

- Unadjusted for Kendall Grad Tower opening (+454 units) in 2020 and Eastgate closing (-203 units) sometime later in the 2020's
- Represents doubling of % of off-campus survey respondents preferring to live on campus for entire program (11% in Clay Report survey in March 2013 → 23% in our Fall 2017 Graduate Housing Needs Survey)
- Available AY18 stock: 2,557 units (in 8 residences including 70 Amherst; 2,424 without 70 Amherst)

For the purposes of this report, housing capacity at MIT can be defined as the number of units available to house graduate students including their partners, spouses and families.

When reporting to the city of Cambridge, MIT includes total number of people housed by MIT including spouses, partners and family members.

Scaled estimates of preference for on campus housing using the Fall 2017 Graduate Housing Needs Survey

	TOTAL RESIDENTIAL GRAD STUDENTS	DOCTOR-AL	SLOAN MBA, MFIN, SM (EMBA EXCLUDED)	MENG	OTHER SM	INT/PR	US CIT
A. Living off-campus this fall	4,278	2,573	725	256	724	1,572	2,706
B. Of those living off-campus, % who would "prefer to live on campus for entire program"	23%	21%	31%	45%	23%	26%	22%
C. Estimate for demand to live on campus for entire program (A*B)	975	536	222	115	165	406	585
D. Total for group	**975**	**1,039**				**991**	
E. Living off-campus this fall, in first year	1,113	251	391	192	279	360	753
F. Of those living off-campus now, % who would "prefer to live on campus for 1st year" but lived off-campus 1st year	8%	8%	9%	5%	9%	8%	8%
G. Estimate for demand to live on campus for 1st year but didn't get to (E*F)	89	19	36	10	24	28	61
H. Total for group	**89**	**90**				**89**	
Total for entire program + 1st year on campus but didn't get to (D+H)	**1,064**	**1,129**				**1,080**	

Source: Fall 2017 Graduate Housing Needs Survey

Scaled estimates of preference for on campus housing using the Fall 2017 Graduate Housing Needs Survey continued

	SINGLE (51.1% of off-campus)	SPOUSE OR PARTNER NOT IN THE SAME HOUSEHOLD (16.6% of off-campus)	HAS SPOUSE OR PARTNER, NOT EMPLOYED, IN SAME HH (often another student; 6.2% of off-campus)	HAS SPOUSE OR PARTNER, EMPLOYED, IN SAME HOUSEHOLD (21.6% of off-campus)	HAS CHILDREN, SPOUSE OR PARTNER EMPLOYED (2.8% of off-campus)	HAS CHILDREN, SPOUSE OR PARTNER NOT EMPLOYED (1.5% of off-campus)
I. Living off-campus this fall	2,187	712	266	926	121	66
J. Of those living off-campus, % who would "prefer to live on campus for entire program"	23%	14%	20%	22%	38%	46%
K. Estimate for demand to live on campus for entire program (A*B)	505	97	54	199	46	30
L. Total for group	**932**					
M. Living off-campus this fall, in first year	569	185	69	241	31	17
N. Of those living off-campus now, % who would "prefer to live on campus for 1st year" but lived off-campus 1st year	8%	6%	11%	9%	0%	0%
O. Estimate for demand to live on campus for 1st year but didn't get to (E*F)	48	11	8	21	0	0
P. Total for group	**88**					
Total for entire program + 1st year on campus but didn't get to (D+H)	**1,020**					
	Single=661		**Couples or With Children=359 (some efficiencies)**			

Source: Fall 2017 Graduate Housing Needs Survey

OTHER ESTIMATES OF PREFERENCE FOR ON CAMPUS HOUSING

Estimating student preference for housing depends on options provided, external market dynamics, rental prices, and what/how the question is asked. In addition to the survey administered by the working group, we also considered these other estimates:

- Clay Report (2014)
  - 500-600 new units based on number of students who would prefer to live on campus (about 11% at the time)
- GSC Housing Survey (2017)
  - 1400-2450 new units based on number of students who would prefer to live on campus depending on what is offered (25%-50% of students currently living off-campus)
- Those in the on campus housing lottery who do not get accommodated (2017)
  - 310 new units
- Those who stay on the waitlist for the housing lottery (2017)
  - 100 new units

CLAY REPORT (2014)

The Clay Report findings suggest graduate student families and international students face special challenges in finding housing. They also found that the number of graduate students is not likely to increase or decrease significantly in the next decade and that relative to peers, MIT is a leader in supporting on campus graduate housing. The Clay Report recommendation was to build housing for 500-600 students to meet 2014 unmet need. The report also called for a consideration of a range of flexible development options for this new housing. Shortly after the report, MIT made a commitment to 250 net-new graduate student units as part of its Kendall Square development projects.

GSC HOUSING SURVEY (2017)

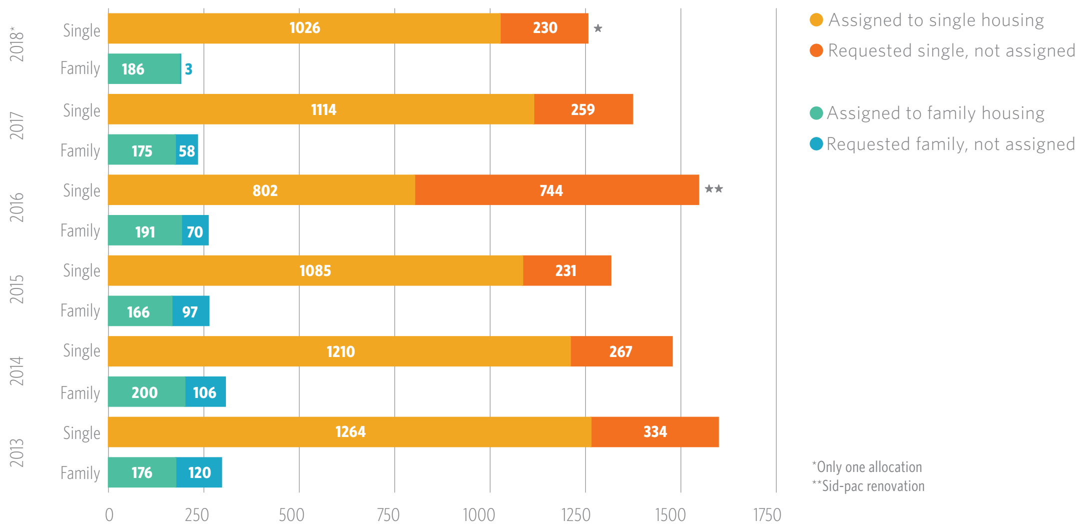
The GSC analysis indicates an unmet preference for graduate housing of around 1,400 units (750 single, 650 family) assuming little to no change in the current housing system.

The analysis also attempted to gauge the level of preference for housing should larger changes (e.g. price, quality, allocation lottery) be made. To determine this, off-campus students (who were not included to estimate the demand of 1,400 units) were asked, "At minimum, MIT-provided housing would need to meet the following requirements for you to prefer MIT-provided housing to off-campus housing (check all that apply)."

They sampled a combination of the most popular choices to generate a moderate demand number. Adding the scaled number of respondents who answered only a combination of these choices leads to an increased preference of 1,750 units (1,050 single, 700 family). Adding more options into the combination leads to larger preference numbers, with a maximum demand of about 2,450 units.

To better understand what is happening today when graduate students request housing, the working group reviewed aggregated allocation data from MIT housing for the last few years. In recent years, close to 95% of new graduate students and 60% of continuing graduate students who apply for single graduate housing, receive housing. About 75% of applicants for family housing receive an assignment, with priority given to new incoming students.

Who applies for housing on campus, but does not receive it?



Source: MIT Housing data

Some of MIT's current housing stock has features and amenities that do not fully align with what some of our students value. In general, students value price and proximity to campus over all other amenities.

CONJOINT ANALYSIS

A conjoint analysis is a technique used to determine how people value certain features of a product or service, and combinations of those features at a certain price. The process begins by describing the features and choices for the offering (rent, size, distance, rooms, amenities), and with a small group, testing the large matrix of combinations created by all these features and choices. This initial testing reduces the combination choices to survey questions: would you prefer A or B? B or C? A or C? From these inputs, the utility of each feature can be estimated, and market simulations based on current and future combinations can be calculated.[2]

We used the following information to determine student preferences:

- Conjoint levels used in Fall 2017 Graduate Housing Needs Survey
- Student preferences from Fall 2017 Graduate Housing Needs Survey
  - Importance of conjoint attributes broken down by student demographics
  - Importance of selected features/amenities broken down by on/off-campus students
- Verifying conjoint results by comparing to actual preferences for current housing stock
  - Conjoint predictions vs. unit types in specific buildings
  - Conjoint predictions vs. general unit types
  - Trends in 1st choice graduate housing allocation preferences

CONJOINT LEVELS

As part of the conjoint analysis, students were shown combinations of housing options. Each combination of attribute levels represents a different potential offering in the conjoint analysis, one of which is seen highlighted below.

2. The market research firm AMS: Applied Marketing Science was used to design and analyze the 2017 Fall Graduate Student Housing Needs Survey: https://www.ams-inc.com

Conjoint levels

ATTRIBUTE	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
Unit Type	Studio (efficiency) w/ private bathroom and compact kitchen	1-bedroom apartment with private bathroom and full-size kitchen (w/ common space)	2-bedroom apartment with 1 shared bathroom and full-size kitchen (w/ common space)	3-bedroom apartment with 1 shared bathroom and full-size kitchen (w/ common space)	Single bedroom with shared bathroom and shared large kitchen on floor (no common space) (dorm style)
Family Status	Singles only Only singles are allowed and must be MIT students	Singles & couples Singles and couples are allowed, but no children. Non-MIT students must be authorized occupants	Couples and Families with children only No singles. Non-MIT students must be authorized occupants	Anyone is allowed All resident types (singles, couples, families) are allowed. Non-MIT students must be authorized occupants	
Access to Grocery Store, Bars, Cafés, Restaurants	Nothing in Neighborhood	Grocery Store nearby; No Bars/Cafés/restaurants nearby	No Grocery Store nearby; Bars/Cafés/restaurants nearby	Grocery Store nearby; Bars/Cafés/restaurants nearby	
Bedroom Size	Medium Bedroom 150 sq ft (14 sq m)	Large Bedroom 200 sq ft (18.6 sq m)	Extra Large Bedroom 250 sq ft (23 sq m)		
Air Conditioning	No A/C installed or allowed	Window units allowed	Central A/C in building	Central A/C in building, plus thermostat in the unit	Central A/C plus thermostat in each room
Building Amenities	None	Few (small lounge, outdoor area, front desk with security)	Some (medium lounge, music/rec rooms, outdoor area, bbq, same day maintenance, front desk with security)	Many (large lounge with HD TV, music/rec rooms, study lounges outdoor area, bbq, children's playground, on site HoH, same day maintenance, front desk with security)	
Fitness Center	None	Small	Large		
Parking	No parking	Paid uncovered parking for $1900	Paid covered parking for $2275		
Sense of Community	None—The residence hall offers no community programs	Few—There is a community program offered about every month	Many—There are several community programs offered every week		
Commute Time	10-min. walk; 3-min. bike (1/2 mile away)	20-min. walk; 10-min. bike (1 mile away)	25-min. bike; 20-min. drive/MBTA (3 miles away)	45-min. bike; 30-min. drive/MBTA (6 miles away)	
Monthly Rent/Bedroom	$800	$1,000	$1,500	$2,000	$2,500

Source: Fall 2017 Graduate Housing Needs Survey

STUDENT PREFERENCES

Our students value price, unit type, short commute time, air conditioning, and access to grocery/restaurants most highly. Our students have a lower willingness to pay for bedroom size, building amenities, sense of community, parking, and fitness center. Modest differences in preferences exist among different segments of our population, except for Sloan MBA students and students with families who have higher willingness to pay more overall and for amenities.

Importance of features based on conjoint choices by percentage of respondents

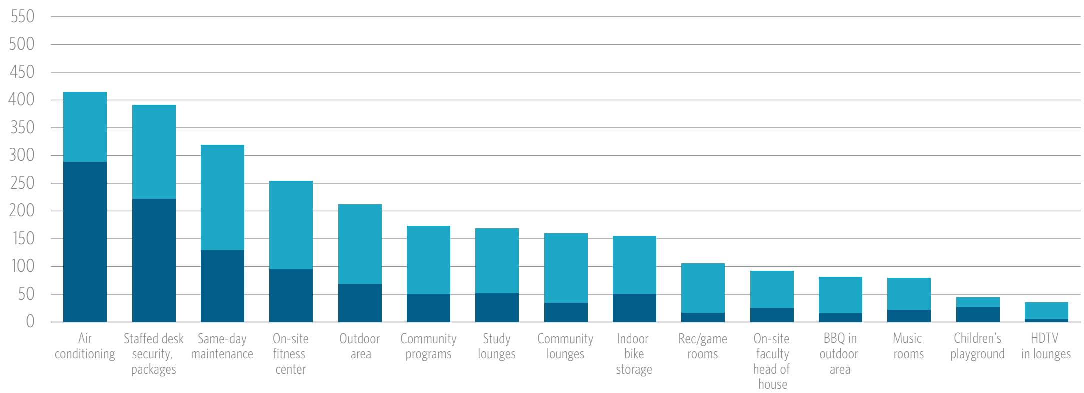
AVERAGE IMPORTANCE'S BASED ON CONJOINT CHOICES	Total	Families (Spouse Living With)	Has Children	In First Year	In Sloan	Lives In Cambridge	US Citizen	International
Monthly Rent/ Bedroom	27%	22%	17%	27%	21%	26%	26%	28%
Commute Time	15%	14%	12%	16%	16%	16%	15%	15%
Unit Type	14%	16%	18%	14%	16%	14%	14%	14%
Family Status	13%	14%	17%	12%	13%	13%	13%	12%
Air Conditioning	8%	9%	9%	8%	9%	8%	8%	8%
Access to Grocery and Bars/Cafés/ Restaurants	7%	8%	7%	7%	7%	8%	7%	7%
Bedroom Size	5%	6%	6%	5%	5%	5%	5%	5%
Building Amenities	3%	4%	4%	3%	4%	3%	3%	3%
Sense of Community	3%	3%	3%	3%	3%	3%	3%	3%
Parking	3%	3%	4%	3%	3%	3%	3%	3%
Fitness Center	3%	3%	3%	3%	3%	3%	2%	3%

Source: Fall 2017 Graduate Housing Needs Survey

AMENITY PREFERENCES

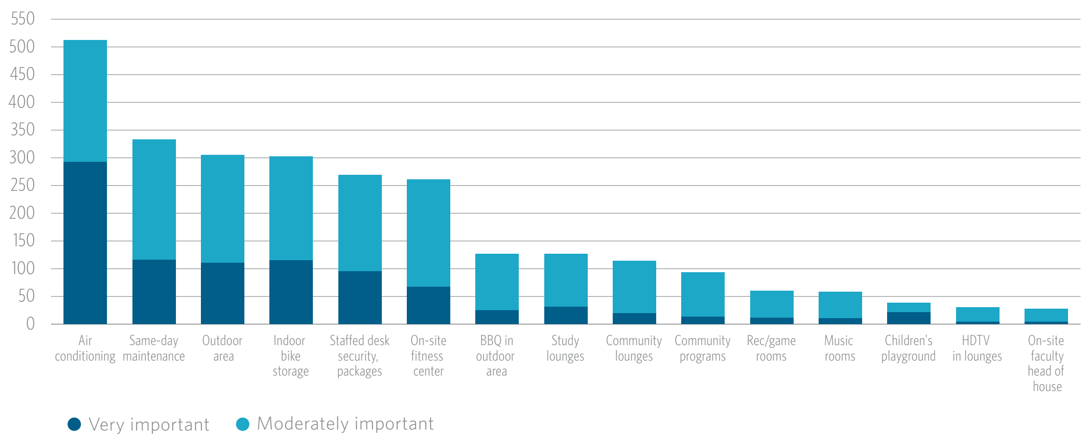
"How important is it to have the following features available to you where you live?"

Respondents who live on campus



Source: Fall 2017 Graduate Housing Needs Survey

Respondents who live off-campus



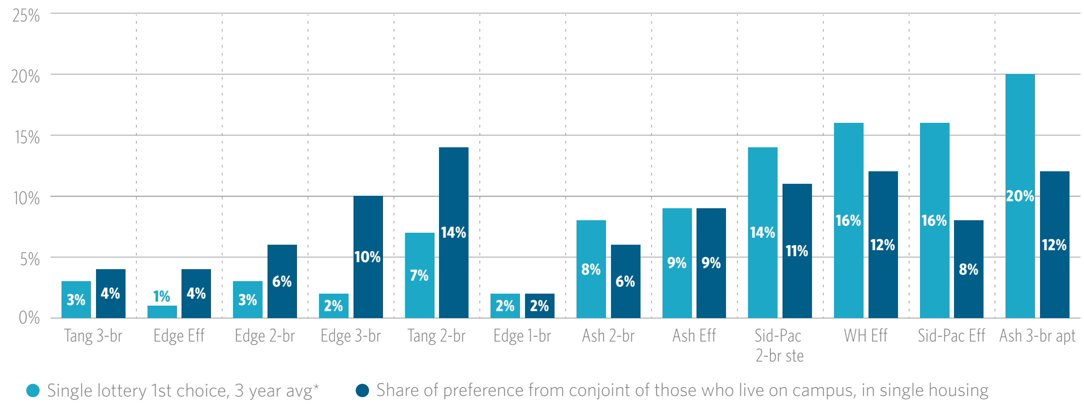
Source: Fall 2017 Graduate Housing Needs Survey

How well does the conjoint predict the buildings our students select in the allocation now?

For students living on campus in single housing, comparing a 3-year average for the first-choice apartment type to the conjoint model where only the same apartment types were available:

- The conjoint overpredicts the share for most Edgerton apartment types, which could be attributed to Edgerton not being furnished; the conjoint told students to assume all future unit types would be furnished or unfurnished at the student's request.
- The conjoint overpredicts the share for Tang 2 BR apartments and did not account for the age of buildings and facility conditions. It under predicts the Ashdown 3 BR apartments, Sidney Pacific, and Warehouse efficiencies, and to some extent, the 2 BR units in Ashdown and Sidney Pacific. We hypothesize this is because the conjoint study did not describe the attractive community that counter balances the negative aspects of sharing a three-bedroom apartment.

Single unit preference choice



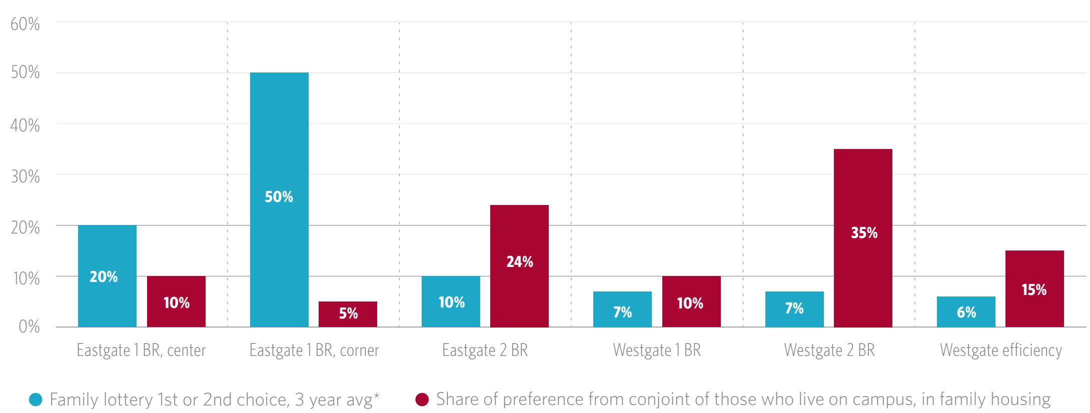
Sources: MIT Housing data
Fall 2017 Graduate Housing Needs Survey

FAMILY UNIT PREFERENCES

For students living on campus in family housing, comparing a 3-year average for the first and second choice apartment type to the conjoint model:

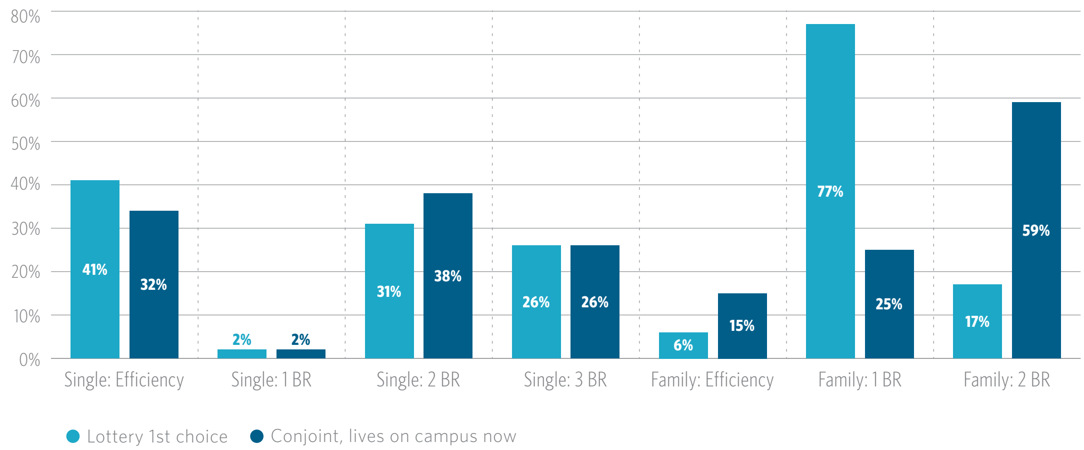
- The conjoint under predicts the share for Eastgate 1BR apartments, Westgate efficiencies and possibly overpredicts the share of Eastgate and Westgate 2 BR apartments (there is some evidence students don't apply for those apartments if they need them given the limited number available).

Compare conjoint prediction to 1st choice lottery preference for family units



Sources: MIT Housing data
Fall 2017 Graduate Housing Needs Survey

How well does the conjoint predict the unit types our students select in the allocation now?

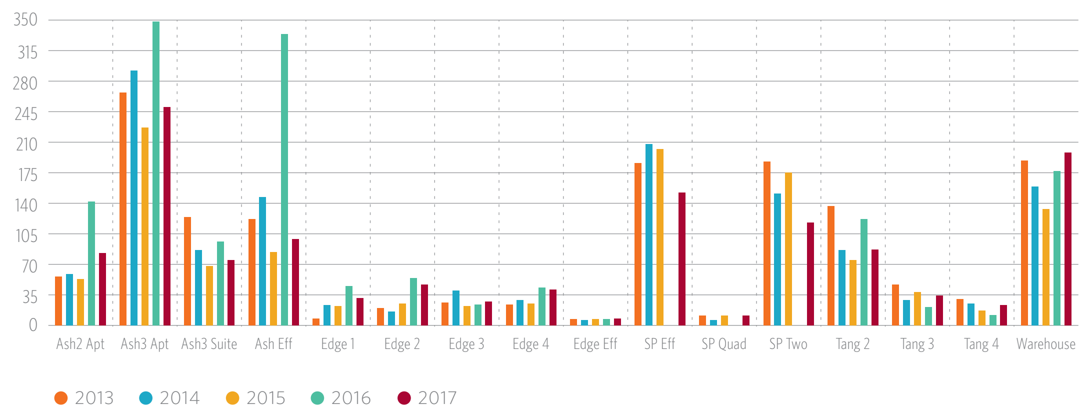


Sources: MIT Housing data
Fall 2017 Graduate Housing Needs Survey

TRENDS IN FIRST CHOICE

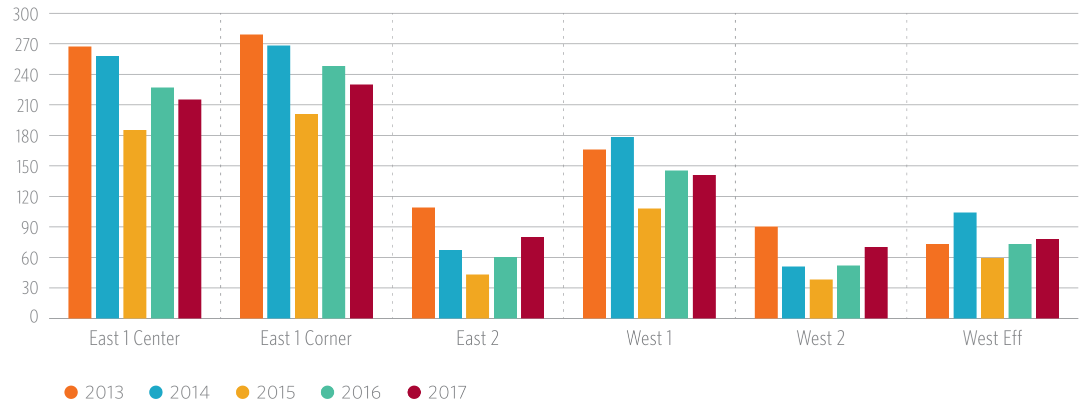
The following two charts show that for Sidney Pacific and Ashdown, 2 and 3 bedroom units are more popular than Tang 2 and 3 bedroom units.

1st choice, single unit types



Source: MIT Housing data

1st choice, family unit types



Source: MIT Housing data

MIT should increase on campus graduate housing capacity with an optimal mix of unit types aligning with the evolving needs of students and families over time. The Institute should assess the feasibility of doing so in a way that breaks-even financially at 30 years with comprehensive stewardship.

RATIONALE FOR THIS RECOMMENDATION

Operating within a comprehensive stewardship model extends the life of the building and leads to higher quality of life for students by providing for better maintained spaces.

A 30-year break even should be considered as the committee does not believe MIT should be making a profit from graduate housing. This may require raising rents in some of our buildings, and then stipends would need to be increased commensurately. If MIT can break even, it would make future expansion easier to achieve, although it is recognized that there are a variety of significant additional constraints associated with available sites, and competing priorities for limited capital. This would also lead to greater equity relative to our current housing model where 38% of the students benefit from below-market on campus housing, and the other students, because they live off-campus, do not.

WHAT DO WE MEAN BY "ALIGNED WITH STUDENT NEEDS?"

To the extent possible, we recommend aligning the services and amenities we offer in on campus housing with what students value. However, we recognize there are a range of needs in the student population so we should provide a range of housing types.

Importantly, we also recognize that MIT has institutional responsibilities (e.g. for supporting and keeping students safe on campus), and these realities may not be appropriately represented in student responses to this survey.

EXPLORING OPTIONS TO FULFILL THE INSTITUTE'S COMMITMENT TO GRADUATE STUDENT HOUSING

After the working group issued our interim report, the Institute committed to create 950 new units. Members of the working group, the Office of Campus Planning, Facilities, and Housing worked together to explore the following:

- Amenities as part of overall square footage to understand costs as portion of construction, operating, and opportunity costs.
- Unit type mix for future buildings that address unmet demand and provide flexibility for use by single students, couples and families as needed.
- Policies regarding couples and family housing.

MIT HAS COMMITTED TO AN INCREASE IN GRADUATE STUDENT HOUSING

MIT VOLPE COMMITMENT LETTER

October 23, 2017

C. Graduate Student Housing. MIT agrees that it shall create 950 new beds for graduate students (collectively, the "New GSH Beds"), pursuant to the schedule set forth in this letter. To that end, MIT agrees that it shall

- Use diligent efforts to complete, on or before December 31, 2020, the construction of Building 4 of MIT's South of Main Street Project in Kendall Square (the construction of which broke ground on October 11, 2017), containing 450 graduate student beds, of which 250 beds will be net New GSH Beds;
- No later than December 31, 2020, apply for a discretionary permit (or a building permit if no discretionary permits are required) to create at least 500 new GSH Beds; and
- Use diligent efforts, on or before December 31, 2020, to either add, by conversion of existing beds and/or establishment of new beds, or apply for a discretionary permit (or building permit(s) and/or alteration permit(s), as the case may be, if no discretionary permit is required) for, or a combination thereof, a minimum of 200 New GSH Beds in existing buildings or otherwise located on MIT's campus or properties owned by MIT, which may include the recently converted 133 graduate student beds at 70 Amherst Street.

https://volpe.mit.edu/wp-content/uploads/2017/10/2017-10-23_MIT-Volpe_Final_Commitment_Letter.pdf

MIT has committed to an increase in graduate student housing

SOURCE	UNITS
Kendall Square Site 4	250
New W-NW	500
Residence Coverted or New	200
Total	**950**

The MIT Office of Campus Planning has been investigating potential locations for the 500 new units noted above, with a focus on the West and Northwest areas of campus. Many of the potential sites are proximate to existing graduate housing communities.

WHAT HAVE WE LEARNED ABOUT COST DRIVERS FOR NEW GRADUATE HOUSING?

BUILDING EFFICIENCY

The amount of amenity and House Team space (approx. 5% of building square footage) is not a big driver of building size or cost. The size and type of residential units (approx. 60% of building square footage) has the most significant influence on building size and cost.

Building efficiency

ALL MIT GRADUATE HOUSING	% OF BUILDING GSF
Student Residential Units	59%
House Team & Amenity	5%
Administration & Service	3%
Circulation, mechanical, other	33%

UNIT MIX

One-bedroom and two-bedroom units generally require more space and are costlier to build than efficiency apartments or dorm-style units.

Unit mix

PROGRAM	UNITS	UNIT MIXES	BEDS	GSF/BED	BUILDING GSF
Site 4 Housing	454	efficiencies - 55% 1 beds - 40% 2 beds - 5%	478	749	358,000
Sample Program 1	415	1 beds - 60% 2 beds - 40%	580	690	400,000
Sample Program 2	390	efficiencies - 13% 1 beds - 38% 2 beds -49%	580	620	360,000
Sample Program 3	350	efficiencies - 14% 1 beds - 43% 2 beds - 43%	500	633	320,000
Sample Program 4	500	efficiencies - 100%	500	525	260,000
Sample Program 5	500	single rooms	500	499	250,000

The working group believes that including 1 and 2-bedrooms within the unit mix of future graduate housing will be important to maintain a balanced on campus portfolio that meets students' needs. Reasons include:

- **Flexibility**: 1 and 2-bedroom units can be used flexibly over time to address a range of housing needs: those of couples, families with children, and single students seeking to lower their housing costs by living with roommates.
- **Future renovations**: Should MIT undertake renovation of existing family housing in the years ahead, additional 1 or 2-bedroom units would provide an on campus alternative while construction — likely to take multiple years — is underway.
- **Balance of Unit Types**: Kendall Square Site 4 and other graduate housing projects (e.g., the Warehouse) have added significantly to MIT's inventory of on campus efficiency units. A new graduate residence hall with too many efficiencies could create an oversupply of this unit type.

As discussion about program and unit mix for future graduate housing continues, the working group recommends that 1 and 2-bedroom units be incorporated into the mix.

CONSTRUCTION COSTS

Housing built by colleges and universities is often costlier to develop than housing built by private developers. Institutions often opt for more robust buildings and higher up-front costs (e.g., longer-lasting, more energy efficient building systems) to defray the long-term costs of ownership, operation, and maintenance.

AMENITY COSTS

The total cost (operating and opportunity) of amenities for the current housing stock is ~$12M/year. This includes utilities, internet and cable TV, fitness facilities, residential life programs, front desk and security, and opportunity costs of spaces to support the community. This is equivalent to ~$4700/unit/year on average. We note that most of these amenities are valued by community members, and not all opportunity costs could/should be recovered.

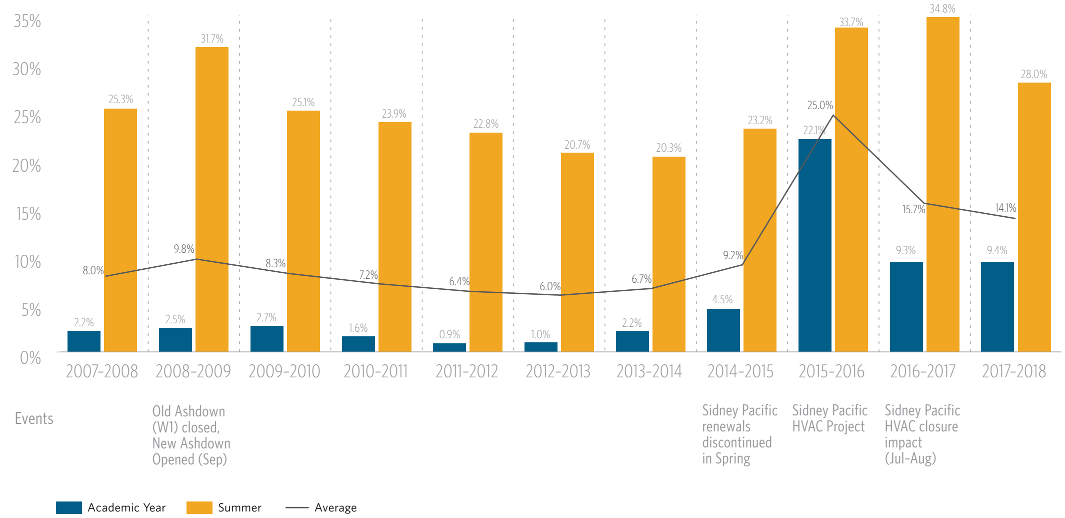
The Institute should identify ways to operate our housing differently. Currently our revenue falls short of what is required for comprehensive stewardship. This leads to lower quality housing and creates an impediment to adding more housing.

As MIT invests in its campus through new construction and major renovations, there is an acknowledgment of the need to budget resources today for future care and renewal of our "newest" assets in a proactive manner. This forward looking approach which reserves funds for planned renewal and maintenance, known as Comprehensive Stewardship, assures the deferred maintenance is addressed and the useful life of our buildings is maximized.

Annual graduate housing revenues of $35 million fall short of target expenses of ~$40 million per year, which would include the investment required to maintain a comprehensive stewardship model. This amount equates to $2,170/unit/year shortfall. The revenue gap of $5 million per year, adds to the total deferred maintenance backlog. Current deferred maintenance for graduate housing stock is $130 million (8% of $1.6 billion campus-wide deferred maintenance). To maintain buildings per industry standards, changes in operations and/or rent are required. Current or future students should not be expected to absorb the past deferred maintenance costs through increases in rent, but operations and rent should change to support comprehensive stewardship going forward.

Vacancy rates in graduate housing have been higher than usual over the past few years, which seems to indicate that on campus housing needs to be operated in ways that better align with students' housing needs and preferences. Causes of vacancy should be studied and multi-faceted solutions should be implemented to address them because we must align our occupancy rates with our growing capacity via residences such as 70 Amherst Street and Kendall Square Site 4. Among other questions, the Institute should consider how housing options can be better aligned with the lengths of time students require for completing degrees.

Graduate housing vacancy (all residents)



Source: MIT Housing data

Operational change options

OPTION	IMPACT / RATIONALE
Increase # of renters per room type, within allowable housing policy & regulatory limits	Would increase the supply of affordable on campus housing by expanding the number of shared-bedroom units available (NOTE: requires ensuring demand for such housing options justifies this offering)
Allow greater flexibility in who can live where; e.g., make any new 2BR units available to families or single students	Would enable MIT to better match available housing stock with year-to-year grad student demand
Increase available units in existing residences by converting common spaces (at a cost, where allowed by code) to rentable units	Would increase supply of on campus housing, and not all current amenities are highly valued by renters (NOTE: Opportunities may be limited)
Increase monthly rental rates	Would increase rent revenue, enabling MIT to better address maintenance needs in existing buildings and more easily expand housing supply when needed (NOTE: we would expect that the annual GSC-MIT administration collaborative review of stipend amounts would ensure any rent increases are not unduly burdensome)
Adjust housing allocation algorithm and process as needed to better optimize results; allow single students to apply together, selecting their own roommates	Could better maximize overall happiness of lottery participants and increase occupancy rates
Change the duration of housing licenses to better align with academic program length	Could better align on campus housing commitments with needs of grad students

Other universities*

	MIT	HARVARD	BOSTON U	STANFORD
Percentage of Grads Housed	39%	Capacity to house 50%	6%	53% on campus with goal of 75% on campus
Housing Offered	410 family apartments; 2043 single student beds, assigned by lottery	Harvard University Housing (HUH)-3000 units; GSAS-400 rooms; Law School-599 rooms; Medical School (1 building), assigned by lottery. HUH housing (operated by RE office) open to students, faculty and staff.	Medical School-208 beds in 2 bedroom units; Others-~800 apartments, assigned first come, first serve. BU RE open to students, faculty and staff.	4850 beds currently on campus. 1034 off-site; assigned by lottery. Provides subsidized off-campus apartments as overflow housing until construction of new 2400 beds complete. Once new complex open, rental of off-site units will be discontinued. Not open to staff.
Housing Priorities	First Year	Families through HUH; First years guaranteed through GSAS if apply by April; Once a tenant is in HUH, can renew as long as eligible	No. Off-campus apartments, can stay as long as students -> treat like commercial property	All 1st years have high priority. After 1st years: PhD, MD, JD have 'medium' priority for program length (all typically renewed). Masters have 'low' for 2nd.
Renting Agency	MIT Housing	Harvard University Housing/ Graduate and Professional Schools	BU Real Estate Office	Stanford Residential and Dining Enterprises
Pricing	Below market rate	Market (30% of portfolio professionally appraised each year. Results used to get projections on market, rates examined by faculty committee.)	Market with slight discount	Cost of running system rather than market rate. 30%+ below market rate. Off-site priced to match on campus rates
Financial Aid	RA/TA stipend rates are set each year for schools of engineering/science. Other schools advised to establish stipends consistent with this range.	Financial aid and stipend (if any) determined by each graduate and professional school	None, with the exception of our Medical School Residence which offers a housing grant of approximately 21% of the market rate	No discounts. All financial aid handled departmentally. Central finaid office for loan options. Housing rates used in total cost of attendance calc to determine stipends & grants.
Capital Renewal and Capital Projects	Program of renewal across entire system, and Site 4 will add 454 mixed use single and family beds in 2020	Generally work in occupied buildings with riders to notify residents of scope of work in 24 month period from leasing period. Saving or spending 2% of replacement value annually for capital renewal.	Take one building (brownstone unit) off line for renovation every other year	Recently built 2 facilities, one with preference for business school, one for law school. New complex with 2400 beds will net 2000 bed spaces in 2020 to replace 1100 subsidized units off-campus and increase capacity by 900 on campus. Complex will include large dining/ retail/amazon/reading rooms.

*Note, some local greater-Boston area universities do not offer on campus housing for graduate students

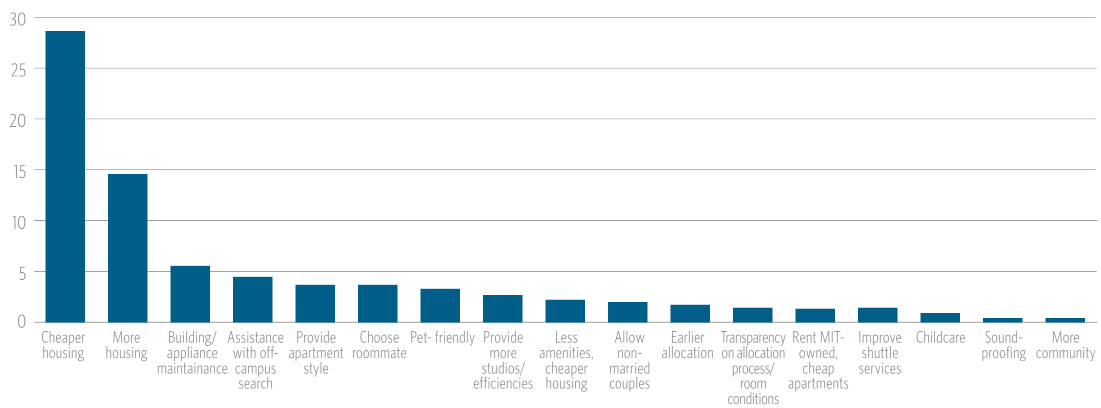
Other universities

	MIT	HARVARD	BOSTON U	STANFORD
Traditional Dorm	Yes	In the schools, not through HUH (Chronkite only exception for HUH)	No	No longer providing for graduates. Previous dorms in traditional style were converted to undergraduate housing
Suite	No	Yes (Private bedroom/bath and shared kitchen). Rented by the bed (one unit with 2 separate leases).	No	No
Studio/Efficiencies	Yes	Yes	Yes	1. Jr. studios – 360sq. ft. common area living/dining off kitchen with 1BR/BA and another 1BR/BA2. Regular studios 350sq ft. 1 room for single students3. Premium studios 450-475sq ft for single or couple4. 2BR/1BA Efficiency with kitchen/dining nook and no living room
1-Bed Apartment	Yes	Yes	Yes	Yes (for couples)
2-Bed Apartment	Yes	Yes	Yes	Yes
3-Bed Apartment	Yes	Yes	Yes	Typically for families and some for single students
4-Bed Apartment	Yes			Some for families and several for single students
Off-campus Defined as the following:1) Open to students, faculty and staff2) Operated by university real estate office (and not the university student life division)	No	Yes (through Harvard University Housing)	Yes (through BU Real Estate)	No Stanford provides subsidized off-campus apartments as overflow student housing until they complete construction of a new 2400 bed complex. Once the new complex is opened, Stanford plans to discontinue off-site units. Units are open only to students and are run by the Stanford R&DE like on campus units. On campus guest and pet policy apply. Units are priced to match on campus prices, and Stanford covers the remaining cost of the full rental rate.
Assist with off-campus search (non-university owned)	No	No	No	Yes Off-campus Rental Housing office serving students faculty and staff

The Institute should develop a process for evaluating the benefits and detriments of changes to our housing policies.

The Fall 2017 Graduate Housing Needs Survey open ended question responses show there are ways we can better support our graduate students who live on campus.

Student responses: suggestions for better support for graduate student needs (total – 759)



Source: Fall 2017 Graduate Housing Needs Survey

IMPLEMENTATION TEAM

The Graduate Housing Implementation Team was convened to evaluate potential changes and develop new initiatives to directly respond to graduate student housing concerns and begin to advance recommendations from the working group report. The team partnered with heads of house and house governments to develop pilot initiatives that began in spring 2018. The team included housing staff, heads of house, and graduate student leaders. It will meet on an ongoing basis in order to continue making progress on these efforts.

IMPLEMENTATION TEAM PROGRESS

Pilots for 2018–2019 include:

- Couples in Single Housing: For the fall 2018 graduate housing allocation, MIT Housing is offering a pilot program allowing couples to live in Edgerton House, Sidney-Pacific, and 70 Amherst Street, in addition to Eastgate and Westgate. Success of the pilot will be measured by how many additional families and couples we will be able to house in the future as compared to the current state.
- Selection of Roommates: Also, for the fall 2018 housing allocation, MIT Housing is offering students the opportunity to enter the allocation together in groups of 1, 2, 3, or 4 people. Previously students were assigned individually. This pilot is available for Edgerton House, Sidney-Pacific, and Tang Hall. Success of the pilot will be measured by determining if our existing capacity is used more effectively based on number of applications, number of matches, and unit utilization.

In addition to the pilot programs, the implementation team is developing and implementing a communication and marketing plan for graduate students promoting on and off-campus housing options, as explained below.

OVERALL HOUSING POLICY

- On campus housing allocation process
  - Increase transparency of housing prioritization e.g. first years, internationals, families with children
  - Increase transparency of room allocation, room conditions
  - Consider earlier allocation
  - Usability testing of housing website to make key pieces of information easier to find
  - Option to choose roommates prior to lottery and/or better roommate matching
- Assistance with off-campus housing search
  - Earlier notification to students to start preparing for living off-campus
  - Develop a guide to off-campus housing searches including expected costs, timing, tenant rights, renter's insurance, landlords to work with or avoid

ACTIONS TAKEN

- New marketing materials and outreach for 2018–2019 allocation process
- Developing a plan to put more information online (need to find an effective platform)
- Implementation team reviewed the website and held focus group to solicit feedback on improvements to the site
- Piloting roommate choice in Tang, Sidney-Pacific, and Edgerton
- Piloting couples living in single housing in Sidney-Pacific, Edgerton, and 70 Amherst St
- Developing marketing materials to help students understand the timing of processes

IMPROVEMENT OF QUALITY OF LIFE IN ON CAMPUS HOUSING

- Quality of life audits of current stock
  - Work with dorm governments to audit buildings for necessary repairs and improve building quality
- Improve usability of process for reporting building problems
  - Ease process for reporting building problems
  - Provide clear timeline for repairs
- Reconsider existing housing policy
  - Review pet policy (on hold while focusing on other priorities)
  - Allow non-married couples to live together, including when one partner is not an MIT student (Piloting a process to expand housing options for couples)

ACTIONS TAKEN

- Conducted an audit of Tang Hall facilities and have developed a strategy to update apartment unit kitchens and baths in 90 units this year
- Developing work order request marketing campaign for higher visibility of the process
- Working with maintenance staff to more fully utilize the work order system and improve communication with residents

A detailed evaluation of graduate student housing should be conducted by a similar working group every three years, with a report to Academic Council and the MIT Faculty. This should also include a short yearly update to assess progress relative to the last detailed evaluation.

GRADUATE STUDENT HOUSING WORKING GROUP — 3-YEAR REVIEW SUGGESTED PROCESS

The guiding principles for future working groups include the following themes and should be included in the 3-year detailed review along with a 1-year checkup.

*Denotes actions also to be taken by the 1-year check-up.

ASSESSMENT

- Review progress on the recommendations of last 3-year review*
- Review (annually) and update (every 3 years) housing financials and estimates for preference/demand*

COMMUNICATION & COMMUNITY ENGAGEMENT

- Issue annual report to community & Academic Council with findings of 3-year review/1-year checkup, call for comments*
- Annually publicize changes to housing system *

RECOMMENDATIONS

- Propose necessary changes to ensure graduate student housing needs are being met

REPRESENTATION

- Propose Membership of the Graduate Housing Working Group which should include equal number of graduate students
- The GHWG will be chaired by one of the Faculty/administration members, chosen by the Chancellor
- The GHWG may be assisted by staff members and/or students, who will not be considered members of the GHWG

PROPOSED TIMELINE FOR 3-YEAR REVIEW WITH SUGGESTED MILESTONES

- **May**: Chancellor updates charge for GHWG, if applicable
- **June-August**: GSC Nominations Board selects graduate students; Chancellor & Provost appoint faculty/administration members
- **Early September**: GHWG begins meeting regularly

- **Early October**: Complete review of past annual reports and survey data related to graduate student housing needs to understand what questions may need to be added to an existing survey or be undertaken as a new study
- **February**: release interim report for public comment
- **April**: release final report for public comment
- **Fall of the following academic year:** Administration's public response

To assist the team putting together the annual report for AY2018–2019, our working group proposes the following "key performance indicators" as potential items for the document that would be published, most likely by the Division of Student Life.

1. **Student Demographics (all system of record data)**
    a. By school, program (Source: Registrar)
    b. Address (Source: Registrar)
    c. How many are in our residence halls (Source: MIT Housing)
    d. How many are in facilities that are considered other Institute-approved housing (Source: MIT Housing)
2. **Report on MIT Housing Operations and Facilities**
    a. Inventory of capacity, annualized occupancy, rent of MIT's graduate student residences
        i. Narrative on vacancies, if appropriate
        ii. Narrative on issues with facilities that caused buildings to be unoccupied for any length of time (e.g., Sidney Pacific or New House)
        iii. Brief narrative on financials
    b. Program changes in MIT Housing
        i. Report on any new initiatives in Housing assignments, if appropriate for that time, e.g., pilots implemented recently to increase attractiveness of grad housing inventory
    c. Buildings that are expected to come online or renewal projects
        i. New Vassar
        ii. Site 4
        iii. Upcoming renewal of ____ in YYYY
    d. Any facilities condition reports?

3. **Graduate Housing Allocation Data**
    a. Who applies for housing
    b. What type of housing they applied for
    c. Who gets housing
    d. Who rejects offered housing
    e. Of those who are not assigned, summary data on what type of housing they requested
    f. Wait list data
4. **Report from MIT's Off-campus Housing Office Service**
    a. What can we get from the listing service automatically?
    b. What benchmark report can we get from firms who do this work professionally, on an annual basis, like Byrne McKinney & Associates or RealPage?

Every three years, survey data should be reviewed by the working group that is convened to add to the data that would be in the annual report and the overall final report which this working group expects would include elements similar to our report.

For survey data, specifically:

1. Every three years, IR runs a Cost of Living Survey for graduate students in early October for the graduate student stipend process. This is a survey on which the working group could ask the questions deemed necessary for the 3 year review process. A suggestion from the 2017–2018 Graduate Housing Working Group: future working groups should be convened by September, and be able to give input on the questions asked on the Cost of Living survey to avoid running an additional survey to understand graduate student housing needs, if at all possible.

2. Other surveys may have some housing questions on them that the working group should review, such as the Enrolled Graduate Student Survey; each working group should review the most recent surveys to understand the most recent surveys to understand the landscape and which key performance indicators are available.