HARVARD
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HARVARD UNIVERSITY'S CAMPUS IN ALLSTON







INSTITUTIONAL MASTER PLAN

JULY 2013
REVISED OCTOBER 2013

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July 26, 2013
October 31, 2013 (Revised)

Peter Meade, Director
Boston Redevelopment Authority
One City Hall Square
9th Floor
Boston, MA 02201

Subject: Institutional Master Plan for Harvard University's Campus in Allston

Dear Mr. Meade:

I am pleased to submit the final Institutional Master Plan ("IMP") for Harvard University's campus in Allston. The document was originally submitted July 26, 2013 pursuant to the provisions of Article 80D-5 of the Boston Zoning Code. Modifications in this final submittal reflect the key changes and clarifications required in the BRA Board memorandum prior to the October 17, 2013 BRA Board hearing.

The information presented in this IMP has been discussed with and reviewed by the BRA, the Harvard Allston Task Force, and the community during multiple Harvard Allston Task Force meetings and working sessions with the BRA. We look forward to continued planning and discussions with the City, the BRA, the Harvard Allston Task Force and members of the Harvard and Allston communities.

Sincerely,

Katie Lapp
Executive Vice President

cc: Kairos Shen, BRA
Gerald Autler, BRA

Institutional Master Plan

Harvard University's Campus in Allston

Submitted to:

Boston Redevelopment Authority

Submitted by:

Harvard University, through:

Harvard Planning & Project Management

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July 2013
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1.0 Introduction

1.1 Overview

Harvard is creating a campus for the next century, a place where students, faculty, staff, visitors and the community alike will learn, live, work, play, and innovate. To do this, Harvard is making critical investments for the future – developing more than a million square feet of new academic, research, and administrative facilities; renovating, both programmatically and physically, buildings that support Executive Education and other uses; and creating new gathering and social spaces for the University and the community.

Today, Harvard's academic mission continues to evolve, creating new types of campus growth needs. New technologies, discoveries, and societal issues require facilities that support innovation and collaboration in new ways and at new scales. Harvard continues to address these academic evolutions, and its land in Allston provides an opportunity to develop new campus resources to support the University's dynamic teaching and research mission. Harvard has before it the extraordinary opportunity to develop its south campus in a way that enables stronger connections and collaborations throughout the University, the surrounding community and the region.

This Institutional Master Plan (IMP) presents Harvard's Ten-Year Plan for its campus in Allston. The Plan focuses on a range of physical planning objectives critical to the University, to the local community, and to the City of Boston. Plans for Harvard's buildings and grounds focus on ensuring that Harvard remains a single unified institution, and that its many parts connect in a manner that supports teaching, advances research, and fosters innovation.

This is a comprehensive plan that will expand the University's academic presence and build upon its shared goal of extending community programming, improving the public realm and infrastructure for Harvard and the Allston community, and creating a new nexus where the University meets the neighborhood. Among the Plan's key objectives are the following:

Continue the activation of Barry's Corner

Harvard's recent activities supporting the revitalization of Barry's Corner include ground leasing a site to a private developer for a major new residential and retail complex with new plazas and enhanced access to Smith Field, redevelopment of 224 Western Avenue for Harvard's Ceramics Program, of the Stone Hearth Pizza and Swiss Bakers restaurants, and creation of the Ed Portal. This Plan advances that effort with the establishment of new residential and retail development surrounding a new basketball venue and the creation of a major new institutional mixed use project, referred to as the Gateway project, with an active at-grade base bringing more retail and service activity to animate and anchor Barry's Corner. The focus of this development activity will be the Barry's Corner Grove, a shady green counterpoint to the bustling activities around it, for the use and enjoyment of the public.

Provide a long-term development vision for campus and community

Although the IMP's primary focus is on a Ten-Year Plan, it also presents the overall physical organization that will guide campus and community development for generations. The Long-Term Vision will change industrial uses to institutional and community-oriented activities. The revitalization of Barry's Corner is a significant focus of this framework. At an area-wide scale, the Long-Term Vision frames a new system of streets, a block plan for building development, a system of open space, and a range of long-term planning and design guidelines, including those addressing the public realm. The projects and other elements comprising the Ten-Year Plan are designed to be consistent with/or not preclude the Long-Term Vision.

Create a new network of green spaces

In addition to new streetscape, the restoration of Barry's Corner Grove, and new campus quadrangles, Harvard's Long-Term Vision and Ten-Year Plan promote the greening of Allston in a variety of other ways. Most important is the creation of a ten-acre Greenway, anchored by the 1.75-acre Ray Mellone Park (which Harvard Constructed in 2011) and stretching eastward approximately one half mile to the Charles River. Portions of the Greenway will be constructed during the Ten-Year Plan, and other portions will be added during the development of adjacent sites. Overall, the Greenway represents the University's commitment to open space and sustainability. It will carry people, infrastructure, stormwater, and wildlife across the campus and community as well as help to address climate change adaptation.

Enhance the public realm

Planned development will enhance the area's public realm through a consistent and carefully designed system of new sidewalks, streetscape, landscape, and civic spaces. Streets will be designed to provide generous pedestrian space, room for public street furnishings such as benches and lighting, pavement materials that provide comfort and ease for pedestrians, and accents of durable and attractive masonry materials evocative of Harvard's campus. The IMP also provides guidelines to ensure that long-term development of the area continues to produce a coherent, consistent, and attractive public realm. Planning for ground floor uses along Western Avenue and in the vicinity of Barry's Corner emphasizes transparency and activation at the street level.

Promote environmental sustainability

Harvard's Ten-Year Plan and Long-Term Vision will enhance the area's natural environment in a variety of ways. For example, the Greenway promotes better area-wide drainage and stormwater management, which will serve the drainage needs of surrounding development and potentially beyond. The existing Blackstone plant in Cambridge will provide thermal energy for the Ten-Year Plan without the near-term need for a generation plant in Allston. Prioritizing walking and biking will assist in minimizing automobile use in the area. New construction will target LEED Gold standards.

Strengthen pedestrian connections

Existing conditions in the IMP area involve a number of large areas that are impenetrable to pedestrians. These include 175 North Harvard Street, much of Smith Field's edges, the current Charlesview site and its frontage grove, the Science foundation area, and the fenced area of Rena Park. Harvard's Ten-Year Plan and Long-Term Vision improve pedestrian

permeability to the area, including creating new pedestrian-friendly streets, entries to Smith Field, passageways through the developed Science project, Rena Park, an opened Barry's Corner Grove, an ambitious linear Greenway connecting the neighborhood and campus with the Charles River to the east, and Longfellow Path, which reaches from the Greenway to the Charles River to the west. Reclaiming some roadway area for pedestrians at the intersection at Barry's Corner will improve pedestrian safety and comfort.

Improve transportation

The Ten-Year Plan includes a range of improvements to the area's overall transportation infrastructure. New streets and connections will enhance connectivity. Better facilities for transit will be provided, and University shuttle services will be expanded and made available to neighborhood residents. The area's bike network will be expanded, as will programs such as Hubway and Zipcar.

Harvard's development program is primarily comprised of projects with low traffic-impact. Most of the projects focus on either renovation, building replacement, or the accommodation of existing user populations.

Establish a program of multi-faceted, mutually-reinforcing new uses

Harvard's Ten-Year Plan includes a diversity of new uses that enable people to teach, learn, collaborate, live, work, play, adapt, and innovate. Its development program includes new construction, building replacement, and renovation projects that support a range of complementary uses including academics, research, Executive Education, assembly, office, hospitality, retail, culture, and housing. These synergistic activities combine to promote a healthy and sustainable mixed use community.

Provide community benefits

Harvard will develop, with community input, a master plan for community benefits commensurate with the scale and scope of the projects anticipated during the life of this IMP. This approach responds to requests from the Allston Task Force for a more holistic look at community benefits. The process thus far, and the details of the proposal underway is more fully discussed in *Chapter 7.0, Community Benefits.*

1.2 Boston Zoning Requirements & Public Process

ZONING REQUIREMENTS

This Institutional Master Plan (IMP) is being submitted to the Boston Redevelopment Authority (BRA) by the President and Fellows of Harvard College (Harvard or the University) in accordance with Section 80D-5 of the Boston Zoning Code (the Zoning Code). On October 17, 2012 Harvard submitted an Institutional Master Plan Notification Form (IMPNF) to begin the review process for a new IMP for Harvard University's Campus in Allston. On March 29, 2013 the BRA issued a Scoping Determination outlining the issues to be addressed in this IMP. A copy of the Scoping Determination is included in Appendix A.

This November 2013 final IMP is a revised version of the IMP submitted by Harvard in July 2013. Revisions involve additional and changed provisions agreed upon by the BRA and Harvard in advance of the October 17, 2013 BRA Board hearing. Key changes are in sections 1.2 (Boston Zoning Requirements and Public Process), 1.4 (IMP Boundary), 5.2 (Barry's Corner District), 5.3 (Science and Enterprise District), 6.1 (Transportation), 6.7 (Construction Phasing and Management), and 6.9 (Housing). If, and to the extent that, other provisions in this IMP conflict with any of the aforementioned sections, said sections shall govern.

The Allston campus area, which is the subject of this IMP, will be governed by the zoning parameters established in the IMP as approved by the BRA and the Boston Zoning Commission. The nine specific institutional projects described in this IMP will be subject to the extent applicable to additional future BRA and community review under Article 80. The IMP will establish guidelines and parameters for proposed development which will constitute the basis for the Allston Campus as it evolves. By way of this IMP, Harvard seeks to renew the current Allston Campus IMP for a term of ten years beginning with its anticipated approval in late 2013.

MEPA REVIEW

On April 1, 2013, Harvard submitted a Notice of Project Change (NPC) to the Massachusetts Environmental Policy Act (MEPA) Office of the Executive Office of Energy and Environmental Affairs. The NPC described the changes to the master plan that have been made since its MEPA review started with the filing of an Environmental Notification Form (ENF) in 2007. On May 10, 2013 the MEPA Office withdrew the previous MEPA Certificate for the 2007 ENF and issued a Certificate outlining the issues to be included in an Environmental Impact Report (EIR) for the master plan.

PUBLIC PROCESS

Harvard works regularly with a Task Force of neighborhood representatives regarding Allston planning and development. The Task Force was first convened in the mid-1980's in preparation for the University's first Institutional Master Plan, filed in 1989.

In January, 2006, Boston Mayor Thomas M. Menino announced a new Harvard-Allston Task Force (the Task Force) to serve as an advisory group to the BRA as Harvard began its new institutional master planning process for the expanded Allston campus. Since 2006, Harvard has met regularly with the approximately 17-member Task Force to review and shape the elements of Harvard's Allston planning and development.



The information presented in this IMP has been discussed with the BRA, the Harvard Allston Task Force, and the community through regular Task Force meetings and working sessions organized by the BRA. Pictured is Ray Mellone, Chair of the Allston Task Force.

Input from the Allston Task Force and the Boston Redevelopment Authority has greatly influenced the Ten-Year Plan. Themes, proposals, and discussions around community benefits have included ideas that emerged from previous community planning exercises including: the North Allston Strategic Framework for Planning (NASFP) , the North Allston-Brighton Community Wide Plan (CWP), the Boston Open Space Plan, and the Massachusetts Department of Conservation and Recreation's Master Plan for the Charles River Basin.

In response to the Task Force request for coordinated planning and decision-making regarding future projects and implementation of public benefits, the BRA has committed to maximizing coordination among the primary elements of ongoing review and planning. Harvard will support in this work through its full and active participation. This is expected to include:

- Article 80 Large Project Review processes
- Continued planning for street activation, including analyzing the amount of retail and other public uses to be included in the Gateway project, the Mixed-Use Facility and Basketball Venue and other projects proximate to Barry's Corner.
- Review of any changes to the Science Complex
- Participation in the Parks and Recreation Department master plan for Smith Field
- Ongoing advancement of neighborhood goals west of Barry's Corner

1.3 Institutional Master Planning

PREVIOUS INSTITUTIONAL MASTER PLANS

Harvard has filed several Institutional Master Plans for its Allston campus since 1989. The most recent fully approved IMP dates back to 1997 (see Figure 1) and includes several now-completed projects such as McArthur Hall, Spangler Center, and Hawes Hall. In 2006 and 2007, the University amended the 1997 IMP to add the proposed Harvard Allston Science project site on Western Avenue to the IMP Area. The 2007 IMP Amendment also extended the term of the renewed IMP for five years, until the end of 2012. In 2011, the IMP was again amended to add the Harvard Innovation Lab (i-lab) and Tata Hall. In early 2013, the University amended the IMP to allow for certain institutional uses to be relocated from 219 Western Avenue to University-owned land at 28 Travis Street, enabling site work for the Barry's Corner Residential and Retail Commons project at 219 Western Avenue. This IMP Amendment also extended the term of the IMP for one year. Services currently located at 219 Western Avenue could begin operating in their new Travis Street location prior to the start of the academic year.

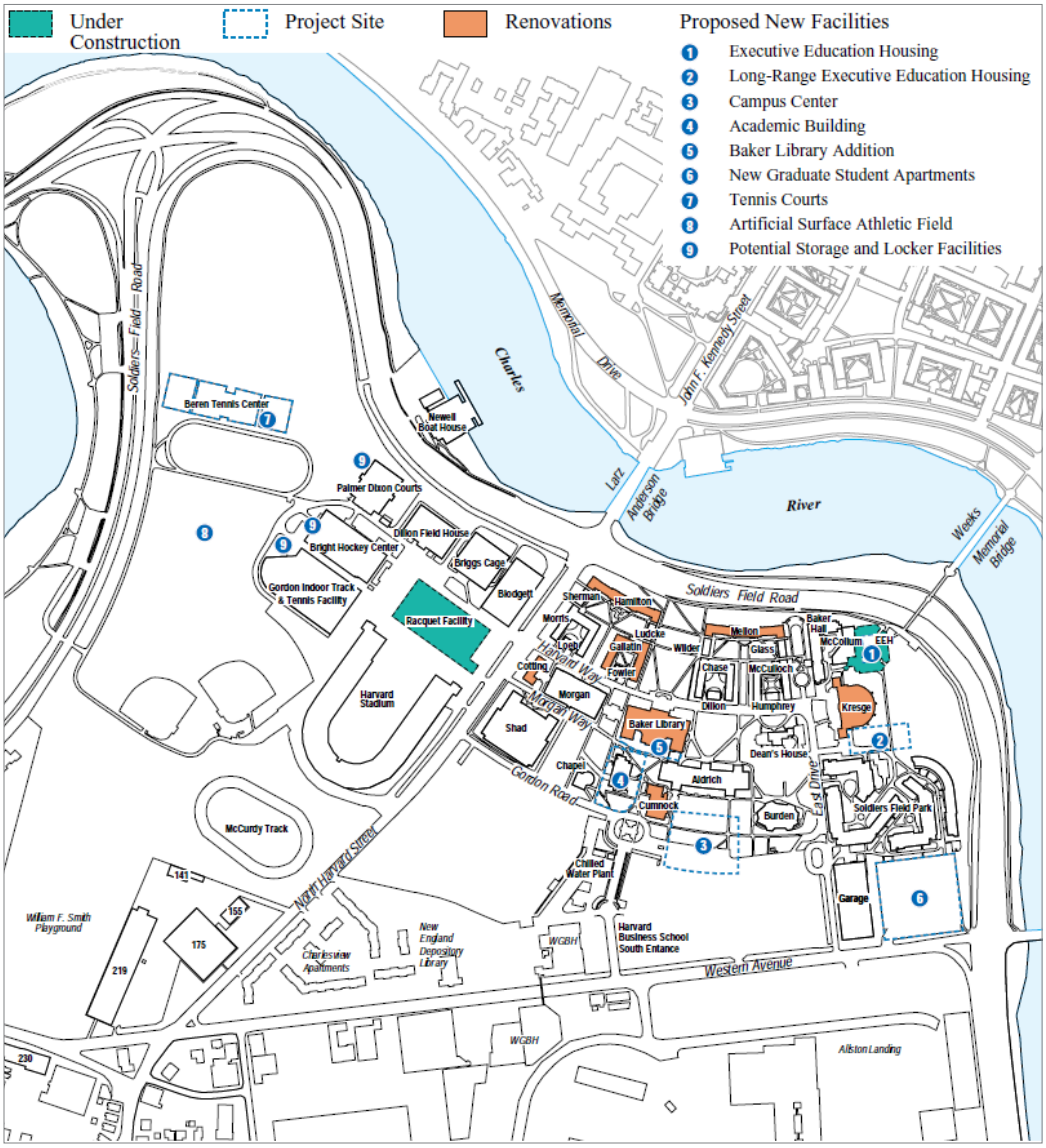


Figure 1: 1997 IMP

In January 2007, the University filed an IMPNF to begin preparing a new IMP. The 2007 IMPNF presented a master plan that included both a 20-year plan and a 50-year vision. In response to the 2007 IMPNF, the BRA issued a Scoping Determination outlining the issues to be addressed in the new IMP. Due to the global financial downturn and its severely constraining effects, the University slowed its long-term master planning process, commenced its Allston Work Team review process (see below) to recalibrate Harvard's goals and capabilities, and did not file a new IMP. As part of the IMPNF filed in the Fall of 2012, Harvard withdrew the 2007 IMPNF.

ALLSTON WORK TEAM RECOMMENDATIONS

In 2010, the University established the Allston Work Team, charged with addressing the University's and the economy's new realities and recommending strategies for achieving a cohesive scientific, academic, and learning campus environment in Allston. The Allston Work Team was comprised of University deans, faculty members, and alumni. In 2011, Harvard announced that the Work Team had issued its recommendations and that they had been endorsed by the President and the Harvard Corporation, along with a general timeline for development. The Work Team recommendations, noted below (and in Figure 2) – combined with other institutional projects – form the basis of the new, recalibrated IMP. The Work Team recommended that the University:

- Resume planning and development of the Science project (now contemplated for the School of Engineering and Applied Sciences).
- Enhance the vibrancy of Barry's Corner through housing and other amenities via an alliance with a real estate partner.
- Enable academic growth by preserving land adjacent to existing campus, consistent with past planning.
- Explore the feasibility of a conference center and hotel.
- Over a longer-term time horizon, develop an Enterprise Research Campus in Allston Landing North, creating a gateway to a collaborative community for business, investment capital, research, and science development.

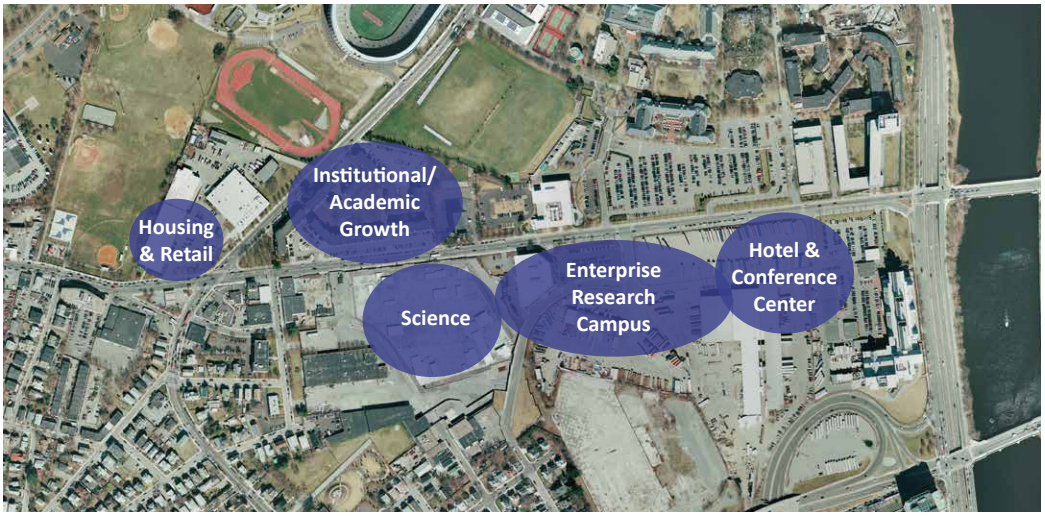


Figure 2: Work Team Recommendations Diagram

PROGRAMMING THEMES

The development program included in this IMP is based on the University's needs and objectives. Consultation with the University's leadership has surfaced the following programmatic themes:

- Reinforcing One Harvard
- Encouraging innovation and incubation
- Capitalizing on interdisciplinary collaboration
- Making Allston a campus anchor
- Extending Harvard's iconic character
- Developing common spaces
- Creating a strong public realm
- Balancing the visionary and the practical

CHANGES SINCE THE OCTOBER 2012 IMPNF

The following projects have progressed since the filing of the IMPNF:

224 Western Avenue
In February 2013, Harvard received a building permit to renovate 224 Western Avenue. This work will allow for the Harvard Ceramics program to move to this location from its existing site at 219 Western Avenue. The project is further described in *Chapter 5.0, District Plans and Project Descriptions (Barry's Corner).*

28 Travis Street
In March and April 2013, the Boston Redevelopment Authority board and the Zoning Commission respectively approved the move of campus services facilities to 28 Travis Street. Construction is underway on the renovation and addition. The project is further described in *Chapter 5.0, District Plans and Project Descriptions (Science & Enterprise).*

Swiss Bakers
In the IMPNF, Swiss Bakers appeared as a non-IMP project and was under construction. The bakery and cafe opened in April 2013.

Barry's Corner Residential and Retail Commons
In April 2013, the Boston Redevelopment Authority board approved the Barry's Corner Residential and Retail Commons. The Zoning Commission approved the project in May 2013. The project is expected to break ground in the fall of 2013. The project is further described in *Chapter 5.0, District Plans and Project Descriptions (Barry's Corner).*

As part of the City approval process for the Residential and Retail Commons, the Public Improvement Commission (PIC) will need to approve the final layout and names of the streets associated with the project. The PIC requires names that are not already City of Boston street names. In the IMPNF, the proposed new streets bordering the Barry's Corner Residential and Retail Commons were previously labeled "Smith Field" and "Grove." Both "Smith Field" and "Grove" are existing Boston street names. Therefore, Harvard has selected new names, "South Campus Drive" and "Ivy Lane", for these two new roads, subject to required approvals.

1.4 IMP Boundary

EXISTING IMP AREA

Today Harvard's Allston campus includes approximately 155 acres of land in the Institutional Master Plan (IMP) area. This number is inclusive of two changes since the filing of the IMPNF:

- As part of the Barry's Corner Residential and Retail Commons non-institutional project, the 2.02-acre project site was removed from the IMP Area and added to the Western Avenue/Solders Field Road Community Commercial Subdistrict.
- By way of an IMP Amendment, the 5.6-acre site of the 28 Travis Street project was added to the IMP Area.

PROPOSED IMP AREA

Based on further planning and at the request of the BRA, the proposed IMP boundary described in this IMP has been refined from what was presented in the IMPNF and July 2013 IMP to reflect the addition of a potential Construction Support Area. This final IMP proposes to add approximately 34 acres of land to the IMP area. This would bring the total Harvard landholdings in the IMP area to 189 acres.

As part of this IMP, Harvard is requesting that the building at 114 Western Avenue be added to the IMP so that it may be used for Science project uses, for other University uses such as institutional offices, research and academic uses, and for activities similar to the i-lab. As presented in Section 6.1, the existing parking lots at 114 Western Avenue are planned to be expanded from 178 spaces to 210 spaces, and these parking spaces would be added to the institutional parking pool.

Figure 3 depicts the existing and proposed IMP boundary as it relates to Harvard property, and is the illustration of record of the proposed IMP boundary. The perimeter of this proposed boundary appears on subsequent drawings for illustration purposes only.

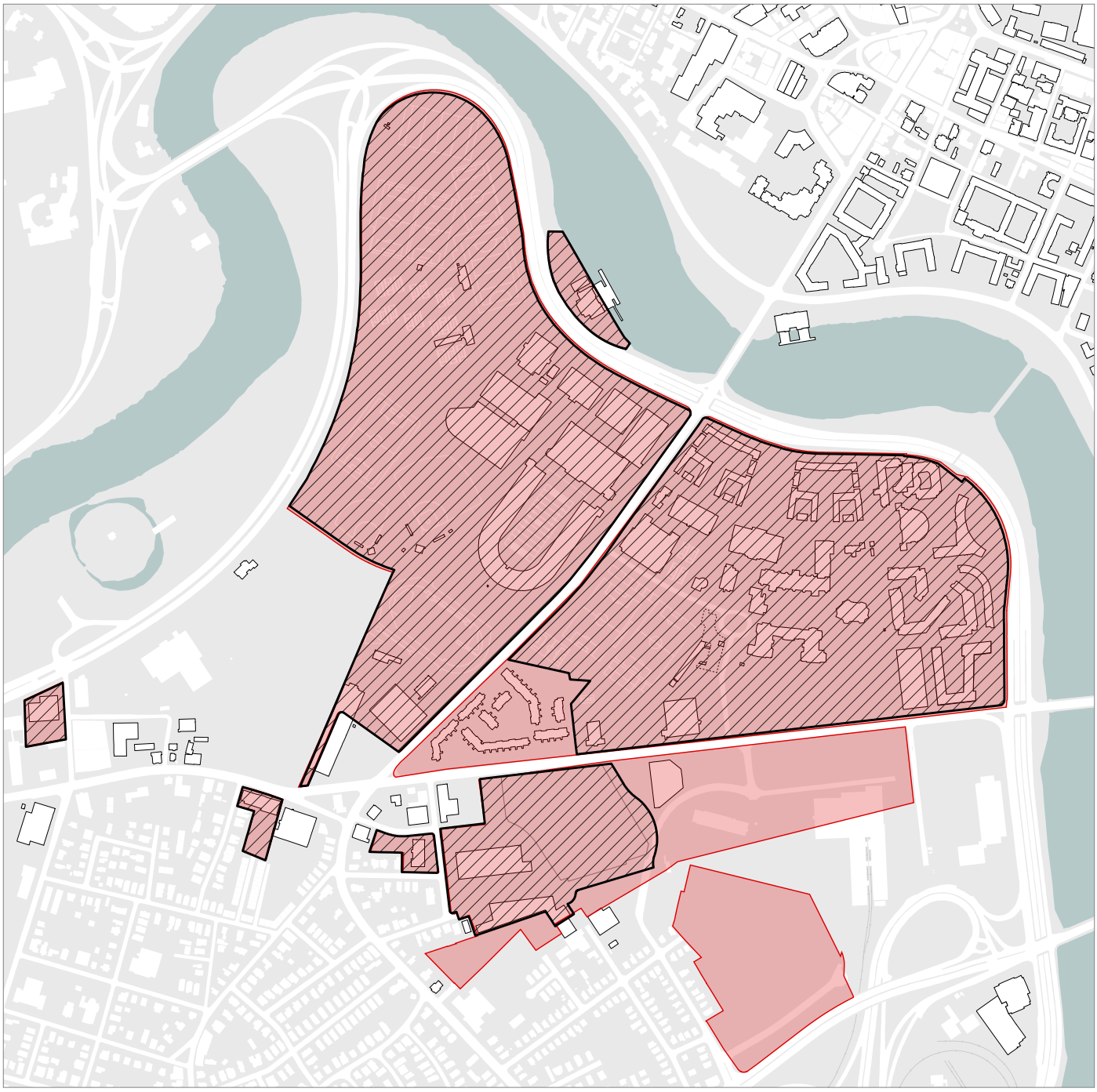


Figure 3: Harvard Property Within Existing & Proposed IMP Area

1.5 Document Organization

On March 29, 2013, the BRA issued a Scoping Determination outlining the issues to be addressed in this IMP. This IMP is designed to respond to the Scoping Determination and provide the appropriate information on the nine projects within the Ten-Year Plan that will allow the BRA Board and the Boston Zoning Commission to approve the IMP.

This November 2013 final IMP is a revised version of the IMP submitted by Harvard in July 2013. Revisions involve additional and changed provisions agreed upon by the BRA and Harvard in advance of the October 17, 2013 BRA Board hearing. Key changes are in sections 1.2 (Boston Zoning Requirements and Public Process), 1.4 (IMP Boundary), 5.2 (Barry's Corner District), 5.3 (Science and Enterprise District), 6.1 (Transportation), 6.7 (Construction Phasing and Management), and 6.9 (Housing). If, and to the extent that, other provisions in this IMP conflict with any of the aforementioned sections, said sections shall govern.

As shown in Figure 4, this document addresses several geographic scales. The document takes into consideration the development of Allston through time, from historic conditions, to current conditions, through the ten-year planning horizon, and beyond. Harvard's Plan differs from that of many other campuses because most of its projects are not infill. Redevelopment of land over time requires forward thinking about street and block plans, open space, circulation networks, and utilities.

The Long-Term Vision guides near-term thinking. It provides a framework and guidelines for campus development beyond the next ten years. Each project in the Ten-Year Plan will contribute to the completeness of this vision. The depiction in the Long-Term Vision is provided for information purposes only and is largely beyond the time frame and geography of the Ten-Year Plan for which the University is seeking approval.

Chapter 1.0, Introduction concludes with a summary of Harvard's history.

Chapter 2.0, Existing Conditions presents a profile of Harvard today, a campus overview, and a discussion of existing land and buildings at area-wide, neighborhood, and campus scales. Information on existing transportation and circulation systems is provided, as is discussion of Harvard's property in Allston that is located beyond the IMP boundary. Stewardship principles are provided for other Harvard real estate outside of the IMP area.

Chapter 3.0, Long-Term Vision considers the broader context and how the campus relates to North Allston, Cambridge and the Charles River. Plan content includes a time frame beyond that of the IMP and geography beyond the formal IMP area. The chapter sets forth a Long-Term Vision inclusive of:

- Planning Principles
- Long-Term Frameworks
- Design Guidelines (Public Realm and Built Form)

The Long-Term Vision is presented for context and not for regulatory approval. The projects in the Ten-Year Plan are designed not to preclude, but to be consistent with, the Long-Term Vision.

Chapter 4.0, Ten-Year Plan presents the core material of this regulatory submission. It describes a range of projects involving renovation, re-use, building replacement, and new construction. The projects described in this chapter are submitted for IMP approval within the framework of the Ten-Year Plan.

Chapter 5.0, District Plans & Project Descriptions focuses on district-specific design objectives and project site planning principles. District content includes annotated plans, 3D models, and project descriptions. Footprints and models are illustrative in nature because many projects are in early stages of planning. Districts include: Barry's Corner, Science and Enterprise, Academic and Athletics.

Chapter 6.0, Technical Reports provides an analysis of the effects of the Ten-Year Plan, including an evaluation of the transportation impacts, other environmental impacts (such as sustainability, stormwater, climate adaptation, and construction), planning for comprehensive support services, and economic and housing impacts. The chapter also identifies the Plan's many environmental benefits.

Chapter 7.0, Community Benefits provides background on the existing community benefits programs that Harvard supports and presents a status report on BRA, Task Force, and City discussions that will lead to a new community benefits program.

Appendices are provided under a separate cover. Included is the Scoping Determination and response to comment letters, as well as the full Transportation Study.

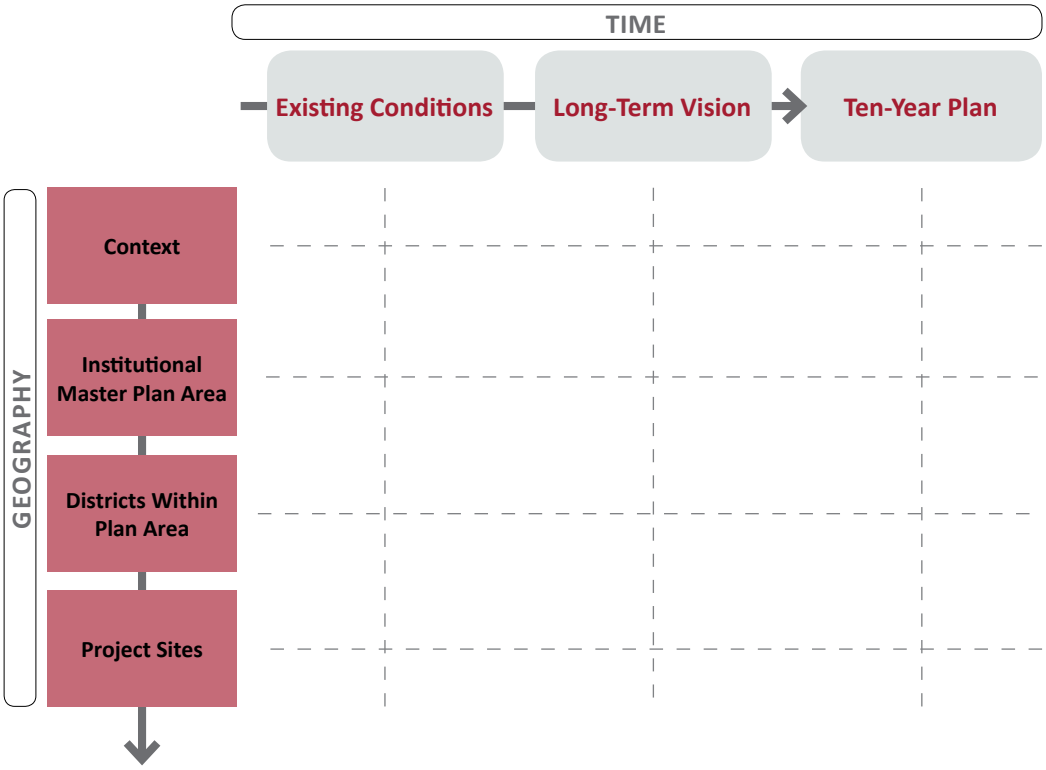


Figure 4: Document Organization



Existing Conditions

Ten-Year Plan

Long-Term Vision

Figure 5: Campus Evolution - 2D Illustrative



Existing Conditions



Ten-Year Plan



Long-Term Vision

Figure 6: Campus Evolution - 3D Illustrative

1.6 Project Team

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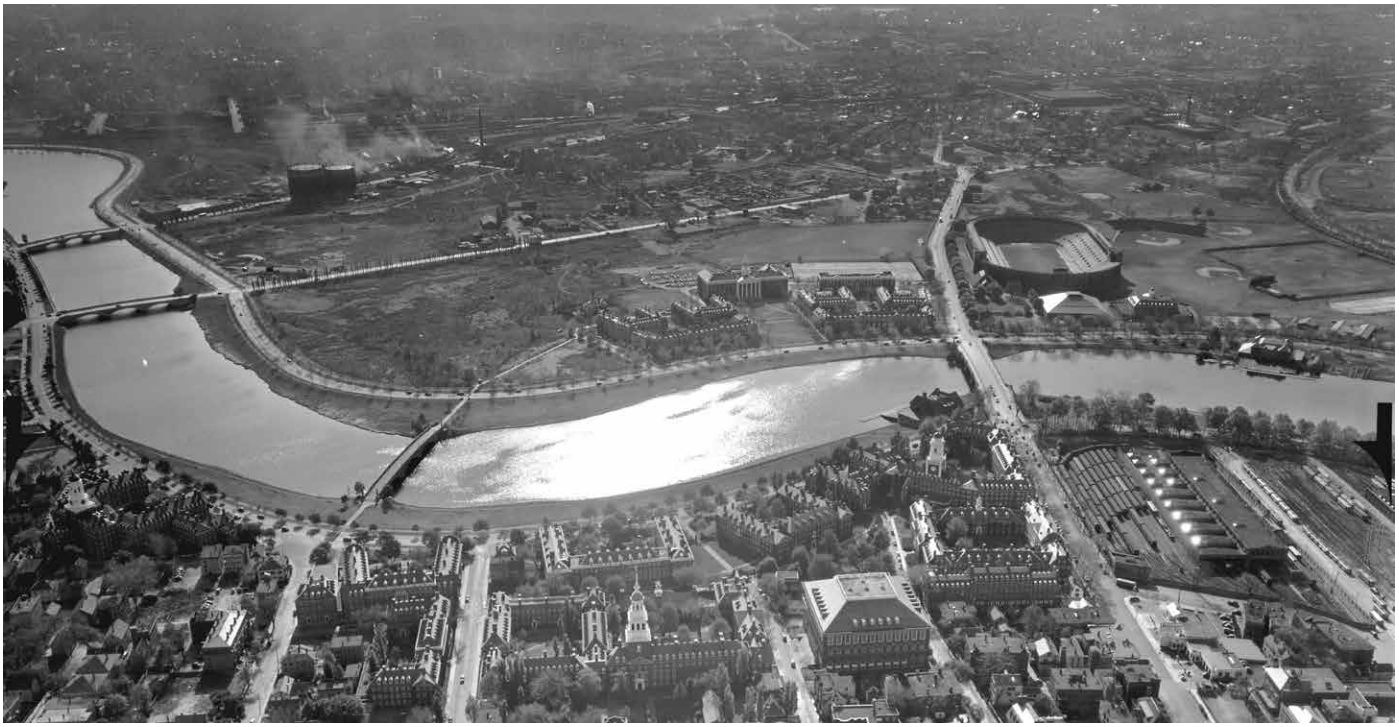
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View of Harvard Business School, Harvard Stadium, and Athletics Area From the North, 1930's



View of Athletics Area and Harvard Business School From the South, 1930's

1.7 University History

Harvard College opened in Cambridge, Massachusetts in 1636 with an enrollment of nine students and one Master to teach all subjects. It was named after the College's first benefactor, the young minister John Harvard of Charlestown, who upon his death in 1638 left his library and half his estate to the institution. A statue of John Harvard stands today in front of University Hall in Harvard Yard.

Harvard's original mission was to educate the religious and intellectual leaders of the newly settled New England colonies. In 1650, the Great and General Court of Massachusetts approved Harvard's charter of incorporation as a Massachusetts educational charitable corporation, which established the President and Fellows of Harvard College (a.k.a. the non-profit Harvard Corporation), a governing board that is the oldest corporation in the Western Hemisphere.

For more than a century, Harvard has undergone continuous and significant physical growth driven by a broad spectrum of societal change and need, including the industrial revolution, the genetics revolution, the decision to house all undergraduates within the College, and the recent establishment of a School of Engineering and Applied Sciences.

Development of Harvard's property in Allston began at the turn of the 20th century, focusing on athletics and new University uses. Harvard Stadium – the country's first large reinforced concrete structure – was built in Allston in 1903. With the construction of the Stadium, Allston became the center of the University's athletic programs.

With the end of World War I, Harvard Business School enrollment surged. As a result, Harvard constructed approximately 500,000 square feet of classroom, library, office and residential space in Allston in accordance with a formal master plan. Designed by the firm of McKim, Mead and White, the plan oriented buildings to a curving axis which follows the line of the Charles River. The plan centers on a formal quadrangle on axis with the Eliot House tower in Cambridge. Buildings that surround this quadrangle are organized by a series of smaller quadrangles and inner courtyards. This overall axial structure has guided the siting of most Business School buildings since that time.

Harvard's development of the Business School was an important part of a broader evolution of the Charles River. Originally a tidal estuary, the River had been characterized by marshes and mudflats and polluted by a range of industrial facilities. In 1908 a dam was built at the mouth of the River, establishing the Charles River basin and resulting in gradual development along its banks. Over time, this evolution of the Charles River has resulted in a world class riverscape that today enormously contributes to the physical character and identity of the University. Portions of Harvard's land in Allston represent one of the last vestiges of the area's earlier industrial heritage.

Concern for health and physical fitness began to grow during the 1970's, resulting in increased participation in recreational, intramural, club, and intercollegiate athletics. In particular, Title IX of the Education Amendments of 1972 ensured that University athletic facilities equally serve women as well as men. In response, Harvard issued a plan for construction of several new athletic buildings and for the renovation of existing athletic facilities. In Allston, the plan resulted in the creation of the Bright Hockey Center, the Gordon Track and the Blodgett Pool. In 1998, Harvard added the Murr Center racquet sports facility.



J.A. Heaton Coal Company and Soldiers Field Marshes Along North Harvard Street, 1870



North Harvard Street and Future Site of Harvard Business School, 1920's



Harvard Business School, 1930's

2.0 Existing Conditions

2.1 Harvard Today

Today, Harvard has approximately 33,000 graduate, undergraduate, and continuing education students. This includes approximately 6,700 undergraduates and 12,600 graduate students. In total Harvard employs approximately 17,000 faculty and staff in various locations across Massachusetts. In addition, Harvard has approximately 10,000 faculty members at its affiliated teaching hospitals, including Massachusetts General Hospital, Brigham and Women's Hospital, and the Beth Israel Deaconess Medical Center.

2.2 Campus Overview

Harvard's operations are located primarily within its three main campuses: Harvard's original campus in Cambridge, centered in Harvard Square; its campus in the Allston neighborhood of Boston (the subject of this IMP); and its facilities within the Longwood Medical and Academic Area (LMA) in Boston. In addition, Harvard's Arnold Arboretum comprises 265 acres in Jamaica Plain and Roslindale. Harvard's facilities in the LMA and at the Arboretum are the subject of separate Institutional Master Plans.

Figure 7 locates the campuses in the larger metropolitan context. Figure 8 maps the Harvard campus in Cambridge and Allston. Figure 9 locates campus buildings in Allston. Table 1 provides a listing of campus buildings in the IMP area.



Existing View Southwest Centered on Weeks Pedestrian Bridge, May 2013

Photography by Mark Flannery

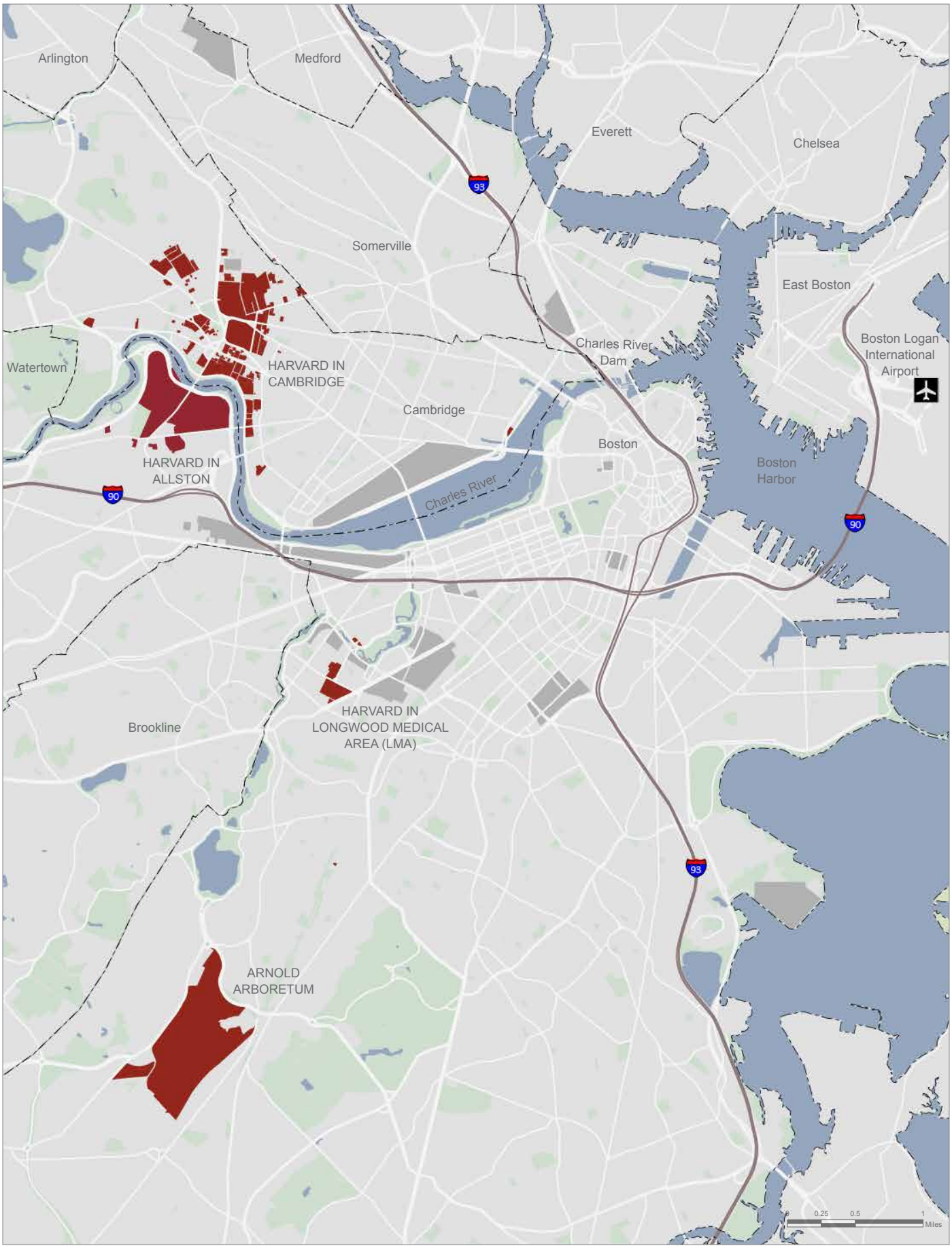


Figure 7: Campus Overview Map (2013)



Figure 8: Existing Campus Map (2013)



Figure 9: Existing Campus Map: Allston Buildings (2013)

Table 1: Allston Property Holdings: Existing IMP Area (2013)

Building Name	Year Built	Building Area (SF)	Height (Stories)	Predominant Use
Harvard Business School				
Aldrich Hall	1953	105,726	3	Classrooms
Baker Hall	1970	78,374	6	Residential
Baker Library | Bloomberg Center	1926	157,698	4	Library, Offices
Burden Hall	1971	28,969	1	Assembly
Batten Hall (i-lab)	1963	72,216	3	Assembly/Classroom
Chase Hall	1926	50,796	4	Residential
Chilled Water Plant	1991	19,627	1	Infrastructure, Central Receiving
Class of 1959 Chapel	1992	6,932	1	Assembly
Connell House	1940	6,067	3	Offices
Cotting House	1968	16,747	3	Offices
Cumnock Hall	1974	26,137	3	Health Services, Classrooms, Offices
Dean's House	1929	10,978	3	Residential
Dillon House	1965	5,674	3	Offices
Gallatin Hall	1926	50,956	4	Residential
Glass House	1926	7,563	3	Offices
Greenhill House	1965	5,940	3	Offices
Hamilton Hall	1926	49,297	4	Residential
Hawes Hall	2002	61,103	3	Classrooms
Kresge Hall	1953	66,822	3	Dining, Faculty Club Dining
Loeb House	1940	6,067	3	Offices
Ludcke House	1926	9,611	3	Offices
McArthur Hall	1999	107,674	6	Residential
McCollum Center	1970	20,083	2	Classrooms
McCulloch Hall	1926	53,118	4	Residential
Mellon Hall	1926	47,697	4	Residential
Morgan Hall	1926	117,707	5	Offices
Morris Hall	1926	50,786	4	Residential
Rock Center	1969	27,782	3	Offices
Shad Hall	1990	124,941	3	Athletics, Offices
Spangler Center	2001	139,437	3	Dining, Student Services, Offices, Assembly
Tata Hall	2013	163,000	7	Residential
Tunnels		55,243		
Wilder House	1926	6,377	3	Offices
Wyss House	1926	6,290	3	Offices, Student Services
Teele Hall	1984	52,688	5	Offices
25 Travis Street	1932	28,286	4	Offices
SUBTOTAL (35 BUILDINGS)		**1,844,409**		

Table 1 (Continued): Allston Property Holdings: Existing IMP Area (2013)

Building Name	Year Built	Building Area (SF)	Height (Stories)	Predominant Use
Soldiers Field Athletic Area				
Blodgett Pool	1978	46,861	2	Athletics/Swimming
Briggs Cage	1927	29,410	2	Athletics/Multi-Purpose
Bright Hockey Center	1979	54,312	2	Athletics/Hockey
Dillon Field House	1931	44,125	3	Athletics/Support
Gordon Indoor Track	1978	74,179	2	Athletics/Track
Harvard Stadium	1903	81,940	3	Athletics/Football
Newell Boat House	1900	22,032	2	Athletics/Rowing
Palmer Dixon	1964	23,962	1	Athletics
Murr Center	1998	87,600	2	Athletics/Tennis and Squash
SUBTOTAL (9 BUILDINGS)		**464,421**		
University Buildings				
Soldiers Field Park (4 buildings)	1976	430,768	4-9	Residential
Soldiers Field Park Parking Garage	1976	254,456	7	Structured Parking
28 Travis Street [1]	(2013)	53,350	1	Office/Storage/ Fleet
141 North Harvard Street [2]	1957	4,570	1	Storage
155 North Harvard Street [2]	1957	5,498	1	Fleet Garage
175 North Harvard Street	1957	39,400	1	Office/Storage
1230 Soldiers Field Road	(2002)	16,215	1	Office
One Western Avenue	2003	250,000	15	Residential
219 Western Avenue [2]	1962	94,724	1	Office/Publishing
SUBTOTAL (8 BUILDINGS)		**1,148,981**		
Non-Institutional Buildings				
135 Western Avenue [3]	(2005)	34,120		Office/Industrial Vacant
SUBTOTAL (1 BUILDINGS)		**34,120**		
TOTAL (53 BUILDINGS)		**3,491,931**		

[1] Renovation/addition underway, uses moving from 219 Western Avenue.
[2] To be demolished, site of approved Barry's Corner Residential and Retail Commons.
[3] Northeast Depository Library (NEDL) to be demolished within time frame of Ten-Year Plan.

Note: Several buildings have received major renovations since the year built, renovation dates have not been included except for a few dates in parentheses which indicate the year the building was acquired, renovated, or anticipated to open.

2.3 Land & Buildings

AREA-WIDE CONTEXT

The accompanying image (Figure 10) illustrates the buildings of Cambridge and Boston divided by the Charles River. Barry's Corner is somewhat isolated and less dense when compared with other corners and squares in Boston and Cambridge. This is largely the result of North Allston's separation from the rest of the urban fabric by the river and the Massachusetts Turnpike. It is also due to the proximity of low density land uses such as athletic fields, and city and state park land, and due to the area's industrial history, including rail and truck yards. As a result, few access/egress points serve the area, making more challenging the University's efforts to create strong links with its Cambridge campus and the North Allston neighborhood and to activate Barry's Corner. An increased level of density in and around the Barry's Corner area is necessary to create a successful, vibrant, pedestrian-friendly neighborhood.



Figure 10: Area-Wide Context (2013)

OPEN SPACE

Harvard open space in Allston encompasses the playing fields within the Soldiers Field Athletic Complex as well as the tree-lined walkways and open grassy courtyards of the Harvard Business School. The heart of campus connects to the Charles River and parklands, owned and managed by the Department of Conservation and Recreation. This network of open space is a critical link between the Harvard University campus and the larger metropolitan area. There is limited pedestrian access from North Allston across Soldiers Field Road to the riverfront parks. Other open space areas are under the jurisdiction of the City of Boston and include Smith Field, Portsmouth Street Playground, Hooker-Sorrento Playground and Ray Mellone Park.

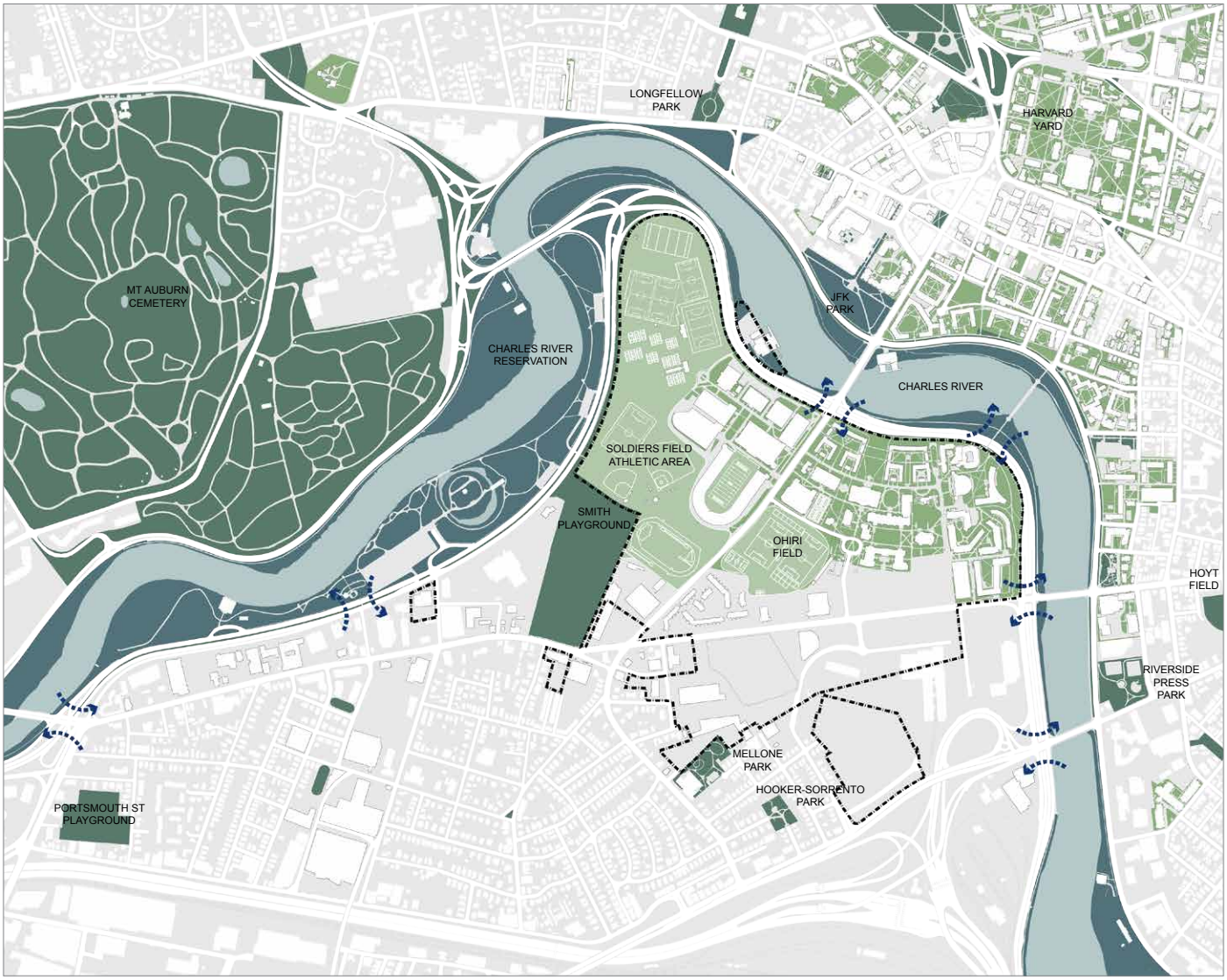


Figure 11: Existing Open Space (2013)

LAND USE

The North Allston neighborhood has its origins in the early 17th century as an agricultural and cattle raising outpost of Cambridge, a precursor to its eventual role as a market town and center for the beef industry. Since then, the area has witnessed intense transformations that have shaped land use patterns, particularly the development of rail and highway infrastructure and their attendant industrial uses.

The late-nineteenth and early-twentieth century was an important period of transition. During this time period rail and industrial uses began to reshape the neighborhood and auto-related uses emerged as new element on the urban landscape. Harvard also began to develop its athletic facilities and Business School in North Allston during this time frame.

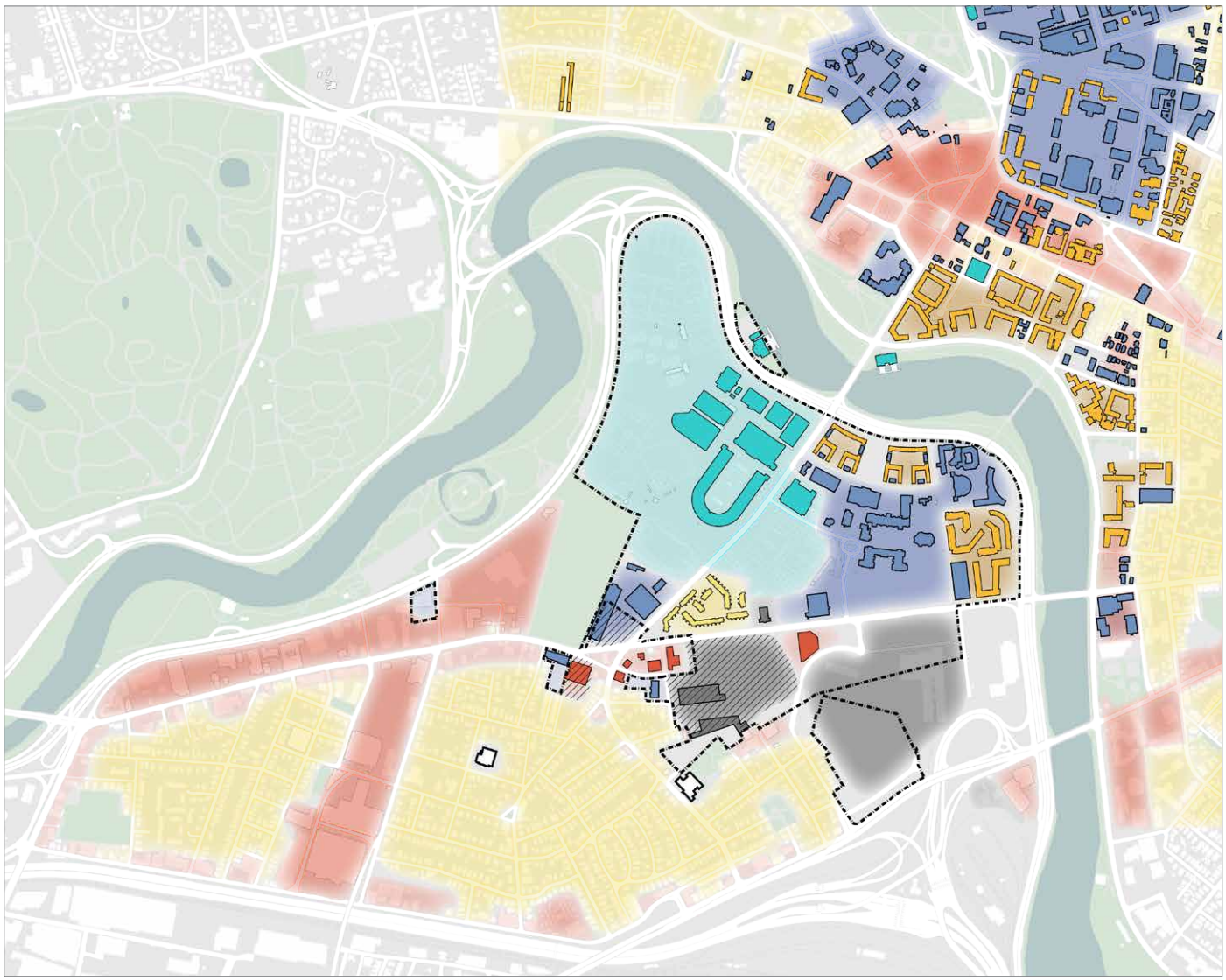


Figure 12: Existing Land Use (2013)

Railroads and Industrial Uses

The advent of the railroad in the mid- to late-nineteenth century in particular had a profound effect on the location and organization of land uses in North Allston. Early rail lines into Boston formed the southern boundary of the neighborhood; established key gateways into the neighborhood that exist in one form or another today; and, created a transportation corridor that would later include the Massachusetts Turnpike (MassPike). Rail yards and facilities emerged along the rail corridor, the last remnants being the facilities remaining today in Beacon Yard.

With rail access, industrial uses sprung up along Everett Street between Lincoln Street and Western Avenue, including factory buildings that divided this part of the emerging neighborhood. Steel mills were located along Lincoln Street and were operational into the middle of the twentieth century. Today, this area is occupied by the Brighton Mills Shopping Center, the new Charlesview residential project, and light industrial buildings along Holton Street, which were built in the early part of the twentieth century.

Commercial and Auto-Oriented Uses

The mid- and late-twentieth century saw further transition with the construction of the MassPike and the decline of rail freight service. Warehousing and distribution facilities emerged in the twentieth century near the Massachusetts Turnpike and its Cambridge Street interchange. Some of these industrial parcels are located within the IMP area along Western Avenue and are poised to change to institutional uses.

Retail and light industrial uses were also developed along Western Avenue, including the auto-oriented uses that quickly emerged in the early twentieth century with the popularization of the automobile. Many auto uses still remain along the Western Avenue corridor in and to the west of Barry's Corner.

These buildings are typically one and two stories with off-street, surface parking. Harvard currently owns a number of these commercial properties on Western Avenue and along the Holton Street corridor and has leased space to a variety of tenants including medical labs, office uses, fitness centers, children's play space, and a film studio.

Residential Neighborhoods

Residential uses originally concentrated around North Harvard Street and Market Street and then filled in the areas next to the industrial buildings along Everett Street during the late-nineteenth and early-twentieth century. More recently, multi-unit apartment buildings and condominium buildings have been constructed in the residential neighborhood, which includes schools, places of worship, and a public library.

HISTORIC RESOURCES

Harvard's campus includes or is located in the vicinity of several properties listed in the State and National Registers of Historic Places and/or included in the Inventory of Historic and Archaeological Assets of the Commonwealth. These include Harvard Stadium, a property listed in the State and National Registers of Historic Places and a National Historic Landmark. These properties are part of the Harvard Business School-Athletic Facilities Area included in the Inventory of Historic and Archaeological Assets of the Commonwealth. The IMP area is also adjacent to the State-and-National Register-listed Charles River Basin Historic District.

Over the ten-year term of the IMP, there are a number of properties that will attain 45 years of age. These properties are depicted in Figure 13 and include Cotting House (1968), Baker Hall (1970), McCollum (1970), Rockefeller (1970), Burden Hall (1971), Cumnock (1975), Soldiers Field Park (1975), 224 Western Avenue (1975), Blodgett Pool (1977), Gordon Indoor Track (1977), and Bright Hockey (1978).

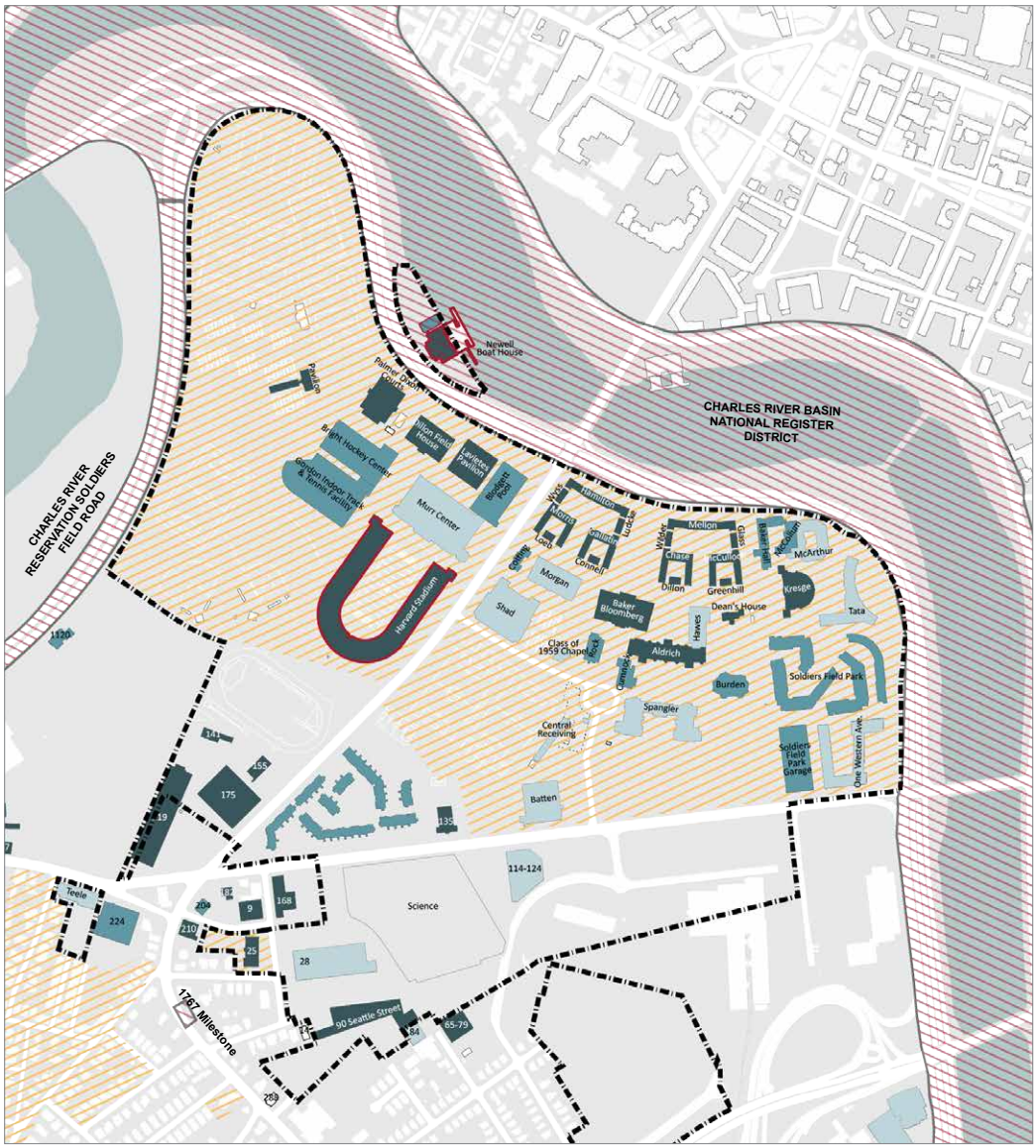


Figure 13: Allston Historic Buildings (2013)

Note: The scoping determination comment letter by the Boston Landmarks Commission requested identification of buildings reaching 45 years of age within the Ten-Year time frame of the IMP.

The building age shown in Figure 13 is based on the original date of construction; renovations and additions are not accounted for.

- National Register Designation Building
- National Register District
- MHC Inventoried Area
- 45+ Years Old by 2013 (Built prior to 1968)
- 45 Years Old by 2023 (Built 1969 -1978)
- Recent Buildings (1979 - Present)
- IMP Boundary

Table 2: Historic Resources within or adjacent to the Allston Campus

Name	Address
Properties Listed in the State and National Registers of Historic Places	
Charles River Reservation – Soldiers Field Road, Boston	Soldiers Field Road
Charles River Basin Historic District, Boston and Cambridge	Eliot Bridge to Charles River Dam including parkland and parkways in Boston and Cambridge
Harvard Stadium	79 North Harvard Street
Newell Boat House	801-805 Soldiers Field Road
1767 Milestone	240 North Harvard Street
Properties Included in the Inventory of Historic and Archaeological Assets of the Commonwealth	
Harvard Business School – Athletic Facilities Area	Soldiers Field Road, North Harvard Street
David L. Barrett School	25 Travis Street

2.4 Circulation

Circulation patterns for pedestrians, bicyclists, transit users and motorists are shaped by the location and nature of the area's regional transportation infrastructure (i.e., roadways, bridges, and rail), the presence of the Charles River, and the impenetrability of large blocks of land that were previously used for industrial purposes. The effect of these constraints is to channel movements of people and vehicles through a limited number of gateway locations on the periphery of North Allston and then to distribute local and through-trips via a few neighborhood connector streets such as Western Avenue, North Harvard Street and Cambridge Street.

The roadways, bridges and paths that comprise the various elements of the transportation network serving the IMP area are multimodal in nature, serving different combinations of pedestrian, bicyclists, transit users and motorists. This is particularly apparent at high volume gateways and key intersections like Barry's Corner. In addition to being multimodal, these facilities are multijurisdictional. Regional facilities are under the jurisdiction of State agencies, while the City of Boston has jurisdiction over local public streets.

- MassDOT has jurisdiction over the Massachusetts Turnpike (MassPike), the vehicular bridges over the Charles River (e.g., Eliot Bridge, Anderson Memorial Bridge, Western Avenue Bridge, River Street Bridge) and the Cambridge Street bridges over the MassPike and its ramps.
- The Department of Conservation and Recreation (DCR) has jurisdiction over the parkways (e.g., Soldiers Field Road) and its pedestrian bridges including the John W. Weeks Bridge over the Charles River and the Charles Sinclair Weeks Bridge and Telford Street Foot Bridge.
- The City of Boston has jurisdiction over North Harvard Street, Western Avenue and Cambridge Street except for bridges and their adjacent intersections.

While key major roadways and bridges form the basic structure of the transportation network, local streets and paths play an important role in the circulation system. The IMP area includes campus streets and paths that are under the jurisdiction of Harvard University, and the adjacent residential neighborhood includes dense network of streets under the jurisdiction of the City of Boston. The combined networks of these streets and paths are particularly important for local pedestrian and bicycle circulation and provide connections between the neighborhood and the campus.

EXISTING STREET TYPOLOGIES

Figure 14 illustrates the current street typologies around the IMP area. North Allston is bound by parkways to the north and east and I-90 to the south. East of the Eliot Bridge, Soldiers Field Road functions like a limited access highway with parkland along the rivers edge and Harvard institutional uses property north of the Western Avenue Bridge. West of the Eliot Bridge, the character of Soldiers Field Road changes, particularly from Everett Street to Market Street where small buildings are located along the southern side of the roadway, each with generous setbacks.

The character of North Harvard Street and Western Avenue changes from Neighborhood Main to Neighborhood Connector as each street passes through Barry's Corner and the adjacent land uses become more institutional in nature. Cambridge Street also has the characteristics of a Neighborhood Connector with its southern side dominated by transportation-related uses.

The remaining streets are either Campus Drives, Neighborhood Residential Streets or Industrial Streets. The Campus Drives include Gordon Way, Batten Way, Harvard Way, and East Drive, as well as the circulation roadways in athletics. Uses are generally set back and adjacent plantings are part of larger landscape plans for the campus. Neighborhood streets are narrow with on-street parking and driveways. Tree plantings often are located in front yards rather than sidewalks. Industrial streets include Hague Street and Rotterdam Street, part of the industrial area to the south of Western Avenue. These streets are oriented toward accommodating truck traffic.



Figure 14: Existing Street Typologies (2013)

PEDESTRIAN CIRCULATION

Figure 15 illustrates the primary pedestrian network connecting Harvard in Allston and Cambridge. Much of Harvard's non-institutional property in North Allston was formerly commercial and industrial land, and is currently fenced and inaccessible. Projects to be completed within the next ten-years will begin the transformation of this area into an accessible pedestrian-friendly environment, with expanded open space and enhanced permeability, as described in the Long-Term Vision.

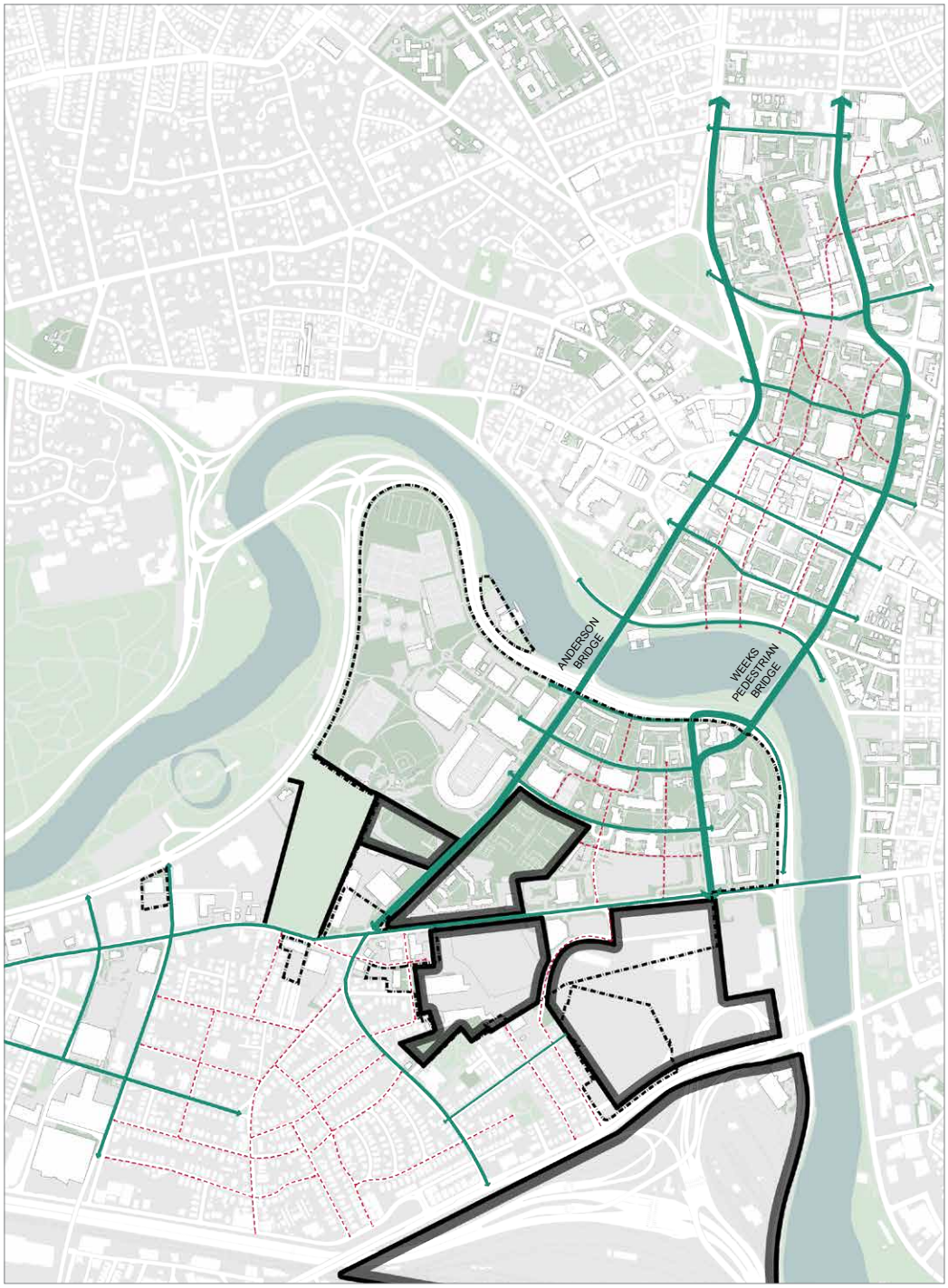


Figure 15: Existing Pedestrian Circulation (2013)

Figure 16 illustrates walk times. Walk time radii of five-minute, ten-minute and fifteen-minute intervals are superimposed on the map and are centered on Barry's Corner. To generate the circles shown, a three-mile per hour walking speed is assumed across level ground. It is possible to walk from Barry's Corner to the river in ten minutes and from Barry's Corner to Harvard Square in 20 minutes. To the west, Brighton Mills is less than a ten minute walk from Barry's Corner.



Figure 16: Walk Times

BICYCLE CIRCULATION

Bicycles facilities and accommodations in the vicinity of the IMP area are illustrated in Figure 17. Prior to 2009, the Paul Dudley White Bicycle Paths along the Charles River provided the only significant bicycle facility in the area. Since 2009, the City of Boston has added nearly three linear miles of bike lanes in North Allston. Harvard has collaborated with the City of Boston to install bicycle lanes on North Harvard Street from Soldiers Field Road to Cambridge Street and on Western Avenue from Barry's Corner to Soldiers Field Road in the east, including a westbound cycle track. The City has designated Franklin Street as a "Bike Boulevard," connecting Barry's Corner with Lincoln Street and the footbridge over the MassPike to Cambridge Street.

Harvard provides both covered and uncovered bicycle parking for its employees, students, and visitors on its Allston Campus. Bicycle parking spaces are clustered around residential and academic buildings on the Allston Campus and provide approximately 210 covered and 700 uncovered bicycle spaces. Harvard has also worked with the City of Boston and the City of Cambridge to install Hubway regional bike-share stations. Four 15-dock Hubway Stations that are sponsored by Harvard University are located within the study area.

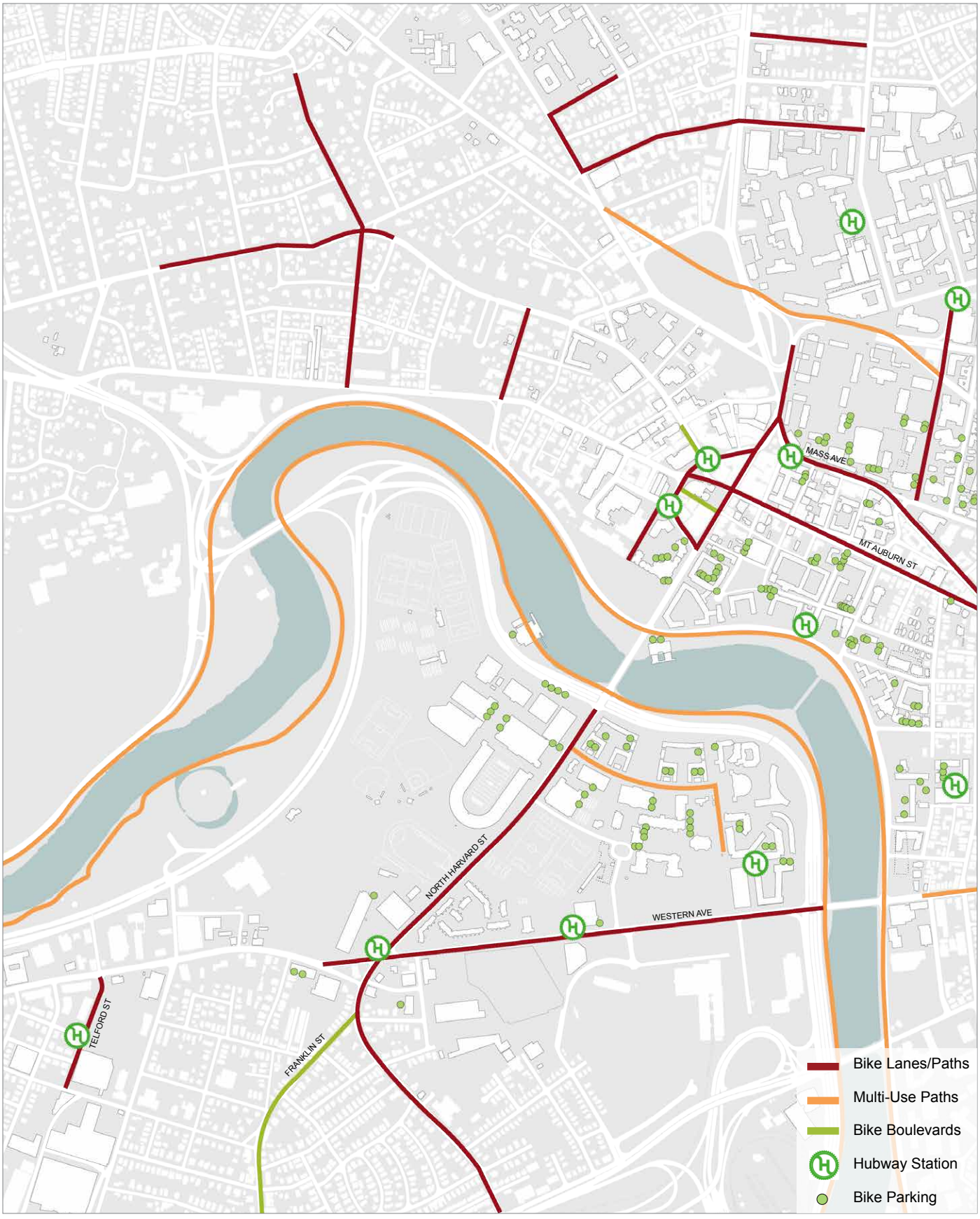


Figure 17: Existing Bicycle Network (2013)

TRANSIT & SHUTTLE

The MBTA operates five bus routes through or near the IMP area: the Route 64 (Oak Square - Central Square); the Route 66 (Harvard Square - Dudley Station); Route 70 (Cedarwood/Waltham - Central Square); Route 70A (North Waltham - Central Square); and Route 86 (Sullivan - Cleveland Circle). All areas within the Allston Campus are within one-quarter mile of bus stops for at least two routes and most of the campus is near bus stops for three routes. The nearest transit station is located in Harvard Square, providing access to the Red Line and other local bus services.

Harvard University provides shuttle services to enhance connectivity between Allston and Cambridge. The Allston Campus Express shuttle provides students and staff transportation throughout the academic year. Buses depart from the Allston Campus approximately every 15 minutes on weekdays with connections at Harvard Square, Harvard Kennedy School, Harvard Stadium, Harvard Business School (HBS), and Soldiers Field Park Garage. The current service through Allston is accessible to neighborhood residents.

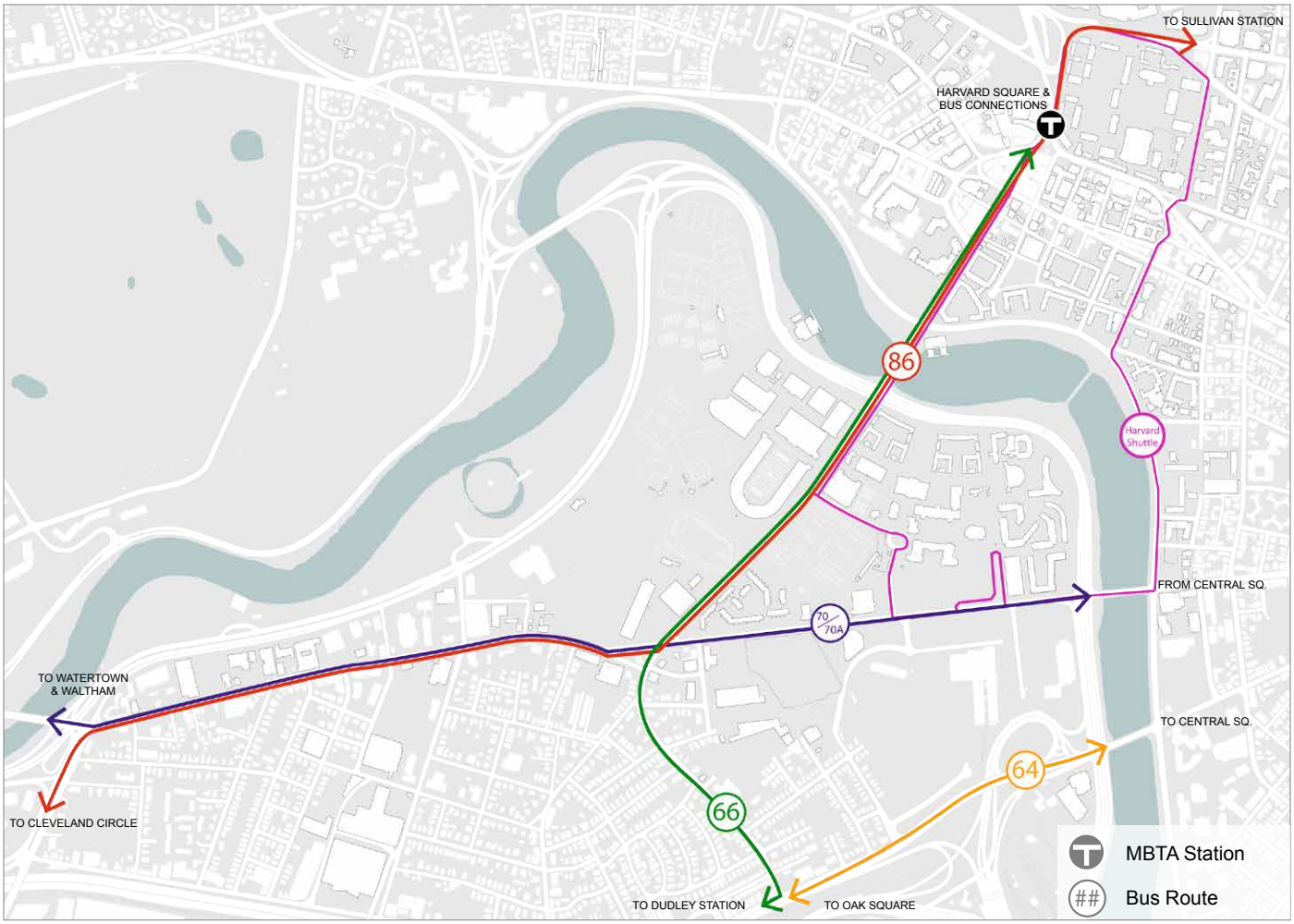


Figure 18: Existing Transit (2013)

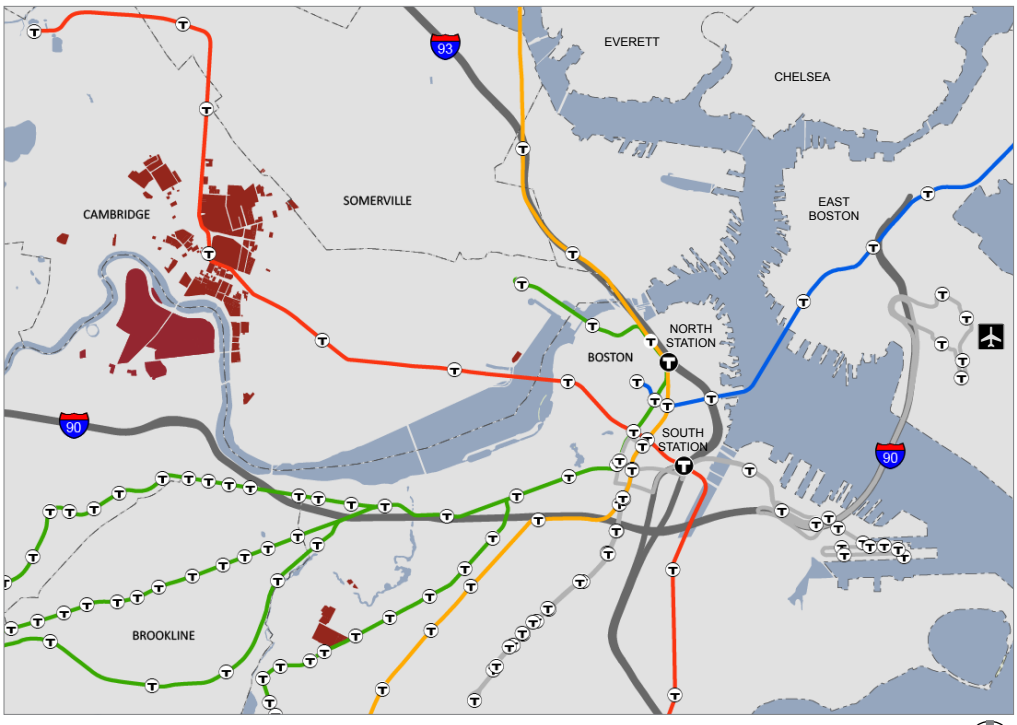


Figure 19: Harvard Campus and MBTA System Map

2.5 Parking & Loading

PARKING

Figure 20 illustrates the location of off-street institutional and non-institutional parking within the IMP area, as well as loading facilities in Harvard's Allston Campus. As indicated in Table 3, there are approximately 2,642 institutional parking spaces on Harvard's Allston Campus and an additional 510 non-institutional parking spaces are located within the IMP area.

Table 3: Off-Street Parking Inventory within IMP Area

Institutional Parking	**Number of Spaces**
219 Western Ave./175 N. Harvard St[1]	120 spaces
Teele Hall	111 spaces
Athletics	241 spaces
Spangler Lot	675 spaces
Soldiers Field Park Garage	645 spaces
One Western Ave.	617 spaces
25 Travis St.	55 spaces
1230 Soldiers Field Road	58 spaces
i-lab	120 spaces
TOTAL INSTITUTIONAL PARKING SUPPLY	**2,642 SPACES**
Non-Institutional Parking	**Number of Spaces**
114 Western Avenue	178 spaces
135 Western Avenue	102 spaces
Charlesview	230 spaces
TOTAL NON-INSTITUTIONAL PARKING SUPPLY	**510 SPACES**
TOTAL	**3,152 SPACES**

[1]75 of these spaces to be relocated to 28 Travis Street.

All University parking is controlled and administered by the Harvard University Parking Office as a University-wide resource with a permitting system and specific parking lot/garage assignments. Parking for eligible staff and faculty costs $1,596 per year for unreserved surface parking and $1,704 per year for unreserved garage parking. Students living on-campus who park in the Soldiers Field Park Garage or One Western Avenue Garage pay $3,192 per year for garage parking and $3,000 for surface parking. These parking rates are for FY14. In addition, Harvard provides visitor parking in the Spangler Lot and at designated multi-space meter locations. Appendix C provides further detail about Harvard's parking management programs.

In addition to off-street parking, a limited amount of on-street parking is available along North Harvard Street, Western Avenue, and Cambridge Street, totaling approximately 270 spaces. The parking supply and regulations along these streets were inventoried and are summarized in Appendix C. Two hour parking is provided on sections of Western Avenue west of Barry's Corner and along a short section of North Harvard Street near Easton Street. Handicap Parking is provided on North Harvard Street in front of the Honan-Allston Library and to the north of Gordon Road. Most of the adjacent neighborhood residential streets are unregulated with the exception of a limited number of streets east of North Harvard Street that have residential parking: Kingsley, Rena, Hopedale, Seattle, Windom, Amboy and Sorrento Streets.



Figure 20: Existing Parking (2013)

LOADING FACILITIES

Figure 21 illustrates the location of the primary Harvard loading docks in the IMP area. These docks are located away from City streets, allowing vehicles to make backing maneuvers within Harvard-owned property. They are accessed from campus streets that connect with either North Harvard Street or Western Avenue.

Two loading docks serve the Business School. The main loading dock is located off Batten Way next to the chilled water plant. This loading dock can accommodate single unit and tractor-trailer trucks. It is connected to a tunnel system that allows for distribution of goods and equipment throughout most of the Business School. A second loading dock is located at Kresge Hall and provides access to the building's kitchen.

Other loading docks are located at One Western, 219 Western Avenue, and, in the near future, 28 Travis Street. Goods delivery and service trucks also use campus streets to access campus buildings like Soldiers Field Park and athletics facilities.

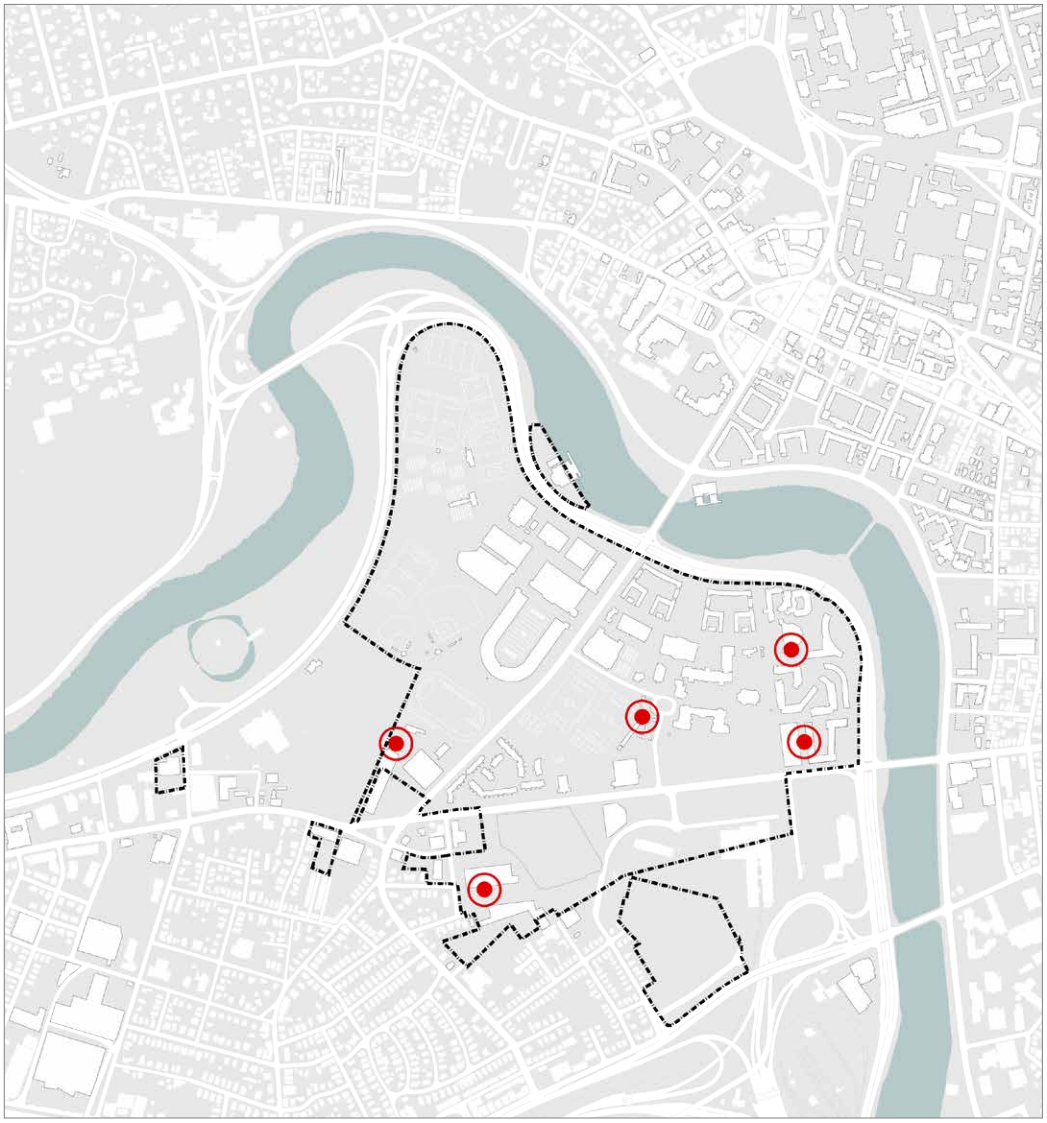


Figure 21: Existing Loading Facilities (2013)

2.6 Transportation Demand Management

Harvard has an extensive Transportation Demand Management (TDM) program that is an important tool in managing vehicular travel to the campus. Harvard maintains an extensive CommuterChoice website (www.commuterchoice.harvard.edu) which provides information about these programs. Table 4 provides an overview of Harvard's TDM program.

Table 4: Overview of CommuterChoice (TDM) Program

Category	TDM Measure
Transit Passes	• 50 percent subsidy for MBTA monthly passes • Pre-tax savings on the purchase of private transit passes and commuter checks is offered as an added bonus for eligible faculty and staff • On-line monthly pass sales • Participation of 6,700 Harvard affiliates in monthly pass program
Marketing	• Transit pass program • Public transportation options and Harvard shuttle services • Bicycling services such as safe cycling classes, repair clinic, the Hubway, and the departmental bike program • Ridesharing options • Walking and bicycle maps • Links to other references and resources.
Bicycle Program	• $50 discounted annual membership in the Hubway bike sharing program • Bicycle safety training and classes • Discounted bike helmets • Harvard affiliates bike registration program in conjunction with the Harvard University Police Department • Participation in the Bicycle Benefit Act providing bicyclists up to $240/year for bicycle expenses.
Rideshare Programs	• Discounted and preferential carpool and vanpool parking in the largest garages and several surface lots • 50 percent discount on annual parking permits for carpoolers if they carpool with one other employee, and a 75 percent discount off the cost of their annual parking permit if they travel with three or more people. • Carpool partner matching and registration • Emergency ride home assistance • Zimride, an online ride sharing program that helps Harvard affiliates locate other people with similar commuting patterns or travel needs and facilitates ridesharing. • RelayRides program to match people who are willing to lend or borrow vehicles from one another.
ZipCar	• Discounted annual Zipcar membership ($25/year) to employees. • Membership for an 18+ age group. • Parking for 28 ZipCars including five in Allston • Participation of 10,000 Harvard affiliates in the program
LEV and Electric Vehicles	• Approximately 26 preferred parking spaces are available, with the appropriate permit, for Low Emission Vehicles (LEV) at ten locations on the Cambridge and Allston campuses. • Two Electric Vehicle Charging Stations on the Allston Campus at 125 Western Avenue (i-lab)

Harvard is also a member of A Better City Transportation Management Association, which provides TDM services to employees at commercial properties. In addition to its extensive TDM program, Harvard also accommodates transportation demands related to athletic, commencement, and Business School events through police detail traffic control/ management, parking demand management and temporary signage.

2.7 Beyond the IMP Boundary

Harvard has landholdings in Allston beyond the IMP boundary of the Institutional Master Plan. This section provides an overview of this property and provides a set of principles for stewardship and leasing.

OTHER REAL ESTATE

East of Barry's Corner

Much of Harvard's land located east of Barry's Corner and south of Western Avenue and known respectively as "Allston Landing North" and "Allston Landing South," is encumbered by an exclusive easement held by CSX Transportation, Inc. (CSX), the freight railway company. CSX is in the process of relocating its freight railway facilities and operations to locations west of Boston, including Worcester and Westborough. In connection with CSX's relocation, Harvard and CSX have entered into an agreement which outlines the steps necessary to transfer ownership and possession of the CSX site to Harvard over the coming years. It is expected that the transfer of interest will occur in phases. The most immediate parcel which may become available to Harvard is expected to be the Allston Landing North area commonly known as the Romar parcel. It is expected that the Allston Landing South area will be transferred subsequently.

The Work Team's recommendations identified space in Allston Landing North as a possible location for portions of the future Enterprise Research Campus. This area includes parcels located close to Western Avenue and the Science project, Harvard Business School, and the i-lab. Harvard will continue to pursue its interest in assuring that these parcels are viable as future contributors to the Enterprise Research Campus long-term. In the near term, however, Harvard believes these parcels may be used to alleviate potential construction and traffic impact on local streets by providing a location for construction support activities during development projects identified in the IMP. Based on further planning and at the request of the BRA, the proposed IMP boundary described in this IMP has been refined from what was presented in the IMPNF and July 2013 IMP to reflect the addition of a potential Construction Support Area.

Similarly, Harvard will seek to ensure that, in the longer term, the land comprising Allston Landing South remains viable as a location for future development. In the near term, Harvard first will engage the Commonwealth of Massachusetts and, in particular, the Massachusetts Department of Transportation (MassDOT) to discuss its needs to use portions of this area for transportation infrastructure improvements, including improvements relating to the ongoing Boston to Worcester commuter rail expansion and to the maintenance and enhancement of the Mass Turnpike. Harvard, the City of Boston and the Commonwealth of Massachusetts share the overriding goal of providing seamless transportation options to commuters.

West of Barry's Corner

The University also owns a number of properties west of Barry's Corner, mainly located along the western portion of Western Avenue and in the north-south corridor to the west of Everett Street. There are no plans to develop these properties for institutional uses during the term of the IMP. Over the past five years, the University has continued to focus on finding new tenants and active uses for these properties.



Figure 22: Harvard Ownership in Allston (2013)

Since 2009, the occupancy of leasable space in this area has increased from 65 percent to 93 percent (more than 900,000 square feet). The University has signed 24 new leases from 2010 – 2012 and welcomed a variety of businesses and non-profit organizations to the Allston community, including a number of businesses in the area west of Barry's Corner, such as the Boston Boxing Club, Quixote Studios, Mass Motion, Seawall Entertainment, and Jump On In. Harvard's new tenants created approximately 390 jobs in the Allston community from 2010 through 2012.

There are two projects, one underway and the other contemplated, that involve development by non-Harvard parties acquiring land from the University via land exchange or sale in the area west of Barry's Corner. These projects are in various stages of planning and construction and are described below.

- *Charlesview Residences:* In June 2011, Harvard and Charlesview Inc. (Charlesview) closed on a land transfer agreement, which exchanged land at the northeast corner of the Western Avenue/North Harvard Street intersection (the existing Charlesview Apartments) for parcels in and across from the Brighton Mills Shopping Center on Western Avenue. Charlesview, with financing from multiple sources, commenced construction on the new Charlesview Residences in 2011.

- The first phase of the new Charlesview Residences will increase the existing rental housing from 213 to 240 rental units. An additional 100 units of homeownership housing will be developed in a subsequent phase – 20 units south of Western Avenue and 80 units on Telford Street. The new design complements the existing neighborhood and includes significant infrastructure and open space. The first phase of construction is expected to be complete by the late summer or early fall of 2103. The University ultimately will demolish the existing complex after residents move to the new Charlesview Residences at Brighton Mills and Harvard conducts a thorough building survey and abatement and disposes of all building materials in accordance with applicable requirements.

- *Skating Club of Boston:* The Skating Club of Boston (the Skating Club) and Harvard University have completed due diligence and have finalized and executed the land exchange agreement enabling the Skating Club to advance planning and development of a new three-rink facility at 176 Lincoln Street in Allston. The agreement, which involves exchanging the Skating Club's current property on Western Avenue for the University's Lincoln Street property, will enable the Skating Club to build a new state of the art facility, expand offerings to the community, and stay in the Allston-Brighton community. The Skating Club's facility will remain in operation in its current location until construction of the new facility is completed. Prior to the Skating Club relocating to its new facility, Harvard will communicate to the community a plan for the near-term use of the Skating Club of Boston property on Western Avenue and the process through which longer term plans will be established.

Two new open spaces were created and are maintained by Harvard University: the Ray Mellone Park located to the east of the Honan-Allston Library, and a smaller green space located at 108 Holton Street.

STEWARDSHIP PRINCIPLES

The University is committed to responsible property stewardship beyond the boundaries of the IMP Area. Harvard will continue to manage its property consistently, with the goals of maintaining reliable tenants, fostering attractive streetscapes and preserving long-term planning options. In particular, the University will:

- Continue to pursue tenants who contribute to the Long-Term Vision.
- Continue to pursue tenants who favor local employment and might bring additional jobs to the Allston community.
- When current leases expire and new tenancies are considered, be mindful of the best use of the property and explore options that advance beneficial longer term planning goals of the community and Harvard, and that contribute to the vibrancy of the neighborhood.
- Provide an annual update on Harvard leasing and property stewardship.
- Engage in discussions with the BRA and Allston Task Force around Harvard holdings in Allston so that near term opportunities for mutually agreeable improvements are captured while preserving longer term opportunities.

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3.0 Long-Term Vision

3.1 Overview

Harvard's Long-Term Vision is intended to guide campus and community development in Allston for many years. It provides the overarching framework for Harvard's Ten-Year Institutional Master Plan, which is the formal subject of this regulatory submission as presented in the next chapter. The Long-Term Vision (also referred to here as the Vision) is included as planning context, but not for formal regulatory approval.

The Vision comprises a broad planning framework that extends beyond the time frame and geography of the Ten-Year Plan. The Vision focuses on transforming an industrial and commercial area that has been vehicular-oriented, largely impenetrable to pedestrians, paved and impermeable to natural drainage, and lacking significant retail or streetscape amenities and lacking in accessible open space. The Vision proposes a long-term development program that emphasizes new connections in the form of new streets, new open spaces, new pathways, and a revitalized public realm. The purpose of the Long-Term Vision is to create a context for development in which defined urban design principles and guidelines will direct new initiatives in this area.

The Vision includes the rejuvenation of Barry's Corner as an active and animated crossroads between the campus and community; a new ten-acre Greenway anchored by the 1.7 acre Ray Mellone Park which the University constructed and opened in 2011 and extending for a half-mile eastward to the riverfront; the creation of Longfellow Path reaching through the campus and Athletics district to the riverfront; a system of new streets that serve new development and reduce traffic in the local neighborhood and a range of new civic spaces for the use and pleasure of the public.

The Vision is also one of an enhanced environment. Natural drainage and improved infrastructure will help protect the quality of the Charles River. Efficient energy systems will reduce greenhouse gas. A focus on sustainability will include green buildings that target LEED gold ratings. A balanced program of varied and mutually-reinforcing land uses will establish the diversity that shapes a healthy community. And an emphasis on walking, biking and transit will help to minimize vehicular traffic.

This presentation of the Long-Term Vision includes the following components:

- *Planning Principles:* The guiding values and standards that shape the Ten-Year Institutional Master Plan
- *Planning Framework*: Physical planning constructs, including new streets, pedestrian connections, open space, and opportunities for growth and development
- *Design Guidelines*: Public Realm Guidelines that prescribe elements necessary to create a cohesive and sustainable public realm, and Built Form Guidelines that are key to implementing district design objectives
- *Illustrations*: Depictions of the Long-Term Vision in the form of a block plan, an illustrative plan and a three-dimensional rendering

3.2 Planning Principles

URBAN DESIGN PRINCIPLES

High Quality Design

The quality of the campus environment is vital to Harvard's academic mission. Capital projects should strive for the highest possible design merit, respecting Harvard's unique physical character, and strengthening the physical integrity and identity of the campus and the Allston neighborhood.

Diversity of Harvard's Campus

New development should continue the tradition of a campus that is as diverse architecturally as it is academically, allowing for varied scales and materials. Vertical elements and landmarks should be included to mark special functions and key focal points. Development should strengthen the qualities that make the campus unique and also reinforce patterns and traces of history, while simultaneously meeting contemporary needs.

Heritage

Plans should acknowledge the heritage of the area by incorporating historical references, maintaining view corridors, and featuring and preserving landmarks.

Open Space

Landscape is an important element which helps to define the character of the campus and public realm. Early planning should frame courtyards, quadrangles and other open spaces that will in time form the campus. It should also enhance landscape function to minimize the impact on ecosystems and water resources, reduce drainage impacts of projects, and improve the quality of stormwater management as it impacts the Charles River.

Public Realm

Publicly accessible open spaces and streets shape the physical setting in the campus and public realm. Plans should enhance the quality of the public realm to create great streets and memorable places. Plans should provide for clear, porous, and welcoming edges, and for activity and common spaces at the campus perimeter.

- *Western Avenue:* Project facades should be oriented toward Western Avenue. Western Avenue from Barry's Corner east to the river should be considered as a distinct urban corridor.
- *North Harvard Street:* The Anderson Bridge corridor is comprised of portions of JFK Street and North Harvard Street. The corridor is anchored by Harvard Square in Cambridge and by Barry's Corner in Allston. The length of this important corridor is less than a mile long and includes a rich variety of land uses that could play important future roles in improving the walk between Harvard Square and Barry's Corner. Pedestrian safety, comfort and interest along North Harvard Street should be improved.

TRANSPORTATION & STREETS PRINCIPLES

Integrated Transportation Network

Plans should provide for an integrated transportation system to serve all modes, including walking, biking, shuttle bus, transit, and automobile use. They should strive to improve access and quality of life, while reducing greenhouse gas emissions and congestion by planning for non-automobile transportation options.

Complete Streets

Streets help to define the character of the built environment and are the common ground where people travel, meet and do business on a daily basis. Street design will be informed by the City of Boston's Complete Streets approach to build road networks that are safer, more liveable, and welcoming. Plans should emphasize green design elements that promote an environmentally sensitive, sustainable use of the public right-of-way, and should utilize smart technologies to create efficient streets that maximize technological advances.

Mobility Hubs

Infrastructure from multiple modes in close proximity should be integrated with information technology to facilitate effective transportation choices. Plans should provide for transportation nodes as comfortable public spaces with bus and shuttle stops, incorporating physical comforts for users located near building lobbies and other key locations.

Parking

Transportation requirements of planned projects should be addressed with appropriate levels of parking without encouraging auto travel. Plans should reduce demand for parking through Transportation Demand Management, use available parking in existing supply to transition to lower parking ratios, create new on-street spaces to meet short-term parking demand, and take advantage of shared parking opportunities.

Connectivity

The livability of the area is enhanced by improving the pedestrian environment and introducing a mix of interconnected experiences. Plans should serve to link previously separated sites, break down large superblocks into more porous pedestrian oriented places, connect the University, community and Charles River, and enhance the campus relationship to points south and west.

SUSTAINABILITY PRINCIPLES

Energy and Climate Change

Progress on reduction of greenhouse gas emissions should be continued. Reduce vulnerability to climate change impacts including natural hazards by integrating climate change adaptation into planning and project design.

Continuous Improvement

Foster a transition toward sustainability. Pursue continuous improvement in:

- Demonstrating institutional practices that promote sustainability, including measures to increase efficiency and use of renewable resources, and to decrease production of waste and hazardous materials, both in Harvard's own operations and in those of its suppliers.
- Promoting health, productivity, and safety of the University community through design and maintenance of the built environment.
- Enhancing the health of campus ecosystems and increasing the diversity of native species.
- Developing planning tools to enable comparative analysis of sustainability implications and to support long-term economic, environmental, and socially responsible decision-making
- Encouraging environmental inquiry and institutional learning throughout the University community.
- Establishing indicators for sustainability that will enable monitoring, reporting and continuous improvement.

Green Building

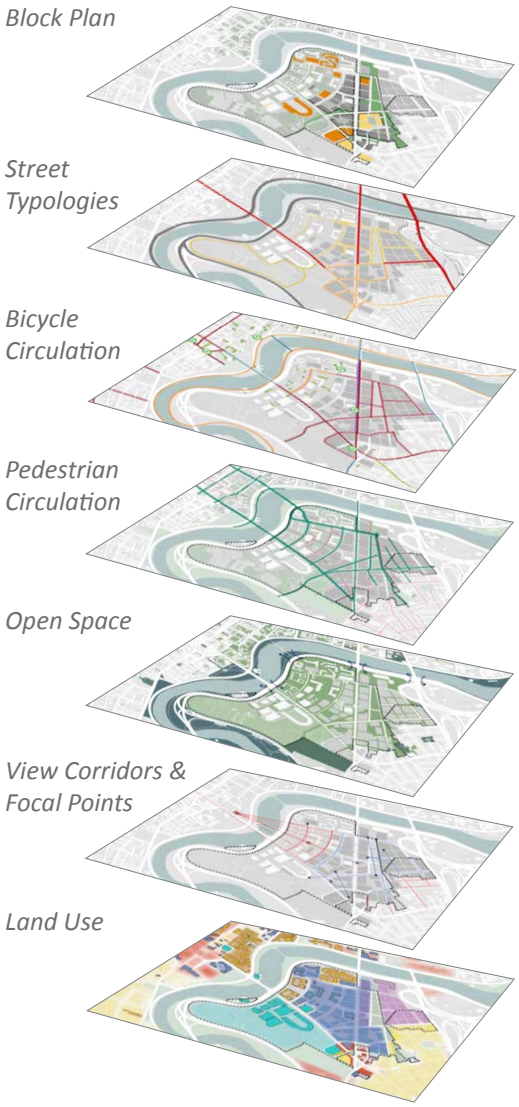
The following principles are derived from the intents of the U.S. Green Building Council's LEED rating system, and have been tailored to be specific to local conditions:

- *Sustainable Sites*: Minimize the impact on ecosystems and water resources. Reduce drainage impacts of the projects, and improve the quality of stormwater management as it impacts the Charles River.
- *Water Efficiency*: Promote smart use of water, inside and out, to reduce potable water consumption
- *Energy & Atmosphere*: Promote better building energy performance through innovative strategies
- *Materials & Resources*: Use sustainable building materials and reduce waste
- *Indoor Environmental Quality*: Promote better indoor air quality and access to daylight and views
- *Smart Location & Linkage*: Promote walkability with efficient transportation options and open space
- *Neighborhood Pattern & Design*: Emphasize compact, walkable mixed-use neighborhoods with good connections to nearby communities
- *Green Infrastructure & Buildings*: Reduce the environmental consequences of the construction and operation of buildings and infrastructure

Sustainability is an intrinsic part of the Ten-Year and Long-Term Plan. Discussion specific to the topic can be found in Chapter 6.0, Technical Reports.

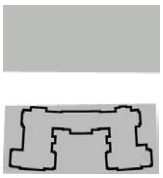
3.3 Long-Term Planning Framework

Layered together, the drawings that follow illustrate a Long-Term Vision for Harvard University's campus in Allston. This Vision provides generalized and flexible parameters to guide the build out of other Harvard landholdings in the longer-term. The geographic area of the Long-Term Vision includes the IMP area plus additional acreage, primarily to the south of Western Avenue. It represents planning concepts, including new streets, pedestrian connections, open space, and opportunities for growth and development that go beyond the ten-year timeline. The Long-Term Vision informs the Ten-Year Plan, ensuring that planning and development in the next decade is consistent with and guided by a longer term vision. This Long-Term Vision is provided for context only and is not submitted for approval under the institutional master planning regulations.



LONG-TERM BLOCK PLAN

The Long-Term Block Plan, organized by streets, paths, and open spaces, breaks down existing impenetrable areas into a system of development blocks that guide future incremental growth. The blocks identify sites within which one or more buildings will be developed in the future. Each site can accommodate a variety of building footprints, perimeter open space, courtyards and quadrangles. The block plan allows for a mix of building types and scales to coexist in Allston. The Illustrative Plan depicts one way in which the blocks might be developed over time.



Blocks illustrate development envelopes. Buildings would be designed within these blocks as time progresses. One block may be developed with one building, or multiple buildings.

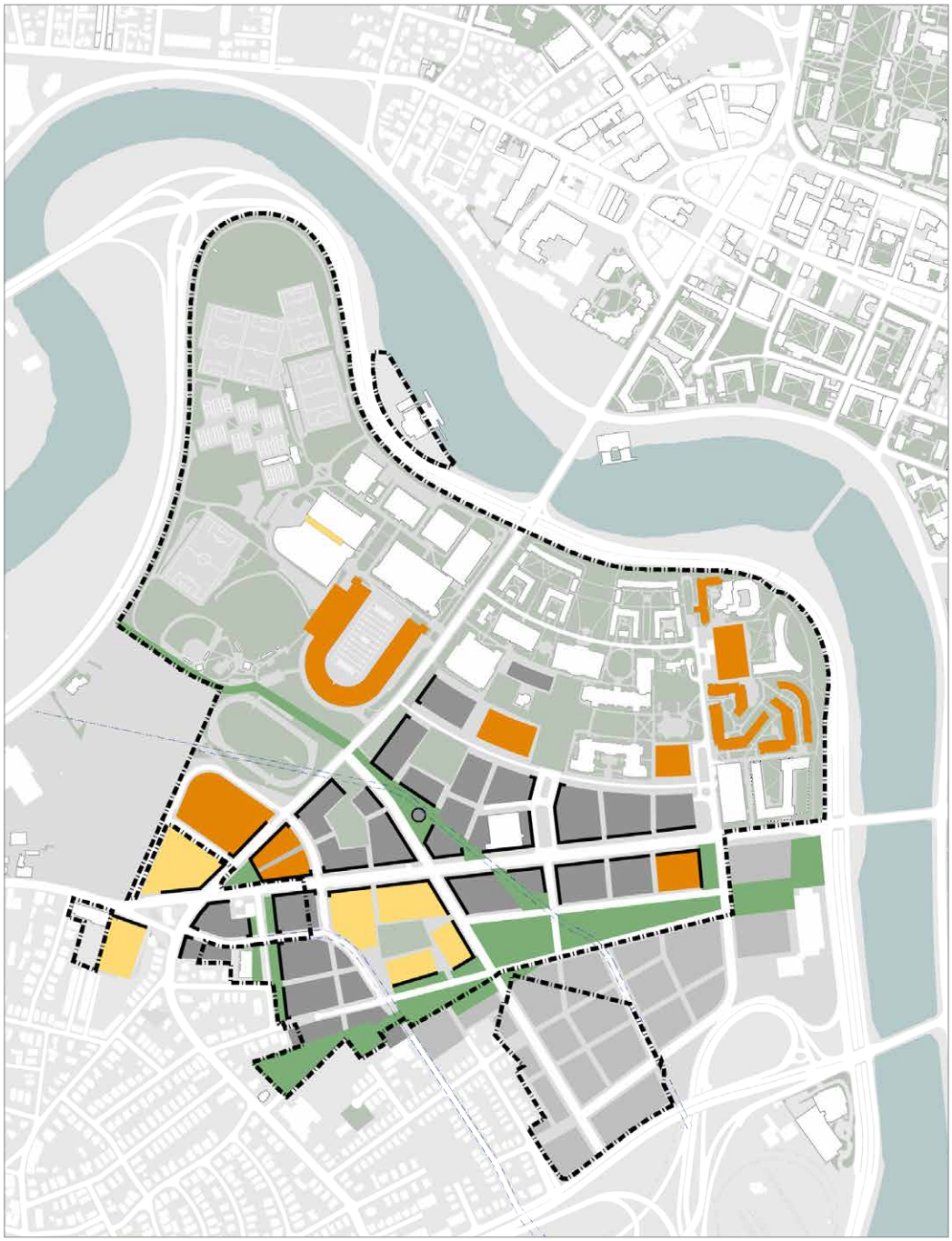


Figure 23: Long-Term Block Plan

LONG-TERM ILLUSTRATIVE PLAN

Figure 24 depicts the Long-Term Illustrative Plan. The footprints depicted illustrate one potential way that the Long-Term Block Plan might be developed. Illustration of buildings beyond the time frame of the IMP provide context to projects proposed in the Ten-Year Plan. Red lines indicate important axial alignments.



Figure 24: Long-Term Illustrative Plan



Figure 25: Long-Term 3D View Northeast



Figure 26: Long-Term 3D View Southeast

LONG-TERM STREET TYPOLOGIES

The hierarchy envisioned for potential future campus streets in Allston is depicted in Figure 27. The street framework incorporates the City of Boston's vision for Complete Streets, emphasizing the character of the entire street rather than traditional road classifications emphasizing vehicle movements. The Ten-Year Plan identifies segments of campus streets that are related to proposed projects and will therefore be built within the IMP time frame. This Long-Term Vision seeks to achieve the following:

- Increase permeability by creating a new north-south connector road, "Stadium Way," and a set of local, campus streets that enhance mobility and circulation by all modes
- Reflect and respect the fine-grain street network of the adjacent residential neighborhood, providing better connections to activities in Barry's Corner and important open spaces
- Improve transit access by creating new pathways to bus stops and integrating shuttle bus circulation needs into the local street network



Figure 27: Long-Term Street Typologies

Note: Street names are illustrative only; It is anticipated they may be renamed in the future.

LONG-TERM PEDESTRIAN CIRCULATION

The Long-Term Vision seeks to extend walkable patterns south into new areas of campus and the residential neighborhood in North Allston by creating a pedestrian-scale block pattern. The goal is to strengthen connections to adjacent neighborhoods by bridging areas that are currently mostly impenetrable to pedestrians. Figure 28 illustrates existing and proposed pedestrian routes, creating a ladder pattern. North-south spines connect the Harvard campus in Cambridge and Allston. Campus and local streets, "rungs," establish a rhythm of blocks, while path networks provide internal pedestrian circulation. Included in this drawing is the long-term concept for "Longfellow Path", a pedestrian connection that would thread together the Greenway, Smith Field, Harvard Athletics, and the Charles River, running along the sewer easement from North Harvard Street northwest (ultimately to Soldiers Field Road) and southeast (ultimately to the Enterprise Research Campus).

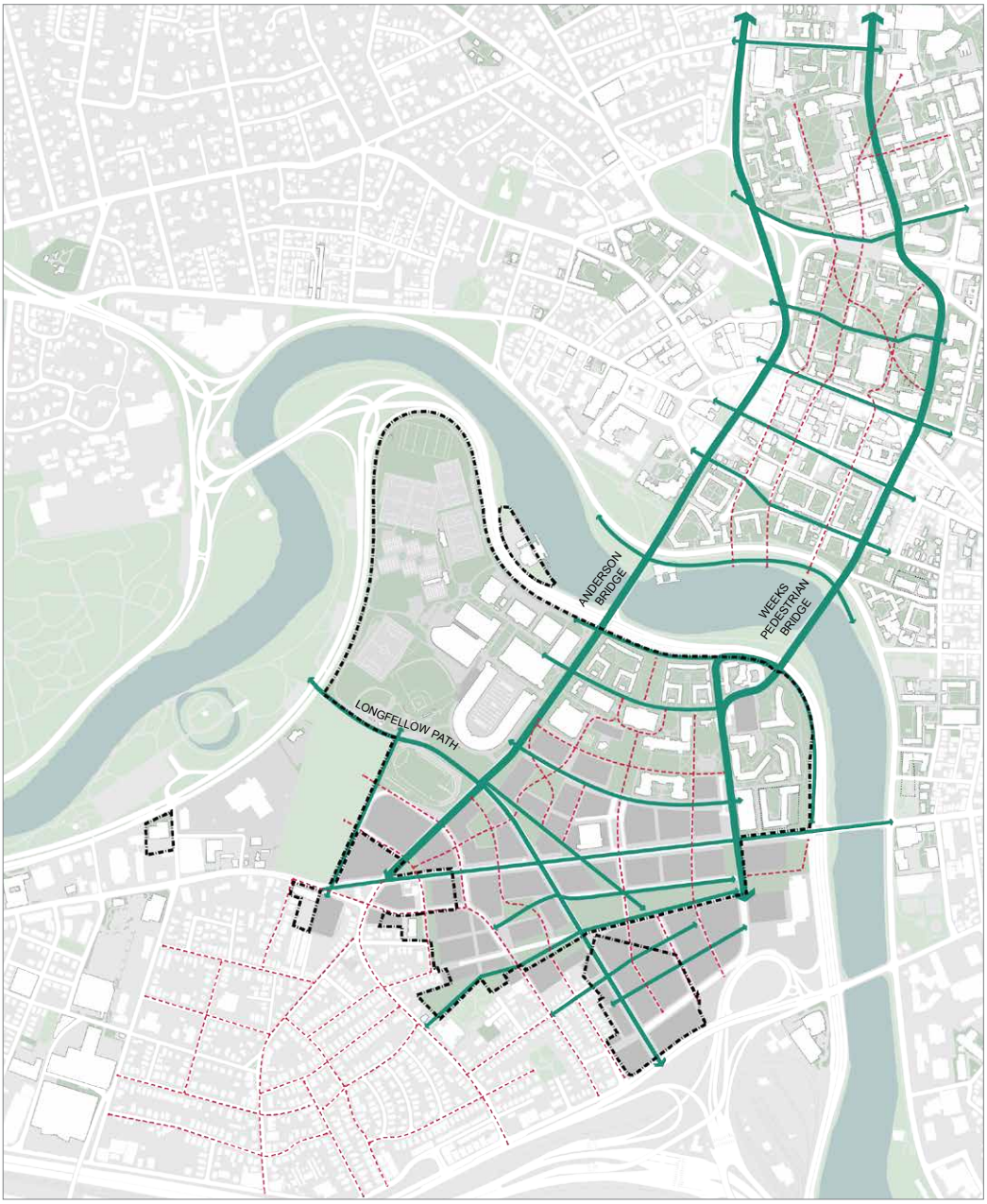


Figure 28: Long-Term Pedestrian Circulation

LONG-TERM BICYCLE NETWORK

A mix of bike lanes and paths are envisioned to be integrated into the growing public bicycle network. Harvard has worked with the cities of Boston and Cambridge as well as MassDOT to develop and implement new bike lanes in Allston and on the Anderson Bridge.

The Long-Term Vision builds on recent public investments that include a new north-south bicycle link from Cambridge Street to Soldiers Field Road, Stadium Way and Longfellow Path create the opportunity for another north-south connection to the River while the Greenway and its adjacent streets will add new east-west bicycle facilities. Improvements to Western Avenue create the opportunity to upgrade the existing cycle track.

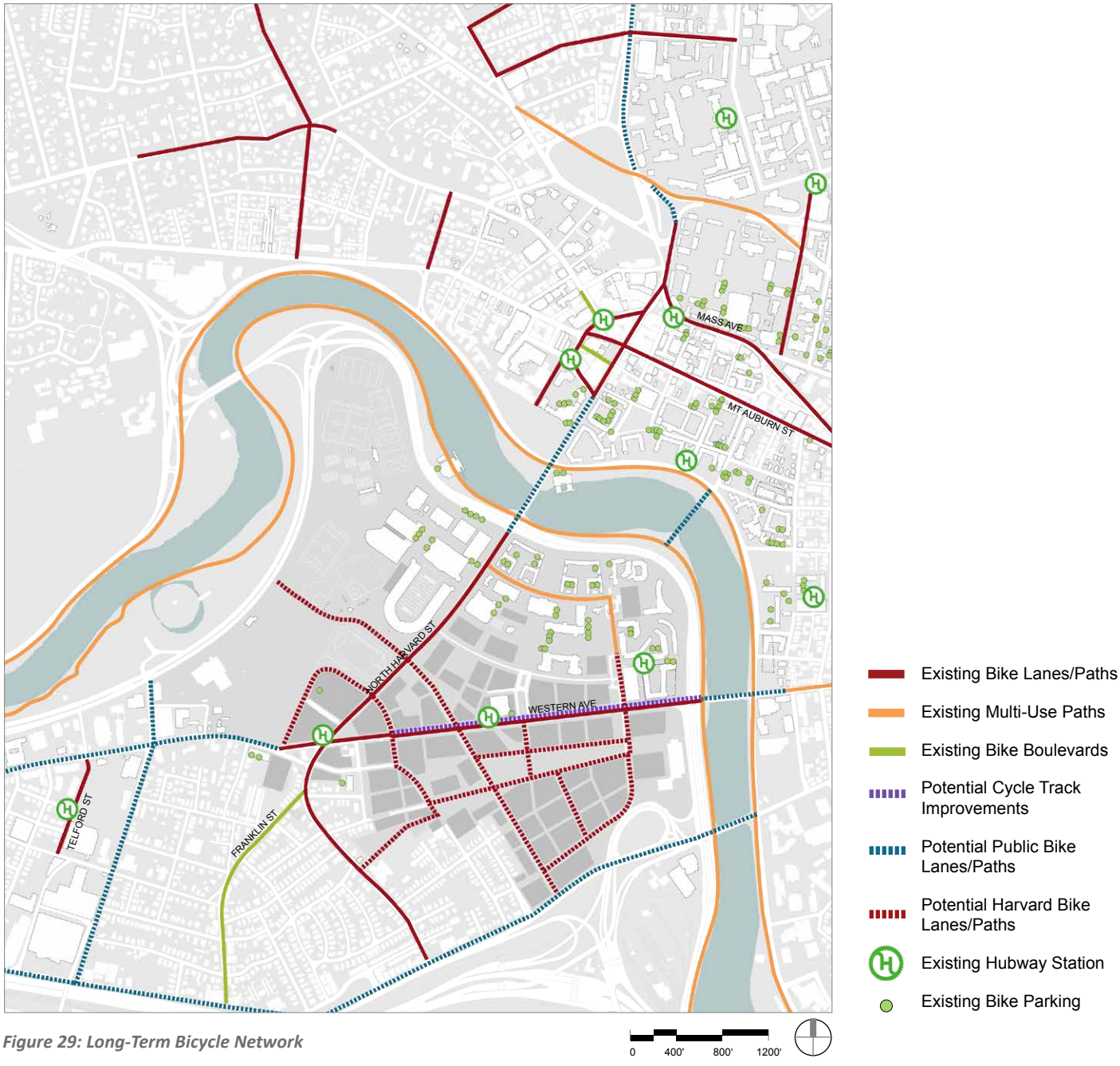


Figure 29: Long-Term Bicycle Network

LONG-TERM CAMPUS OPEN SPACE

Together with the streets, the potential open spaces provide the framework for Harvard's campus in Allston and its connection with the North Allston residential neighborhood. These spaces would allow Harvard and the community to meet, work, and play within a welcoming system of green spaces. The Plan maintains the Soldiers Field Athletic Complex west of North Harvard Street and envisions new quadrangles as the organizing elements of future academic expansion on the existing Charlesview and Ohiri Field sites.

The University sees an opportunity to begin greening this area once the Charlesview Apartments are taken down. Harvard is committed to preserving and enhancing the grove of trees at Barry's Corner. Work sessions led by the BRA with the Allston Task Force have suggested shifting the focus of Barry's Corner away from the intersection eastward toward the grove of trees. This idea reinforces the concept that Barry's Corner will be a central place for people to meet and interact. The wooded open space is comparable in size to Cambridge's Winthrop Square and could become a vibrant, informal gathering space for members of the Allston and Harvard communities. The Grove is further described in the Barry's Corner District section.

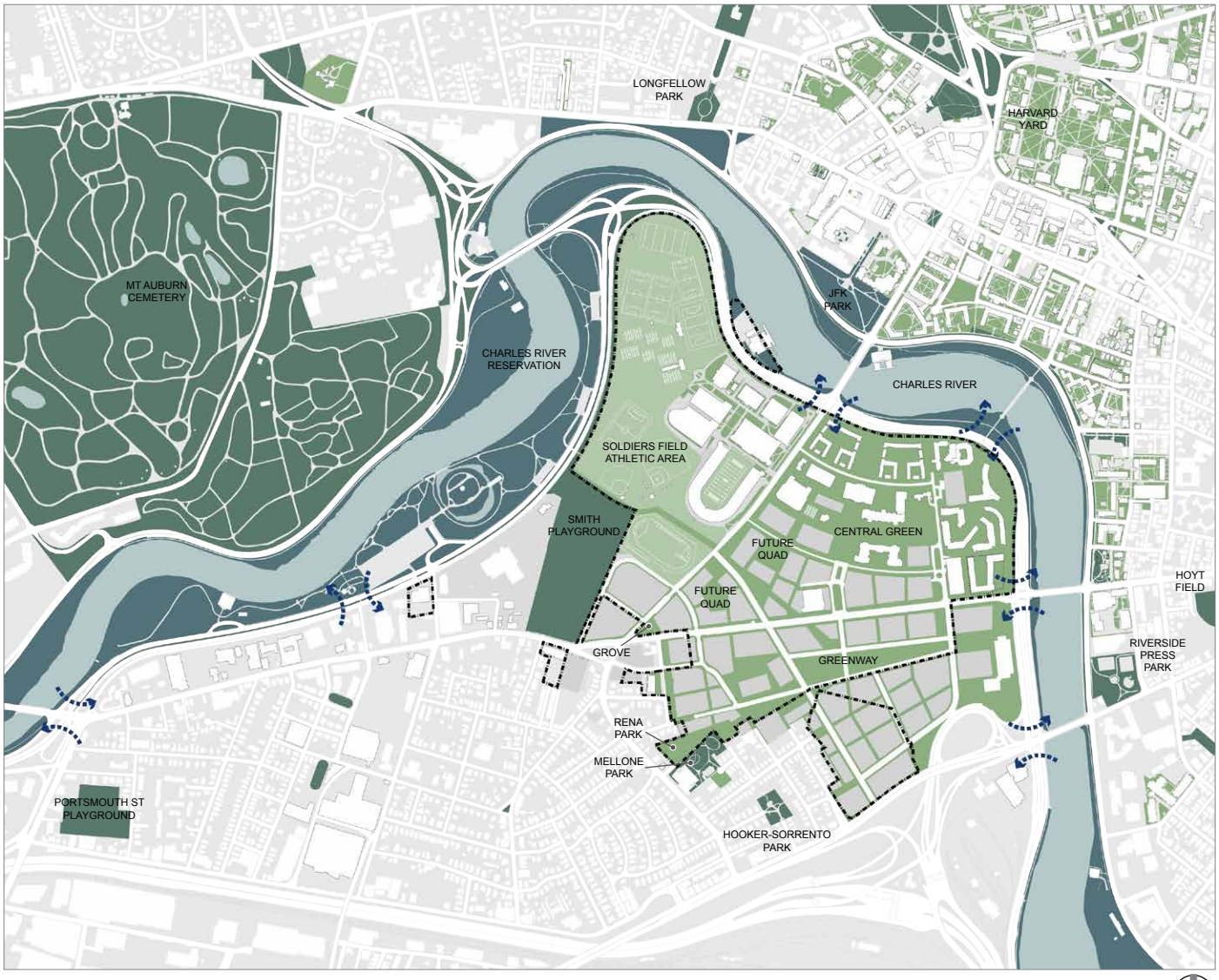


Figure 30: Long-Term Open Space

Harvard's 2007 IMPNF proposed a large centralized quadrangle south of Western Avenue in the area currently proposed for the Greenway. As compared to the 2007 plan, the current Greenway reflects a significant shift toward open space as a connector rather than solely as an interior campus amenity. As part of the Long-Term Vision the Greenway will extend more than one half mile from Ray Mellone Park toward the River, comprising approximately 10 acres of publicly accessible open space.

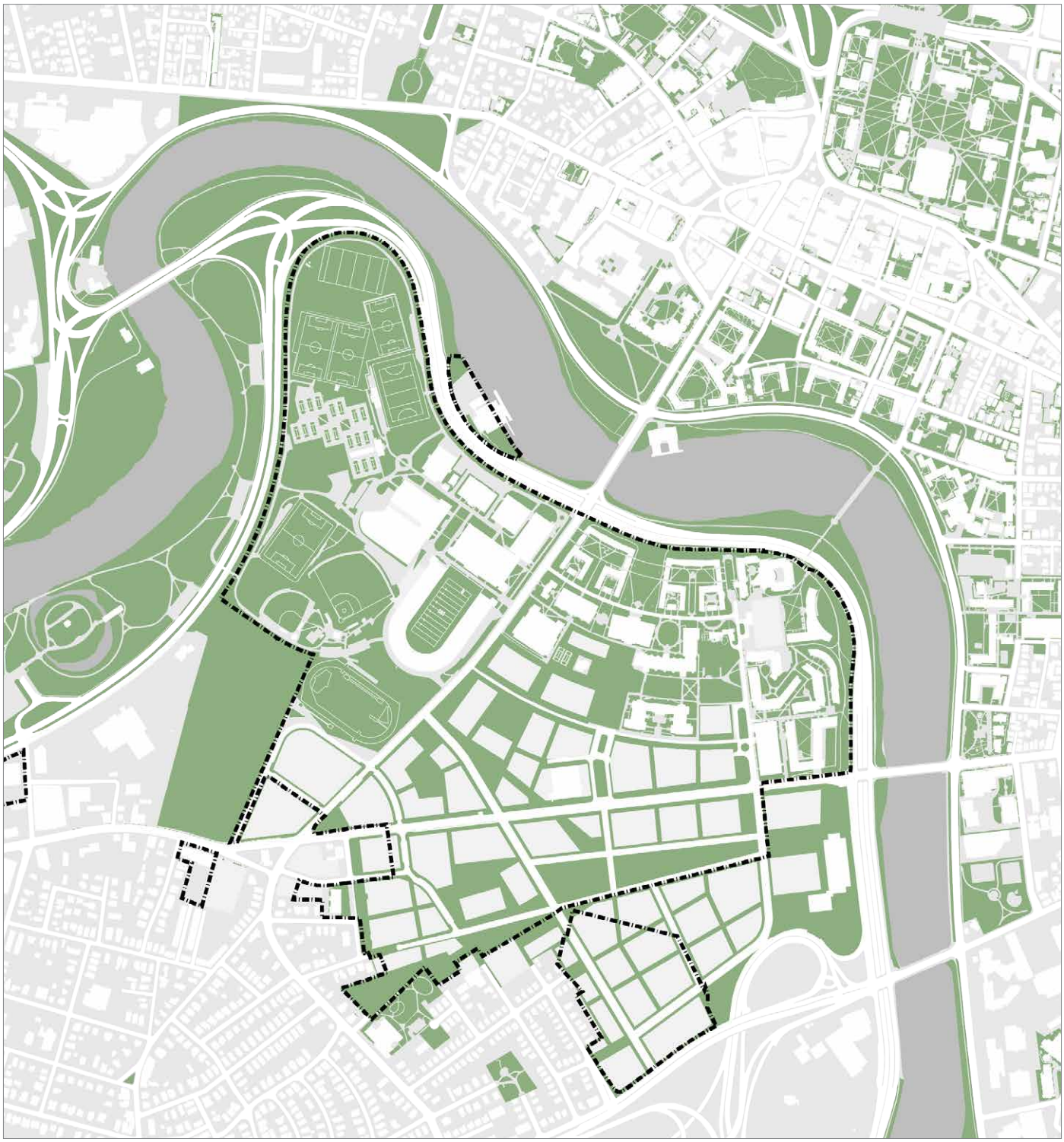


Figure 31: Long-Term Open Space Network

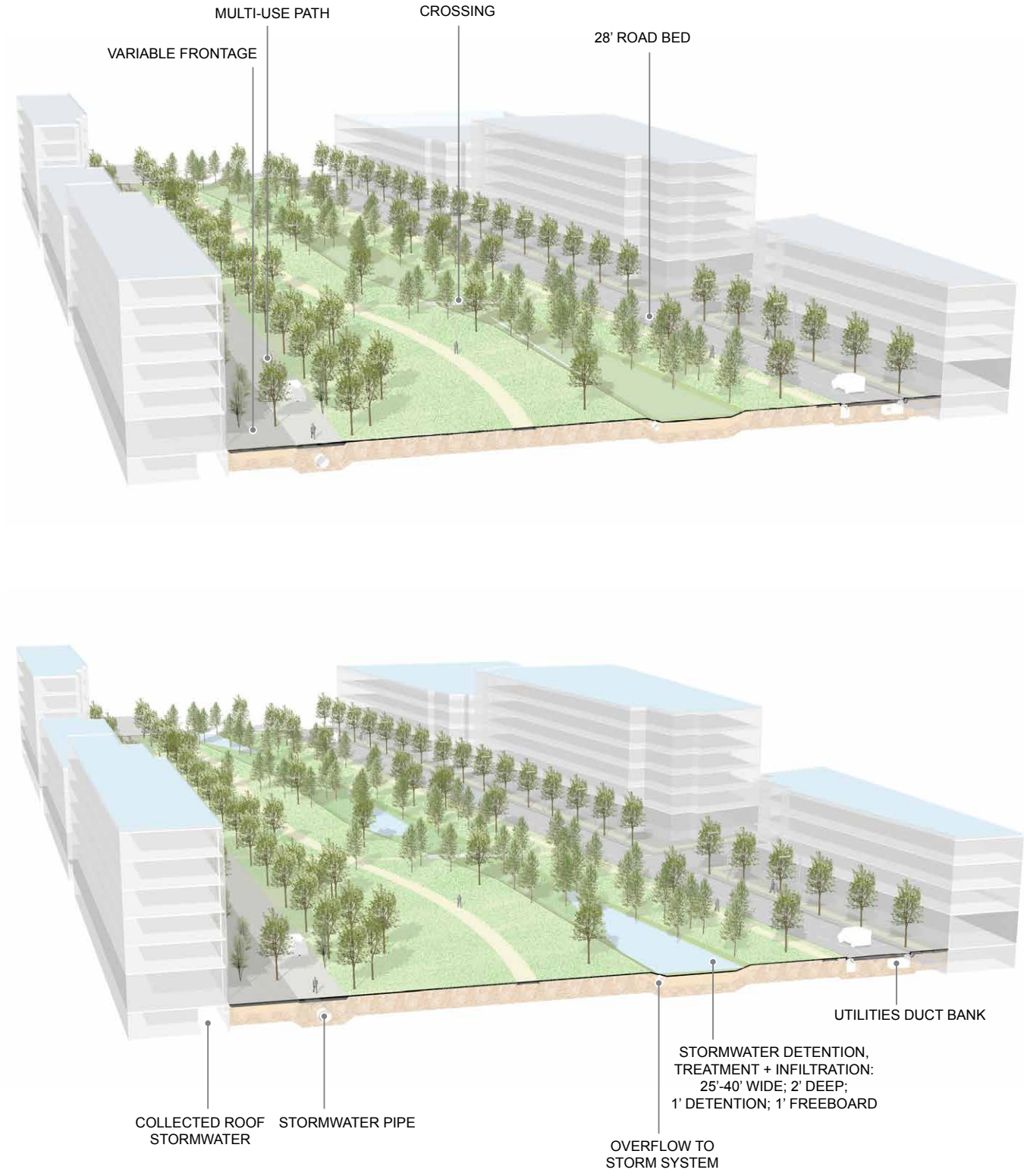


Figure 32: Long-Term Greenway Illustrative Cross Sections: Dry and Storm Conditions

Greenway

The proposed Greenway, a complex linear working landscape, organizes adjacent urban design, infrastructure, sustainability and open space aspects of the Long-Term Vision. As an urban design strategy, the Greenway provides a positive, active landscape backbone to the Science and Enterprise district, shaping the streets, building frontages, and opportunities for varied landscape spaces. As a long-term infrastructure corridor, it shapes logical and efficient routes for energy and communications and transportation networks that promise to sustain the district's full build-out. As a civic landscape, the Greenway provides a living connective tissue – a continuous park-like setting that joins residential neighborhoods, parks, public facilities, and campus spaces with the regional recreation, pedestrian and bicycle circuits along the Charles River Reservation.

Contributing to long-term sustainability, the location and shape of the proposed Greenway builds on existing utility and drainage systems. While there is no compelling upland/lowland distinction topographically, and while there are significant remains from past uses that must be recuperated over time as constraints on former land uses evolve, utilities required to service aspects of the Science and Enterprise District in the near term can be efficiently placed along Hague Street. The proposed alignment of the Greenway defines a continuously varied landscape space that will support below-grade storm and sewer lines; it will allow sufficient wet/dry above-grade capacity for stormwater conveyance, storage, and treatment capacity for the long-term build-out.

Like all high-performance urban landscape projects, the Greenway will evolve through adaptation and adjustment over time. Today, except for the completed Mellone Park and the upcoming improvements to the proposed Rena path, the sites that will make up the future Greenway are primarily paved, displaying degraded urban fill conditions in many areas.

The IMP includes the Greenway in the Long-Term Vision context because the timeline for actual completion of the green space relies upon a number of factors, including in particular the completion of projects in adjacent areas. The land is reserved for the Greenway and planning has begun for the first piece of the connective green space located in the Rena Street corridor between Rena Street and the Science project.

Harvard proposes that the segments that comprise the Greenway ideally should be created as buildings developed along the length of the Greenway. One parcel which is likely to also occur during the Ten-Year IMP is the Hotel and Conference Center. Development of this project would incorporate another piece into the Greenway connection. Similar portions will be created as projects come on-line.

In conjunction with the BRA and the Task Force, Harvard will explore strategies to implement elements of the proposed Greenway in at least an interim condition. This study will be carried out in 2014.

The implementation schedule for the full Greenway may extend beyond the Ten-Year IMP. Before CSX, the current holder of the exclusive railroad easement encumbering the Allston Landing North area, may transfer control of this land to Harvard, CSX must complete agreed-upon environmental testing and remediation.

Therefore, as Rena Park is shown to be completed during the term of the IMP, the full build-out of the Greenway is included in the Long-Term Vision so that it can be viewed as such and remains the subject of further discussion within the University and with the City and neighborhood.

LONG-TERM VIEW CORRIDORS AND FOCAL POINTS

The Long-Term Vision is shaped by existing axial alignments, view corridors and focal points. Illuminated bridges and towers glowing over the tree line serve to physically identify Harvard University and to orient pedestrians. In Allston, Baker Library was designed to serve as the visual and intellectual focal point of the McKim, Mead and White-designed historic campus. The axial alignment with Eliot House maintains Baker Library as a focus point and has continued to guide development in Allston. The plan foresees possible opportunities for new landmarks and focal points.

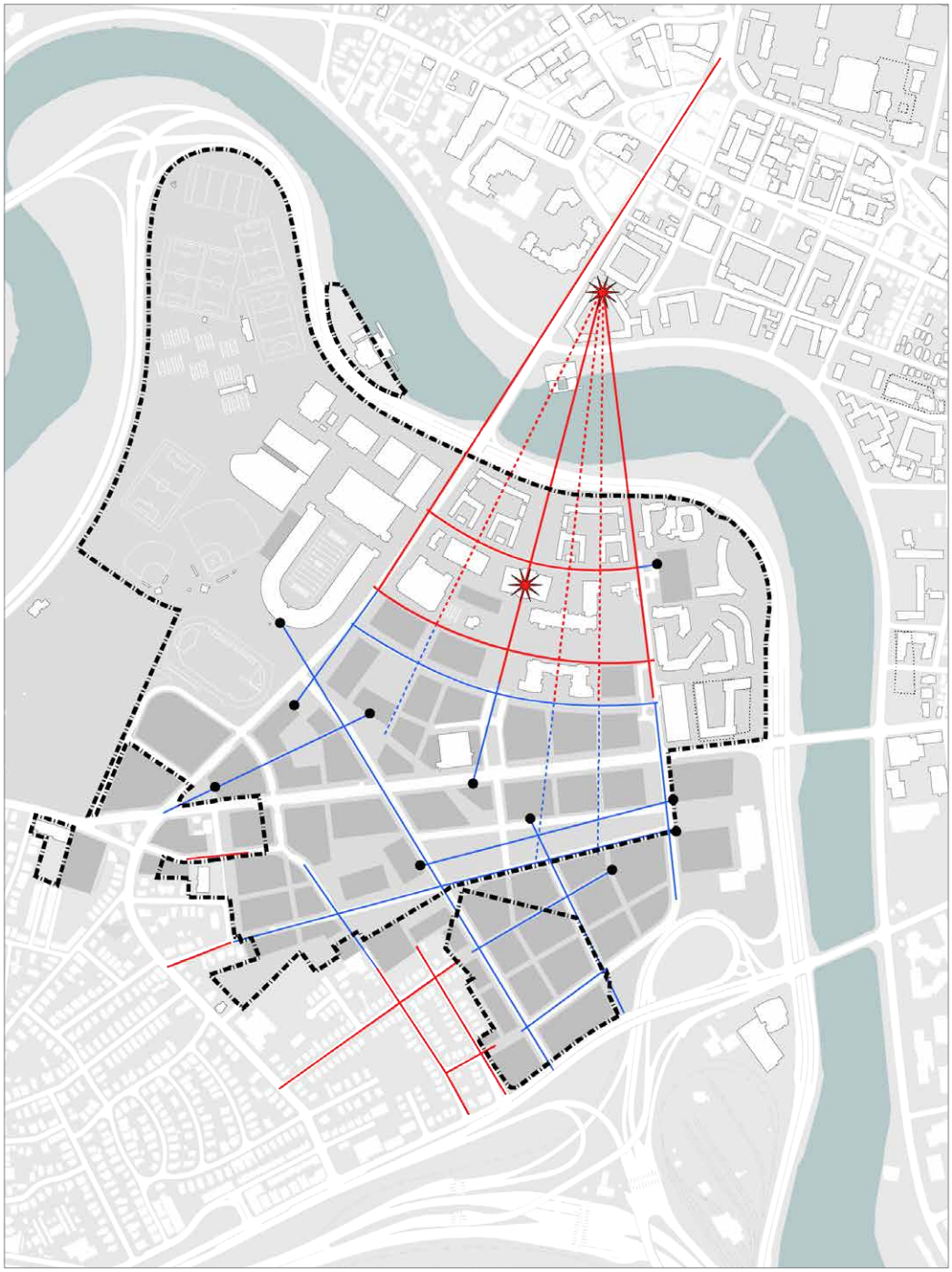


Figure 33: Long-Term View Corridors & Focal Points

LONG-TERM LAND USE

A generalized pattern of planned long-term land use is depicted in the accompanying diagram. Core institutional uses are shown in blue, extending through the former Charlesview site to Barry's Corner in accordance with Harvard's Work Team recommendations, which stated that the University should enable academic growth by preserving land adjacent to the existing campus. To the south, also consistent with the Work Team recommendations, is an area shown in purple and designated as the future Enterprise Research Campus, planned as a collaborative community for business, investment capital, research and science development. Just south of Western Avenue is an area shown as striped blue and purple, indicating a potential mix of institutional and Enterprise Campus development. In Barry's Corner, red is used to depict areas designated for active ground floor use.

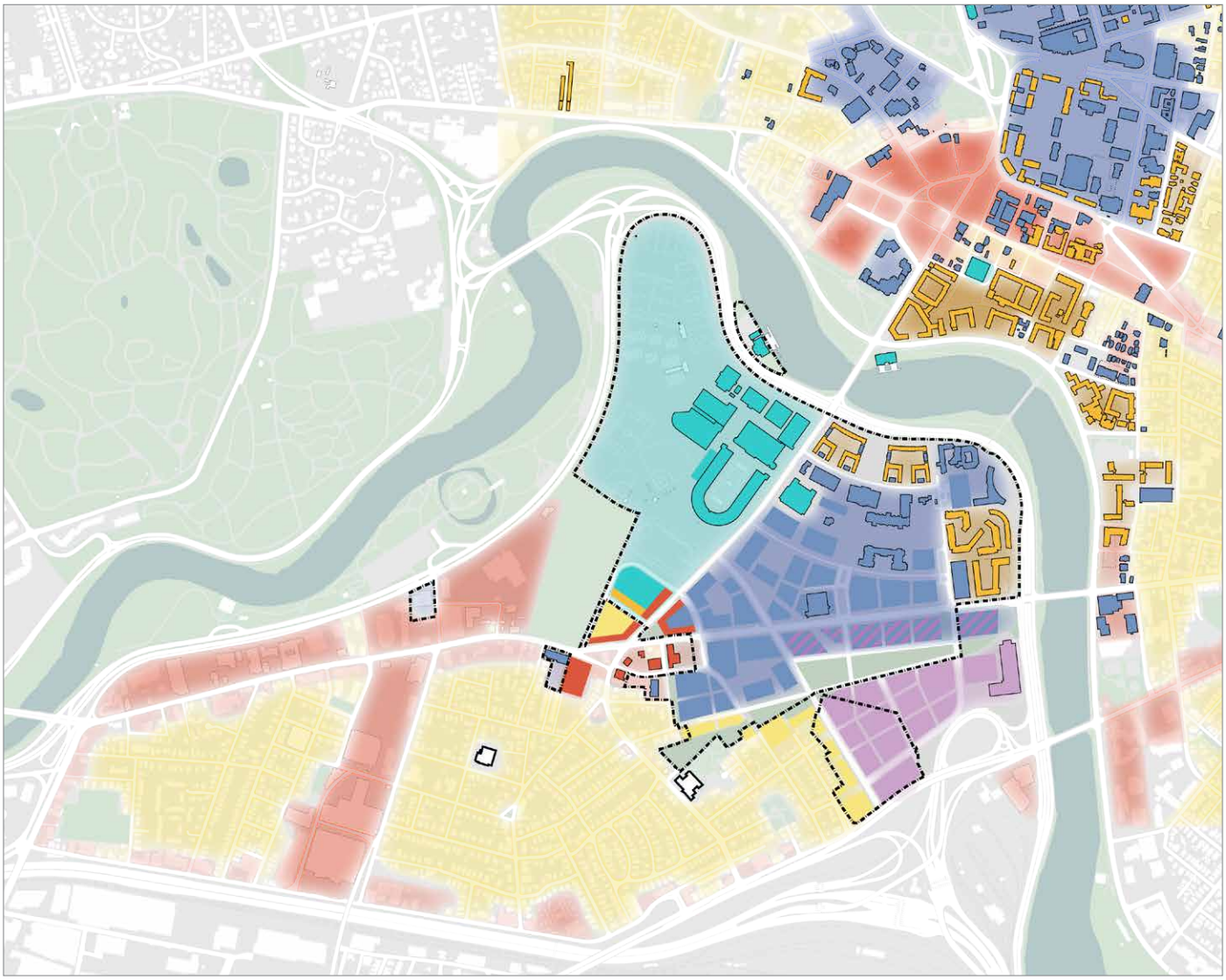


Figure 34: Long-Term Land Use

3.4 Design Guidelines

DESIGN GUIDELINES OVERVIEW

The drawings and guidelines that follow are intended to direct building and public realm improvements over time. The goal is to create a unified yet diverse environment and influence the design process of individual projects. To achieve this balance, guidelines focus in two areas – built form and public realm.

Built Form Guidelines focus on elements of the built form which are key to implementing district and plan design objectives. A form-based approach addresses the relationship between building facades and the public realm, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks. Guidelines are provided for:

- Build-to-lines.
- Building heights.
- Ground floor uses.

Guidelines do not include standards for building materials, fenestration, or style. Individual projects will continue to be held to high standards through Harvard's internal processes and by the review of individual projects by the Boston Redevelopment Authority and by the Boston Civic Design Commission (BCDC) as appropriate.

Public Realm Guidelines prescribe elements which are necessary to create a cohesive and sustainable public realm. Principles follow those of Boston's Complete Streets Guidelines, which state that streets should be sensitive to their context, recognized as an essential component of public spaces, supportive of multiple functions and encouraging of non-motorized uses.

A hierarchy of street typologies is the organizing element of the Public Realm Guidelines. Typical roadway and sidewalk sections prescribe dimensional guidance. Guidance is provided for components of the pedestrian realm, networks (pedestrian, bicycle and transit), landscape function, establishment of an urban tree canopy, paving materials and lighting.

HARVARD DESIGN REVIEW PROCESS

Harvard conducts a design review process for capital projects and physical plans in consultation with faculty deans and department directors. Design Review is intended to promote a healthy dialogue concerning buildings, landscape and development of the campus. The process seeks to ensure that proposed capital projects and physical plans are of the highest possible design merit; that they respect Harvard's unique physical character; that they enhance the relationship between the University and the neighborhood; and that they strengthen the physical integrity and identity of the campus.

The design review panel provides advice to the project sponsor as well as the University leadership on the design of capital projects and physical plans. It was created to affirm Harvard's commitment to – and collective responsibility for – achieving design excellence in capital projects and physical plans and to establish a uniform and consistent framework for planning and design.

BUILT-FORM GUIDELINES

The drawings that follow are diagrams, not designs. The intention is to give parameters that implement plan principles and contextual sensitivities while still allowing for design flexibility. In order to provide context for near-term projects, these guidelines also apply to sites that will be developed beyond the time frame of the IMP.

Build-To Lines

These guidelines position and configure individual buildings, open spaces and circulation routes together in a coordinated way. Definition of building edges, or build-to lines, will allow cohesive development to be implemented over time, encourage diversity of architectural form, material and style, while ensuring that a strong building wall will define the edge conditions of the public realm. Where appropriate, landscape elements may be used in place of a build-to line to hold the street edge and define space.

Category 1 - Strongest Adherence
Strong adherence is recommended to the build-to lines articulated in Figure 35. These planning parameters establish the planes of the building facade that will form the urban edge of the public realm and ensure continuity of the street wall. A limited number of major breaks and projections are encouraged to enhance the streetscape and create diversity along the frontage of the block. Major breaks should be used to separate a building or buildings into distinct massing elements and assist in defining convening areas.

Category 2 - Recommended Adherence
This zone recommends adherence to the build-to lines to the greatest extent feasible. Greater flexibility is allowed in this zone, including major breaks between buildings and projections, as described above.

Category 3 - No Build-To Line / Adherence Not Required
Adherence to the build-to lines in this zone is not critical to the establishment of open space or streetscapes. Deviation from the blocks/site boundaries as drawn should consider larger impacts on circulation routes and open space typologies identified in the plan.

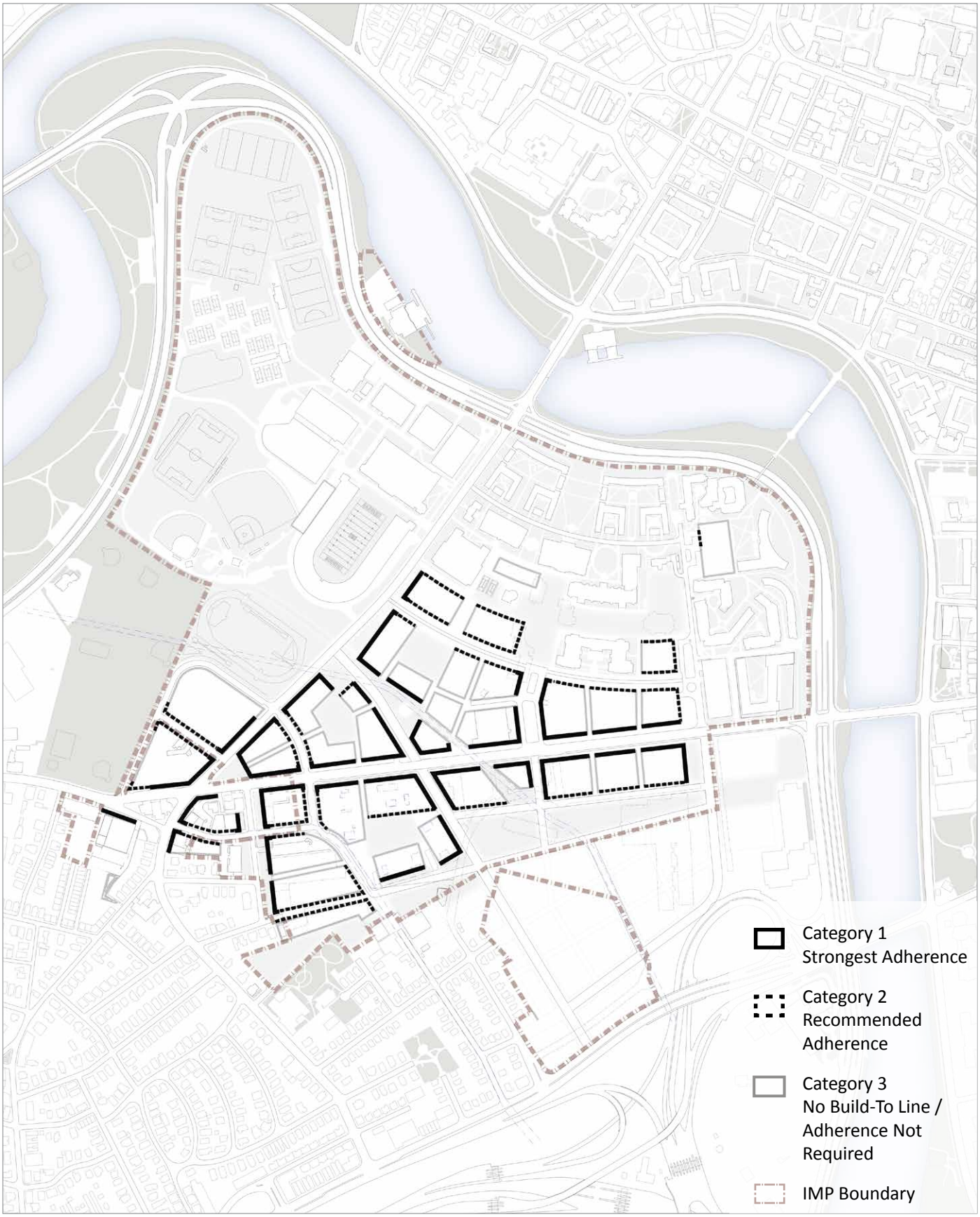


Figure 35: Long-Term Build-to-Lines

Building Heights

In regard to height, buildings should:

- Respect the scale and pattern of the existing Allston neighborhood and campus buildings.
- Support outcomes for density.
- Use recess lines and set-backs to define the enclosure of public space and create transitions to adjacent low-scale buildings.
- Optimize daylight and consider impact of shadows on the public realm.
- Provide for landmark elements and focal points along visual axes.
- Provide opportunities to maintain and enhance views to significant historic structures and to the Charles River.
- Provide variability in the skyline. While in street wall situations it is desirable to relate architectural elements for new construction to significant elements on adjacent buildings, building height does not necessarily need to be uniform from one building to another.
- Minimize monolithic massing and break down the scale of large buildings.
- Express the base, middle, and top for tall buildings.

Building height guidelines are illustrated in Figure 36.

Category 1 (maximum 55')
Height in this zone is intended to align development with the existing context of the Allston neighborhood and the historic McKim, Mead, and White designed campus. Careful attention should be given to the proper grafting of scale and pattern of new development to the existing context.

Category 2 (maximum 70')
Development within this zone is intended to create a sense of density and urbanity. Greater allowable height is combined with a stricter adherence to the build-to lines to create a stronger urban zone. Careful attention should be given to the proposed massing to ensure that for the majority of the day sunlight reaches the streetscape or open space that the development fronts.

Category 3 (maximum 120')
This zone allows for greater height to realize urban design goals and create active, well-populated streets. Recess lines and set-backs are recommended to minimize the impact of greater height on the character of the ground plane.

Category 4 (maximum 190')
This zone allows for significant height. Recess lines and set-backs are recommended to minimize the impact of greater height on the character of the ground plane.

Focal Point Opportunity
Locations for new landmarks and focal points are recommended. The locations are directed by axial alignments and view corridors. These focal points may include vertical elements (much like steeples) that may exceed these heights.

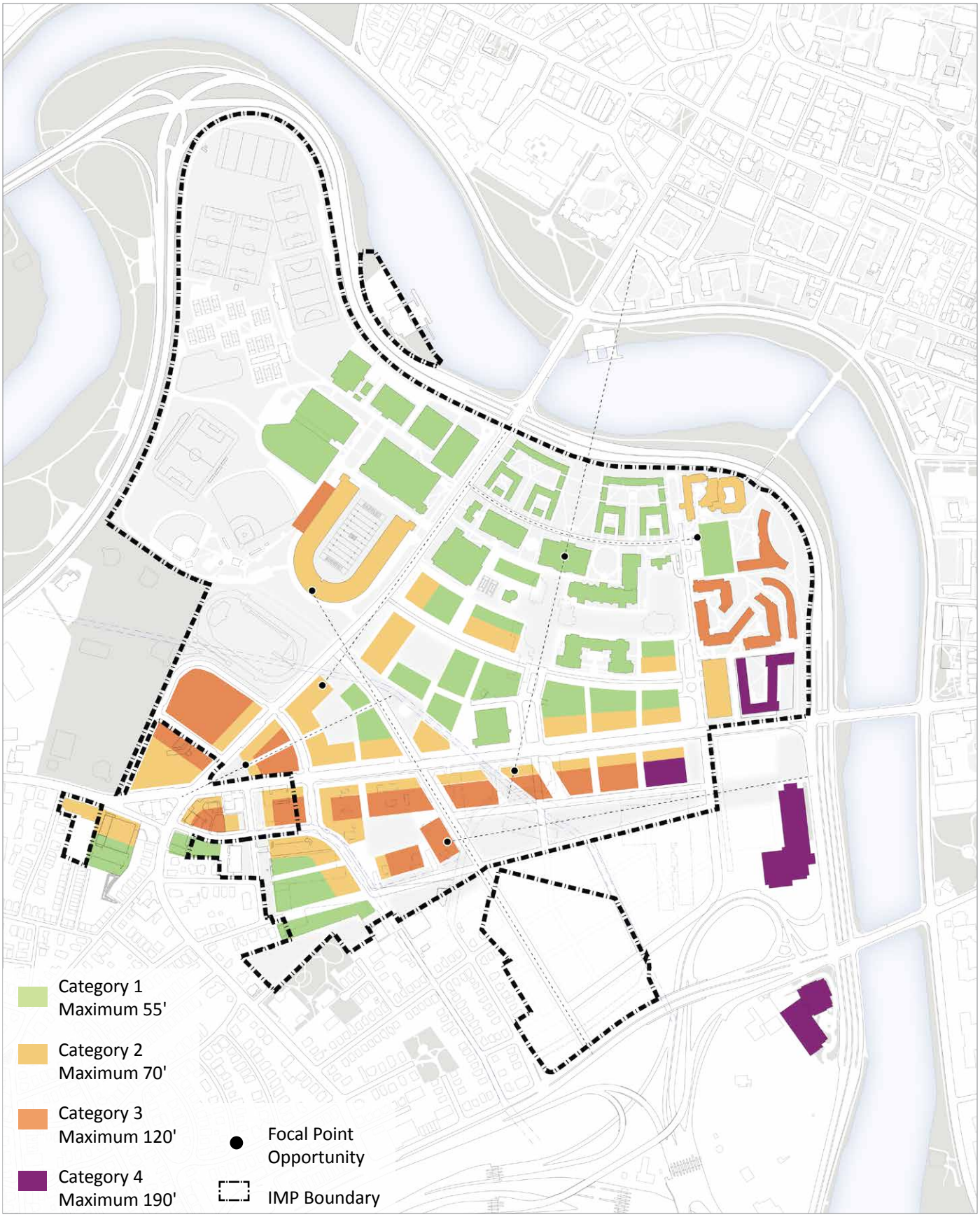


Figure 36: Long-Term Building Heights

Note: These guidelines refer to the definition of height in Article 2 of the City of Boston Zoning Code.

Ground Floor Zones

To ensure that the proposed development creates and establishes vibrant and active open spaces and streetscapes, these guidelines recommend that the public character and role of some ground floor uses be prescribed. Guidelines aim to create the highest degree of porosity in Barry's Corner. Program-driven uses with lower porosity may occur at interior edges and upper floors.

Category 1 – Active Ground Floor
A high degree of porosity and public interface is desired. Ground floor uses may be commercial or institutional, examples include (but are not limited to) retail stores, service establishments, and institutional uses involving public programming. Service areas or parking and loading entrances should not be located in this zone. Significant ground floor glass is recommended for building entrance locations.

Category 2 – Contributing Ground Floor
This zone suggests that, when feasible, program elements with the highest levels of activity, visibility and pedestrian traffic be located on the ground floor. For institutional uses, examples that might be incorporated include lounges, classrooms, and exhibit spaces. Service areas or parking and loading entries may be located in this zone, however, they should not be more than a single bay wide and should not be located across from another loading area. Service areas or parking and loading entries should not be located on North Harvard Street or Western Avenue.

Category 3 – Program Driven Ground Floor
Active ground floor uses are encouraged but not required. These ground floor areas may be more program-driven and internally focused. Service areas or entries may be located in this zone; however, they are discouraged from being more than a single bay wide and should not be located across from another loading area. Service areas should not be located on streets that are neighborhood connectors or main streets.

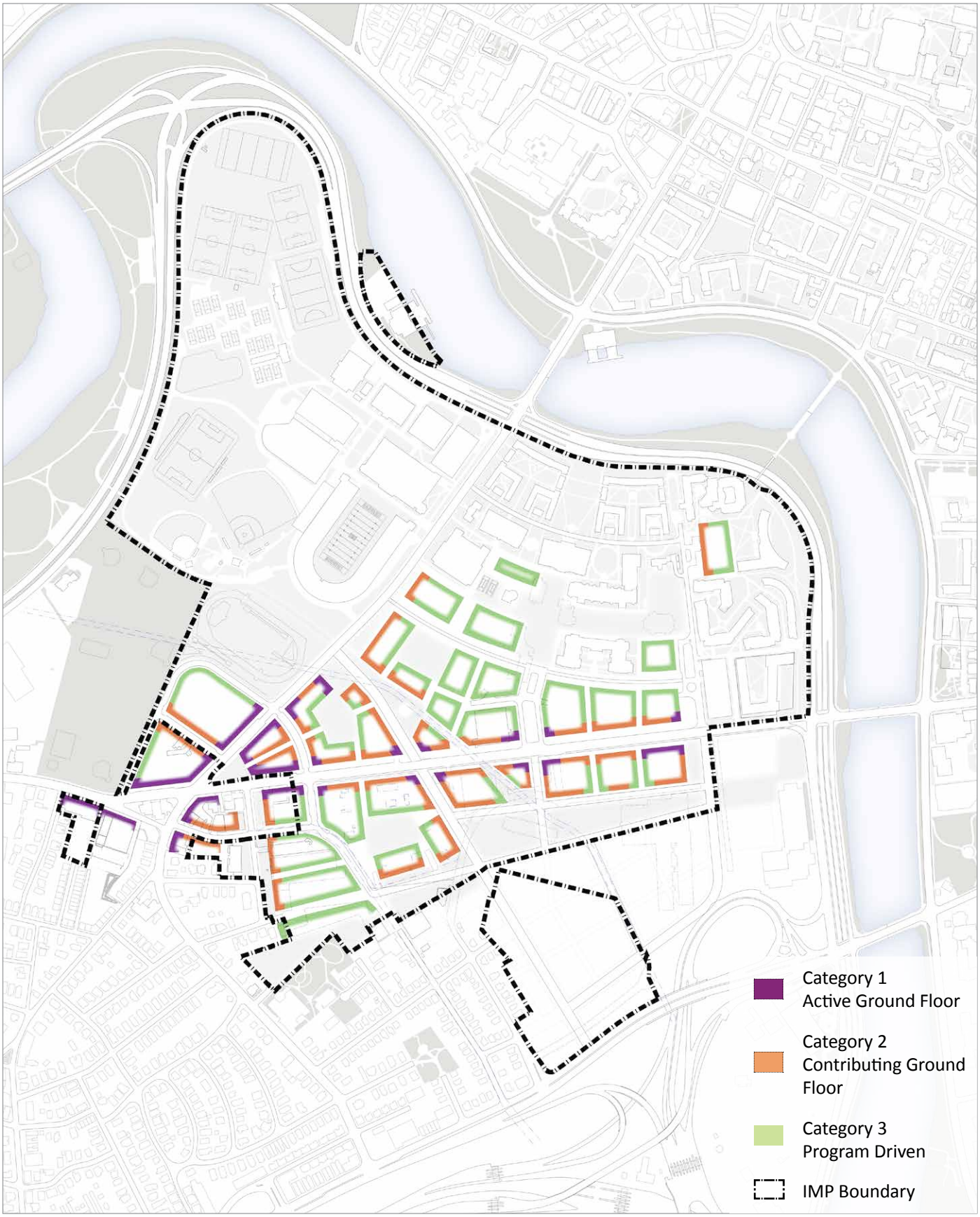


Figure 37: Long-Term Ground Floor Uses

PUBLIC REALM GUIDELINES

The success of a master plan for Harvard's Allston properties will hinge in part on the achievement of public realm improvements that can be realized in the ten-year horizon, but that also anticipate a longer and more comprehensive implementation beyond the IMP period. Long term, the plan aims for a coherent network of streets, sidewalks, and shared spaces that brings to life a vibrant and active neighborhood in Allston.

Planning emphasis for the public realm draws on a history of discussions with the Boston Redevelopment Authority, the Harvard Allston Task Force, and other stakeholders. The Long-Term Vision also takes the Boston Transportation Department's (BTD) recent delivery of its Complete Streets Guidelines as a defining reference in the adaptation of a system of streets and walks that prioritize pedestrian orientation, comfort, and safety as defining measures of a good urban plan. To that end, the plan follows BTD's guidance and also includes measures specific to the interface between Harvard's campus landscape and the city proper.

Streets in the plan are conceptually organized through this system. Scale and neighborhood texture are recognized by shifts in type on the three primary routes in the plan: North Harvard Street, Western Avenue, and the long-term proposed street identified as "Stadium Way."

Boston's Complete Streets: Street Type Principles

Principle 1
Boston's streets should be sensitive to the surrounding land uses and the environmental, cultural and historical context.

Principle 2
Streets should be recognized as an essential component of Boston's vibrant public spaces.

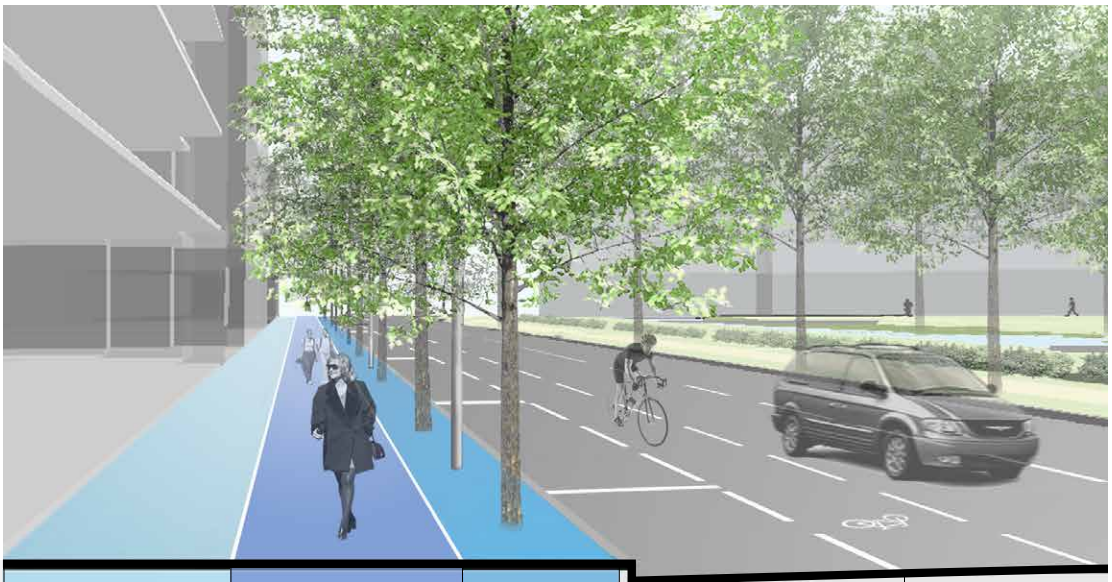
Principle 3
Boston's streets should serve multiple functions and encourage non-motorized uses.

Source: Boston Complete Streets Guidelines (June 2013 http://bostoncompletestreets.org/)



Figure 38: Long-Term Street Typologies

Note: Street names are illustrative only; It is anticipated they may be renamed in the future.



STREET TYPE **Street**/Blocks	FRONTAGE ZONE Preferred	Min.	Max.	PEDESTRIAN ZONE Preferred	Min.	FURNISHING ZONE 4' Plus Curb Extension	ON-STREET PARKING	BIKE ACCOMMODATION
NEIGHBORHOOD CONNECTOR								
Western Avenue								
North Side, Stadium Way to SFR*	30'	20'	40'		6'		8'	5'
North Harvard								
Stadium Way to SFR	30'	20'	50'		6'		7'	5'
NEIGHBORHOOD MAIN STREET								
Western Avenue								
Riverdale St -Stadium Way	6'	2'	10'	7'	6'		8'	5' **
South Side, Stadium Way to SFR*	6'	2'	10'	7'	6'		8'	5' **
North Harvard								
Spur Street to Stadium Way	6'	2'	10'	7'	6'		7'	5'
South Campus Drive	6'	2'	10'		6'		8'	10' ***
Spur Street	6'	2'	10'		6'		7'	5'
Ivy Lane	6'	2'	10'		6'		7'	-
Academic Way	6'	2'	10'		6'		8'	Sharrows
Stadium Way	6'	2'	10'		6'		8'	-
CAMPUS DRIVE								
Cattle Drive	40'	20'	40'		6'		8'	-
East Drive	40'	20'	50'		6'		8'	-

** Soldiers Field Road*
*** Bicycle accommodation along south side of Western Avenue between "Academic Way" and Soldiers Field Road is a 7-foot sidewalk level cycle track*
**** Shared use path north of "Ivy Lane"; 2-way buffered bike lane south of "Ivy Lane"*

Note: Names of new streets may change in the future.

Figure 39: Street Types and Sidewalk Components

Pedestrian Realm Components

A coherent pedestrian realm that combines an evolving campus with a diverse urban landscape will be achieved over time. Critical ingredients include the organization of buildings, land uses, and memorable spaces that contribute to a unique urban quality; activation of the street with extensive programs of public accommodation; and the efficient and systematic design of vehicle, bicycle, and pedestrian ways that build on mutual aims and shared rewards. Boston's Complete Streets Guidelines offer guidance on programmatic issues, dimensions, materials and techniques, performance and function, and the achievement of comprehensive environmental benefits. This plan, however, adds to the Complete Streets index by including provision for "Campus Drives," roadways that are built or modified primarily for internal campus use.

Pedestrian Zone
Sidewalks should have continuous and unobstructed pathways and sight lines. Uniform, monolithic surfaces are recommended and should be made with poured concrete surface or smooth pavers that utilize large dimensions to minimize vibration. The Pedestrian Zone should line up legibly and logically with intersection crosswalks. This system achieves optimal navigation and ease of travel for persons with varying disabilities.

Furnishing Zone
Between the pedestrian zone and the curb of the roadbed, a furnishing zone is recommended to accommodate tree planting and soil infiltration zones, pedestrian and street lighting, street furniture, and any fixtures and appurtenances required for transit. Dimensions vary according to existing conditions and roadway configuration, but throughout the IMP area, this zone should remain 4 feet in width, plus curb extensions where they exist. Unit pavers are recommended and furnishing zones are intended to have permeability for stormwater infiltration.

Frontage Zone
The frontage zone frames the inside edge of the pedestrian zone, extends the sidewalk as dimensions allow, and may accommodate sidewalk cafes, store entries, retail displays, and landscape elements. The frontage zone can be widened to create plazas and gathering spaces at periodic breaks in the streetwall. Dimensions and materials in the frontage will vary according to building use and building type.

Prototypical sections and plans that follow outline the proposed relationships in each of the four street types.

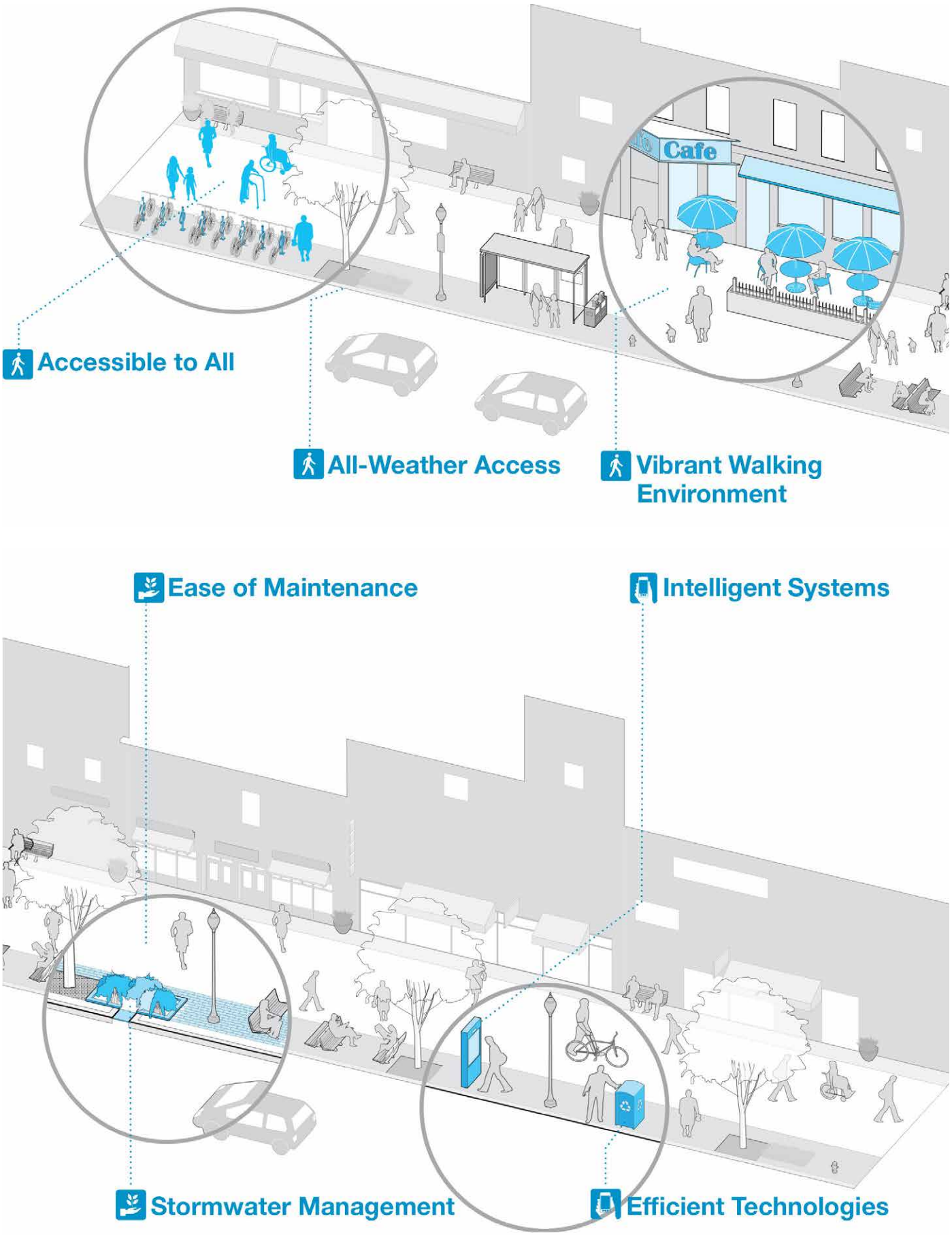
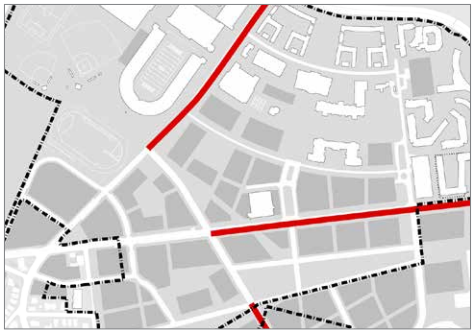
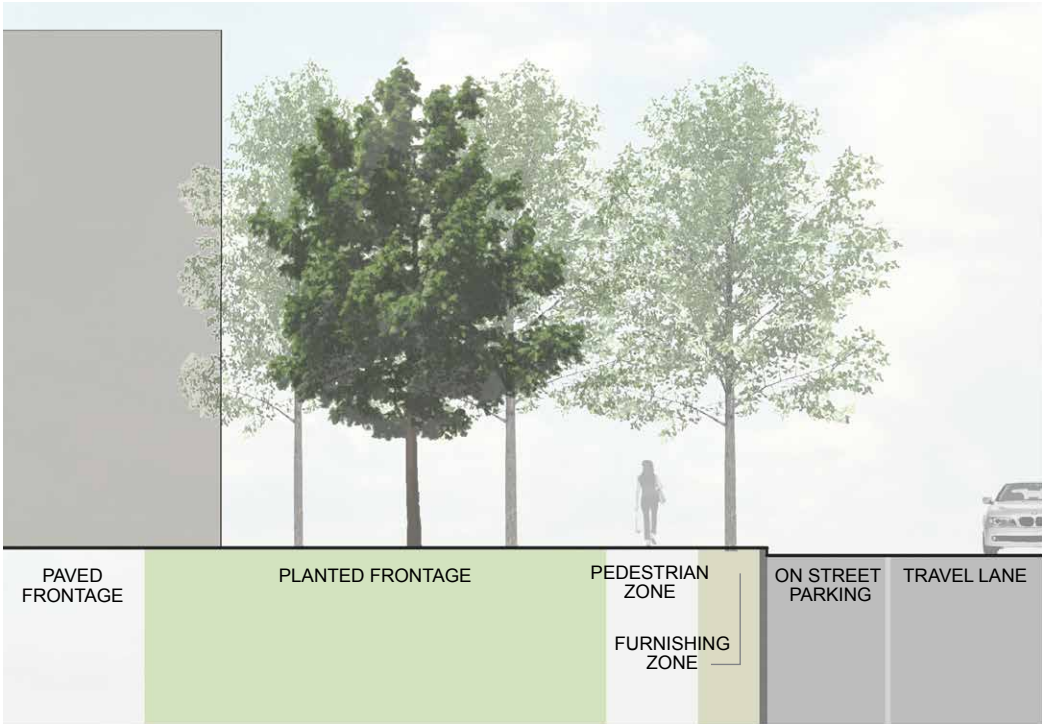


Figure 40: Boston Complete Streets Sidewalk Design Principles

Source: Boston Complete Streets Guidelines, Boston Transportation Department, October 2011 Draft





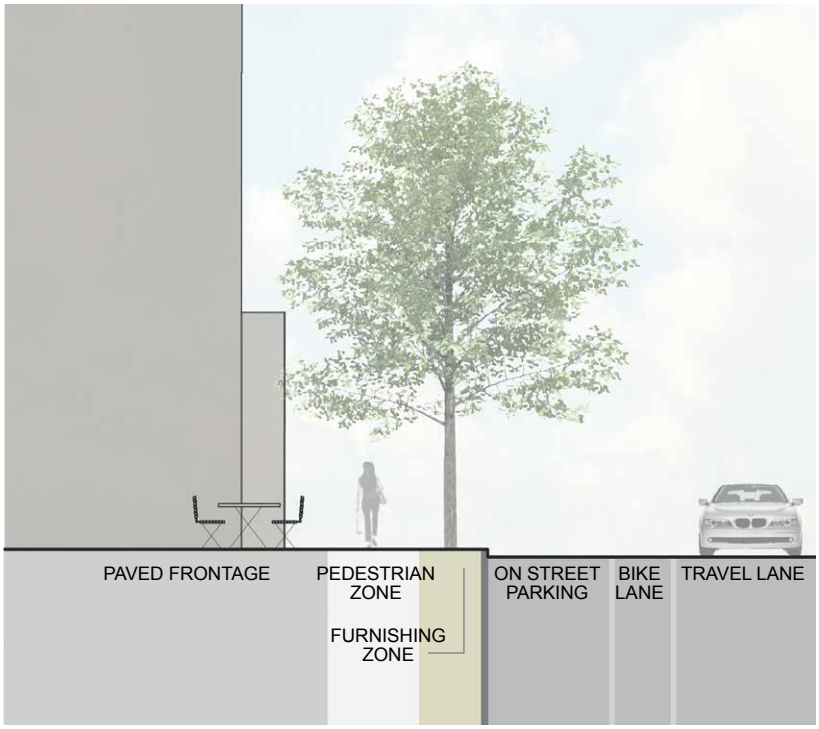


NEIGHBORHOOD CONNECTOR

Neighborhood Connectors are defined by deep frontage zones with relatively continuous informal plantings of large canopy trees, shaping a sense of connectivity when walking or driving along these routes.

Figure 41: Pedestrian Realm Prototype: Connector





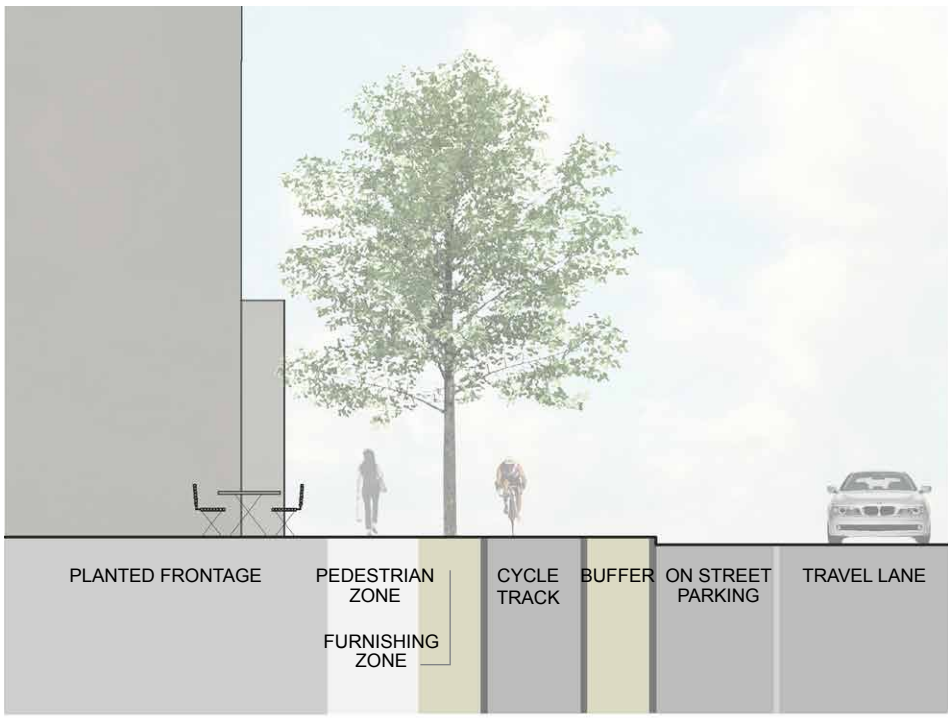


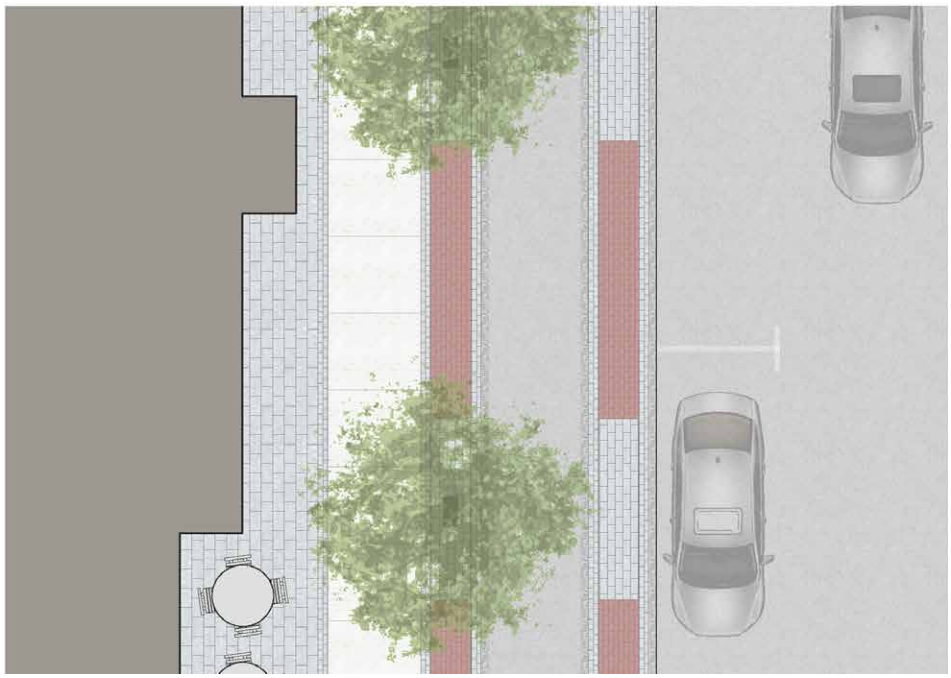
NEIGHBORHOOD MAIN STREET

Neighborhood Main Streets exhibit an urban density, with relatively regular building walls close to the sidewalk. Frontages are primarily paved and where depth allows may be furnished, programmed, and planted with shade trees. On-street parking is encouraged with curb extensions at crosswalks and intersections.

Figure 42: Pedestrian Realm Prototype: Neighborhood Main Street





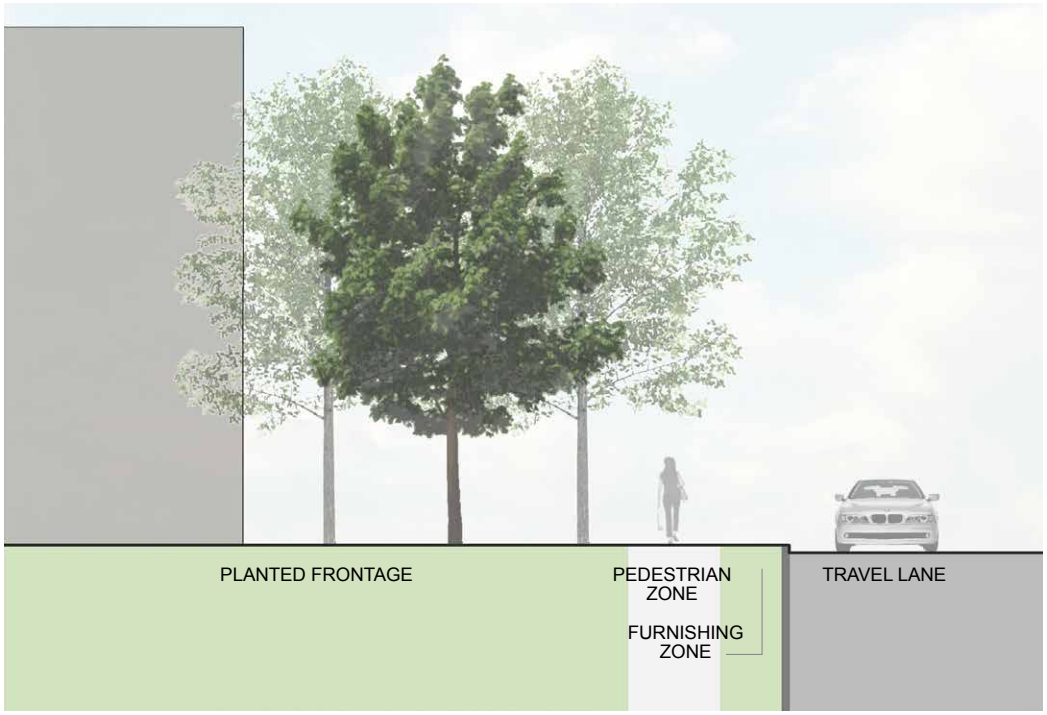


NEIGHBORHOOD MAIN STREET WITH CYCLE TRACK

Where dimension allows, cycle tracks may be placed above the curb. Buffers, paved like the furnishing zone should separate the curb and cycle track and the cycle track and the sidewalk. Trees should be placed between the cycle track and sidewalk.

Figure 43: Pedestrian Realm Prototype: Neighborhood Main Street with Cycle Track

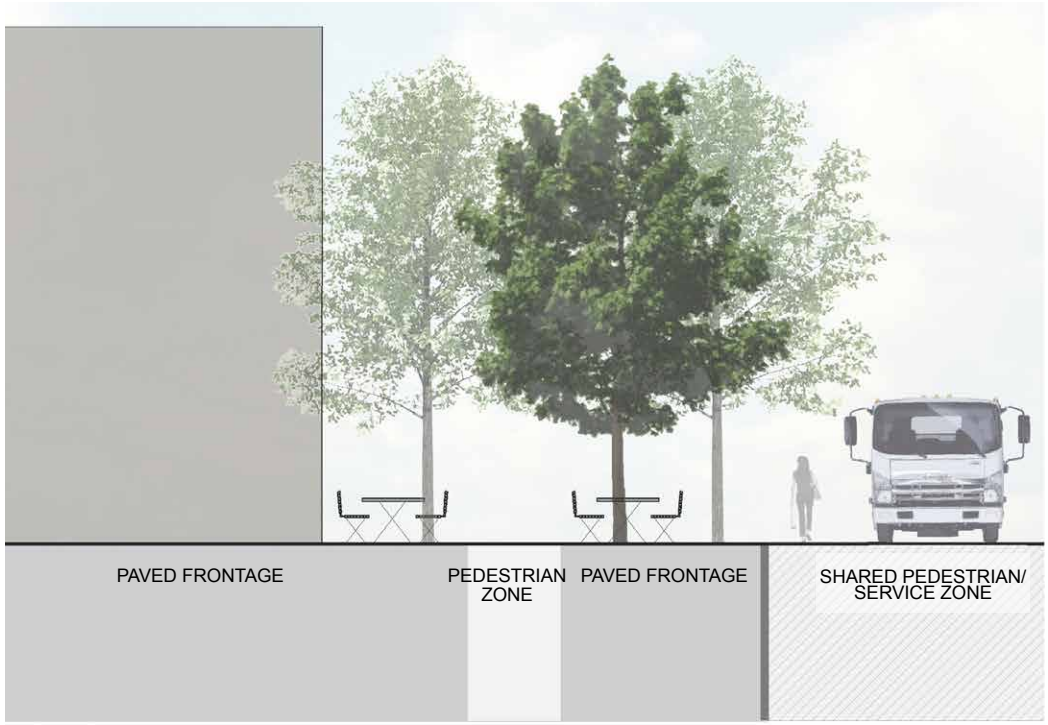






Campus Drives may have vegetated buffers between sidewalk and roadway and are defined by deeper vegetated frontage zones which often vary in depth. This prototype is reserved for use within the heart of the academic district and is not intended for public through traffic routes.

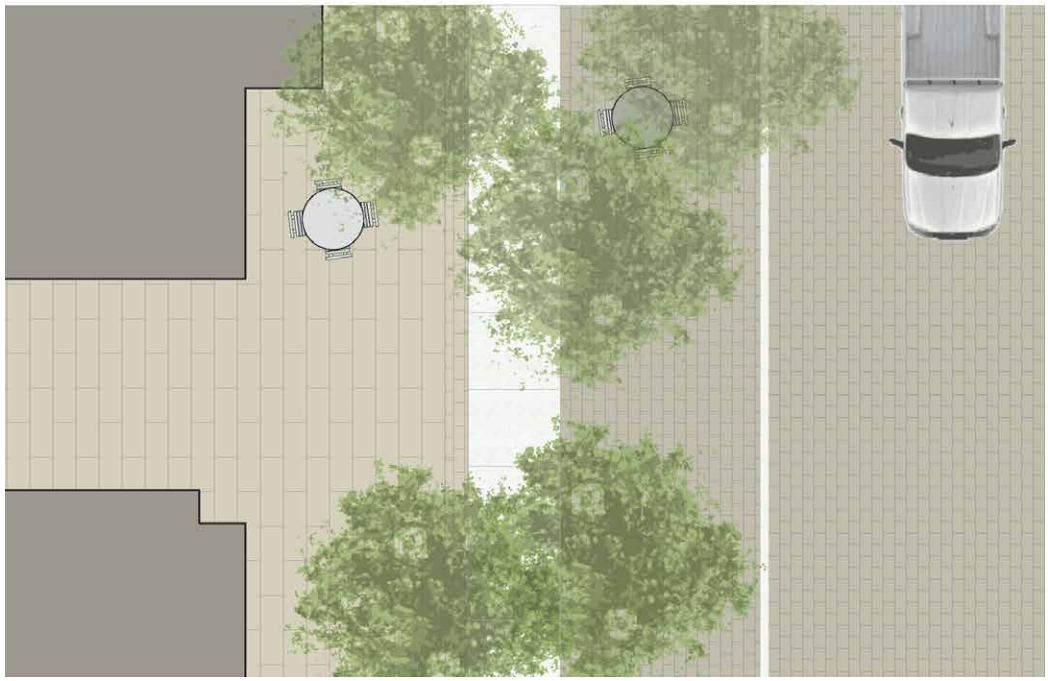
Figure 44: Pedestrian Realm Prototype: Campus Drive







Winthrop Street, Harvard Square Shared Pedestrian/ Service Area



SHARED PEDESTRIAN/SERVICE AREA

Multi-use paths are curbless ways that accommodate intermittent service but privilege the pedestrian experience. They are paved with unit paving and defined by informally placed canopy trees and the regular use of site furnishings.

Figure 45: Pedestrian Realm Prototype: Pedestrian/Service Area

Pedestrian Realm Concept Plan

As a complement to the provision of active ground floor uses and other urban design principles, the proposed street typologies and sidewalk guidelines help shape a vibrant and cohesive pedestrian realm. This plan illustrates the primary public ways along the public streets feeding onto North Harvard Street and Western Avenue, and also indicates primary publicly accessible passages through the Academic District, notably on an expanded Batten Way and reorganized East Drive. In addition, on campus and in the Science and Enterprise District, a network of shared service/pedestrian routes is envisioned that provides limited vehicle access on a time-managed basis. These ways should be oriented to pedestrians in their dimensions and scale, materials, provision for shade, seating, and general design character; similar shared routes may be found in Harvard Yard and in Winthrop Square, Cambridge. They provide an urban character and a generous public realm quality to the overlap between campus and city.

Plazas and public gathering spaces are encouraged where appropriate as part of the street environment. Where possible, plaza locations should be guided by proximity to transit stops or other pedestrian generators. Successful plazas support a wide variety of activities including temporary markets, art installations, or performances. Plazas should be designed with canopy coverage, high-performance soils, rainfall harvesting, and other sustainability measures.

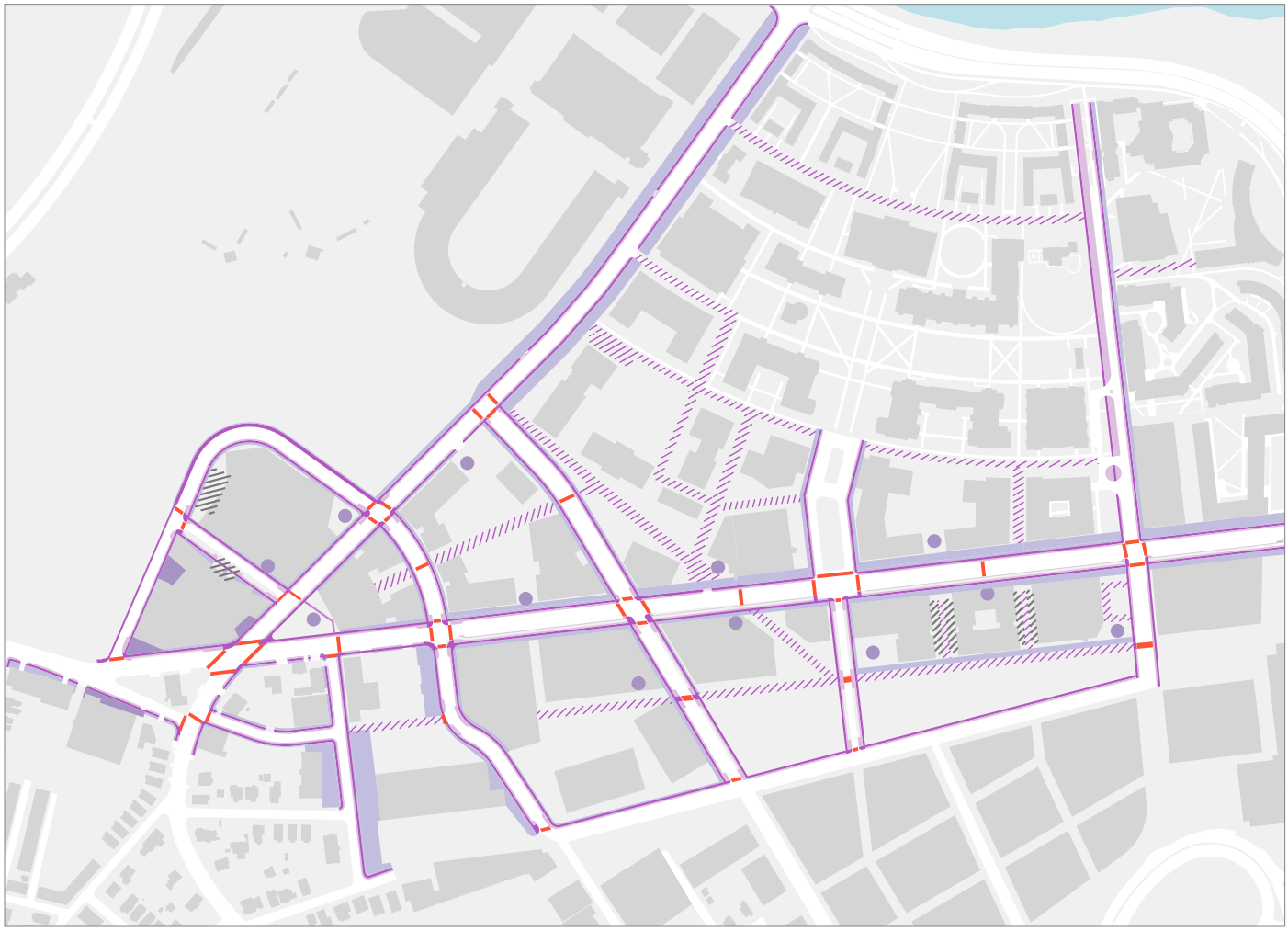


Figure 46: Pedestrian Realm Concept Plan

Networks: Pedestrian, Bicycle and Transit Concept Plan

A comprehensive and flexible urban network of overlapping routes of travel – for pedestrians, transit users, bicyclists and drivers – will improve connectivity with surrounding campus area and communities. The guidelines recognize the opportunity to bring coherence and continuity to all forms of mobility that can be implemented over time as projects are built. Networks should achieve these goals:

- Bring clarity, consistency, and legibility to the systems of pedestrian, bicycle, and transit circulation
- Build on local desire lines to link sidewalks and campus pathways, creating legible routes with distinctive thresholds at campus edges
- Bolster the civic character of the area with outdoor spaces of public accommodation at regular intervals along streets and public ways
- Integrate mobility hubs at key activated spaces where networks overlap
- Use on-street parking to calm traffic and activate the public realm

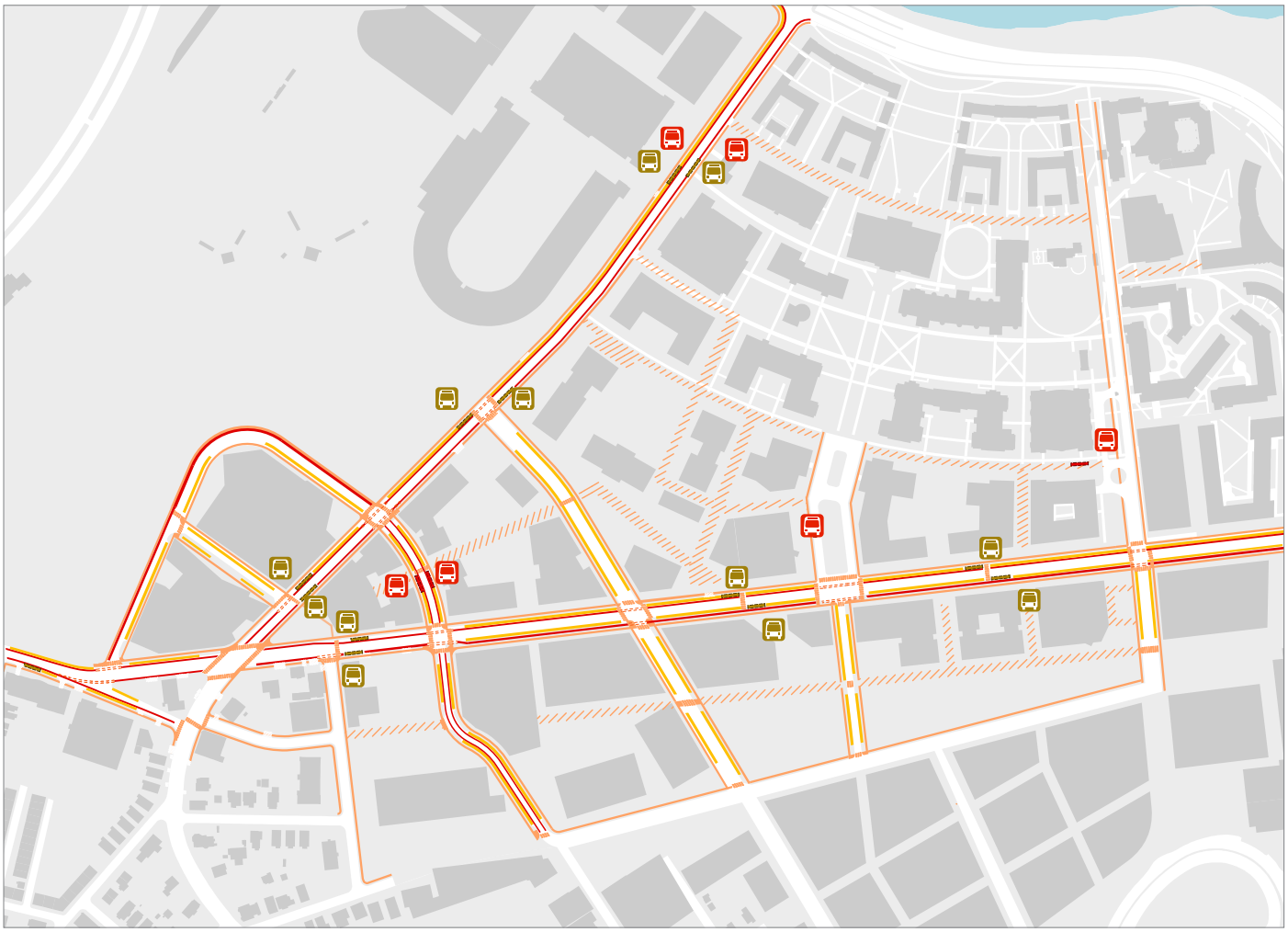


Figure 47: Networks Concept Plan

Landscape Function Concept Plan

Building on the University's commitment to sustainable practices, outlined in Section 6.2 of this report, the plan embraces Boston's goal of a substantial increase in coverage of the urban tree canopy – defined by urban foresters as including all living components of vegetative land cover. Street trees, campus groves and courts, parklands, lawns, and fields all perform significant landscape functions by helping regulate stormwater management and rainfall harvesting; providing shade in summer to promote urban cooling; and promoting the emergence of a strongly vegetated urban character that distinguishes neighborhoods and shared spaces.

Following guidance from Boston's Complete Streets, the plan promotes a street and sidewalk configuration that will ensure high performance and longevity for Harvard's investment in new street trees. Pervious paving and structural soil volumes in the planted areas provide horticultural support for the trees, but they also significantly increase infiltration and reduce the outflow of stormwater in rain events through below-grade detention. Over time, this system will ensure a notable increase in canopy coverage throughout the IMP area and will contribute to the evolution of a unified network of streets throughout.



Figure 48: Pedestrian Realm Concept Plan

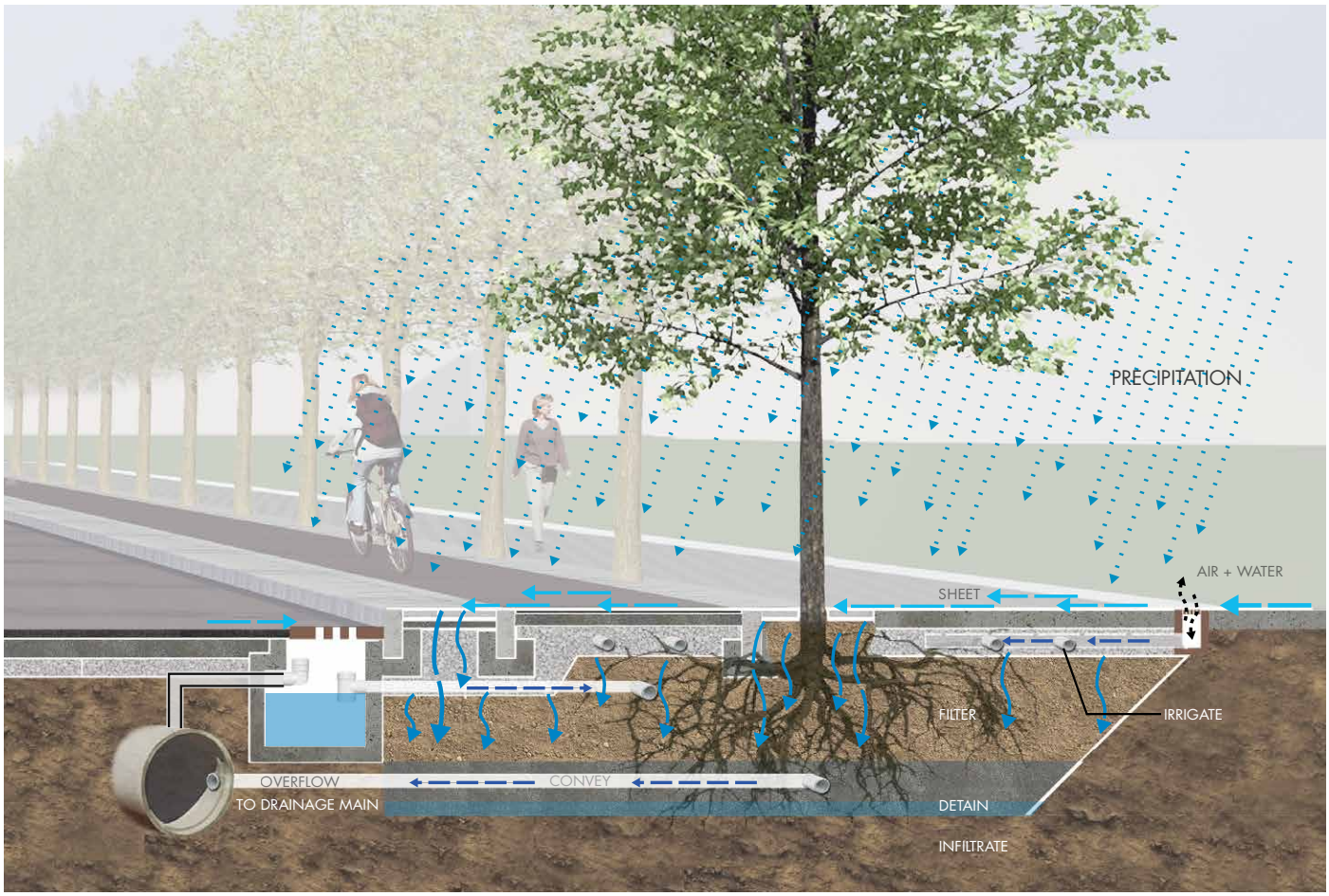
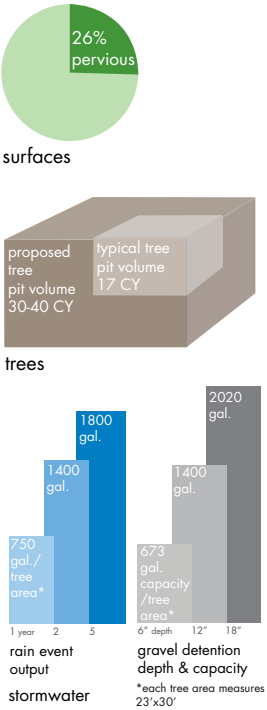


Figure 49: Landscape Function Street Section

Manufactured soils produced from local materials are planned to be used to ensure that performance criteria related to permeability, structural loading, and compaction resistance can be met and maintained over time. Planting media shall provide robust horticultural support for the long-term viability of plantings. When under pavement, structural soils, preferably sand-based, should be utilized, and paired with adequate underdrainage, aeration, and irrigation infrastructure. Street trees shall be provided at least 40 cubic yards of contiguous planting medium. When trees share continuous treeways, soil volume can be less, equaling at least 30 cubic yards per tree.



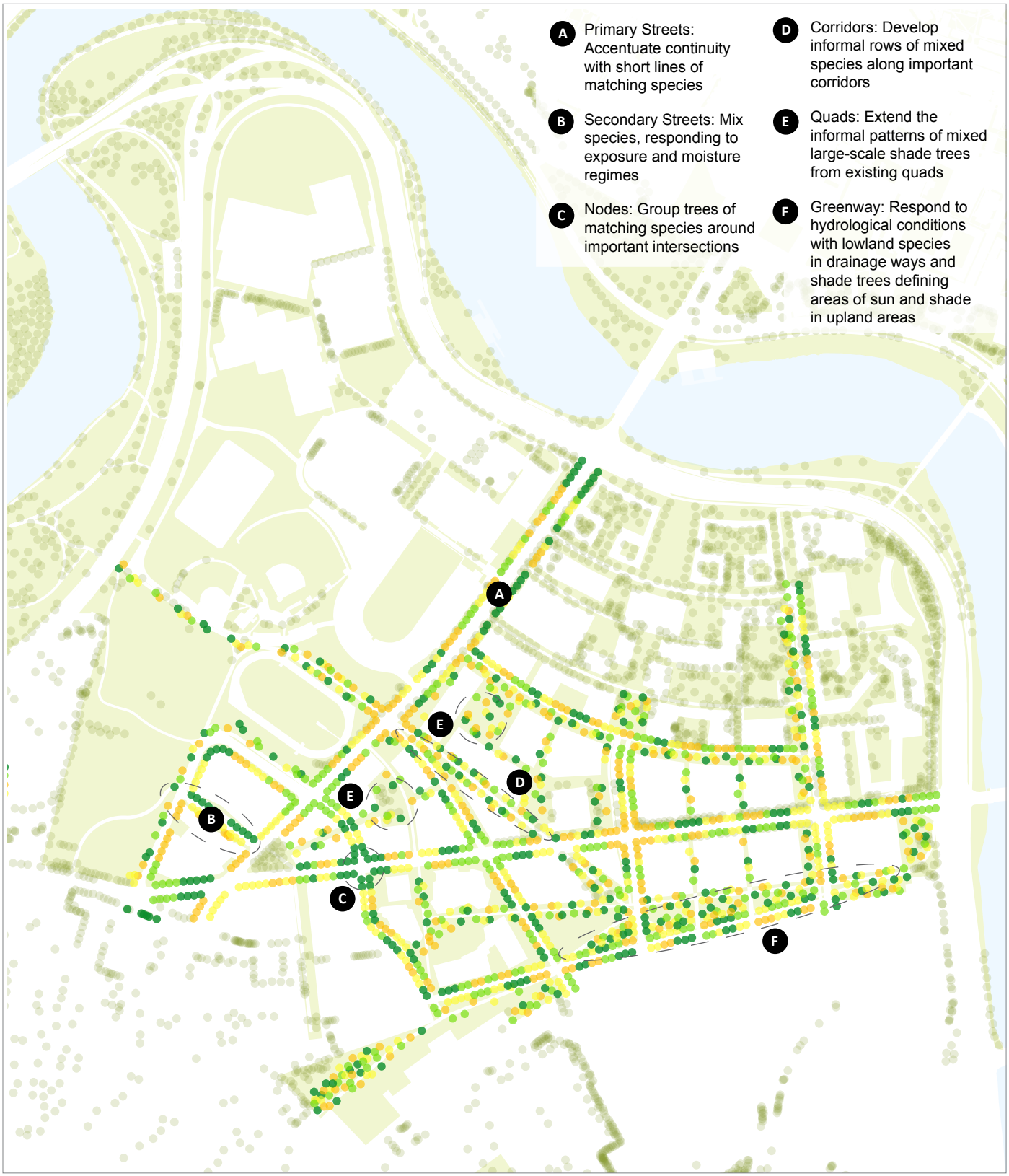


Figure 50: Urban Canopy Concept Plan

Overall Urban Canopy Coverage

Plantings in the city and on campus – in broad terms, the management of the University's and the community's urban forest canopy – represent a long-term enterprise. This requires carefully gauged investments that, with good stewardship, will deliver big environmental dividends. Harvard's McKim, Mead and White campus provides a great example of both measurable and immeasurable benefits of a strong deciduous tree canopy. This landscape helps cool the campus and reduce the impacts of storm events.

The Urban Canopy Concept Plan graphically depicts a set of principles for the IMP area and beyond. It is not a blueprint; it describes an aspiration for canopy coverage in the campus and community, implemented over time, project by project. The following principles apply:

Adaptability
Street tree species are limited to a list of well-adapted hardwoods that will thrive in sand-based structural soils along paved walks and furnishing zones; the list of trees in open landscape conditions is longer but also based on adaptability and long-term vitality.

Spatial Arrangement
Trees should be organized to structure a strong spatial character specific to each project situation. Street trees in frontage zones on Neighborhood Connector Streets and Neighborhood Main Streets should be arranged in regulated or staggered lines. Trees along pedestrian routes should usually be staggered or arranged in grove-like groups. Lines of equally spaced trees should generally be avoided.

Diversity
Species should vary in all arrangements to avoid monoculture conditions. When street trees are aligned dimensionally, species should be applied in runs of three to six or eight, but then alternate with another similar species (Pin Oak, then Swamp White Oak, for example).

Performance
Vitality and continuity in urban canopy trees requires a commitment to the high-performance soils and moisture regime described in Figure 49. Each of the IMP projects will contribute to the City's overall goal of an increase in stem count and canopy coverage. The potential benefits of realizing a long-term landscape and canopy coverage strategy for Allston (as depicted in Figure 50) have been modeled using the US Forest Service iTree software. Benefits include:

- Annual reduction of approximately 55 megawatt hours of electricity in summer.
- Annual interception of approximately 914,600 gallons of rain fall.
- Annual removal of approximately 560 pounds of pollutants from the air.
- Annual sequestration of approximately 104,600 pounds of CO_2.

Harvard will work with the BRA and City GIS Department to provide a data layer for existing and proposed trees in Allston.

Paving Materials

The selection of sidewalk paving materials involves judgments about character (color, dimension, pattern and grain), durability, and performance. Consistent with the guidance from Complete Streets, paving material choices are organized through the structure of the sidewalk zones (pedestrian, furnishing, frontage). Concrete paving and modular unit paving will be consistent to convey a unified urban character on the streets and a coherent pedestrian network on the campus.

Furnishing Zone: Provides continuity and is planned to be utilized throughout the IMP area. Red-toned and natural concrete unit pavers of small scale will have an open joint to infiltrate runoff before entering streets.

Pedestrian Zone/Sidewalk: A monolithic cast-in-place concrete is planned with a uniform broom finish and saw-cut joints in a natural color or smooth pavers that utilize large dimensions to minimize vibration.

Frontage Zone: A unitized paving system, but scale, color, and material may vary depending on individual building conditions. Larger units than those deployed in the furnishing zone are preferred. Areas of lawn and vegetation are encouraged where dimensions allow.

FURNISHING ZONE

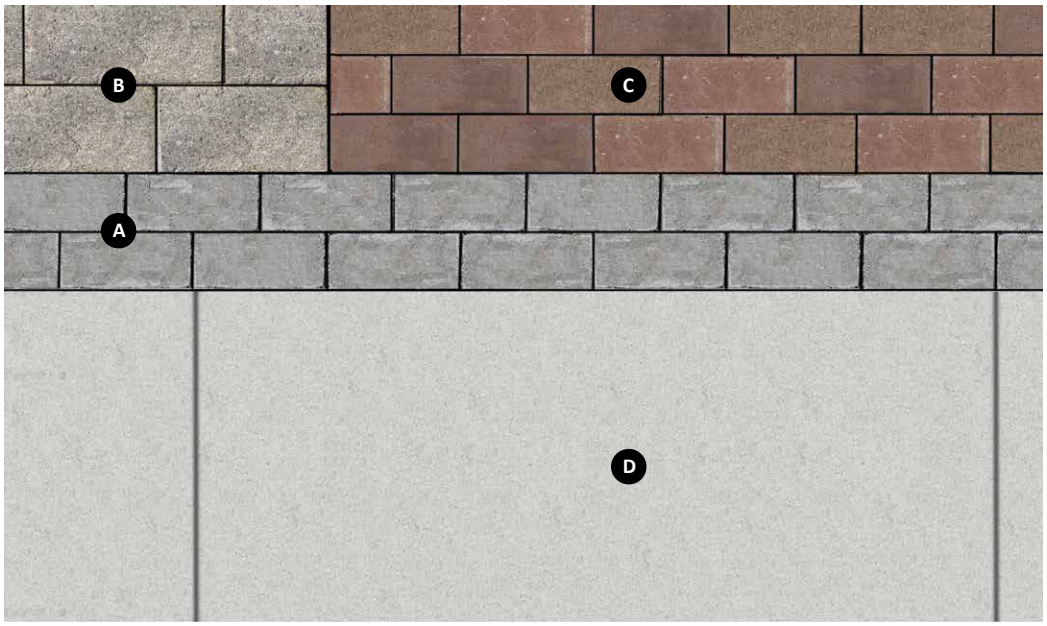
A 4”x 8” Traditional Square Edge Concrete Prest Brick.
Color: Natural
Finish: Natural

B 6”x 12” Traditional Style Concrete Prest Brick.
Matrix: 92649
Finish: Tumbled

C 4”x 8” Traditional Square Edge Concrete Prest Brick.
Color: mix of Russett Blend (40%), Terracotta (20%) and Quarry Red (40%) Finish: Natural

PEDESTRIAN ZONE

D CIP Concrete Sidewalk



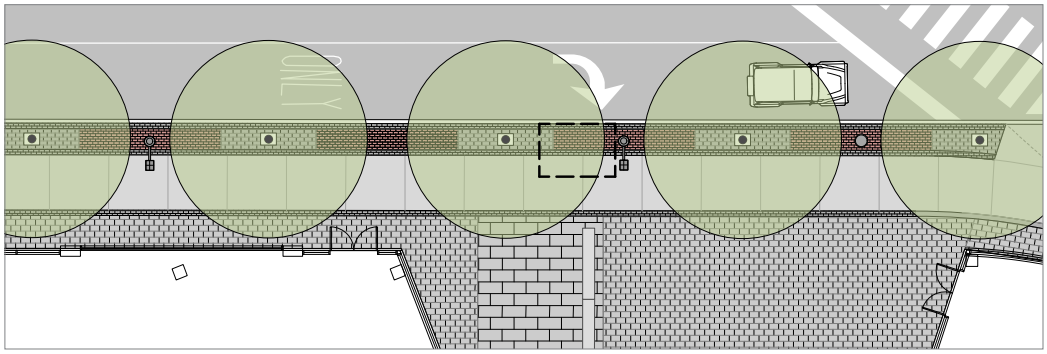


Figure 51: Paving Materials Enlargement and Context Plan

Lighting on Campus and in the Public Realm

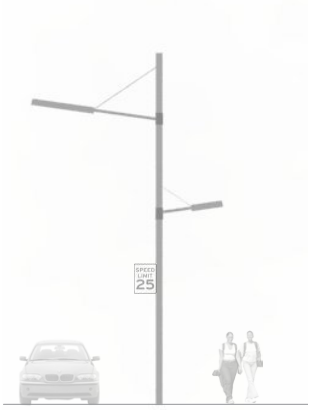
Nighttime lighting is crucial for pedestrian safety, essential for wayfinding, and critical to the visual character of the University and the neighborhood. The projects within the IMP area will require upgrades and alterations to at least four kinds of light: existing street and sidewalk lighting; new lighting for walkways and plaza spaces associated with an activated public realm; exterior building lighting; and pedestrian lighting for internal campus spaces.

Given the importance of the network of streets, especially Western Avenue and North Harvard Street, in Allston's evolving character, Harvard will pursue the development of a lighting system that brings unity and coherence to the area's nighttime and daytime character. This system can be implemented over time as projects develop.

The City's current reliance on LED lighting for streets affords unprecedented flexibility and technical efficiency. While adherence to City performance standards is expected, Harvard will promote an increased emphasis on pedestrian-level lighting through a two-tiered system on the streets, as illustrated. Tall fixtures that concentrate light on the surface of the street will be emphasized primarily at crosswalks, bicycle lanes, vehicle intersections, and turn lanes; on long stretches of the roadway, automobile headlights, bicycle headlamps, and reflectors compensate for reduced light levels in the middle of the street. The proposed system concentrates lighting in the space where people walk, with fixtures that are lower in height, smaller in size, and more directed in orientation. This approach will reduce light pollution and light trespass, especially on residential street fronts. Overall, these measures greatly increase visibility, safety, and security for University and neighborhood populations.



Figure 52: Western Avenue at Night



Example lighting strategy showing pedestrian level lighting on light poles.

Street Furnishings

Furnishings within the public realm should encourage pedestrian vitality, promote wayfinding, and structure public gathering spaces. Furnishings are planned to be of robust construction and finish, and be made with sustainable materials. Consistency of furnishing selections will lend coherence to the districts, however, because of the extended timeline in which the projects will be completed, variation will necessarily be accepted as product lines evolve.

These guidelines suggest furnishing types — backless and backed benches, trash and recycling containers, and bike racks — and define how furniture elements are to be deployed in prototypical conditions. Furnishings, when possible, should be grouped in an efficient and visually organized manner within the furnishing zone. Concentrations of furnishings should be located near building entries and plazas, multi-modal mobility hubs, and at key intersections where the furnishing zones widen with curb extensions.

Furnishings within the frontage zones of buildings may vary, but elements which are complementary in terms of character and material selection are encouraged.

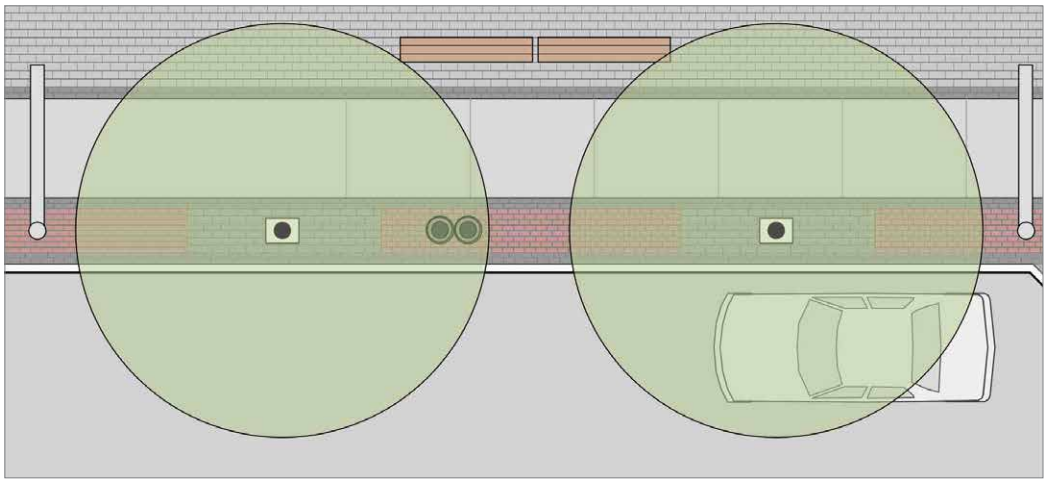


Figure 53: Bench Layout in Narrow Paved Frontage Zone

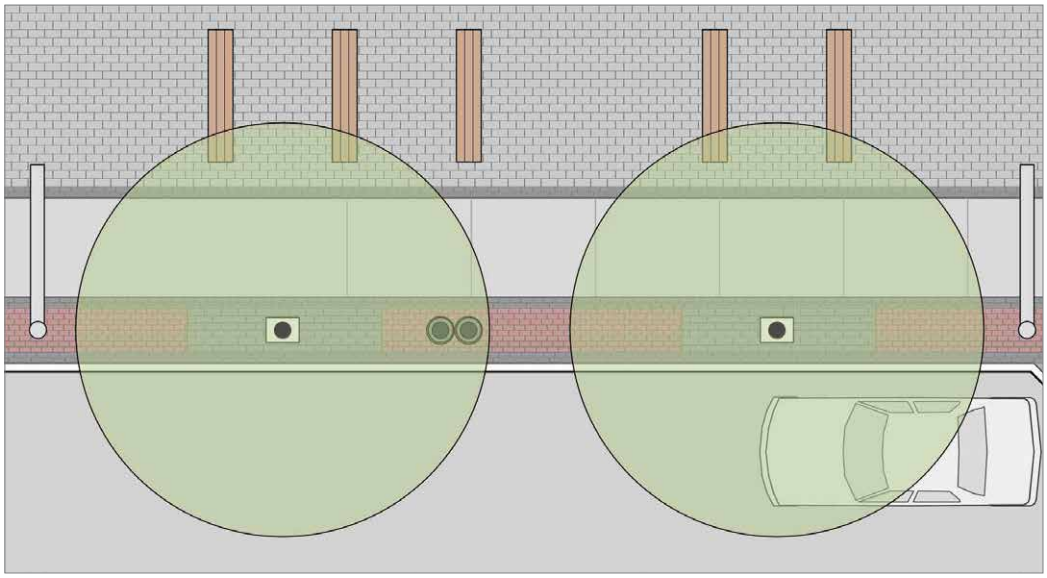
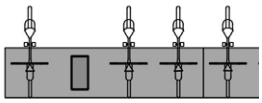


Figure 54: Bench Layout in Wide Paved Frontage Zone

Wooden Backless Bench



Hubway Station



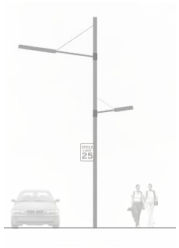


Stainless Steel Refuse and Recycling Receptacles



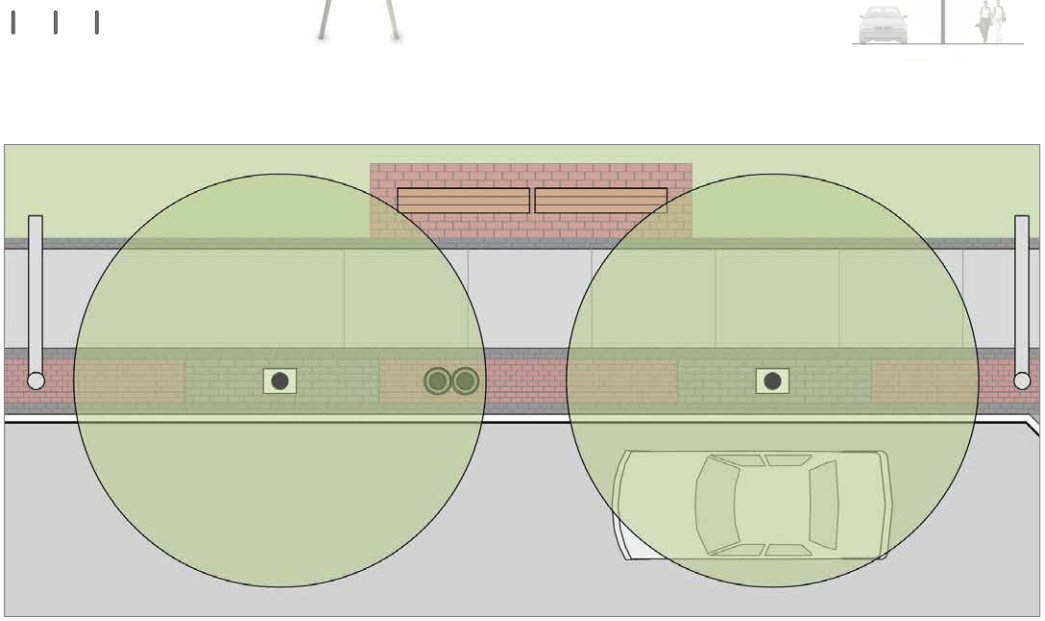
Light Pole





Stainless Steel Bike Rib



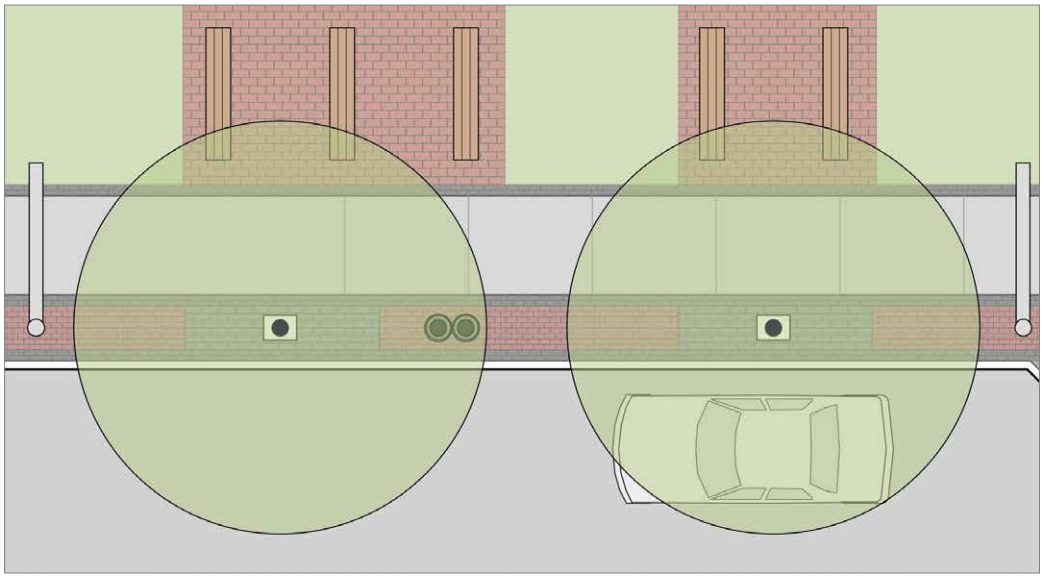


Narrow Planted Frontage Zone

Pedestrian Zone

Furnishing Zone

Figure 55: Bench Layout in Narrow Planted Frontage Zone



Wide Planted Frontage Zone

Pedestrian Zone

Furnishing Zone

Figure 56: Bench Layout in Wide Planted Frontage Zone

Narrow Paved Frontage Zone

Pedestrian Zone

Furnishing Zone with Curb Extension: Hubway Layout

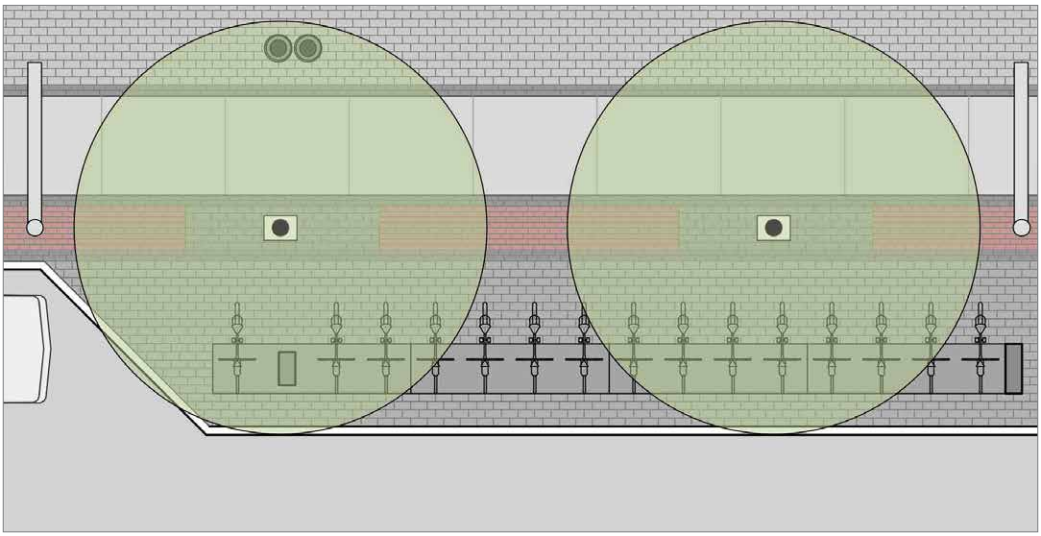


Figure 57: Hubway Layout in Curb Extension

Narrow Paved Frontage Zone

Pedestrian Zone

Furnishing Zone with Curb Extension: Bench Layout

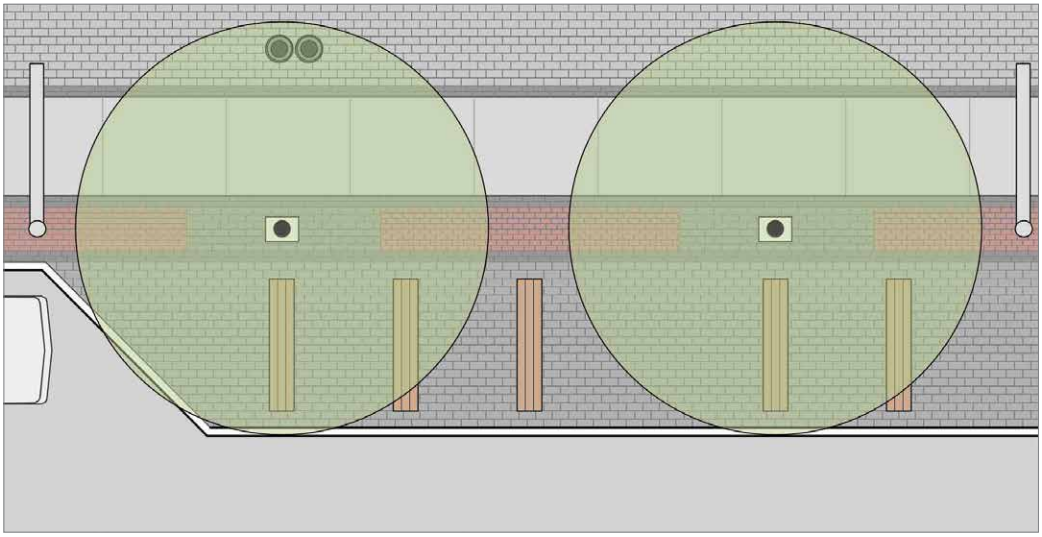


Figure 58: Bench Layout in Curb Extension

Narrow Paved Frontage Zone

Pedestrian Zone

Furnishing Zone with Curb Extension: Bench & Bike Layout

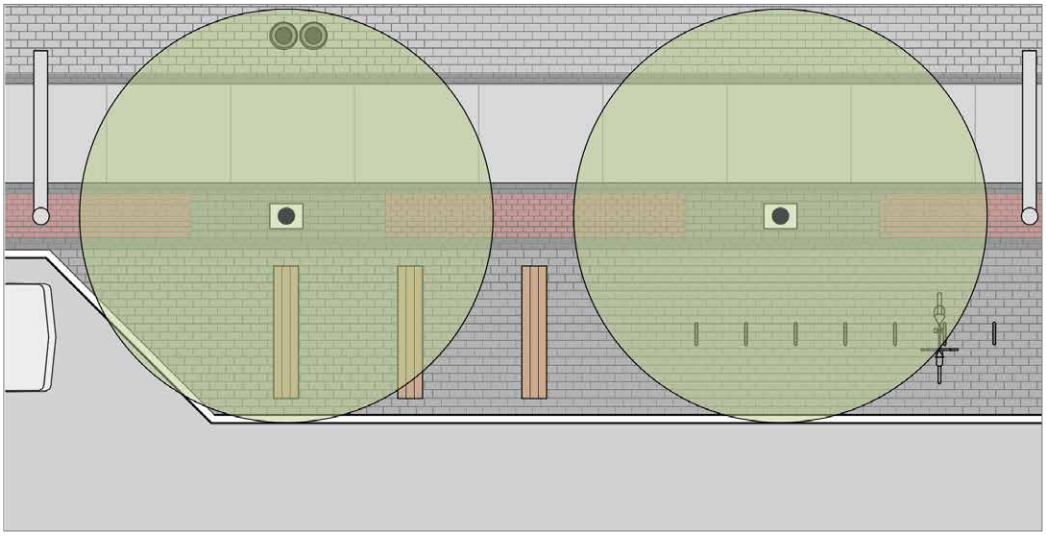


Figure 59: Bench and Bike Rack Layout in Curb Extension

4.0 Ten-Year Plan

4.1 Ten-Year Plan Overview

The Ten-Year Plan is the core material of the IMP regulatory submission. It comprises a range of projects involving renovation, re-use, building replacement and new construction, and proposes a synergistic program of diverse uses including academic, residential, retail, athletics, hospitality, office, and assembly space. The Ten-Year Plan proposes to activate Barry's Corner, create new green space, and enhance the public realm. It also aims to improve area circulation and enhance the natural environment.

For purposes of clarity and regulatory review, this chapter presents a concise description of the Ten-Year Plan. This includes descriptions of new construction projects, renovation projects, new streets, new green space, and construction phasing. The following chapter, *Chapter 5.0, District Plans and Project Descriptions,* provides greater detail concerning how projects fit within their campus and neighborhood context.

The Ten-Year Plan comprises nine projects (see Figure 61), each of which will target LEED Gold status in terms of sustainable design and construction. These projects include replacing the Kresge building with the Chao Center as well as replacing Burden Hall with a new assembly facility, a new Business School office building, renovation and addition to Harvard Stadium, a new basketball venue with new housing and retail, the Gateway project (a mixed use institutional building), a Hotel and Conference Center, a Soldiers Field housing complex renovation and a renovation to Baker Hall (to be renamed Esteves Hall).

Related projects outside of the IMP scope include new construction of Harvard Business School's Tata Hall (now under construction) as well as the Science laboratory and classroom project for the School of Engineering and Applied Sciences (SEAS), located south of Western Avenue. The Barry's Corner Residential and Retail Commons, the renovations of 224 Western Avenue and 28 Travis Street, and the Bright Hockey Center Addition/ Renovation support and complement the development outlined in the Ten-Year Plan of this IMP. These projects are outside of the scope of the IMP because they are either already under construction, have been permitted separately and/or are non-institutional uses.

The Ten-Year Plan also includes new green space, new streets, and an improved public realm. Establishment of Rena Park, adjacent to the existing Ray Mellone Park, will begin the incremental creation of a continuous half mile Greenway, which will continue to the Hotel and Conference Center site, thus establishing the Greenway's west and east ends. Harvard is committed to preserving and enhancing the existing grove of trees in Barry's Corner and opening the area to public use. With construction of the Science project will also come the creation of new streets, notably "Academic Way," which will extend across Western Avenue, northward through the former Charlesview site, to North Harvard Street.

Key to Harvard's Ten-Year Plan is the creation of a walkable, neighborhood-oriented, mixed use environment at Barry's Corner. Barry's Corner is poised to become a community, social, and academic hub within the North Allston neighborhood, providing a concentration of retail in a mixed use setting that will incorporate meaningful gathering spaces for community residents. This will include publicly accessible open spaces, wide sidewalks with trees and outdoor chairs and tables, ground floor uses that engage pedestrians, and shops and restaurants designed to create a destination for neighbors, residents, members of the Harvard community, workers, and visitors.

Urban design opportunities for Barry's Corner include creating a vibrant mix of uses that will attract a variety of users, providing meaningful open space that is a shared amenity between building residents and the public, creating a main street-like environment with community-oriented shops and services, with housing on upper floors, introducing additional connections from the existing North Allston residential neighborhood to Smith Field, and transforming this portion of Western Avenue into a pedestrian-friendly corner by means of building orientation, careful attention to scale, and treatment of sidewalks and landscape, and the relationships of private development to public realm.

This Ten-Year Plan is guided by the overall framework plan presented in *Chapter 3.0, Long Term Vision*. More information on each of the districts that make up the Ten-Year Plan is presented in *Chapter 5.0, District Plans and Projects*. In addition, the impacts of the implementation of the Ten-Year Plan are presented in *Chapter 6.0, Technical Reports*.

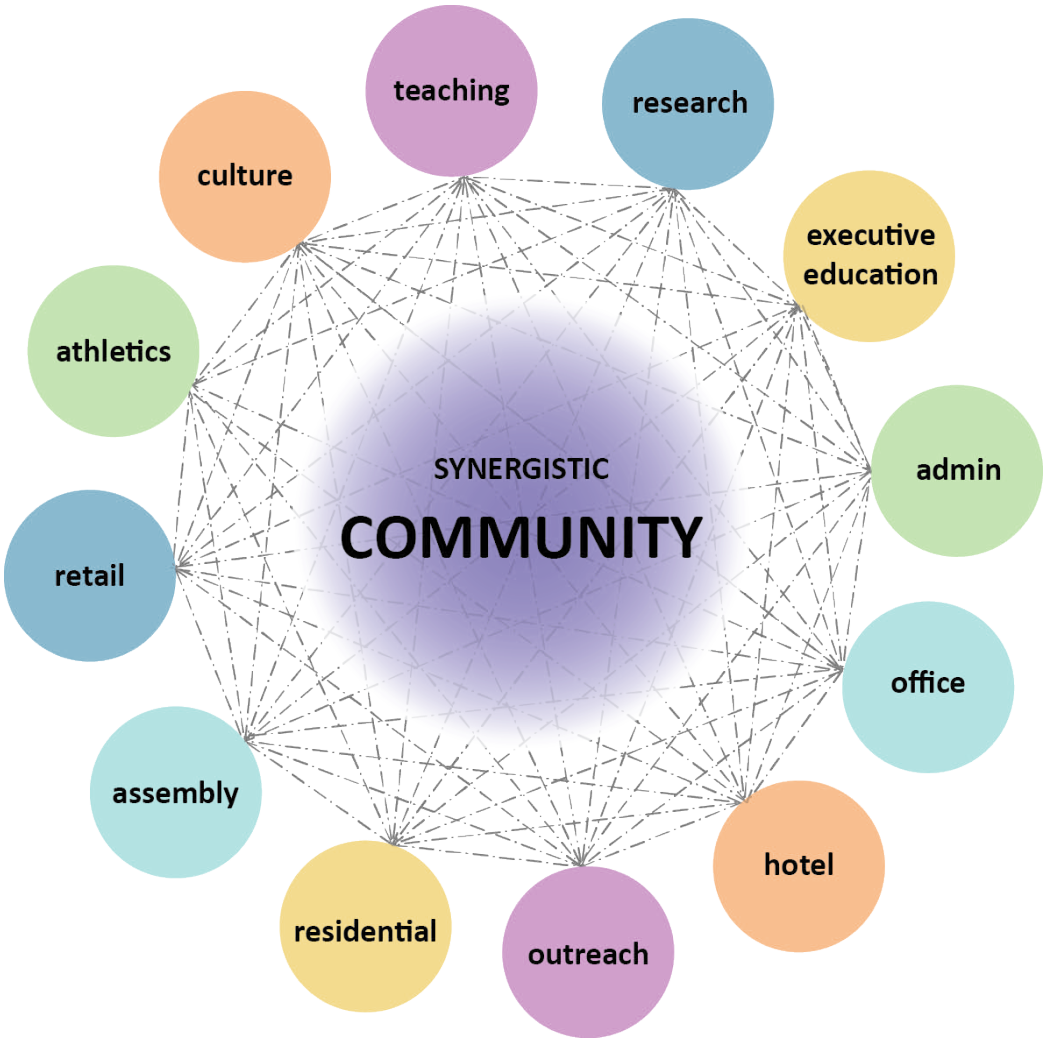


Figure 60: Uses Included in the Ten-Year Projects

4.2 Ten-Year Block Plan and Project Locations

Figure 61 locates the IMP projects and divides the projects into three categories: new construction, replacement, and renovation/renewal. Also identified are non-IMP projects inclusive of noninstitutional projects and institutional projects that are already underway. Table 5 summarizes square footage and project locations within districts.

Detailed project descriptions and urban design illustrations are organized by district in *Chapter 5.0, Districts Plans and Projects*. The order of the listing of the projects does not represent any prioritization or intended sequence. Phasing is discussed in Table 6.

Table 5: Ten-Year Projects

	New Construction	**SF**	**District**
1	Harvard Business School Chao Center (Kresge Hall Replacement)	90,000	Academic
2	Harvard Business School Burden Hall Replacement	140,000	Academic
3	Harvard Business School Faculty & Administrative Office Building	110,000	Academic
4	Harvard Stadium Addition/Renovation	211,000	Athletics
5	Mixed Use Facility & Basketball Venue	270,000-340,000	Barry's Corner
6	Gateway Project	300,000	Barry's Corner
7	Hotel & Conference Center	250,000	Science & Enterprise
	Total New Construction	**1.4 M**	

	Renovation		
8	Harvard Business School Baker Hall Renovation (to be renamed Esteves Hall)	78,000	Academic
9	Soldiers Field Park Housing Renovation	423,000	Academic
	Total Renovation	**501,000**	

	Non-IMP	
A	Science Project	Science & Enterprise
B	Barry's Corner Residential & Retail Commons	Barry's Corner
C	224 Western Avenue	Barry's Corner
D	28 Travis Street	Science & Enterprise
E	Tata Hall	Academic
F	Bright Hockey/Gordon Track	Athletics



Figure 61: Proposed Institutional Projects

Note: With the exception of renovation, areas shown are development sites, not building footprints.

4.3 Project Briefs

The IMP includes seven new projects and two renovation projects, including:

1. *HBS Ruth Mulan Chu Chao Center (Kresge Replacement)*
   Harvard will replace the existing Kresge Hall with a new facility to be called the Ruth Mulan Chu Chao Center. The Chao Center will be approximately 90,000 square feet and will serve HBS's Executive Education program, providing space for dining, classrooms, offices, and common spaces.

2. *HBS Burden Hall*
   Harvard will replace the existing Burden Hall with a new classroom and academic building. As currently envisioned, the project will be three stories above grade, and a level below grade totalling 140,000 square feet.

3. *HBS Faculty and Administrative Office Building*
   Harvard will construct a new Faculty and Administrative Office Building. The proposed site is in the northeast corner of what is now Ohiri Field and is directly north of the i-lab/Batten Hall. As currently planned, the building will be approximately 110,000 square feet and four stories in height.

4. *Harvard Stadium Addition and Renovation*
   Harvard will undertake a renovation and addition to Harvard Stadium. This project will provide improved accessibility to visitors with disabilities, renovate existing areas, relocate program areas from other athletic buildings in the district, provide new program space and restore areas of the existing structure. As part of this project, it is anticipated that the total number of seats in the Stadium will be reduced.

5. *Mixed Use Facility and Basketball Venue*
   The University intends to build a new basketball venue – with the balance of the site accommodating additional institutional/ mixed uses. As currently planned, the basketball venue will be approximately 60,000 square feet and would include approximately 3,000 seats (approximately 1,000 more than the existing Lavietes Pavilion), locker rooms, athletics offices, and concession areas. The remainder of the site will be a project that is largely focused on institutional affiliate/graduate student housing and/or potentially office space. This portion of the project will include between 200,000 and 250,000 square feet of residential space and approximately 10,000-30,000 square feet of ground floor retail.

6. *Gateway Project*
   On the site of the existing Charlesview Apartments, the University is proposing to construct a project of approximately 300,000 square feet of space, including between 35,000 and 50,000 square feet of ground floor retail space. An active ground floor supporting permeability will include mixed use activities, comprising service, retail, and/or other institutional uses and programming. The upper floors will include institutional/mixed uses, which may also include administrative or academic office space. The project will be between six and nine stories to be compatible with the Barry's Corner mixed use development on the west side of North Harvard Street.

7. *Hotel and Conference Center*
   The University plans to develop a hotel and conference center on the south side of Western Avenue, across from the parking lot, framing the northern edge of the future Greenway. It is currently anticipated that the project will have approximately 200 hotel rooms and approximately 26,500 square feet of meeting space for a total project of approximately 250,000 square feet. In addition, there will be approximately 125 parking spaces.

   If Harvard chooses to engage a third-party developer to develop and operate the Hotel & Conference Center for non-institutional use, an IMP Amendment will be required.

8. *HBS Baker Hall (to be renamed Esteves Hall)*
   Harvard intends to renovate the interior of HBS's Baker Hall and improve adjacent landscaping. The building has not had a significant renovation since its opening, and as a result it requires both cosmetic and system upgrades in order to provide comfortable accommodations and accessibility improvements for Executive Education participants.

9. *Soldiers Field Park Housing*
   Harvard intends to renovate Soldiers Field Park housing. This graduate student housing complex has not had a significant renovation since its opening in 1974, and as a result it requires both cosmetic and system upgrades. The University is investigating a range of options for renovating these buildings.

4.4 Ten-Year Illustrative Plan

The figures here depict the Ten-Year Illustrative Plan with conceptual building footprints and massing.



Figure 62: Ten-Year 3D View Southeast



Figure 63: Ten-Year 3D View Northeast



Figure 64: Ten-Year Illustrative Plan

4.5 Ten-Year Plan Circulation

NEW STREETS

The Ten-Year Plan includes four new streets: “South Campus Drive” (formerly identified as Smith Field Drive), “Ivy Lane” (formerly known as Grove Street), “Academic Way,” and “Science Drive.” Boston’s Complete Streets Guidelines will inform the design of these new streets. The new streets will create new connections to Barry’s Corner, link the proposed Greenway and Smith Field, support shuttle bus service, and provide access to the proposed projects in the Ten-Year Plan, particularly those projects located near Barry’s Corner. In addition, on-street parking is proposed along one or both sides of these streets.

To facilitate the Barry’s Corner Residential and Retail Commons Project, Samuels and Associates will construct “South Campus Drive” and “Ivy Lane” for Harvard. The planning and design of these streets has been coordinated with the development of the IMP. It is anticipated that the section of “South Campus Drive” north of “Ivy Lane” will be upgraded as part of the Mixed Use Facility and Basketball Venue. These streets will improve pedestrian and bicycle circulation, including access to Smith Field, and provide vehicular access to the new, adjacent land uses. A multi-use path is also being constructed as part of the roadway project.

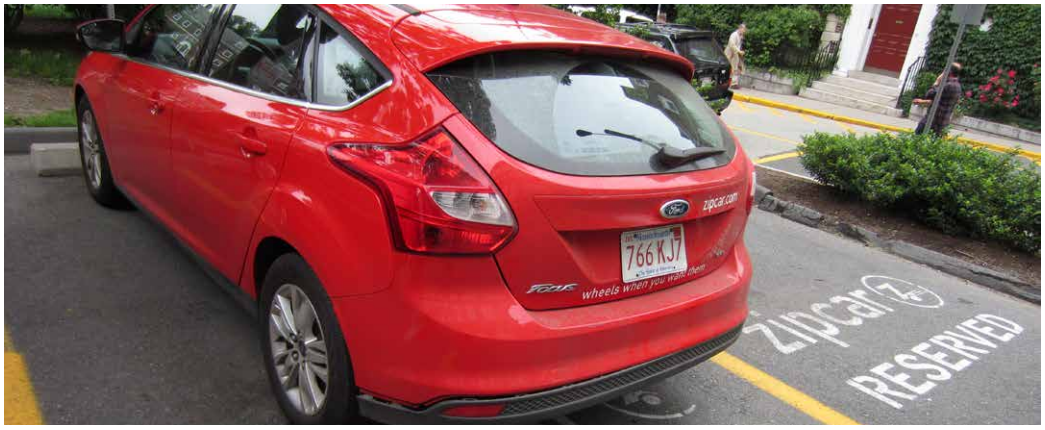
After the Charlesview site is cleared, “Academic Way” will be constructed between North Harvard Street and Western Avenue, including improvements to the two new intersections. This new street will facilitate Harvard’s extended shuttle system into Barry’s Corner and will create new vehicular circulation options to divert traffic away from the intersection of Western Avenue and North Harvard Street. These traffic diversions will reduce traffic congestion and create an opportunity to ‘tighten’ the intersection by eliminating the traffic island and realigning the curb on the northeast corner of the intersection. The remainder of “Academic Way” south of Western Avenue and “Science Drive” will be constructed as part of the Science project.

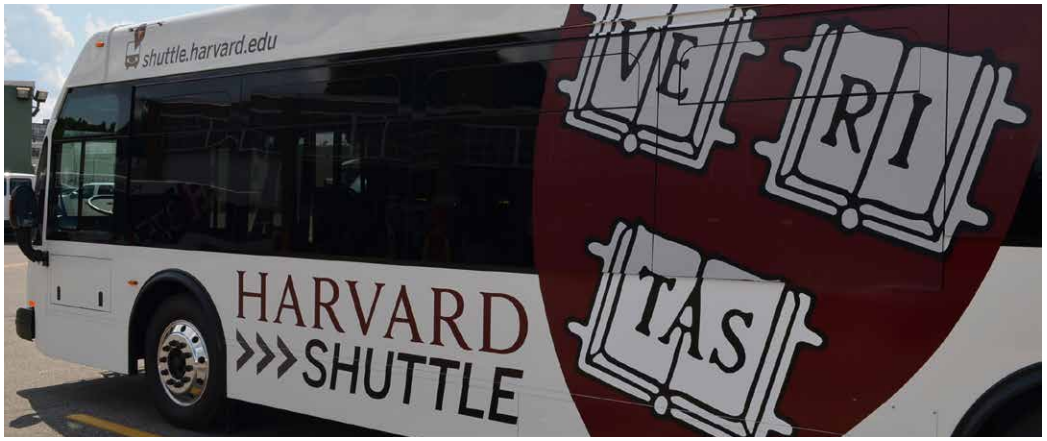


Figure 65: New Streets

Note: Street names are illustrative only, it is anticipated they may be re-named in the future.









From Top to Bottom: Hubway, Zipcar, Harvard Shuttle, Electric Charging Station

MOBILITY HUBS

Mobility Hubs are points of multimodal access that provide a range of transportation options for travellers as part of a larger interconnected network. These facilities do not rely on the construction of significant transportation infrastructure. Instead, the focus is on providing different mode options and organizing them to provide convenient use to accommodate transfers between modes. In this way, the Mobility Hub network will provide a virtual structure to facilitate the use of non-auto modes and environmentally sensitive vehicles as the IMP area is developed.

The Ten-Year Plan identifies five Mobility Hub locations in Allston: four locations are in the IMP area and one is at Brighton Mills. Each Mobility Hub is on one or two MBTA bus routes and four are located along Harvard shuttle routes. In addition to bus stops, Mobility Hubs can include Hubway stations, electric car charging stations, car sharing services (e.g., Zipcar) and taxi stands. Many of these elements are in place; others will be added or expanded as new projects are constructed.

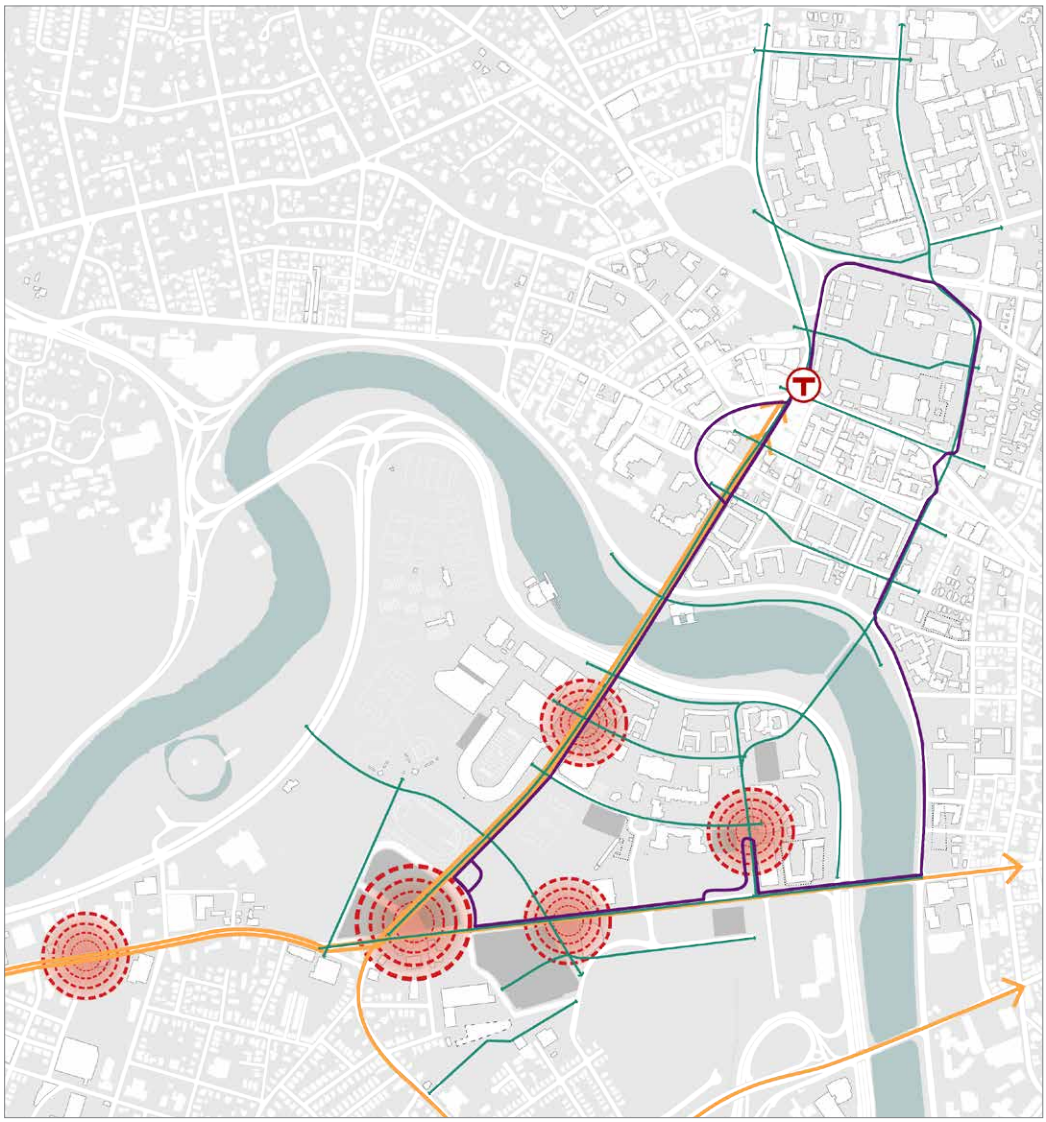


Figure 66: Ten-Year Mobility Hubs

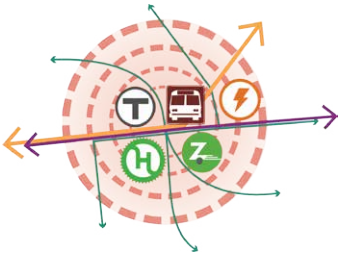


Figure 67: Prototypical Mobility Hub

- Hubway
- MBTA Bus Stop
- Harvard Shuttle Stop
- Electric Charging Station
- Zipcar Location

- MBTA Bus Routes
- Harvard Shuttle Route
- "Ladder" Pedestrian Connection
- Mobility Hub
- Harvard MBTA Station

PARKING

The Ten-Year Plan includes 3,807 off-street institutional parking spaces, including 50 spaces in a "parking reserve" that is subject to future administrative review by the BRA and BTD. The institutional parking spaces will accommodate the anticipated growth in demand by Harvard residents, commuters and visitors. The Hotel and Conference Center parking spaces may be non-institutional depending on the programming of this facility. The proposed new streets will provide an opportunity to create between 60-70 new parking spaces in addition to the
41 spaces that will be constructed on the streets next to the Barry's Corner Residential and Retail Commons project.

The location of the parking lots and garages seeks to minimize impacts on adjacent streets by taking advantage of new streets such as "Academic Way" and "South Campus Drive" to divert traffic away from Barry's Corner. The parking facilities and their driveways will be integrated into the network of pedestrian paths in the Ten-Year Plan to minimize pedestrian and vehicular conflicts and to provide suitable connections to the new and existing institutional uses.

The proposed increase to the institutional parking supply along with the new pedestrian paths and streets will also improve Harvard's ability to manage events at its athletic facilities and other venues, particularly at times when multiple events are occurring on the campus. Harvard currently uses a "shared parking" approach to accommodate event-related parking demand. These events typically occur at night and on weekends when commuter parking demand is low. The Harvard commuter-oriented parking in the Ten-Year plan is particularly well suited to accommodate parking demand for athletic events, relieving pressure on the Spangler parking lot.

LOADING

The IMP projects will include loading facilities to accommodate goods delivery and waste/ recycling removal. It is anticipated that each building will have its own loading facility that will be accessed from a campus roadway. The proposed Business School projects are near the existing service tunnel system that is connected to the Central Loading Facility near Batten Way. To the extent practical, these facilities will be connected to the tunnel system. Harvard will work with BTD to review loading facilities as the projects pass through the BRA's Article 80 review process.

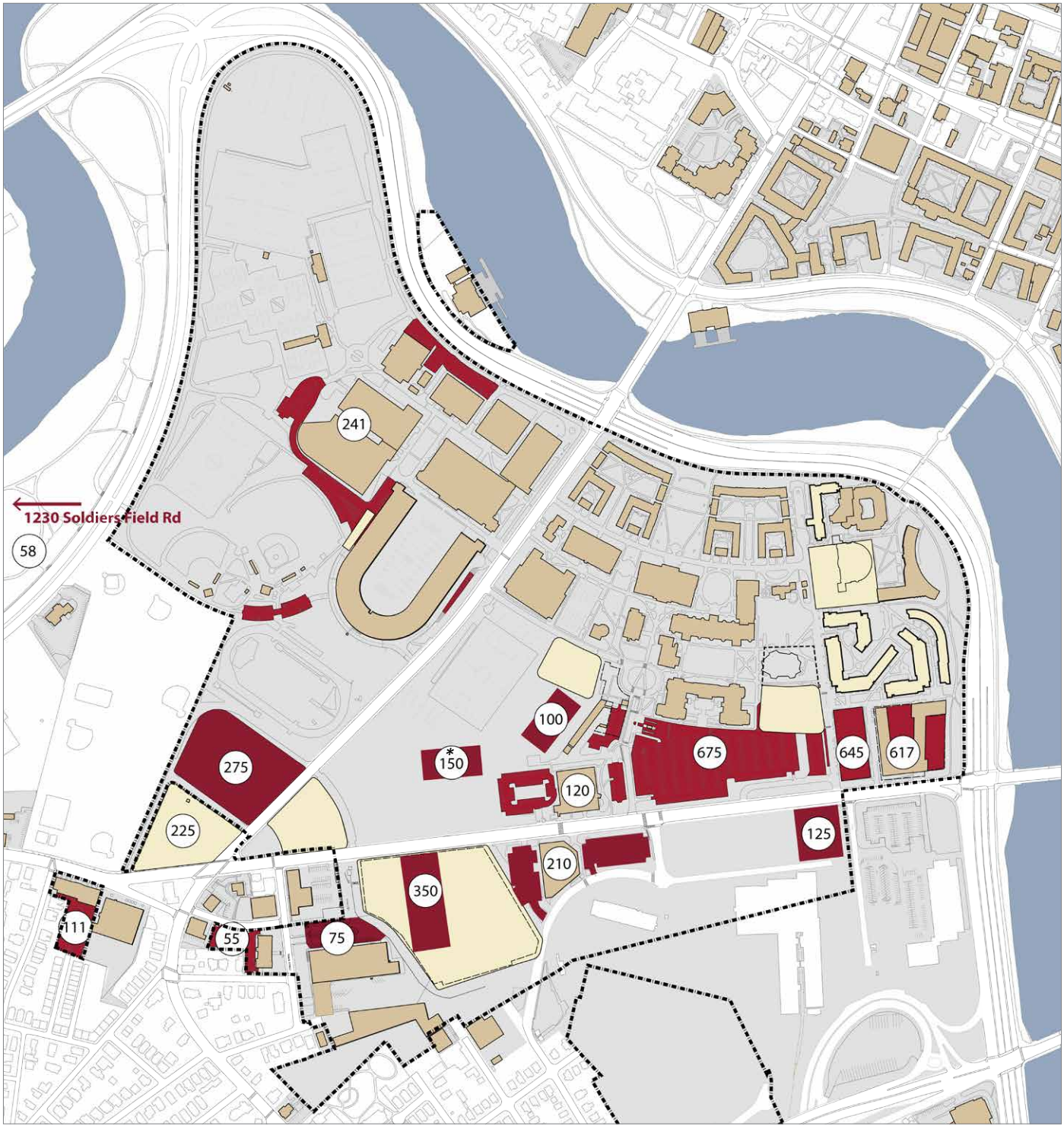


Figure 68: Ten-Year Proposed Parking

**Note: Includes 50 spaces in a "parking reserve" that is subject to future administrative review by the BRA and BTD.*

4.6 Ten-Year Plan Phasing

Table 6 depicts the approximate timing of the building projects and the open space, infrastructure, and roadway improvements that will accompany them.

Table 6: Ten-Year Plan Phasing

Projects	Open Space/Infrastructure/Roadway Improvements
Early (2014-2018)	
224 Western (underway at submission) 28 Travis Street (underway at submission) Barry's Corner Residential & Retail Commons Charlesview demolition **Chao Center (Kresge Replacement)** **Burden Replacement** **Harvard Stadium Addition/Renovation** **Baker Hall Renovation**	Barry's Corner Grove (interim) "South Campus Drive" "Ivy Lane" Rena Park
Mid (2018-2020)	
HBS Faculty and Administrative Offices **Soldiers Field Park Housing Renovation** Science project **Gateway project**	"Academic Way" (north of Western Avenue) and narrowing of intersection/elimination of traffic island at Barry's Corner "Academic Way" (south of Western Avenue) "Science Drive" (west of Rotterdam Street) Longfellow Path Rena Path Barry's Corner Grove (completed)
Late (2020-2024)	
Hotel Conference Center **Mixed Use Facility & Basketball Venue**	Greenway (early phase, eastern segment near Hotel and Conference)
IMP Projects = Bold	

5.0 District Plans & Project Descriptions

5.1 District Overview

Harvard's campus is characterized by an overall structure based on districts that comprise academic "neighborhoods" of similar character and use. Examples include: Harvard Yard, North Yard, or the River district. Similarly, Harvard's campus in Allston comprises four districts. For purposes of this IMP, these districts as shown in Figure 69, include:

- *Barry's Corner*, including the properties that face into the intersection of Western Avenue and North Harvard Street.
- The *Science & Enterprise* area between the Greenway and Western Avenue.
- The *Academic* area comprising the Harvard Business School, University Housing and an area of future academic growth between Western Avenue and North Harvard Street.
- The *Athletics* area, comprising fields and buildings for athletics and recreational use.

This chapter describes how each project fits into this campus context of individual districts (Figure 70). District boundaries are drawn with the recognition that each has a unique character, though the districts are inherently overlapping and typically relate strongly to one another. The public realm ties together the campus and connects it with the surrounding community. Planning for districts requires evaluating both the broader context and the scale of the district.

Each district section describes:

- Existing conditions
- District planning objectives
- Projects underway and how they contribute to district planning objectives
- Projects intended to occur within the ten-year time frame of the IMP
- Activities or plans to strengthen the public realm
- Urban design guidelines and site planning principles for each project site



Figure 69: Districts Overview

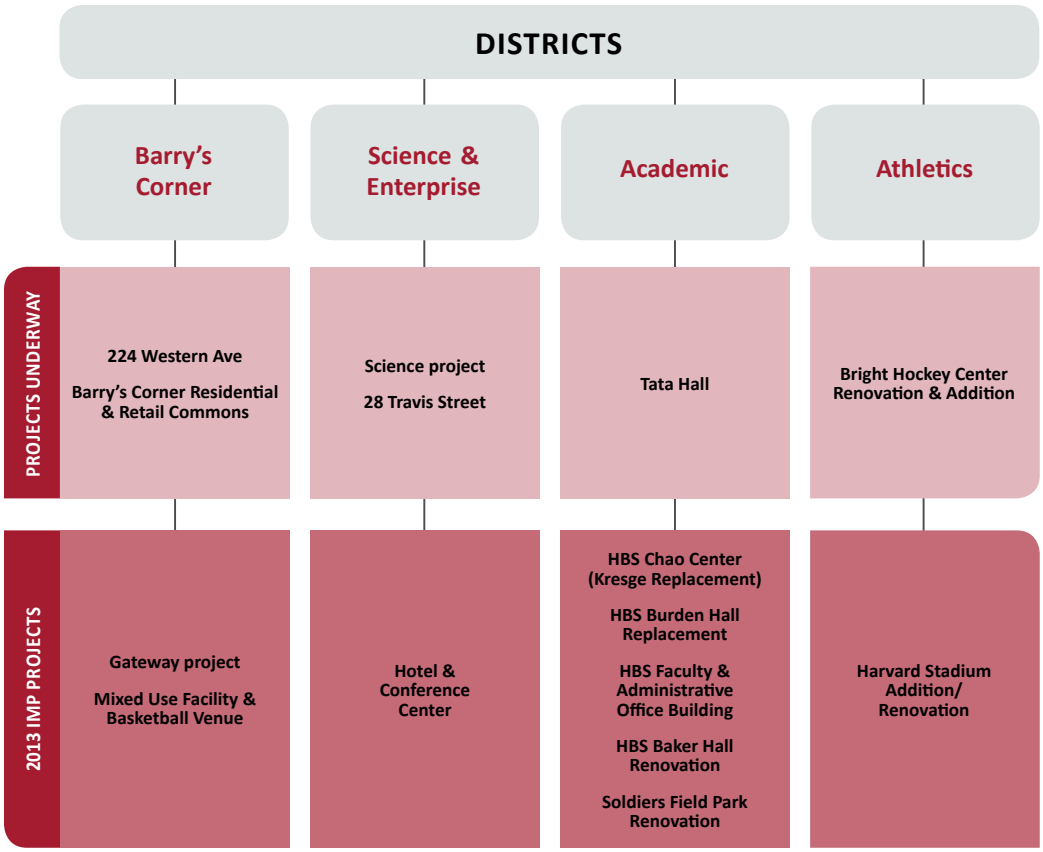


Figure 70: Projects by District



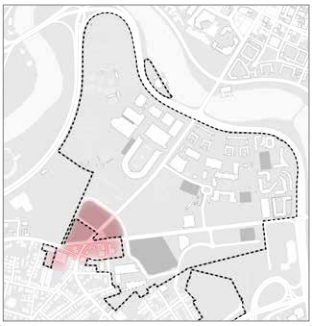
Western Avenue, 1950's



Barry's Corner District Existing View North, May 2013

Photography by Mark Flannery

5.2 Barry's Corner District



Barry's Corner is envisioned as a mixed use district at the intersection of the neighborhood and University. Buildings will house a variety of uses and include active ground floors. Barry's Corner will evolve to a higher density urban square over time. The district will have an engaging public realm with wide sidewalks, street tree plantings, and buildings set close to the street.

EXISTING CONDITIONS

Barry's Corner is at the intersection of two historic roadways, North Harvard Street and Western Avenue, connecting Harvard Square and Allston-Brighton, and Central Square and Watertown. It is also the intersection of the neighborhood and the University and provides the greatest opportunity for establishing a dense mix of diverse activities which can join them together.

In the late 1950's Barry's Corner was a compact working class neighborhood comprising about nine acres, more than 50 housing units, and approximately 70 families. The neighborhood had good public transportation access to Union, Central and Harvard Squares. In the early 1960's a City of Boston plan to redevelop the northeast corner resulted in the construction of the Charlesview Apartments, a 213 unit affordable housing development which opened its doors in 1971. In 2011, a land exchange agreement was executed by Harvard and Charlesview, and subsequently 240 units of replacement rental housing were developed at Brighton Mills. All residents of the former Charlesview will have moved to the new development by the fall of 2013. The site will then become available for redevelopment (this is further discussed in Section 5.4).

The south side of Western Avenue at this intersection has a number of single story buildings. The corner buildings are set back far from the street with parking areas immediately adjacent to the sidewalk, creating an ill-defined street wall and making it difficult to engage pedestrians with ground floor retail activities that have recently been introduced. A service station located on an island in the intersection interrupts ground floor activities, adds to the separation of opposite sides of the street, and creates an extended crossing lengthening the time required by pedestrians to cross the street.

ACTIVATION OF BARRY'S CORNER

Harvard's recent activities supporting the revitalization of Barry's Corner include ground leasing a site to a private developer for a major new residential and retail complex with new plazas and enhanced access to Smith Field, redevelopment of 224 Western Avenue for Harvard's Ceramics Program, development of Stone Hearth Pizza and Swiss Bakers, and the creation of the Innovation Lab (i-lab) and Ed Portal. This Plan advances that effort with the establishment of new residential and retail development surrounding a new basketball venue and the creation of a major new institutional mixed use project, referred to as the Gateway project, with an active at-grade base bringing more retail and service activity to animate and anchor Barry's Corner. The focus of this development activity will be the Barry's Corner Grove, a shady green counterpoint to the bustling activities around it, for the use and enjoyment of the public.

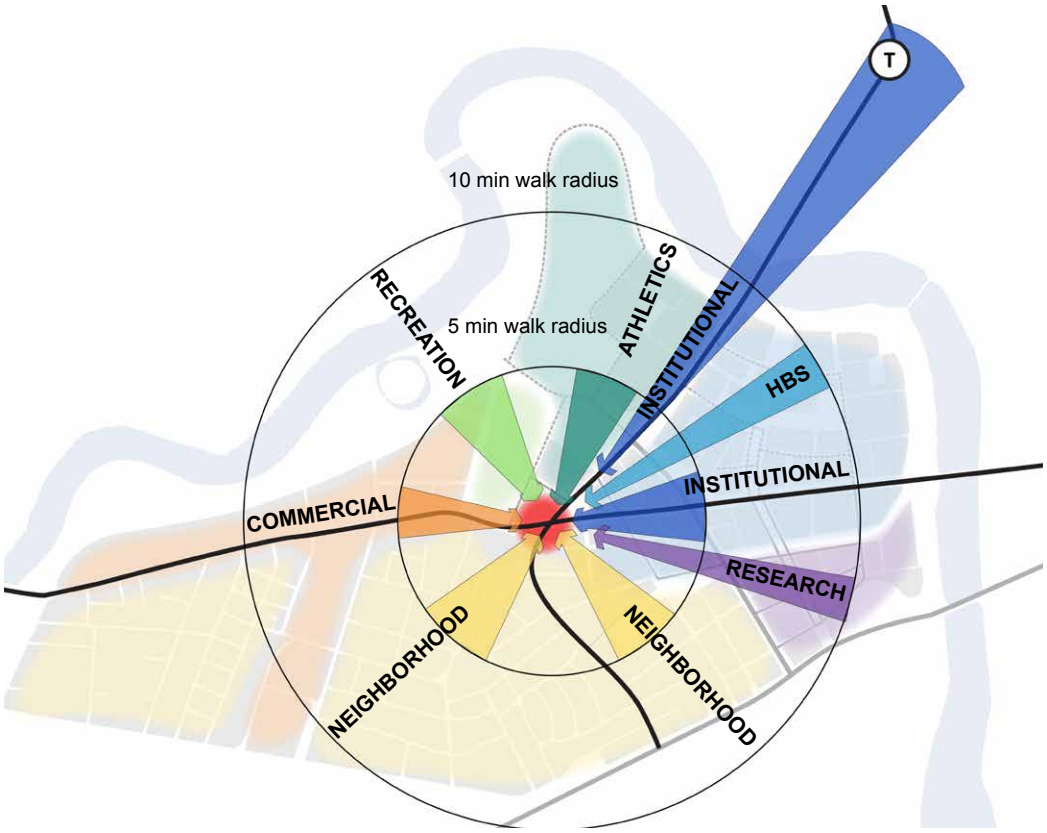


Figure 71: Uses That Will Support Barry's Corner

At the intersection of Western Avenue and North Harvard Street Harvard proposes to eliminate the traffic island and reallocate street space to accommodate pedestrians. This is consistent with strategies set forth in the City's Complete Streets Guidelines.



Existing Distance Across



Future Distance Across

BARRY'S CORNER DISTRICT PLANNING OBJECTIVES

- Develop a mixed use district at the intersection of the neighborhood and University with strong connections to adjacent communities
- Establish a diverse mix of uses that activate Barry's Corner during the daytime as well as evening and weekends. Address academic needs, while creating new housing and retail opportunities
- Create the identity and vitality of an urban square over time, with sufficient density to support retail and an active public realm
- Balance the crossroads so that activity centers on the Grove. The Grove is seen as a vibrant gathering place with a simple landscape palette of turf, trees, hardscape and seating
- Transform the area with an accessible, interconnected and continuous landscape, canopy trees and green spaces. The landscape of Barry's Corner can play an important role in making the district comfortable, memorable, and sustainable
- Enhance the landscape function and ecological processes of the district
- Make the intersection safer and more comfortable for bicyclists and pedestrians
- Provide on street parking for traffic calming and to support retail at Barry's Corner
- Tighten pedestrian connections at the intersection of Western Avenue and North Harvard Street
- Establish new streets that address vehicular circulation and that also provide new pedestrian connections to and from key destinations such as Smith Field, Barry's Corner Grove and other open plaza areas



"Barry's Corner can emerge as a lively community-serving, pedestrian friendly Main Street opening onto Smith Field and extending toward Brighton Mills and Harvard's campus."

- North Allston Strategic Framework for Planning

Figure 72: Barry's Corner Rendering - North Allston Strategic Framework for Planning (BRA, May 2005)



Figure 73: Existing Conditions (2013)



Figure 74: Barry's Corner Long-Term District Planning Objectives



Figure 75: Ten-Year Illustrative Plan



Figure 76: Long-Term Illustrative Plan

BARRY'S CORNER 3D ILLUSTRATIVE VIEWS



Figure 77: Ten-Year 3D: Barry's Corner View North



Figure 78: Long-Term 3D: Barry's Corner View North



Figure 79: Ten-Year 3D: Barry's Corner View West



Figure 80: Long-Term 3D: Barry's Corner View West

BARRY'S CORNER GROVE

The grove of trees that currently occupies the northeast corner of the intersection of North Harvard Street and Western Avenue will become the "town square" – or "town common" – of the Barry's Corner neighborhood. As building and population densities increase, a protected landscape at the center gains immeasurably in value. The existing grove trees already stake a claim for an iconic landscape presence and identity at this historic intersection; the IMP advances that prospect accordingly. This newly accessible landscaped area will be the counterpoint to the hard surfaced plaza on the west side of North Harvard Street. These two civic spaces will work together to form an identifiable center.

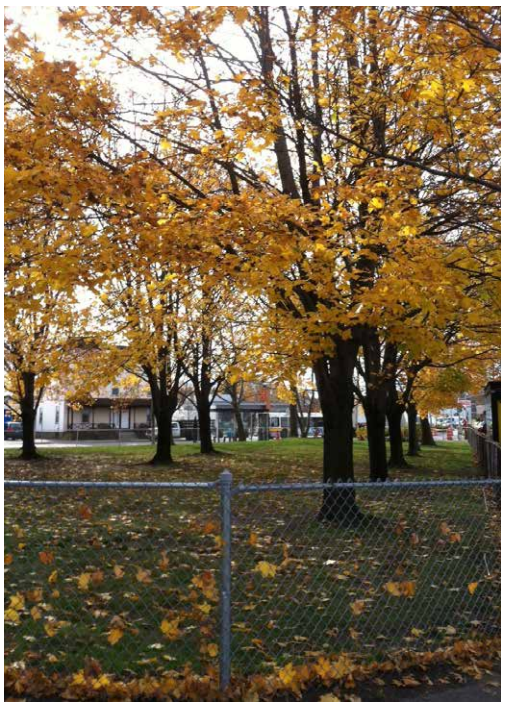
Two prevalent tree species define the grove today: London Planes, which are generally healthy and provide outstanding character and sustainability benefits; and Norway Maples, which are relatively short-lived and already somewhat compromised in their vitality. Over the ten-year plan, the Norway Maples will be replaced, incrementally, with species that provide greater environmental and spatial benefits.

Forbes Plaza and Winthrop Square in Cambridge are both comparable in size to the Grove at Barry's Corner. Both include formal and informal seating, and a simple landscape palette that is consistent with what is envisioned for the Grove.

During the period in which the former Charlesview Apartments undergo demolition, to the extent consistent with health and safety, Harvard will make portions of the grove fully accessible to the public, with provision for internal walkways and seating areas. Further, when the proposed Gateway mixed use institutional project immediately east of the grove is built, the grove will be expanded by a shaded plaza that supports the active ground floor uses of that building. This will solidify the grove as a lively and permanent gathering space – a local destination in itself – at a location that joins neighborhood and university populations together.

Urban Design and Planning Principles

- The design of the grove and its adjacencies should support desires for the grove to become a gathering space for Barry's Corner neighborhood.
- Preserve the London Planes as possible, incrementally replace the Norway Maples
- Provide access in the near term to the grove in an interim state, formalize and complement immediate improvements with construction of "Academic Way" and the Gateway project



Barry's Corner Grove View Southwest, Nov. 2011



Barry's Corner Grove View Southwest, May 2012



Forbes Plaza, Cambridge





Winthrop Square, Cambridge

Figure 81 and Figure 82 illustrate possible schematic design concepts for the Grove at three stages in time.



Interim Condition (Charlesview Demolition)



Post Construction of "Academic Way" & Narrowing of Barry's Corner Intersection



With Gateway Project

Figure 81: Grove Concept A (Evolving)



Interim Condition
(Charlesview Demolition)



Post Construction of
"Academic Way" & Narrowing
of Barry's Corner Intersection



With Gateway Project

Figure 82: Grove Concept B (Evolving)

Figure 83 and Figure 84 illustrate street level conditions of Concept B (Figure 82) at three stages in time.



Existing Conditions, 2013



Interim Condition (Charlesview Demolition)



With Gateway Project

Figure 83: View from Western Avenue (Concept B - Evolving)



Existing Conditions, 2013



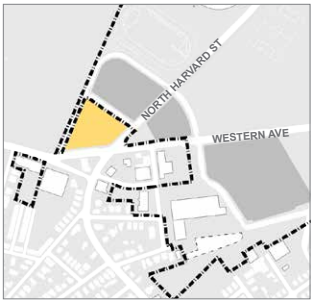
Interim Condition (Charlesview Demolition)



With Gateway Project

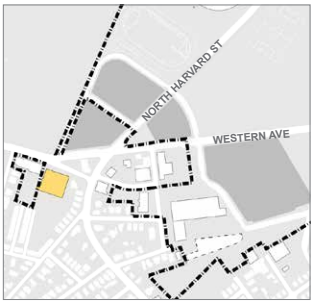
Figure 84: View from North Harvard Street (Concept B - Evolving)

BARRY'S CORNER PROJECTS UNDERWAY



Barry's Corner Residential and Retail Commons

Through a request for proposals and selection process that included administrators, faculty members and two Allston neighbors, Harvard University selected a real estate partner, Samuels and Associates, to develop the Barry's Corner Residential and Retail Commons under a long-term ground lease. The project was approved as a Planned Development Area (PDA) by the BRA Board in April 2013 and by the Zoning Commission in May 2013. It includes approximately 325 units of housing, approximately 45,000 SF of retail space, and 225 parking spaces. Barry's Corner will include public realm improvements and improved access to Smith Playground. Transportation improvements will accommodate car sharing and bike sharing services. Two new streets ("South Campus Drive" and "Ivy Lane") will be built to facilitate access to Barry's Corner and Smith Field, to improve traffic flow, and to create on-street parking. The residential units will be split into two components sharing a single podium for retail and residential amenities.



224 Western Avenue Renovation

Harvard Ceramics will be relocated to 224 Western Avenue, the former Verizon building, to accommodate programmatic needs and to activate a key Barry's Corner location with a community-friendly use and an open, welcoming design. Relocating the Harvard Ceramics Program from 219 Western Avenue will provide an active use at 224 Western Avenue and allow for construction of the Barry's Corner Residential and Retail Commons. Known internationally for its leadership in the field, the Ceramics Program provides a creative learning environment for a dynamic mix of members of the public from North Allston and greater Boston, professionals, artists, students, University affiliates, and international participants from the University, and international community. Public realm improvements have been included to enhance the pedestrian environment with new sidewalks, landscaping and seating areas.



Figure 85: Barry's Corner Rendering A: View of Grove from Western Avenue *By Elkus Manfredi Architects*



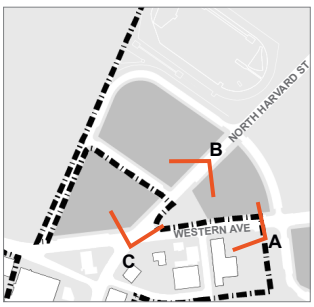
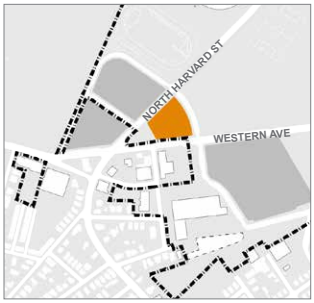


Figure 86: Barry's Corner Rendering B: North Harvard Street View Southwest *By Elkus Manfredi Architects*



Figure 87: Barry's Corner Rendering C: View Northeast *By Elkus Manfredi Architects*

BARRY'S CORNER IMP PROJECT DESCRIPTIONS



Gateway Project

Project Elements

The University plans to propose development on the existing Charlesview site. The University recognizes the importance of this site in the development of Barry's Corner, and a number of important planning principles and design guidelines have emerged from the early analysis of the site and discussions with the BRA and Task Force which will guide future development.

In terms of siting and design, the intention is to enliven Barry's Corner, enhance the pedestrian environment, and link students, faculty members, staff and the community. This concept will also respect and incorporate the existing grove of trees by providing informal seating, spaces for music or performances, and a gathering place for the community. This will provide pedestrian permeability between the Barry's Corner Grove and the Harvard campus to the northeast and east. Development on this site will also provide an important complement to the Barry's Corner Residential and Retail Commons by providing additional amenities and activity.

As currently planned, the proposed project would include approximately 300,000 square feet of space, including between 35,000 and 50,000 square feet of retail space, at between six and nine stories. An active ground floor supporting permeability would be mixed use, comprised of service, retail, and/or other institutional uses and programming. The upper floors would include institutional/mixed uses, which may include administrative or academic office space. The office uses will provide daytime activation that complements residential and retail uses.

Ground floor uses will be of an active public nature, including and without limitation ground floor retail. These ground floor uses will focus on activities that provide face-to-face interaction and will not comprise back-office service uses.

Harvard is open to a discussion of using the building as a possible future home for the Harvard-Allston Education Portal and/or incorporating cultural programming into the project.

Recognizing the importance of the Gateway Project to the success of Barry's Corner, Harvard is moving the project forward in its projected phasing from the "late" (2020-2024) category to the "mid" (2018-2020) category.

Table 7: Barry's Corner IMP Project Dimensions

Item	Gateway Project
Site locations and approximate building footprints	Portion of existing Charlesview site (approximately 1.2 acres, excluding Grove)
Uses	Administrative Offices, Retail, Institutional
Square feet of gross floor area	Approximately 300,000 SF, including: 250,000 to 265,000 SF of administrative office 35,000 to 50,000 SF Retail/Active Ground Floor
Square feet of demolition	0 (assumes demolition of existing Charlesview)
Building heights	6 to 9 stories
Parking areas	TBD

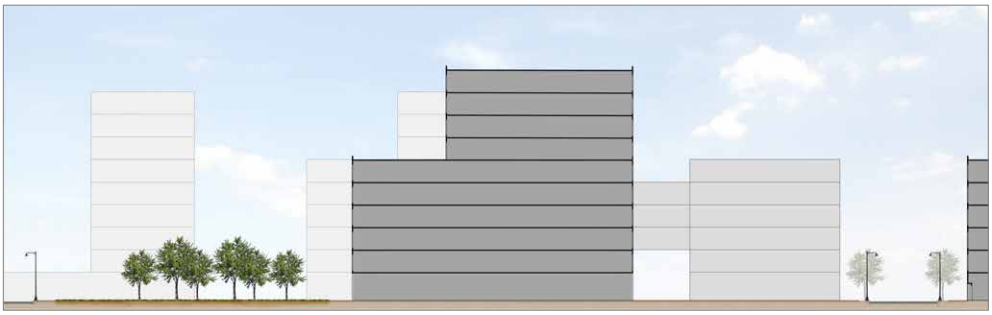
Urban Design and Site Planning Principles

- Create a permeable edge linking Barry's Corner to the future academic area to the northeast, and which responds to newly constructed mixed use projects at Barry's Corner
- Provide opportunities for community interface by enhancing the University's presence in Barry's Corner, including office uses complementary to housing on the west side of North Harvard Street
- Engage projects and streetscape improvements with the Grove and bring vitality to Barry's Corner
- Create an inviting public realm
- Create a visible campus gateway from points south and west, acting as a landmark and opportunity to establish an important view corridor
- Design the facade of the building to engage the public with activities and views within the building
- Plan for pedestrian circulation through the site to connect with streets and path to and from Barry's Corner
- Reinforce the focus of Barry's Corner at the Grove

Illustrative massing alternatives are presented in Figure 88. Figure 89 and Figure 90 are illustrative site sections which relate the massing to surrounding streets and buildings.



Figure 88: Gateway Project Illustrative Massing Alternatives (Long-Term View North)



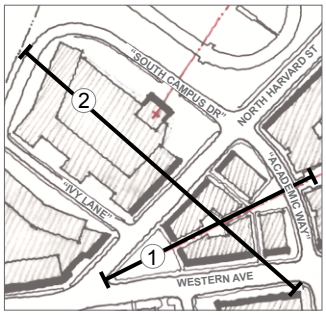


Figure 89: Illustrative Site Section 1 View Northwest

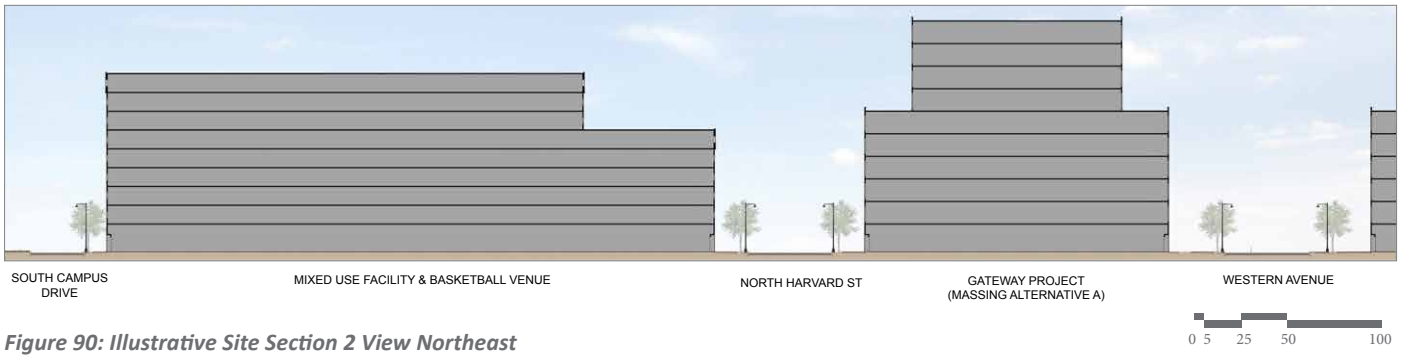


Figure 90: Illustrative Site Section 2 View Northeast

Mixed Use Facility & Basketball Venue



Project Elements

The University intends to build a new basketball venue – with the balance of the site accommodating additional residential and retail uses. The Harvard basketball teams currently play in the Ray Lavietes Pavilion, located in the Briggs Cage on the northern edge of the Athletics district. The building opened in 1926 and was used for Harvard's indoor track activities. In the 1990's, the building was renovated to become the home to the Harvard men's and women's basketball teams. Lavietes Pavilion requires facility and building upgrades and at approximately 1,950 seats, it remains the smallest basketball venue in the Ivy League.

It is currently envisioned that 175 North Harvard Street – the site of the existing Education Portal – would be redeveloped for a new project that will include a basketball venue with the balance of the site accommodating institutional/mixed uses. The Education Portal will be located elsewhere within the Barry's Corner area. The new basketball venue is currently envisioned to be approximately 60,000 square feet and would include approximately 3,000 seats (approximately 1,000 more than the existing Lavietes Pavilion), locker rooms, athletics offices, and concession areas. The site is large enough to allow for the basketball venue to be situated in a strong relationship with other abutting facilities and also permits other uses that will tie directly to activities along North Harvard Street.

The remainder of the site will be developed for a mixed use institutional development that is largely focused on institutional affiliate/graduate student housing. As currently proposed, the non-basketball portion of the project will include between approximately 200,000 and 250,000 square feet of residential space and approximately 10,000-30,000 square feet of ground floor retail. Recognizing that a basketball venue alone does not provide significant opportunities for active street uses outside of event days, the intent of the project is to provide a mix of uses that will activate the street and bring activity to the site and to Barry's Corner throughout the day and all year long.

Harvard will work with the BRA and the Task Force to participate in the creation of or stabilization of housing in conjunction with this IMP, and to maximize the linkage funding that is spent in the neighborhood, as well as the contributions any housing component of the Mixed Use Facility and Basketball Venue might make to the mix of neighborhood housing. Such alternatives may include a component of the housing portion of the project that is available for the broader public, as opposed to only Harvard affiliates.

When the Mixed-Use Facility and Basketball Venue proposal is submitted for Large Project Review, Harvard will continue to review with the BRA opportunities to enhance or promote non-affiliated housing as a part of community benefits associated with the IMP. Furthermore, Harvard will consider an increase in retail and other active public uses should analysis at that time show they are viable and warranted.

Table 8: Mixed Use Facility & Basketball Venue IMP Project Dimensions

Item	Mixed Use Facility & Basketball Venue
Site locations and approximate building footprints	West side of North Harvard Street Site of existing building at 175 North Harvard Street (approximately 2.7 acres)
Uses	Housing/Institutional/Office/Retail Basketball venue
Square feet of gross floor area	TOTAL – approximately 270,000 to 340,000 SF Basketball venue – approximately 60,000 SF Residential – approximately 200,000 to 250,000 SF Retail – approximately 10,000 to 30,000 SF
Square feet of demolition	50,000 SF (175 North Harvard Street plus garages)
Building heights	6 to 10 stories
Parking areas	approximately 275 spaces

Urban Design and Site Planning Principles

- Locate basketball facilities so that they relate to both Barry's Corner and the Athletics district
- Locate active mixed uses on North Harvard Street and include public spaces/plazas at entries to the facility
- Create variable massing on "Ivy Lane" opposite the Barry's Corner Residential and Retail Commons
- Provide a recognizable entry to Barry's Corner on North Harvard Street (arriving from east)
- Extend pedestrian circulation through to Smith Field from the Grove
- Provide continuity of built form and streetscape that is compatible with and extends the design of Barry's Corner Residential and Retail Commons
- Maximize views to the Harvard Stadium
- Create an active edge on development facing Smith Field, carefully locating service entries to minimize back-of-house interference to the public realm

Illustrative massing alternatives are presented in Figure 91. Figure 92 is an illustrative site section that relates the massing to surrounding streets and buildings.

Site Selection Rationale

The selection of the basketball venue site was the product of a careful analysis of various siting options within Harvard's Allston property. Central to this analysis was the goal of maintaining the University's athletics facilities within a cohesive geographic district, allowing for functional activities and connections to be optimized, and enabling students to move comfortably and safely between different athletic facilities – e.g., locker rooms, fitness venues, etc. – at various hours of the day.

The study began with an assessment of the existing conditions of the buildings and fields within the Athletics district. This assessment recognized that athletic playfields are critical components of the overall athletics program, and that their locations, sizes and clustering reflect the programmatic needs of the athletic activities that they support. The fields are heavily utilized by the University's students and others. Significant changes to this network would need to reflect the requirements of the basketball program, and would need to represent an improvement upon the dynamics of the existing field network. No sites for basketball within the Athletics district were available that would not require major reorganization and reduction of Harvard's network of playfields.

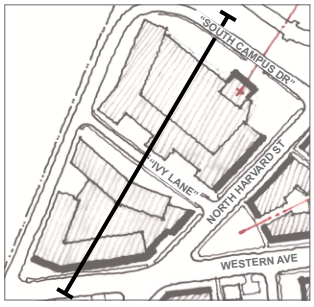
Siting options across North Harvard Street were also considered, but were not selected due to two primary factors. First, frequent crossing of busy North Harvard Street would be required, and this was not seen as desirable in terms of convenience, Athletics district coherence, and most importantly student safety. In addition, the Harvard Work Team recommendations that guide this master plan effort prioritized the Ohiri Field/Charlesview district as an area to support academic facilities.

In considering the best location for basketball, a key criterion was how best to optimize event atmosphere for athletes and Harvard community in the spirit of Ivy League competition, ensuring that the facilities work not only as competitive sites, but also as venues for the Harvard community to enjoy as meaningful stages for the excitement and camaraderie of collegiate athletic contests. This demands comfortable seating with excellent sight lines and acoustics. Major renovation of the Lavietes building, Harvard's current basketball venue, was considered and, while feasible, was not viewed as the best means of achieving the goals stated above. This 1925 facility is considered undersized, and would require extensive building system improvements, and if renovated would still not produce a basketball arena comparable to that of the planned new facility.

This overall analysis concluded that the basketball venue is most appropriate in the proposed location at the edge of the Athletics District, and that the adjacent housing and retail elements will provide an effective transition to the Barry's Corner District in terms of scale, size and use.



Figure 91: Illustrative Massing Alternatives (Basketball and Mixed Use Project)



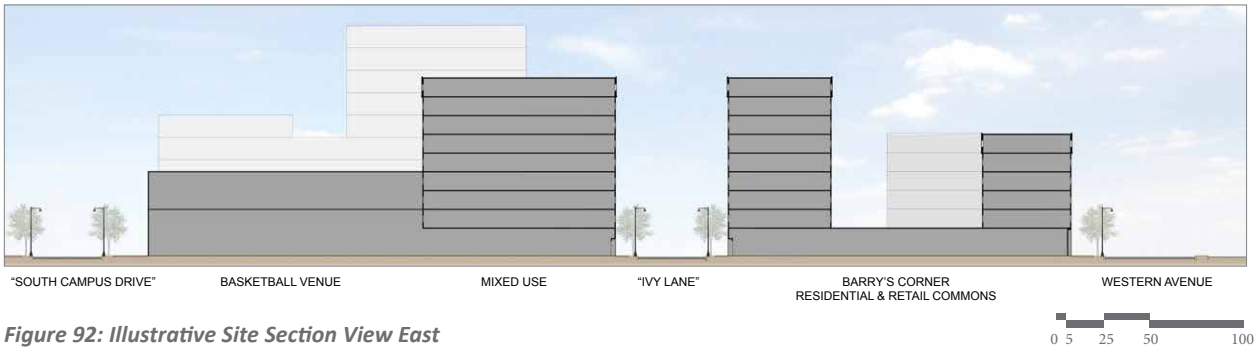
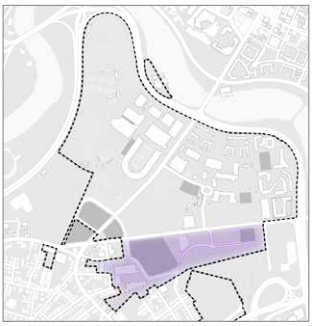


Figure 92: Illustrative Site Section View East



5.3 Science and Enterprise District

The south side of Western Avenue will include flexible and adaptable facilities that can accommodate changing research requirements and paradigms. Building sites along Western Avenue respond to the Long-Term Vision of the University and also anticipate future connections to the urban grid of the Enterprise Research Campus (beyond the time frame of the IMP). The Greenway, a working landscape for stormwater management marks the transition between the IMP area and the Enterprise Research Campus.

EXISTING CONDITIONS

The area is largely vacant, covered with impervious paving and not penetrable to pedestrians. It includes the 28 Travis Street redevelopment (currently underway), the Science foundation, and land formerly occupied by Romar Transportation Systems in "Allston Landing North". Romar is likely the first parcel which may become available from the Harvard landholdings east of Barry's Corner and south of Western Avenue that are encumbered by the exclusive, perpetual railroad easement held by CSX Transportation, Inc. (CSX).

The overall area has an industrial history. At the west end of the district, Ray Mellone Park has been developed on the former site of McNamara Concrete Co. Sites of the 28 Travis Street project and Science project formerly contained warehouses. Romar facilities have included warehousing and a container yard. The area has good proximity to vehicular routes and offers the opportunity for floor plates required by the sciences that are not achievable in Cambridge.



McNammara's Concrete, 1940's (now Ray Mellone Park)



Western Avenue, View East Toward Charles River and Cambridge, 1990's

SCIENCE AND ENTERPRISE DISTRICT PLANNING OBJECTIVES

- Improve and create a cohesive streetscape on Western Avenue, establishing a consistent urban design on both sides of Western Avenue, including a continuous street tree canopy and pedestrian crossings to assist with knitting together the academic district and the science and enterprise districts
- Introduce active uses along Western Avenue, recognizing this is one link in a larger urban corridor
- Create a dynamic blend of activity that will make the area a sought after destination – a place where companies want to locate, and a place where people want to work and live
- Create a network (pedestrian, bike, transit, vehicular and open space) that will provide access to new areas and destinations
- Enhance the landscape within the district, reducing impervious paved areas
- Introduce the Greenway as a working landscape for stormwater management and as a flood channel to mitigate impacts of climate change
- Implement segments of the Greenway over time, creating links between the community, the campus, and the Charles River
- In conjunction with the BRA and the Task Force, Harvard will explore strategies to implement elements of the proposed Greenway in at least an interim condition. This study will be carried out in 2014



Science and Enterprise District Existing View Northeast, May 2013 *Photography by Mark Flannery*



Figure 93: Existing Conditions: Science and Enterprise District (2013)

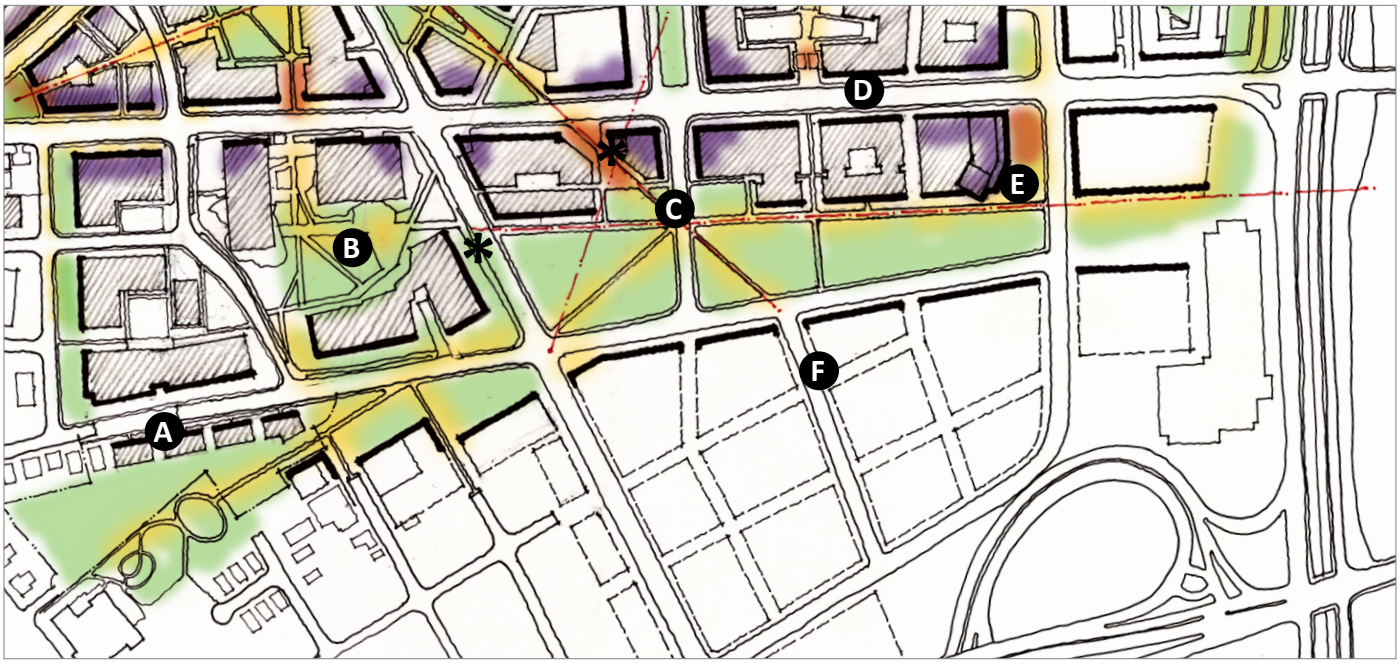


Figure 94: Long-Term Planning Objectives: Science and Enterprise District

- Open Space
- Plaza
- Pedestrian Circulation
- Active Ground Floor

A. Transition to neighborhood with massing sensitive to context

B. Provide connectivity to surrounding greenspaces

C. Important intersection/ nexus of Greenway and Longfellow Path

D. Transform the industrial character of this segment of Western Avenue with two-sided development.

E. Important pivot point/nexus of Greenway and East Drive and potential hotel and conference center site

F. Plan for long-term connections to future Enterprise Research Campus

✱ Focal Point Opportunity

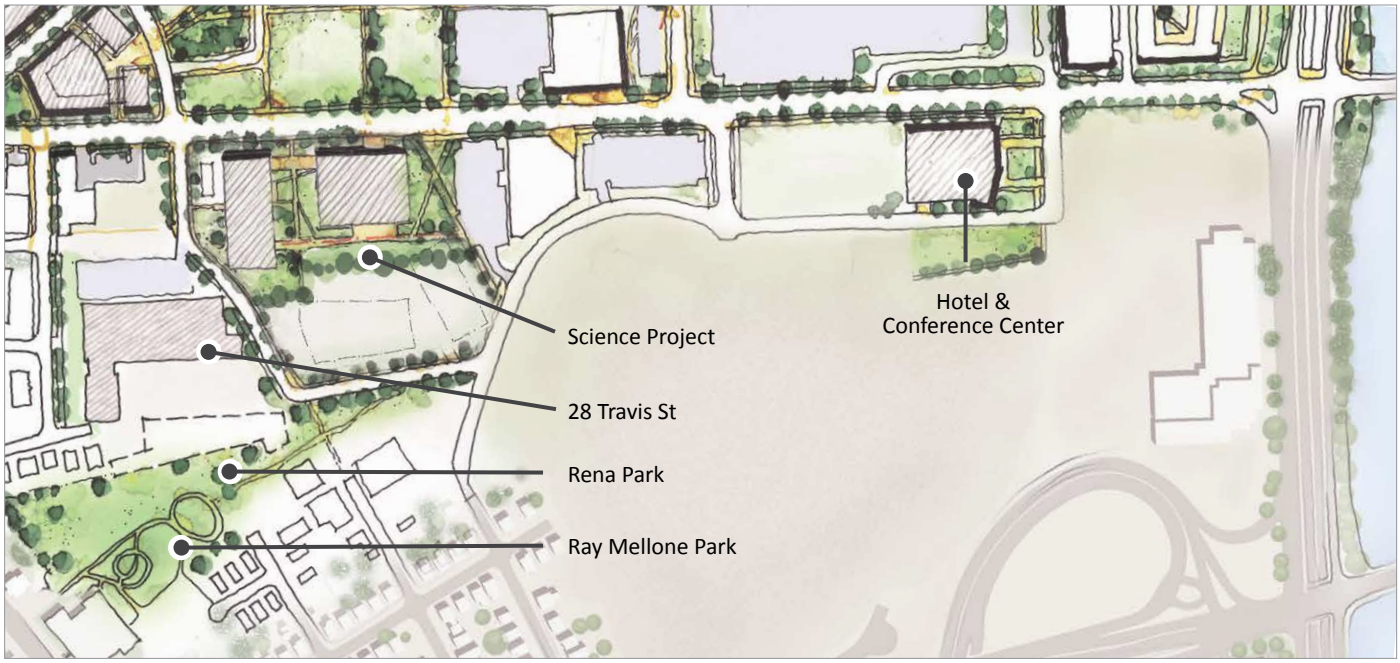


Figure 95: Ten-Year Illustrative Plan: Science and Enterprise District



Figure 96: Long-Term Illustrative Plan: Science and Enterprise District

SCIENCE AND ENTERPRISE 3D ILLUSTRATIVE VIEWS



Figure 97: Ten-Year 3D View: Science and Enterprise District



Figure 98: Long-Term 3D View: Science and Enterprise District



Figure 99: Ten-Year 3D View: Science and Enterprise District



Figure 100: Long-Term 3D View: Science and Enterprise District

SCIENCE AND ENTERPRISE PROJECTS UNDERWAY



Science Project

In 2007, the BRA Board and the Boston Zoning Commission approved the Harvard Allston Science Complex following the review of an IMP Amendment and the completion of the BRA's Large Project Review process. Construction of the project started in late 2007 and resulted in the completion of the foundation and the subsurface component of the project, but in 2009, due to the global financial downturn and its severely constraining effects, the University announced that work on the project would be paused.

Consistent with the Work Team recommendations of June 2011, the Science project is being re-designed to maximize available square footage for science. Currently, the University is advancing a program that includes the anchoring presence of laboratory and teaching space for the School of Engineering and Applied Sciences, as well as a significant area of flexible lab space dedicated to cross-faculty collaborations and experiments.

The building program is anticipated to include faculty, students and staff of the School of Engineering and Applied Sciences (SEAS). There will be a larger teaching and undergraduate presence than was included in the previous project. The building will include a mix of wet and dry lab experimentalists, as well as applied mathematicians and theorists. The initial program will include approximately 550,000 GSF. The plan will also include approximately 35,000 GSF in the 114 Western Avenue building, adjacent to science.

The existing parking lots at 114 Western Avenue are planned to be expanded from 178 spaces to 210 spaces necessary for the first phase of construction. No below grade parking is required for the initial program. The project will include a Distributed Energy Facility for chilled water, hot water, and electrical distribution but will not have energy generated on-site. Instead, the project will take advantage of the significant improvements that have been made to the Blackstone Plant in Cambridge for its energy needs to advance sustainability goals. Academic planning is currently underway to determine the process for developing the balance of the permitted foundation.

Stefan Behnisch from the firm of Behnisch Architekten (the architect for the initial Allston Science Complex) has been re-engaged as the project architect.

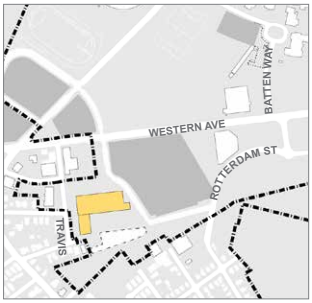
Principles that will govern the design of the project:

- Maintain the previously approved above-ground square footage and maximize the below-grade space for usable space
- Increase and maximize the amount of space for academic and research purposes
- Design "Academic Way" to be a street running between Western Avenue and "Science Drive" (rather than a pedestrian path)
- Design "Science Drive" to connect Rotterdam Street to "Academic Way"

Urban Design and Site Planning Principles

- Extend the street wall of Western Avenue facade, with appropriately dimensioned setbacks and landscaping in setback, and create active ground floor uses along Western Avenue
- Create visual presence at the Western Avenue main entrance, visible from Barry's Corner and from corner of Western Avenue and East Drive
- Maintain building height consistent with street and block patterns set out in the IMP and those of the approved design; reinforce primacy of Barry's Corner and Western Avenue districts, respecting scale of residential areas
- Establish building density consistent with the planning principles identified for this district, higher at the north at Western Avenue and lower to the south of the site near residential areas
- Make building massing consistent with setbacks identified in the IMP along the street, minimizing shadow impacts on and around the site
- Establish building use consistent with planning objectives identified in the IMP, with academic uses between Barry's Corner and the historic campus to the north and east
- Maintain permeable site circulation with courtyard connections to open space networks including the Greenway, and pedestrian connections to adjacent streets like Bertram Street
- Plan for the building to be connected to the area's intermodal transportation network

28 Travis Street



This project involves the adaptive re-use of a former Comcast warehouse into approximately 42,000 square foot Campus Services building with an adjacent approximately 10,000 square foot fleet maintenance facility. The project was included in the December 14, 2012 Institutional Master Plan Amendment (Revised February 14, 2013) because services and functions had to be relocated from Barry's Corner to allow for the construction of the Residential and Retail Commons project. This project was approved by the BRA Board on March 14, 2013 and by the Zoning Commission on April 10, 2013.

The building will be the home of Harvard's Information Technology services center, mail facility, transportation department, Harvard University Police Department Training Facility and recycling center. These uses will employ over 90 employees. Approximately 30,000 square feet of the main building will house active service uses that host over 30 visitors each day. This significant employee and visitor base will contribute to the activation of the Barry's Corner retail center. The Campus Services building is undergoing significant renovation with completion estimated at September 2013.

SCIENCE AND ENTERPRISE IMP PROJECT DESCRIPTIONS



Hotel and Conference Center

Project Elements

Within the Science and Enterprise District, the University plans to develop a hotel and conference center. It is currently planned to be located on the south side of Western Avenue, across from the Spangler Center parking lot, framing the northern edge of the future Greenway. This location would take advantage of its proximity to the campus, the Science project, and the long-term future development anticipated in the Enterprise Research Campus.

As currently envisioned, the project will include approximately 200 hotel rooms and approximately 30,000 square feet of meeting space for a total project of approximately 250,000 square feet. In addition, it is estimated that there will be approximately 125 parking spaces.

It has not been determined whether this would be a Harvard-run facility that would cater primarily to Harvard events or whether it would be developed and managed by a third-party operator who might take advantage of the proximity to the Harvard campus in Allston to attract both Harvard and non-Harvard events. If Harvard chooses to engage a third-party developer to develop and operate the Hotel & Conference Center for non-institutional use, an IMP Amendment will be required.

Project Dimensions

Table 9: Science & Enterprise IMP Project Descriptions

Item	Hotel & Conference Center
Site locations and approximate building footprints	South side of Western Avenue (approximately 1 acre)
Uses	Hotel Conference Space
Square feet of gross floor area	TOTAL - approximately 250,000 SF Approximately 200 rooms Approximately 30,000 SF of meeting space, dining room, lounge
Square feet of demolition	0
Building heights	Approximately 13 stories
Parking areas	Approximately 125 spaces

Urban Design and Site Planning Principles

- Establish a height that is comparable with that of surrounding buildings, locating the tower element in a way that is compatible with this context
- To the extent feasible, minimize the impact of shadows on the public realm and in particular the sidewalk on the north side of Western Avenue
- Design open space and landscape improvements on the hotel site to link to the larger Greenway system that will be developed over time

- Act as a pivot point between East Drive and the Greenway. Create fluidity between the spaces and extend the green space north to Western Avenue to connect with the streetscape
- Ensure a variety of active uses with transparency on the ground floor facing the Greenway, and also continue the vitality planned for Western Avenue
- Create focal point at the eastern terminus of the Greenway
- Create an anchor to the eastern end of Western Avenue (opposite Barry's Corner anchor) to encourage pedestrian traffic along Western Avenue
- Build density to ensure economic viability and to enliven the street
- Minimize traffic congestion and keep traffic away from local neighborhoods and out of Barry's Corner intersection
- Locate the convening facility proximate to Burden Hall Replacement Facility

Illustrative massing alternatives are presented in Figure 101. Figure 102 is an illustrative site section that relates the massing to surrounding streets and buildings.

Site Selection Rationale

The siting of the Hotel and Conference Center places it adjacent to the planned Enterprise Campus, and reflects the University's intention to pursue the Enterprise Campus development concept. It is anticipated that the Hotel and Conference Center will provide a venue for meetings and collaboration between entities involved in the Enterprise Campus, and between those entities and members of the Harvard community.

The proposed location also provides the opportunity for a strong relationship to the Harvard Business School. Complementing the assembly functions planned by the Business School for the Burden Hall replacement site, the Hotel and Conference Center location offers a strong visual connection with the Business School and close proximity with easy pedestrian access for its students and executives, providing for potential collaboration between members of the University and members of the private sector.

The proposed Hotel and Conference Center site is highly visible from the regional Charles River corridor that is flanked by Soldiers Field Road and Memorial Drive. It is expected that a significant portion of its clientele may involve visitors with affiliations other than Harvard or the Enterprise Campus. The site of the Hotel and Conference Center would enable easy vehicular access to and from these regional roadways, keep vehicular traffic at the perimeter of the North Allston neighborhood, and establish regional identity for the facility.

The height and massing of the proposed Hotel and Conference Center at this location would provide a strong visual anchor at the northeastern end of the planned Greenway, which is planned to stretch from Ray Mellone Park and the Honan-Allston Branch Library through Harvard property toward the Charles River. It would also establish an appropriate anchor to this end of Western Avenue. The proposed height will be comparable with height that exists along the riverfront.

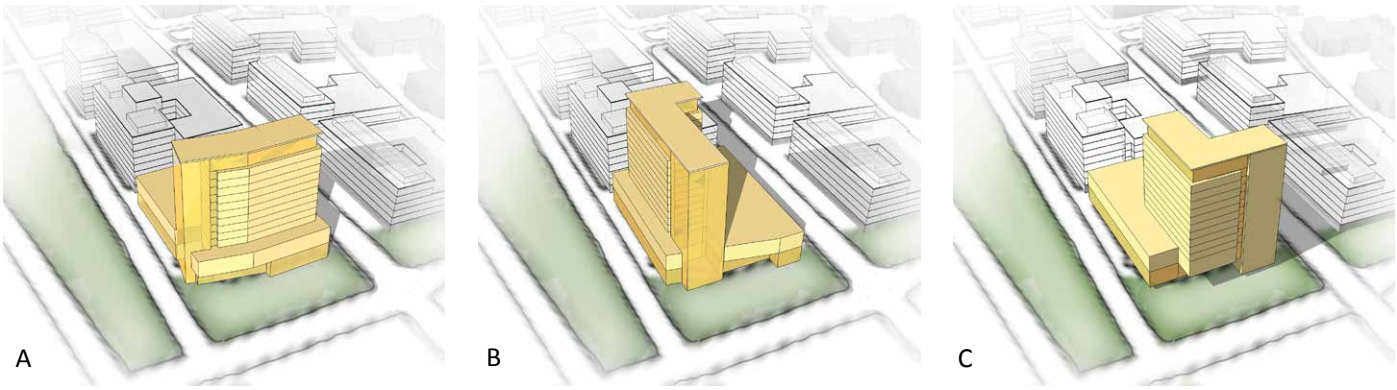


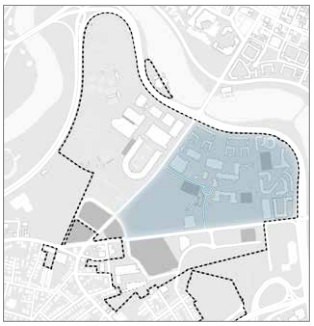
Figure 101: Illustrative Massing Alternatives (Hotel and Conference Center)





Figure 102: Illustrative Site Section View West

5.4 Academic District



Between North Harvard Street and Western Avenue, Harvard will continue to have a dynamic academic and residential campus. The district can be considered as two sub areas: *Existing Academic Area (*McKim, Mead and White − designed historic campus and more recently constructed buildings), and *Future Academic Area* (play fields and the now obsolete Charlesview Apartments replaced by Charlesview at Brighton Mills). Building development in the district will extend south and west over time. In the long-term, new campus buildings and quadrangles will extend the campus.

Existing Academic Subdistrict

EXISTING CONDITIONS

The existing academic area is inclusive of Harvard Business School, and several residential structures maintained by the University. The area is a unified academic and residential subdistrict.

The original portion of the Harvard Business School campus was designed by the renowned architectural firm of McKim, Mead and White, to follow the traditional Harvard University neo-Georgian style with red-brick buildings. These buildings were organized using a radial grid. The original landscape design was by Fredrick Law Olmsted. Today, courtyards and greens remain as an intrinsic part of pedestrian circulation through campus. Cars have been kept to the perimeter. Harvard Business School uses include classroom and assembly space, office and administration, student services, Executive Education, housing, athletics and service.

Residential buildings maintained by the University include Soldiers Field Park and One Western Avenue. These buildings occupy a prominent site at the southeast corner of the district, adjacent to the Charles River, where Western Avenue crosses Soldiers Field Road.



Academic District Existing View Southwest, May 2013 *Photography by Mark Flannery*

EXISTING ACADEMIC SUBDISTRICT PLANNING OBJECTIVES

- Remain consistent with the organizing principles of the historic McKim, Mead and White master plan, including, where appropriate, radial and axial guidelines and a variety of open space scales
- Provide enhanced pedestrian routes that connect from the river crossings to the north, to Allston to the south and west, through a welcoming open space and path network
- Preserve the character and identity of the campus, while allowing for the evolution of program and building type and scale
- Create an active, well-defined, and pedestrian-oriented streetscape along Western Avenue in the long term
- Modulate building heights across the district to respect the scale of the historic HBS campus buildings. Allow for larger scale development toward Western Avenue in the long term



Academic District Existing View West, May 2013 *Photography by Mark Flannery*



Batten Way will provide the formal vehicular entry from Western Avenue, with a scale and landscaping that is harmonious with the existing campus and features and with the iconic view of the Baker Library | Bloomberg Center bell tower. A redesign of vehicular circulation patterns will separate service traffic from visitor drop-off, preserve the pedestrian precinct of campus, and create a memorable main entry to HBS from Western Avenue.

Figure 103: Batten Way Rendering *By Beyer Blinder Belle*



The proposed Central Green will dovetail the historic, river-oriented campus with the southward expansion towards Western Avenue. This open space will provide both ceremonial and activity space to be experienced on a daily basis by the entire campus population and will act as an outdoor connector between academic, faculty, and student-oriented buildings. Central Green will become the heart of the expanded campus.

Figure 104: Central Green Rendering *By Beyer Blinder Belle*

- Harvard Institutional
- Harvard Non-Institutional
- Harvard Open Space
- Public/Other Open Space



Figure 105: Academic District Existing Conditions (2013)

A. Frame long-term academic quadrangles, similar to Harvard's Cambridge campus, to be built out over time

B. Reinforce the organizing principles of the historic McKim, Mead and White master plan

C. Create an active, well-defined, and pedestrian-oriented streetscape along Western Avenue. Development on both sides of the street offers opportunity to create "University Boulevard".

D. Strengthen pedestrian connections between Weeks Bridge and Greenway along East Drive.

E. Frame Central Green as central green space and gathering point, similar to historic Baker Lawn.

- ✱ Focal Point Opportunity
- Campus Gateways

- Open Space
- Plaza
- Pedestrian Circulation
- Active Ground Floor

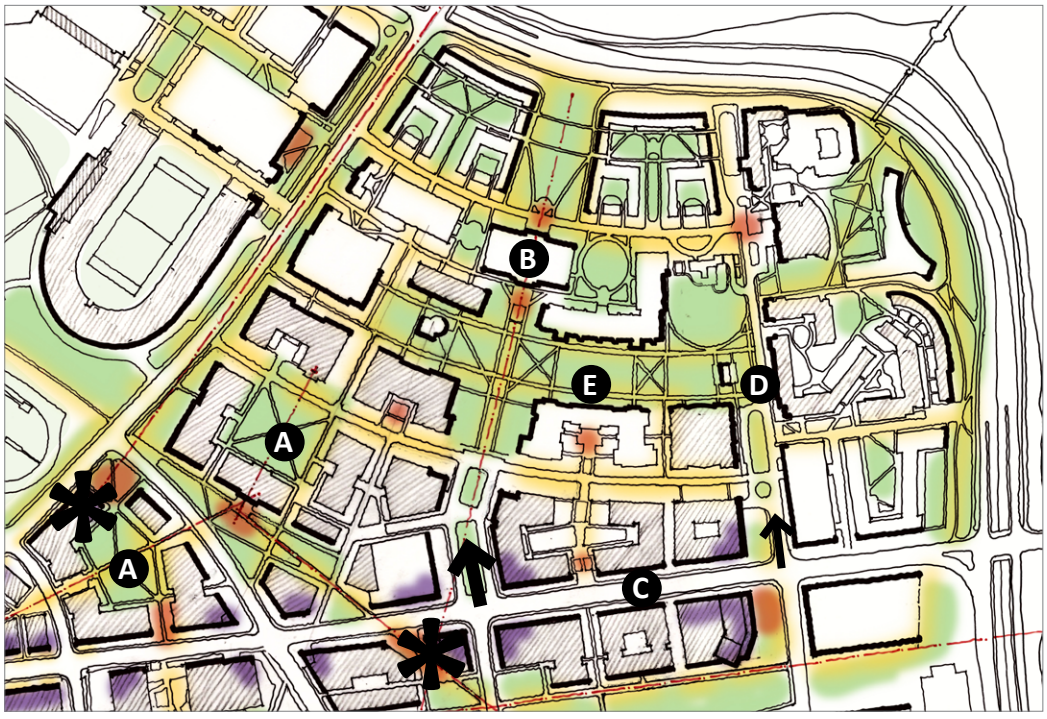


Figure 106: Long-Term Planning Objectives: Academic District

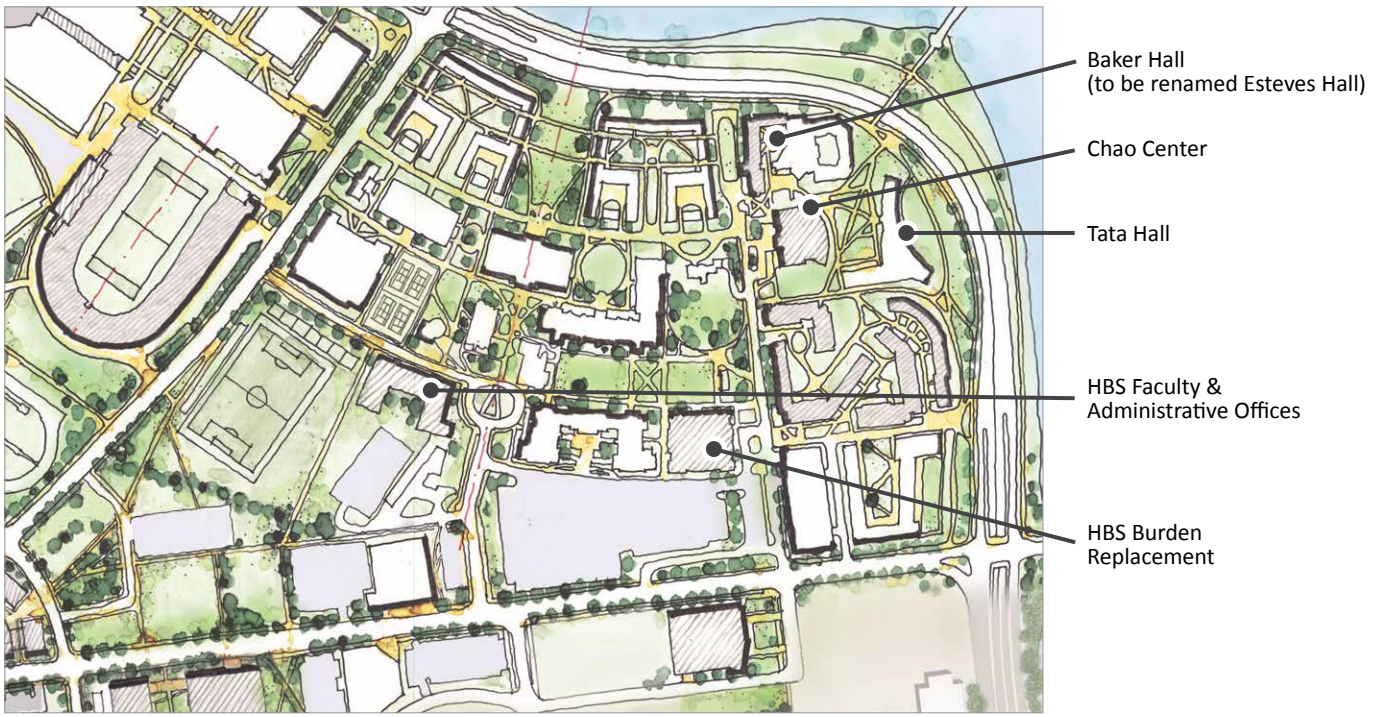


Figure 107: Academic District Ten-Year Illustrative



Figure 108: Academic District Long-Term Illustrative

ACADEMIC DISTRICT 3D ILLUSTRATIVE VIEWS



Figure 109: Academic District Ten-Year 3D View West



Figure 110: Long-Term Academic District 3D View West



Figure 111: Academic District Ten-Year 3D View South



Figure 112: Academic District Long-Term 3D View South

EXISTING ACADEMIC SUBDISTRICT PROJECTS UNDERWAY



HBS Tata Hall

Situated at the northeast corner of the Academic district, Tata Hall will face the Charles River and complete an Executive Education quadrangle. The project, which broke ground in December 2011 and is expected to be completed in December 2013, will include 179 beds, two classrooms, and common meeting space for HBS's Executive Education Program.

EXISTING ACADEMIC SUBDISTRICT IMP PROJECT DESCRIPTIONS



HBS Ruth Mulan Chu Chao Center

Project Elements

Within the first five years of this IMP, Harvard will replace the existing Kresge Hall with a new HBS building of approximately 90,000 square feet to be called the Ruth Mulan Chu Chao Center. Kresge Hall, dedicated in June 1953, was for many years the main dining facility for HBS. Kresge Hall is a D-shaped Georgian Revival structure with approximately 70,000 square feet of space on three floors. Following the construction of the Spangler Center in 2001, the use in Kresge focused on providing dining facilities to participants in HBS's Executive Education program rather than the broader HBS community.

The University's 1997 IMP filing proposed that during the time period of that IMP, Kresge Hall would be renovated to accommodate the growing needs of HBS's Executive Education Program. However, the IMP also noted that a renovation of Kresge would not fully meet the needs of the Executive Education Program. The section of the 1997 IMP that addressed long-term planning for HBS stated that the "alternative plan proposes demolition of Kresge and construction of a new facility just east of the existing structure. The future decision to renovate or rebuild will be based on a comparison of the costs and benefits of an entirely new, state-of-the-art facility, specifically designed to complement the expanded and newly consolidated Executive Education Program facilities." It should be noted that the Kresge building was not constructed as part of the original McKim, Mead and White design, does not strengthen East Drive, lacks handicap accessibility, and does not provide for strong pedestrian connections through to Tata Hall.

In this interim period, and while the Executive Education program has continued to grow, HBS has continued to evaluate its programmatic and space needs relative to the existing Kresge Hall. The site has emerged as a focal point for a newly designed Executive Education quadrangle also comprising Baker Hall, McArthur Hall, McCollum Center, and Tata Hall (to be completed in 2013). Harvard has concluded that a new building on the current site of Kresge Hall can provide a much needed mix of program space, which would not be feasible with a renovation of the existing facility. As such, Harvard is proposing to replace the existing Kresge Hall with a new HBS building.

The vision of the Chao Center as a gateway to Executive Education is in keeping with the consensus among planners that the new facility will be instrumental in transforming a collection of disparate buildings on the northeast quadrant of the campus into a true HBS Executive Education quadrangle.

The site is strategically positioned at the terminus of Harvard Way and serves as a prominent node of the pedestrian route between the Cambridge and Allston portions of the Harvard Campus. Such paths that extend along East Drive and cross the HBS campus diagonally through courtyards are important connectors of campus and community.

An important program element of the building is a central reception and greeting space which is planned to be the first experience participants will have with the HBS Executive Education precinct. The reception area will essentially become the "Front Door" of Executive Education at HBS and serve as a place for the HBS community, especially MBA students, to interact with participants.

Early discussions of the building's programming have focused on the fundamental HBS principle that learning happens both within and beyond the classroom. Daily life for Executive Education participants is rich with opportunities for discussion, debate, networking, and personal and professional growth. A central element of the building is a dining facility which will provide a vibrant, flexible, comfortable environment for mealtime meetings, guest speakers, and social functions. Other components of the program include:

- Classrooms of varying types that can be reconfigured in different ways.
- Smaller project rooms for team-based learning or executive coaching.
- Comfortable common spaces to accommodate events and to supplement existing lounges in Baker and McArthur Halls.

Also planned for the building are Executive Education administrative spaces, bringing together staff members, such as program delivery teams, who now work in widespread locations across campus.

Temporary Dining Facility

In order to facilitate the construction of the Chao Center, Harvard needs to undertake some initial work in order to prepare the project site while maintaining the uses that currently exist in Kresge Hall. In particular, Kresge Hall is currently the dining facility for HBS's Executive Education program and this dining program will need to be maintained during the construction of the Chao Center.

In order to meet this need, HBS will construct a temporary replacement dining facility approximately 200 feet to the southwest of Kresge Hall on a site that is currently the back yard of the Dean's House. The elements of the structure will be manufactured off-site and then assembled and constructed on-site. The structure, smaller than the existing Kresge facility, will be approximately 8,800 square feet and will include dining and servery areas, as well as kitchen and storage areas, restrooms, and a loading dock. This facility will be in place for approximately two, perhaps three years, until the Chao Center obtains its certificate of occupancy and the dining facility at the Chao Center commences operation, at which point the dining uses for the Executive Education program will be included in the Chao Center and the temporary structure will be dismantled and removed. If any IMP approval is necessary for the Temporary Dining Facility, then such approval will be included as part of the approval of this IMP.

Table 10: Chao Center Project Dimensions

Item	Chao Center
Site locations and approximate building footprints	HBS Campus (approximately 1 acre)
Uses	Exec Ed Dining Administrative Offices Classrooms
Square feet of gross floor area	Approximately 90,000 SF
Square feet of demolition	Approximately 67,000 SF
Building heights	4 stories (3 above grade)
Parking areas	None

Urban Design and Site Planning Principles

- Locate Executive Education drop-off and vehicular functions to preserve a formal pedestrian oriented front on Harvard Way
- Ensure that the fronting facade is harmonious in scale with the Georgian legacy campus
- Reinforce the eastern leg of the pedestrian ladder, strengthening north-south pedestrian connections
- Create a cohesive composition of outdoor spaces for Executive Education with the addition of this new building
- Enhance connectivity between Tata Hall and Baker/McCollum/McArthur Halls
- Create visible entrances to open spaces and promote active uses of new quads and space on the ground floor that invite members of the community to activities and amenities
- Locate Executive Education uses along East Drive to keep automobile traffic away from Barry's Corner and the neighborhood
- Provide accessibility for people with disabilities
- Establish a stronger relationship between the Executive Education quadrant and the McKim, Mead and White campus



View from Harvard Way



View from East Drive Approach



View from the landing of the Sinclair Weeks Bridge

Figure 113: Chao Center Renderings (Draft)



HBS Burden Hall Replacement

Project Elements

Within the first five years of the planning horizon of this IMP, Harvard intends to build a new academic building to replace HBS's Burden Hall. Burden Hall is an approximately 29,000 square foot academic building built in 1971 and designed by the firm of Johnson/ Burgee Architects. It includes a 766 seat auditorium that is used for class capstone events, student-run conferences, faculty and guest lectures, and academic and alumni gatherings. Burden's auditorium is too small for many of the School's current gatherings, and the Hall's lack of foyer and meeting space, support facilities, and accessibility, limit the School's ability to host global events and create a first-class learning environment. Burden Hall was not built as part of the McKim, Mead and White campus, and is a windowless object building lacking a positive relationship with campus open spaces, pedestrian paths, and buildings. It is disconnected from other campus academic and student buildings, and does not contribute to a positive participant experience, or campus life. It constricts views and pedestrian connections between the HBS Central Green, the focus of the academic campus, and East Drive, an important pedestrian route.

HBS intends to replace Burden Hall with approximately 140,000 square feet of new construction, to be phased in two closely consecutive stages so that the School will have a large auditorium at all times. The first phase will consist of approximately 110,000 sf of new construction immediately south of existing Burden, on the south edge of the Central Green, east of the Spangler Center. Similar in height to Spangler, this three-story structure with two below-grade concourse levels, will house a modern, media-equipped auditorium seating approximately 1000, the size of one MBA class, and foyer, reception, meeting and service space to support world-class convening. It will connect to the Spangler Center, the center of MBA student life, and to academic buildings at the concourse (tunnel) level. Foyer and reception areas activated by social and study space will overlook the Central Green and create an attractive entrance from East Drive. As part of this project, Harvard will create the east end of the new Spangler Way, and provide for vehicular access and drop-off to the facility from East Drive. Service and deliveries will be primarily through Batten Way to Central Receiving and the tunnel system. Up to 60 parking spaces in the Spangler Lot displaced by the building construction will be relocated within the lot or to adjacent parking facilities by restriping these facilities.

The second phase of Burden Replacement will demolish Burden Hall and replace it with an approximately 30,000 sf two-story facility below grade, containing meeting and classroom space closely integrated with the new auditorium to the south. As part of this project, the Central Green will extend eastward to East Drive, joining two important campus precincts. A small pavilion on the Green is envisioned as a "jewel" in the landscape, inspired by the existing Class of 1959 Chapel, a successful complement to the Georgian-influenced buildings on campus.

Table 11: HBS Burden Replacement Project Dimensions

Item	HBS Burden Replacement
Site locations and approximate building footprints	HBS Campus (approximately 0.7 acres above grade)
Uses	Academic and Classroom Auditorium
Square feet of gross floor area	Approximately 140,000 SF
Square feet of demolition	Approximately 29,000 SF
Building heights	3 stories above grade, 1 story below grade
Parking areas	None

Urban Design and Site Planning Principles

- Complete the south edge of the Central Green to the east
- Serve as a gateway to the pedestrian zone of campus and the Central Green from East Drive
- Provide accessibility for people with disabilities
- Establish a clear relationship with the McKim, Mead and White campus and its organizing principles
- Strengthen the legibility of the Central Green and other courtyards that support a network of pedestrian paths



HBS Faculty and Administrative Offices

Project Elements

Within the second five years of the planning horizon of this IMP, Harvard intends to build a new HBS faculty and administrative office building. The proposed site is in the northeast corner of what is now Ohiri Field and is directly north of the i-lab/Batten Hall.

As currently planned, the building will be approximately 110,000 square feet and four stories in height. Its footprint is designed symmetrically to Spangler Center, framing the axis and major pathway to Baker Library|Bloomberg Center. Proximate to the proposed visitor drop-off court at the north end of Batten Way, the HBS Faculty and Administrative Offices building will be both a gateway building to the HBS campus and an active edge to the pedestrian zone of the Central Green.

Table 12: HBS Faculty & Administrative Offices Project Dimensions

Item	HBS Faculty & Administrative Offices
Site locations and approximate building footprints	HBS Campus (approximately 1 acre)
Uses	Faculty and Administrative Offices
Square feet of gross floor area	Approximately 110,000 SF
Square feet of demolition	0
Building heights	4 stories
Parking areas	None

Urban Design and Site Planning Principles

- Complete the south edge of the Central Green to the west
- Provide symmetry to the Spangler Center, framing the axis and major pathways to the Baker Library | Bloomberg Center
- Provide a gateway to the HBS campus at the north end of Batten Way
- Firmly root the building in the pedestrian zone of the Central Green
- Consider how the south face can engage future academic development around a quadrangle (as depicted in the Long-Term Framework on the current site of Ohiri Field)
- Frame courtyards and campus drives that support a network of pedestrian paths

Renovations to Baker Hall (to be renamed Esteves Hall)



Project Elements

Harvard intends to renovate HBS's Baker Hall, which will be renamed Esteves Hall. Baker Hall was designed by the architectural firm of Shepley, Bulfinch, Richardson and Abbott, and opened in 1970. It is located in the northeast corner of the Academic district and serves as a residence facility for HBS's Executive Education program. The building is approximately 75,000 square feet and six stories in height and features "living groups," each made up of eight or nine bedrooms around a shared living room/lounge.

The building has not had a significant renovation since its opening, and as a result it requires both cosmetic and system upgrades in order to provide comfortable accommodations and accessibility improvements for Executive Education participants.

A new ramp will be added on the east side of the building to provide an accessible approach to a seven foot grade change. In addition, the entrance is planned to be greatly improved by creating a new landscaped courtyard between this building and McCollum Hall. The new courtyard and entry will connect to a new landscaped courtyard on the northern edge of the Chao Center.

Table 13: Baker Hall Renovation Project Dimensions

Item	HBS Baker Hall Renovation
Site locations and approximate building footprints	HBS Campus
Uses	Executive Education Residence Hall
Square feet of gross floor area	Renovation of approximately 78,000 SF
Square feet of demolition	0
Building heights	6 stories
Parking areas	None



Soldiers Field Park Housing Renovation

Project Elements

Harvard intends to renovate Soldiers Field Park Housing. These facilities were built in 1974 as housing for Harvard University graduate students. The four building complex, designed by the architectural firm of Benjamin Thompson and Associates, includes 478 units in approximately 423,000 square feet of space. The complex is located on the eastern edge of Harvard's Allston campus, between East Drive and Soldiers Field Road, south of HBS's Kresge Hall and Tata Hall (now under construction) and north of One Western Avenue. The buildings range in height from three to nine stories and are connected by a series of courtyards and pedestrian pathways which are framed by mature trees and plantings.

The complex has not been significantly renovated since opening, and as a result it requires both cosmetic and system upgrades. The University is investigating a range of options to renovate these buildings.

Table 14: Soldiers Field Park Housing Renovation Project Dimensions

Item	Soldiers Field Park Renovation
Site locations and approximate building footprints	Existing
Uses	Housing
Square feet of gross floor area	Renovation of approximately 423,000 SF
Square feet of demolition	0
Building heights	3 to 9 stories
Parking areas	None

Future Academic Subdistrict

EXISTING CONDITIONS

This subdistrict is the site of the current Charlesview Apartments, the vacant Northeast Depository Library (NEDL), and Ohiri playfields. Once the Charlesview Apartments are vacated, the buildings are planned for demolition. The portion of the Charlesview site closest to Barry's Corner will be redeveloped into the Gateway Project. This project will be bounded on its east side by a new street "Academic Way". In the near-term "Academic Way" will be an area of transition between Barry's Corner and the Academic District.

FUTURE ACADEMIC SUBDISTRICT PLANNING OBJECTIVES

- Near-term
    - Introduce new pedestrian circulation routes
    - Enhance edge conditions through streetscape improvements. Locate and screen surface parking to minimize its effect on the character of Western Avenue
    - Maintain the mature grove of trees in the middle of the existing Charlesview housing complex (a future campus quadrangle)
    - Continue to support athletic and other programmatic functions in Ohiri Field
    - Locate active uses at the perimeter of the site
    - Consider synergies with adjacencies including the mix of uses at Barry's Corner, the Science project, and Harvard i-lab
    - Include active ground floor uses to support and activate North Harvard Street and Western Avenue
    - Anticipate future development in a block pattern with Academic quads consistent with the Long-Term Vision
    - Ensure the future alignment of "Stadium Way"
- Long-term
    - Support academic expansion around campus quadrangles consistent with the Cambridge campus
    - Introduce "Stadium Way" connecting to the Science and Enterprise District

FUTURE ACADEMIC SUBDISTRICT PROJECTS UNDERWAY

Current Site of the Charlesview Apartments

Within the period of the Ten-Year Plan, the southwestern portion of the current Charlesview apartment complex will become the location of the new Gateway project, with the currently fenced grove of trees becoming renewed as an accessible, vibrant open space for the enjoyment of the public. The balance of the site is depicted in the Long-Term Vision as a fully-developed new academic district. Until the Long-Term Vision is implemented, Harvard will utilize the balance of the former Charlesview site for a range of interim functions that

support University needs and foster an active Western Avenue streetscape. Interim uses can be located here after removal of regulated building materials from on-site buildings and the subsequent completion of demolition, which is planned to be completed by the Fall of 2015.

During this interim period, certain aspects of the area's landscape and streetscape will receive particular attention. In addition to opening the Barry's Corner Grove of trees to public use, Harvard will work to preserve a stand of trees currently located within the center of the Charlesview Apartments complex. This will require special care during the Charlesview demolition process. Although not all of the trees are in good condition, they will be carefully assessed during the interim period, and it is hoped that the trees can be incorporated into the area's landscape system.

The former New England Depository Library (NEDL) Building will be demolished along with the former Charlesview complex. The NEDL Building cannot be reused because of design limitations (e.g. low floor-to-floor heights). It does not provide an opportunity to contribute to the vitality of the district because it lacks ground floor permeability necessary in this location. Demolition of the NEDL Building will allow for the creation of Stadium Way in its planned alignment, linking the Science and Barry's Corner districts and extending the public realm.

Interim circulation systems within this area will serve vehicular, pedestrian and transit needs. New pathways will connect North Harvard Street, Gordon Road and "Academic Way", and will support new pedestrian activity between the Science project and Harvard's Cambridge campus. New campus drives will serve the needs of new shuttle routes serving this area, allowing shuttles to circulate through without encountering Western Avenue traffic. These drives will be accompanied by pedestrian shelter and associated facilities. With the construction of the Science project, "Academic Way" will be built, linking Western Avenue and North Harvard Street through this area. Streetscape improvements along the perimeter of the site will also be constructed at that time. While "Stadium Way" is not in the Ten-Year Plan, it is important to make sure it is not precluded in the future. Near-term moves will consider the future alignment of "Stadium Way". Long-term, "Stadium Way" will serve as a neighborhood connector linking the Academic District with the Science and Enterprise District.

The interim planning for this area would reduce the site's current 230 parking spaces to approximately 150 spaces, which will support institutional project requirements and potentially provide construction-related parking. The parking would also help support the establishment of new retail activities in Barry's Corner and provide a new parking alternative for visitors to athletics events and facilities. The parking will be located well-away from Western Avenue, either fully internal to the site or partially along North Harvard Street, where it will be well-buffered by landscape materials. The area may also serve other Harvard functional needs including support services, interim office space, construction offices and support.

Harvard is also considering the establishment of interim uses that would support the establishment of a new School of Engineering and Applied Sciences population at the Science project while also animating portions of Western Avenue for active use. This may include non-permanent structures for student life programming, study space, coffee and snack areas, club spaces and art studios. It is expected that the interim uses would also include uses of interest to the public such as art exhibition space, space for outdoor recreation activities and flexible program spaces for activities such as farmers markets, craft markets, book fairs and performance spaces.

5.5 Athletics District



The Soldiers Field Athletics Area will continue to house athletics functions. Athletics at Harvard builds community through engagement of students, faculty, staff and alumni, and creates a portal through which neighboring communities can enjoy the University.

EXISTING CONDITIONS

Along North Harvard Street buildings are aligned to the street and set back behind a traditional fence which is wrought iron, brick, and stone, with gates which are open for pedestrian passage. Several buildings are set back in a second row and are placed around an internal green centered on Dillon Field House. Entrances are typically set back, separated from the public realm by the fence, so that the landscape contributes to the public realm and provides areas that could be frequented by pedestrians. Programmatic needs lend themselves to large rectilinear footprints and fenestration is often limited. Playing fields occupy a contiguous land area to north and west, an area that was historically marshland. Many improvements have been made to address drainage requirements and increase use of these facilities. In some areas artificial playing surfaces have been installed extending the annual use of these fields. Spectator events occur primarily on weekends. Weekday activity is highest in the early morning and late afternoon and largely comes from undergraduates living on campus. The athletic complex involves purposeful visitation, but not pass-through.









Clockwise from top left: Football game in Harvard Stadium; Murr Center; North Harvard Street at Murr Center and Blodgett Pool; Dillion Field House and courtyard

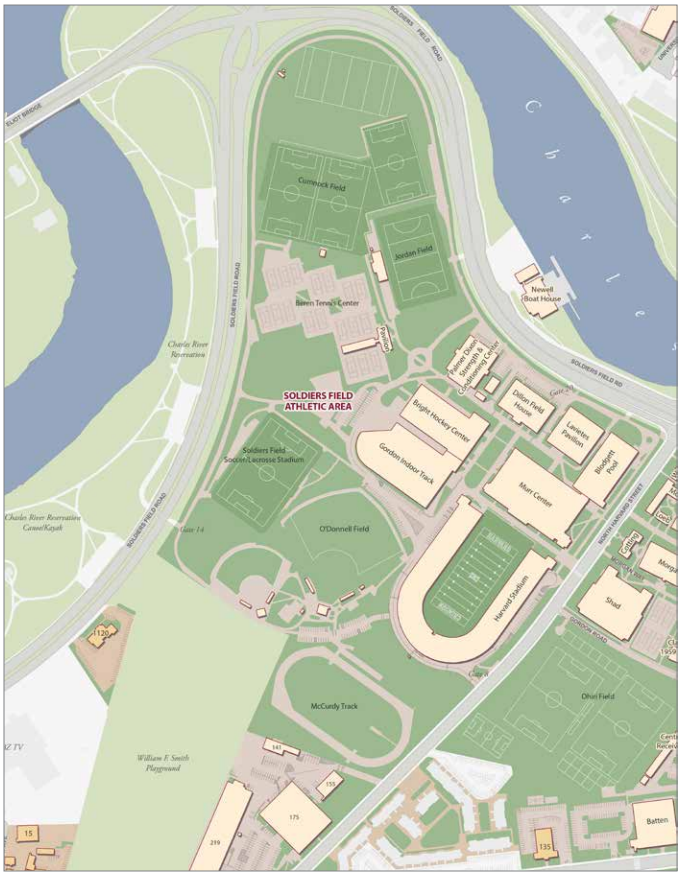


Figure 114: Athletics District Existing Conditions

- Harvard Institutional
- Harvard Non-Institutional
- Harvard Open Space
- Public/Other Open Space

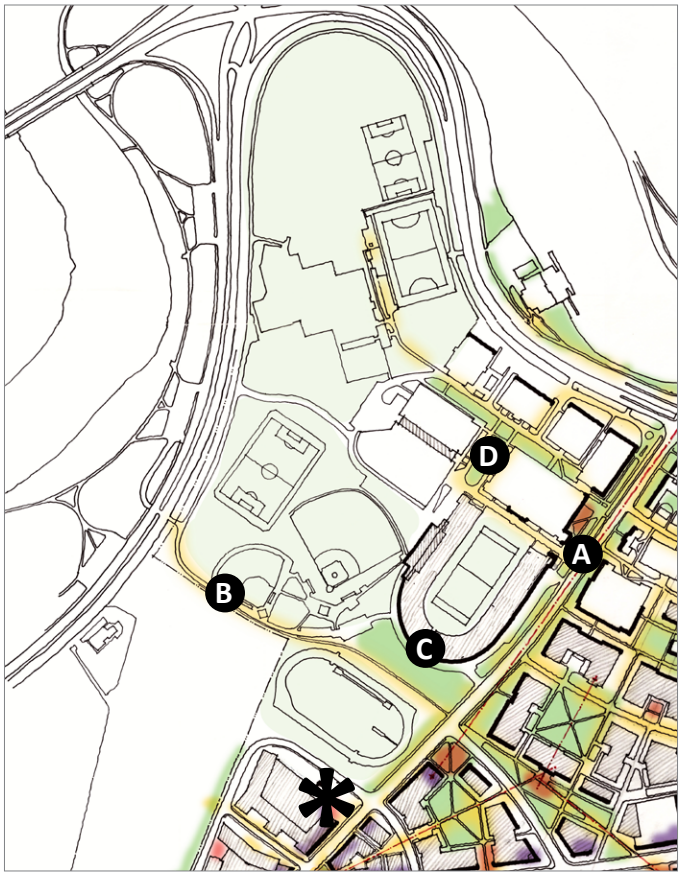


Figure 115: Athletics District Planning Objectives

- Athletic Fields
- Open Space
- Plaza
- Pedestrian Circulation
- Active Ground Floor
- * Focal Point Opportunity

ATHLETICS DISTRICT PLANNING OBJECTIVES

A. Shorten the perceived distance between Barry's Corner and Harvard Square by improving the experience of pedestrians on North Harvard Street

B. Create connectivity between the Charles River Reservation and North Harvard Street via Longfellow Path

C. Maintain memorable view corridors to the Stadium

D. Maintain the framed internal green centered on Dillon Field House as a communal space for student athletes, coaches and visitors

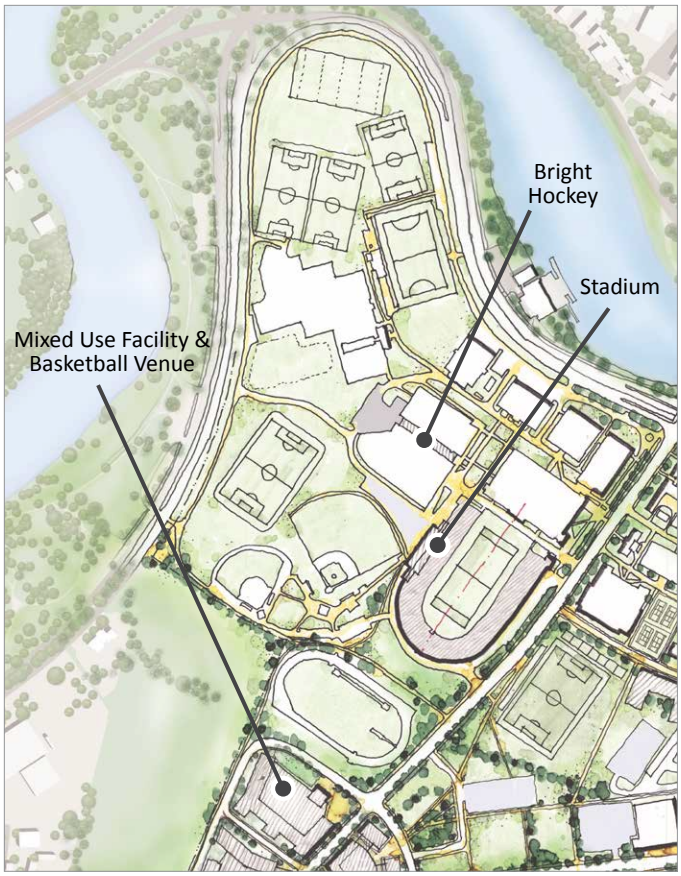


Figure 116: Athletics District Ten-Year Illustrative



Figure 117: Athletics District with Long-Term Context

ATHLETICS DISTRICT PROJECTS UNDERWAY

Bright Hockey Center Addition/Renovation

The Bright Hockey Center Addition/Renovation project involves the interior renovation of approximately 11,000 square feet of space within the Bright Hockey Center and Gordon Indoor Track facilities within Harvard's Athletics area. For regulatory purposes, this interior renovation work needed to be approved as part of an Institutional Master Plan and the project was included in the December 14, 2012 Institutional Master Plan Amendment (Revised February 14, 2013) approved by the BRA and the Zoning Commission earlier in 2013. This work complements other planned work involving the addition of an infill arcade of approximately 18,300 square feet of space between the Bright Hockey and Gordon Track facilities. The renovated space in the Bright Hockey Center and the Gordon Arena will allow for the expansion of existing locker rooms, bathrooms, coaches' facilities, and storage. Given that the Bright Hockey project involves an infill addition, the interior renovation of space and no expansion of program, there will be no adverse environmental impacts resulting from this work. Among the project's urban design benefits will be that it:

- Creates a memorable entrance and focal point in a district of large-scale windowless buildings.
- Increases the level of amenity thus contributing to the vitality of the district.
- Helps form a more consistent street wall along the Dillon Courtyard.



Athletics District Existing View Southwest, May 2013 *Photography by Mark Flannery*



Stadium, 1920's

ATHLETICS DISTRICT IMP PROJECT DESCRIPTIONS



Harvard Stadium Addition / Renovation

Project Elements

Harvard anticipates undertaking a renovation and addition to Harvard Stadium. This project will provide improved accessibility to visitors with disabilities, renovate existing areas, relocate program areas from other athletic buildings in the district, provide new program space and restore areas of the existing structure. As part of this project, it is anticipated that the total number of seats in the Stadium will be reduced.

Constructed in 1903, Harvard Stadium has hosted over one hundred years of Harvard Football and, since the installation of lights, a synthetic field and seasonal bubble in 2006 has served Harvard men and women across varsity, club and intramural programs.

The use of Harvard Stadium has greatly expanded in recent years. The University is proposing to renovate the Stadium in order to address several deficiencies:

- *Building Preservation*: This project will repair areas of deterioration, match old repairs to a consistent coloring, clean the surface and seal the concrete to avoid future deterioration.
- *Accessibility*: The renovation will increase accessibility by introducing elevator access to all levels, and provide appropriate seating opportunities including indoor seating and accessible amenities for visitors with disabilities.
- *Amenities*: Restroom and concession facilities will be expanded and upgraded in the renovation.
- *Programmatic Space*:
    - *Locker Rooms*: New spaces will be constructed with adjacent sports medicine and equipment support spaces to meet the operational needs of the football program.
    - *Press areas:* New, accessible press areas will provide appropriate space and technology for coaching staffs, broadcast teams, video production, and working media.
    - *Indoor Seating*: The renovation would introduce an enclosed seating level for approximately 350 spectators with restrooms and concession areas, function/ gathering space and a small terrace overlooking the athletic complex.
    - *Meeting/Office Space*: New spaces will be constructed to help meet the current demands of the Athletics Department.
    - *Overall Seating*: The Stadium currently seats 30,262 people; the number will be reduced to 22,333 seats after the project.

To address these needs, the project will consist of the construction of a wide, shallow addition containing approximately 46,000 square feet to the westerly side of the stadium. The addition will extend above the existing roof, with all of the other proposed improvements located within the existing building envelope.

The project will include the demolition of several small areas under the seating bowl including two storage sheds, two concession stands, two half time rooms, and men's wash room. None of these areas were part of the original construction but were added sometime in the 1950's and beyond.

Following Harvard's sustainability guidelines and goals the project will pursue LEED Gold. The following goals have been established for the project, now in its early design stage: 30 percent energy reduction from ASHRAE standard, 25 percent lighting density reduction, 35 percent water usage reduction over EPAC standard.

Table 15: Harvard Stadium Addition/Renovation Project Dimensions

Item	**Harvard Stadium Addition/Renovation**
Site locations and approximate building footprints	Athletics Campus (total site approximately 6.8 acres, addition .3)
Uses	Press Areas Athletics Offices Athletic facilities
Square feet of gross floor area	Approximately 46,000 SF addition Approximately 34,200 new interior construction Approximately 130,500 SF interior renewal
Square feet of demolition	0
Building heights	4 to 6 stories
Parking areas	None

Urban Design Site Planning Principles

- Respect the historic structure; minimize impacts of an addition
- Improve pedestrian access and circulation
- Ensure that the visual integrity of the historic structure remains legible and intact
- Respect the strong axial relation of the Dillon Field House and internal green
- Maintain original building facade when viewed from the public way along North Harvard Street, Anderson Bridge and Barry's Corner
- Maintain profile of the interior bowl of the Stadium
- Integrate the addition and site improvements with the athletic campus

Existing Structural Conditions

Harvard Stadium is a concrete structure over one hundred years old. The building has a number of deficiencies, most of which stem from the experimental nature of concrete construction and lack of knowledge about the mechanisms of concrete deterioration in the early years of concrete's use when this structure was constructed. The fact that the Stadium is an open, exposed, and unheated building has contributed to its concrete deterioration.

A program of testing and monitoring will be established in order to understand the damage, the rate of deterioration, and the potential for future damage. The extent of repairs identified may require that the conservation and restoration work be phased. Since new construction is proposed on the west side of the Stadium, it is important that the repair to the historic concrete in this portion of the Stadium be coordinated with the new construction.



Figure 118: Ten-Year 3D View Southwest Athletics District



Figure 119: Ten-Year 3D View Northeast Athletics District

Other Athletics Projects

During the term of the IMP, Harvard also anticipates pursuing four other projects within its Athletics district. These projects are under study and two were included in the IMPNF for completeness.

One such study is the enhancement of facilities for the baseball and softball program. This preliminary study involves two projects: the construction of a permanent, fully enclosed batting cage for baseball and softball to replace a temporary, seasonal batting cage which is made of chain link fence and mesh netting. This new structure would likely be located near the existing facility between the existing baseball and softball fields. The second baseball project being investigated is a structure continuously wrapping the baseball field from first to third base which would incorporate spectator stands, new dugouts, restrooms under the structure, and a press box.

Harvard is considering the potential renovation of and addition to the Newell Boat House to meet the current needs of the rowing program. This project is being actively investigated and is in its early planning stages. The renovation and addition would address the limitations of interior program areas, boat storage, and building systems upgrades. The project would carefully consider the need to replace the 1960's rowing tank and the building that houses it. As planning proceeds, Harvard will work closely with the Boston Redevelopment Authority and relevant State agencies with interests in the project.

There is also discussion about the a future relocation of Harvard's wrestling program. Wrestling is housed in the Malkin Athletic Center in an area substantially undersized for the current program. The possible relocation from the Malkin Athletic Center to a potential "in-fill" addition between Bright Hockey Center and Gordon Track would provide the necessary space to safely and appropriately accommodate this varsity-level program.

6.0 Technical Reports

6.1 Transportation

This section of the IMP presents a detailed analysis of the transportation conditions and impacts of the Ten-Year Plan. In accordance with the Boston Transportation Department's (BTD's) Transportation Access Plan Guidelines (2001) and the BRA Development Review Guidelines (2006), this analysis evaluates existing 2012 conditions, a 2022 No Build Scenario, and a 2022 Build Scenario. The 2022 Build scenario includes the Ten-Year Plan and the projects in the No Build scenario. The analysis of the 2022 Build scenario estimates person-trips by various modes and vehicle-trips and distributes these trips over the study area network. The methodology and analysis are discussed in detail in Appendix C.

The IMP includes a range of transportation improvements that will improve access and safety and promote a balanced transportation network that accommodates pedestrians, bicycles and transit priorities. These improvements include the construction of "Academic Way" and "Science Drive;" traffic signal improvements in Barry's Corner and new traffic signals on "Academic Way;" new pedestrian paths, enhanced crossings, and upgraded sidewalks; new and enhanced bicycle facilities and parking; upgraded shuttle bus service between Barry's Corner and Harvard Square, and consolidation of MBTA bus stops. These improvements build on commitments by the Barry's Corner Residential and Retail Commons Project to upgrade signals at Barry's Corner and to construct "South Campus Drive" and "Ivy Lane."

The IMP is focussed on efforts to enliven and activate Barry's Corner. The transportation improvements will accommodate the future activities in and around Barry's Corner and significantly improve traffic operations. Peak hour traffic operations at this intersection in Barry's Corner in the 2022 Build scenario will be better that the 2022 No Build scenario despite the increased levels of pedestrian, bicycle, and vehicular traffic. This reflects the operational improvements to the signal system at this intersection, consolidation and relocation of MBTA bus stops, and the construction of "Academic Way," which will divert traffic away from Barry's Corner. The analysis also indicates that there is sufficient capacity on the MBTA and Harvard shuttle buses serving the IMP area. Other transportation improvement in the IMP will offset the impacts of potential IMP traffic growth.

EXISTING CONDITIONS

The existing conditions portion of this transportation section include roadway geometry, traffic controls, daily and peak period traffic flow, vehicular crash information data, traffic operations, parking, public transportation, pedestrian and bicycle facilities, and loading/service. Traffic, pedestrian and bicycle data was collected in April 2012 and supplemented by transit, shuttle, and traffic safety data from other sources.

Regional Transportation Facilities

Two regional roadways, the MassPike and Soldiers Field Road, and the rail lines to the south establish the location of gateways for North Allston that provide connections into the neighborhood and the IMP area. The gateways at the river crossings are integral to shaping circulation patterns between Allston and Cambridge. The crossings of Soldiers Field Road provide access to the river.

MassPike

Originating at Logan Airport, this highway, also known as Interstate 90 (I-90), is a major east-west facility that connects North Allston and other adjacent communities to the regional highway system via its interchange on Cambridge Street near Soldiers Field Road. As such, it is a significant attraction for regional traffic using Cambridge Street, North Harvard Street, Western Avenue and the Charles River roads. The MassPike also provides important access to and from the North Allston area.

The intersection of the MassPike ramp system with Cambridge Street and the Soldiers Field Road ramp system is a major congestion point. This intersection is actually comprised of three closely spaced intersections with complicated roadway geometry and high traffic volumes. Approximately 3,300 vehicles enter the intersection during the morning peak hour and approximately 3,600 vehicles enter during the evening peak hour. As a result, significant delays are felt on several approaches and traffic queues extend onto the MassPike ramp system during peak commuting hours. As part of the River Street Bridge project, MassDOT is evaluating improvements to the intersection geometry and its signal system to improve the efficiency and safety of the intersection and better accommodate pedestrian and bicycle movements.

The MassPike has four lanes in each direction as it passes by North Allston/North Brighton. MassDOT data for 2010 indicate that the highway carries approximately 141,000 vehicles on an average weekday in this area. Crossings over the MassPike are limited to three locations between Market Street and the BU Bridge: Telford Street, Cambridge Street and the Franklin Street Footbridge. MassDOT plans to reconstruct the Cambridge Street Bridge near Franklin Street and add buffered bike lanes (six foot bike lane with three foot buffer) to support the City's efforts to expand its bicycle network.

Soldiers Field Road

Soldiers Field Road runs along the south side of the Charles River from the Boston University Bridge in the east to North Beacon Street in the west. Soldiers Field Road has two travel lanes in each direction, with additional lanes for on-ramps and off-ramps. Parking, bicycles and, in general, commercial vehicles (e.g., buses and trucks) are prohibited on the roadway. Bicycles and pedestrians are accommodated in the adjacent paths including the Paul Dudley White Bicycle Path. Land uses along Soldiers Field Road are primarily recreational to the north with access to the Charles River and office, institutional, and industrial uses to the south.

To the east, Soldiers Field Road becomes Storrow Drive; to the west, Soldiers Field Road becomes Nonantum Road. Soldiers Field Road provides access to Route 2 via Fresh Pond Parkway, to I-90 at the Allston/Brighton interchange, and to Interstate 93/U.S. 1 at Leverett Circle. The character of the roadway changes to the west of the Eliot Bridge intersection, which is the first traffic signal to the east of Leverett Circle. MassDOT data for 2006 indicates that traffic volumes are significantly lower to the west of the Eliot Bridge -- approximately

37,500 vehicles on an average week day in the vicinity of Smith Field as compared to approximately 73,000 vehicles in the vicinity of Harvard's campus.

Pedestrian and bicycle access to the river is limited to the North Harvard Street, Western Avenue and Cambridge Street gateways and the two pedestrian bridges over Soldiers Field Road: the Sinclair Weeks Bridge (located between the North Harvard Street and Western Avenue) and the Telford Street Pedestrian Bridge (the only pedestrian crossing between the Arsenal Street Bridge and the Anderson Memorial Bridge). Neither of the pedestrian bridges meet current accessibility requirements.

River Bridges

Four vehicular and one pedestrian bridge cross the Charles River near the IMP area, connecting North Allston with Cambridge. Three of the vehicular bridges are part of MassDOT's Accelerated Bridge Program and are either under construction (i.e., Anderson Memorial Bridge) or soon to be under construction (i.e., the Western Avenue Bridge and the River Street Bridge). The fourth vehicular bridge is the Eliot Bridge.

The Anderson Memorial Bridge is an important connection between Allston and Cambridge. It is considered to be the western side of the "Ladder Diagram" (see Figure 28) that provides north-south connections within Harvard's campus. The fifth bridge over the river, the iconic John Weeks pedestrian bridge, is another important element of the "Ladder Diagram," providing pedestrian north-south connections. This bridge does not meet current accessibility requirements.

Neighborhood Connectors and Local Roadways

Western Avenue, North Harvard Street and Cambridge Street are important local streets providing multimodal connections to and through North Allston and the IMP area. These streets provide vehicular connections to the parkways and regional highway system via the I-90 interchange on Cambridge Street. These two-way streets also provide vehicular access to the adjacent neighborhood residential streets, which include one-way streets that are organized to discourage through-traffic diversions from the arterial roadways. Table 16 describes the various transportation elements of these streets. Data is from 2012 unless noted otherwise.



View of Allston From Cambridge; From Right to Left: Anderson Memorial Bridge, John Weeks Bridge, Western Avenue Bridge, and River Street Bridge, May 2013, Photography by Mark Flannery

Western Avenue

Western Avenue transitions from a Neighborhood Main Street to a Neighborhood Connector at Barry's Corner. West of Barry's Corner Western Avenue has a mix of residential and commercial/retail land uses, including the new Charlesview residences near Brighton Mills. East of Barry's Corner, the abutting land uses are primarily Harvard-related uses and include industrial uses along the southerly side of the street between Hague Street and Soldiers Field Road. Western Avenue carries approximately 12,250 vehicles during an average weekday east of Barry's Corner and approximately 20,200 vehicles during an average weekday west of Barry's Corner.

The highest peak hour pedestrian flows at Western Avenue intersections occur in Barry's Corner and at the Western Avenue Bridge. Approximately 100 pedestrians cross Western Avenue in a north-south direction in the morning peak hour and approximately 140 pedestrians cross in the evening peak hour. Comparable east-west pedestrian flows also occur on the crosswalks leading to and from the Western Avenue Bridge. Peak hour bike volumes are in the range of 40-60 bikes (both directions combined).

North Harvard Street

North Harvard Street transitions from a Neighborhood Main Street to the South of Barry's Corner where the abutting land uses are primarily residential with a mix of commercial/ retail and community centers (e.g., Honan Library) to a Neighborhood Connector north of Barry's Corner where the abutting land uses are primarily Harvard-related uses. Traffic counts from 2012 indicate that North Harvard Street carried approximately 13,400 vehicles during an average weekday north of Barry's Corner and through the IMP area, comparable to the approximately 14,200 vehicles south of Barry's Corner (2008 traffic data).

The highest peak hour pedestrian flows occur on the crosswalks leading to and from the Anderson Bridge: approximately 450 pedestrians cross in the morning peak hour and approximately 650 pedestrians cross in the evening peak hour. MassDOT has indicated that the pedestrian volumes on the Anderson Bridge are among the highest in the Charles River Basin. Peak hour bike volumes are in the range of 50-70 bikes (both directions combined).

Cambridge Street

Cambridge Street is a major traffic artery that has the characteristics of a Neighborhood Connector. The street is abutted by a mix of residential, commercial/retail, industrial and transportation infrastructure uses. Cambridge Street provides regional access to and from I-90 via a major highway interchange at Soldiers Field Road. This role is reflected in the level of traffic on the street. Cambridge Street carried approximately 31,400 vehicles during an average weekday in the vicinity of Windom Street.

North of the MassPike, the highest peak hour pedestrian crossing of Cambridge Street intersections occurs at the River Street Bridge as the river path crosses the intersection at-grade. Approximately 80 pedestrians cross in a north-south direction in the morning peak hour and approximately 110 pedestrians cross in the evening peak hour. Peak hour bike volumes are in the range of 15-25 bikes (both directions combined), the lowest of the three Neighborhood Connectors.

Table 16: Overview of Key Roadways

Roadway	Traffic Attribute	Pedestrian Element	Bicycle Facilities	Transit Service
Western Avenue (east) Barry's Corner to Soldiers Field Road/ Memorial Drive	Minor urban arterial 3,100 feet in length One travel lane in each direction; turn lanes at traffic signals Approximately 45-47 feet wide curb-to-curb Approximately 38 on-street parking spaces	Eight to ten foot wide sidewalks (typical) Crossings at traffic signals Unsignalized crossings: Travis Street 114 Western Avenue East Drive	Five-six foot bike lanes in both directions Seven foot wide east-bound cycle track with three foot buffer and a floating parking lane from Travis Street to Soldiers Field Road	Route 70/70A (Waltham – Central Sq.) Three sets of bus stops that are approximately 1,200-1,300 feet apart
Western Avenue (west) Barry's Corner to Soldiers Field Road/ Arsenal Street	Minor urban arterial 4,300 feet in length One travel lane in each direction; turn lanes at key intersections Approximately 42 feet wide curb-to-curb Approximately 200 on-street parking spaces	Eight to ten foot wide sidewalks (typical) Crossings at traffic signals Pedestrian signal at River-dale Street No unsignalized crossings	No bicycle facilities	Route 70/70A (Waltham – Central Sq.) Route 86 (Sullivan Sq. – Cleveland Circle) Seven sets of bus stops that are approximately 400-1,200 feet apart
North Harvard Street Barry's Corner to Soldiers Field Road	Minor urban arterial 2,400 feet in length One travel lane in each direction; turn lanes at key intersections Approximately 40 feet wide curb-to-curb Approximately 30 on-street parking spaces	Eight to ten foot wide sidewalks (typical) Crossings at traffic signals One unsignalized crossing north of Gordon Road	Five foot bike lanes in both directions	Route 66 (Harvard Sq. – Dudley Station) Route 86 (Sullivan Sq. – Cleveland Circle) Three sets of bus stops that are approximately 500-1,400 feet apart
North Harvard Street Barry's Corner to Cambridge Street	Minor urban arterial 2,200 feet in length One travel lane in each direction; turn lanes at key intersections Approximately 40 feet wide curb-to-curb Approximately 89 on-street parking spaces	Eight to ten foot wide sidewalks (typical) Crossings at traffic signals Pedestrian signal near Easton Street Unsignalized crossings: Spur St./Bertram St. Coolidge Road Eatonia Street Hooker Street Empire Street	Five foot bike lanes in both directions except for "Sharrows" in northbound approach to Barry's Corner	Route 66 (Harvard Sq. – Dudley Station) Three sets of bus stops that are approximately 700-800 feet apart
Cambridge Street Mass Pike to Soldiers Field Road	Minor urban arterial 4,500 feet in length Two to three travel lanes in each direction; turn lanes at key intersections Median divided roadway between Franklin Street and Soldiers Field Road Approximately 80-88 feet wide curb-to-curb Approximately 26 on-street parking spaces	Eight to ten foot wide sidewalks (typical) Crossings at traffic signals No unsignalized crossings	New bridge / overpass design includes bike lanes.	Route 66 (Harvard Sq. – Dudley Station) Route 64 (Oak Sq. – Central Sq.) Five sets of bus stops that are approximately 800-1,800 feet apart

2022 NO BUILD

The 2022 No-Build scenario includes future traffic volumes from planned and/or approved developments near the IMP area, as well as planned transportation improvements in the study area. The 2022 No Build scenario provides future baseline conditions for comparison with the transportation impacts IMP. The 2022 No Build does not include the IMP projects.

Planned and Proposed Transportation Improvements

As illustrated in Figure 120, a number of significant, multi-modal transportation improvements are planned or proposed for North Allston. These include bridge and intersection improvements by MassDOT as part of their Accelerated Bridge Program, accessibility improvements at the Weeks Bridge by DCR, and bicycle improvements by the Cities of Boston and Cambridge.

Private developers are also planning transportation improvements to mitigate the impacts of their projects. Samuels and Associates has proposed new streets and improvements to Barry's Corner and, as part of its Brighton Landing project, New Balance is funding the construction of a new commuter rail station and making improvements to local streets and intersections.

MassDOT will add new five foot wide bike lanes to the Anderson Bridge (both directions) and enhance pedestrian crossings and vehicular operations at the adjacent intersections. Prior to construction, the bridge carried two travel lanes in each direction. After construction, the bridge will carry one southbound travel lane and two northbound travel lanes. The City of Cambridge is planning to add new bike lanes on JFK Street between Memorial Drive and Eliot Street, completing the connection from North Harvard Street to Harvard Square.

MassDOT is also planning improvements to the Western Avenue and River Street Bridges as part of the Accelerated Bridge Program. The bridges currently operate as a one-way pair with three travel lanes on each bridge. The proposed project will add one-way cycle tracks, enhance pedestrian facilities and improve intersection geometry and operations. Each bridge will continue to carry three traffic lanes after completion of the construction. The new westbound cycle track on the Western Avenue Bridge will extend to the westbound cycle track that the City of Cambridge is currently constructing on Western Avenue from Central Square to the Charles River.

The Cambridge Street Bridge over the MassPike will be reconstructed by MassDOT. The bridge is a median-divided two-way bridge with three lanes in each direction. MassDOT proposes to reconstruct the bridge with two lanes in each direction, replacing two of the travel lanes with buffered bike lanes. Construction is anticipated to begin in Winter 2013/2014 and will last approximately two years.

DCR plans to improve accessibility on the John Weeks bridge by replacing the stairs with ramps and providing handrails on the steeper sections of the bridge. These improvements will also allow bicyclists to cross the river without carrying their bikes ups up and down sets of stairs. Construction is anticipated to begin later this year.

Boston's Bike Network Plan includes an array of proposed improvements to build on recent actions and create a robust and well-connected bike network, including the installation of buffered bike lanes on Cambridge Street in coordination with the MassDOT bridge projects. During the upcoming construction season, the City plans to install bike lanes and "Sharrows" (i.e., shared lane markings) on Western Avenue west of Barry's Corner where the roadway is not wide enough for bike lanes in both directions.

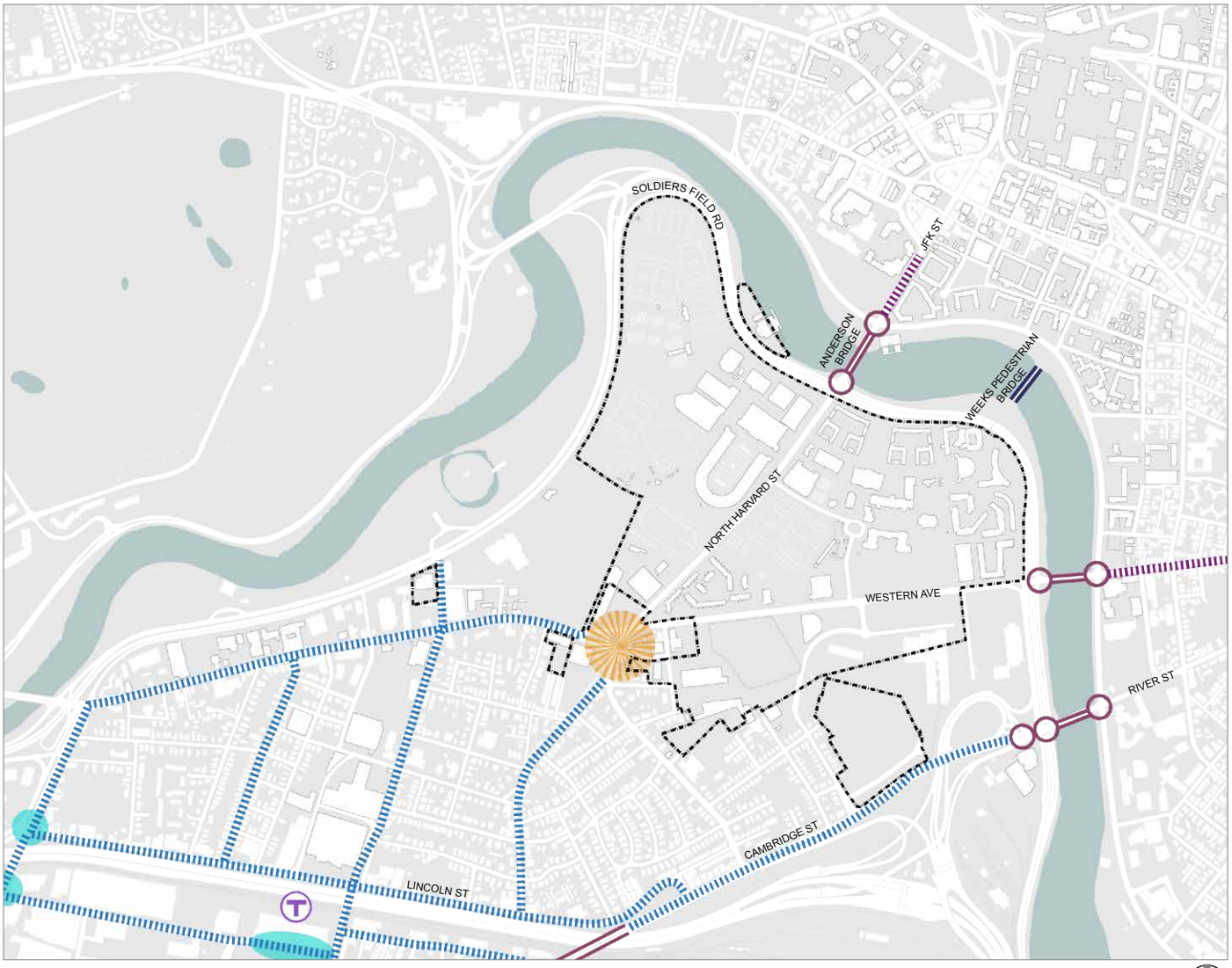


Figure 120: Planned Transportation Improvements

Planned/Approved Development Projects

Through discussions with BTD and based on historical data, it was determined that a 0.25 percent annual growth rate would be appropriate for traffic volumes in this area for a ten-year time frame. This annual growth rate was applied to existing traffic volumes. In addition to accounting for historical background growth, the 2022 No Build scenario includes site-specific traffic associated with planned and/or approved developments near the IMP area. Trip generation information for the background projects is included in Appendix C. The following projects were included in the 2022 No Build Scenario.

- *Science Project* (formally referred to as the Allston Science Complex) as described in the *Allston Science Complex Draft Project Impact Report* (DPIR), completed in September 2006
- *Charlesview Redevelopment* as described in the Charlesview Redevelopment Complete Streets Analysis memorandum, a supplemental document to the *Charlesview Redevelopment DPIR*, submitted in July 2009. Traffic associated with the existing Charlesview complex was removed from the existing network, while trips associated with the relocation/ redevelopment project were added to the network
- *New Brighton Landing* (New Balance) as described in the *New Brighton Landing Expanded Project Notification Form* (PNF), completed in May 2012
- *Barry's Corner RRCP* as described in the *Barry's Corner Residential and Retail Commons Expanded PNF*, completed in December 2012
- *28 Travis Street* as described in the *28 Travis Street, 38 Travis Street/90 Seattle Street, Bright Hockey Center Renovation Institutional Master Plan Notification Form/PNF*, completed in October 2012
- *Tata Hall,* which is currently under construction, as described in the *Institutional Master Plan Amendment/DPIR*, completed in July 8, 2011

In addition, trip generation estimates were made for Swiss Bakers, which was not open at the time of the April 2012 data collection effort.

2022 BUILD

The 2022 Build scenario represents future transportation conditions in the study area with the transportation demands and proposed improvements of the IMP, including proposed campus circulation and parking access; displacement of existing trips; the projection and distribution of site-generated traffic volumes associated with the IMP; and proposed parking, transit, pedestrian, bicycle, and loading/service conditions.

New Roadways

The Ten-Year Plan includes four new streets: "South Campus Drive," "Ivy Lane," "Academic Way," and "Science Drive." Boston's Complete Streets Guidelines will inform the design of all of these new streets. The streets will create new connections to Barry's Corner, link the proposed Greenway and Smith Field, support shuttle bus operations, and provide access to the proposed projects in the Ten-Year Plan, particularly those projects located near Barry's Corner. In addition, on-street parking is proposed along one or both sides of these streets.

As discussed previously, to facilitate the Barry's Corner residential project, Samuels and Associates will construct "South Campus Drive" and "Ivy Lane". After the Charlesview site is cleared, "Academic Way" will be constructed between North Harvard Street and Western Avenue. This new street will enable Harvard to extend its shuttle system into Barry's Corner and will create new vehicular circulations options to relieve congestion at the intersection of Western Avenue and North Harvard Street (Barry's Corner). The remainder of "Academic Way" south of Western Avenue and "Science Drive" will be constructed as part of the Science project.

Transportation Demands

For the transportation Build analysis, only the projects that generate peak hour transportation demands, shift traffic, alter access/egress patterns, or change parking demand/supply are considered. Four of the nine IMP projects are anticipated to generate new peak hour transportation demands. These are:

- HBS Faculty and Administrative Office Building
- Mixed Use Facility and Basketball Venue
- Gateway project
- Hotel and Conference Center

It is anticipated that the two renovation projects (the proposed Soldiers Field Park Renovation and the Baker Hall Renovation) will add little or no new typical daily or peak hour traffic volumes to the area network. The remaining three IMP projects are replacement that will add little or no new typical daily or peak hour traffic volumes to the area network. The proposed Kresge and Burden projects involve the replacement of existing buildings at the Harvard Business School campus. The proposed Harvard Stadium Addition will improve amenities but reduce the number of seats.

The proposed Basketball Venue includes the relocation of an existing facility and increasing the number of seats from 1,950 to 3,000. The increased traffic and parking demand of this facility will not occur during the typical morning or evening peak hours and instead will occur in connection with facility events and will be managed as part of the University's event management strategy.

Person Trips

Person trips were estimated to assess the traffic impacts of the Ten-Year Plan. The estimates were based on standard rates from the Institute of Transportation Engineers (ITE) Trip Generation and Harvard empirical data, where appropriate. The trip generation methodology for each project included in the Ten-Year Plan is presented in Appendix C. Table 17 summarizes the resulting gross trips, by mode for the Ten-Year Plan. The estimates for auto person-trips are before any credits are taken for shared or pass-by trips, discussed below.

Table 17: Ten-Year Plan Gross Person Trip Generation by Mode

Direction	Person Trips by Autos	Person Trips by Transit	Person Trips by Walk/Bikes	Total Person Trips
Weekday Daily [1]	7,760	2,160	4,970	14,890
Weekday Morning Peak Hour [2]				
Enter	420	135	225	780
Exit	120	30	85	235
Total	**540**	**165**	**310**	**1,1015**
Weekday Evening Peak Hour [2]				
Enter	215	50	180	445
Exit	435	140	285	860
Total	**650**	**190**	**465**	**1,305**

[1] *Expressed in trips per day*
[2] *Expressed in trips per hour*

Vehicle Trips

Vehicle trips were estimated by applying an automobile mode share and an average vehicle occupancy rate (VOR) to the person trip generation estimates. These estimates are based on BTD's published mode share data by trip purpose for Area 17 (the zone for Allston) and supplemented by Harvard empirical data where appropriate and noted. The IMP projects will generate approximately 5,300 average weekday daily trips (2,650 in and 2,650 out). During the morning peak hour the IMP projects will generate approximately 415 vehicle trips (340 in and 75 out). During the evening peak hour the IMP projects will generate approximately 475 vehicle trips (135 in and 340 out). Appendix C provides additional detail about the vehicle trip estimation.

TRAFFIC ANALYSIS

Consistent with BTD's guidelines, Synchro 6 software, based on the 2000 Highway Capacity Manual (HCM), was used to model level of service (LOS) operations at the study area intersections. The term LOS is used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay, and freedom to maneuver.

Level of Service

Level of service for signalized intersections is based on average delay for all vehicles entering the intersection, including initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For unsignalized intersections, level of service is based on stopped delay for vehicles on the side street approaches since the main street traffic is not affected by side street traffic. The level of service criteria for signalized and unsignalized intersections are presented in Table 18.

Table 18: Vehicle Level of Service Criteria

Stopped Delay (seconds/vehicle)		
Level of Service	**Signalized Intersection**	**Unsignalized Intersection**
LOS A	≤ 10	≤ 10
LOS B	> 10-20	> 10-15
LOS C	> 20-35	> 15-25
LOS D	> 35-55	> 25-35
LOS E	> 55-80	> 35-50
LOS F	> 80	> 50

Source: 2000 Highway Capacity Manual (HCM)

Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service is derived directly from the delay calculation. Signalized intersections with LOS D-F are commonly found in urban areas, particularly at the convergence of two or more arterial roadways.

The LOS results of the signalized intersection analyses are summarized in Table 19 for the Existing (2012), 2022 No-Build, 2022 Build and 2022 Build with Mitigation conditions. The results for the unsignalized intersections are summarized in Table 20. Detailed results including delay by approach, queuing and volume to capacity ratio are presented in Appendix C along with the detailed Synchro results.

Table 19: Signalized Intersection Level of Service Summary

Intersection	Measure	Weekday Morning				Weekday Evening			
		2012 Exiting	2022 No-Build	2022 Build	2022 Build w/ mit.	2012 Exiting	2022 No-Build	2022 Build	2022 Build w/ mit.
Western Avenue at	LOS	A	A	A	A	A	B	B	B
Telford Street/	Delay (sec.)	5	9	10	10	7	11	12	12
Telford Street Extension	v/c	0.64	0.73	0.75	0.76	0.64	0.76	0.77	0.78
Western Avenue at	LOS	E	F	F	F	D	E	F	E
Everett Street	Delay (sec.)	69	111	>120	117	37	78	86	76
	v/c	1.04	>1.20	>1.20	>1.20	0.92	1.13	1.16	1.13
Soldiers Field Road at	LOS	C	D	D	D	B	C	C	C
Everett Street	Delay (sec.)	32	38	38	40	18	27	25	22
	v/c	0.94	1.01	1.01	0.96	0.84	0.96	0.95	0.91
Western Avenue at	LOS	D	E	D	D	D	F	E	E
North Harvard Street	Delay (sec.)	45	61	52	49	52	94	75	73
(Barry's Corner)	v/c	0.86	1.01	0.88	0.86	0.94	1.11	1.03	1.08
North Harvard Street at	LOS	B	B	B	B	B	B	B	B
Franklin Street /	Delay (sec.)	17	17	18	16	12	15	16	12
Kingsley Street	v/c	0.58	0.62	0.68	0.68	0.52	0.61	0.64	0.64
Western Avenue at	LOS	D	B	E	D	C	B	E	D
Hague Street/Batten Way	Delay (sec.)	37	10	61	47	27	13	71	51
	v/c	0.71	0.56	1.12	0.91	0.69	0.62	0.98	0.97
North Harvard Street at	LOS	C	C	C	C	C	C	C	C
Soldiers Field Road EB	Delay (sec.)	34	29	34	34	35	27	32	32
	v/c	0.78	0.89	0.92	0.92	0.73	0.86	0.93	0.93
North Harvard Street/	LOS	D	D	D	D	E	C	E	E
Anderson Memorial Bridge	Delay (sec.)	39	43	54	54	66	33	56	56
at Soldiers Field Road WB	v/c	0.87	0.91	1.02	1.02	0.98	0.94	>1.20	>1.20
Western Avenue at	LOS	D	F	F	F	D	F	F	F
Soldiers Field Road EB	Delay (sec.)	50	>120	>120	91	37	>120	>120	95
	v/c	0.84	>1.20	>1.20	1.08	0.75	1.11	>1.20	0.96
Western Avenue at	LOS	E	E	E	D	D	F	F	F
Soldiers Field Road WB	Delay (sec.)	67	62	62	53	42	>120	>120	>120
	v/c	0.8	0.83	0.87	0.87	0.94	0.97	0.99	0.99
Cambridge Street at	LOS	D	D	D	D	D	F	F	F
I-90 Ramp/Hotel driveway	Delay (sec.)	51	42	43	43	51	115	110	110
	v/c	0.65	0.72	0.74	0.74	0.77	0.91	0.91	0.91
Cambridge Street at	LOS	E	D	D	D	D	C	D	D
Soldiers Field Road EB	Delay (sec.)	60	41	40	40	51	32	39	39
	v/c	0.7	0.83	0.85	0.85	0.75	0.86	0.89	0.89
Cambridge Street at	LOS	D	F	F	F	D	F	F	F
Soldiers Field Road WB	Delay (sec.)	49	94	113	113	42	102	107	107
	v/c	0.75	0.85	0.9	0.9	0.79	0.87	0.88	0.88
Cambridge Street at	LOS	A	B	B	B	B	B	B	B
Windom Street	Delay (sec.)	9	16	17	17	12	16	16	15
	v/c	0.64	0.84	0.86	0.86	0.7	0.82	0.81	0.81
Cambridge Street at	LOS	C	D	D	D	C	C	D	C
North Harvard Street	Delay (sec.)	26	44	48	47	23	33	38	34
	v/c	0.79	0.96	0.99	0.99	0.84	0.95	0.99	0.99
Cambridge Street at	LOS	C	C	C	C	C	F	F	F
Franklin Street and	Delay (sec.)	24	29	31	31	28	80	84	84
Harvard Avenue	v/c	0.81	0.93	0.95	0.95	0.81	1.12	1.15	1.15

Source: VHB, Inc. using Synchro 6 (Build 614) software.

LOS – Level-of-Service. LOS A indicates free flow conditions with minimal delays. LOS E and F indicate congested conditions.

Delay – Control delay per vehicle, expressed in seconds, includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

V/C – Volume-to-capacity ratio. V/C ratios range from 1.0 when demand equals capacity to 0 when demand is zero. Values over 1.0 indicate demand in excess of capacity.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; L = Left-turn; T = Through; R = Right-turn

Table 19 (continued): Signalized Intersection Level of Service Summary

Intersection	Measure	Weekday Morning				Weekday Evening			
		2012 Exiting	2022 No-Build	2022 Build	2022 Build w/ mit.	2012 Exiting	2022 No-Build	2022 Build	2022 Build w/ mit.
Soldiers Field Road at	LOS	F	F	F	C	D	D	D	D
Eliot Bridge	Delay (sec.)	89	101	115	33	44	51	51	36
	v/c	0.81	0.83	0.85	0.82	0.82	0.86	0.86	0.83
North Harvard Street at	LOS	n/a	n/a	B	B	n/a	n/a	A	B
"Academic Way"/"South	Delay (sec.)	n/a	n/a	11	11	n/a	n/a	10	10
Campus Drive"	v/c	n/a	n/a	0.46	0.46	n/a	n/a	0.53	0.52
Western Avenue at	LOS	n/a	n/a	n/a	A	n/a	n/a	n/a	B
"Academic Way"	Delay (sec.)	n/a	n/a	n/a	9	n/a	n/a	n/a	12
	v/c	n/a	n/a	n/a	0.52	n/a	n/a	n/a	0.65

Source: VHB, Inc. using Synchro 6 (Build 614) software.
LOS – Level-of-Service. LOS A indicates free flow conditions with minimal delays. LOS E and F indicate congested conditions.
Delay – Control delay per vehicle, expressed in seconds, includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.
V/C – Volume-to-capacity ratio. V/C ratios range from 1.0 when demand equals capacity to 0 when demand is zero. Values over 1.0 indicate demand in excess of capacity.
NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; L = Left-turn; T = Through; R = Right-turn

Existing Conditions

In general, except as otherwise noted below, the intersections next to and near the IMP area operate at LOS D or better during the existing (2012) morning and evening peak hours. Congestion primarily occurs at the gateway locations during the morning peak hours. The following intersections operate at LOS E or F during the morning or evening peak hours:

- North Harvard Street at the Soldiers Field Road ramps (PM) – LOS E
- Western Avenue at the Soldiers Field Road ramps (AM) – LOS E
- Cambridge Street at the Soldiers Field Road ramps (AM), which affects traffic congestion at the Mass Pike exit ramps – LOS E
- Western Avenue at Telford Street (AM) – LOS E
- Eliot Bridge with Soldiers Field Road (AM) – LOS F

Three of these locations are scheduled for improvement as part of MassDOT's Accelerated Bridge Program. The fourth, Western Avenue at Telford Street, recently had its signal equipment upgraded as part of the Charlesview project. The only intersection operating at LOS F was the intersection of the Eliot Bridge with Soldiers Field Road during the morning peak hour. All of the unsignalized intersections in the study area operate at LOS D or better.

Some specific traffic movements through intersections do operate at LOS E-F including left-turns from Western Avenue and Cambridge Street onto North Harvard Street, and several movements at the intersection of Cambridge Street with the MassPike ramps and Soldiers Field Road. The complexity of the MassPike / Soldiers Field Road intersection further exacerbates congestion at this location.

Table 20: Unsignalized Intersection Level of Service Summary

Intersection	Critical Movement(s)	Measure	Weekday Morning				Weekday Evening			
			2012 Exiting	2022 No-Build	2022 Build	2022 Build w/ mit.	2012 Exiting	2022 No-Build	2022 Build	2022 Build w/ mit.
North Harvard Street	Bertram St. WB	LOS	C	C	C	C	C	C	C	C
at Bertram Street/	Approach	Delay (sec.)	16	17	20	20	15	16	18	18
Spurr Street		v/c	0.05	0.05	0.06	0.06	0.09	0.10	0.11	0.11
	Spurr St. EB L	LOS	C	C	C	C	C	C	C	C
		Delay (sec.)	18	19	24	24	17	18	20	21
		v/c	0.19	0.20	0.26	0.26	0.09	0.09	0.11	0.11
	Spurr St. EB R	LOS	B	B	B	B	B	C	C	C
		Delay (sec.)	12	12	12	13	15	17	20	21
		v/c	0.25	0.27	0.28	0.28	0.39	0.46	0.52	0.54
North Harvard Street	Bayard St. EB	LOS	B	C	C	C	B	B	C	C
Bayard Street /	Approach	Delay (sec.)	15	16	17	17	14	15	17	17
Rena Street		v/c	0.07	0.08	0.09	0.09	0.04	0.05	0.06	0.06
Western Avenue at	Travis St. NB	LOS	B	C	C	C	B	C	C	B
Travis Street	Approach	Delay (sec.)	14	18	17	15	15	20	19	14
		v/c	0.08	0.12	0.10	0.09	0.06	0.09	0.08	0.06
Hague Street at	Hague St. NB	LOS	C	n/a	n/a	n/a	B	n/a	n/a	n/a
Rotterdam Street	Approach	Delay (sec.)	19	n/a	n/a	n/a	14	n/a	n/a	n/a
		v/c	0.06	n/a	n/a	n/a	0.04	n/a	n/a	n/a
	Hague St. SB	LOS	B	n/a	n/a	n/a	B	n/a	n/a	n/a
	Approach	Delay (sec.)	12	n/a	n/a	n/a	10	n/a	n/a	n/a
		v/c	0.12	n/a	n/a	n/a	0.09	n/a	n/a	n/a
North Harvard Street	Gordon Rd. WB	LOS	C	C	C	C	B	C	C	C
at Gordon Road	Approach	Delay (sec.)	15	16	17	17	14	15	18	18
		v/c	0.17	0.19	0.21	0.21	0.24	0.27	0.35	0.35
North Harvard Street	"S. Campus Dr."	LOS	n/a	C	n/a	n/a	n/a	C	n/a	n/a
at "S. Campus Drive"	EB Approach	Delay (sec.)	n/a	17	n/a	n/a	n/a	19	n/a	n/a
		v/c	n/a	0.07	n/a	n/a	n/a	0.10	n/a	n/a
North Harvard Street	"Ivy Lane" EB	LOS	n/a	B	B	B	n/a	B	B	B
at "Ivy Lane"	Approach	Delay (sec.)	n/a	11	11	11	n/a	13	13	13
		v/c	n/a	0.09	0.06	0.06	n/a	0.15	0.13	0.13
Western Avenue at	"Academic Way"	LOS	n/a	n/a	C	n/a	n/a	n/a	E	n/a
"Academic Way"	NB AWpproach	Delay (sec.)	n/a	n/a	22	n/a	n/a	n/a	39	n/a
		v/c	n/a	n/a	0.19	n/a	n/a	n/a	0.55	n/a
	"Academic Way"	LOS	n/a	n/a	D	n/a	n/a	n/a	F	n/a
	SB Approach	Delay (sec.)	n/a	n/a	29	n/a	n/a	n/a	96	n/a
		v/c	n/a	n/a	0.49	n/a	n/a	n/a	0.87	n/a
Rotterdam Street at	"Science Dr." EB	LOS	n/a	n/a	B	n/a	n/a	n/a	B	n/a
"Science Drive"	Approach	Delay (sec.)	n/a	n/a	12	n/a	n/a	n/a	10	n/a
		v/c	n/a	n/a	0.09	n/a	n/a	n/a	0.16	n/a

Source: VHB, Inc. using Synchro 6 (Build 614) software.

LOS – Level-of-Service. LOS A indicates free flow conditions with minimal delays. LOS E and F indicate congested conditions.

Delay – Control delay per vehicle, expressed in seconds, includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

V/C – Volume-to-capacity ratio. V/C ratios range from 1.0 when demand equals capacity to 0 when demand is zero. Values over 1.0 indicate demand in excess of capacity.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; L = Left-turn; T = Through; R = Right-turn

2022 No Build vs 2022 Build

Study area corridors process heavy traffic and pedestrians volumes during the commuter peak hours, affecting intersection operations particularly at gateway intersections at the river bridges and where two arterial roadways intersect (e.g., Barry's Corner).

- *2022 No Build conditions*: Six of the seventeen signalized intersections operate at LOS E or F during the morning peak hour and seven operate at LOS E or F during the evening peak hour. All of the unsignalized intersections in the study area operate at LOS D or better.
- *2022 Build conditions*: Six of the eighteen signalized intersections operate at LOS E or F during the morning peak hour and nine operate at LOS E or F during the evening peak hour. One of the unsignalized intersections in the study area operates at LOS F during the evening peak hour.
- *2022 Build with mitigation conditions*: Three of the nineteen signalized intersections operate at LOS E or F during the morning peak hour and eight operate at LOS E or F during the evening peak hour. All of the unsignalized intersections in the study area operate at LOS D or better.

The Ten-Year Plan improves future conditions at Barry's Corner and includes mitigation to address degradations in level of service at five intersections operating at LOS E or F. Specific measures are described at these locations. The traffic mitigation plan also includes interconnecting traffic signals along North Harvard Street and providing communications improvements to link the North Harvard Street intersections ("Academic Way" to Cambridge Street) and Cambridge Street intersections (Windom Street to Harvard Avenue) to the City Traffic Management Center.

North Harvard Street at Western Avenue (Barry's Corner)

The inclusion of "Academic Way" in the roadway network has a significant and positive impact on Barry's Corner. This new roadway allows traffic to avoid Barry's Corner and creates the opportunity to improve pedestrian crossings by eliminating the traffic island on the northeast corner and extending the curb into the intersection. As a result of this improvement, level of service improves from LOS E in the 2022 No Build morning peak hour to LOS D in the Build scenario and from LOS F in the 2022 No Build evening peak hour to LOS E in the Build scenario. Additionally, queues are maintained or improved from the No-Build to the Build condition.

The Barry's Corner Residential and Retail Commons Project will improve striping; retime the signals to accommodate concurrent rather than exclusive pedestrian crossings; and relocate the bus stop in the southbound direction on North Harvard Street further from the intersections. The Build scenario builds on these improvements. Proposed mitigation includes signal optimization and coordination with the proposed signalized intersection of North Harvard Street at "Academic Way" and upgrading communications and video monitoring equipment at this location. In addition, two more bus stops located next to the Grove – one on North Harvard Street northbound and one on Western Avenue westbound – will be relocated away from the intersection. These improvements will further simplify operations and traffic flow at the intersection.

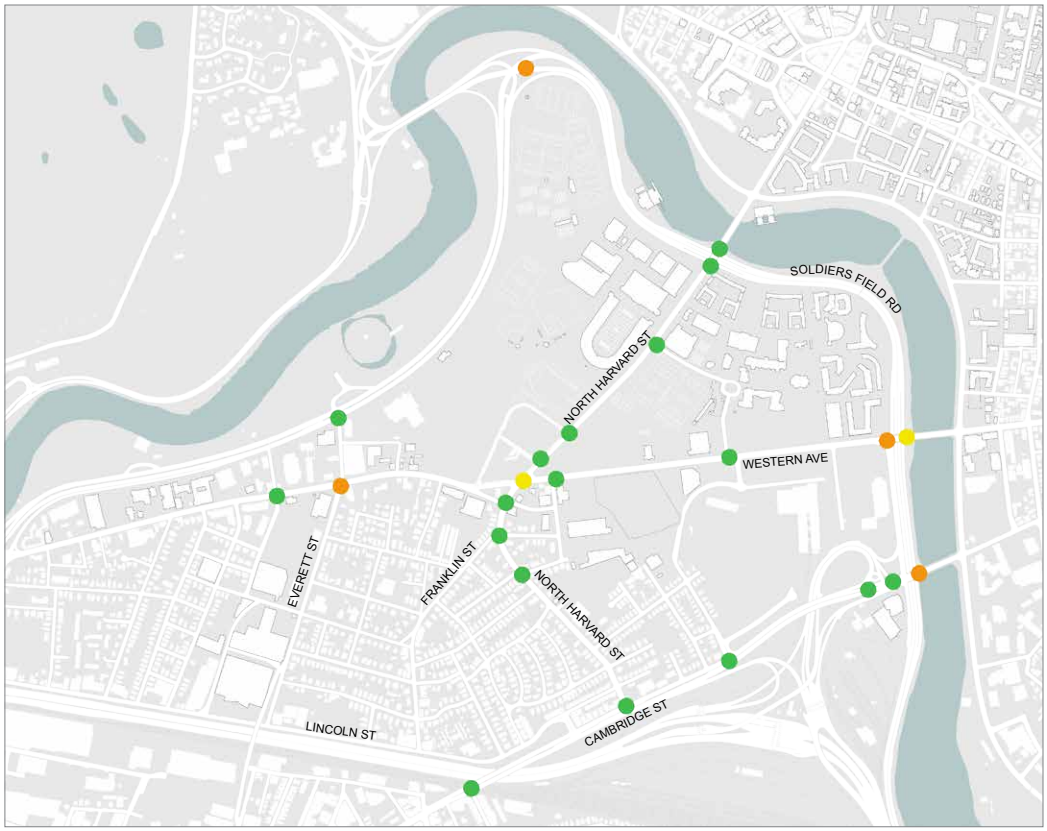
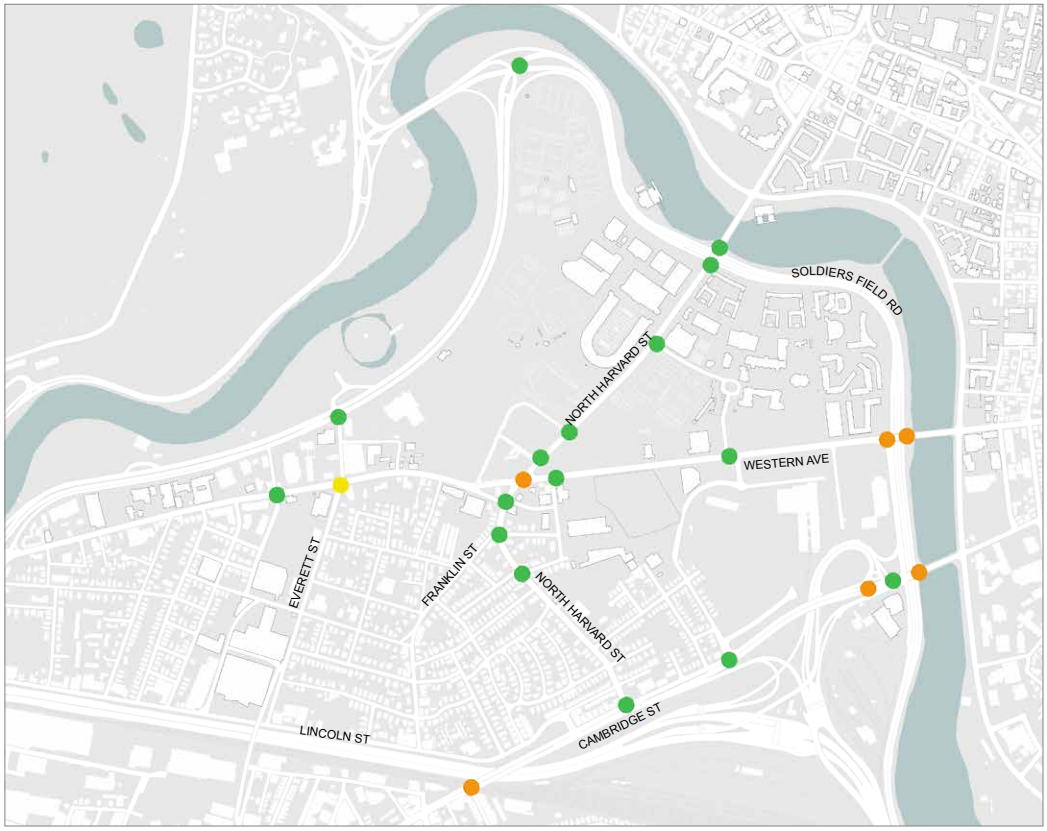


Figure 121: 2022 No Build Intersection Level of Service: AM Peak Hour



Level of Service A-D

Level of Service E

Level of Service F

Figure 122: 2022 No Build Intersection Level of Service: PM Peak Hour

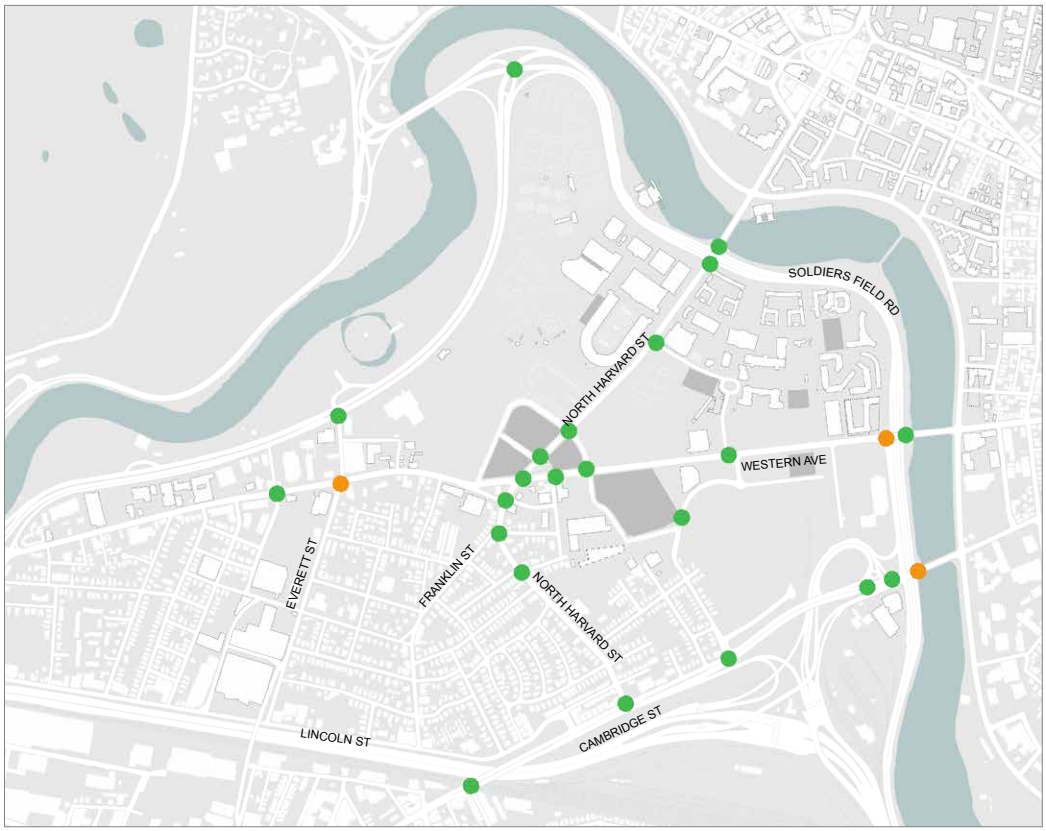


Figure 123: 2022 Build with Mitigation Intersection Level of Service: AM Peak Hour

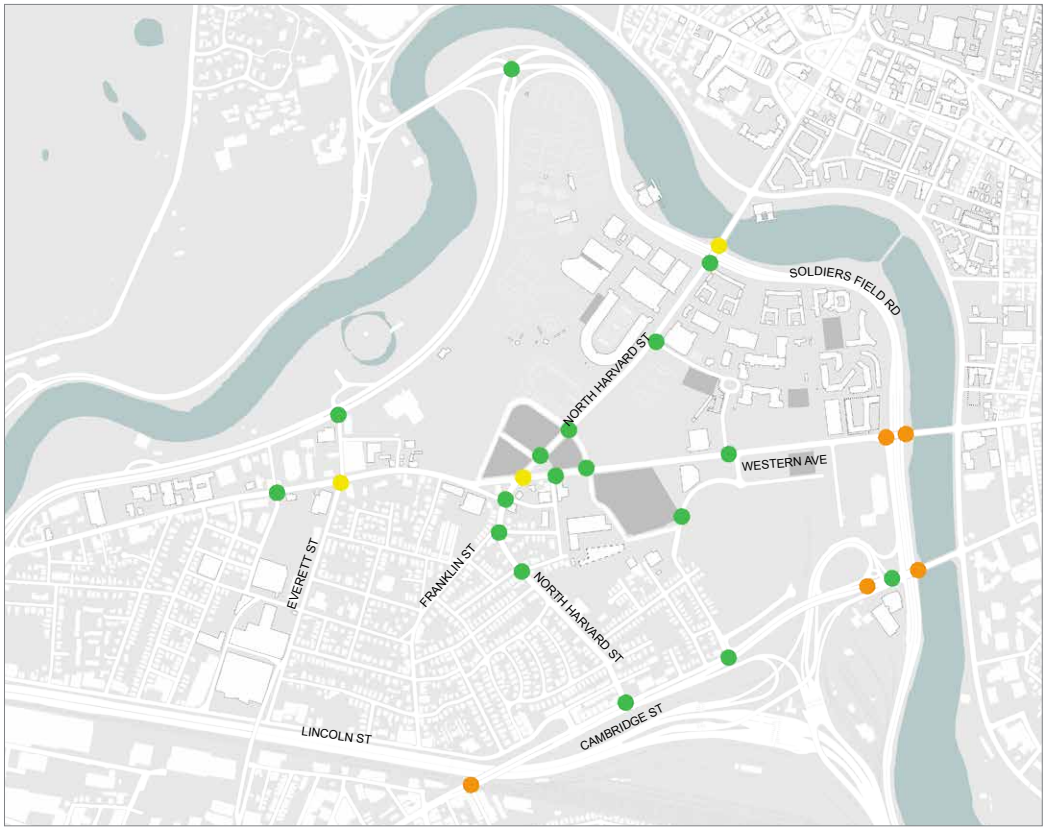


Figure 124: 2022 Build with Mitigation Intersection Level of Service: PM Peak Hour

Western Avenue at "Academic Way"

New traffic signals are proposed on "Academic Way" at Western Avenue. The side street approaches at this intersection operates at LOS E or F during the evening peak hour from the 2022 Build scenario. With the traffic signal in place, the evening peak hour level of service improves to LOS A at the North Harvard Street intersection and LOS B at the Western Avenue intersection. The signal operations will be coordinated with the adjacent Barry's Corner intersection. Prior to installing the traffic signal, Harvard will fully evaluate the intersection with updated traffic volume data to confirm that warrant(s) are fully met. In addition, the signal would require appropriate approvals from BTD prior to installation.

Western Avenue at Everett Street

This intersection currently operates at LOS E and LOS D and is projected to degrade to LOS F and LOS E during the morning and evening peak hours, respectively, in the No-Build condition when background projects increase traffic volumes at the intersection by approximately 12-16 percent. The intersection is projected to experience additional delay under the 2022 Build condition and is projected to operate at LOS F under both peak hours when the Ten Year Plan increases traffic volumes at the intersection by an addition 4-5 percent.

A "No Left Turn" restriction is proposed for Western Avenue eastbound approach as mitigation for this intersection. This measure, which could be implemented during the morning and evening peak hours, will reduce eastbound queues on the Western Avenue approach and improve the 2022 Build level of service to LOS E during the evening peak hour, comparable to the 2022 No Build level of service.

Soldiers Field Road at Eliot Bridge

This intersection operates at a LOS F during the morning peak hour under the Existing, 2022 No-Build and 2022 Build conditions. Signal timing modifications are proposed that will improve the level of service to LOS C during the morning peak hour for the 2022 Build scenario.

Western Avenue at Hague Street and Batten Way

This intersection is projected to operate at LOS E during both peak hours in the 2022 Build condition. This is due to project-generated trips being added at this intersection during each of the peak hours. Signal timing modifications are proposed that will improve the level of service to LOS D during each peak hour.

Cambridge Street at Franklin Street and Harvard Avenue

This intersection is projected to operate at LOS F during the evening peak hour in the 2022 No Build and Build scenarios. The Ten Year Plan increases traffic volumes at the intersection by approximately two percent. Most of the traffic volume increases (90 percent) at this intersection result from background traffic generated by No Build projects. The Ten Year Plan proposes installing video detection equipment as mitigation at this intersection.

Anderson Bridge Intersections

The Anderson Memorial Bridge and its intersections are being reconstructed as part of MassDOT's Accelerated Bridge Program. The improvements on the bridge are multimodal in nature and greatly improve pedestrian and bicycle mobility by eliminating a southbound traffic lane on the bridge and replacing it with two bike lanes. MassDOT will also make geometric and signal improvements at the adjacent intersections. With signal timing optimization, the two closely spaced and coordinated intersections on the Boston side of the bridge will operate at LOS D or E during the 2022 Build scenario, which is comparable to Existing Conditions.

Western Avenue and River Street Bridge Intersections

Both of these bridges and their adjacent intersection will be reconstructed as part of the Accelerated Bridge Program. Similar to the Anderson Memorial Bridge, improvements at the Western Avenue and River Street bridge intersections are multimodal in nature, creating new pedestrian and bicycle facilities and improving the overall organization of the intersections. Construction is scheduled to begin in the summer of 2014 once work on the Anderson Memorial Bridge is substantially complete and all of the traffic lanes are in service.

As traffic volumes continue to grow in the future, operations at several of the intersections are projected to degrade from Existing conditions, even with the proposed improvements. In both the 2022 No Build and 2022 Build scenarios, three of the five intersections operate at LOS E or F during the morning peak hour and four of the five intersections operate at LOS F during the evening peak hour.

One improvement has been identified for the intersection of Western Avenue and the Soldiers Field Road westbound off-ramp. The proposed MassDOT design eliminates one of the eastbound approach lanes on Western Avenue, resulting in significant queues on Western Avenue. Restoring this approach lane with a No Turn on Red at the intersection approach will significantly reduce queuing and overall intersection delay, although it will continue to operate at LOS F. Harvard will work with MassDOT to assess this traffic mitigation within the context of improving pedestrian and bicycle accommodations at the intersection.

PEDESTRIAN NETWORK

The analysis of pedestrian operations focuses on pedestrian crossings at signalized intersections for the Existing, 2022 No build and 2022 Build conditions. This analysis indicates that the majority of movements through the signalized intersections in the study area operate at pedestrian level of service (PLOS) D or better. The proposed signal timing changes at Barry's Corner will improve operations at this intersection from PLOS E during each peak hour to PLOS B-D, while improvements at the river bridges improve safety. Additional information is provided in Appendix C.

Future Pedestrian Network

Planned improvements to the pedestrian network include signal improvements at the Barry's Corner intersection; upgrades to pedestrian crossings, sidewalks, and signal improvements as part of MassDOT's reconstruction of the river bridges; and accessibility improvements to the Weeks Bridge by DCR. The IMP also includes a number of pedestrian improvements including sidewalk reconstruction, new traffic signals on "Academic Way" and new pathways. Design guidelines based on Boston's Complete Streets Guidelines will be used to ensure that the IMP projects create a positive pedestrian environment.

Collectively, these improvements will strengthen pedestrian connections and reduce the impenetrability of the IMP area. The proposed intersection improvements include an increased use of concurrent crossings instead of exclusive pedestrian crossings. These types of improvements help to reduce pedestrian delay and improve pedestrian level of service. Other intersection improvements add new signal equipment to improve safety.

Pedestrian Operations Analysis

Pedestrian level of service (PLOS) at signalized intersections is dictated by the portion of the signal cycle dedicated to pedestrian crossings. The methodology used to complete this analysis is based on the 2000 Highway Capacity Manual. Similar to the vehicle LOS calculation, the approximate delay to pedestrians crossing the intersection correlates to a PLOS based on the criteria described in Table 21. Based on HCM methodology, increasing pedestrian volumes does not alter PLOS at signalized intersections; changing the signal timings does alter the PLOS.

Table 21: Pedestrian Level of Service Criteria

Pedestrian Level of Service	Pedestrian Delay (seconds/pedestrian)
PLOS A	≤ 10
PLOS B	> 10-20
PLOS C	> 20-30
PLOS D	> 30 - 40
PLOS E	> 40 - 60
PLOS F	> 60

Source: 2000 Highway Capacity Manual (HCM)

Table 22: Pedestrian Level of Service at Barry's Corner

Intersection	Crosswalk		Weekday Morning Peak Hour			Weekday Evening Peak Hour		
			2012 Existing	2022 No-Build	2022 Build	2012 Existing	2022 No-Build	2022 Build
Western Avenue at North Harvard Street	Western Ave.	East	E	B	B	E	B	C
	Western Ave.	West	E	D	D	E	D	D
	N. Harvard St.	North	E	C	C	E	C	C
	N. Harvard St.	South	E	C	C	E	C	C

Source: 2000 Highway Capacity Manual (HCM)

Pedestrian analysis was completed for each crosswalk at signalized study area intersections during the morning and evening peak hours under 2012 Existing, 2022 No-Build, and 2022 Build conditions. The results of this analysis are summarized below and presented in detail in Appendix C.

The most significant improvement in pedestrian level of service occurs at Barry's Corner. Intersection improvements are proposed at this location as part of the Barry's Corner RRCP, including revising the pedestrian accommodations from exclusive to concurrent phasing. As shown in Table 22, this modification results in improved PLOS in the No-Build and Build conditions. The 2022 No Build and 2022 Build crosswalks operate at PLOS D or better during the morning and evening peak hours. The PLOS did not change between the 2022 No Build and 2022 Build scenarios for the other intersections.

Changes to PLOS were also identified along the bridge intersections with Soldiers Field Road, where MassDOT is reconstructing the adjacent bridge. These changes occurred between Existing conditions and the future scenarios. As with the other intersections, the PLOS did not change between the 2022 No Build and 2022 Build scenarios. The proposed improvements are multimodal in nature and include a number of safety improvements.

BICYCLE NETWORK

Figure 125 shows the bicycle network of the Ten-Year Plan.

The analysis of the IMP estimated and assigned new bike trips to the bike network and roadways serving the IMP area. The IMP will generate approximately 170 and 255 bicycle trips during the morning and evening peak hours, respectively. These trips and trips from No Build projects were added to the existing bicycle network to evaluate conditions at the signalized intersections in the Study Area.

The analysis of bicycle level of service (BLOS) indicates that the majority of movements through the signalized intersections in the study area operate at BLOS D or better with the exception of several side streets and one of the movements through the complicated intersection of Cambridge Street and Soldiers Field Road; this set of bicycle movements operate at BLOS E. Additional information is provided in Appendix C.

Future Bicycle Network

Significant improvements are planned to the bicycle network serving the IMP area and are included in the analysis of future conditions. These include new bike lanes and cycle tracks that will be built as part of MassDOT's bridge projects, improvements to the Weeks Bridge and other projects that are part of Boston's Bike Network Plan including bike lanes on Western Avenue west of Barry's Corner and buffered bike lanes on Cambridge Street.

The Ten Year Plan includes further expansion to the bicycle network serving North Allston. These improvements will further increase the density of the bicycle network and improve the livability of the area for residents, commuters and Harvard affiliates. In addition to improving options for commuters, the new facilities will link people with open space and provide new low-stress cycling options. The proposed elements include:

- A new multi-use path along "South Campus Drive" that will accommodate bikes and create a new off-street cycling route around Barry's Corner with access to Smith Field. This facility will be constructed by Samuels and Associates in coordination with the Barry's Corner Residential and Retail Commons project.
- Bicycle facilities on "Academic Way" that will link Rena Park with Smith Field and create another route option to cycle around Barry's Corner.
- New multi-use paths in Rena Park that will create a cycling gateway to the park and the future Greenway.
- Upgrades to Western Avenue that formalize the existing cycle track. New projects on Western Avenue (e.g., Science) that are adjacent to the existing cycle track will move it from the street to a section separated by curbing from the parking lane.
- Expansion of the Hubway stations as demand increases.
- Provisions of covered off street bike parking at each new building with accessible. public spaces that are convenient to building entrances.

Bicycle Operations Analysis

The analysis of bicycle level of service is based on the methodology presented in the 2000 Highway Capacity Manual. Similar to pedestrian analysis, BLOS at signalized intersections is dictated by the portion of the signal cycle on each approach. However, unlike pedestrian analysis, bicycle volumes play a role in this level of service calculation. The criteria that

equate control delay for bicycles at signalized intersections to BLOS is presented in Table 23. The methodology is presented further in Appendix C.

Table 23: Bicycle Level of Service Criteria

Bicycle Level of Service	Control Delay (seconds/bicycle)
BLOS A	≤ 10
BLOS B	> 10-20
BLOS C	> 20-30
BLOS D	> 30 - 40
BLOS E	> 40 - 60
BLOS F	> 60

Source: 2000 Highway Capacity Manual (HCM)

Bicycle analysis was completed for each approach at signalized study area intersections during the morning and evening peak hours under 2012 Existing, 2022 No-Build, and 2022 Build conditions. The detailed results of this analysis are included in Appendix C. In the future conditions, general bicycle volume growth and future trips in the study area associated with specific projects were considered. These trips were assigned to roadways serving the study area, using data that reflects Harvard affiliate commuting patterns and Access Boston guidance for walk/bike trips from/to Area 17.

The majority of approaches are operating at acceptable levels of service during the morning and evening peak hours under all conditions, with the following exceptions:

- Franklin Street eastbound at North Harvard Street during Existing, 2022 No-Build and 2022 Build conditions (AM/PM peak hours)
- Cambridge Street eastbound at I-90 ramps during Existing conditions (AM/PM peak hours)
- Cambridge Street eastbound at Soldiers Field Road EB ramp during No-Build and Build conditions (AM/PM peak hours)
- Kingsley Street westbound at North Harvard Street during Existing, 2022 No-Build, and 2022 Build conditions (AM peak hour)
- Windom Street southbound at North Harvard Street during No-Build and Build conditions (PM peak hour)

It should be noted that bicycle operations are dictated largely by the proportion of green time available to the bicycle movement, which varies in each condition due to the changing vehicle volumes in each condition. Adjustments to signal timing at the North Harvard intersection with Kinglsey Street and Franklin Street will improve the level of service from BLOS E to BLOS D on the Kinglsey Street and Franklin Street approaches.

At the Cambridge Street eastbound approach to Soldiers Field Road, MassDOT proposes to install new bicycle signals and change the proportion of green time allocated to bicycles on these approaches. This change will increases clearance times to improve bicycle safety, but result in higher bicycle delay. There are no bicycle facilities on this approach today.

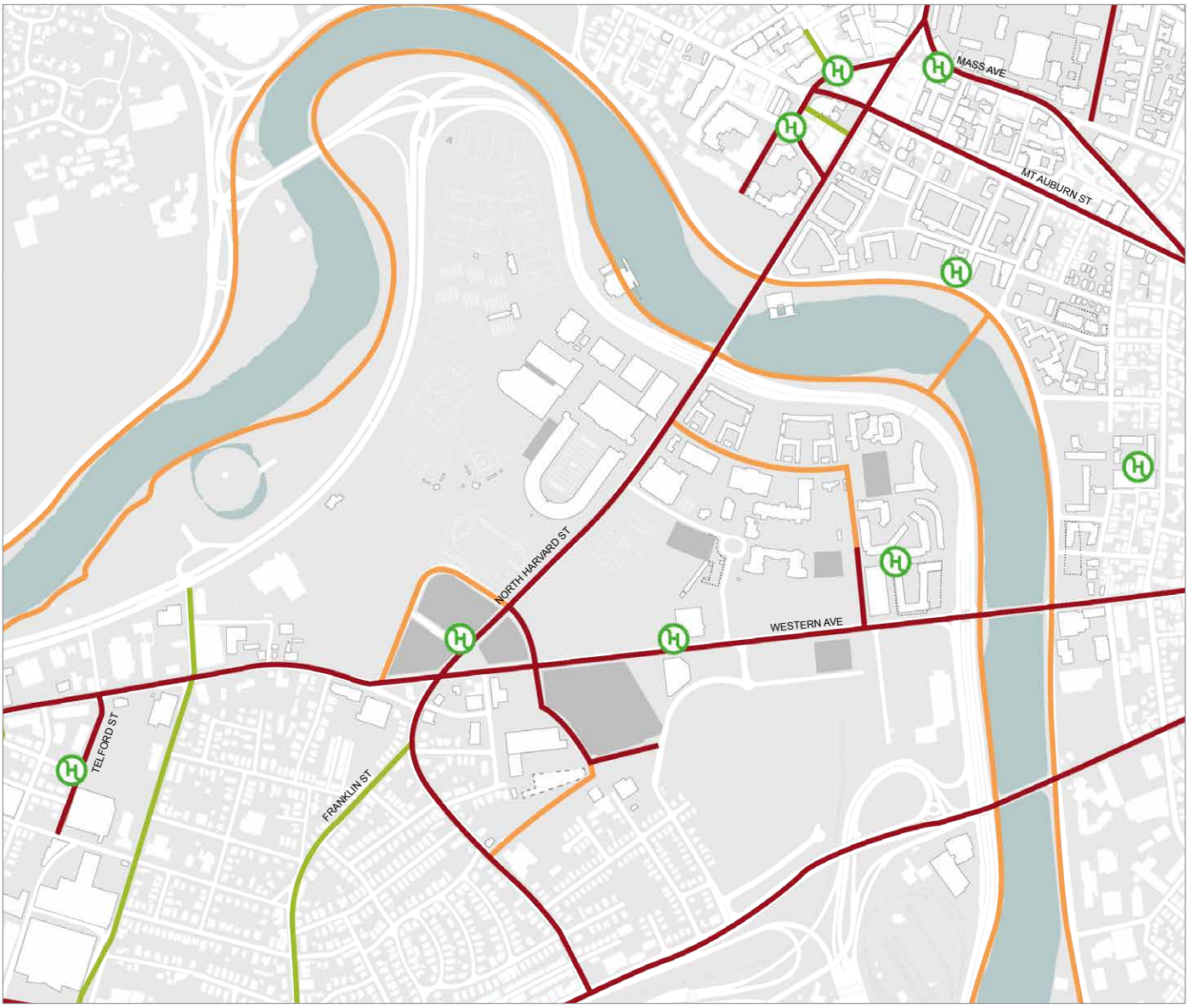


Figure 125: Ten-Year Bicycle Network

PUBLIC TRANSIT

The analysis of the IMP estimated and assigned new transit trips to the bus services serving the IMP area. The new trips includes future ridership estimates for the IMP projects, the Science project, and Barry's Corner RRCP. These projects would have direct impacts on ridership levels on the routes serving the IMP area. Additional information is provided in Appendix C.

There is no clear route that serves a majority of trips to the study area. Rather, Route 66, Route 86, the combined Route 70/70A and the Harvard shuttle serve approximately 20-percent to 30-percent of trips. The MBTA routes serve large segments of the Boston and Cambridge communities and the MBTA Red Line, which make them desirable transit options. The analysis indicates that there is sufficient capacity to accommodate future transit trips.

MBTA Bus Service

All areas within the Allston Campus are within one-quarter mile of bus stops for at least two routes and most of the campus is near bus stops for three routes. Service to and from Harvard Station is provided by Routes 66 and 86 buses, which combine to provide ten buses per hour during peak periods. Table 24 summarizes the ridership levels on these routes.

Table 24: MBTA Bus Service in Allston

Route #	Route Name	Allston Area Service Via	Peak Period Headway (minutes)	Average Weekday Ridership
64	Oak Square (Brighton) – Central Square	Cambridge Street	15-20	1,270
66	Harvard Square – Dudley Station	North Harvard Street	10	14,700
70	Cedarwood (Waltham) – Central Square	Western Avenue	20	4,650
70A	North Waltham – Central Square	Western Avenue	30	2,030
86	Sullivan (Somerville) – Cleveland Circle	North Harvard Street & Western Avenue	15	5,140

Source: MBTA Ridership and Service Statistics (Thirteenth Edition, 2010).

The MBTA is implementing improvements to the Route 66 bus in 2013 as part of its Key Bus Route Improvement Program. The purpose of these improvements is to reduce travel times and improve reliability. One of the proposed improvements in the IMP area is to eliminate a pair of bus stops on North Harvard Street to the north of Barry's Corner once Charlesview tenants are relocated. In addition, Samuels & Associates (developers of Barry's Corner Residential and Retail Commons) will relocate the southbound Routes 66 and 86 bus stops at Barry's Corner away from the intersection as part of their project.

Regional Transit and Rail Service

The Harvard Square Station, which is one mile from Barry's Corner, is the most significant regional transit facility near the IMP area. Red Line service provides connections to the northwest and as far south as Braintree, as well as connections to the Orange Line, the Green Line and commuter and intercity rail at South Station. In addition to the Red Line, Harvard Square is a major bus facility that accommodates ten surface bus routes and four trolley-bus services.

Commuter rail lines pass to the south of the IMP area through Beacon Yard. These tracks contribute to the barrier caused by the MassPike along the southern edge of North Allston/ North Brighton. The Worcester-Framingham branch operates over this corridor. While there are currently no commuter rail stations in this area, New Balance has agreed to fund the construction of a new station to the west of Everett Street as part of their Brighton Landing project. As part of Access Boston, the Boston Transportation Department has also identified a potential location in Beacon Yard for a West Station.

Bus System Capacity

Bus route capacity is a function of vehicle size and frequency of service. The peak hour capacities for this analysis are based on a bus capacity of 60 passengers for a standard MBTA bus, though, crush capacities are higher. The service rush-hour frequencies are based on the most current schedules for the Routes 64, 66, 70, 70A, and 86. Load profiles by bus route collected in Fall 2012 were provided by the MBTA. These load profiles detail the passenger loads by bus and by stop over a typical day. The existing MBTA bus services have a volume-to-capacity ratio well under 1.0 with the Route 86 bus outbound having the highest morning volume-to-capacity (v/c) ratio of 0.77 and the inbound service having the highest evening utilization with a v/c ratio of 0.77.

The IMP projects, the Science project, and Barry's Corner RRCP are expected to generate 415 new transit trips (370 entering, 45 exiting) during the AM peak hour and 330 new transit trips (65 entering, 265 exiting) during the PM peak hour. These new transit trips were assigned to the MBTA bus routes serving the IMP area using 2012 employee zip code data for the Allston Campus provided by Harvard for Harvard affiliates and BTD data for Area 17 for other new transit trips. In addition to the project generated trips, some existing residential trips were shifted from the MBTA service to the Harvard Square Express service, representing those Allston residents that may consider using the Harvard Shuttle as opposed to MBTA service to Harvard Square.

The transit trips by line were added to the existing route volumes. With the exception of Route 64, where few trips are added, all MBTA routes see some increase in volume-to-capacity ratio due to the project-generated trips. Route 66 and Route 86 ridership does grow due to project generated trips. Ridership also grows on Routes 70 and 70A as these routes continue to be the best options for traveling between Central Square and Allston. The Route 66 bus outbound service has the highest morning v/c ratio of 0.86 and the Route 70A inbound service has the highest evening utilization with a v/c ratio of 0.83.

Bus Stops

Transit services that run at high frequencies may be subject to bunching. Bunching is caused when transit vehicles, in this case shuttles or buses, incur delay along a route and headways between vehicles are impacted and reduced. This results in congestion at transit stops, crowding on the lead transit vehicle, or conversely, subsequent transit vehicles running well under capacity. High frequency routes, specifically Route 66, are likely subject to bunching resulting in individual buses with higher v/c ratios than the average hourly v/c ratio shown in the figures above.

The MBTA's Key Bus Route program, which includes the Route 66, seeks to address the bunching issue by consolidating and relocating bus stops to reduce delay and improve service reliability. The proposed relocation of bus stops in Barry's Corner and the elimination of several stops next to the existing Charlesview site, shown in Figure 126, is consistent with this approach. The new stops will be located next to paths and crosswalk to facilitate connections to the campus and neighborhood.



Figure 126: MBTA Bus Stops at Barry's Corner

HARVARD SHUTTLE BUS SERVICES

The Ten Year Plan includes expansion of Harvard's shuttle bus service into Barry's Corner and increased service between Harvard Square and Barry's Corner. The shuttle system will serve Harvard affiliates including undergraduates, graduate student, staff and faculty. Neighborhood residents and employees of the Barry's Corner Residential and Retail Commons will be able to use the shuttle. Additional information is provided in Appendix C.

Today, Harvard's Allston Express operates as a one-way loop that originates at the Soldiers Field Park Garage and travels as far north as the North Campus in Cambridge. Stops along this route include the i-lab, Cotting Hall on North Harvard Street near Harvard Way, Harvard Square and other stops in Cambridge. The route operates on 15 minute headways (i.e., one bus every 15 minutes) on weekdays. In the future, as shown in Figure 127, the service will be closer to Barry's Corner and provide more frequent connections between Barry's Corner and
Harvard Square.

New Shuttle Bus Routes

The construction of "Academic Way" creates the opportunity to extend the existing Allston Express service into Barry's Corner. The shuttle buses would no longer travel on Batten Way and Gordon Road. After leaving the Soldiers Field Park Garage stop, buses would travel on Western Avenue then turn onto "Academic Way" to a new Barry's Corner stop before continuing onto North Harvard Street.

The Allston Express service would be supplemented by a new Barry's Corner to Harvard Square service that would travel along North Harvard Street, making stops at Barry's Corner, Cotting Hall, Eliot Street in Cambridge and Harvard Square. The service would operate on ten minute headways on weekdays. A new loop roadway would be created within the former Charlesview site to connect North Harvard Street with "Academic Way" and accommodate the shuttle route at Barry's Corner.

Capacity Analysis

Today, the Allston Express has a volume-to-capacity ratio of 0.5 during the morning and evening peak hours. This route does not exceed capacity with the additional project-generated trips from the Ten Year Plan. The evening peak hour volume-to-capacity ratio is estimated to be 0.66.

Future ridership on the Harvard Square Express is anticipated to make up less than half of the future capacity, with volume-to-capacity ratios of approximately 0.44 and 0.31 in the peak direction during the morning and evening peak hour, respectively. Estimates include both project-generated trips and an assumption that some Allston residents will use the Harvard shuttle.

The MBTA Red line is the closest subway stop to the study area. As such, it serves as the terminus for all subway and commuter rail trips to the study area, many of which will transfer to the Harvard Square Express to reach the study area. The Allston Express shuttle does not serve as many trips as the Harvard Square Express shuttle due to the lower frequency of shuttles and the direction of the route.

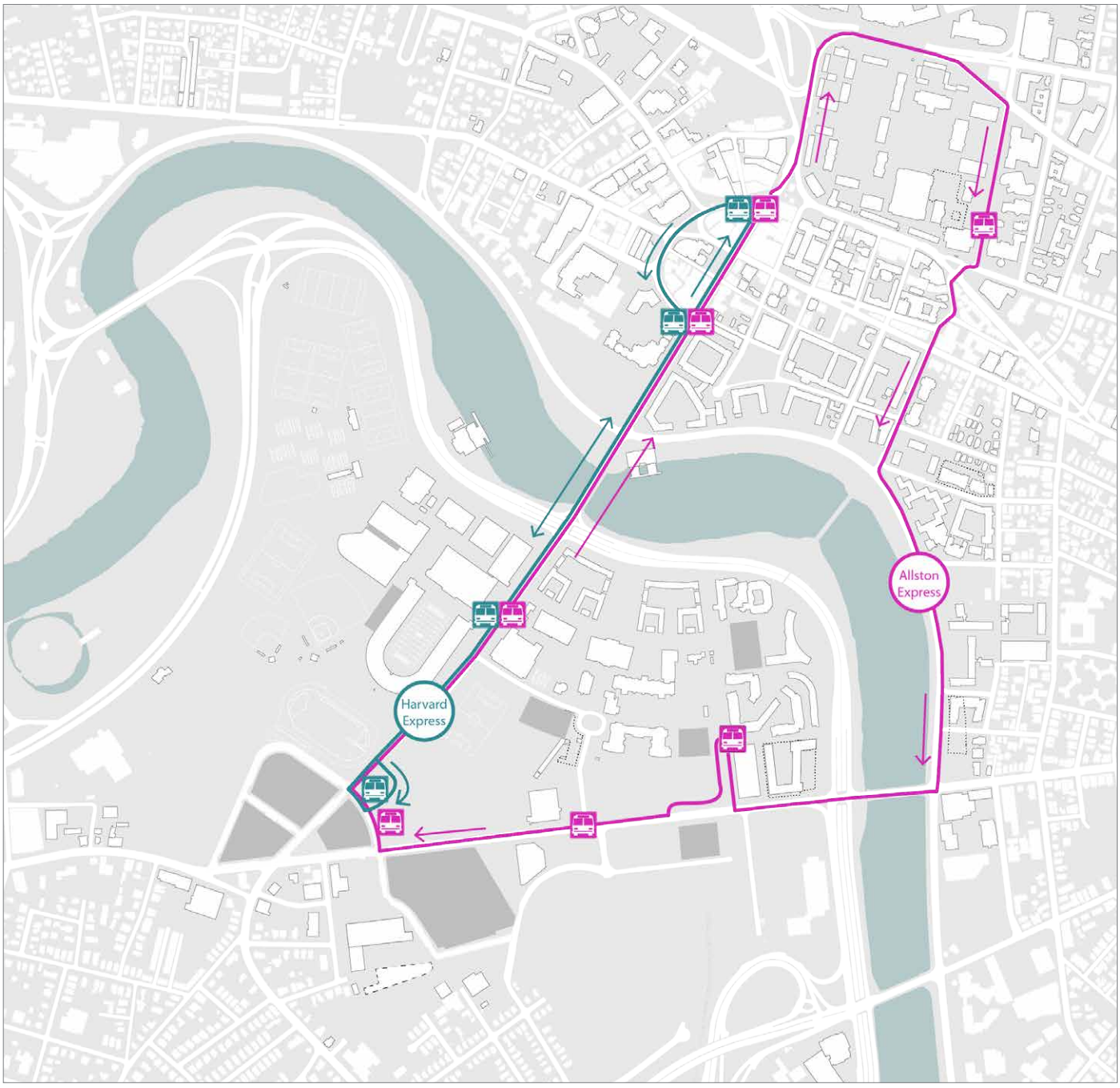


Figure 127: Proposed Harvard Shuttle Routes

PARKING

As described in Chapter 2.0, Existing Conditions, all University parking is controlled and administered by the Harvard University Parking Office as a University-wide resource with a permitting system and specific parking lot/garage assignments. This parking supply accommodates eligible Harvard affiliates, including commuters and residents living on-campus, and visitors parking in the Spangler Lot and at designated multi-space meter locations. As indicated in Table 25, the Ten-Year Plan includes 3,807 off-street institutional parking spaces, including 50 spaces in a parking reserve that is subject to future administrative review by the BRA and BTD. Locations for the new parking facilities are shown in Chapter 4.0, Ten-Year Plan.

Table 25: Off-Street Parking Inventory

	Number of Spaces	
Institutional Parking	**Existing/Approved**	**Ten-Year Plan**
219 Western Ave./175 N. Harvard St	45 spaces	
Teele Hall	111 spaces	111 spaces
Athletics	241 spaces	241 spaces
Spangler Lot	675 spaces	675 spaces
Soldiers Field Park Garage	645 spaces	645 spaces
One Western Ave.	617 spaces	617 spaces
25 Travis St.	55 spaces	55 spaces
1230 Soldiers Field Road	58 spaces	58 spaces
I-LAB	120 spaces	120 spaces
28 Travis Street	75 spaces	75 spaces
Science [1]	500 spaces	350 Spaces
114 Western Avenue		210 spaces
Basketball Venue and Mixed Use Project		275 spaces
Future Academic District (surface lots) [2]		250 spaces [5]
Hotel/Conference Center [3]		125 spaces
TOTAL INSTITUTIONAL PARKING SUPPLY	**3,142 SPACES**	**3,807 SPACES**
Total Non-Institutional Parking Supply [4]	510 spaces	-
TOTAL	**3,652 SPACES**	**3,807 SPACES**

[1] Existing/Approved includes previously approved on-site and off-site parking; Ten-Year Plan includes previously approved on-site parking only.
[2] Includes 150 surface spaces on the Charlesview site and 100 surface spaces on an Ohiri Field site next to HBS Central Loading.
[3] These spaces may be non-institutional parking spaces depending on the hotel programming.
[4] Includes 114 Western Avenue (178 spaces), Charlesview (230 spaces), and 135 Western Avenue (102 spaces)
[5] Includes 50 spaces in a "parking reserve" that is subject to future administrative review by the BRA and BTD.

Harvard anticipates that these off-street spaces will be managed as a University-wide resource, consistent with current practices. In addition, the proposed new streets will provide an opportunity to create between 60-70 new on-street parking spaces in addition to the 41 spaces that will be constructed on the streets next to the Barry's Corner RRCP. Harvard anticipates that a portion of these new on-street spaces would be publicly accessible.

These new institutional parking spaces will accommodate parking demand from four IMP projects: the new Faculty and Administrative Office Building at the Business School; the Mixed Use Facility and Basketball Venue; the Gateway project in Barry's Corner; and, the Hotel and Conference Center on Western Avenue. Other uses in the Ten Year Plan involve renovation and replacement project that will not require new parking.

TRANSPORTATION DEMAND MANAGEMENT

As described in Chapter 2.0, Existing Conditions, Harvard has an extensive Transportation Demand Management (TDM) program that is an important tool in managing vehicular travel to the campus. Harvard is committed to maintaining and enhancing this program with respect to the Ten Year Plan. The existing and envisioned continued expansion of the TDM program will support alternative modes as a major component of day-to-day transportation operations supporting the IMP development program. In addition to the programmatic TDM elements, Harvard will incorporate the following elements as part of the IMP projects:

- Provide bicycle parking for new projects
- Expand Hubway stations as warranted by demand
- Add new electric charging stations
- Designate parking for High Occupancy Vehicles and Low Emissions Vehicles
- Expand shared ride car services (e.g., ZipCar)

As described in Chapter 4.0, Ten-Year Plan, Mobility Hubs are a promising approach to organize these transportation alternatives as the IMP area is developed. Mobility Hubs are points of multimodal access that provide a range of transportation options for travelers as part of a larger interconnected network. These facilities do not rely on the construction of significant transportation infrastructure. Instead, the focus is on providing different mode options that accommodate convenient use including transfers between modes.

TRANSPORTATION ACCESS PLAN

Harvard will submit an Institutional Transportation Access Plan Agreement (TAPA) to BTD. Individual IMP projects will submit TAPAs as part of their Article 80 Large Project Review process. These project TAPAs will be coordinated with the Institutional TAPA. In addition to mitigation commitments identified in this section and in Appendix C, the Institutional TAPA will address the following:

Mode Share Goal

Harvard will set a mode share goal for the term of this IMP of under 40 percent of commuters travelling to the Allston campus by car, an aggressive target comparable to downtown Boston but one that recognizes the differences between Allston and Cambridge in terms of the commuting population and the level of transportation infrastructure.

Resident Parking

Recognizing concerns about potential spillover parking impacts on neighborhood streets, the BRA and BTD have committed to a public process leading to implementation of a Residential Parking Protection Program that will include, where appropriate, new or modified curbside regulations and/or new enforcement protocols. This process will be carried out during 2014. Harvard has agreed to provide assistance with implementation, and will define this commitment in its Institutional TAPA.

Special Studies

As part of the Institutional TAPA, Harvard will complete the following special studies:

Stadium Way Design

Harvard will proceed with the design of Stadium Way to the 25% design stage within 24 months of the effective date of the IMP. The decision about whether or not to build Stadium Way during the term of this IMP will be subject to the results of the transportation and parking analysis (see below).

Transportation Demand Management at Non-institutional Properties

Harvard will study strategies for extending transportation demand management (TDM) measures to its tenants in North Allston/North Brighton. These may include provision of additional infrastructure supporting alternative transportation modes (e.g. bike racks, showers), access to certain components of Harvard's TDM programs listed in the IMP, and inclusion in the Transportation Management Association (TMA) slated for expansion to Allston and Brighton.

Special Events

Harvard will complete a study of special events traffic and parking impacts (including athletic events and graduation). The scope of this study shall be determined through consultation with the Task Force and BTD, as well as the BRA, and the study shall be completed by April 30, 2014, in order to ensure implementation of initial recommendations for 2014 graduation ceremonies.

Parking Reserve

Harvard has agreed to reduce the number of surface parking spaces on the former (i.e., recently vacated) Charlesview site from 150 to 100, with the additional 50 spaces to be implemented through a "parking reserve" mechanism if deemed necessary through future review by the BRA and BTD. Harvard will identify potential future alternative locations for surface parking. Given that much of the land owned by Harvard that might be suitable for such a use is currently subject to the CSX easement, the options available for surface parking will increase in the future. This analysis shall be completed within six months of the effective date of the IMP and shall evaluate the potential for phasing out the surface parking on the Charlesview site.

Ongoing Transportation and Parking Analysis Program

Harvard will conduct an ongoing transportation and parking analysis program, the exact scope of which will be worked out in consultation with BTD for inclusion in the TAPA.

6.2 Sustainability

UNIVERSITY APPROACH TO SUSTAINABILITY

Harvard's commitment to sustainability is driven by Sustainability Principles adopted in 2004 that define the University's vision for a healthier, more sustainable future. University-wide goals and commitments lay out a clear road map for reducing the environmental impact of campus operations:

- Greenhouse Gas (GHG) Reduction. Harvard has achieved a reduction in GHG emissions of 16 percent inclusive of growth. Without growth, Harvard has achieved a 24 percent reduction in emissions from 2006.
- Capital projects, renovations and building system upgrades of $100,000 and above undergo a smart design process incorporating life cycle costing, integrated design, energy modeling when applicable and other elements that ensure a broad range of potential sustainable design and operations opportunities are vetted and that performance requirements are achieved in a cost-effective manner.

It is important to note that these internal principles and practices are not static. The University is continually evaluating and improving the implementation and efficacy of these measures to determine their effectiveness in both reducing environmental impacts and as tools for the internal review of capital projects.

A collaborative decision-making framework has been established to engage and empower stakeholders across Harvard. University-wide committees and working groups meet to share best practices and develop new policies and practices that drive continuous improvement.

Every member of the Harvard community has a role to play in contributing to the University's sustainability. Harvard's comprehensive approach to change management includes occupant engagement and behavior change programs that encourage collaborative problem solving and provide tools, trainings and resources to hundreds of students and staff at all levels of the University.

- Community engagement campaigns foster a culture of sustainability by educating and mobilizing thousands of students, faculty and staff to create innovative solutions that can be replicated at Harvard and beyond.
- Employee Green Teams, the Green Office program, student environmental leaders in dorms, and a Student Sustainability Grants program engage the entire Harvard community around taking action to reduce the University's environmental impact through individual action.
- Recognition programs, such as the Annual Green Carpet Awards further serve to foster the culture of sustainability.

UNIVERSITY SUSTAINABILITY PRINCIPLES

The University's approach to sustainability is based on three principles:

Principle 1: To demonstrate respect for nature and society, sustainability considerations should be an integral part of planning, construction, renovation, and operation of buildings on campus

Harvard requires varying levels of integrated design, life cycle costing, energy modeling and greenhouse gas estimation, metering and sub-metering, project close-out and operations and maintenance readiness, water conservation, occupant education and specific environmental performance targets based on the project scope. In addition, the Harvard Life Cycle Costing Calculator was developed as a University-wide tool that uses consistent, clear financial and GHG reduction metrics to ensure long-term financial impacts are included in decision-making and project prioritization.

As of June 2013, Harvard has 110 buildings registered with the United States Green Building Council (USGBC), 85 of which are certified, the highest number of certified projects of any higher education institution according to the USGBC. There are 12 LEED certified and 3 LEED registered building projects in Allston.

Table 26: LEED Buildings in Allston

LEED Certified	Level	Category	Version
125 Western Ave - Batten Hall	Gold	LEED NC	3.0
Aldrich Hall, Harvard Business School	Silver	LEED NC	2.2
Class of 1959 Memorial Chapel	Gold	LEED EB: O&M	2.0
Dean's House, Harvard Business School	Silver	LEED NC	3.0
Gallatin Hall, Harvard Business School	Gold	LEED NC	2.2
Gordon Track: Locker Rooms & Offices	Certified	LEED CI	2.0
Hamilton Hall, Harvard Business School	Gold	LEED NC	2.1
McCollum Hall, Harvard Business School	Gold	LEED CI	2.0
McCulloch Hall, Harvard Business School	Platinum	LEED CI	2.0
Murr Center - Tennis Center Lockers	Certified	LEED CI	2.0
One Western Ave	Silver	LEED NC	2.0
Wyss Hall, Harvard Business School	Gold	LEED NC	2.1

LEED Registered			
Bright Hockey Concourse - Harvard FAS	Registered	LEED NC	3.0
Spangler Kitchen - HBS	Registered	LEED CI	3.0
Tata Hall - HBS	Registered	LEED NC	3.0

Harvard embeds life cycle costing, energy saving, and GHG Reduction planning into the University's mid and long-range space and growth planning and decision-making.

Principle 2: To ensure long-term sustainable campus development, campus-wide master planning, and target-setting should include environmental and social goals.

Harvard is committed to developing and maintaining an environment that enhances human health and fosters a sustainable campus.

The University continues to improve its operations with a focus on seamlessly integrating sustainability into its management and financial systems and learn through advanced research, analysis and experience gained over time. The Harvard Sustainability Principles are intended to "...guide Harvard's practices toward sustainability through the management of building design, construction, renovation, procurement, landscape, energy, water, waste, emissions, transportation, human health, and productivity."

Comprehensive physical or master planning on Harvard's campuses in Allston is being undertaken at a district level, recognizing the unique physical and functional attributes of distinct areas of the campus. Sustainability considerations are incorporated fully into master planning efforts. District level planning exercises implemented after Harvard's adoption of the Sustainability Principles have utilized a sustainability framework that includes energy and greenhouse gas emissions, water, waste, transportation, landscape and ecology, campus culture and human health, and reuse of existing infrastructure.

Principle 3: To align the organization's core mission with sustainable development, facilities, research, and education should be linked to create a "living laboratory" for sustainability.

Harvard believes universities have a special role and special responsibility in confronting the challenges of climate change and sustainability. Every member of the Harvard community has a role to play in contributing to this progress. The University will carry out research and translate the findings of that research into action. Together the Harvard community is focused on building a culture of environmental responsibility at Harvard. Harvard works as a catalyst for change by partnering with faculty, students and staff to foster a culture of sustainability and use the campus as a living laboratory for innovation. Harvard convenes the community to share best practices and develop new programs and policies that strive to serve as replicable models to inspire students and future leaders, and seek to influence the higher education, government and business sectors.

Occupant engagement programs and initiatives work to educate the community, change behavior and inspire individual action among the Harvard community. The programs use community-based social marketing techniques such as competition, incentives, benchmarking and rewarding progress and building social norms to bring about lasting change in behaviors.

Harvard students and faculty are confronting the energy-climate challenge, with programs in research and education across nearly all of Harvard's Schools and departments. Hundreds of faculty are brought together at Harvard's Center for the Environment to form a diverse intellectual community, creating a place where faculty, researchers and students can come together to discuss, debate and create new ideas for how we will navigate the challenges ahead:

- Working across the University, Harvard scientists are studying the climate system to better predict effects of climate change. They are also advancing the frontiers of materials science that may lead to new energy systems including fuel cells and photovoltaics.

- At the School of Public Health, faculty are working to understand the consequences of the reliance on fossil fuels as well as the emerging threats to human health from climate change.
- Across the University, faculty members are engaged with various efforts to turn scholarship into practice, advising governments and industries about the public policies that will be required to address these challenges.

EXISTING SUSTAINABILITY INITIATIVES

The implementation of these principles has led to many significant energy and sustainability measures being implemented on the Allston, Longwood, and Cambridge campuses, including:

Energy and Emissions

- From Fiscal Year 2006 to Fiscal Year 2012 Harvard experienced a 16 percent decline in the University's overall greenhouse gas emissions including growth, and a 24 percent decline in emissions if growth is excluded.
- To date, Harvard has implemented over 1,000 energy conservation measures resulting in annual savings of $9 million.
- In FY12 and FY13 Harvard's Schools completed 375 energy conservation measures resulting in an estimated $2.3 million in utility savings annually and reduction in 5,600 Metric Tons of Carbon Dioxide Equivalent (MTCDE) annually.
- As of 2013, 23 percent of the University's electricity is generated from renewable or alternative energy sources. There is over one megawatt of installed solar PV on campus including 2,275 solar panels on the 1.5 acres of roof space on the Gordon Indoor Track and Tennis Center in Allston, Harvard's largest solar project.

Green Buildings

- Harvard University has more LEED certification than any other higher education institution in the world according to the US Green Building Council. As of June 2013, Harvard has 110 LEED projects – 85 certified and 25 registered projects.
- LEED projects have resulted in an estimated $2.17 million in utility savings and 11,836 reduction in MTCDE (through Renewable Energy Certificates (REC) offsets) and 31,093 tons of construction waste diverted from landfills.
- The Green Revolving Fund has loaned over $15 million, supporting nearly 200 projects that have yielded over $4 million in energy savings annually. There have been 12 projects approved since December 2012 that will result in an estimated $650,000 in energy savings and an reduction of 1,900 MTCDE.

Health and Wellness

- Food waste in undergraduate dining halls has dropped 54 percent since Spring 2005.
- 35 percent of food purchases for undergraduate dining halls were locally grown or produced.
- Harvard hosts two Farmers Markets, one in Allston and one in Cambridge.

Transportation

- In 2013, Harvard University and Harvard's Longwood Campus were awarded Mayor Thomas M. Menino's City of Boston Gold-level Bike Friendly Business Award.
- In 2012, 14 percent of Cambridge/Allston employees and 15 percent of Longwood employees drove to work alone. 78 percent of Longwood employees and 80 percent of Cambridge/Allston employees commuted by transit, bicycle or walking.
- Harvard has sponsored 12 Hubway bike share stations on its campuses in Allston, Cambridge, and Longwood.
- 69 shuttle, dining, mail services and recycling vehicles are fueled with biodiesel.
- More than 11 hybrid vehicles are in the campus fleet, including Harvard University Police Department's entire fleet of marked patrol cars. Six 100 percent electric vehicles are in use by landscaping services and HUPD.

Waste Reduction and Recycling

- From 1992 to 2012 Harvard's recycling rate increased from 7 percent to 52 percent. This is a result of a new single stream recycling process, composting programs in cafes, office buildings and dorms, as well as student-led waste audits, freecycle events, reuse efforts such as the Harvard Reuse List and Harvard Surplus Center, and efforts of Green Teams across the campus.
- In Fiscal Year 2011 alone, Harvard's surplus program donated over 2.5 million dollars worth of products to over 200 charities.

Water and Operations

- Certified green cleaning in 10 million gross square feet of its campuses.
- New construction and renovation projects include water retention and rainwater collection systems for use in irrigation and for non-potable uses.

Community Engagement and External Partnerships

- Harvard is an active member of the Mayor Menino's Boston Green Ribbon Commission, serving as chair of the Higher Education Working Group, and recently signed a Community Compact for a Sustainable Future with the City of Cambridge and MIT.
- Harvard's Green Office Program has engaged over 2,600 employees in 145 offices. A network of 67 Green Team Leaders meet regularly to help lead the University's efforts to make the workplace more sustainable.
- Over 30 student-run environmental groups on campus.
- The Office for Sustainability manages the Council of Student Sustainability Leaders (CSSL) which is comprised of students from Harvard College and all of the graduate schools. CSSL makes recommendations for the University in addition to taking on projects and initiatives to engage their peers in reducing energy and resources on campus.
- Student peer-to-peer outreach campaigns and competitions, including the undergraduate Green Cup competition – in 2013, the winning House reduced electricity use by 13 percent.

PERFORMANCE STANDARDS AND INDICATORS

Harvard has been tracking and publicly reporting University Greenhouse Gas Emissions since 2000.

Harvard University's Greenhouse Gas Inventory represents the full breadth of the University's GHG footprint in North America and uses the Climate Registry Protocol as its methodology. The inventory covers more than 26 million square feet of space and reports on all of the critical Kyoto protocol gases from both direct (Scope 1) and indirect (Scope 2) sources. Harvard's emissions are reported annually in two ways, 1) FY06 vs. current fiscal year for just our Baseline Buildings (e.g., Buildings that have remained constant since FY 2006) and 2) FY06 vs. current fiscal year for the Total Campus (including any growth in square footage or usage). This analysis is conservative in that adjustments to these emissions associated with Harvard's use of biofuels, biomass, Carbon uptake associated with the 3,500 acre Harvard Forest and Renewable Energy Certificates have not been made.

In addition to its Greenhouse Gas Emissions Inventory, Harvard launched its first ever University-wide Sustainability Impact Report online in 2012 at www.green.harvard.edu/report. The report:

- Provides a baseline for future reporting and benchmarking by collecting and displaying sustainability performance data across our University.
- Displays the breadth and depth of our community's commitment to sustainability in order to educate and hopefully inspire others inside and outside Harvard.
- Encourages an open and honest conversation about the challenges we face in implementing Harvard's sustainability goals so we can identify the solutions that will help us move forward.

APPLICATION OF SUSTAINABILITY PRINCIPLES IN THE MASTER PLAN

The implementation and application of the University's sustainability principles begin in the early stages of project planning. The process embeds life cycle costing, energy saving, and GHG Reduction planning into the University's mid- and long-range space and growth planning and decision-making. In addition, it provides the Office for Sustainability with estimates of growth and emissions due to construction or purchase of new buildings or more energy intensive use of existing space.

Beyond project-specific planning, and in recognition of the unique physical and functional attributes of distinct areas of the campuses, sustainability considerations are incorporated fully into master planning efforts. District level planning exercises implemented after Harvard's adoption of the Sustainability Principles have utilized a sustainability framework that includes energy and greenhouse gas emissions, water, waste, transportation, landscape and ecology, campus culture and human health, and reuse of existing infrastructure.

6.3 Water, Sewer, Stormwater

WATER AND WASTEWATER

Institutional Master Plan (Ten-Year Plan)

The following sections describe the impacts of the Ten-Year Plan on the water and wastewater infrastructure in the area. Within the IMP Area, the Ten-Year Plan includes demolition of existing buildings, including some older high water using and wastewater generating buildings such as Burden Hall and Kresge Hall. The reduction in water use and wastewater generation by demolishing these older less efficient buildings will help offset the water and wastewater requirements of the new, more efficient Harvard building space being proposed for the IMP's ten-year term. Also proposed is a significant amount of renovation that will also result in reduced water and wastewater requirements as older fixtures are replaced with new more efficient fixtures. It is estimated that the development described in this IMP will result in a net increase in average annual water demand of 146,900 gallons per day (gpd) and 133,600 gallons per day of wastewater generation. In *Chapter 4.0, Ten-Year Plan*, Figure 61 shows the proposed IMP area including proposed project locations and project data. In addition, there will be new green space associated with the IMP projects that will require irrigation to supplement rainfall. Harvard plans to incorporate the use of non-potable water whenever feasible to reduce the need for potable water for irrigation.

Harvard proposes to completely offset the wastewater generation from its Ten-Year Plan by removing infiltration and inflow (I/I) in the area at a ratio of 4 gallons I/I removed per gallon of wastewater generated. These water demand and wastewater generation estimates were developed using generation rates from the Massachusetts State Environmental Code (Title V), as shown in Table 27. Table 27 shows the reduction in water and wastewater flows due to the planned demolition of buildings to make way for the new building construction in the Ten-Year Plan, an estimate of the new building flow contribution/demands, and the net water and wastewater flows.

Note that renovation projects in the IMP including the Baker Hall and Soldiers Field Park are not included in Table 27 because wastewater generation and water demands are expected to be reduced when the renovation is completed. The preliminary water demand and wastewater generation estimates will be updated, along with additional information about the potential water and wastewater infrastructure extensions or relocation needs during the Article 80 Large Project Review process for each project.

Table 27: Ten-Year Plan Wastewater and Potable Water Estimates

Network/Land Use	Title V Flow Unit (sf) or (Bedroom)	Title V Flow Rate (GPD/1,000 sf) or (GPD/ Bedroom)	Wastewater Flow (GPD)	Water Demand (GPD)
Reduction of Existing Flow (Through Demolition)				
Kresge	67,000	75	5,025	5,528
Burden	29,000	75	2,175	2,393
175 North Harvard Street & Garages	50,000	75	3,750	4,125
Total Wastewater and Water Flow Reduction			**10,950**	**12,045**
New/Additional Flow				
Stadium Addition/Renovation[1]	50,000		0	0
HBS Chao Center (Kresge Replacement) (Dining, Offices, Classrooms)	90,000	75	6,750	7,425
Basketball Venue[2]	60,000	75	10,000	11,000
Mixed Use Facility				0
Residential (Assume 300 Units w/ 2 Bedrooms Each)	300,000	110	66,000	72,600
Retail	12,300	50	615	677
Childcare	10,000	75	750	825
Gateway Project				0
Administrative Offices	250,000	75	18,750	20,625
Retail	50,000	50	2,500	2,750
HBS Burden Replacement (Academic/ Classrooms)	92,000	75	6,900	7,590
HBS Faculty & Administrative Office	110,000	75	8,250	9,075
Hotel/Conference Center				0
Rooms	200	110	22,000	24,200
Meeting Space	26,500	75	1,988	2,186
Total Wastewater and Water Flow Added			**144,503**	**158,953**
Net New Wastewater Generation/Water Demand				
Total Wastewater and Water Flow Added			144,503	158,953
Total Wastewater and Water Flow Reduction			-10,950	-12,045
Total Increase in Flow			**133,553**	**146,908**

[1] Reduction of 7,000 seats = 21,000 GPD wastewater reduction; 46,300 sf of new office = 3,472 GPD addition; Expanded/Upgraded restrooms may increase flow; Therefore, assume ZERO flow increase
[2] 25 GPD/participant and 3 GPD/spectator wastewater - Assume 40 players and 3,000 seats = 10,000 GPD Water demand is 1.1 times wastewater flow.

Other Proposed Major Non-IMP Projects

Within or immediately adjacent to the IMP area are two major proposed projects that are not included in the Ten-Year Plan; the Science project (formerly the Harvard Life Science Complex) and the Barry's Corner Residential and Retail Commons. A discussion of the water demands and wastewater generation from these projects is included here as it will impact the same BWSC system serving the IMP area. Accordingly, the analysis of system capacity

below includes the cumulative impact of the Ten-Year Plan and the two major non-IMP projects described above. For these non-IMP projects, water demand and wastewater generation estimates were developed using generation rates from the Massachusetts State Environmental Code (Title V), as shown in Table 28 and Table 29.

Table 28: Science Project and Mixed Use Wastewater and Potable Water Estimates

Network/Land Use	Title V Flow Unit (sf) or (Bedroom)	Title V Flow Rate (GPD/1,000 sf) or (GPD/ Bedroom)	Wastewater Flow (GPD)	Water Demand (GPD)
Reduction of Existing Flow (Through Demolition)				
NEDL Building, 135 Western Avenue	34,000	75	2,550	2,805
Charlesview Apartments (213 Units - Assume 2 Bedrooms Each)	426	110	46,860	51,546
Total Wastewater and Water Flow Reduction			**49,410**	**54,351**
New/Additional Flow				
Science Project	50,000		0	0
Laboratory	700,000	65	45,500	50,050
Administrative Office	160,000	75	12,000	13,200
Retail	40,000	50	2,000	2,200
Total Wastewater and Water Flow Added			**59,500**	**65,450**
Net New Wastewater Generation/Water Demand				
Total Wastewater and Water Flow Added			59,500	65,450
Total Wastewater and Water Flow Reduction			-49,410	-54,351
Total Increase in Flow			**10,090**	**11,099**

Note: Water demand is 1.1 times wastewater flow.

Table 29: Barry's Corner Project Wastewater and Potable Water Estimates

Network/Land Use	Title V Flow Unit (sf) or (Bedroom)	Title V Flow Rate (GPD/1,000 sf) or (GPD/ Bedroom)	Wastewater Flow (GPD)	Water Demand (GPD)
Reduction of Existing Flow (Through Demolition)				
219 Western Avenue	94,000	75	7,050	7,755
Total Wastewater and Water Flow Reduction			**7,050**	**7,755**
New/Additional Flow				
Barry's Corner Mixed Use Housing (200-400 Units)				
325 Units (2 Bedrooms/Unit)	650	110	71,500	78,650
Retail	45,000	50	2,250	2,475
Total Wastewater and Water Flow Added			**73,750**	**81,125**
Net New Wastewater Generation/Water Demand				
Total Wastewater and Water Flow Added			73,750	81,125
Total Wastewater and Water Flow Reduction			-7,050	-7,755
Total Increase in Flow			**66,700**	**73,370**

Note: Water demand is 1.1 times wastewater flow.

Existing Water System

Within the IMP area, the BWSC water system directly serves existing buildings individually, except for Harvard Business School buildings which are served by a Harvard-owned piping network that receives its water supply through three BWSC master meters. Refer to Figure 128 that depicts the existing Harvard-owned, BWSC and MWRA water mains. The BWSC system receives water from the MWRA through several MWRA revenue meters. The closest MWRA meter (Meter 101) to the IMP area is located on Spurr Street between North Harvard Street and Western Avenue. Under average conditions, about 50 percent of the flow conveyed into Allston originates from MWRA Meter 101.

Recently, BWSC has improved the hydraulic capacity in the area by relining existing water mains on Bertram Street and replacing the old main on North Harvard Street, south of Western Avenue with a new 12-inch diameter main. In addition, Harvard recently replaced an old tuberculated 8-inch main on Travis Street with a new larger capacity 8-inch water main. This new main was turned over to BWSC upon completion. These improvements have resulted in a significant capacity increase in the area, especially in the vicinity of Barry's Corner.

Water System Evaluation

Table 29 The existing BWSC water system will need to meet the water demands of the Ten-Year Plan described in Table 27, as well as of the non-IMP projects described in Table 28, and Table 29. BWSC's hydraulic model of the water system was utilized to determine the net impact of all these project demands on pressures during peak hour demand and on fire protection. First, the model was run simulating existing conditions to establish a baseline of pressure and fire flow delivery. Next, the water demands of all of the proposed projects, including the IMP and non-IMP projects, were added to the model. These water demands were added to the model nodes (or junctions) on the BWSC network closest to the proposed building locations. Figure 129 shows the modeled locations of these new demands.

Table 30 shows the nine projects that add new water demand; seven of the nine projects are part of the Ten-Year Plan. Also shown in Table 30 are the "before" and "after" system pressures at peak hour demand at the nine locations and the difference between the two. The impact or difference in pressure resulting from the new demands is less than 1.5 psi (pounds per square inch) at peak hour. The system pressures during peak hour with the new demands are still in the upper 60's, which is more than sufficient per MassDEP criteria. MassDEP recommends a normal system working pressure of between 60 psi and 80 psi as design criteria for water systems.

Fire protection modeling results are shown in Table 31 at the nine project locations. It is a convention to report available fire flow at 20 psi residual pressure for comparison purposes. A pressure of 20 psi is the minimum the MassDEP allows. Existing fire protection coincident with maximum day system demands ranges from 5,800 gallons per minute (gpm) at 20 psi to 11,200 gpm at 20 psi at the various locations in the IMP area. As shown in Table 31, the added water demands from the nine new projects resulted in about 4 percent to 5 percent reduction in available fire flow at 20 psi. Simulated future fire flows, however, still range from 5,500 gpm at 20 psi to 10,800 gpm at 20 psi which is more than adequate. In general, municipal fire flow requirements do not exceed 3,500 gpm at 20 psi. In addition, the fire flow requirements of the proposed new and renovated buildings will typically be in the vicinity of 2500 gpm at 20 psi since the new buildings will be equipped with sprinkler systems. Accordingly, fire protection in the IMP area will be more than sufficient to meet the needs of new and existing buildings.



Figure 128: Proposed Conditions Water Plan

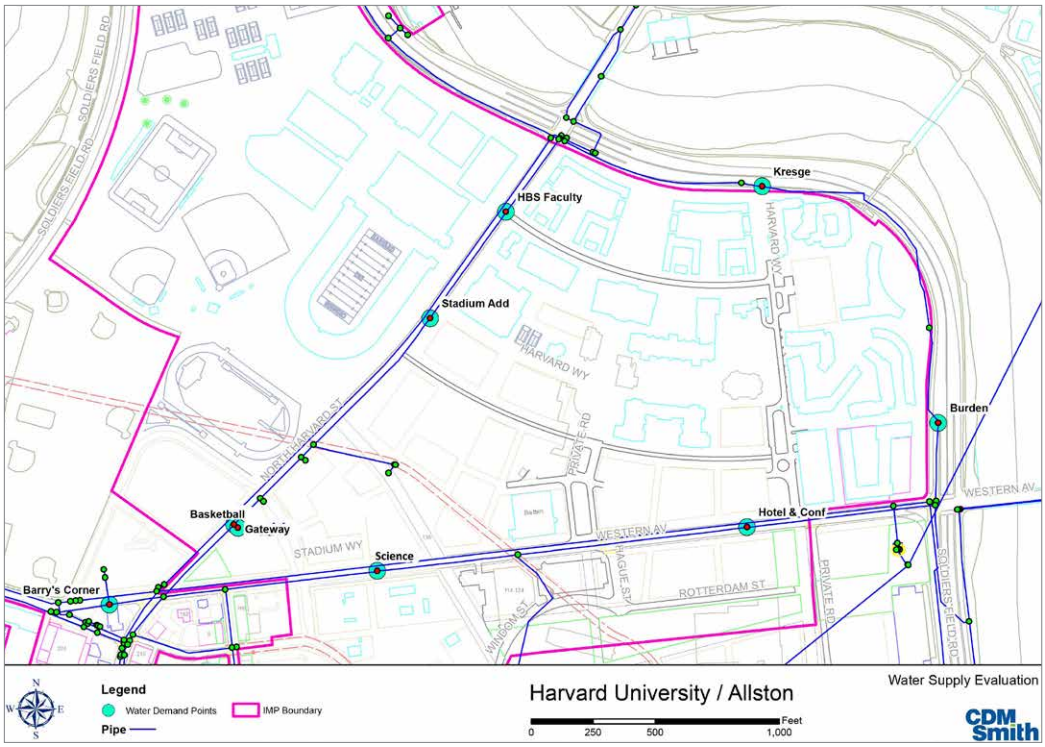


Figure 129: Water Supply Evaluation

Table 30: Peak Hour Hydraulic Model Evaluation

New IMP Project	Model Junction	New Avg. Daily Demand		Peak Demand (3) gpm Avg. x 3.0	Peak Hour Service Pressure psi			% Change
		GPD (1)	gpm (2)		Before(4)	After(5)	Difference	
HBS Burden Hall[1]	1898	5,197	3.5	10.4	67.6	66.2	1.4	2%
Mixed Use Facility and Basketball Venue[1]	2061	80,977	54.0	162.0	68.9	67.6	1.3	2%
Gateway Project	2065	23,375	15.6	46.8	68.9	67.6	1.3	2%
Barry's Corner[1]	2191	73,370	48.9	146.7	69.7	68.5	1.2	2%
Science Project[1]	30,228	11,099	7.4	22.2	68.6	67.2	1.3	2%
Hotel & Conference Center	30,230	26,386	17.6	52.8	68.4	67.0	1.4	2%
Stadium Addition	30,232	-	0.0	0.0	68.1	66.8	1.4	2%
HBS Faculty & Admin	30,234	9,075	6.1	18.2	68.1	66.7	1.4	2%
HBS Chao Center[1]	30,236	1,897	1.3	3.8	66.0	64.6	1.4	2%
Totals		**231,376**	**154.3**	**462.8**				

[1] *Includes demand reduction due to demolition of existing buildings*

Notes:

(1) GPD equals gallons per day
(2) gpm equals gallons per minute
(3) Assumes new water demand is used over 8 hour period for peaking factor of 3.0.
(4) "Before" denotes the baseline system performance before the new demands are added.
(5) "After" denotes the system performance after the new demands are added.

With respect to water infrastructure improvements required for the Ten-Year Plan, there are seven new projects that may use existing water service connections or may require new or relocated water service connections. Three of the projects, the Burden Hall replacement, the Kresge Hall replacement (Chao Center) and the Harvard Business School Faculty and Administration building are within the Harvard Business School and would be connected to the Harvard-owned water mains. The Harvard-owned water system has three metered connections to the BWSC system. New development along Western Avenue, including the new Gateway project and the Hotel/Conference Center project can be connected to and adequately served by the existing BWSC 12-inch water main in Western Avenue. The Stadium Addition/Renovation and the Mixed Use Facility and Basketball Venue can be connected to and adequately served by the existing BWSC 12-inch water main in North Harvard Street. Based on the hydraulic analyses discussed above, no BWSC or MWRA infrastructure improvements are required to support the Ten-Year Plan.

Table 31: Fire Flow Hydraulic Model Evaluation

				Available Fire Flow at 20 psi Residual Pressure			
	Model Junction	New Avg. Daily Demand		gpm			% Change
New IMP Project		GPD (1)	gpm (2)	Before (3)	After (4)	Difference	
HBS Burden Hall[1]	1898	5,197	3.5	6,210	5,898	311	5%
Mixed Use Facility and Basketball Venue[1]	2061	80,977	54.0	8,502	8,117	385	5%
Gateway Project	2065	23,375	15.6	8,148	7,770	378	5%
Barry's Corner[1]	2191	73,370	48.9	11,219	10,822	397	4%
Science Project[1]	30228	11,099	7.4	7,669	7,391	278	4%
Hotel & Conference Center	30230	26,386	17.6	6,377	6,124	253	4%
Stadium Addition	30232	-	0.0	6,475	6,188	288	4%
HBS Faculty & Admin	30234	9,075	6.1	6,167	5,883	284	5%
HBS Chao Center[1]	30236	1,897	1.3	5,806	5,519	287	5%
TOTALS		**231,376**	**154.3**				

[1] Includes demand reduction due to demolition of existing

Notes:

(1) GPD equals gallons per day
(2) gpm equals gallons per minute
(3) "Before" denotes the baseline system performance before the new demands are added.
(4) "After" denotes the system performance after the new demands are added.

Wastewater

The existing wastewater system is made up of pipes of various materials, size and age owned by the MWRA, the BWSC, or Harvard. Refer to Figure 130 that depicts the existing Harvard-owned, BWSC and MWRA sewer mains. As part of the previously approved Science project (aka, Health and Life Sciences Center) project, Harvard has constructed new sewer facilities in Western Avenue and Travis Street. These new sewers were subsequently turned over to BWSC. A new 12-in PVC sewer was constructed in Western Avenue near Travis Street. This sewer was connected to the new 18-in PVC sewer in Travis Street which discharges to the MWRA's Charles River Valley Sewer (CRVS). A portion of the 4.5'x5.12' brick CRVS was lined with cured-in-place pipe to strengthen it prior to the foundation work



Figure 130: Proposed Conditions Sewer Plan

being performed in the vicinity of the site and to improve its capacity. The CRVS is subject to surcharge during wet weather events and overflows to the MWRA's 7'x9.33' South Charles Relief Sewer (SCRS), which runs nearly parallel to the CRVS through this area. Based on discussion with BWSC, the BWSC sewers in Allston are separate from the stormwater system and do not accept stormwater flows.

As discussed, both the BWSC and MWRA sewers have adequate wastewater capacity in dry weather and even during most wet weather events. However, during large wet weather events, combined sewer overflows can occur in the MWRA system downstream of the IMP area.

Wastewater System Evaluation

Similar to the water system analysis, the wastewater collection system could be impacted by the wastewater generated by the Ten-Year Plan, described in Table 27, as well as by the non-IMP projects described in Table 28 and Table 29. Under dry weather conditions and most wet weather conditions, the BWSC and MWRA systems will have sufficient capacity to convey the flows from the nine proposed projects to the Ward Street headworks and eventually to the Deer Island Wastewater Treatment Facility. However, under more extreme wet weather conditions when combined sewer overflows (CSOs) occur in the MWRA system, the contribution of any new wastewater could add to the volume of overflow. This potential condition was anticipated by BWSC and the MassDEP. To mitigate the possible negative impact of new wastewater generation, both agencies require that Harvard offset the new wastewater generation by removing 4 gallons of infiltration/inflow (I/I) from the Allston system for every gallon of new wastewater generated (4:1 offset). As such, the overall impact of the Ten-Year Plan and the non-IMP projects will actually be a reduction in wastewater contributed to the wastewater system as compared to existing conditions.

With respect to wastewater infrastructure improvements required for the Ten-Year Plan, there are seven new projects that may use existing sewer service connections or may require new or relocated sewer service connections. Three of the projects, the Burden Hall replacement, the Kresge Hall replacement and the Harvard Business School Faculty and Administration building are within the Harvard Business School and would be connected to the Harvard-owned sewer mains. The Harvard-owned sewer system discharges to the BWSC system. New development of along Western Avenue, west of the SCRS toward the North Harvard Street intersection, including the new Gateway project, can be adequately served by the new 12-inch sewer main (installed for BWSC by Harvard) that connects to the CRVS via Travis Street. The Stadium Addition/Renovation and the Mixed Use Facility and Basketball Venue projects would connect to the existing 15-inch to 24-inch diameter BWSC sewer mains in North Harvard Street, that in turn connect to the CRVS where it crosses North Harvard Street, south of Western Ave.

Development adjacent to Western Ave, east of where the SCRS crosses Western Avenue near address No. 125, including the Hotel/Conference Center, can be adequately served by the existing 24-in BWSC sewer in Western Ave that discharges directly to the SCRS. These wastewater facilities are capable of accommodating the new flows generated by the projects within the Ten-Year Plan and with the proposed 4:1 I/I reduction in the project area, should not negatively impact CSOs in the MWRA system.

STORMWATER

The development of Harvard's campus in Allston is a unique opportunity to improve how stormwater is addressed. Given that so much of the study area consists of previously-developed impervious surfaces, thoughtful development of projects within the IMP Area is anticipated to provide environmental benefit in the area.

The current IMP Area footprint includes varying types of surface areas, ranging from open athletic fields to highly developed, predominantly industrial and commercial acreage. The existing infrastructure was built as individual parcels were developed. Today, the opportunity exists to reassess and implement stormwater solutions, using measures that will lead to such benefits as improved water quality of stormwater runoff to the river, reducing the volume of direct stormwater discharge to the river, and increasing water conservation by rainwater harvesting. These benefits are planned in parallel with improving surface drainage by reconfiguring drainage basins and rerouting piping alignments to more efficiently manage stormwater.

The total area within the IMP Project Area boundary is approximately 178 acres, approximately half of which consists of impervious surfaces (buildings and paved areas) under existing conditions. The proposed developed IMP Area for the new Allston campus will result in a net increase in green areas of approximately 0.6 acres compared to existing conditions under the Ten-Year Plan and further increases the green areas are planned in the long-term. (This number is conservative in that it looks at just the IMP project sites. The actual increase in green areas will be larger as they will include areas that are not part of specific projects but these areas are not yet defined.) As part of the IMP, Harvard will continue to investigate opportunities for installing green stormwater management and water quality treatment measures within the IMP Area. The greening of the project area in concert with proposed stormwater management will also provide significant reductions in peak rates of runoff to BWSC drainage systems in Allston public ways throughout the campus.

Stormwater management controls will be established in compliance with BWSC standards and the Department of Environmental Protection's (DEP's) Stormwater Management Standards. They will also be designed to reduce phosphorus and bacteria loads to the Charles River, in accordance with Boston's anticipated EPA National Pollutant Discharge Elimination System (NPDES) permit.

BWSC Standards

Any proposed connections to the existing BWSC storm drainage system will comply with BWSC Site Plan Application regulations. Site plans will show in detail how drainage from building roofs and from other impervious areas will be managed. The development of the Ten-Year Plan is expected to improve runoff water quality through treatment and infiltration. BWSC now requires treatment of one inch of runoff from the proposed impervious area of a development to meet EPA NPDES Permit requirements, described below. Project designs will include methods for retaining this volume of stormwater on project sites, by directing stormwater to water features, porous pavements and other infiltration facilities, and landscaped areas, including vegetated bioretention areas and swales. The flows reaching the stormwater management facilities will typically be pre-treated by routing through grassed swales, deep-sump hooded catch basins and/or particle separators that, combined with the stormwater management facilities, will achieve the goal of 80 percent or greater total suspended solids (TSS) removal.

The capacity of BWSC storm drainage systems serving the Allston campus and individual project sites are expected to be adequate to meet future project demands due to the planned reduction in impervious areas and the installation of green infrastructure. Over the past several years, Harvard has constructed new drainage facilities in the area, including new 12- to 36-inch drains in Western Avenue, a 72-inch drain in the roadways around the perimeter of the Science project, and stormwater management facilities in Ray Mellone Park, including a grassed channel and leaching manhole.

State Stormwater Standards

The proposed drainage facilities will be designed in accordance with the DEP's Stormwater Management Standards to the maximum extent practicable. If impervious areas are not increased, as is the case with Harvard's IMP and two non-IMP projects, the project is a redevelopment project per the Massachusetts Stormwater regulations. For redevelopment, stormwater management standards addressing peak flow attenuation, groundwater recharge, and TSS removal must be met only to the maximum extent practicable; the remaining standards must be fully met. To meet the Massachusetts regulations, peak flow attenuation will not be required if there will be no increase in impervious area. Infiltration and stormwater management systems will be required to provide groundwater recharge and TSS removal.

EPA NPDES Permit Requirements

Since the University's runoff is tributary to the Charles River, it will be subject to Total Maximum Daily Load (TMDL) requirements for phosphorus and bacteria under Boston's anticipated NPDES permit. BWSC expects that, in the long run, the City will be required to reduce phosphorous to the Charles River by 65 percent. This reduction can be met by treating the inch of runoff from impervious areas of the developed sites discussed above, with stormwater management controls such as bioretention, porous pavements, and other infiltration devices. The University's stormwater management measures will be designed to reduce phosphorous in compliance with BWSC guidelines.

Drainage Analysis

Figure 131 presents IMP project drainage areas, excluding the potential Construction Support Area to the south. Table 32 compares the drainage characteristics of the seven Ten-Year Plan new construction projects under existing and proposed conditions, including paved areas, roof areas and pervious areas/green space. The total drainage area of the seven projects is 31.7 acres. As shown in the table, the Ten-Year Plan development will result in a net increase of 0.6 acres of pervious area/green space. The last two columns show the water quality volume that will be treated to meet the BWSC one-inch requirement, and the approximate area that would be reserved for one-foot deep bioretention areas/rain gardens to treat and infiltrate this volume of runoff. The total water quality volume for the Ten-Year Plan development is 1.5 acre-feet, requiring approximately 1.5 acres of bioretention areas/rain gardens.



Figure 131: Proposed Conditions Drainage Areas

The computer program HydroCAD, Version 10.00, was used to determine peak rates of runoff and total runoff volumes from the Ten-Year Plan project areas during 2-,10-, 25- and 100-year, 24-hour rainfall events. The HydroCAD program is based on the Natural Resources Conservation Service's (formerly the Soil Conservation Service) runoff curve number method.

GIS mapping was used to determine the land use, hydrologic soil group (HSG), and impervious area for each drainage area. Runoff velocities for estimating time of concentration (Tc) are based on the "SCS National Engineering Handbook, Figure 15.2 – Velocities for Upland Method of estimating Tc."

Precipitation data for standard storms used in the models were taken from Cornell University Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada (September 1993). The estimated precipitation depths during the 2-, 10-, 25-, and 100-year 24-hour storms are 3.25, 4.80, 5.93, and 8.47-inches, respectively. Compared to rainfall depths in Technical Paper No. 40 (Rainfall Frequency Atlas of the United States), the rainfall depths from the Cornell University study are higher for storms greater than a 10-year 24-hour storm, and provide a more conservative evaluation and design of existing and proposed stormwater management facilities, as well as a factor of safety for potential climate change.

Table 32: Summary of Water Quality Treatment Volumes

2013 Existing Conditions						Proposed IMP Area									
Existing Drainage Area ID	Total Drainage Area (acres)	Existing Paved Area (acres)	Roof Area (acres)	Pervious Area (acres)	Proposed Drainage Area ID	Total Drainage Area (acres)	Proposed Paved Area (acres)	Proposed New Roof Area (acres)	Roof Area to be Demolished (acres)	Net Change in Roof Area (acres)	Total Roof Area (acres)	Proposed Pervious Area/ Greenspace (acres)	Water Quality Volume with Pre-Treatment (ac-ft)	Total Water Quality Volume (ac-ft)	Stormwater Control Areas** (acres)
E-06a	10.9	5.3	0.0	5.6	P-06a Harvard Stadium Addition/ Renovation	10.9	5.1	0.2	0.0	0.2	0.2	5.6	0.43	0.44	0.44
E-08a	3.9	0.8	1.2	2.0	P-08a Mixed Use and Basketball	3.9	1.1	2.5	1.2	1.4	2.5	0.3	0.09	0.30	0.30
E-11	6.6	4.9	1.5	0.2	P-11 Gateway Project	6.6	2.9	1.1	1.5	-0.4	1.2	2.6	0.24	0.34	0.34
E-12b	4.5	0.4	0.0	4.1	P-12b HBS Faculty and Admin Offices	4.5	1.0	0.6		0.6	0.6	2.9	0.08	0.14	0.14
E-16a	2.2	0.5	0.4	1.3	P-16a Chao Center (Kresge Replacement)	2.2	0.4	0.5	0.4	0.1	0.5	1.3	0.03	0.08	0.08
E-19a	1.2	1.2	0.0	0.0	P-19a Burden Replacement	1.2	0.3	0.7		0.7	0.7	0.2	0.03	0.08	0.08
E-29	2.4	2.4	0.0	0.0	P-29 Hotel and Conference Center	2.4	1.0	0.5	0.0	0.5	0.5	0.9	0.08	0.13	0.13
TOTALS	**31.7**	**15.5**	**3.1**	**13.2**	**TOTALS**	**31.7**	**11.8**	**6.1**	**3.0**	**3.1**	**6.2**	**13.8**	**0.98**	**1.50**	**1.50**
							15.5				3.1	13.2			
						Net change:	-3.7	6.1	3.0	3.1	3.1	0.6			

Note: BWSC requirement is 1 inch times impervious area

Table 33: Existing and Proposed Peak Rates and Volumes of Runoff

Drainage Area	24-Hour Storm Event							
	2-yr		10-Yr		25-Yr		100-Yr	
	Peak Rate of Runoff (cfs)	Volume of Runoff (af)	Peak Rate of Runoff (cfs)	Volume of Runoff (af)	Peak Rate of Runoff (cfs)	Volume of Runoff (af)	Peak Rate of Runoff (cfs)	Volume of Runoff (af)
Existing E-06a	15.9	1.5	28.9	2.7	38.6	3.7	60.6	5.8
Proposed P-06a Harvard Stadium Addition/Renovation	15.7	1.2	28.7	2.4	38.3	3.3	60.4	5.5
Existing E-08a	6.5	0.6	11.3	1.1	14.7	1.4	22.6	2.2
Proposed P-08a Mixed Use Facility and Basketball	8.9	0.7	13.6	1.2	17.0	1.5	24.5	2.3
Existing E-11	15.7	1.6	23.5	2.4	29.1	3.1	41.8	4.5
Proposed P-11 Gateway Project	12.2	0.9	20.3	1.7	26.2	2.3	39.4	3.6
Existing E-12b	4.6	0.4	9.4	0.9	13.3	1.2	22.2	2.1
Proposed P-12b HBS Faculty and Admin Offices	6.4	0.4	11.7	0.8	15.7	1.2	24.8	2.1
Existing E-16a	3.9	0.3	6.9	0.6	9.2	0.8	14.3	1.2
Proposed P-16a Chao Center (Kresge Replacement)	3.3	0.3	6.0	0.5	7.9	0.7	12.4	1.3
Existing E-19a	6.7	0.6	9.9	0.9	12.2	1.1	17.5	1.6
Proposed P-19a Burden Replacement	3.0	0.2	4.7	0.3	5.9	0.5	8.6	0.7
Existing E-29	6.7	0.6	9.9	0.9	12.2	1.1	17.5	1.6
Proposed P-29 Hotel and Conference Center	5.1	0.3	8.5	0.6	11.0	0.8	16.5	1.3
TOTAL EXISTING TO CHARLES RIVER	**57.8**	**5.7**	**96.7**	**9.5**	**126.0**	**12.4**	**191.2**	**19.1**
TOTAL PROPOSED TO CHARLES RIVER	**46.9**	**3.4**	**79.7**	**6.4**	**104.0**	**8.7**	**158.3**	**14.1**

Notes:
(1) cfs: cubic feet per second
(2) af: acre-feet

Table 33 shows the modelled peak rates of runoff and total runoff volumes for each of the seven projects under existing and proposed conditions, including proposed rain gardens/ bioretention areas. As shown in the table, the proposed Ten-Year Plan development will reduce peak rates of runoff approximately 18 percent, and will reduce runoff volumes by 30 to 40 percent.

Pipe Capacity Analysis

The BWSC drain model (an EPA Stormwater Management Model, or SWMM model) was used to assess the capacity of BWSC collector drains in public roadways in the IMP project area. The drain model has been used for numerous studies throughout Boston, most recently for a comprehensive water quality modeling effort that evaluated phosphorus and bacteria loads to the Charles River, Boston Harbor, and the Neponset River. For the Harvard University drainage capacity analysis, the model was expanded to include long-term characteristics of the proposed Allston campus.

In addition, as part of the previously proposed Science Complex project in 2007, Harvard had discussed a future phase of work whereby the newly constructed 72-inch drain line around the perimeter of the Science Complex site would be extended down Western Avenue to a new outfall to be constructed in the Charles River. This drain line was contemplated in connection with and because of Harvard's then-proposed long-term (50 year) master plan which at that time proposed nine to ten million square feet of development over a fifty year period. As requested by the BWSC in its comment letter on the IMPNF, this drain model was used to evaluate the effectiveness of such a future 72-inch drain line in relationship to the currently proposed set of IMP projects.

The BWSC drain model revealed the following:

- Under proposed conditions, the IMP projects will reduce peak rates and volumes of runoff.
- Under existing and proposed conditions, a new 72-inch drain through the campus to the Charles River will not reduce flooding in the upstream neighborhoods due to existing capacity issues within the upstream neighborhoods and is not required in connection with Harvard's projects. Therefore there is no likely need for this drainline within the IMP ten-year term.
- If BWSC were to enlarge the upstream drain pipes, a 72-inch drain (or other large-size drain) would be needed to serve upstream neighborhoods and future campus development beyond the Ten-Year Plan in the long-term to control peak rates of runoff from a 25-year 24-hour storm. Harvard will continue to work with the BWSC to evaluate the drainage needs of this area over the term of the IMP. Harvard is planning and sizing the Greenway to accommodate a variety of public and private infrastructure, including preserving a corridor for the construction of a drain line if and when it is needed.
- The existing 36-to 42-inch drainage system through the Harvard Business School (referred to as the end of the "Shepard Brook" drain in BWSC comment letters) has sufficient capacity to control peak rates of runoff from the Business School parcels north of Western Avenue during a 10-year 24-hour storm under existing and proposed conditions.
- The IMP projects will provide a net increase of 0.7 acres of pervious/green area, which will reduce peak rates and volumes of runoff to the BWSC's North Harvard Street drain.
- In the short term under the Ten-Year-Plan, development of a Hotel and Conference Center will replace nearly an acre of pavement with improved green areas and will reduce peak rates and volumes of runoff to the BWSC's Cambridge Street system.

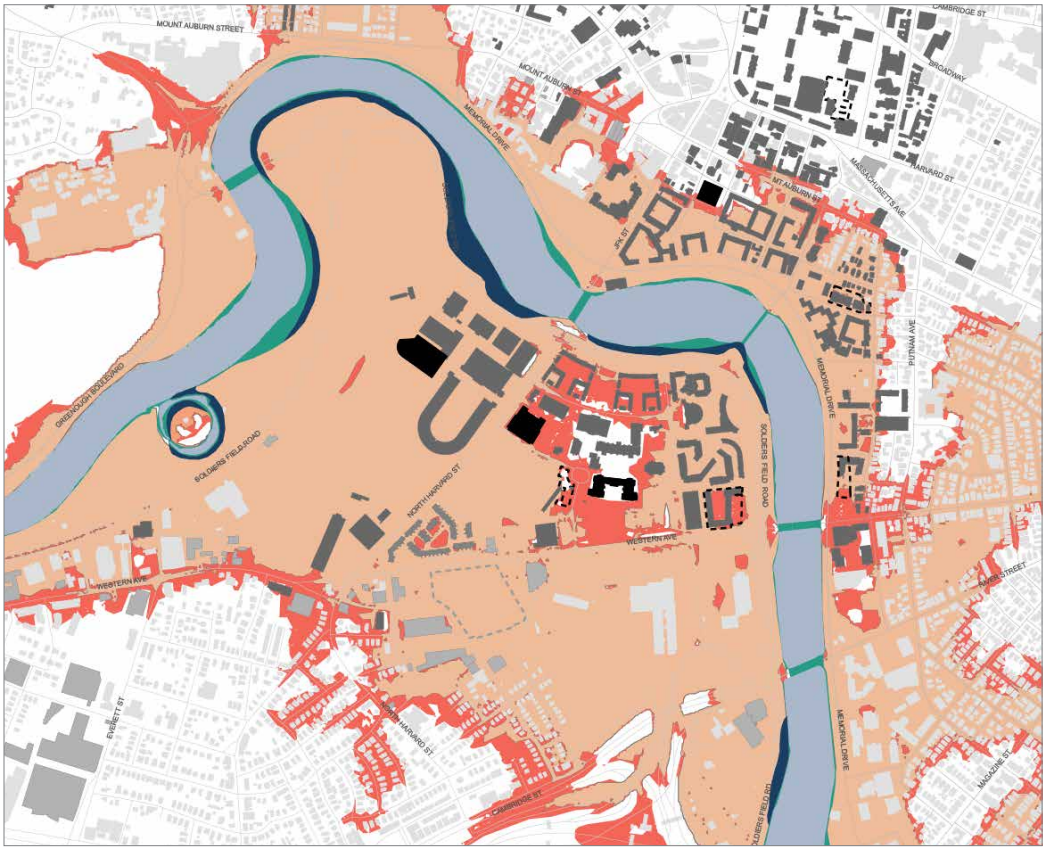
6.4 Climate Change Adaptation

Harvard University proposes to adopt climate change adaptation procedural guidelines and climate change resilience strategies for the development of the Allston campus. These adaptation procedural guidelines are the implementation process for the climate change resilience policies. In implementing these guidelines and policies, Harvard plans to conduct a detailed Allston campus-wide vulnerability assessment and adaptation plan, and ensure that all new development is resilient to the impacts of climate change.

EXISTING CONDITIONS AT THE ALLSTON CAMPUS

In the past, Harvard University has considered historic conditions when planning new buildings and facilities. In the face of climate change, future conditions must also be considered. Buildings and facilities need to be designed to a different standard to withstand the impacts of climate change.

The Allston campus is located on the Charles River. As shown in Figure 132, some areas lay within the 100-year and 500-year floodplain and the current buildings and facilities would not be greatly impacted by these levels of floods. However, some of the athletic facilities and parts of the Harvard Business School in Allston are already vulnerable to storm surge inundation from hurricanes. A small portion of the Allston campus is vulnerable to flooding from a Category 1 hurricane and this area expands as the category of hurricane increases. Harvard expects these impacts to become more frequent as a result of climate change, and that new impacts will arise.



Emergency Shelters
Harvard Institutional Buildings
Harvard Other Buildings
Harvard Underground
Water Bodies
100-Year Flood
500-Year Flood
Category 4 Hurricane
Category 3 Hurricane
Category 2 Hurricane
Category 1 Hurricane

A 100-year flood is a flood event that has a 1% chance of occurring during any given year. A 500-year flood is a flood event that has a 0.2% chance of occurring during any given year.

National Flood Hazard Layer: Federal Emergency Management Agency (FEMA)

Hurricane Source Data: US Army Corps of Engineers

Figure 132: Floodplains and Hurricane Surge Inundation

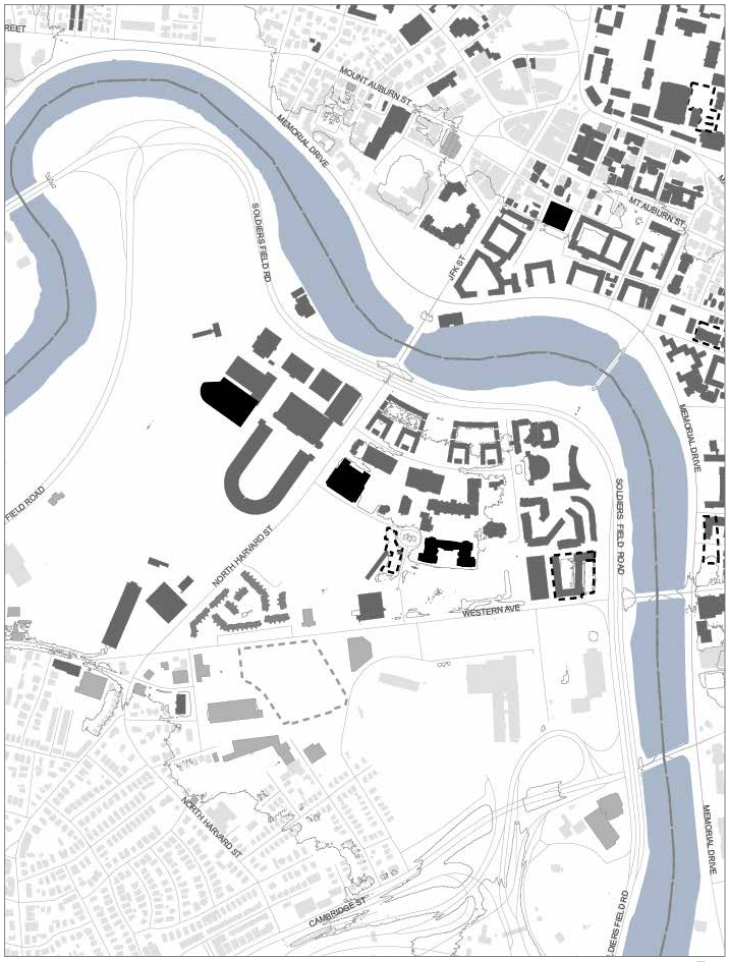


Figure 133: Existing Conditions

The following figures are based on analysis conducted and presented by The Boston Harbor Association (TBHA) in the 2013 report, *Preparing for the Rising Tide*. Figure 133 depicts the existing flood conditions in the area. Figure 134 and Figure 135 respectively depict two scenarios of coastal flooding that could result from a combination of factors (sea level rise, storm surge, astronomical high tides, etc.). Figure 134 depicts a 50 year scenario with a 5½ foot Coastal Flood. As shown in the figure, the analysis assumes that the conditions within the Charles River Basin are managed by the Charles River Dam. Figure 135 depicts a 100 year scenario with a 7½ foot Coastal Flood. As shown on this figure, the flood elevation of 7½ feet exceeds the top of the Charles River Dam and would result in widespread flooding within the Charles River Basin.

- Emergency Shelters
- Harvard Institutional Buildings
- Harvard Other Buildings
- Harvard Underground
- Water Bodies
- City Boundary
- 5.5' above Mean Higher High Water



Figure 134: 50 Year Scenario - Coastal Flood Plus 5.5 feet (Charles River Dam in Place)

Methodology for Figure 133, Figure 134, and Figure 135: Preparing for the Rising Tide Report, The Boston Harbor Association 2013

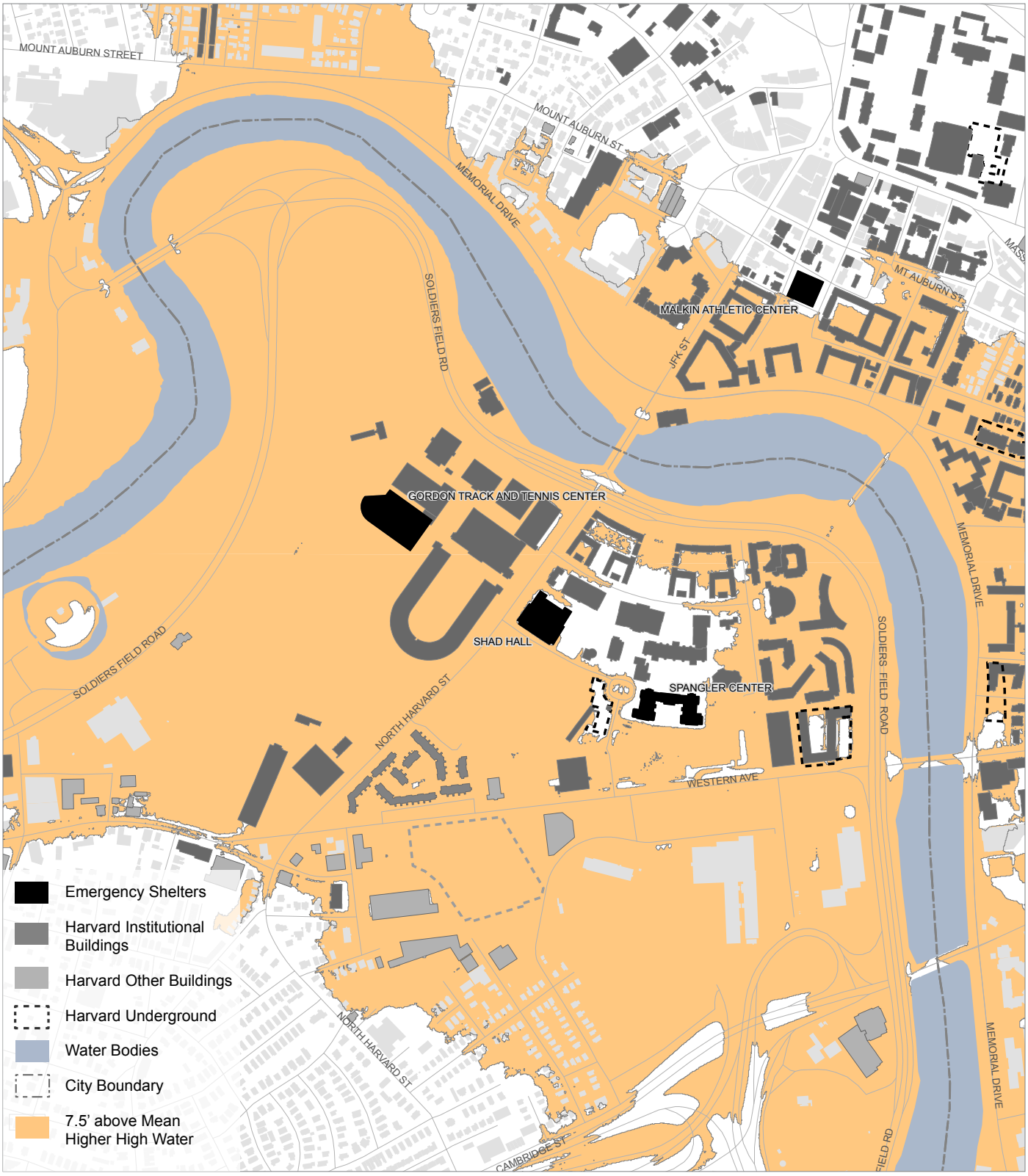


Figure 135: 100 Year Scenario - Coastal Flood Plus 7.5 feet (Charles River Dam Breached)

THE MASSACHUSETTS CLIMATE CHANGE ADAPTATION REPORT

Harvard reviewed the Massachusetts Climate Change Adaptation Report to assess the possible climate change impacts to the Allston campus. The Massachusetts Global Warming Solutions Act of 2008 required the state to investigate the likely climate change impacts in Massachusetts. In September 2011, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) and the Climate Change Adaptation Advisory Committee published the Massachusetts Climate Change Adaptation Report.

The Report identifies and summarizes the likely changes to the climate, climate impacts, vulnerabilities, and possible adaptation measures in Massachusetts. The Report uses the most recent information and climate predictions available, including from the International Panel on Climate Change (IPCC) and other peer-reviewed scientific climate change projections. The Boston Harbor Association's recent report, *Preparing for the Rising Tide*, also uses key climate stressors from the Massachusetts report in their analysis.

The Report refers to climate change impacts in terms of a low range and high range; these represent the lowest low emissions scenario and the highest high emissions scenario from the IPCC Fourth Assessment Report (AR4).[1] Climate change impacts are discussed in terms of current conditions (average of the years 1961-1990), future mid-century conditions (average of 2035-2064, often referred to as conditions in 2050), and end of century conditions (2100). Table 34 is from the Report, and shows the expected changes to Massachusetts' climate.

Each of these expected climate changes in Massachusetts have multiple consequences or impacts that Harvard will take into consideration to make projects more resilient to these effects – essentially preparing for and adapting to the changing climate.

Table 34: Changes in Massachusetts' Climate: Current, Future Mid-Century, & End of Century Conditions

Parameter	Current Conditions (1961–1990)	Predicted Range of Change by 2050	Predicted Range of Change by 2100
Annual temperature[1] (°C/°F)	8/46	2 to 3 / 4 to 5	3 to 5/5 to 10**
Winter temperature[1] (°C/°F)	-5/23	1 to 3 / 2 to 5	2 to 5 / 4 to 10**
Summer temperature[1] (°C/°F)	20/68	2 to 3 / 4 to 5	2 to 6 / 4 to 10**
Over 90 °F (32.2 °C) temperature[2] (days/yr)	5 to 20	—	30 to 60
Over 100 °F (37.7° C) temperature[2] (days/yr)	0 to 2	—	3 to 28
Ocean pH[3,4]	7 to 8	—	-0.1 to -0.3*
Annual sea surface temperature (°C/°F)	12/53[5]	2/3 (in 2050)[5]	4/8
Annual precipitation[1]	103 cm/41 in.	5% to 8%	7% to 14%**
Winter precipitation[1]	21 cm/8 in.	6% to 16%	12% to 30%**
Summer precipitation[1]	28 cm/11 in.	-1% to –3%	-1% to 0%**
Streamflow—timing of spring peak flow[1] (number of calendar days following January 1)	85	-5 to -8	-11 to -13**
Droughts lasting 1–3 months[1] (#/30 yrs)	13	5 to 7	3 to 10**
Snow days (number of days/month)[1]	5	-2	-2 to –4**
Length of growing season[1] (days/year)	184	12 to 27	29 to 43

1 The lowest low emissions scenario is referred to as "B1" which predicts that carbon dioxide concentrations in the atmosphere will be 550 ppm or above. The highest high emissions scenario, "A1F1", predicts that carbon dioxide concentrations in the atmosphere will be 970 ppm.

CLIMATE CHANGE AND IMPACTS IN ALLSTON

For Harvard's Allston campus, the most impactful climate changes will be the changes in air and sea surface temperature, precipitation, and sea level rise. It is reasonable to assume that the areas which are currently at risk for flooding and hurricane surge in Allston today, will continue to be of concern in the future. The impacts from each of these climate changes that are of particular importance for the development of the Allston campus are outlined below, however they are not inclusive of all possible climate change consequences.

- *Ambient Air Temperature*: Increases in ambient temperature will result in more frequent days above 90˚F and 100˚F. The Report predicts 30-60 days over 90˚F by 2100 (up from 12 under current conditions), and between 3-28 days above 100˚F by 2100, depending on the emissions scenario. There will also be longer durations of heat waves. These conditions will place a high demand on the electric grid, risking more frequent power outages. There are also air quality implications leading to health concerns of the occupants of the buildings. These conditions may be worse in urban areas, because of the heat-absorbing pavement and buildings.

- *Sea Surface Temperature*: Increases in sea surface temperature may increase the frequency and intensity of severe ocean storms, which could cause flooding events on the Allston campus.

- *Sea Level Rise:* Sea level rise is caused by local coastal subsidence, plus the expansion of water with increased temperatures and the melting of land ice in places such as Greenland and Antarctica. Of concern to the Allston campus are the impacts from sea level rise, coupled with waves from an on-shore storm occurring at high tide (storm surge). The Allston campus is behind the Charles River Dam, owned by the Massachusetts Department of Conservation and Recreation (DCR). However, DCR has yet to study the effectiveness of the dam in a severe storm event, to take into account sea level rise, and more intense storms. If the dam was overtopped or not effective, there is a possibility of flooding in the Allston campus.

- *Precipitation*: There are expected changes in precipitation patterns in Massachusetts that will affect the Allston campus. There will be an increase in overall precipitation. However, it is expected that the precipitation will fall more frequently in the winter and less so in the summer – leading to the extremes of both flooding and droughts. Winter precipitation may increase as much as 30 percent under the high emissions scenario, but due to the changes in air temperatures, it may fall more frequently in the form of rain and ice rather than snow. Ice storms have different implications for building safety and power reliability than snow and rain storms. Extreme precipitation events (those with greater than 2 inches of rainfall) are predicted to increase in frequency. The Allston campus is expected to experience a 100-year flood every two or three years by 2050, and every year to two years by 2100.

For the Allston campus to be resilient to climate change, Harvard University will plan for the key impacts outlined above – especially flooding events, power loss, and extreme heat.

BRA CLIMATE CHANGE PREPAREDNESS QUESTIONNAIRE

In April 2013, the BRA released a Climate Change Preparedness Questionnaire. Harvard University understands that all development projects subject to Article 80 (including IMP modifications and updates) must complete the Questionnaire regarding project specific strategies and actions to make the projects more resilient to the effects of climate change.

The BRA's priority in requiring climate change adaptation as a component under Article 80 is to ensure that institutions and developers make themselves aware of climate risks and take steps to safeguard existing and future assets. In particular, the BRA is interested in features that incorporate climate change mitigation and adaptation together. The topics addressed in the Questionnaire include:

- Planning for higher temperatures and heat waves.
- Preparing for sea-level rise and storms.
- Flood proofing buildings.
- Building resilience and adaptability.
- Energy demand, including active and passive strategies.
- Green building design components.

These topics closely align with the most likely climate change impacts expected for the Allston campus.

CLIMATE CHANGE ADAPTATION PROCEDURAL GUIDELINES

The climate change adaptation procedural guidelines described below will serve as a checklist of the climate change related items to be addressed as each of the nine projects in this IMP move through the planning and development stages. They are specific actions that will be undertaken to help the projects incorporate the anticipated climate impacts and vulnerabilities into the design, so the resulting project is more climate resilient and adaptive.

The United States Agency for International Development (USAID) created guidelines to incorporate climate change into project development. Harvard University will use this procedure to ensure that the climate change vulnerabilities are assessed for each of the nine projects in this IMP and that appropriate adaptation measures are implemented. These steps in the procedure are summarized below.

1. *Vulnerability Screening*: A vulnerability screening assesses the potential climate change impacts to a project. If climate change could compromise a project, it should be taken into account. This step is directly in line with the BRA's priority to ensure that institutions and developers make themselves aware of climate risks and take steps to safeguard existing and future assets.

2. *Identify Adaptations*: Based on the expected climate change impacts, identify how to make a project resilient. The climate change resilience strategies outlined in the next section inform this step, to help identify the type of adaptation measures, based on Harvard University's priorities.

3. *Conduct Analysis:* Conduct an analysis to determine how effective the identified adaptation measures will be to make the project climate resilient. Cost and feasibility of a project should be assessed.

4. *Select Course of Action:* A course of action should be determined for the project; including determining which adaptation measures are appropriate, based on the analysis.

5. *Implement Adaptations*: Adaptation measures should be incorporated into the design, construction, and operations of the projects.

6. *Evaluate Adaptations*: The adaptation measure should be assessed based on their effectiveness in making the project more climate resilient and the cost.

The flow chart below explains each of these steps in more detail.

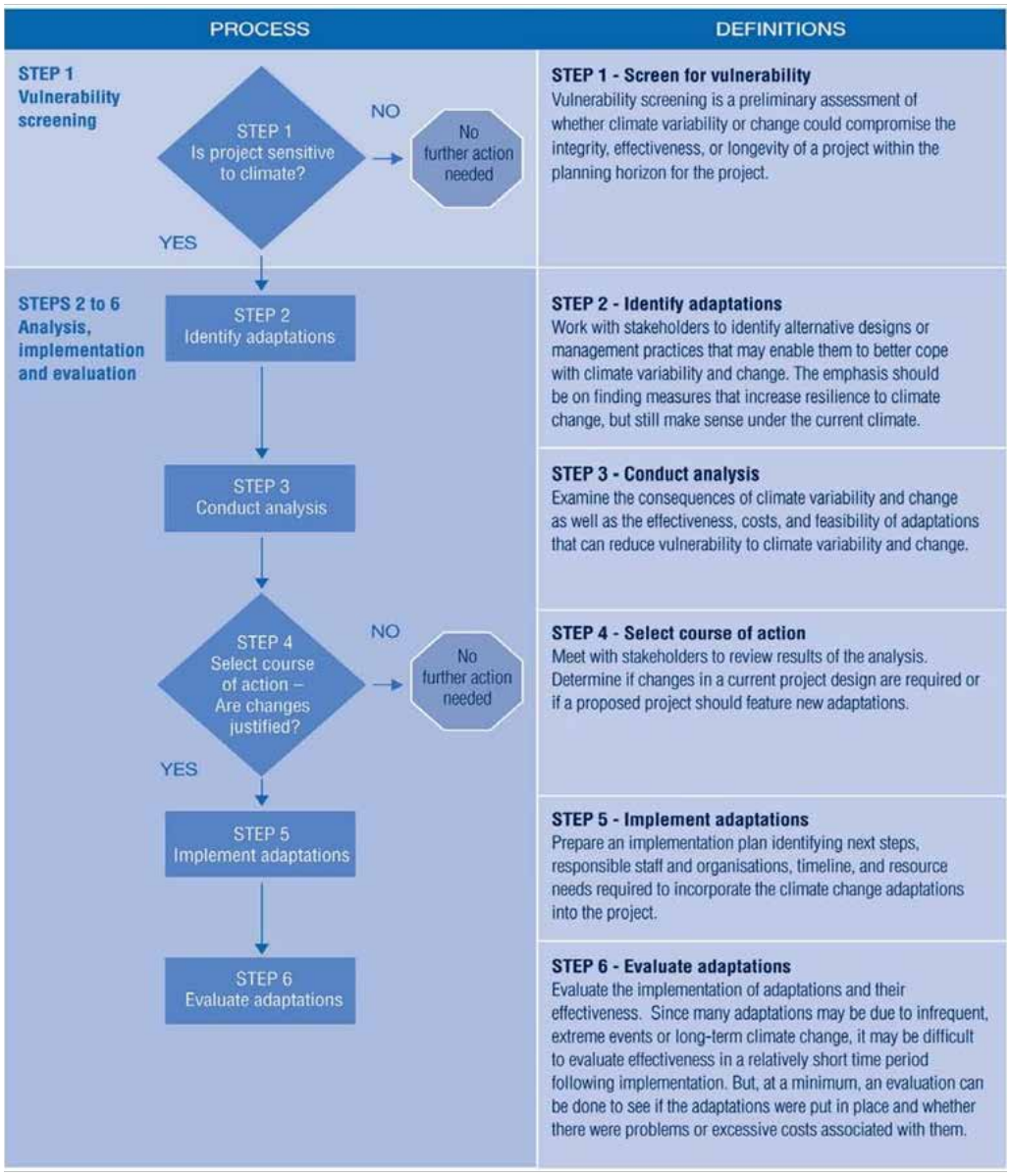


Figure 136: USAID's Process for Incorporating Climate Change into Project Development

Source: Organisation for Economic Co-operation and Development. 2009. Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance.

CLIMATE CHANGE RESILIENCE POLICIES

Infrastructure is generally designed based on historic weather patterns. The key to making the Allston campus resilient is to design an infrastructure plan based on the expected climate change impacts. It will be important to keep system redundancies in mind, design for synergies, and for extremes.

This IMP addresses climate change adaptation by providing a detailed framework of climate change resilience strategies and adaptation measures that each project on the Allston campus will follow, to ensure the buildings remain sound, that all damage from climate impacts are minor and easily repairable, and that the occupants remain safe. The planning and development guidelines which follow are suggested adaptation measures that will be evaluated by Harvard as projects move forward in early planning and in the design process. They inform the climate change adaptation guidelines from the previous section. Harvard University will evaluate the appropriateness and feasibility of these climate change resilience policies in the design of each of the projects in this IMP.

Table 35: Climate Change Resilience Policies

Climate change resilience addressing the change in climate related to:	Ambient Air Temperature	Increased Storm Severity	Sea Level Rise, Storm Surge	Precipitation, Local Flooding
Design stormwater management plans for extreme precipitation events; consider Adaptive Management Techniques		●	●	●
Build infrastructure to withstand and recover from severe storm impacts, included extended flooding events		●	●	●
Diversify the energy supply to the buildings and incorporate redundant energy systems	●	●	●	●
Incorporate innovative renewable energy options to the extent feasible, to hedge against grid power outages	●	●	●	●
Create a microgrid to generate, distribute and regulate within the Allston campus	●	●	●	●
Locate mechanical and electrical installations on the roof, with mechanisms to refuel in the case of a power outage	●	●	●	●
Strategically plants trees to provide shading around buildings, thus providing natural shading canopies	●			
Work with the Department of Conservation and Recreation to ensure that the Charles River Dam continues to be able to regulate the level of the Charles River in the face of severe storms to sea level rise		●	●	●
Incorporate non-mechanical strategies to support building functionality during climate events (e.g. key-operable windows for emergency ventilation)	●	●	●	●
Elevate buildings to or above expected 100-year flood elevations. Methods include building on alternative fill, pier and beams, or bored piles		●	●	●
Locate critical facilities above the first floors and basements of structures		●	●	●

Table 35 continued

Climate change resilience policy addresses the change in climate related to:	Ambient Air Temperature	Increased Storm Severity	Sea Level Rise, Storm Surge	Precipitation, Local Flooding
Use water resistant and quick drying building materials, including supports, insulation, joinery and fittings		●	●	●
Design external vents that double as water drainage in the case of flooding, to equalize the pressure of the water both in and outside the building		●	●	●
Build with durable supports that would not be weakened by long-term water exposure		●	●	●
Design and construct the buildings to withstand flood loads and the pressure of rising water – both still and moving		●	●	●
Build with materials that are able to withstand the impact floating debris and high winds		●	●	●
Flood proof the building below the 100-year flood elevations (or higher); consider both wet flood proofing that allows for flooding, and dry flood proofing to keep the water out		●	●	●
Use breakaway construction materials for non-structural building elements		●	●	●
Design facilities to reduce the urban heat-island effect	●			
Require green roofs or white roofs to reduce the summer cooling loads	●			
Create energy efficient building envelopes that reduce the electricity load of the building, especially in the summer months	●			

6.5 Energy

Harvard's facilities contained within the IMP area derive their heating and cooling energy supplies from building specific (stand-alone) equipment as well as from Harvard-owned district energy systems. Building specific systems include equipment such as natural gas fired boilers, domestic hot water heaters, building-scale chillers, and cooling towers. Harvard-owned district energy systems produce and deliver steam (or hot water), electricity, and chilled water on a larger scale to multiple facilities on campus. Additionally, Harvard purchases both electricity and natural gas from local distribution companies (e.g. NSTAR and National Grid) and provides service to facilities through direct connections to the utility or through a Harvard-owned distribution network serving multiple facilities.

Existing Harvard-owned district energy systems serving all or portions of the IMP area include an electric micro-grid, a steam distribution network, and a chilled water plant/ distribution system. The electric micro-grid is primarily comprised of electrical switchgear that receives its supply from NSTAR and distribution cable running in an underground duct and manhole system to local/building electrical vaults where the voltage is transformed from distribution level to building level (typically from 13.8 kV to 480/208 V). The steam distribution network is primarily comprised of distribution piping (steam and condensate) running from the steam source (the Blackstone energy facility in Cambridge) to individual buildings where the heat-energy is typically converted to hot water for distribution/use within buildings.

The Blackstone energy facility currently has multiple steam boilers that generate steam at 400 psig and a 5 mega-watt backpressure steam turbine generator. The steam and electricity produced at the Blackstone facility is used within the facility and also distributed to Harvard buildings. While all of the boilers at Blackstone have dual-fuel capabilities, natural gas is considered the facilities' primary fuel source (accounting for more than 95 percent of the fuel use in recent years). As a result of utilizing natural gas as the primary fuel source, upgrades made over the past several years, and leveraging the environmental benefits derived through combined heat and power (CHP) operations, the greenhouse gas intensity (MTCDE/unit of steam output) has been reduced by over 30 percent compared to Harvard's 2006 baseline. Currently there are approximately 160 buildings supplied by the Blackstone facility and 180 building supplied by Harvard-owned micro-grids across Harvard's Cambridge/Allston campus. Harvard's existing chilled water plant in Allston has multiple electric-driven chillers and distributes cool water to a number of Harvard Business School buildings, typically for space conditioning. Over time, as energy supply needs have increased, these Harvard-owned district energy systems have been expanded, upgraded, extended, or supplemented with additional facilities in response to changing needs.

Harvard expects to provide heating energy, cooling energy, and electricity as needed to existing, renovated, and new academic facilities within the IMP area in a similar manner going forward including the installation of building specific equipment where desirable as well as expanding the use of existing district energy facilities/systems and installing additional district energy facilities/systems over time where economically viable. Harvard currently supplements its primary energy sources with on-site renewable and alternative energy systems including wind, solar thermal, solar PV, geothermal, and small-scale cogeneration/combined heat and power systems. Additionally, in recent years Harvard has purchased about 25,000,000 kWhs of wind energy per year through a long-term power and REC purchase agreement with a third party. As planning associated with the IMP area and technology advance, Harvard will continue to explore and analyze the use of renewable and alternative energy sources.

In support of the near-term planned projects associated with Harvard's academic facilities, including the new Science project, Harvard anticipates installing a new district energy facility. It is anticipated that the new facility will not include any new combustion sources and will generate chilled water (for space conditioning and possibly process needs), generate hot water through steam to hot water heat exchangers (for space conditioning and domestic hot water heating), and contain a 13.8 kV electrical distribution substation (for distributing electric power). The facility is anticipated to be co-located within the new Science Project on Western Avenue. The new district energy facility will be supplied with high-pressure steam from Harvard's existing Blackstone energy facility. To accomplish this, steam and condensate distribution piping/infrastructure will need to be extended from the One Western Avenue/Genzyme area to the site of the new district facility with a new connection being made through the Harvard-owned Hague Street. Steam will be used to support building process needs (e.g. laboratory related equipment/processes) as well as heating/thermal energy needs through conversion to hot water based systems. Additionally, NSTAR will need to install new 13.8kV electrical feeders from their existing facilities to the new Harvard electrical distribution substation within the energy facility. The energy facility will also have associated energy distribution infrastructure (e.g. piping, electrical conduit/cables, etc.) that will be routed to Harvard buildings and/or interconnected with existing Harvard infrastructure. Distribution infrastructure is expected to be located primarily on Harvard property; however there will likely be instances where public ways will need to be crossed. At this time specific routings, piping/conduit sizing, etc. have yet to be determined and/or evaluated. This will be done as planning, alternatives analyses, and preliminary design activities progress.

While the energy needs for several projects are envisioned to be served by existing Harvard-owned district energy facilities and the new district energy facility described above, additional energy (e.g. steam, hot water, chilled water, electricity) generation, cogeneration, energy conversion, and energy distribution equipment/systems/facilities may be added over time within the master plan area to meet energy supply requirements and/or operational needs for projects beyond the term of the IMP. As part of this process Harvard anticipates working with the City, local utilities (e.g. NSTAR, National Grid), and regulators to ensure adequate systems are in place to meet the energy needs of the Harvard facilities in the master plan area.

6.6 Support Services

Harvard is engaged in a "Comprehensive Support Services" planning process for University support services associated with the projects in the Institutional Master Plan. This process includes an assessment of all existing and anticipated future support service needs and an evaluation of how these services will be accommodated.

The IMP projects will include loading facilities to accommodate the delivery of goods (including mail) and the removal of waste/recycling. When projects included in the IMP are brought forward for review, proposals will include details about how the project's necessary support services will be managed. It is anticipated that each building will have its own loading facility that will be accessed from a campus roadway. The proposed HBS projects are near the existing service tunnel system that is connected to the Central Loading Facility near Batten Way. To the extent practical, these facilities will be connected to the tunnel system. Harvard will work with BTD to review loading facilities as the projects pass through the BRA's Article 80 review process.

As part of this work, Harvard has reviewed the support service needs for the projects presented in the IMP and as shown on Table 36, these support needs will be handled either through existing facilities or on the site of each individual project.

Table 36: Support Service Needs for IMP Projects

IMP Project	Support Service Needs
Chao Center	Handled on-site through HBS network
Burden Hall Replacement	Handled on-site through HBS network
HBS Faculty and Administration Office	Handled on-site through HBS network
Harvard Stadium	Handled on-site
Basketball Venue and Institutional Mixed Use	Handled on-site
Gateway	Handled on-site or North of Western Avenue
Hotel and Conference Center	Handled on-site
Baker Hall Renovation	Handled on-site through HBS network
Soldiers Field Housing Renovation	Handled on-site

OVERVIEW OF 28 TRAVIS STREET SUPPORT SERVICES

The existing support services to be relocated to 28 Travis Street include:

- Fleet Management Services.
- Harvard University Information Technology.
- Harvard University Police Training.
- Harvard University Mail Room Services.
- Recycling and Landscaping.

More detailed information about these services can be found by going to the following websites:

- Transit, Fleet, and Mail: http://www.campusservices.harvard.edu/
- Harvard University Police: http://www.hupd.harvard.edu/
- Harvard University Information Technology: http://huit.harvard.edu/

There is parking for up to 45 service vehicles at the 28 Travis Street facility in an area specifically designated for those vehicles, internal to the site, and removed from neighboring residential areas. The site will accommodate existing and planned growth of the fleets for:

- Transit Services: shuttle buses (12 currently + 2 for growth) and passenger vans (5 currently + 1 for growth)
- Fleet Services: pickups (8) and cargo vans (4)
- Mail Services: box trucks (3 + 1 for growth), cargo vans (7) and hybrid autos (2)

There are 75 parking spaces on the 28 Travis Street employee and visitor parking lot, although the university anticipates no more than 35 to be occupied at any given time. At the request of the BRA and the Community, access to the employee and visitor parking lot will be off of Western Avenue.

VEHICLE AND RELATED SERVICE INFORMATION

- Shuttle Services operate during the academic year providing safe, convenient, and reliable transportation throughout the Cambridge and Allston campuses. Major stops include: Memorial Hall, Pound Hall, Currier House, Mather House, Boylston Gate, Lamont Library, Kennedy School of Government, the i-lab and the Business School. Harvard Shuttles are open to all members of the Harvard Community – including faculty, staff, students and to neighborhood residents and employees of Barry's Corner Residential and Retial Commons Project. Harvard's entire system is accessible for riders of all abilities and includes low-floor and lift-equipped buses, and door-to-door paratransit van service. The shuttle service operates seven days a week, Buses will not enter/exit the 28 Travis Street site between the hours of 12 midnight to 6 a.m to minimize disruption to the surrounding community.
- Fleet Management provides comprehensive vehicle services, including acquisition, leases, preventative and corrective maintenance, and a fuel administration program to Harvard customers. The five-bay facility is equipped to handle repairs on a variety of Harvard vehicles, from diesel buses to off-road equipment. Our parts inventory consists of more than 300 cataloged items that are commonly used to make repairs. ASE certified employees and a well-equipped facility provide the support needed to make most repairs. Contracted services are only required on state inspections, warranty repairs, glass replacement, and bodywork. Approximately half of the service vehicles are buses and box trucks. The other half is comprised of medium duty cargo and passenger vans, pickup trucks and hybrid autos.

- The Daytime Van Service is designed for persons who, because of physical impairment or medical condition, find it extremely difficult or impossible to use the regular fully accessible shuttle bus. This service operates year round, except for designated holidays, throughout the Cambridge and Allston campuses and is available to faculty, staff and students.

- Evening Van Service is designed to transport faculty, staff and students safely around the campus area as a supplement to the shuttle bus system. The service operates between 7 p.m. and 3:00 a.m., seven days a week throughout the academic year.

COMPREHENSIVE SUPPORT SERVICES PLANNING IMPLEMENTATION

When 28 Travis Street is operational in the fall of 2013, Harvard will carefully assess any impacts on neighbors from the 28 Travis Street program on a regular basis. This feedback will lead to an impact assessment and ultimately to a plan to either sustain the existing programming or provide a plan to modify the facility with specific time frames for vacancy, relocation, and/or demolition of existing facilities as well as construction and occupancy of any new facilities no later than one year after the date of issuance of a Certificate of Occupancy for the Allston Science Complex. In the event that any of these uses needs to be relocated in the long-term future, Harvard will consider all available real estate options including new properties associated with CSX which are anticipated to come under Harvard control during the course of this IMP. In identifying alternative locations Harvard will consider not only convenience to users of services and the deliverers of those services, but potential impacts on the residential community.

6.7 Construction Phasing and Management

Introduction

Each of the individual IMP projects will be required to prepare a Construction Management Plan (CMP) in compliance with the City's Construction Management Program. Each CMP will be submitted to the Boston Transportation Department (BTD) once final plans are developed for each project and the construction schedules are fixed. The construction contractor will be required to comply with the details and conditions of the approved CMP.

Harvard will develop an Institutional CMP to coordinate the preparation and implementation of the individual project CMPs. The Institutional CMP will be submitted to BTD for their review prior to the submittal of the individual CMPs. The Institutional CMP will describe the principles and procedures that guide development of individual Construction Management Plans; provide a mechanism to integrate and coordinate individual project CMPs including construction staging and laydown areas, truck routes, construction worker parking, and rodent control; describe common features for Construction Management Plans of individual projects, such as communication and notification protocols, construction worker hours and protection of utilities; and, identify Best Management Practices to address environmental, air quality, noise, and construction waste. The Institutional CMP will be regularly updated to reflect new IMP project construction activities.

Phasing of Projects and Infrastructure

The phasing of the IMP projects and related infrastructure is presented in Section 4.6.

Construction Management Strategy

There are a number of principles and approaches to construction management that will guide the CMPs and mitigation measures for each of the specific projects. These are discussed in the following sections.

Communication

In an effort to have clear, open and up-to-date communications with the neighborhood, each IMP project will utilize a communications plan consistent with other Harvard projects in Allston. A 24-hour hotline will be established upon commencement of construction activity. In addition, when construction commences, a website will provide updates on construction activities. A mitigation staff and protocol will be established and be available to address all project issues. Emergency contacts will be maintained for immediate follow-up on emergency situations. Additionally Harvard will direct the construction manager for each project to install bulletin boards with project information, including the mitigation phone number, at each of the project sites. These bulletin boards will be maintained with current activity and schedule information.

Construction Work Hours

Consistent with City requirements, typical construction hours for the IMP projects will be from 7:00 a.m. to 6:00 p.m., Monday through Friday. No substantial sound-generating activity will occur before 7:00 a.m. If longer hours, additional shifts, or Saturday work is required, the construction manager for each project will submit a work permit request to the City's Inspectional Services Department. Notification should occur during normal business hours, Monday through Friday.

Potential Construction Support Area

Harvard has identified a location for a potential centralized area for construction-related uses, including truck layover, materials storage, worker parking and temporary support structures. Harvard will formalize these plans with BTD through the Institutional CMP and/or one or more TAPAs and CMPs. In addition to the Construction Support Area, Harvard anticipated that some construction staging and material laydown may occur within each of the specific project sites and at remote facilities.

Harvard and its construction managers for each IMP project will work to ensure that staging activities minimize impacts to pedestrian and vehicular flow in the neighborhood and that the staging activities are being coordinated with other construction activity in the immediate area. Access to the Construction Support Area will be set forth in the Institutional CMP and the CMP for each IMP project.

Public Safety and Access

Construction methodologies for each IMP project that ensure public safety and protect nearby buildings and individuals in the area will be employed as part of each project. Techniques such as barricades and signage will be used. As the design of each of the projects progresses, Harvard will meet with BTD to discuss the specific location of barricades, the need for lane closures, pedestrian walkways, and truck queuing areas. These will be incorporated into the CMP which will be submitted to BTD for approval prior to the commencement of construction work for each IMP project.

Construction Worker Transportation

To reduce vehicle trips to and from the construction site, construction workers will be encouraged to use non-auto modes. But recognizing that many workers will choose to drive to the site, the University anticipates that Harvard parking facilities in the immediate area will be used to accommodate worker parking which will discourage parking on neighborhood streets. The location of parking for construction workers will be coordinated through the Institutional CMP. The construction manager for each IMP project will work aggressively to ensure that construction workers are well informed of the public and Harvard-owned transportation options serving the area.

The specific location of construction worker parking will vary over time and will be dependent on the phasing of each IMP project. The general approach is to use available capacity in Harvard parking facilities north of Western Avenue, starting with Soldiers Field Park Garage. To the extent that additional parking may be required, Harvard would explore the use of other facilities with the City and neighborhood including the Construction Support Area, parking lot proposed for the existing Charlesview site, 175 North Harvard Street (following the relocation of the Ed Portal), and to the extent available and feasible, the CSX property south of Western Avenue.

Construction Truck Routes and Deliveries

As currently proposed, the main route for construction trucks accessing the site will be via the Massachusetts Turnpike to the Soldiers Field Road access road to Western Avenue and they will depart using the same roadways. These routes will be clarified depending on the location of each specific project. Trucks will be prohibited from using local neighborhood streets to arrive at or depart from the site.

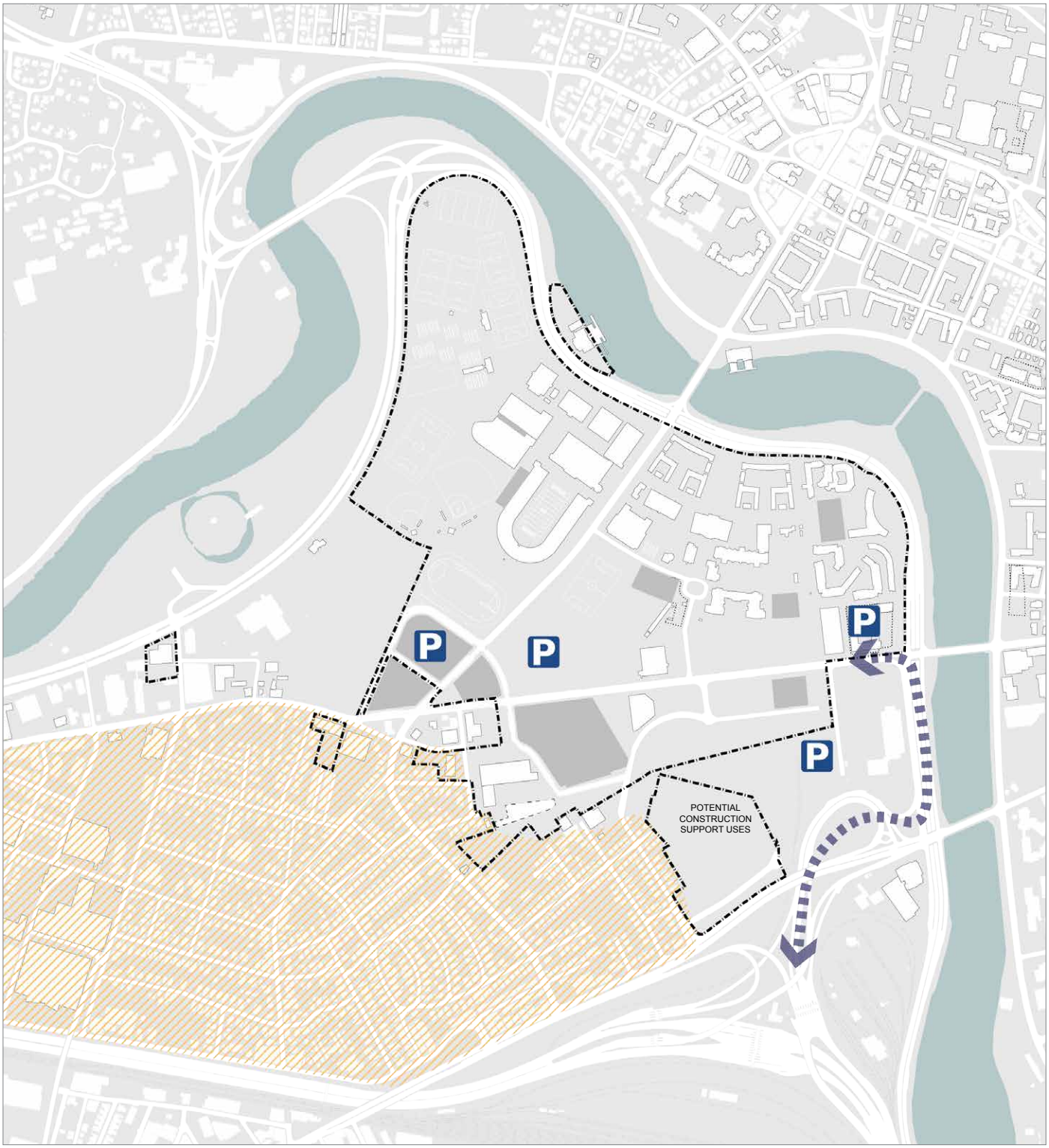


Figure 137: Potential Construction Parking

Harvard is evaluating a "North Allston Haul Road" through the Harvard-controlled property to provide a "fallback" connection, if needed, from Cambridge Street to Western Avenue via Rotterdam Street. Combined with the plan for centralized construction operations in the Construction Support Area, this can provide a solution to the challenge of managing construction traffic if the initial construction traffic approach experiences difficulties.

The construction team for each project will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. The construction teams will provide subcontractors and vendors with Construction Vehicle and Delivery Truck Route Brochures in advance of construction activity. "No Idling" signs will be included at the loading, delivery, pick-up and drop-off areas.

Construction Employment

Harvard will enter into a Boston Residents Construction Employment Plan with the City of Boston for each project. As required by this plan, Harvard will make reasonable good-faith efforts to have at least 50 percent of the total employee work hours be for Boston residents, at least 25 percent of total employee work hours be for minorities, and at least 10 percent of the total employee work hours be for women.

Environmental Mitigation

Harvard will follow City and MassDEP guidelines with regard to environmental mitigation during the construction period. As part of this process, Harvard and its construction teams will evaluate the Commonwealth's Clean Air Construction Initiative.

"Don't Dump – Drains to Charles River" plaques will be installed at any new storm drains that are replaced or installed by the projects.

Air Quality

Short-term air quality impacts from fugitive dust may be expected during excavation, demolition, and the early phases of construction of each of the IMP projects. Plans for controlling fugitive dust during excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks. The construction contract for each project will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts. These measures are expected to include:

- Using wetting agents on areas of exposed soil on a scheduled basis.
- Using covered trucks.
- Minimizing spoils on the construction site.
- Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized.
- Minimizing storage of debris on the site.
- Providing a wheel wash for vehicles leaving the project site.

Noise

Harvard is committed to mitigating noise impacts from the construction of the IMP projects. Increased sound levels, however, are an inherent consequence of construction activities. Construction work will comply with the requirements of the City of Boston Noise Ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities. Mitigation measures are expected to include:

- Instituting a proactive program to ensure compliance with the City of Boston noise limitation policy.
- Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers.
- Replacing specific construction operations and techniques by less noisy ones where feasible.
- Selecting the quietest of alternative items of equipment where feasible.
- Turning off idling equipment.
- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

Construction Waste

Harvard and its construction teams will take an active role with regard to the reprocessing and recycling of construction waste. The disposal contracts for each project will include specific requirements that will ensure that construction procedures allow for the necessary segregation, reprocessing, reuse and recycling of materials when possible. For those materials that cannot be recycled, solid waste will be transported in covered trucks to an approved solid waste facility, per MassDEP Regulations for Solid Waste Facilities, 310 CMR 16.00. This requirement will be specified in the disposal contracts for each project. Construction will be conducted so that materials that may be recycled are segregated from those materials not recyclable to enable disposal at an approved solid waste facility.

Protection of Utilities

Existing site drainage and private infrastructure located within or adjacent to the project sites will be protected during construction. Specific methods for constructing proposed utilities where they are near to, or connect with, existing water, sewer and drain facilities will be reviewed by Boston Water and Sewer Commission as part of its Site Plan Review process.

Rodent Control

A rodent extermination certificate will be filed with each building permit application to the City. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work in compliance with the City's requirements. Rodent extermination prior to work start-up will consist of treatment of areas throughout the site. During the construction process, regular service visits will be made.

6.8 Economic Impact

Economic Development

Harvard University is a significant economic engine for the City of Boston, the City of Cambridge, the cities and towns of the metro-Boston region and the Commonwealth of Massachusetts.

With an annual budget of more than $4 billion and more than 33,000 graduate, undergraduate and continuing education students, Harvard employs more than 17,000 faculty and staff members making it the fifth largest employer in Massachusetts according to the 2013 Boston Business Journal Book of Lists.

In addition, close relationships between Harvard and its affiliated teaching hospitals fuel a network recognized for its positive impacts on the regional economy as well as public health. Approximately 10,000 doctors hold Harvard faculty appointments at Harvard's affiliated teaching hospitals. Nearly 50,000 Harvard alumni live in Massachusetts. And, Harvard's cultural, athletic and education programs attract visitors from around the world and contribute to the region's economic vitality.

This synopsis of Harvard's economic impact reports exclusively on Harvard's direct spending – including the University's salary and benefit obligations, purchase of goods and services, and capital expenses. Spending by students and out-of-town visitors is also considered direct Harvard spending. These Harvard expenditures are primarily concentrated in the metro-Boston area and benefit local residents and businesses. The direct spending of Harvard's direct affiliates (the American Repertory Theater, Harvard University Press, and others) is included in this economic impact analysis. Harvard's indirect impacts are not quantified in this chapter.

Harvard University Employment

Harvard University employs more than 17,000 faculty and staff members in various locations across Massachusetts. Harvard employees work at Harvard's Cambridge, Allston and Longwood campuses, as well as at: the Arnold Arboretum (Jamaica Plain), Harvard affiliated teaching hospitals (Boston, Cambridge, and Belmont), at Case Estate (Weston), at the Concord Field Station (Concord, Bedford and Carlisle), at Harvard Forest (Petersham, Hamilton, Phillipston and Royalston), at Agassiz Cottage Observatory (Harvard) and at the Artemas Ward Homestead (Shrewsbury). Harvard also has employees based outside of Massachusetts. The employment figure provided does not count student employees, employees that work for Harvard University contractors, or faculty that hold appointments but do not offer instruction.

Harvard faculty attract more than $823.3 million in research grants and contracts and include world leading authorities in a variety of disciplines and subjects.

Future Employment in Allston

Harvard's proposed IMP development will create significant construction employment. Harvard estimates that the proposed IMP projects will create more than 1,200 construction jobs. In addition, there are five other Harvard development projects in Allston, which are proceeding on a parallel regulatory track outside of the University's IMP, which will create approximately 1,150 additional construction jobs.

Table 37: Projected Construction Employment for Projects in the IMP

Project	Construction Jobs Created
HBS Chao Center (Kresge Replacement)	73
Burden Hall Replacement	105
HBS Faculty and Administration Office Building	79
Harvard Stadium Addition/Renovation	68
Basketball and Mixed Use Project	144
Mixed Use Institutional Building	216
Hotel and Conference Center	180
HBS Baker Hall Renovation	56
Soldiers Field Housing Renovation	305
TOTAL JOBS CREATED	**1,226**

Table 38: Projected Construction Employment for Approved Projects Outside of the IMP

Project	Construction Jobs Created
Science	523
Barry's Corner Residential and Retail Commons	500
28 Travis Street	45
Bright Hockey Center Addition/Renovation	43
224 Western Avenue	46
TOTAL JOBS CREATED	**1,157**

In addition to construction jobs, the science project on Western Avenue will house approximately 1,000 permanent employees – relocated from Cambridge to Boston – and the Barry's Corner Residential and Retail Commons project will create an estimated 250 permanent jobs (pending final building plans and retail composition).

Renewed Allston Leasing Program

In 2009, the University focused its attention on the immediate need for property improvements and aggressive leasing of vacant or partially vacant properties in Allston. The University made more properties available for leasing, undertook property improvements to increase their appeal to potential tenants, and extended the length of leases from short to longer terms. As a result, Harvard's Allston commercial properties are currently more than 90 percent leased to community-friendly tenants such as Swiss Bakers, Stone Hearth Pizza, Boston Boxing and Quixote Studios. Harvard's Allston tenants employ nearly 400 individuals.

Workforce Development

Harvard supports several workforce development and training programs for Boston residents. The Harvard Allston Workforce Development Collaborative (WDC) offers free employment development programs to Allston-Brighton residents. WDC programs are offered at the Harvard Allston Education Portal and include: computer skills trainings, resume writing workshops, networking strategy sessions and job interview coaching. Harvard's Human Resources Department offers community workshops through the WDC.

Harvard is deeply engaged with the Allston-Brighton Adult Education Coalition and the Allston and Brighton Boards of Trade. In partnership with the Brighton Board of Trade, Harvard recently launched a pilot professional internship program. The pilot program

will place Allston-Brighton job seekers that have participated in the WDC program in administrative positions at local businesses. The interns will work a minimum of four hours per week using their newly developed or updated skills to gain first-hand experience, get back into the working world and network with potential employers. The pilot program benefits both job seekers and local businesses by connecting people looking for jobs with businesses in search of qualified employees.

Through Harvard's Office of Human Resources, the University is also working to develop the career skills of Boston's youth. The University's summer youth employment program offers paid summer internships to Boston public school students. Many program participants are drawn from Brighton High School. In 2012, Harvard provided employment to 126 Boston public school students.

Harvard also partners with the Allston-Brighton Resource Center, a City of Boston run entity, to provide career development workshops and job search assistance. Harvard has provided $500,000 to the Resource Center over the past five years. This money has helped the Center achieve its workforce development mission.

Contributions to the Innovation Economy

Harvard is a key member of the Boston innovation economy. Harvard imports hundreds of millions of dollars to Massachusetts annually to support university research projects and operations. In FY12, Harvard received a total of $823.3 million in federal and non-federal research support. Non-federal research funding from foundations, trusts and industry totaled $167.2 million. The balance – $656.1 million – came from federal sources. The single largest source of federal research dollars was the National Institutes of Health (NIH). Harvard received $469.55 million in NIH grants. For eighteen consecutive years, Boston has been the nation's leading city in NIH dollars received – in 2012 seven of the top ten recipients of those funds were Harvard Schools or Harvard affiliated institutions. Sponsored research dollars fund 21 percent of the University's annual operating budget and support the payment of wages and benefits and the purchase of goods and services.

Table 39: Research Funding Generated

Total Federal Research Funding	**$656 million**
NIH	$469.55 million
National Science Foundation	$50.24 million
Department of Defense	$44 million
Other Federal Research Funding	$92.31 million
Total Non-Federal Research Funding	**$167.2 million**
Bill and Melinda Gates Foundation	$14.99 million
Robert Wood Johnson Foundation	$5.05 million
Hoffman-La Roche, Inc.	$3.64 million
Other Non-Federal Research Funding	$143.52 million
TOTAL FY12 SPONSORED RESEARCH SUPPORT IMPORTED TO MASSACHUSETTS	**$823.3 MILLION**

The research and training made possible by external funding benefits the local economy. Companies throughout the greater Boston area have been founded based on technology discovered in a Harvard lab or through the insights of senior scientific or corporate leaders trained at Harvard. Harvard's influence is most visible in the life science sector. Biotech companies founded based on research discoveries made by a Harvard faculty member, or which employ Harvard faculty or alumni in a senior leadership position, received $567.4 million in venture capital and angel funding in 2012. In total, 93.4 percent of all venture capital and angel investment in Massachusetts biotech companies in 2012 flowed to emerging companies with high level Harvard ties. Private investment ensures the viability of the Massachusetts life science sector by supporting small cutting edge biotech firms who one day may blossom into large regional employers and, in turn, attract large mature firms to the region.

In FY12, Harvard University's Office of Technology Development received notice of 368 inventions from the Harvard community, resulting in the filing of 197 patent applications. As of January 1, 2012 Harvard held a combined 1,500 U.S. and international patents. Based on Harvard's patents, 510 agreements have been executed that allow Harvard intellectual property to be used by industry to develop and improve existing therapies and products.

The University also uses institutional funds to support the creation of new companies. The Harvard Technology Accelerator Fund awards grants to Harvard researchers to allow research discoveries' potential commercial applications to be explored. The fund seeks to bridge the notorious gap between research discovery and commercial development. The Accelerator Fund has awarded $6.2 million in grants over the past six years to 37 separate projects.

Harvard also supports company formation through its innovation lab (i-lab) located in Allston. Through April 2013, more than 200 innovator teams had been residents of the i-lab where the teams further developed their innovation and received advice and support on business formation, intellectual property, and fundraising matters. From its November 2011 opening through April 2013, 28,000 Harvard students had visited the i-lab and 1,450 events had been held there.

Harvard University Spending

Harvard University's direct economic impact on the Commonwealth of Massachusetts totaled $2.54 billion in FY12. This includes employee wages and benefits, the purchase of goods and services, and payment for renovation and construction. Spending by students and visitors is not included in this calculation.

Table 40: Summary of Harvard University's Direct Economic Impact

	City of Boston	Boston & Metropolitan Area	Commonwealth of Massachusetts
Salaries and Wages	$195,252,279	$1,300,017,933	$1,339,872,136
Renovation/Construction	$159,000,000	$284,242,507	$292,000,000
Purchase of Goods and Services	$517,603,420	$897,176,408	$912,947,265
Total Impact	$871,855,699	$2,481,436,848	$2,544,819,401

Goods and Services

Harvard University's purchase of goods and services from Massachusetts firms totaled $912.9 million in FY12. Vendors with a location in Boston received $517.6 million of this spending and firms in Boston and the surrounding area received $897.1 million. Harvard spending on capital improvements is not included in these figures and, therefore, represents additional economic impact.

Harvard purchases a wide range of goods and services annually. Purchases include state-of-the-art lab equipment, vehicle parts and services, landscaping services, food and drink and office supplies. The purchase of many of these items occurs annually and is not directly correlated to capital expenditures. The construction of new facilities or large scale renovation projects increases spending on goods and services as new equipment and furniture is required.

Capital Spending

Harvard has had a stable presence in the City of Boston for more than one hundred years and currently operates more than 8.43 million square feet of classroom, office and research space. During the past several years, Harvard University has invested heavily in its Boston physical plant, and the additional proposed projects will impact both capital and operating spending.

In FY12, Harvard paid Boston construction firms, $159 million in order to renovate and improve the University's physical plant. Construction firms in the Boston metropolitan area received $284.2 million from Harvard. A total of $292 million was paid to Massachusetts firms for costs associated with capital improvements. Construction and renovation projects conducted by Harvard aim to enhance the student experience, enrich academic instruction, and improve the ability of faculty and staff to conduct cutting edge research.

Individual Spending

Harvard attracts millions of dollars to the metro-Boston region, ranging from sponsored research grants for academic investigations, to spending by out-of-state and international tourists who visit Harvard. Among the spending that Harvard brings to Boston, the metro-Boston region and Massachusetts is:

- Spending by out-of-state and international tourists who visit Harvard.
- Spending by students.
- Spending by faculty and staff.
- Spending by individuals who attend Harvard academic, cultural and athletic events.

Direct Payments and Services to Local Communities

Harvard University strives to be a good neighbor to its host communities. Harvard provides a variety of services which otherwise would be the responsibility of the residential and commercial tax base. Harvard operates its own police force which patrols Harvard's Boston campuses and provides additional law enforcement protection to residents of the City of Boston. Harvard maintains public property that abuts its campus and much of its Boston property is publicly accessible. Harvard's property in Boston supplements the City's extensive park system and provides green space in some of Boston's most congested neighborhoods. Harvard also provides rent free space and makes available several Harvard facilities free of charge to a number of city departments.

Harvard's Arnold Arboretum is a prime example of the types of public benefits the University provides to the City of Boston. The 281 acre Arnold Arboretum is a safe and accessible community resource and is free and open to the public every day of the year. The Arboretum is a vital part of the Boston's Emerald Necklace park system and is one of the best preserved examples of famed landscape architect Fredrick Law Olmsted's work. In FY13, Harvard spent $13.3 million to maintain the Arboretum as a public museum and to conduct important botanical and biological research.

Closer to Harvard's IMP area, Harvard recently built Ray Mellone Park, donated it to the City, and has committed to maintain it for ten years.

Taxes and Voluntary Payments In Lieu of Taxes

Harvard also provides financial support to its host communities through direct payments of taxes (including real estate taxes to the City of Boston for all of its non-institutional properties in Boston) and voluntary payments in lieu of taxes (PILOT).

Over the past decade Harvard has paid the City of Boston $19.02 million in voluntary PILOT payments. In FY12, Harvard made voluntary PILOT payments of $2.12 million to the City of Boston – the second largest of any Boston educational nonprofit that year. Harvard also currently has a PILOT agreement with the City of Cambridge. The University makes additional voluntary PILOT and real estate tax payments in other Massachusetts municipalities where it owns property.

Table 41: Real Estate Tax and PILOT Payments to the City of Boston

FY	PILOT	Taxes	Total
2012	$2,121,894	$6,097,707	$8,219,600
2011	$2,109,293	$6,324,174	$8,433,467
2010	$2,049,849	$6,278,144	$8,327,993
2009	$1,996,977	$6,044,876	$8,041,853
2008	$1,929,788	$6,315,933	$8,245,721
2007	$1,835,946	$5,549,538	$7,385,484
2006	$1,813,480	$5,578,192	$7,391,672
2005	$1,820,560	$4,401,845	$6,222,405
2004	$1,777,064	$3,364,581	$5,141,645
2003	$1,567,192	$2,390,278	$3,957,470
Total	**$19,022,043**	**$52,345,268**	**$71,367,310**

Harvard Students and Alumni

Students come to Harvard from around the United States and around the world. Harvard has at least one student from every U.S. state, the U.S. Virgin Islands and Puerto Rico. Twenty percent of Harvard's matriculated student population comes from outside the United States.

In FY13, 872 students from Massachusetts attended Harvard College. Nearly sixty-four percent of these students – 558 students – received need-based scholarship assistance from Harvard averaging $38,403 in FY13. The awards were supported by $21.42 million from institutional and government sources. Institutional need-based support accounted for 93.5 percent of the financial aid provided to Massachusetts students – a total of $20.04 million or an average of $35,927 per student. In FY13, 112 Boston residents attended Harvard College.

Harvard prepares its graduates to make significant contributions to their communities. Out of the 49,000 alumni that live within 75 miles of Boston, 2,430 hold senior leadership positions in or were the founders of companies. These corporate leaders and company founders are responsible for generating thousands of local jobs.

6.9 Housing

Harvard's total housing portfolio in Boston, Cambridge and Somerville has over 8,200 units with approximately 13,000 beds which house virtually all of the undergraduate student population in Cambridge and which has the capacity to house 50 percent of graduate students in Cambridge and Somerville, and in Boston's Allston and Fenway neighborhoods. In Cambridge and Somerville, there are approximately 11,000 beds available to Harvard affiliates. Of these, approximately 6,900 are in the undergraduate Houses, and 4,100 are available to other affiliates. In Boston, there are 2,243 beds available to affiliates; of these, 658 are located in the Fenway neighborhood at Vanderbilt Hall, Harvard at Trilogy (170 Brookline Avenue) and The Henry Lee Shattuck House. The remaining approximately 1,585 affiliate beds are located in Allston in Harvard Business School dormitories and at the One Western Avenue and Soldiers Field Park apartment complexes. Total bed counts are summarized in the table below excerpted from the spring 2013 University Accountability Ordinance Report.

Many affiliate housing complexes are open to all full-time Harvard graduate students, while some are school specific. Most students tend to select housing complexes that are as close to their classes as possible. Consequently most of the demand for the affiliate housing located in the Fenway neighborhood is from students at the Harvard Medical School, the Harvard Dental School, or the Harvard School of Public Health and most of the demand for affiliate Housing in Allston is from Harvard Business School students.

As summarized in the table below from the spring 2013 University Accountability Ordinance Report, there are 3,738 full- and part-time graduates students enrolled in Harvard's Boston-based graduate schools. Of these, 1,844 reside on campus and 1,894 reside off campus. Of those living off campus, 615 live in Boston, while 1,279 live outside of Boston.

Table 42: Harvard University Housing

V. LIST OF ALL ON CAMPUS HOUSING BUILDINGS			Period:	**Spring 2013**	
School:	Harvard University - Boston-Based Schools (Business, Medical, Dental, and Public Health)				
Date:	February 20, 2013				
Note:	List each building alphabetically sorted by street name (if possible) and include total number of students				
	housed. One row for each building. Use as many rows as necessary to include all buildings.				
	* Building type codes: O=Own, L=Lease, R=Rent, X=Other; ***-Executive Education Housing				
Name of Building	Address		Zip	Building	Number of
(If Different From Address)	Street Number	Street Name	Code	Type *	Students
Vanderbilt Hall (HMS)	107	Avenue Louis Pasteur	02115	O	321
Harvard @ Trilogy (HRES)	170	Brookline Avenue	02215	O	250
Morris Hall (HBS)	14	Harvard Way	02163	O	136
Gallatin Hall (HBS)	24	Harvard Way	02163	O	73
Chase Hall (HBS)	34	Harvard Way	02163	O	115
McCulloch Hall (HBS)	44	Harvard Way	02163	O	85
Baker Hall (HBS)	45	Harvard Way	02163	O	0***
McArthur Hall (HBS)	47A	Harvard Way	02163	O	0***
Shattuck House (HSPH)	199-207	Park Drive	02215	O	87
Hamilton Hall (HBS)	700	Soldiers Field Road	02163	O	72
Mellon Hall (HBS)	670	Soldiers Field Road	02163	O	0***
One Western Ave (HRES)	1	Western Avenue	02163	O	365
Soldiers Field Park (HRES)	111	Western Avenue	02163	O	739
					2243

Table 43: Student Enrollment and Residence Statistics

I. SUMMARY OF STUDENT ENROLLMENT AND RESIDENCE STATISTICS							Period: Spring 2013		
School:	Harvard University - Boston-Based Schools (Business, Medical, Dental, and Public Health)								
Date:	February 20, 2013								
	Undergraduates			***Graduates***			***All Students***		
	Full-Time	Part-Time	Total UGs	Full-Time	Part-Time	Total Grads	Full-Time	Part-Time	Total Students
Total Enrollment	0	0	0	3,535	203	3,738	3,535	203	3,738
Total Residing On-Campus	0	0	0	1,842	2	1,844	1,842	2	1,844
Total Residing Off-Campus	0	0	0	1,693	201	1,894	1,693	201	1,894
Total Residing in Boston	0	0	0	2,173	57	2,230	2,173	57	2,230
Residing in Boston On-Campus	0	0	0	1,613	2	1,615	1,613	2	1,615
Residing in Boston Off-Campus	0	0	0	560	55	615	560	55	615
Total Residing outside Boston	0	0	0	1,362	146	1,508	1,362	146	1,508
Residing outside Boston On-Campus	0	0	0	229	0	229	229	0	229
Residing outside Boston Off-Campus	0	0	0	1,133	146	1,279	1,133	146	1,279

In Allston, the Harvard Business School has a total of approximately 1,850 students and there are 1,585 affiliate beds in Allston; so, although graduate students are not required to live in University housing, most HBS students are able to live in affiliate housing on or close to the Allston campus, with many living in University housing in Cambridge.

In addition to the supply of University owned housing in Allston, Samuel & Associates is developing the Barry's Corner Residential and Retail Commons project which includes approximately 325 apartment units in a mixed-use building on Harvard-owned land at 219 Western Avenue. This mixed-use complex will offer approximately 450 additional beds adjacent to Harvard's Allston campus and within walking distance of the Cambridge campus. This new residential building will not be University owned, but some Harvard affiliates may self-select to live there.

Within the area of Allston covered by the IMP, additional housing for Harvard affiliates is being considered for the site at 175 North Harvard Street. This site may also be the location of a new University basketball venue. There may also be additional potential housing and mixed-use development opportunities on Harvard-owned land, in the Barry's Corner area, outside of the IMP boundaries. Going forward, as such housing opportunities are advanced, Harvard will work with the City and neighborhood to determine whether Linkage funds can be directed to support these initiatives. In addition, the existing Soldier's Field Park housing complex which was built in 1974 will be undergoing a phased renovation.

Harvard will work with the BRA and the Task Force to participate in the creation of or stabilization of housing in conjunction with this IMP, and to maximize the linkage funding that is spent in the neighborhood, as well as the contributions any housing component of the Mixed Use Facility and Basketball Venue might make to the mix of neighborhood housing. Such alternatives may include a component of the housing portion of the project that is available for the broader public, as opposed to only Harvard affiliates.

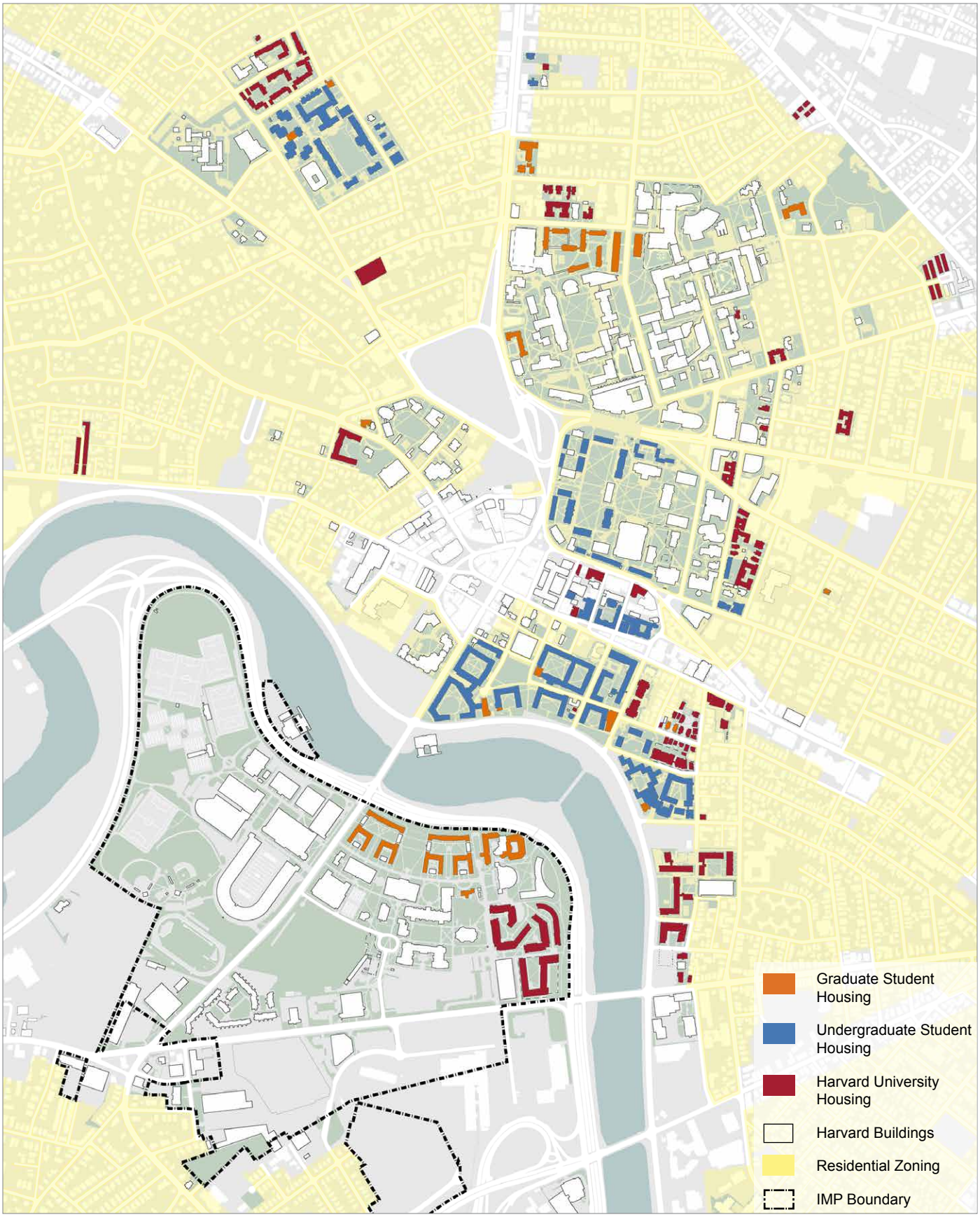


Figure 138: Existing Harvard Housing

6.10 Retail

A vibrant retail portfolio will play an important role in the continued transformation of the Allston-Brighton neighborhood, particularly in Barry's Corner, where campus and community meet. The University projects anticipated over the next ten years will enhance pedestrian activity and attract Harvard students, faculty, staff as well as residents and neighbors to the area.

Over the past five years Harvard has worked to attract community friendly tenants to its leasable space and will continue this effort. In addition, the University will introduce new spaces and a variety of retailers and services to Allston.

The University is committed to responsible property stewardship with the goals of maintaining reliable tenants, fostering attractive streetscapes, and preserving long-term planning options.

Harvard Commercial Real Estate Inventory in Allston

Harvard owns over one million square feet of leasable office, warehouse and retail space (commercial real estate) in Allston. In 2009, 65 percent of Harvard's leasable space in Allston was occupied. The University proactively pursued small businesses, minority and women-owned businesses, and community-friendly tenants – serving to strengthen the community. Today, more than over 93 percent of the University's leasable space in Allston is occupied. From 2010 to 2013, the University signed 24 new leases and welcomed a variety of businesses and non-profit organizations to the Allston community. These new tenants have created approximately 400 jobs and brought commercial and service activity, pedestrian traffic and vitality back to many sections of the neighborhood that were previously dominated by automotive and industrial uses.

Barry's Corner Retail and Service Goals

Harvard will build on this strong Allston-wide foundation of local commercial and retail leasing by creating a diverse, concentrated retail hub in Barry's Corner. To achieve this goal, Harvard will continue to employ its proven retail strategy and will expand its leasing efforts to attract new businesses and customers to Barry's Corner.

Ongoing Retail and Commercial Goals

- *Re-use of Existing Buildings:* Over the past five years, Harvard has focused on the adaptive re-use of existing warehouse space and industrial buildings. Barry's Corner has experienced the evolution of a gas station into Stone Hearth Pizza and a car dealership into Swiss Bakers. In the fall of 2013, the former Verizon garage, located at 224 Western Avenue, will be transformed into a new community-oriented arts and education center housing the Harvard Ceramics Program.

- *Preference for Local Tenants:* Harvard actively seeks long-term local tenants that bring transformative, community-friendly uses to existing spaces. Harvard has been extremely discerning in the tenant selection process, sifting through hundreds of prospective tenants to partner with only the right quality tenants and uses. The University selectively targets potential businesses that bring products or services to the community and help enliven Allston's commercial districts and invite pedestrian activity.

- *Favorable Rates for Local Pioneering Tenants:* Harvard has offered below market affordable rates to select community friendly tenants. These were intended to help the first tenants in Barry's Corner successfully launch their business without being encumbered by high occupancy costs.

- *Local Hiring*: Harvard encourages its tenants to hire locally. Harvard has partnered with the BRA's Career Services Center to achieve this goal. When a tenant is ready to hire staff, Harvard works with the Career Service Center to help facilitate a career fair for the local community in collaboration with the tenant.

- *Building Transparency*: Barry's Corner retail space - Harvard designs its retail space to be inviting and welcoming to everyone passing by, especially the local community. Harvard uses generous amounts of glass and warm landscaping to achieve this goal. This attention and special consideration to transparency will continue to be an important component for each retail space.

- *Temporary Use of Unoccupied Space*: In order to maximize the activation of its buildings, Harvard seeks out temporary uses for its unoccupied spaces when long-term tenants are not available. An example of this was seen at 168 Western Avenue where Harvard introduced two temporary community-oriented uses to the property as part of its effort to strengthen property stewardship and improve community vitality in Allston. During the winter of 2010 this property was home to a temporary ice rink and later that year hosted a mini-golf facility and batting cages.

Additional Future Retail Goals

The University's future retail goals build upon the ongoing goals and strategies outlined above. Harvard will continue to reuse existing facilities where possible, partner with tenants that share its goals and vision, and encourage tenants to hire from within the local community. Building on this foundation, Harvard will move into its next phase of retail development in North Allston – the creation of a new neighborhood retail center focused around the grove of trees in Barry's Corner. Harvard plans to increase the draw to the area by providing a diversity of sizes and types retail spaces and by actively working to locate destination retail and services in Barry's Corner. Future goals include:

- *Larger Retail Opportunities for Anchors and Junior Anchors*: Harvard has identified a select number of parcels in and around the Barry's Corner Grove for the new construction of anchor and junior anchor-sized retail spaces. In the past, most of Harvard's North Allston retail spaces have been small and medium sized spaces of 1,500 to 5,000 square feet in size. In order to attract retailers that can serve as anchors for the growing Barry's Corner retail center, Harvard will seek to develop larger spaces up to 10,000-25,000 square feet in the phases and at the locations described below. The introduction of newly constructed, larger retail spaces will offer a new type of retail space and will attract a more diverse retailer base than would have otherwise located in the Barry's Corner area. Anchors and junior anchors attracted to these spaces could include stores such as a grocer, apparel store, pharmacy, bookstore, etc.

- *Mix of Tenant Types*: In order to fully activate the Barry's Corner retail center, Harvard will seek to introduce a mix of regional and national tenants to complement existing local retail tenants to strengthen the customer base. National and regional retailers give smaller and local tenants the confidence to set up their businesses nearby and will help attract customers from outside the immediate area.

- *Destination Retail and Services*: In order to create a new shopping destination and draw shoppers from Harvard Square and other areas of the city, Harvard will seek to locate destination or specialty retail and services in Barry's Corner. A destination store can entice shoppers to make a special trip solely for the purpose of shopping at that location. The store may offer a special product or shopping experience that is unique to the area. Likewise, destination service providers offer services that cannot be found elsewhere and customers must travel to that location to receive those services. Smaller retailers gravitate to areas surrounding a destination store in hopes that shoppers will filter into their stores as well. Harvard will work to locate destination retail and services close to the grove area to catalyze the commercial growth and success of Barry's Corner.

Retail Scope and Implementation

Harvard plans to achieve the goal of creating a retail destination by concentrating nearly 200,000 square feet of retail and service space in and around Barry's Corner. The development of this retail center will take place over three phases. Phase I already has been completed and includes the recently redeveloped retail spaces that exist today in Barry's Corner. Phase II involves the redevelopment of four key parcels, all of which are currently in permitting and/or construction and will be completed in the next 1-5 years. Phase III includes the new construction of two larger developments at the edge of the grove of trees and will offer opportunities to create larger anchor/junior anchor parcels as well as destination retail and services. The planning for this third phase is in process with permitting and construction anticipated over the next 5-10 years.

Phase I - Existing Retail Development – 30,000 square feet

The BRA's Scoping Determination requested an inventory of existing retail in Barry's Corner. Today, there is approximately 30,000 square feet of existing retail space in Barry's Corner. Over 80 percent of this existing retail, approximately 25,000 square feet, is owned and recently redeveloped and/or leased by Harvard.

The following tenants make up the existing Barry's Corner retail and service development:

Stone Hearth Pizza - 182 Western Avenue	2,000 square feet
Swiss Bakers - 168 Western Avenue	14,000 square feet
Teele Hall Retail/Cafe – Western Avenue	2,000 square feet
7/11 Store - 204-206 North Harvard	2,500 square feet
Art Sign and Sandcastle - 210 North Harvard	5,000 square feet
Dunkin Donuts – (non-Harvard)	2,000 square feet
Flint Cleaners – (non-Harvard)	2,500 square feet
Gulf Gas Station – (non-Harvard)	1,000 square feet
TOTAL	**31,000 square feet**

Phase II – Planned Retail and Service Development - 100,000+/- square feet

Currently, there are four new projects which include approximately 100,000 square feet of retail and service uses being planned, permitted and constructed in and around Barry's Corner. These major projects will bring visibility, new housing and employment destinations and a surge of retail and pedestrian activity to Barry's Corner.

- *Residential and Retail Commons, 219 Western Avenue*: approximately 40,000 square feet. Harvard has agreed to ground-lease to a third party Real Estate Partner, Samuels & Associates, to develop the first anchor retail development for North Allston's new retail center – the Barry's Corner Residential and Retail Commons. This project involves the demolition of a warehouse at 219 Western Avenue and construction of 325 rental housing units and approximately 40,000 square feet of new retail. This project will be home to over 500 people who will provide the first critical mass of pedestrian activity to this location. The retail component of the project is expected to include the area's first anchor/junior anchor, restaurants, services and dry goods retail stores. The project is on schedule to break ground in the fall of 2013, with occupancy projected for the fall of 2015.

- *Harvard Science, Western Avenue*: 5,000 +/- square feet. Harvard is moving forward with the construction of a new science complex on Western Avenue. The building will be approximately 500,000 square feet in size and will house the Harvard School of Engineering and Applied Sciences (SEAS) as the anchor presence of this complex bringing students, researchers, faculty and staff to its new location in Barry's Corner. Harvard anticipates that the science complex will include active ground floor uses and approximately 5,000 square feet of retail development along Western Avenue. This project is in the planning phase with construction estimated to commence in 2014 and occupancy estimated at 2017.

- *28 Travis Street*: 30,000 square feet. This involves the adapative re-use of an old Comcast warehouse into a 42,000 square feet campus services building with an adjacent 10,000 square feet fleet maintenance facility. The building will be the home of Harvard's IT services center, mail facility, transportation department and recycling center. These uses will employ over 90 employees. Approximately, 30,000 square feet of the main building will house active service uses that host over 30 visitors each day. This significant employee and visitor base will contribute to the activation of the Barry's Corner retail center. The Campus Services building is currently under construction with completion estimated at September 2013.

- *Harvard Ceramics, 224 Western Avenue*: 25,000 square feet. This project consists of the conversion of a vacant Verizon garage into a community-oriented arts and education building housing the Harvard Ceramics program. This Harvard-affiliated program is focused on and open to all members of the community. This project will enliven and activate the south-west edge of the new Barry's Corner retail center and draw customers from the surrounding neighborhoods and larger Harvard community to the shops and services in Barry's Corner. This project is currently under construction with a move in date in the summer of 2013 for Harvard Ceramics.

Phase III – Future Retail and Service Development – 45,000-80,000 square feet

Once Phase II is complete, Harvard estimates that it will develop between an additional 45,000 and 80,000 square feet of retail and service space in Barry's Corner. Harvard has identified two strategic parcels that offer opportunities to create larger ground floor retail footprints and can significantly contribute to the activation of Barry's Corner. Development of these two parcels is conceptual at this point in time, but is expected to move into the planning, permitting and construction stages over the next five to ten years. Ground floor uses will be of an active public nature, including and without limitation ground floor retail. These ground floor uses will focus on activities that provide face-to-face interaction and will not comprise back-office service uses. Furthermore, Harvard will consider an increase in retail and other active public uses should analysis at that time show they are viable and warranted.

- *Gateway Project*: 35,000-50,000 square feet. This parcel is located at the intersection of North Harvard Street and Western Avenue directly adjacent to the Barry's Corner Grove. This parcel is slated to be developed to include approximately 300,000 square feet of institutional administrative space on the upper floors with approximately 35,000 square feet of ground floor retail. This development could include multiple retail shops fronting on North Harvard Street, Western Avenue, and the grove of trees, as well as a larger retail space to attract a regional or national destination-style tenant for Barry's Corner. Harvard is also exploring the possibility of locating additional retail and/or Harvard-related services on approximately 15,000 square feet of the second floor of this building which could serve as an added draw to the area.

- *Mixed Use Facility and Basketball Venue:* 10,000-30,000 square feet. The Mixed Use Facility and Basketball Venue is located on North Harvard Street, across the street from the Gateway project site and directly north of the Residential and Retail Commons. In five to ten years, Harvard plans to build a new basketball venue at this location with the balance of the site accommodating additional institutional/mixed-uses – a total development of approximately 250,000 square feet in size. Harvard anticipates that approximately 10,000 to 30,000 square feet of this development will consist of ground floor retail and/or service uses. The final mix, size and configuration of these retail spaces will depend on the ultimate size and location of the basketball and institutional uses on this site. Harvard believes this site may also be an appropriate location for a larger anchor or junior anchor retail space.

Business Development Strategies

As stated, one of Harvard's primary, on-going retail goals is to foster and support locally-owned business growth in the Barry's Corner area. To date, Harvard has worked to identify promising local business that fit well into the North Allston neighborhood and has supported them through its partnership with the BRA Career Services Center and, in some cases, favorable introductory rents. In addition to these on-going efforts, Harvard has actively promoted new business development and a positive and collaborative business environment in Allston through its newly launched Harvard Innovation Lab (i-lab) located on Western Avenue a few blocks from the center of Barry's Corner.

The i-lab is an innovative initiative that fosters team-based and entrepreneurial activities and deepens interactions among Harvard students, faculty, entrepreneurs, and members of the Allston and Greater Boston community. In its first year and a half of operation, more than 16,000 interested neighbors from Allston Brighton and the Greater Boston innovation

community participated in more than 1,400 different events at the i-lab, including public lectures, i-lab workshops, educational seminars taught by i-lab community partner organizations and one-on-one business advising and counseling.

Moving forward, Harvard will continue to foster local small business development by providing current and prospective tenants and members of the Allston community with information on the following important business development resources now available at little or no cost to all members of the community through the Harvard i-lab:

- *Massachusetts Small Business Development Center (MSBDC)*: Through the i-lab, the Massachusetts Small Business Center network offers free business advisory courses, educational programs, and financing assistance to local entrepreneurs and small businesses. MSBDC advocates are on site at the i-lab weekly. MSBDC also connects local businesses with the federal government, state government and academic resources throughout Massachusetts.

- *SCORE Boston*: SCORE helps local small business owners start or manage their own for-profit or non-profit. Through the Harvard i-lab, SCORE offers counseling services and low-or-no cost workshops led by volunteers with significant experience in the ownership, operation and/or management of both small and large businesses.

- *Center for Women and Enterprise (CWE):* The Center for Women and Enterprise works with community members to help women start and grow their own businesses. At the i-lab, the CWE connects entrepreneurs with education, training, technical assistance, women's business enterprise certification and access to both debt and equity capital, regardless of their ability to pay.

- *Small Business Administration (SBA)*: The Small Business Administration partners with the i-lab to connect local business owners with access to fundraising, development, government contracting and advocacy opportunities. Through the Harvard i-lab, the SBA works with local entrepreneurs to deliver loans, loan guarantees, contracts, counseling sessions and many other forms of assistance.

7.0 Community Benefits

7.1 Master Plan for Community Benefits

This Institutional Master Plan includes nine new projects anticipated over a five to ten-year period. Prior to/as part of the approval of this IMP, Harvard will develop, with community input, a master plan for community benefits commensurate with the scale and scope of the projects anticipated during the life of this IMP. The conversation around community benefits will also include the identification of a transformative project – or suite of projects collectively constituting a transformative project - that is responsive to the existing Cooperation Agreement associated with the Science project.

Harvard and Allston have developed extensive programming over the past ten years that is discussed later in this document and that provides a platform upon which to build new and expanded ventures as long-term partners. The University's efforts continue to be informed by the community survey implemented in 2008 which has continued to provide guidance on community priorities throughout its deliberations.

Since the filing of the IMPNF in October of 2012, the Task Force has dedicated significant time to discussions about community benefits. These have included presentations and discussions associated with public school programming and public realm improvements and open space. Harvard expects dedicated Task Force time to the topic of workforce development and has benefited from a distillation of expressed priorities produced by members of the Task Force and shared at the meeting on July 15.

Harvard has listened carefully to all of the discussion during recent Task Force meetings and remains mindful of previous discussion throughout the past decade on programming and physical improvements. In order to move the discussion forward constructively, Harvard plans to submit a proposal of community benefits to the Task Force and BRA prior to the meeting in August. This proposal will build upon all previous discussions and, the University believes, will incorporate specific proposals that have a high level of support in the community and will include concepts related to every major area raised throughout the public discussion.

Harvard looks forward to receiving feedback on the proposal at the August meeting and throughout the process.

7.2 Existing Community Benefits

EDUCATION, ARTS AND CULTURE

- *AP Biology Hinton Scholars*: Hinton Scholars (11th and 12th grade students from select Boston schools) meet after school during the academic year with their AP Biology teacher on the Harvard Medical School campus for additional academic tutoring in preparation for the AP Biology exam. Students engage in hands on, inquiry-based AP laboratory experiences and participate in AP Biology exam preparation provided by Harvard University graduate students and post-docs.

- *AP Biology Callbacks*: Provides workshops on best practices and professional development, seminars and lectures throughout the academic year to Boston Public School teachers who teach AP Biology and participate in the AP Biology Hinton Scholars program.

- *Arnold Arboretum School Programs*: School Programs began at the Arboretum in 1984 in response to a request to local museums from Boston Public Schools for help with science instruction. This need continues today, illustrated by Boston Mayor Thomas Menino's "Step-Up" program, which challenged Boston's largest institutions of higher learning to assist troubled schools. Through its unique relationship with the City of Boston, the Arboretum has been increasingly committed to improving local science education. The programs emphasize depth over breadth, and consequently field study programs are offered to approximately 2,000 students annually. In a small group setting that emphasizes inquiry and hands-on learning, students receive increased attention with a well-trained volunteer as their guide through the landscape.

- *Art History Workshops*: Workshops for K-12 teachers to encourage integration of art history into social studies and art curriculum.

- *Askwith Forum Series*: Each year, thousands of members of the public gather at the Harvard Graduate School of Education to learn about and engage experts on issues relevant to education and learning. This free lecture series seeks to serve as a galvanizing force for debate and conversation about education issues ranging from national policy to path-breaking research findings. Past speakers have included Steven Pinker, Ted Sizer, James Comer, E.D. Hirsch, and Elmo from Sesame Street.

- *Boston Teachers Union School*: In the 2011-12 academic year, the Arboretum initiated a partnership with the Boston Teachers Union (BTU) School. In collaboration with teachers, Arboretum Science Specialists provided science instruction in preschool, kindergarten, first grade, and second grade classrooms throughout the school year, covering topics on plants and animals, earth science, weather studies, and physical science. Students in each elementary grade at the BTU School—as well as students in the eighth grade—participated in field studies at the Arboretum. In June, the Arboretum hosted an open house for the families of BTU School students to showcase student achievement from the first year of partnership.

- *Bridge to AP Biology*: Summer enrichment pre-AP Biology program for 11th and 12th grade students and their teachers from select Boston schools. Held at Harvard Medical School for students and teachers who will be Hinton Scholars during the following academic year. Students are exposed to AP Biology concepts, hands on lab experiments and academic field trips before commencing their AP Biology courses in the fall.

- *Explorations*: Annual one-day science enrichment program for middle school students who have an interest in science, mathematics or health careers. The program links students with Harvard Medical School faculty, researchers and medical/graduate students who provide hands-on scientific research experience in a lab.

- *Field Study Experiences*: The Arboretum offers seasonal school programs for students in grades 3 to 6. These two-hour programs are designed to encourage the investigation of plant science in the meadows and woodlands of the Arnold Arboretum. Lessons that begin in the classroom can be explored and enlarged through these outdoor learning adventures. The programs emphasize student inquiry and direct interaction with natural phenomena. Students work in small groups with a volunteer guide to explore and discuss science-oriented questions. Pre- and post-visit materials help teachers plan a challenging learning opportunity. Children from Boston schools are served free of charge.

- *Gardner Pilot Academy Partnership*: For many years, Harvard has had a growing relationship with the GPA.

    - *GPA Field Days:* Every June, Harvard hosts GPA's annual Field Days at the Harvard Track and Infield, welcoming all grades for the event.

    - *GPA fourth and fifth grade after-school program:* Students engaged in hands-on inquiry-based science enrichment activities in small groups.

    - *Harvard Art Museum:* 2nd and 5th grade program: This partnership is a multi-visit museum program with the GPA that fosters connections between learning in the classroom and in the museum. Additionally, the Harvard/Art Museum (H/AM) has an ongoing relationship with the GPA that encourages teachers in all grades to use the resources of the museum.

    - *Harvard Public School Initiative:* Works with the GPA after-school staff for professional development focused on: SmartTALK Homework Support, Project Based Learning (PBL), and Differentiated Instruction through a PBL Model. Harvard staff also serve as the after-school coach for all GPA surround care teachers.





The Harvard Allston Education Portal brings Harvard's greatest strength of teaching and research to the Allston-Brighton community.

- *Harvard Allston Education Portal:* The Harvard Allston Education Portal, located at 175 North Harvard Street, opened in June 2008 and brings Harvard's greatest strength of teaching and research to the Allston-Brighton community. Anyone living in Allston-Brighton or attending school in North Allston-Brighton can become a member of the Harvard Allston Education Portal. Membership is free. The Harvard Allston Education Portal provides mentoring and enrichment opportunities in science, math, writing and public speaking by Harvard undergraduates for children and youth who are Ed Portal members. Additional Education Portal programs include an adult speaker series, scholarships to athletic camps and museum summer programs, and links to Harvard enrichment programs, athletic programs, and events. The Harvard Allston Education Portal Advisory Board advises the Faculty Director of the Education Portal and Harvard University. The Board has 11 members, selected by Harvard in coordination with the BRA and the Harvard Allston Task Force.

- *Harvard Allston Education Portal Mentee Showcase (Summer, Fall, and Spring):* The Harvard Allston Education Portal has created an ongoing end of the semester Mentee Showcase, providing an opportunity for students enrolled in the mentoring program to show their family members and friends what they have learned throughout their participation in the mentoring program. The program includes hands-on science experiments that are part of science club and science mentoring and skits and storytelling performed by the writing mentees and mentors.

- *Harvard Art Museums:* The Harvard Art Museums are free to children under 18.

- *Harvard Business School Staff Mentors:* HBS Human Resources, matches HBS staff with students at a local school to help them practice and improve upon their writing skills. This provides the opportunity for students to interact with an adult role model. HBS staff correspond with students once a month and attend an end of the school year celebration cookout.

- *Harvard Public School Initiative:* SmartTALK, prepares after-school staff to help kids develop their academic skills in out-of-school time by creating a positive learning environment and providing students with standards-aligned, games-based activities to support homework time. Mind Matters, is a program that translates the science of how children learn for real-world practice in early care and education.

- *Harvard-Manville Mentoring Program:* The Manville School at the Judge Baker Center in Mission Hill is a therapeutic day school for children ages 5 – 16 who experience emotional, neurological, or learning difficulties that have impacted their ability to succeed in other school settings. HMS/HSDM students are paired with one child and act as a big sister/brother throughout the year while simultaneously completing related coursework.

- *Harvard University i-lab (Batten Hall):* The Harvard Innovation Lab is an innovative initiative that fosters team-based and entrepreneurial activities and deepens interactions among Harvard students, faculty, entrepreneurs, and members of the Allston and Greater Boston community. Since its opening in November 2011, the i-lab has hosted more than 400 events, welcoming people from the University, the Allston Brighton community, and the region.

- *HBS Apprentice:* HBS Apprentice held its second annual 5th grade entrepreneurship program with 41 students from the Gardner Pilot Academy on April 14 & 15. Six student teams launched small businesses that raised $680 for Gardner in two hours by selling products they envisioned, produced, and marketed on the Harvard Business School campus.

- *Head Start Initiative:* The Arnold Arboretum has offered field trips for local Head Start programs in Boston since 2007. In this age-appropriate program, volunteer guides conduct multi-sensory explorations, allowing children to participate in investigations, gather a collection of plant materials, and make an observational drawing. Preschool children come in the spring, summer, and fall.

- *Head Start Family Day:* In addition to the seasonal field trips, the Arboretum hosts Head Start Family Day, a fall open house for families of Head Start students. With bus transportation provided by the Arboretum, families embark together on hikes, make leaf rubbings, examine plant material under microscopes, and enjoy healthy snacks. Last year the Arboretum hosted 60 parents and children, the largest number of attendees yet for this annual event. This fall, the Arboretum anticipates hosting the Mattapan Head Start families in addition to the South Side families for this special day.

- *Health Professions Recruitment and Exposure Program (HPREP):* HPREP brings high school students who are interested in the health professions to HMS for nine weeks where students are exposed to a wide variety of students, faculty and events. About 30 minority students from all over Boston participate in this yearly event.

- *Hemlock Hill:* An ecosystem study for Boston Public School fifth grade students. Boston Public Schools and the Arboretum have collaborated to enhance fifth grade life science curriculum on ecosystems. Hemlock Hill was chosen as a small ecosystem for study because it is a local forest undergoing significant ecological change that students can visibly observe.

- *MBA Impact Initiative with Timilty Middle School and Frederick Middle School:* Harvard Business School students visited two middle schools in Dorchester and Roxbury to mentor 7th graders about leadership. Middle school children later visited HBS for follow-up sessions.

- *Museum Tours:* Tours are available of Harvard Art Museum, Botanic and Peabody, Mineralogical, Geological and Museum of Comparative Zoology to interested schools and other groups.

- *Reflection in Action:* Building Healthy Communities™ (RIA) is the spring component of Explorations. It is a contest culminating in a day of celebrating healthy life styles at Harvard Medical School. It offers students the opportunity to generate a vision for change by weaving together the themes of heart, lung and blood diseases, oral health, health disparities, community engagement and creative expression to promote positive change in their community. Through visual, written and performing arts, students identify pressing health care needs that are currently overlooked in today's media and provide a proactive approach to healthy living that focuses on personal empowerment, access and awareness, and good health habits. RIA has incorporated First Lady, Michelle Obama's "Let's Move" Campaign.





Since its opening in November 2011, the i-lab has hosted more than 400 events, welcoming people from the University, the Allston Brighton community, and the region.

PUBLIC HEALTH

- *Boston Asthma Swim Program:* Student volunteers travel to Chinatown every Friday to provide health education and swimming classes for children and information for families at the Boston Chinatown Neighborhood Center. Volunteers work with physicians at South Cove Community Health Center to get referrals to the program. Now, in its 11th year (the longest running asthma swim program in the city), tracking "peak flow" measurements over time has shown that participation in the program helps the children either maintain or improve their asthma management.

- *Faculty Community Outreach:* Many Harvard Medical School faculty members serve as volunteer staff, providing free or affordable health services in many of the community's underserved areas. Local health organizations served include Dimock Community Health Center, East Boston Neighborhood Health Center, and Health Care for the Homeless.

- *First-Year Urban Neighborhood Campaign:* This program was started in 1998 and brings incoming Harvard Medical School and Harvard School of Dental Medicine students to the Longwood Medical Area one week before classes start to complete community service work in the Boston area. Students participate in community service projects throughout Boston, including vaccination, pediatric prevention programs, dental awareness programs and meals programs in sites such as community health centers, battered women's shelters, and AIDS service organizations.

- *HIV Counseling and Testing Program:* Harvard Medical School and Harvard School of Dental Medicine first year students get trained and certified as HIV Test Counselors (MA certification) and volunteer once a week at five sites: East Boston Neighborhood Health Center, The Dimock Center (Roxbury), The MALE Center (AIDS Action Committee), Boston HAPPENS (program through Children's Hospital that serves youth at risk from all over the city) and Martha Eliot Health Center (Jamaica Plain). Now in its sixth year, more than 3,000 hours have been donated to these sites and volunteers have assisted in doing outreach events, expanding hours for the agencies, and reaching more people at risk for HIV.

- *Operation Mouthguard:* A dental program that provides oral health education and free mouthguards to young athletes at sites around Boston. In operation for more than ten years, sites have included the Charlestown Boys and Girls Club and the Boston Boys and Girls Club.

- *Prevention, Health Awareness and Choice through Education:* Harvard Medical and Dental School students participate in a training program on adolescent health issues and volunteer to teach sexual health education at the McKinley Schools (middle and high school) in Boston.

SCHOLARSHIPS

- *Allston-Brighton Scholarship Programs:* As part of Harvard's partnership with the City of Boston and the Allston-Brighton community, Harvard's Office of Public Affairs and Communications and the Division of Continuing Education offers a number of scholarship programs specifically for Allston-Brighton residents; they include:
    - Allston-Brighton Community Scholars Program;
    - Allston-Brighton English Language Scholarships; and
    - Brian J. Honan Scholarships for municipal employees.
- *The Crimson Summer Academy at Harvard University:* Over the course of three consecutive summers, 30 high-achieving students from Boston and Cambridge high schools engage in a stimulating mix of classes, projects, field trips and cultural activities as they prepare for success in college and beyond. After a period of orientation, Crimson Scholars live on Harvard's Cambridge campus from Sunday evenings through Friday afternoons, returning to their homes on weekends. Through small group instruction, sustained support, and close mentoring relationships with Harvard undergraduates, Crimson Scholars expand their vision of what's possible as they prepare for admission to challenging four-year colleges and universities.
- *Harvard Business School Executive Education Scholarships:* HBS provides scholarships in its Executive Education program to Boston residents and City employees.
- *Harvard Museum of Natural History Summer Program Scholarships:* Through the Harvard Allston Education Portal, Harvard offers 10 Harvard Museum of Natural History summer program scholarships, selected by lottery, to children who are residents of Allston-Brighton or attend the Gardner Pilot Academy (regardless of where they live).
- *Secondary School Scholarships to Harvard Summer School:* Designated for students living in Allston–Brighton who have completed their junior or senior year of high school, this program offers free tuition for one 4-unit course (equivalent to half-time summer study).
- *Skills Workshops for High School and College Students:* Program for high school and college students from New England and surrounding states in collaboration with the Biomedical Science Careers Program (BSCP). It provides students, especially African American, Hispanic American and American Indian/ Alaska Native students with information and guidance through mentorship in areas such as the application process for college, medical and graduate school; including interviewing skills, resume writing and financial aid. An informational session on educational options, career planning and financial aid is also offered to parents and caregivers.
- *Summer Athletic Camp Scholarship Program (25 scholarships/year):* Through the Harvard Allston Education Portal, Harvard offers approximately 25 athletic camp scholarships, selected by lottery, to children and youth who are residents of Allston-Brighton or attend the Gardner Pilot Academy (regardless of where they live).





Boston and Cambridge high school students engage in a stimulating mix of classes, projects, field trips and cultural activities at the Crimson Summer Academy.





The Harvard Allston Workforce Collaborative Program is a workforce development program run through the Education Portal in conjunction with the Allston-Brighton Resource Center.

WORKFORCE AND HOUSING

- *Boston Youth Jobs:* Through the Boston Private Industry Council, HBS recruits high school students to work in part-time, paid roles across campus.
- *Career and Business Resource Center:* In 2005, Harvard made an "early action" commitment of support to help establish the City of Boston's Career and Business Resource Center, which opened in June 2006.
- *Harvard Allston Summer Corps:* Harvard University, in partnership with the City of Boston's Youth Fund summer jobs program, funds 20 Harvard Allston Summer Corps members. The program provides summer youth employment at local non-profit organizations.
- *Harvard Allston Workforce Collaborative:* Courses, taught by staff from Harvard's Office of Human Resources, are held at the Harvard Allston Education Portal. Courses include Career Explorations and Computer Skills Training.
- *Harvard Business School/Boston Employment Center Partnership:* Through the Boston Employment Center, an HBS recruiter spends 8-10 hours per month meeting with clients, conducting resume reviews and mock interviews, and advising on job searches.
- *Harvard Business School Leadership Fellows:* HBS funds the Leadership Fellows program, which supports full-time fellows working in non-profit and public sector organizations in Boston.
- *Harvard 20/20/2000 Affordable Housing Initiative:* In Spring 1999, residents and civic leaders in Boston and Cambridge identified affordable housing as a chief community concern. In response, Harvard examined how University resources could help address the cities' challenge. The study determined that Harvard could play an effective role by using its financial and intellectual resources to fill gaps in the housing financing system – utilizing the well-established infrastructure of public and private agencies and intermediaries.

  With input from civic and community leaders, Harvard University identified a need for low cost capital to increase the supply of affordable housing particularly for middle-income families. The study findings became the basis of the University's 20/20/2000 Housing Initiative. To date, 20/20/2000 financing has supported the following affordable housing projects in Allston:

  - *The Brian J. Honan Apartments:* Fifty units of affordable housing on Everett Street in Allston named to honor the late City Councilor, Brian J. Honan, comprise nine buildings on a site once occupied by Legal Seafood's fish processing plant. In support of the Mayor's housing objectives, Harvard helped fund this project with a $2.8 million grant, one of the largest grants ever made by a single private institution to an affordable housing project in Boston. The Allston Brighton Community Development Corporation developed the project with the financial support of Harvard and state and city organizations.
  - *Hano Homes on Hano Street:* Harvard contributed approximately $300,000 to the renovation of the 20 rental units - 15 of them affordable - through its 20/20/2000 affordable housing partnership. Allston Brighton Community Development Corporation, which has owned Hano Homes since 1985, renovated the 20 units, replacing electrical and plumbing systems, reconfiguring walls, and installing new flooring and drywall. Undertaking the renovation also greatly increased the energy efficiency of the units.

- *Project Success:* Opening the Door to Biomedical Careers for Boston and Cambridge students in grades 11 and 12. Project Success places high school students at Harvard research sites where they complete an eight-week, hands-on, paid, mentored summer research project under the supervision of Harvard faculty, attend a science and career development seminar series and through oral presentations and preparations of research reports enhance their speaking and writing skills. Once a student is accepted in the program he/she is welcome to reapply every year through college as long as they maintain a 2.75 GPA and continue to major in a career related to the biomedical sciences. The program had been in existence since 1993 with 99 percent of participants matriculating at four-year colleges. Participants include Gates Millennium Scholars, Posse Scholars and recipients of full scholarships to prestigious colleges and universities.



During Boston Shines, staff and volunteers from Harvard University work alongside Allston neighbors, neighborhood businesses, public organizations and private agencies.



In 2008, Harvard launched the Harvard Allston Farmer's Market in Barry's Corner.

PHYSICAL IMPROVEMENTS AND GREENING INITIATIVES

- *Boston Shines:* Since the inception of Boston Shines in 2004, Harvard University has actively supported this annual citywide neighborhood cleanup by donating flowers and cleaning up streets and sidewalks around the Jackson Mann Community Center, the Honan Allston Library, and the Cambridge Street firehouse in Allston. Staff and volunteers from Harvard University work alongside Allston neighbors, neighborhood businesses, public organizations and private agencies.
- *Harvard Allston Farmers' Market in Barry's Corner:* In 2008, Harvard launched the Farmer's Market. The Farmer's Market is held every Friday from 3:00-7:00 p.m. from mid-June through October.
- *Holton Street Green Space:* The University created and maintains an open green space located at 108 Holton Street.
- *North Harvard Street Improvements:* Harvard worked with the Boston Transportation Department ("BTD") and the Boston Public Works Department on the redesign of a portion of North Harvard Street in the fall of 2009. This work, which Harvard designed and the City implemented, created bike lanes on newly-paved North Harvard Street from Soldiers Field Road to the intersection of Western Avenue.
- *Ray Mellone Park:* Harvard worked with Allston neighbors to design a new 1.74 acre neighborhood park behind the Honan Allston Branch Library on North Harvard Street. The park officially opened in 2011 and is maintained by Harvard University.
- *Rodent Control and Container Distribution Program:* In fall 2009, Harvard partnered with the City of Boston's Inspectional Services Department ("ISD") to provide every household in North Allston-Brighton whose trash is collected by the City of Boston with a new, 64-gallon, rodent-proof trash container. Harvard also worked with ISD to create a rodent control educational guide that was distributed to every household in North Allston-Brighton to provide residents with comprehensive information about the City of Boston's rodent control program and actions that residents can take to assist with rodent control.
- *Smith Field:* Harvard Real Estate Services and Harvard Athletics crews perform maintenance on the Smith Field little league baseball diamonds and the perimeter of this public park.
- *Western Avenue Sidewalks and Tree Plantings:* In fall 2007, more than 100 trees were planted along Western Avenue as part of a streetscape improvement project.





The annual Family Skating Party draws Allston-Brighton residents of all ages to Harvard's Bright Hockey Center for an evening of free ice skating.

CONTRIBUTIONS AND VOLUNTEERISM

- *Allston Brighton Game Nights:* Every year, athletic designates Allston-Brighton game nights for a variety of sports, where residents can attend for free.
- *Allston Brighton Oral History Project:* The oral history project was the first comprehensive multimedia oral history of the Allston neighborhood. It was conceived by residents of Allston-Brighton and funded and created by Harvard University to celebrate and preserve the rich history of the neighborhood. The project includes more than 70 interviews with longtime Allston residents, historic photographs, and other treasures. It is now housed by the Boston Public Library as part of the online Center for Neighborhood History. The Allston-Brighton Oral History documentary film is available to interested residents at the Honan-Allston Branch Library, 300 North Harvard Street, Allston, and at the Brighton-Allston Local History Room at the Brighton Branch Library, 40 Academy Hill Road, Brighton.
- *Annual Allston-Brighton Family Skating Party:* Annual Allston-Brighton Family Skating Party is held at Bright Hockey Center.
- *Annual Community Football Day:* All Allston-Brighton residents receive free admission to the game and complimentary lunch.
- *Blodgett Pool Access:* Harvard makes Blodgett Pool available in the summer to all Harvard Allston Education Portal members.
- *Community use of Athletics facilities:*
    - Boston Children, Youth and Families Swim Meet (May)
    - Special Olympics (June)
    - Boston Scholar Athlete Programs All-Star High School Baseball Game (June)
    - Boston Scholar Athlete Program All-Star High School Soccer Game (Oct/Nov)
- *Community Use of Facilities:* Harvard Business School continues to provide space for meetings of local organizations, including the Harvard Allston Task Force, Brighton Board of Trade, the Allston-Brighton Community Development Corporation, the Jackson Mann Community Center, and others.
- *Contributions to Allston-Brighton Nonprofits:* Harvard Business School has made contributions to a number of local organizations, including the Allston-Brighton Community Development Corporation, Allston-Brighton Little League, Allston Brighton Youth Hockey, the Joseph M. Smith Community Health Center, the Oak Square YMCA, and more.
- *Football Games:* Free admission to all children age 12 and under to Harvard football games, making it a convenient and affordable entertainment option for the whole family

- *Harvard Allston Partnership Fund:* The Harvard Allston Partnership Fund ("HAPF") was created by Harvard and the City of Boston, in collaboration with the Allston community, to support neighborhood improvement projects, cultural enrichment, and educational programming. The program awards $100,000 in grants each year.
- *HBS Board Fellows Program:* MBA student club members serve in one-year roles on the boards of Boston-area nonprofit organizations. Twenty-three Boston-area nonprofit organizations received a total of 2,900 person-hours of engagement in the 2010-2011 season. Organizations included: Adoption&Foster Care Mentoring; Affordable Housing Institute; Citi Performing Arts; Citizen Schools; Clean Power Now; Mass. Appleseed; Prize4Life; Rediscovery House; Acre Family Child Care; BELL; Community Boating; Science Club for Girls; Seeds of Peace; Solutions at Work; West End Boys & Girls Club; Bay Sate Community Services; City Year Boston; COMPASS; Generation Citizen; Greater Boston Foodbank; Minds Matter Boston; South Shore YMCA; Sustainable Endowments Institute.
- *HBS Faculty Volunteerism:* HBS faculty members are involved in community activities through presentations, pro-bono consulting to local community organizations, and participation on local boards.
- *HBS/Year Up Partnership:* HBS supports Year Up, a training program for post high school students. HBS pays for two interns a year who do six-month apprenticeships on the HBS campus.



On Community Day, all Allston-Brighton residents receive free admission to the game and complimentary lunch.

7.3 Linkage and PILOT

In addition, it should be noted that the University's Allston development will also produce the following public benefits.

- *Linkage:* In accordance with Article 80B-7 of the Boston Zoning Code, in connection with any Development Impact Project ("DIP"), Harvard will make a housing linkage contribution to the Neighborhood Housing Trust and jobs linkage contribution to the Neighborhood Jobs Trust.
- *PILOT:* Harvard currently has a Payment in Lieu of Taxes ("PILOT") agreement with the City of Boston. This PILOT agreement provides for payments (in place of property taxes) for those Harvard-owned properties that are being used by the University for institutional purposes. With respect to all of the Harvard-owned property in Boston that is not being used for institutional purposes, Harvard pays the required property taxes in accordance with the City property tax assessment process.