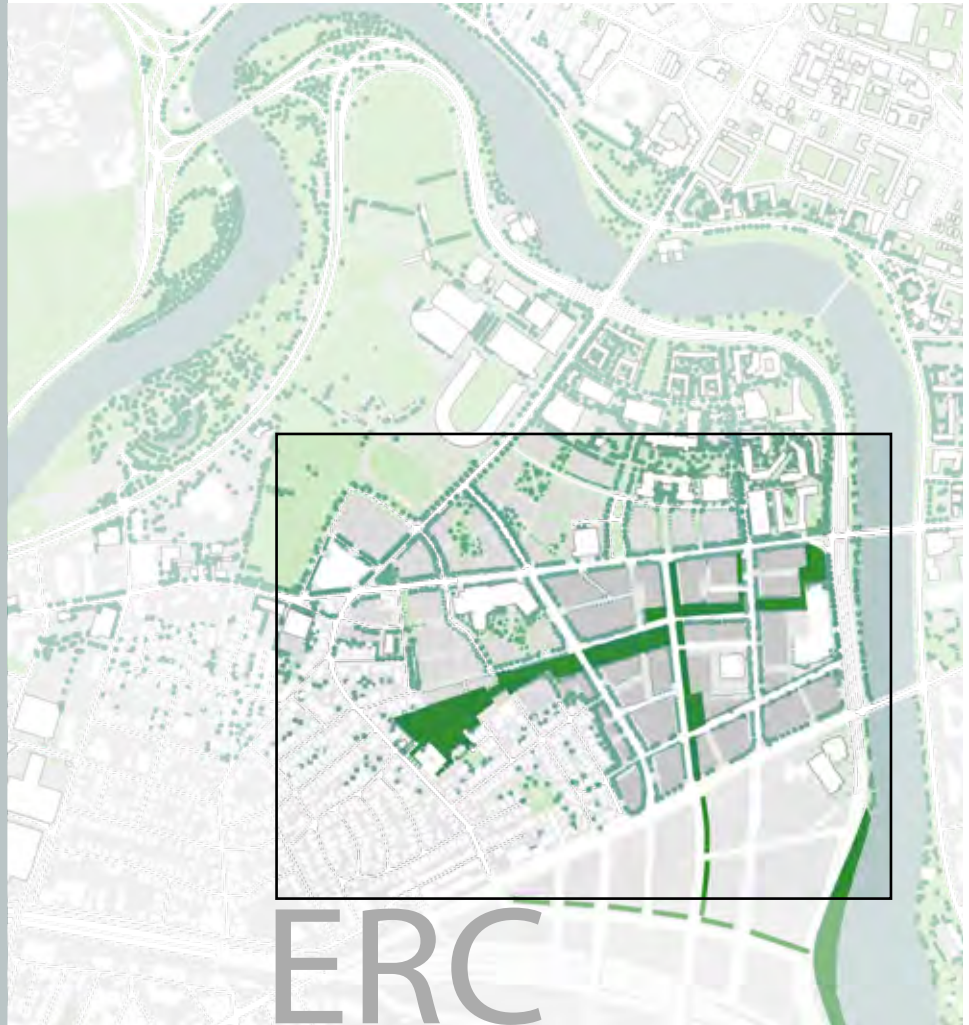


HARVARD
UNIVERSITY



Harvard Enterprise Research Campus
FRAMEWORK PLAN

MARCH 15, 2018

Harvard Enterprise Research Campus FRAMEWORK PLAN

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Table of Contents

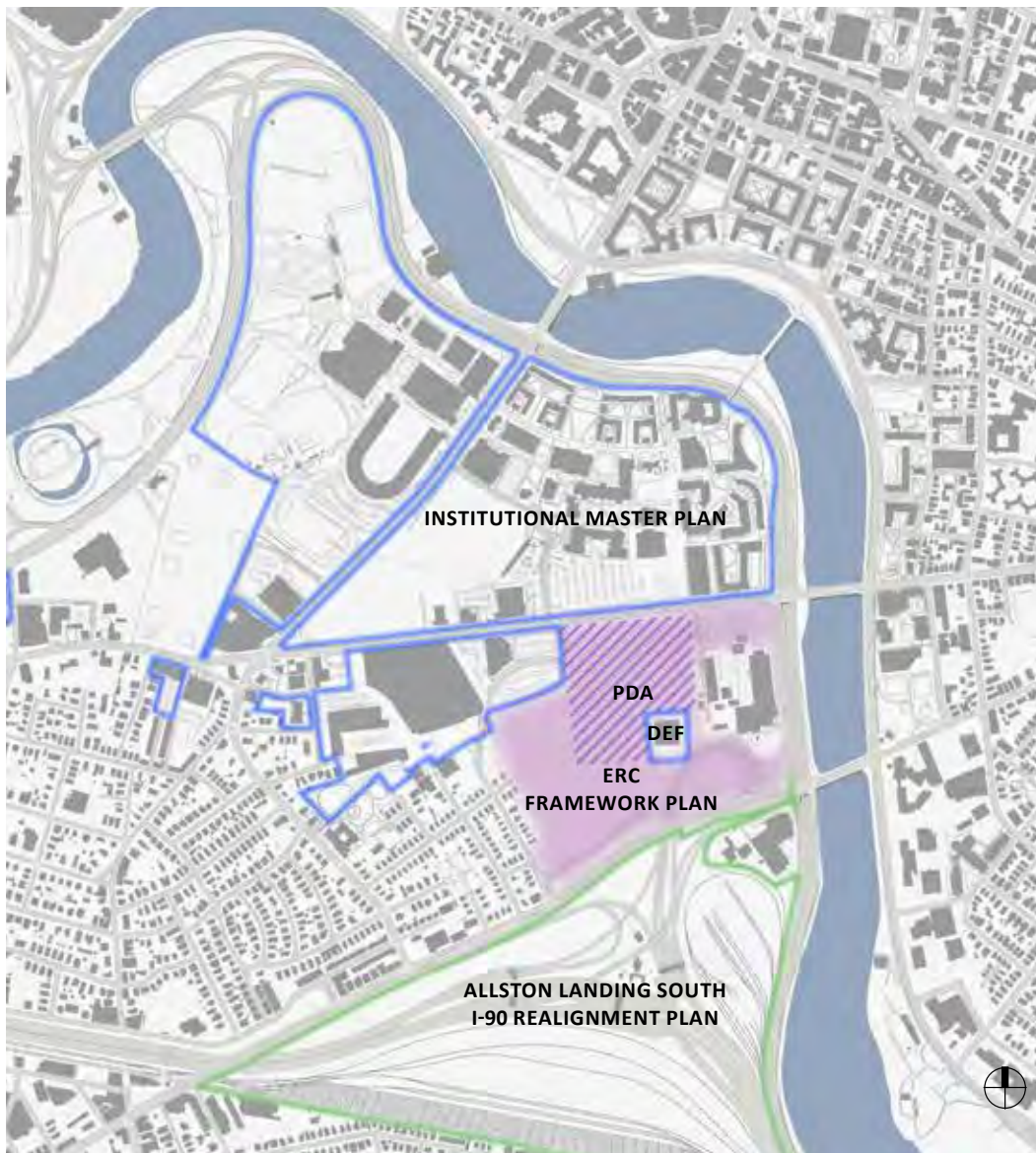
1. Introduction	1
2. Process	3
3. Vision	5
4. Context	7
Geographic and Permitting Context	7
Transportation Access	8
Imagine Boston 2030	9
History of Harvard Landscape Transformation	9
History of Land Area	10
Looking Ahead	17
Physical Limitations	18
5. Planning Approach	19
Framework Plan & Overall Principles	19
Planned Development Area	20
6. Land Use	23
Land Use Principles	23
Housing	25
7. Transportation	27
Transportation Principles	27
Streets	28
Breakdown of Blocks	29
Transit	30
Pedestrian Permeability	32

Bicycle Network	33
Parking	35
Complete Streets	36
Streetscape Guidelines	37
Prototypical East-West Street Sections	38
Prototypical North-South Street Sections	39
Cattle Drive	40
Additional Issues	42
8. Infrastructure, Sustainability & Resilience	43
Infrastructure, Sustainability and Resilience Principles	43
Potential District Impacts	44
Design for Resilience	46
Utility Corridors/Smart Utilities	48
Conceptual Grading	49
Stormwater Management	49
9. Public Realm	53
Public Realm Principles	55
Urban Design Framework	56
Landscape Framework	58
Long-Term Illustrative Plan	60

1. Introduction

Harvard's planned Enterprise Research Campus (ERC) will comprise a vibrant and exciting urban district focusing on research, entrepreneurship and innovation. The University plans to develop the ERC in conjunction with development partners within a district adjacent to its campus in Allston. The ERC will foster new levels of collaboration between Harvard, businesses, entrepreneurs, investors, its neighboring higher education institutions, the region's robust life sciences community as well as global entities.

This Framework Plan was first submitted in conjunction with the filing of the Planned Development Area (PDA) Master Plan for the first phase of the ERC to provide district level planning context. The Framework Plan is not intended for regulatory review or approval. The Plan presents a development vision largely beyond the time frame, geography and program for which the University has gained approval through the PDA Master Plan process.



Enterprise Research Campus Planning/Permitting Context

This document takes into consideration the development of Allston through time, from historic conditions, to current conditions, through the initial phase of the ERC and beyond. The University’s landholdings will be developed over decades to come – requiring forward thinking about street and block plans, open space, circulation networks and utilities. This Framework Plan is intended as a “living document” that will evolve and respond to new ideas and changing conditions such as the final resolution of the Massachusetts Department of Transportation (MassDOT) plans for the reconstruction of the I-90 Interchange.

The Framework Plan envisions an active mixed-use urban district supported by complete streets and resilient infrastructure. The Plan emphasizes the importance of a robust public realm to include an interconnected network of open space, public plazas and ground-level retail. The Plan also promotes access to the area by walking, biking and the use of transit.

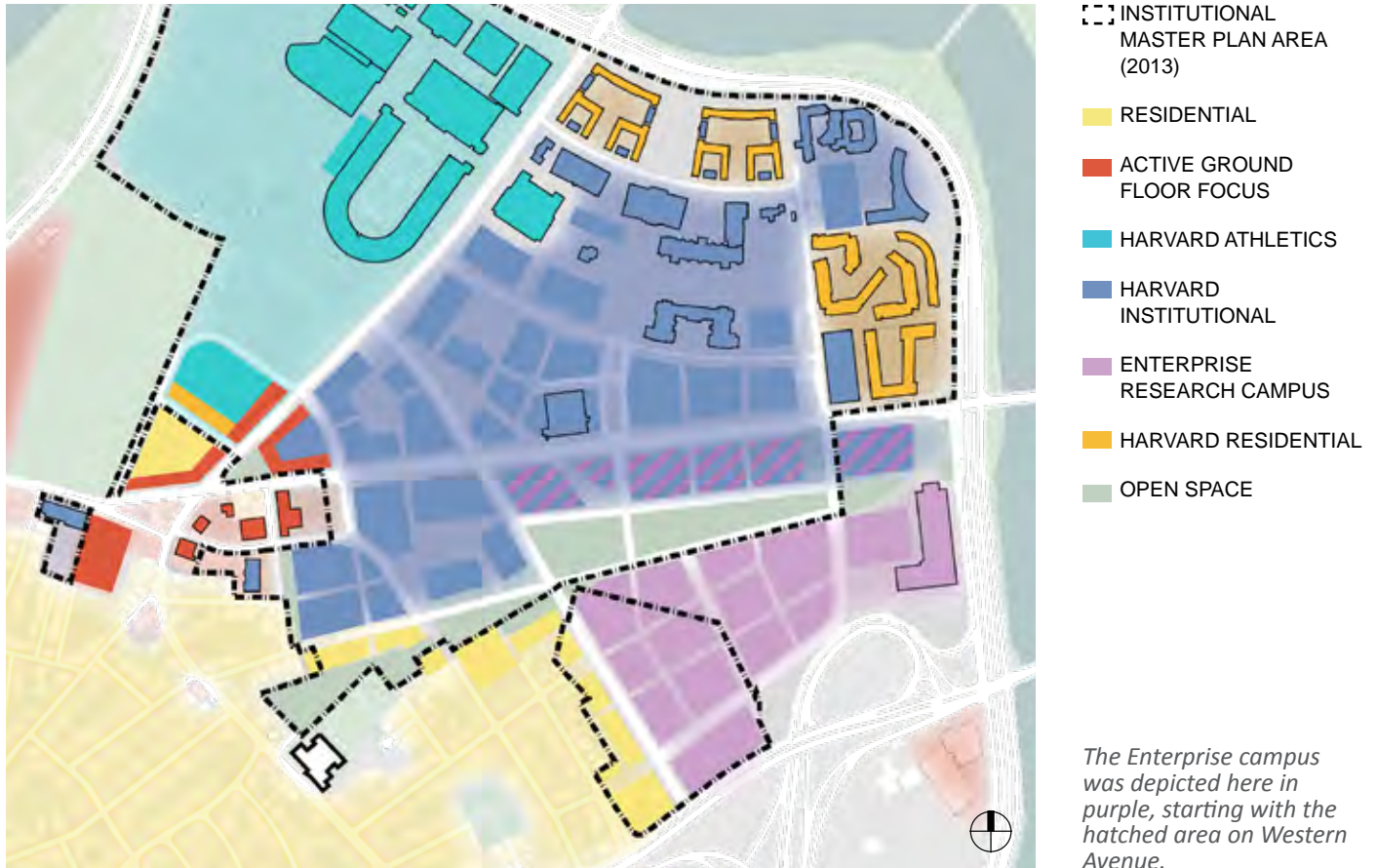


Framework Plan Overview + Context



2. Process

The ERC was recommended in 2011 by a specially convened Harvard committee, the Harvard University Allston Work Team, to complement institutional growth. This concept and its location south of Western Avenue was depicted in the 2013 Institutional Master Plan. In 2013 when this image was presented, the future street grid was not yet reflective of planning for the I-90 Interchange immediately to the south.



Harvard-Allston Institutional Master Plan (2013)

The Enterprise campus was depicted here in purple, starting with the hatched area on Western Avenue.

In March 2018 the Boston Planning & Development Agency (BPDA) Board voted to approve a PDA Master Plan for an initial development phase of 900,000 gross square feet (GSF) on an area of 14 acres. In order to provide a district context and rationale for the PDA Master Plan, Harvard produced the ERC Framework Plan. The Framework Plan provides an overall vision for the ERC and illustrates the major physical systems that over time will shape the ERC development such as streets, open space, bike and pedestrian circulation, and infrastructure.

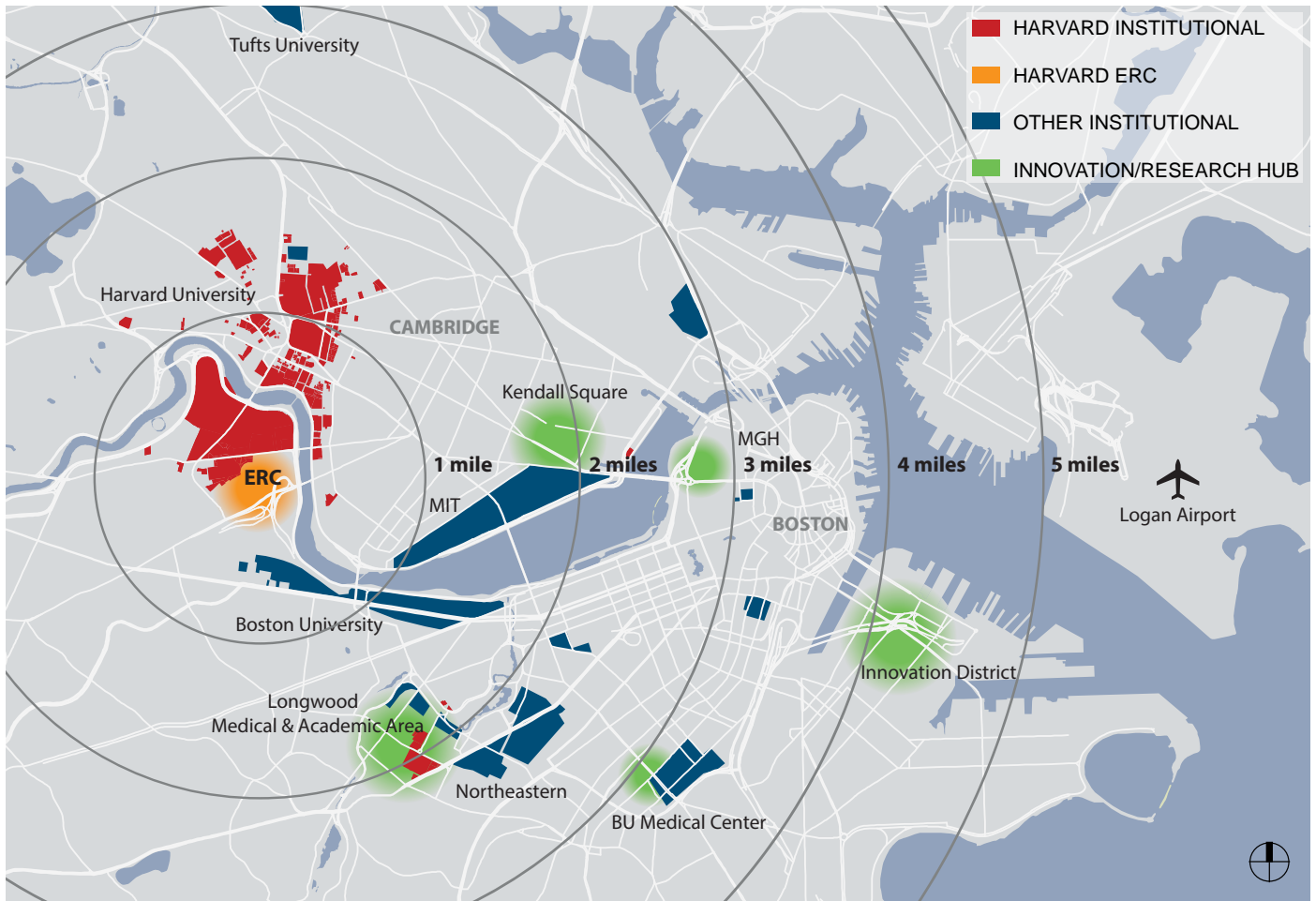
The ERC Framework Plan has been updated to capture the public process leading up to the PDA Master Plan regulatory approval, including additional documentation in areas such as the planned Greenway, open space, bike circulation, parking, housing and other issues raised in Impact Advisory Group (IAG) and City discussions. The Greenway configuration has been revised and expanded, and key information communicated through the public review process has been specifically addressed. This revised Framework document comprises the most up-to-date Harvard vision for ERC development as of the March 2018 PDA Master Plan approval.

Areas that have been indicated as subject for longer-term planning, including topics such as design guidelines, the evolution of transportation mode share, height and character of housing, and various other relevant issues, will be addressed in subsequent regulatory filings and will be added to the Framework Plan. Such updates will be conducted in collaboration with City staff and will be presented to and discussed with the IAG.

3. Vision

The ERC will become a hub for both large and small companies and non-profit organizations pursuing a wide range of opportunities for applied research and entrepreneurship. Its development will facilitate community and academic collaborations across the region. For some enterprises, Harvard’s strengths in business, science, engineering, medicine, design, law, and liberal arts will be important attractions. These groups will also benefit from the proximity to neighboring research institutions and Boston’s world leading hospitals.

The ERC will be designed to foster collaboration. Details of the plan – from landscaping to building layout, roadways to hallways, sidewalks to restaurants – will be developed with an eye toward promoting community. The campus will foster connections between the academic community (faculty, students, postdoctoral trainees) and their counterparts in private sector companies; the area’s numerous higher education institutions; between would be entrepreneurs and investors; and between local companies and global partners. Its buildings and services will support a diverse group of research and development firms. The ERC will be inclusive, welcoming innovators from around the world. Anchor companies, incubators, and startups, will be invited to help populate the neighborhood alongside Harvard-affiliated endeavors.



Area-Wide Institutions & Innovation Districts

As Harvard sets out to define this special opportunity, it will look to the future, take inspiration from the present and the past, and proceed with thoughtful attention to the integrity of the University's academic mission and the well being of the Allston community. The University will expect its partners in the development of the ERC to proceed in ways that are consistent with Harvard's institutional goals and values and that will bring a range of economic and social benefits to Boston, Cambridge and the region.

In addition to private companies and institutions, realization of this vision will depend on partnerships and collaborations with a range of City and State agencies. The planning process for the ERC will include open and dynamic approaches—to evolving circumstances, changing priorities, and emergent opportunities. A guiding intention throughout will be to create the conditions that will form and sustain an environment that is conducive to innovation, technology translation, and commercialization. The district will also seek to be innovative in its form and function. As the Framework Plan evolves innovations in many aspects of city building will be explored. With the expertise and assistance of many participants who will help to shape this neighborhood, the ERC will realize its exceptional potential.

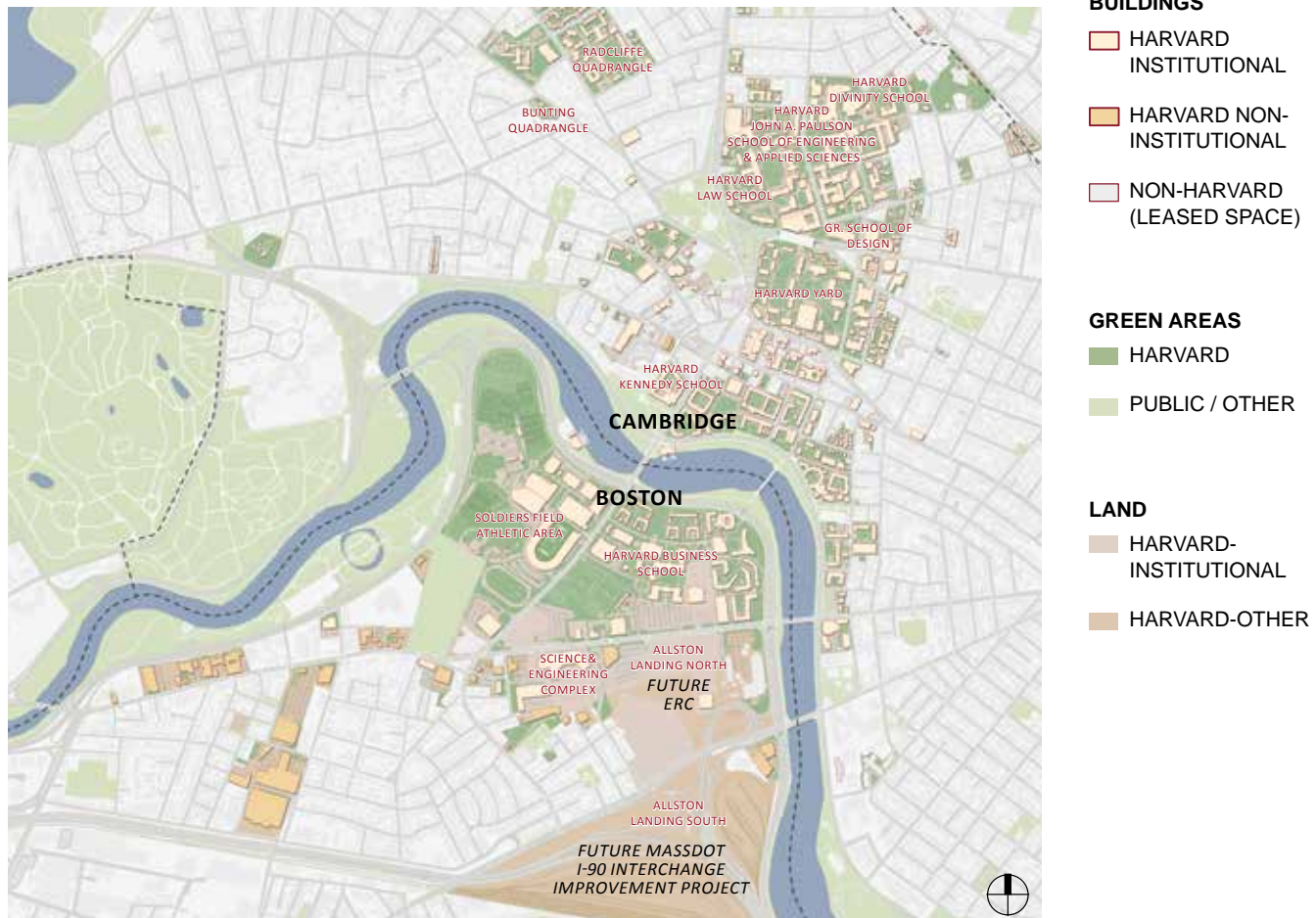
4. Context

Geographic and Permitting Context

Harvard's Cambridge-Allston campus straddles the Charles River and two municipalities, Cambridge and Boston. Planning respects and responds to individual municipal contexts and development approval processes. In Boston, institutional projects are generally governed by an Institutional Master Plan (IMP). Harvard's 2013 IMP included a Ten-Year Plan of projects as well as a Long-Term Vision, outlining future development beyond the ten-year time frame.

Development by private and commercial entities is considered non-institutional and is subject to a zoning mechanism other than the IMP process. On this basis, Harvard is proceeding in the ERC under the Planned Development Area (PDA) Master Plan for Development process. Harvard's 2018 PDA Master Plan submission for the ERC includes an initial phase of development on approximately 14 acres of land on Allston Landing North. The initial program includes 900,000 GSF and approximately 800-900 parking spaces (below grade and interim surface). Before a specific building project is approved, the follow-up step of a PDA Development Plan and Large Project Review is required.

As noted earlier in the document, while important regional factors are evolving, this document serves to capture a current long-term planning framework for the district at-large and context for the first phase development within the ERC.

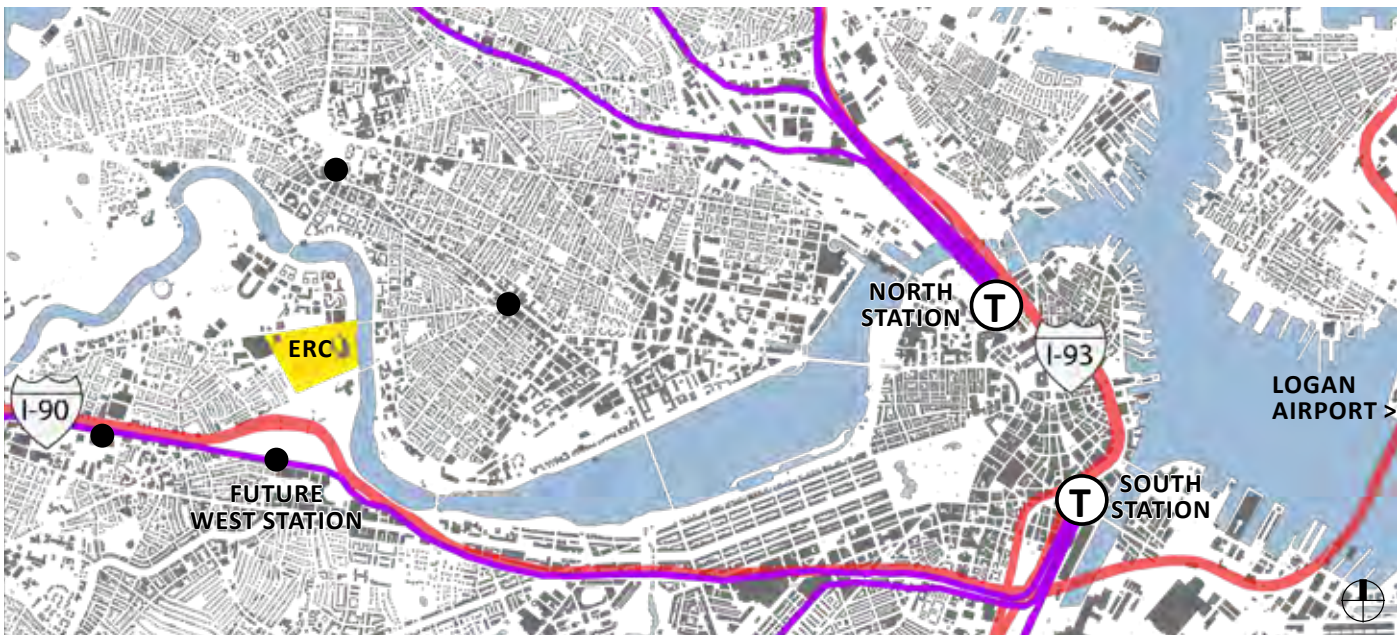


Harvard Cambridge-Allston Campus Map (2018)

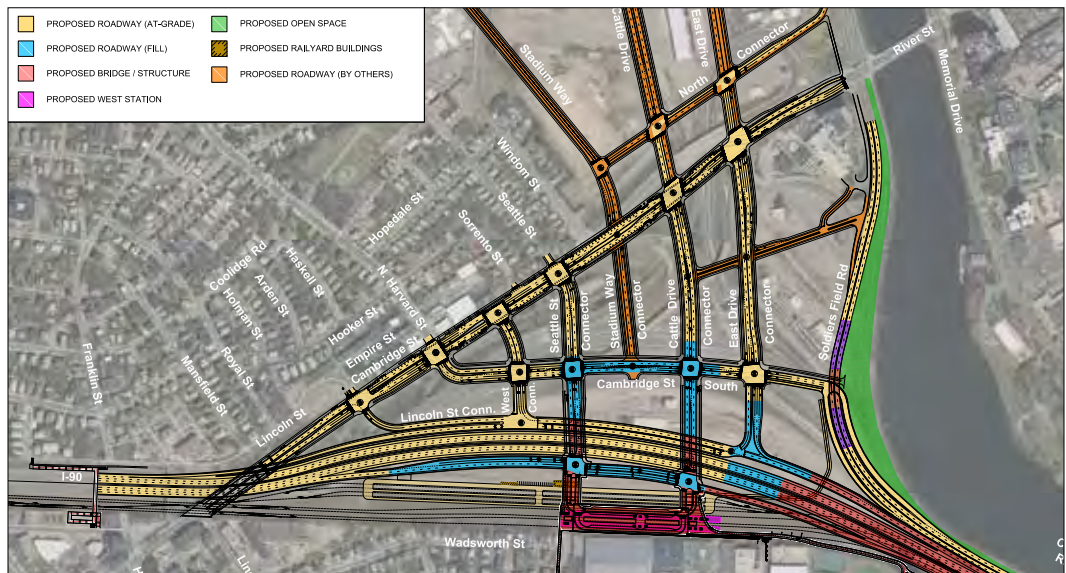
Transportation Access

Undeveloped land adjacent to highway and rail infrastructure presents the University and City of Boston with an important development opportunity. MassDOT is actively working on the planning for I-90 Allston Interchange Improvement Project around exit 18. The project is the result of the need to replace a deficient and obsolete viaduct and bridge structure in the interchange area along with the opportunity to reduce the footprint of the existing interchange with the addition of electronic tolling. The street grid planned for the ERC will tie into the new urban interchange configuration planned by MassDOT to the south. As part of the MassDOT project, the University has participated in planning for and committed funding for the creation of a new intermodal transit center with a new stop on the Worcester/Framingham commuter rail line to be known as West Station. The area is already served by exceptional highway access to Logan International Airport and downtown Boston via I-90.

- COMMUTER RAIL
- HIGHWAY
- ERC
- ADJACENT TRANSIT STOP



Metropolitan Context / Figure-Ground



MassDOT I-90 Interchange Concept 3K (2016)

The MassDOT design for the reconfiguration of exit 18 on the Mass Pike and future West Station.

History of Land Area

In the early days of Boston's history, the area of the ERC was largely comprised of wetland, partially inundated by tides twice per day, crossed by creeks, naturally drained, unfenced and open. By the time Harvard acquired the land in 2000, it was of an entirely different character. Fully paved and fenced, the land was essentially a barren truck yard contributing little to the area's economy.

Tidal Salt Marsh

Prior to the mid Nineteenth Century, the area of the planned ERC was largely a wetland estuary, subject to the ebbs and flows of tidal forces. Surrounded by hundreds of acres of salt marsh, the land included various shallow channels that led to the Charles River. Partially inundated at high tide, and largely mudflats at low tide, the land met the Charles River in the form of watery inlets and small coves. Like much of the Charles River basin at that time, the land was not suitable for significant real estate development. Open and unsettled, the property provided little economic benefit beyond the harvesting of salt hay.

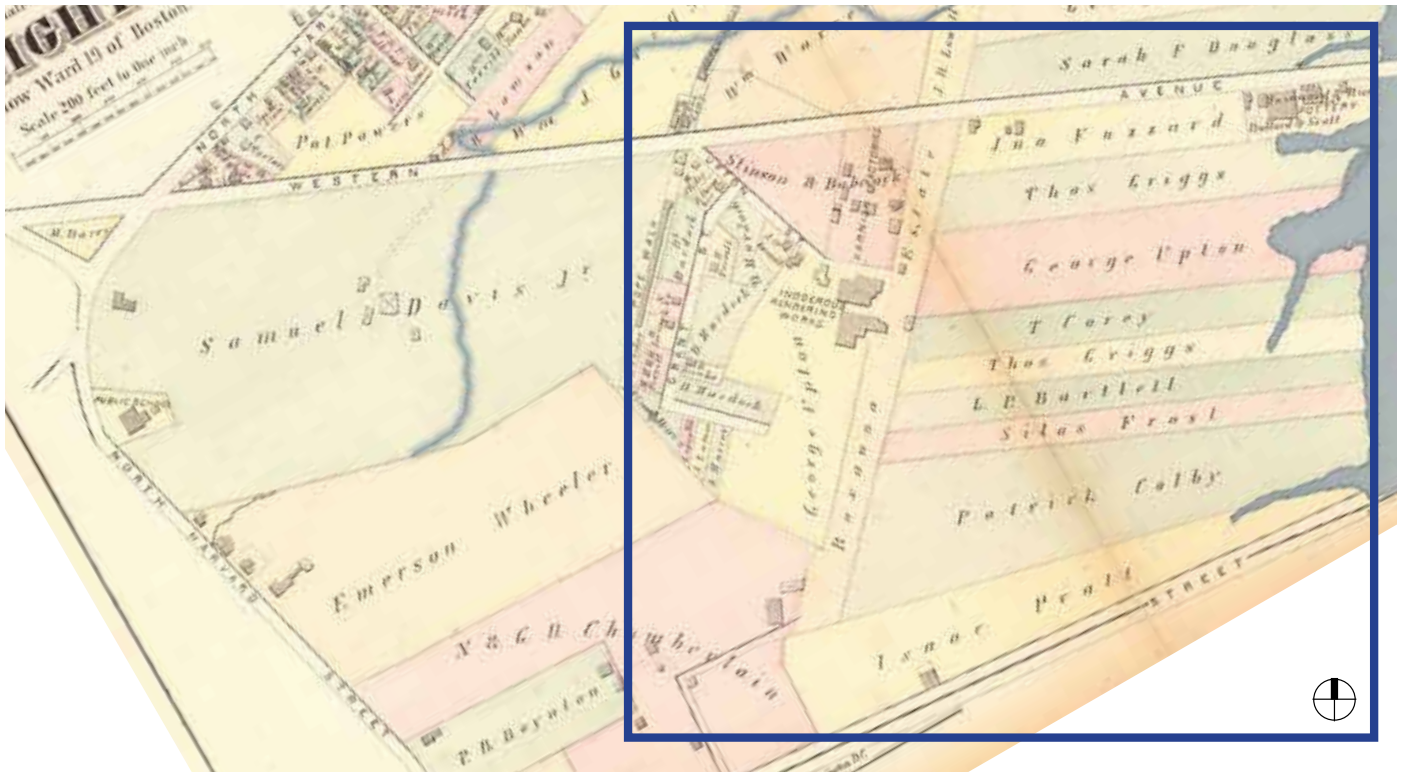
Establishment of Regional Rail Service

The introduction of a major railroad line, the Boston and Worcester Railroad, in the area during the mid Nineteenth Century resulted in the utilization of flanking properties, including the planned ERC area, as support sites for the freight operations of the railroad. Later renamed the Boston & Albany Railroad, the rail line gradually expanded by adding extensive car repair and paint shops, a freight yard, round houses and loading facilities. In the 1920's, railroad round-houses were constructed along Cambridge Street, just south of the area of the planned ERC. These linked to the main line railroad to the south, and served as freight spurs and service facilities. Due largely to the availability of freight rail service, within the planned ERC area a number of industrial uses were established. This began the process of fencing and paving portions of the site.

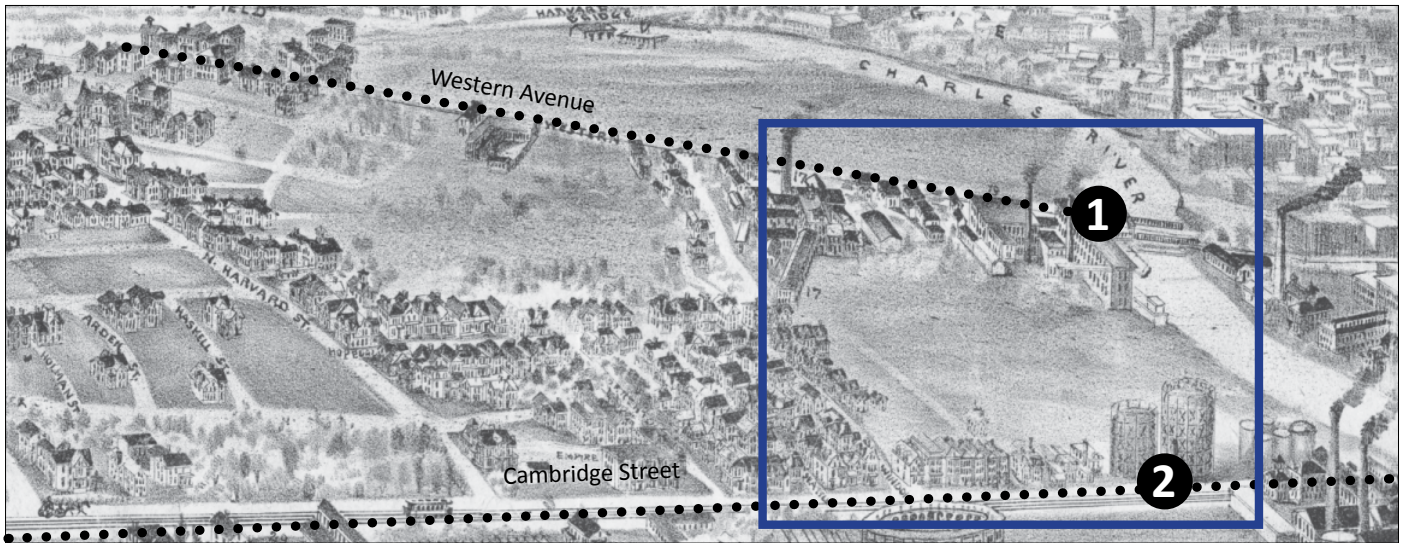
Charles River Dam and Riverfront Transformation

The construction of the Charles River Dam in 1910 stabilized the river bank that had up until then been subject to daily tidal flows. With the subsequent construction of Soldiers Field Road, the Charles riverfront area began the process of evolving from industrial uses such as wharves and cattle abattoirs to higher education uses such as the campus frontages of MIT, Boston University and Harvard. The area of the planned ERC is among the last former industrial sites along this portion of the Charles River to undergo redevelopment.

With the stabilization of the riverfront, Harvard's growth into the Allston area in the 1930's established the importance of this portion of Allston to the City's future. The Harvard Business School development, just north of the planned ERC area, initially focused exclusively toward the riverfront to its north. Only upon construction of the Spangler student center in 2001 did the Business School begin to turn part of its focus toward Western Avenue, bringing new attention to the area now planned as the ERC.



Tidal Marsh (1875)



(1) Coca-Cola Plant
(2) Brookline Gas Lamp Co



Industry (1899)

Massachusetts Turnpike Extension

During the early 1960's, the Allston Landing North area underwent a fundamental change in ownership that strongly influenced its future utilization. Until that time, the area included over 20 separate parcels, and a variety of private owners. The Massachusetts Turnpike Authority (MTA), a predecessor agency to MassDOT, used its eminent domain powers to assemble this assortment of privately owned parcels into a single property, preparing for the land's use for highway and associated facilities. As a result, from that time forward the property became a large singular "super-block" and its redevelopment potential changed dramatically.

Subsequently, the MTA constructed the Massachusetts Turnpike Extension and its associated ramps serving the Allston area, which enabled trucking services to supplement the railroad's freight delivery services. Construction of the Turnpike ramps reinforced the vehicular orientation of the area, and facilitated significant heavy truck operations along Western Avenue and Cambridge Street, some of which spilled over into the adjacent neighborhood along Windom Street.

During this same period, the MTA's additional acquisition by eminent domain of property to the south of the currently planned ERC enabled the creation of the Beacon Yard rail support area just south across Cambridge Street. The establishment of the Beacon Yard support facilities resulted in the area currently planned as the ERC to be utilized then as a secondary support yard, providing intermodal truck access to the rail freight operation. The ERC area to the north of Beacon Yard was subsequently leased by CSXT to Romar Transportation System for freight forwarding.



Warehouse, Trucking & Auto Oriented Uses (1990's)



Transition to Enterprise Research Campus (2013)

Redevelopment Proposals

After construction of the Turnpike Extension and continuing into the early 1990's, a number of redevelopment proposals for this area emerged. For example, in the 1960's the debate over the potential location of the Kennedy Library in the vicinity of Harvard Square resulted in interest in a location within the area of the currently planned ERC. The planning process involved a North Allston/Harvard Land Use Task Force, and a product of this planning effort included the following community goals for future development, which even today are generally consistent with Harvard's long-term planning for an Enterprise Research Campus:

- New development should complement the existing neighbors and enhance the character of the existing neighborhood.
- New development should alleviate truck traffic from neighborhood streets and access directly from the Turnpike if possible.
- A complete mix of housing types should be provided within economic constraints.
- Public open space should take advantage of river frontage and provide recreational areas.
- Any plan must be capable of implementation predominantly by the private sector.

During the 1970's and 1980's the MTA explored different development opportunities for the ERC area. These development concepts ranged from residential to high density commercial schemes. In 2002 the City of Boston began an area-wide redevelopment plan that included the planned ERC land, referring to it as an "Economic Development Campus." The plan was documented by the Boston Redevelopment Authority (BRA) as the North Allston Neighborhood Strategic Framework.

A Boston Redevelopment Authority plan involving residents, businesses and community organizations in developing a vision for the North Allston Neighborhood.



North Allston Strategic Framework (2005)

Harvard Purchase of Allston Landing

In the late decades of the 20th century, Harvard's development potential in Cambridge was becoming an increasingly scarce commodity. Projecting that it would literally run out of space in the early decades of the 21st century, Harvard in 1989 began purchasing commercial land in Allston, including the ten-acre Sears warehouse site located directly west of the Romar operation.

Harvard purchased the underlying rights to Allston Landing North (ALN) in 2000 and Allston Landing South in 2003, collectively Beacon Park Yard (BPY), from the then Massachusetts Turnpike Authority. CSXT continued to control and utilize BPY for ongoing rail-related operations through permanent easements after Harvard's purchases. Over the course of a decade, Harvard and CSXT negotiated and implemented an agreement for CSXT to relocate operations from BPY. Implementation of that agreement has occurred in phases including the removal of structures, environmental investigations and remediation. Where necessary, remediation continues to unfold today.

CSXT relinquished their easement rights in ALN to Harvard in December 2015, providing the opportunity to locate a new District Energy Facility (DEF) project in ALN and also setting the stage for the planning of Harvard's Enterprise Research Campus to commence in earnest.

Concurrently, the viaduct supporting the adjacent I-90 interchange through Allston was determined to be in deteriorating condition. As the Commonwealth contemplated ways to address this critical infrastructure issue, the reduced presence of CSXT in BPY and Harvard's status as the single landowner also made possible the consideration of I-90 project design approaches beyond merely fixing the viaduct in-place.

Harvard's purchases of BPY and subsequent negotiations with both CSXT and MassDOT collectively have contributed to new development opportunities for Harvard's Enterprise Research Campus in addition to the I-90 Allston interchange. While the emerging I-90 project currently contemplates the potential for significant long-term public benefit and development from the main rail line to Cambridge Street, Harvard's Enterprise Research Campus similarly considers opportunities from Western Avenue to Cambridge Street.

The long-term plan for the transformation of this property, known as Allston Landing South, includes a new multi-modal transit station and significant new real estate development. As shown on page 8, the plan, known as MassDOT I-90 Interchange Concept, has influenced and is directly related to the development potential of the ERC. In association with the planned reconstruction of the Turnpike and access ramps in this area, the prospect of new transit service supporting significant new development at Allston Landing South now provides a major contextual element to planning for the ERC.

Recent Harvard Projects/Construction Activities

In 2007, in response to neighborhood concerns about construction support activities anticipated within the Allston Landing North area, Harvard constructed an approximately 700 foot long, eight feet high pressure treated wooden noise barrier fence along the east edge of the Windom Street neighborhood. The fence shields the neighborhood visually and acoustically from activities occurring within the Allston Landing North area.

Nearby, a site for the Health and Life Science Center was also fenced—construction started but was paused in 2009 after the foundation was completed due to the financial crisis. This project has resumed as Harvard's Science and Engineering Complex (SEC) which will be open in the fall of 2020. The SEC will house approximately two-thirds of Harvard's John A. Paulson School of Engineering and Applied Sciences (SEAS) and will be among the most cutting-edge teaching and research facilities in the country — featuring laboratories, classrooms, and related teaching and research space. The building will be used by undergraduates, graduate students, researchers, and faculty members. The adjacent 114 Western Avenue building will be renovated to house administrative functions.

In 2015, Harvard determined that the District Energy Facility originally slated for a location below the planned SEC would be at-risk to the flooding impacts of climate change. This determination led Harvard to remove the facility from the subsurface level of the SEC and to construct an above-grade facility in Allston Landing North. The reasons for this decision included land control, flexibility of the site, and distance from the residential neighborhood. The DEF facility will be the first new building within the Allston Landing North area when it opens in 2019.

North of the ERC, HBS is constructing Klarman Hall, a convening center which is expected to open in 2018. While setback from the street, this facility continues the extension of the HBS campus south toward Western Avenue. The University first established an academic presence on Western Avenue with the i-lab (2011) and the Life Lab (2016). The ArtLab along North Harvard Street will add to the innovation cluster, construction has commenced and it is expected to open in 2019.



Aerial View (2017) & Projects In Construction

Looking Ahead

Today and looking forward, Harvard seeks to develop in a new way, to create a venue for research-based businesses and other entities to thrive and to promote interaction across fields, disciplines, and institutions. The University can now utilize a number of opportunities that this unique property and Allston Landing South provides. In addition to adjacency to a world-class teaching and research campus, these opportunities include a shift in emphasis from freight transport to passenger transit, improved highway access, single ownership of a multi-acre site, riverfront proximity, and the long-term transformation and redevelopment of the Beacon Yard area. What has been an impenetrable, impervious, vehicular-oriented superblock will soon undergo transformation from industrial use to an urban district providing economic benefit to the neighborhood, City and region.



2005 - Transportation & Warehouse Uses



2015 - Vacant Condition



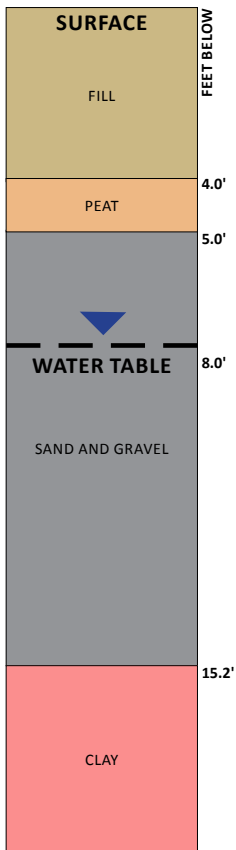
Projects in Construction + Initial ERC Phase



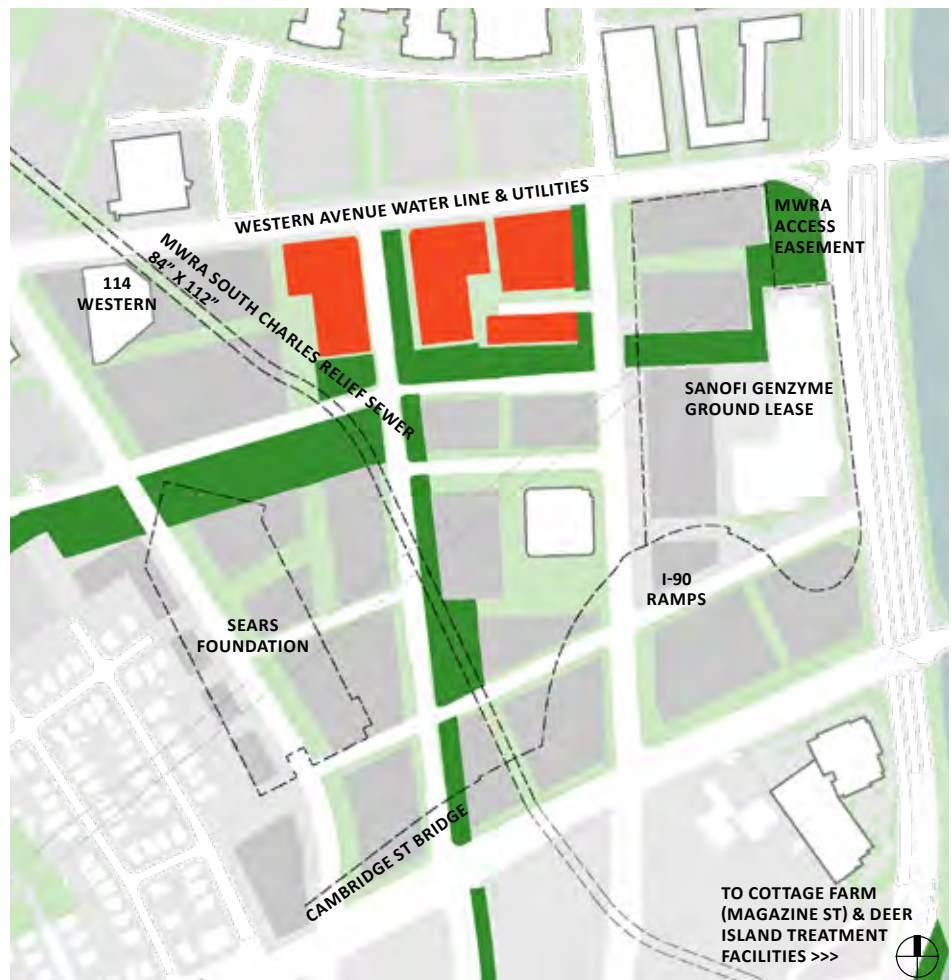
Long-Term Framework

Physical Limitations

Although the ERC site area is largely vacant, it presents a number of challenging conditions that constrain long-term development plans and phasing. One particularly significant constraint is the area's high water table, and the water level maintained in the nearby Charles River Basin. The water table is at approximately eight feet below the surface, potentially impacting plans for foundations and sub-surface parking facilities, and also posing flood risks as indicated by climate change projections. Older infrastructure and roadway facilities on-site also constrain development plans. These include a major 84 inch by 112 inch regional Massachusetts Water Resources Authority (MWRA) sewer line that extends diagonally through the site from northwest to southeast. The ability to build above this sewer line is limited and will need to be reviewed and approved by the MWRA. A former Sears warehouse foundation structure that is approximately one-half acre in size occupies the southwest corner of the site. Removal of the structure will enable later phases of the ERC development program. Introduction of basic infrastructure that does not currently exist (utilities and roads) must proceed development and these significant upfront costs will need to be phased appropriately. An existing Turnpike ramp and the elevated Cambridge Street also currently constrain development plans, but are expected to be addressed as part of MassDOT's I-90 Interchange Improvement Project.



Sample Soil Profile



Existing Physical Limitations

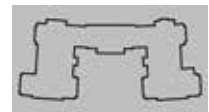
5. Planning Approach

Framework Plan & Overall Principles

This Framework Plan is intended to define the basic parameters that will guide long-term development of the ERC. Rather than defining specific development outcomes, the Plan expresses key principles that, together, express the general character, form and components that the ERC will comprise. The sections that follow list planning principles that apply to each of the topic areas addressed in the Framework Plan.

Overall Principles

- Create a vibrant urban district.
- Establish a synergistic mix of uses.
- Respond to existing and emerging context.
- Create a robust system of open space.
- Plan comprehensively for an active public realm.
- Promote regional transportation access.
- Establish a balanced parking program.
- Support development with a functional smart infrastructure system.
- Demonstrate leadership in environmental sustainability.



Note: Blocks are conceptual in nature; future buildings will be articulated within blocks.

Framework Plan Overview

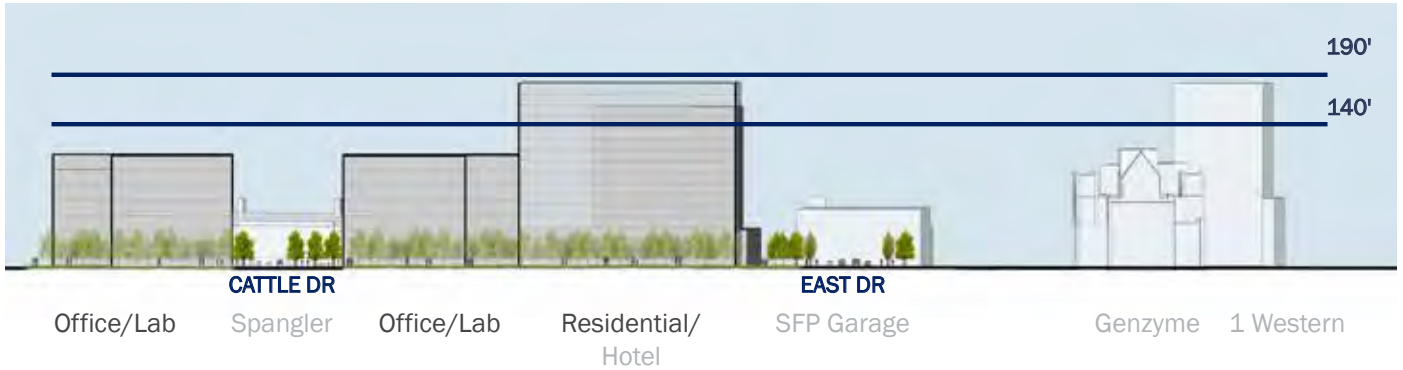
Planned Development Area

The plans and program for the initial phase are summarized here. They are described in detail in the 2018 Planned Development Area (PDA) Master Plan submission.



The location and layout of the initial PDA has been determined by a number of considerations. Use of the south side of Western Avenue will be a logical starting point for ERC activities. By locating proximate to HBS, University Housing, the i-lab Network, and the SEC, a cluster of uses and people will add to the overall vibrancy of the Western Avenue corridor. Later phases further south require removal of the Sears pad and completion of the MassDOT project that will put Cambridge Street at-grade.

The 2018 PDA Master Plan set forth the maximum height for each potential Proposed Project within the initial PDA development program. The site section shown here depicts potential massing of the 900,000 square foot PDA (looking north). The height of the Proposed Project office/lab use fronting on Western Avenue will be limited to a maximum of 140 feet. The height of the Proposed Project for hotel/conference center use will be limited to a maximum of 190 feet. The height of the Proposed Project for residential use will be limited to a maximum of 190 feet.



Site Section - Planned Development Area (Looking North)



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6. Land Use

The Framework Plan seeks to support programmatic relationships between the future commercial tenants of the ERC and the teaching and research mission of the University. The nature of this programmatic relationship will comprise an important aspect of how the ERC meets the goals of the University. Simultaneously, the success of the ERC as an urban district will also be contingent on the establishment of a robust mixed-use development program, including commercial office, lab, research, residential, and retail uses, as well as a range of publicly accessible open spaces. This type of mix will ensure that the area is vibrant, with activity extending through the course of the day and evening.

Land Use Principles

- Establish relationships between commercial, research and academic entities and the University teaching and research mission.
 - Leverage institutional and commercial expertise to translate discoveries into solutions.
 - Integrate faculty and students with experts and industry partners.
- Blend uses both horizontally and vertically to achieve a dynamic 24/7 live, work, play environment.
- Create activity nodes by clustering active uses.
- Provide office, research, retail, residential, and cultural spaces.
- Activate the streetscape - locate private uses and those requiring large floor plates on upper stories.
- Employ pop-up uses for seasonal or interim activation.
- Integrate building typologies to achieve a physical outcome which is diverse—not monolithic.
- Allow for varied scales and materials.
- Provide space for a wide range of commercial and non-profit entities from well-established organizations to startups.
- Allow for convertibility of space as the district matures and technology advances.

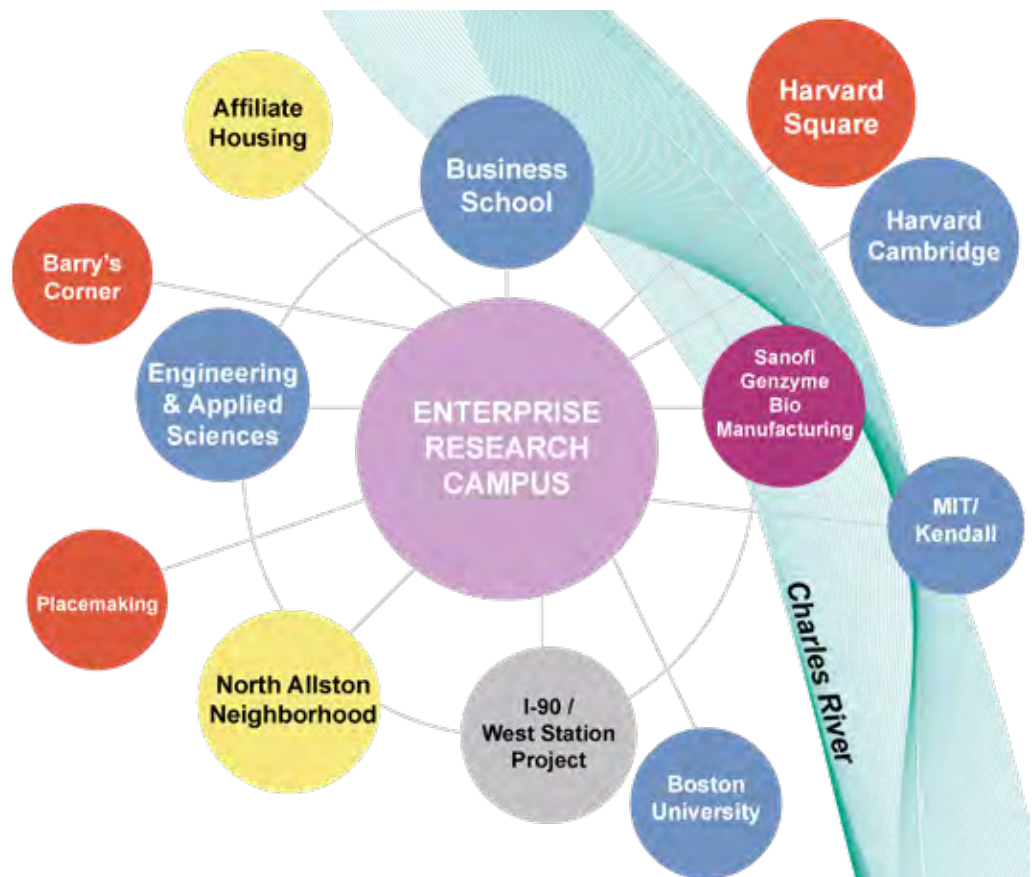
*“The enterprise research campus is a bold development: a new innovation district offering a **broad mix of uses, including new spaces to live, work, play, research, adapt, innovate, and collaborate...**”*

Executive Vice President - Katie Lapp, Harvard Gazette, March 2016

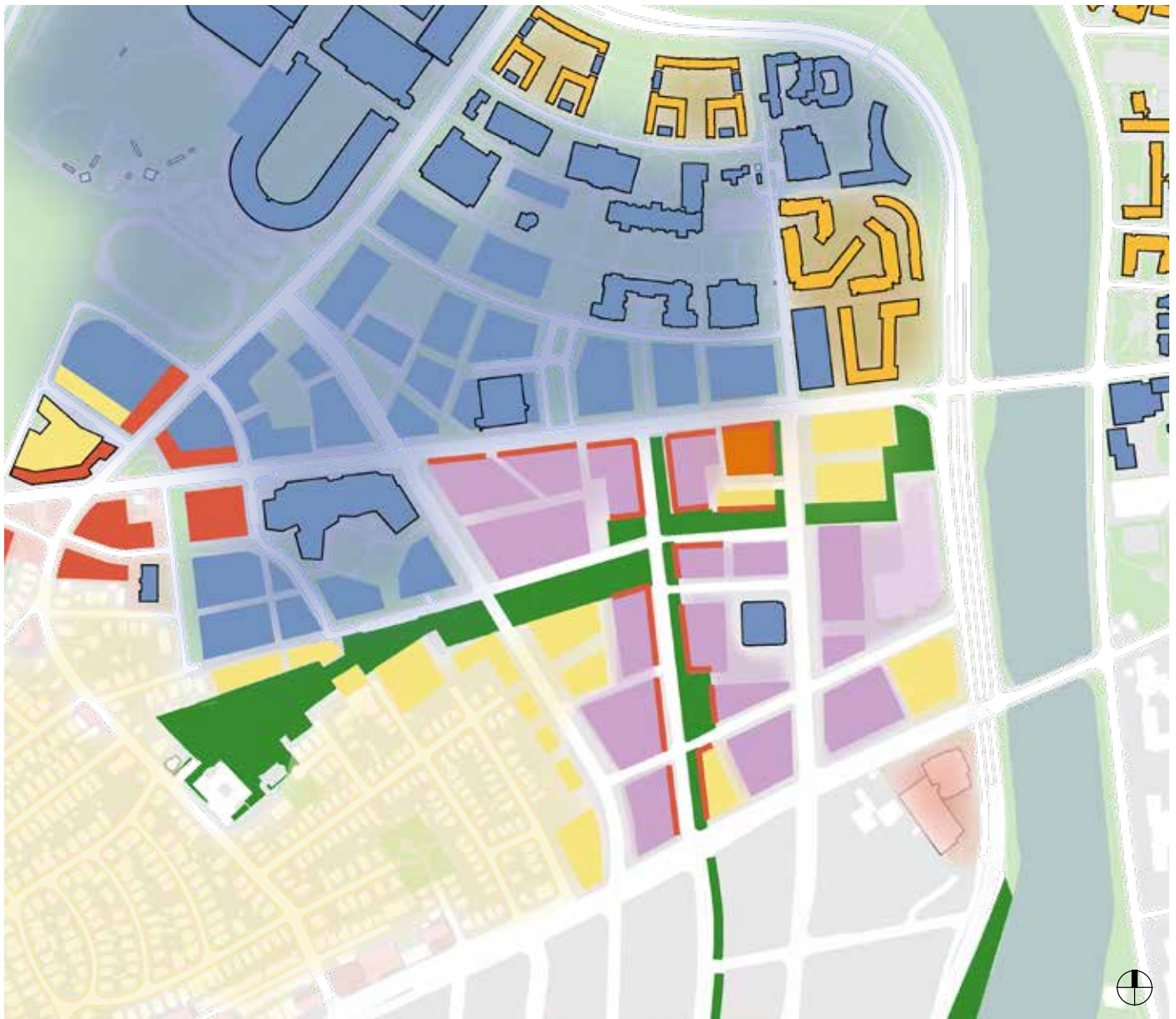
A dynamic mix of uses surround the ERC presenting a range of possibilities for the establishment of programmatic connections. Mutually beneficial relationships might be established between institutional and private groups. Western Avenue will become an important corridor for this interface, and more detail about physical connectivity across Western Avenue will be developed as planning for the area continues.

The land use framework is intended to show an intent for mixed-use with energy focused along Cattle Drive and Western Avenue. New employment, learning, housing, shopping and dining opportunities will exist throughout the ERC. Beyond the PDA area, additional residential sites have yet to be determined. As planning for the area continues, Harvard will work with the City to understand the adequacy of public services.

A high degree of porosity and public interface is desired along primary ERC main streets. Ground floor uses may include retail stores, office, service establishments, common spaces, and cultural and institutional uses involving public programming. Institutional and creative office use may animate ground floors, particularly in early phases, prior to achieving critical mass sufficient to support active retail storefronts. Future PDA Development Plans and Large Project Review filings will provide detail on the ground floor active uses associated with that building or project. Harvard will work with the BPDA and other relevant public agencies to develop goals for inclusion of locally-owned businesses and affordable ground floor commercial space.



Existing District Adjacencies



Long-Term Land Use Framework

- ACTIVE GROUND FLOOR FOCUS
- RESIDENTIAL
- HARVARD INSTITUTIONAL
- HARVARD RESIDENTIAL
- ERC
- HOTEL
- OPEN SPACE

Housing

The Framework Plan recognizes that a meaningful mix of uses is important to the area. Housing will play a central role in the ERC toward establishing a new, vibrant area where the presence of a diversity of active uses and participants leads to a thriving community of workers, residents, business owners, and neighbors.

Harvard University has a long history of active engagement in the creation of affordable housing and remains committed to working with its host communities to address the region’s cost of housing. Through its 20/20/2000 program, Harvard has been a partner in the creation of over 5,000 units across Boston and in Allston. Recently, in collaboration with the Allston community and the City of Boston, the University established the All Bright Homeownership Program—a creative, first-of-its kind housing initiative aimed at fostering owner occupied homeownership specifically in Allston.

In addition to these initiatives, Harvard donated a parcel of property in Allston, providing an opportunity for the City of Boston to issue a creative housing development RFP and resulting in the selection of a developer and project that will include over 50% affordable homeownership units. The University also played a central financial role in and facilitated the transfer of land with Charlesview, Inc. thus enabling the construction of the new Charlesview Residences, additional market rate units, and homeownership housing in the Western Avenue corridor. The University also has paid millions of dollars in linkage payments to the City of Boston related to specific development projects and has committed in its Cooperation Agreements to explore with the City of Boston creative ways to use these funds locally.

Identifying ways to increase a diverse housing stock—through increases to number of units, the number of affordable units, the diversity of units that can support individuals and families, and home ownership opportunities—continues to be a high priority confronting our region. As such, it has understandably been a clear and consistent area of focus for the ERC IAG and Allston neighbors throughout the community meetings and comment letters associated with Harvard’s PDA Master Plan submission.

The University heard clearly that future development in the ERC should contribute to achieving a diverse housing mix, including constructing housing projects that yield “1/3 market rate, 1/3 middle income, 1/3 affordable” as articulated by the IAG. There are consequential issues that Harvard will confront in developing specific plans for the overall 36 acre ERC— including the introduction of basic infrastructure that does not currently exist and which has specific bearing on the financial strategies and feasibility of all components of the ERC (including housing). Therefore, while acknowledging the stated views of IAG members, Harvard has been clear in responding that we are unable to make a specific commitment of this nature at this time.

As the Framework unfolds over time, Harvard is committed to the cumulative impact of ERC development to include upwards of 1,000 units of housing. Harvard will, per regulatory requirements, adhere to the City’s inclusionary housing policies—which may continue to evolve over time. While this represents a threshold requirement, it does provide predictability for the minimum number of affordable units anticipated in the full build-out of the ERC. As the University seeks development partners for the ERC and future development is contemplated, the IAG’s focus on housing will be a critical part of the process.

In response to IAG requests, Harvard agrees to participate in a housing study for the region with other stakeholders. Recognizing that there is no single solution to address the cost of housing in the region, it is the University’s aspiration that thoughtful planning of the ERC can help identify new approaches to residential development.

One of the stated urban design goals in this Framework Plan for the area near the future Stadium Way is to "transition [the] scale of development downward adjacent to low-rise residential." As the Framework Plan is refined over time, guidelines for height and character of housing in different areas of the ERC will be developed.

7. Transportation

Today, the proposed ERC area is a large tract of land that has been fenced and remains inaccessible. A comprehensive and flexible urban network of overlapping routes of travel – for pedestrians, transit users, bicyclists and drivers – will establish permeability and connectivity with surrounding communities and campus areas. The goal is to bring coherence and continuity to all forms of mobility that can be implemented over time as projects are built.

The long-term streets framework for the ERC is driven by many factors including connectivity with existing and planned streets, utility locations within the district and configuration of future development parcels, building on past studies including the Stadium Road 25% Design Study submitted to the City of Boston in 2015. The ERC roadway network is consistent with the MassDOT I-90 Allston Interchange Improvement Project which will transform the area south of the ERC, with the introduction of an urban street grid and opportunities for transit-oriented development around West Station.

Transportation Principles

- Promote regional transportation access.
- Establish an efficient vehicular circulation network.
- Encourage walking and biking.
- Build on local desire lines.
- Create legible routes with distinctive thresholds/gateways.
- Integrate mobility hubs at key activated spaces where networks overlap.
- Minimize impacts of parking and establish a balanced parking program.

Streets

Consistent with the 2013 IMP, the ERC will continue to develop streets for all users and modes complying with the intentions of Boston's Complete Streets Guidelines. Street types balance operational capacity with the context and character of the street and surrounding neighborhood. Preliminary designs for the key streets in the ERC are shown in cross sections beginning on page 38. District frameworks for circulation, urban design, and utilities all impact the manner in which the guidelines are applied. Street locations are in some cases driven by planned intersections determined by I-90 planning. The streets depicted here are the highest level of the hierarchy. The block plan will be broken down and adjusted over time with smaller intervening streets, access drives and non vehicular connections as future phases become defined. Gray blocks are illustrative—showing potential sites within which one or more buildings could be developed. Future street names are placeholders.

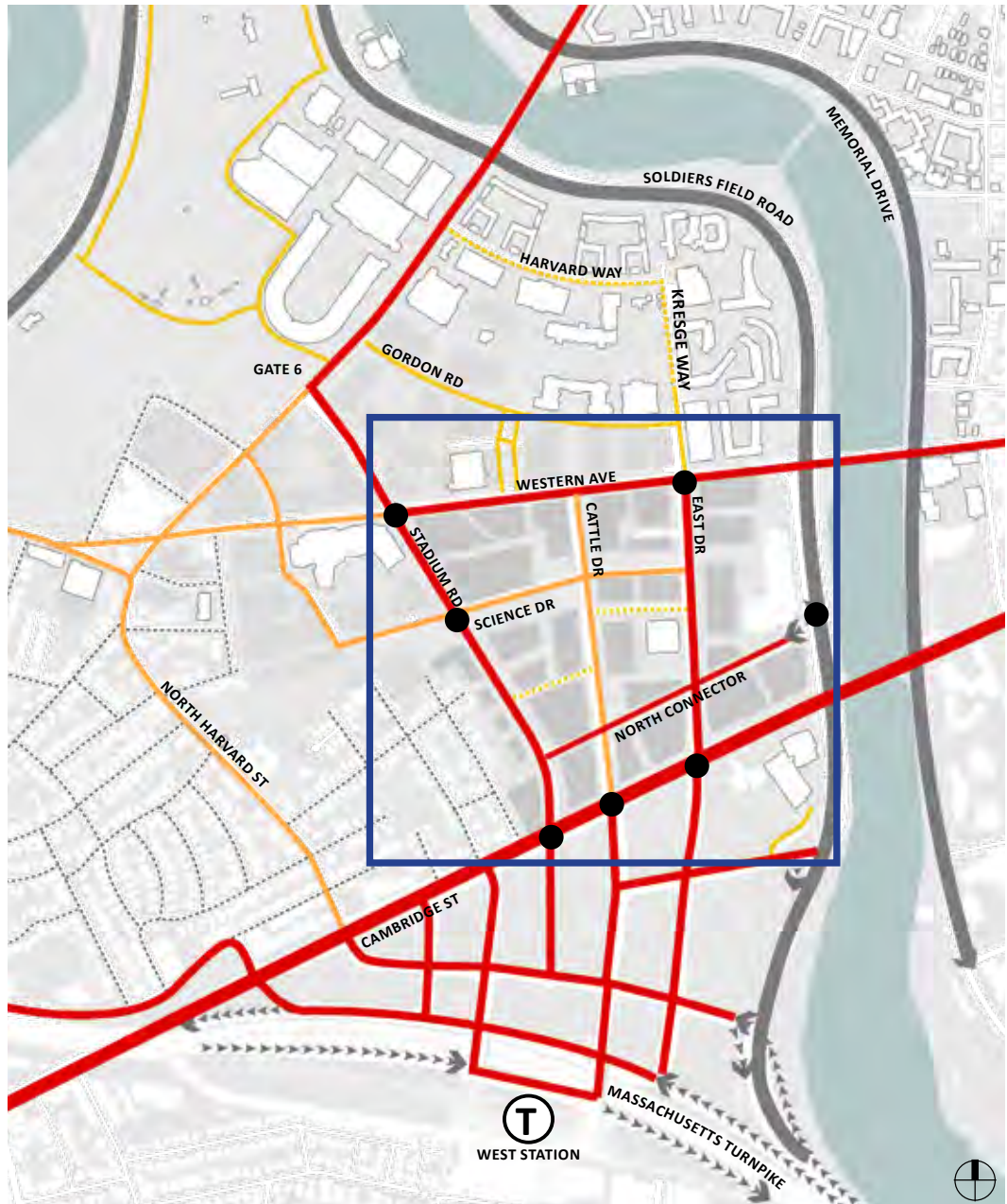


BASELINE (SEC COMPLETE)



STADIUM ROAD 25% DESIGN STUDY (2015)

- FIXED INTERSECTIONS
- █ PARKWAYS
- █ NEIGHBORHOOD CONNECTOR
- █ NEIGHBORHOOD MAIN
- █ CAMPUS DRIVE
- █ CAMPUS DRIVE/LIMITED VEHICULAR ACCESS
- ➔ MASSACHUSETTS TURNPIKE RAMPS



Long-Term Streets Framework

Breakdown of Blocks

The Framework Plan illustrates the major streets in the system. Balance must be struck between providing flexible development parcels and achieving a human scale place. Early on, the block plan must accommodate a variety of typical floor plates including large lab facilities. Urban design objectives must be balanced with needs of buildings users and service requirements. Several positive examples of scaling down can be drawn from Harvard's existing surroundings. The following principles apply.

Block Planning Principles

- Prioritize pedestrians.
- Control/direct vehicular and service activity.
- Seek ways to minimize service areas and garage access points (shared facilities, one way circulation, etc).
- Add mid-block connections.
- Network civic space—hard and soft.
- Reduce perceived block size—break down massing of large buildings and provide multiple entry points.



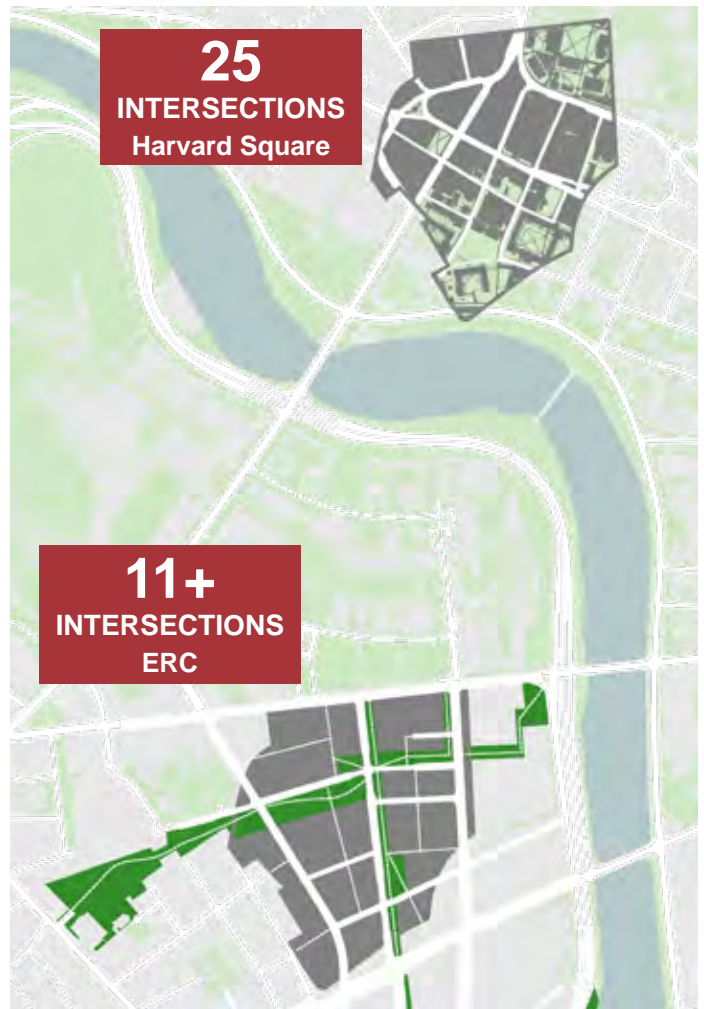
(1) Pedestrian Way/Limited Service - Winthrop St, Harvard Sq



(2) Mid-block path along Harvard Kennedy School



(3) The beginning of a network of civic space - Rena Path, Allston



An area of comparable size around Harvard Square has many more intersections than the initial streets hierarchy for the ERC. Further breakdown of blocks must be part of future ERC phases.

Transit

Transit is a key element to the development potential of the district. Plans will provide for a multi-modal integrated transit system.

Mobility Hubs

Identified initially in the 2013 Institutional Master Plan, mobility hubs will provide available transportation options in organized clusters. Each location will identify a variety of choices to users such as MBTA travel, bicycle facilities, and car sharing to allow for seamless transfers.

Campus Shuttle Bus Connections

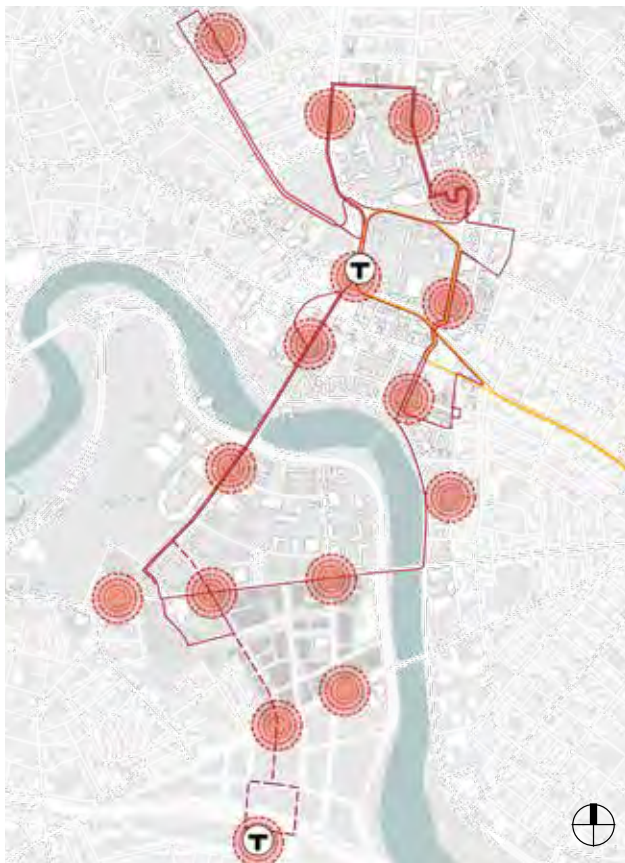
Harvard operates the Allston Express shuttle which connects the existing campus with a one-way loop and the two-way Barry's Corner service connecting Barry's Corner with Harvard Square. Extension of shuttle services are planned as part of the SEC project. These extensions will also make the Harvard shuttle services more convenient for travel to and from the ERC. In the future it is anticipated that the shuttle system will extend to West Station.

Local and Regional Connections

In the future, existing area bus routes can be modified to provide service to the ERC. For example, existing MBTA bus service between Allston and Central Square is currently comprised of the 70/70A route along Western Avenue and the 64 route along Cambridge Street. Both routes can provide better transit connectivity for the ERC when modified to travel via East Drive. Stadium Road will ultimately provide a transit corridor through the ERC, linking the ERC with the Harvard Red Line subway station to the north and a new West Station to the south.

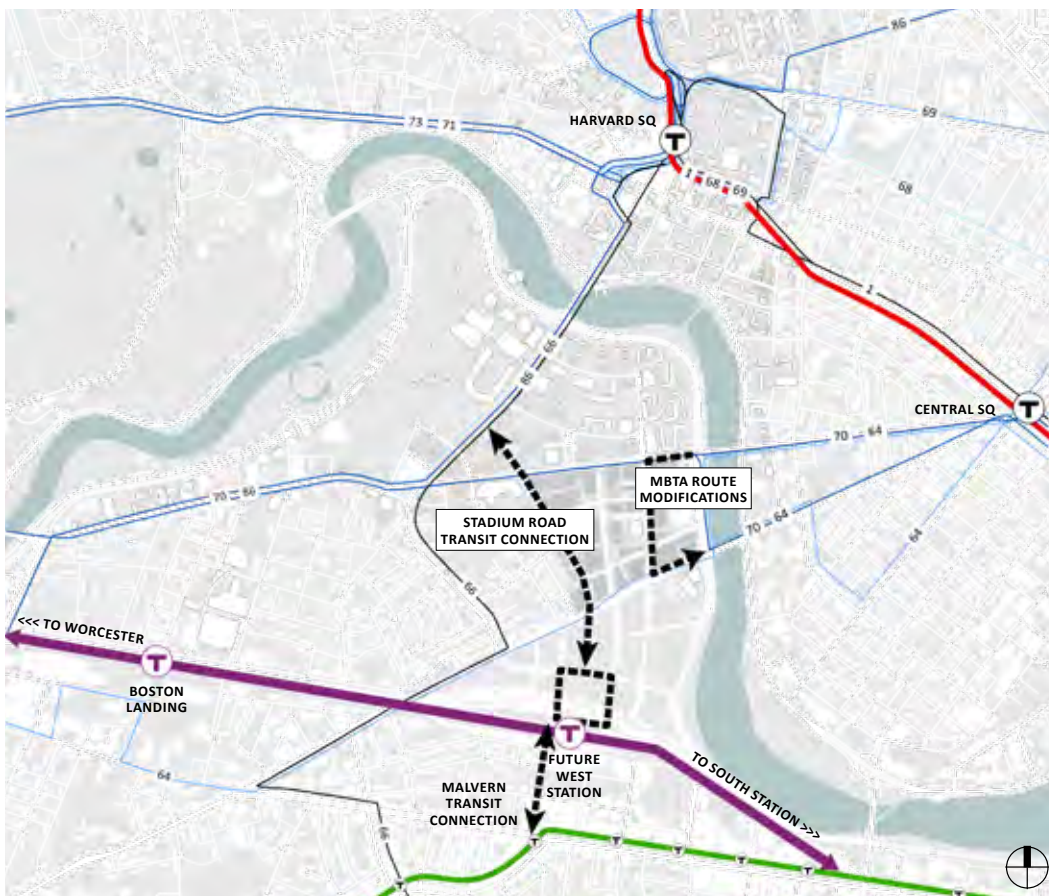
Transit Principles:

- Promote regional transit access in coordination with the MBTA and MassDOT.
- Implement transit improvement in coordination with increased density.
- Establish transit priority routes and mobility hubs for convenient transfers.
- Integrate stops with pedestrian and bicycle networks.
- Seek transportation connections to other innovation and research districts.



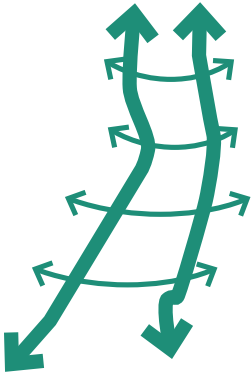
- HARVARD SHUTTLE
- MASCO LMA SHUTTLE
- MOBILITY HUB

Long-Term Shuttle Framework and Mobility Hubs



- - - BUS (FUTURE)
- — — BUS (EXISTING)
- SUBWAY
- COMMUTER RAIL

Long-Term Transit Framework



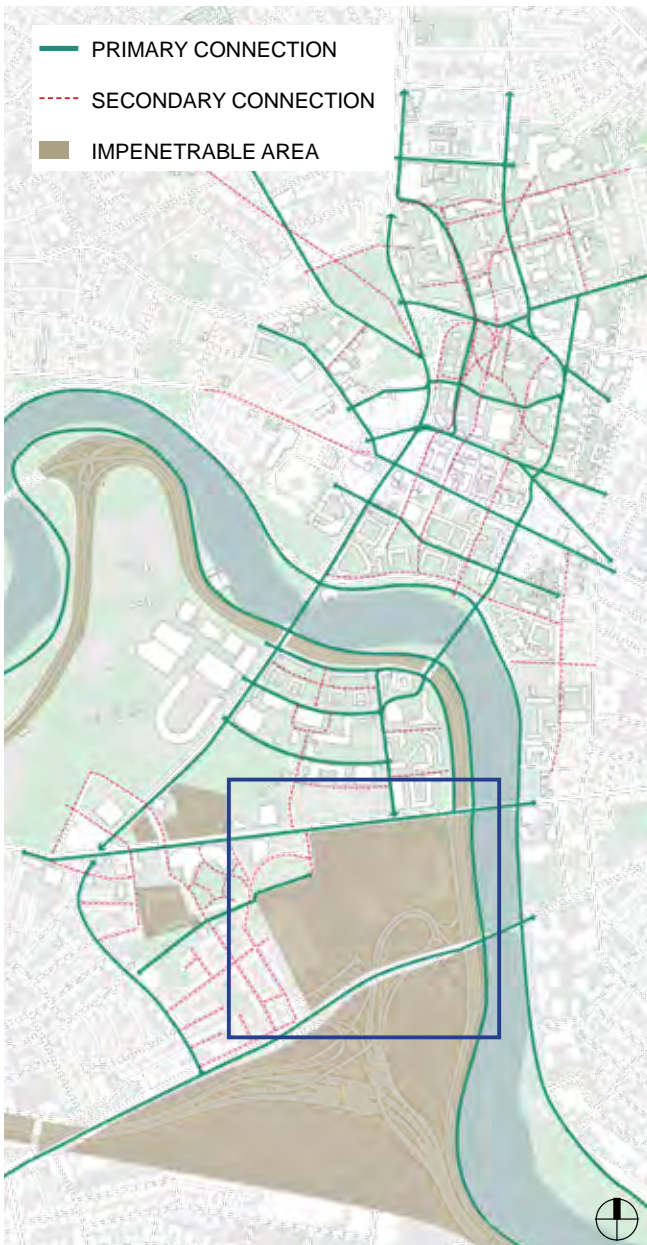
Pedestrian "ladder" connecting Harvard in Cambridge and Allston

Pedestrian Permeability

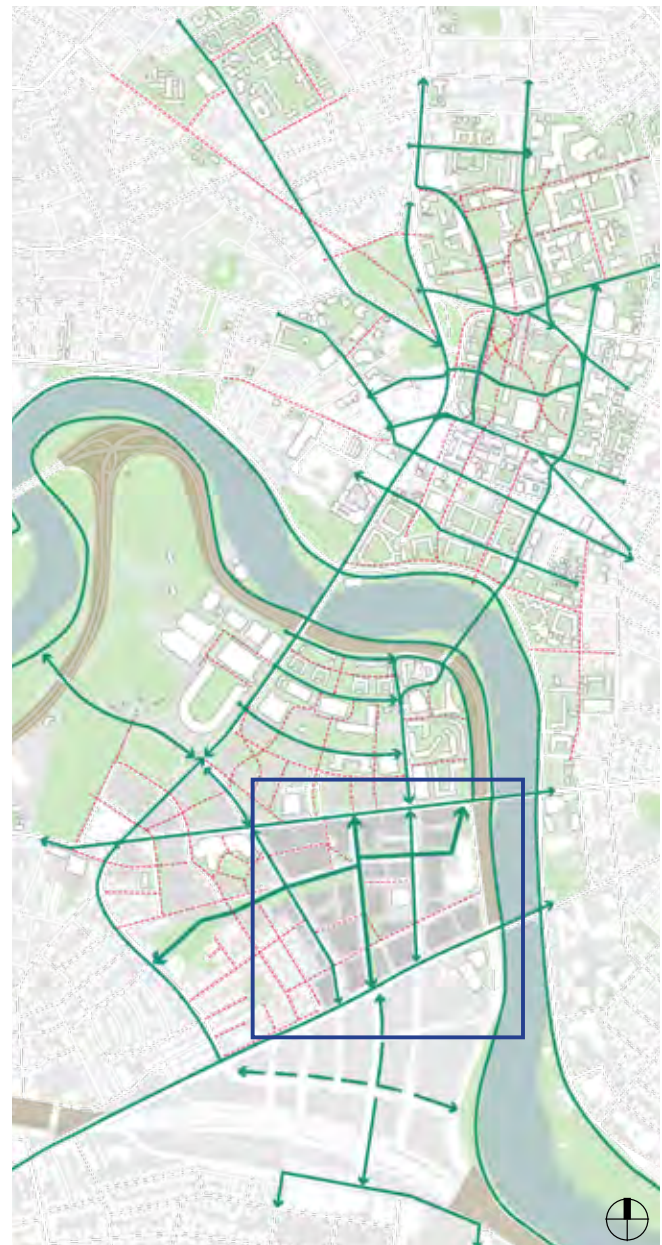
The ERC area, currently dominated by large impenetrable parcels, will undergo a transformation to a walkable urban district. New blocks, streets and open spaces will support pedestrian circulation, connecting the ERC to Harvard's Allston campus, the riverfront and the adjacent residential neighborhood. The primary pedestrian network connecting Allston and Cambridge will be extended southward.

Pedestrian Network Principles

- Break down large impenetrable tracts
- Create a porous and walkable environment
- Establish pedestrian-scale blocks and comfortable sidewalks



Pedestrian Conditions (Post SEC)



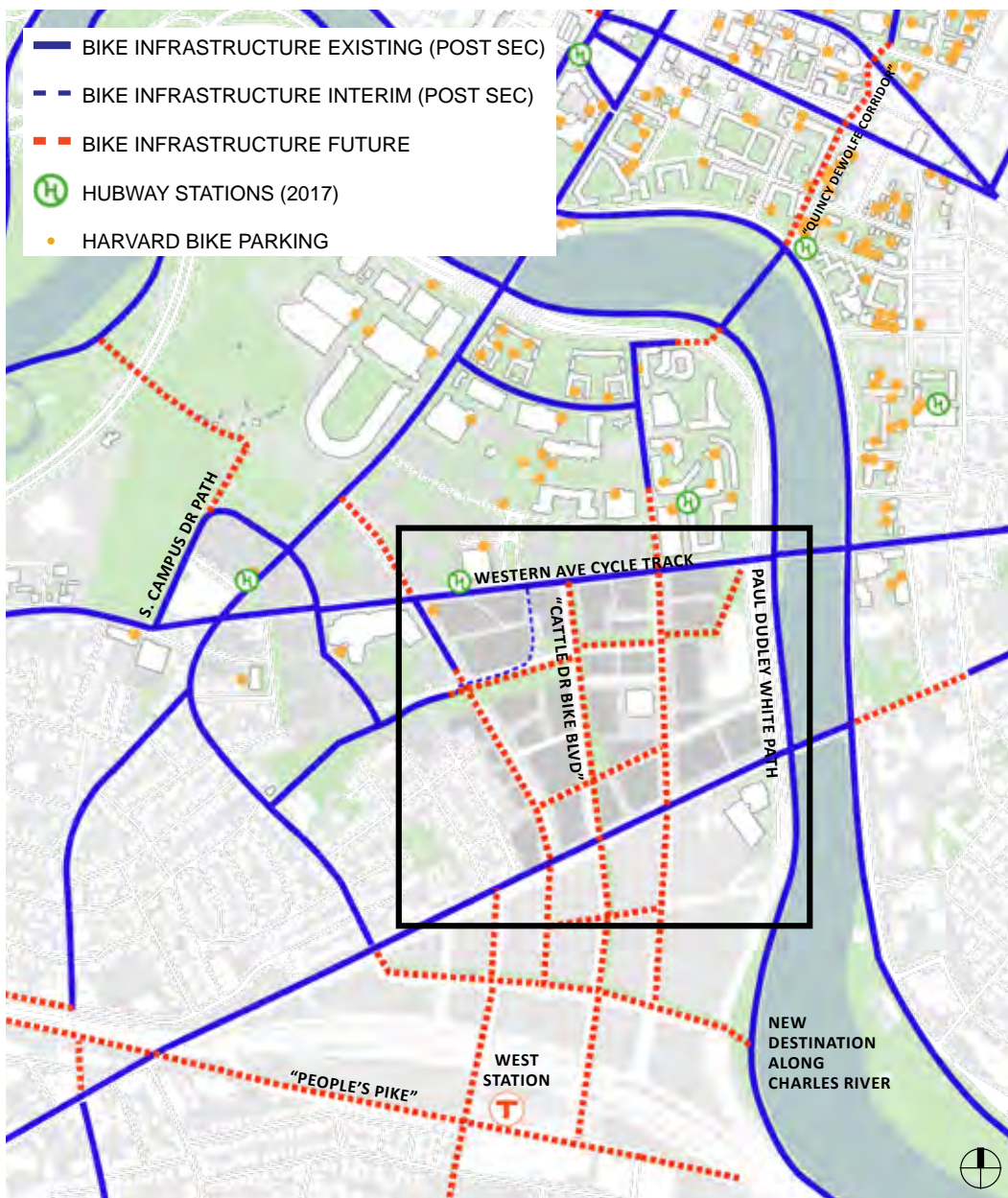
Long-Term Pedestrian Framework

Bicycle Network

Harvard has collaborated with the Boston Transportation Department (BTD) to expand the City's bicycle network in Allston. Cycling will be an important access mode to the ERC and bicycle facilities will be extended over time to create a continuous network.

Bicycle Network Principles:

- Encourage cycling by providing separated facilities where possible.
- Provide bicycle parking including covered/secure parking.
- Consider including building amenities which encourage bicycling (showers, lockers, etc).
- Add Hubway stations at key locations.



Long-Term Bicycle Framework



Western Avenue



Stadium Way



Science Drive



Cattle Drive



North Connector



East Drive

Separated Bike Facilities Along All Primary Streets

Primary streets will include separated bicycle facilities in the form of one-way cycle tracks and two-way paths.

Parking

The supply of parking (form and quantity) will need to evolve over time as the area matures. Initially autos will be the main mode of access. In the long-term, however, non-auto modes are planned to collectively become the dominant means of travel to the ERC. Initially, open air parking lots will be used to accommodate this shift in mode choice by providing the flexibility to reduce parking ratios over time as new buildings or other uses replace the lots. Mode shares will be refined in the future PDA Development Plans and Large Project Review process in collaboration with the BPDA and BTM.

Parking Principles:

Minimize impacts of parking

- Locate parking facilities in relation to circulation plans.
- Protect core public realm.
- Minimize impacts of curb cuts, especially on primary streets.
- Provide parking below buildings as possible.
- Provide interim at-grade parking. Long-term, provide primarily structured parking.
- Create on-street spaces to meet short-term parking demand, calm traffic and activate the public realm.
- Take advantage of shared parking opportunities to reduce required supply.

Establish a balanced parking program

- Provide sufficient parking to meet reasonable demand without encouraging auto travel.
- Reduce the parking ratio over time as greater density, housing and transit services are established.
- Reduce demand through Transportation Demand Management.



- ← LONG-TERM VEHICULAR GATEWAYS
- PROTECT CORE PUBLIC REALM
- CONTINUE SINGLE TRAYS OF PARKING BELOW EACH BUILDING

Long-Term Parking Framework

Long-term parking principles aim to minimize impacts of parking on core public realm areas and establish a balanced parking program to meet reasonable demand without encouraging auto travel. As a principle, parking will be built in connection with specific building projects and as demand warrants it. Harvard anticipates that the surface parking spaces will be built closest to the development first and expanded to the south as warranted by new demands.

The proposed parking supply in the PDA Master Plan includes one level of underground garage parking in each building. The amount of parking in these garages will be insufficient to accommodate the total anticipated parking demands, so the plan also includes interim surface parking lots that will eventually be replaced by new buildings, open space, and roadways as the district is built out.

The intent of the interim surface parking plan, which will be implemented as necessary as specific projects come on line, is to guard against over-building permanent structured parking facilities. The total range of parking included in the initial PDA Master Plan represents the maximum anticipated level of parking that might be necessary to support the initial development program when it is fully constructed. Harvard's goal and expectation is that innovations to the transportation system that will be introduced over time will increase the district's non-auto mode share and reduce parking demand.

Complete Streets

The design of streets within the ERC will follow Boston Complete Street Guidelines, accommodating a full range of users and modes. Widths are identified for the varying components of each street. The goal is to strike a balance – creating a great pedestrian-oriented place while accommodating projected traffic needs, especially volumes anticipated by the I-90 Interchange Improvement Project to the south. Variances in dimensions relate to urban design objectives as well as utility plans.



FRONTAGE

PEDESTRIAN

FURNISHING / GREENSCAPE

Complete Streets Sidewalk Components

Streetscape Guidelines

Streetscape specifications and materials are anticipated to extend from the Institutional Mater Plan area to the Enterprise Research Campus. These include:

- Specifications for tree collars, increased structural soils, underdrainage and aeration to ensure performance and longevity of street trees.
- Generous sidewalks including furnishing, pedestrian and frontage zones. Consistent with complete streets, the pedestrian zone will be a monolithic surface of brushed concrete. The frontage and furnishing zones will employ the same palette of pavers found around Barry's Corner and the Science and Engineering Complex pictured here.

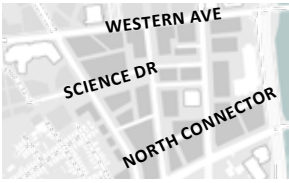


Sidewalk Palette

- Street furnishings that promote a diverse yet cohesive public realm will also be extended.
- Dual-height lighting was previously approved by the City of Boston for the area. This lighting scheme improves safety for cyclists and pedestrians. Fixtures will be modern energy efficient LEDs.



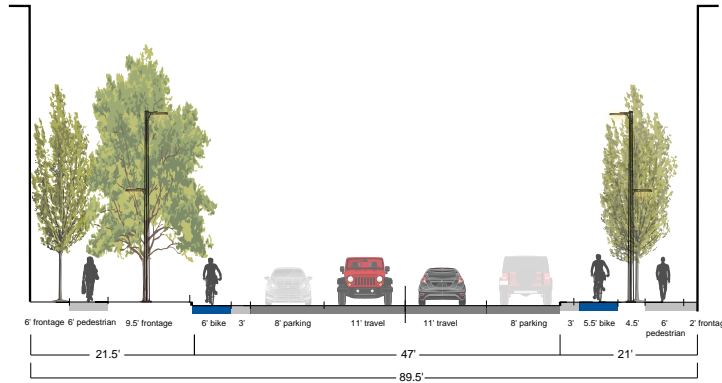
Dual-Height Lighting Along Western Avenue



Prototypical East-West Street Sections

Western Avenue looking East

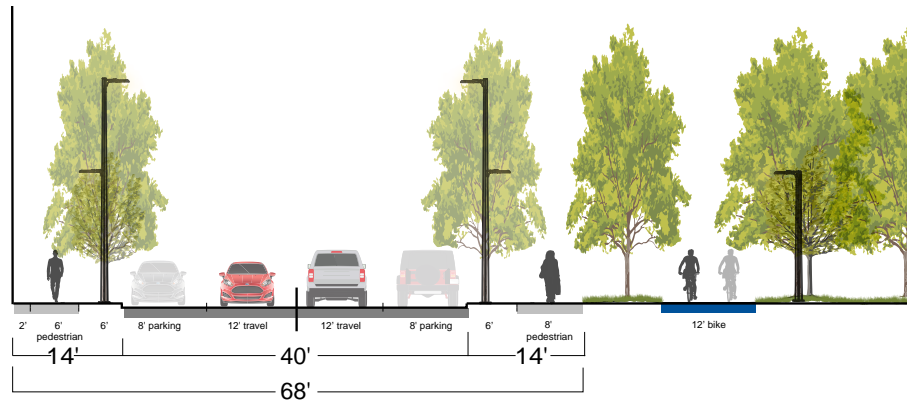
- Multi-modal corridor
- Regional utility corridor



Science Drive looking East

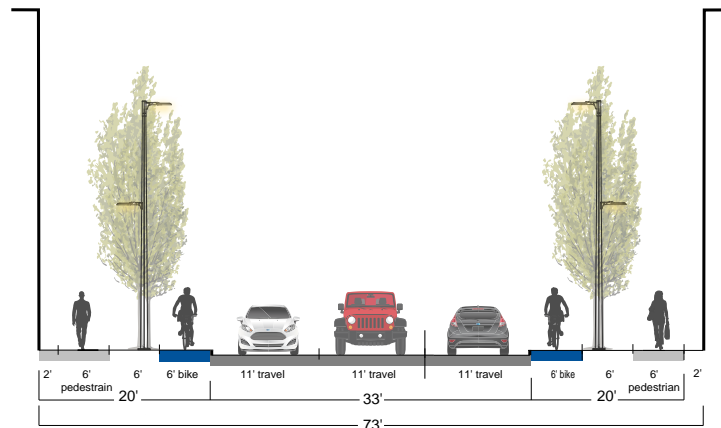
(West of Cattle Drive)

- Multi-modal district circulation
- Major regional and district utility corridor



North Connector looking East

- Vehicular link between Soldiers Field Road and Turnpike ramps
- District circulation
- Major regional utility corridor

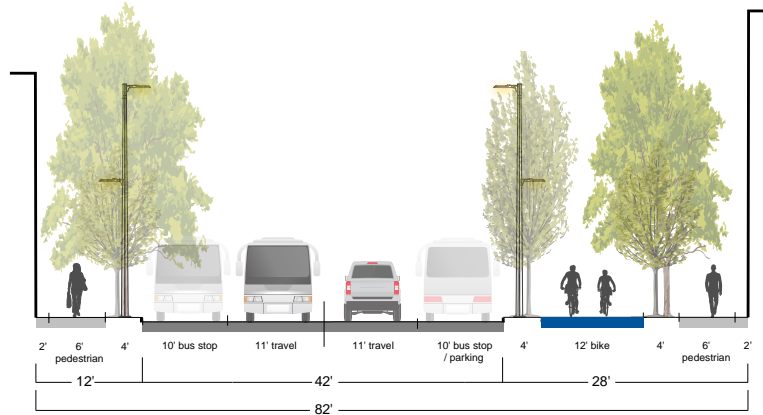




Prototypical North-South Street Sections

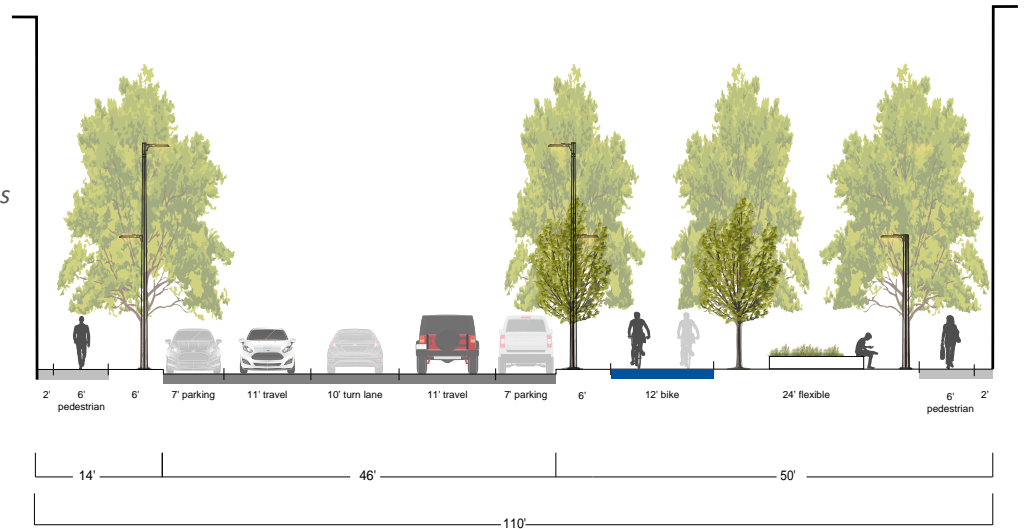
Stadium Road looking North

- *Transit priority corridor (2015 25% Design Report)*
- *Connection between North Harvard Street and Allston Landing South*
- *Local access to adjacent uses*



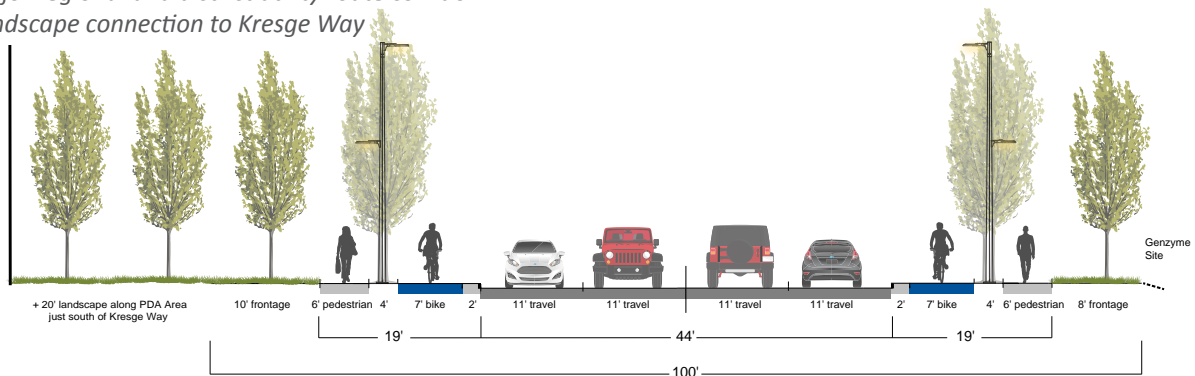
Cattle Drive looking North

- *Main street for ERC*
- *Multi-modal gateway to ERC*
- *Bike route linking open spaces*
- *Direct access to West Station*
- *Connection to Turnpike ramps*



East Drive looking North

- *Multi-modal corridor providing regional and local vehicular connectivity to Turnpike ramps*
- *Major regional and district utility route corridor*
- *Landscape connection to Kresge Way*



Cattle Drive

Cattle Drive is envisioned as the main street of the ERC both in terms of geography and activity. This corridor presents an opportunity to create an identifiable link to the riverfront and West Station. Several design options were considered to create an aesthetically pleasing green spine consistent with district public realm goals, bike accommodation, pedestrian amenity, and stormwater management strategies. An asymmetrical design was determined to be most consistent with planning principles, especially the ability to respond to the evolving district over time.

Cattle Drive Principles

Vitality

Gather public realm resources into cohesive zones that build synergies with activated ground floor uses.

Connectivity

Develop coherent connections to surrounding cycle and transit resources.

Access

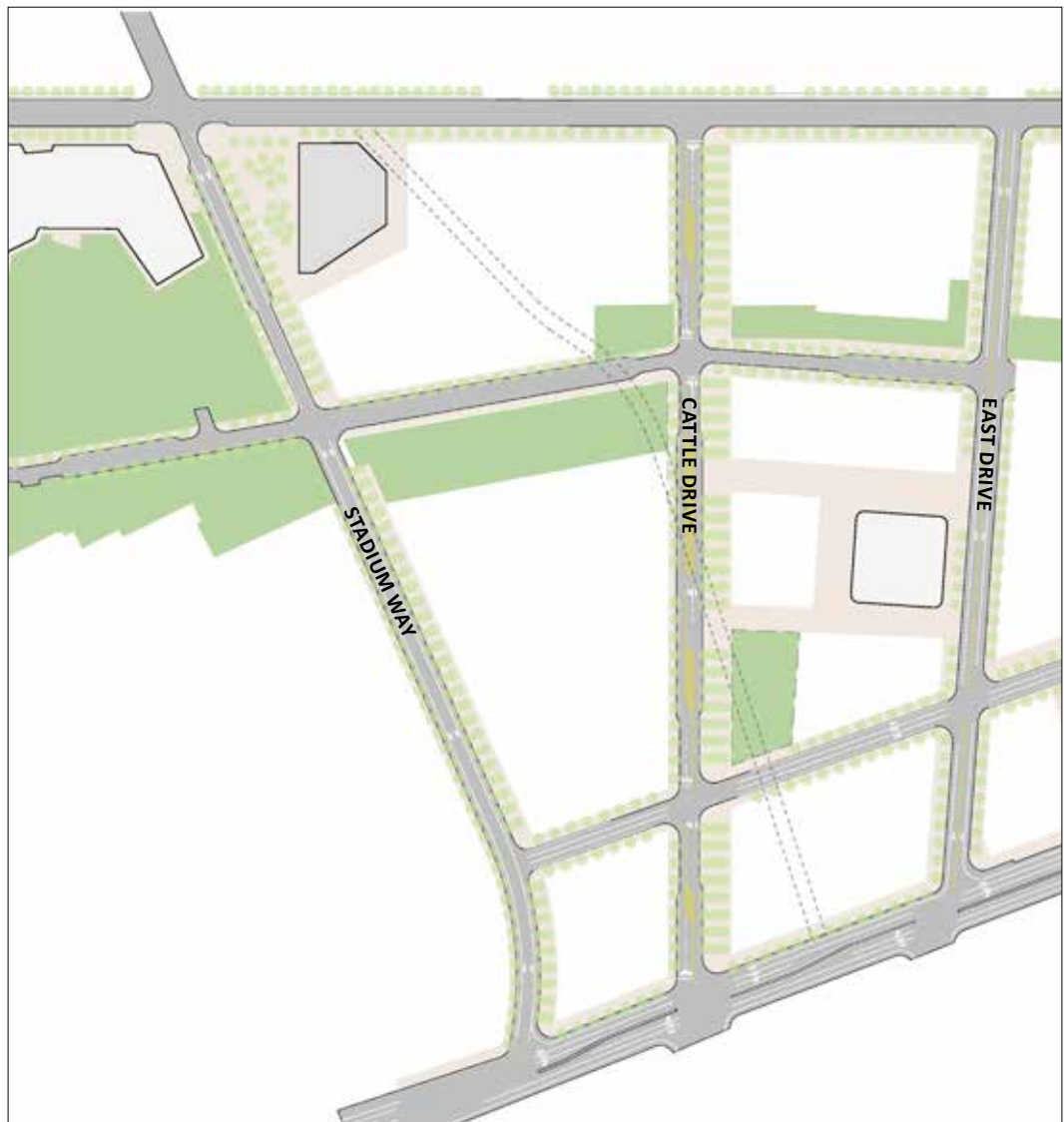
Simplify access to cycle routes and enable mid-block connections.

Identity

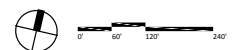
Hybridize familiar street typologies to create novel opportunities.

Adaptability

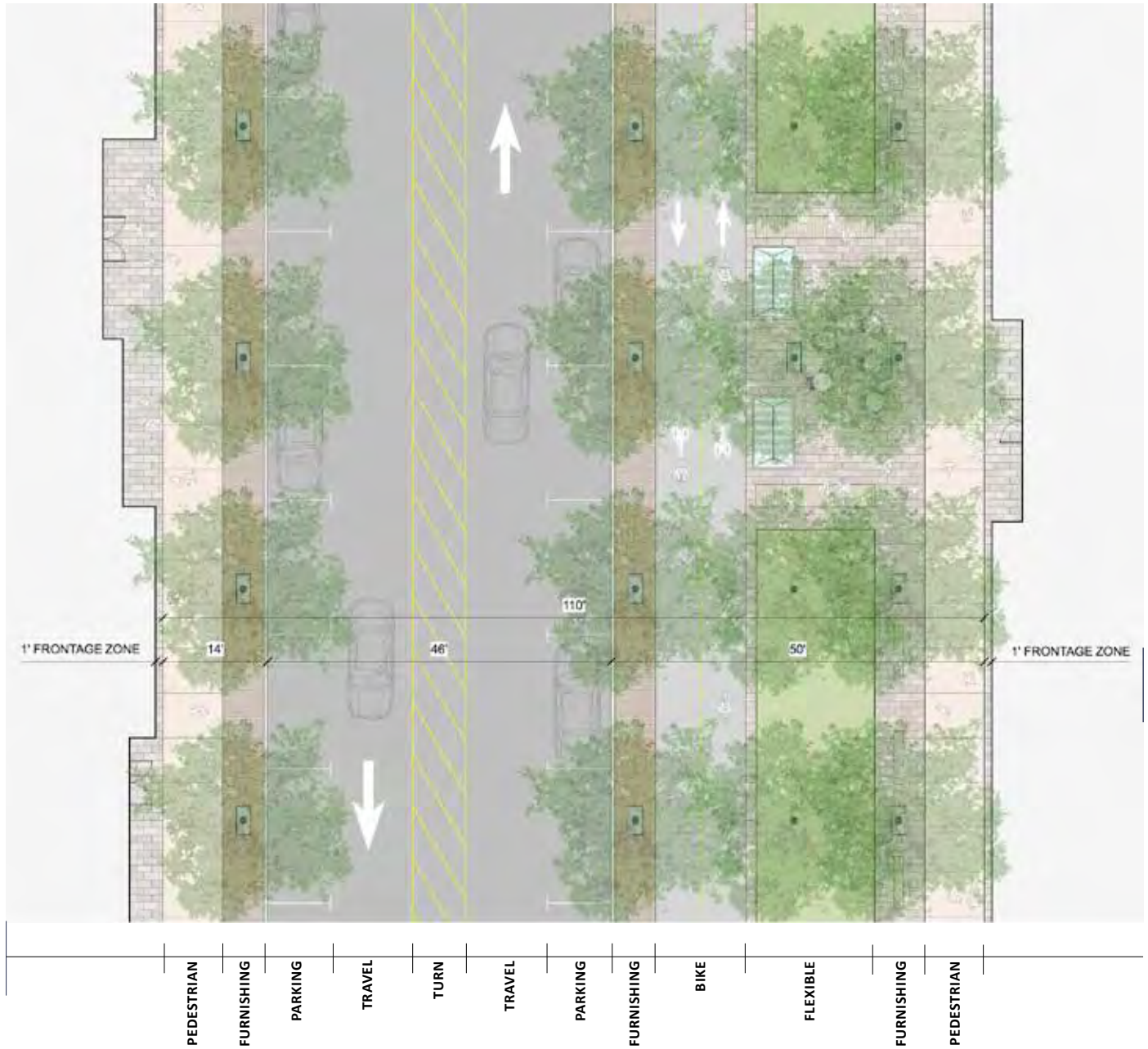
Build a landscape that functions as connective tissue in the short term and as an active destination in the longer term.



Cattle Drive Overview (Reed Hilderbrand)



A promenade along the east side of Cattle Drive provides a flexible zone in which to locate landscape and program elements, seating, kiosks, public art, etc. The area is expected to evolve over time as adjacencies change and the population of the district increases. The east side was chosen to take advantage of afternoon sun. This layout provides the advantage of clear separation between bikes and pedestrians.



Cattle Drive Detail (Reed Hilderbrand)



Additional Issues

Regional pedestrian and bicycle connections

The proposed improvements to the so-called “pork chop” traffic island at Western Avenue and Soldier Field Road are part of MassDOT’s Western Avenue Bridge project. Harvard will coordinate with MassDOT at such time that the bridge project is reactivated. Additionally, Harvard will work with the City of Boston and DCR to evaluate whether interim improvements could be made to improve operations in advance of the full reconstruction of the intersection.

Ongoing studies

Harvard will participate in the proposed Metropolitan Area Planning Council/City of Boston transit study and looks forward to reviewing the proposed scope of work to ensure that it addresses important ERC connectivity issues, rail service opportunities afforded by Harvard’s significant contribution to construct both an interim and full-build regional West Station, potential route extensions from Harvard Square and Central Square and new north-south routes through the area that could be possible as part of MassDOT’s I-90 Allston Interchange Improvement Project.

Design for Western Avenue from Barry’s Corner to Soldiers Field Road

As part of the range of issues to be discussed as part of the Framework Plan as it evolves, Harvard will define a process and timeline for the development of a 25% proposed design for Western Avenue from Barry’s Corner to Soldiers Field Road, in collaboration with the BPDA and BTM. As property adjacent to Western Avenue is developed and buildings facing Western Avenue are constructed, sections of Western Avenue abutting the PDA Master Plan area will be improved.

The PDA Master Plan proposes to extend the one-way pair of cycle tracks on Western Avenue that will be constructed as part of the SEC project. These one-way cycle tracks are consistent with connections to bicycle facilities to the west and east of the site.

The eastbound cycle track, which is located on the southern side of Western Avenue will be located at sidewalk level. The westbound cycle track on the northern side of the street will be at the street level. To address concerns about the shallow 60-inch water main that is located under the westbound buffer and protect cyclists, Harvard is working with the City of Boston (as part of the SEC project) to test the installation of a berm section to separate the westbound cycle track from parked cars and moving traffic between Stadium Way and Academic Way. If this solution is deemed successful, it could be applicable in front of the PDA Master Plan area.

Improvements to MBTA bus service

Harvard will continue to work with the MBTA to implement improvements to bus service along Western Avenue and North Harvard Street by consolidating, relocating, and upgrading bus stops.

In looking more broadly at transit, Harvard has introduced the concept of an “early action” West Station and offered to pay up to \$8 million to MassDOT for the construction the station as part of the I-90 Allston Interchange Improvement Project and continues to advocate for regional transit improvements as part of that project.

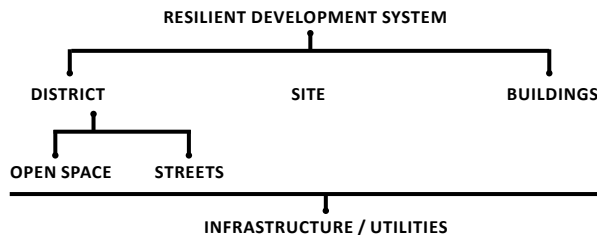
Harvard has additionally raised its financial commitment in support of the permanent West Station to \$50 million, over half of the current estimate included in the DEIR recently filed. Harvard has further called for this station to be fully multi-modal facility that facilitates both regional and urban rail service.

8. Infrastructure, Sustainability & Resilience

The ERC presents an opportunity to redevelop an area that has largely been vacant – void of people, infrastructure and vegetation – to a vibrant and sustainable district. Harvard recognizes that sustainability and resiliency go hand-in-hand. Such challenges are complex and interconnected, demanding an ever-developing approach. The University is working with others throughout the region to understand and plan for climate change impacts, participating in groups such as the Green Ribbon Commission.

Estimating future climate risk relies on various sources of data having a large amount of uncertainty associated with them. Climate models predict varying future climatic conditions that can be categorized in two ways - gradual changes and extreme events. As the frequency of natural hazards and severity of effects increase, the largest concerns in Allston will be heavy precipitation from severe storms, higher ambient air temperatures and high winds. Water levels in the basin at this time are controlled by the Charles River Dam, some sea level rise models show a future where the Dam could be breached resulting in widespread flooding.

As the singular land owner of the ERC - Harvard has the benefit of addressing sustainability and resilience on multiple scales. At the district level, innovations in the design of streets and open spaces could enhance both the resiliency and the spatial quality of the urban fabric. The finest grain resiliency measures can be implemented at the parcel and building scale. Projects within the ERC will comply with the requirements of Article 37 (Green Buildings) of the Boston Zoning Code.



Infrastructure, Sustainability and Resilience Principles

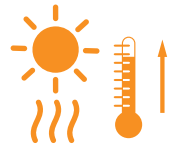
- Demonstrate leadership in environmental sustainability.
- Integrate climate change adaptation into planning and project design.
- Participate in regional solutions to resilience and approaches to the Charles River Basin.
- Pursue continuous improvements in sustainability.
- Support development with a functional smart infrastructure system.
- Establish an efficient vehicular circulation network.
- Use best management practices for stormwater.
- Minimize temporary expenditures on utility and site work.



SEA LEVEL RISE | STORM SURGE | INLAND FLOODING



INCREASED PRECIPITATION | HEAVY DOWNPOUR



TEMPERATURE RISE | HEAT WAVE

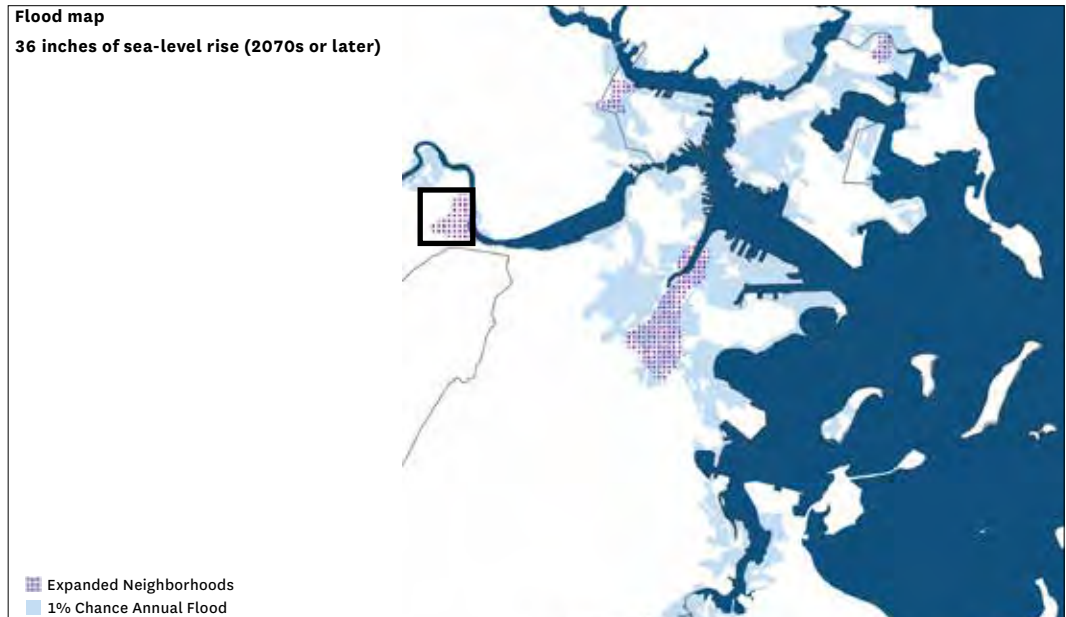


HIGH WINDS

Potential District Impacts

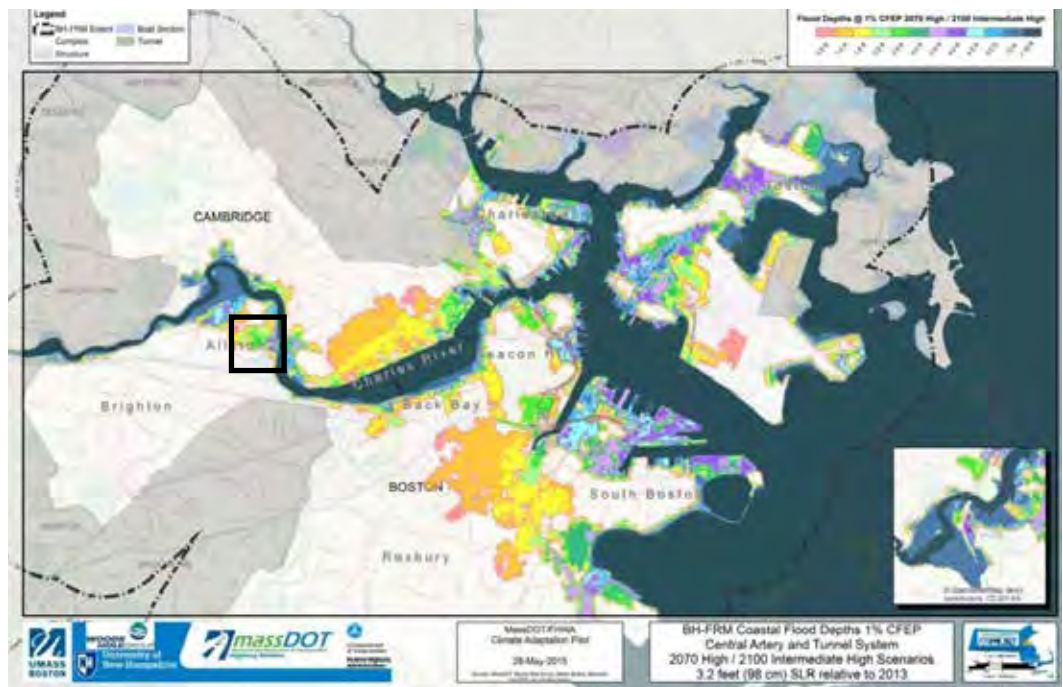
The Charles River Dam creates an advantage for the ERC over Boston harbor-front growth areas given sea level rise projections. However, modifications to the height of the dam mechanical systems and operational strategies will be needed to protect the Charles River Basin against future storm surges.

*Future Condition 2070
+ 3' Sea Level Rise
Imagine Boston 2030
-BPDA*

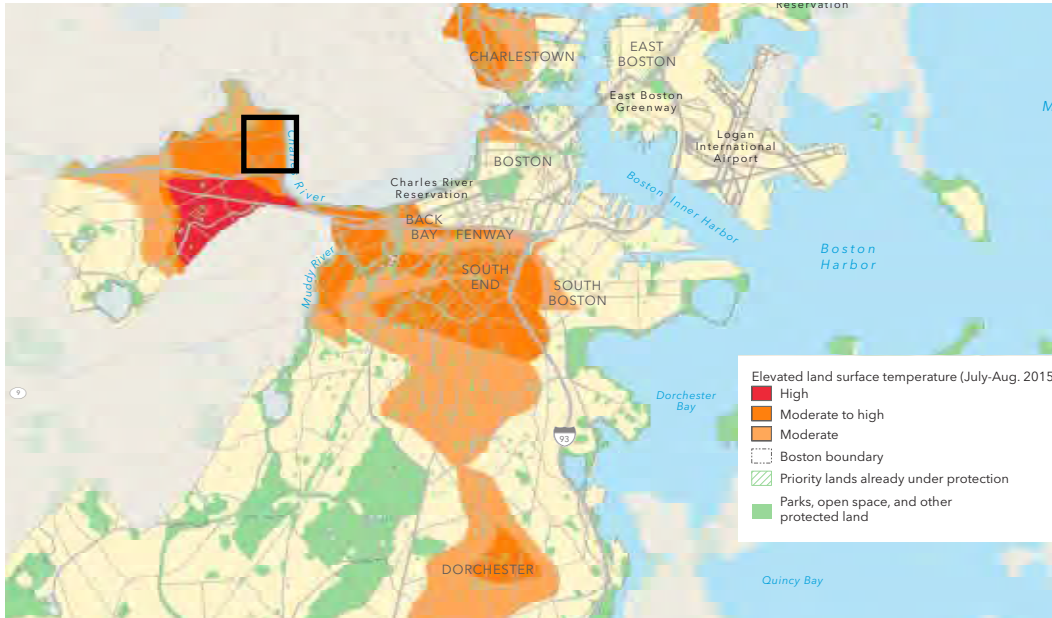


With projected severe rain events – significant flooding is predicted.

*Future Condition 2070
+3.2' Sea Level Rise &
500-YR Storm
-DOT & Woods Hole -
Model for Central Artery*



Recorded temperatures suggest Allston is one of several Boston neighborhoods that experience urban heat island effects.



The preexisting condition is largely impervious surface, with minimal tree canopy. District green space and site landscaping can ease urban heat island effects reducing temperature levels in the area.

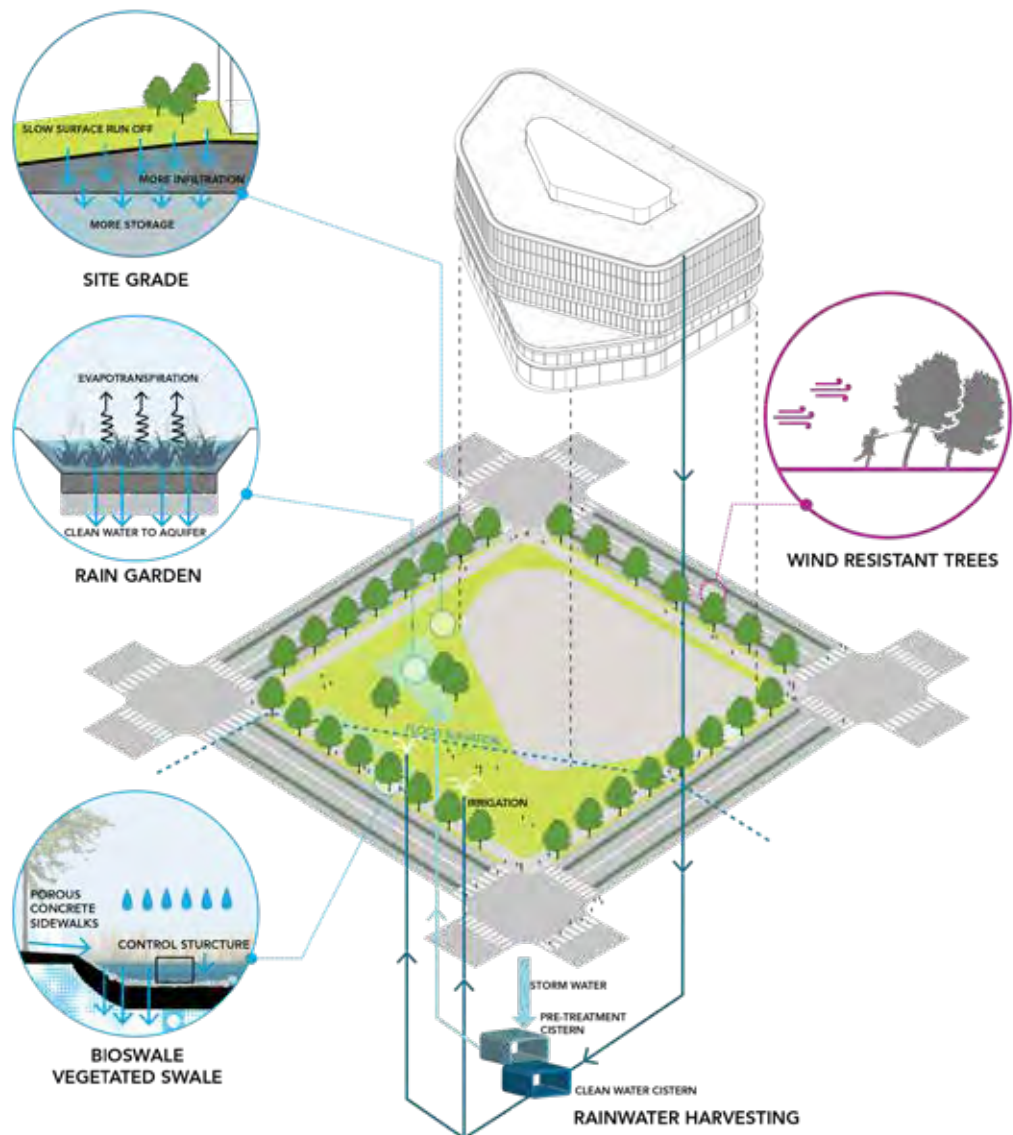


*Harvard University
Aerial 2017*

Design for Resilience

Site Strategies

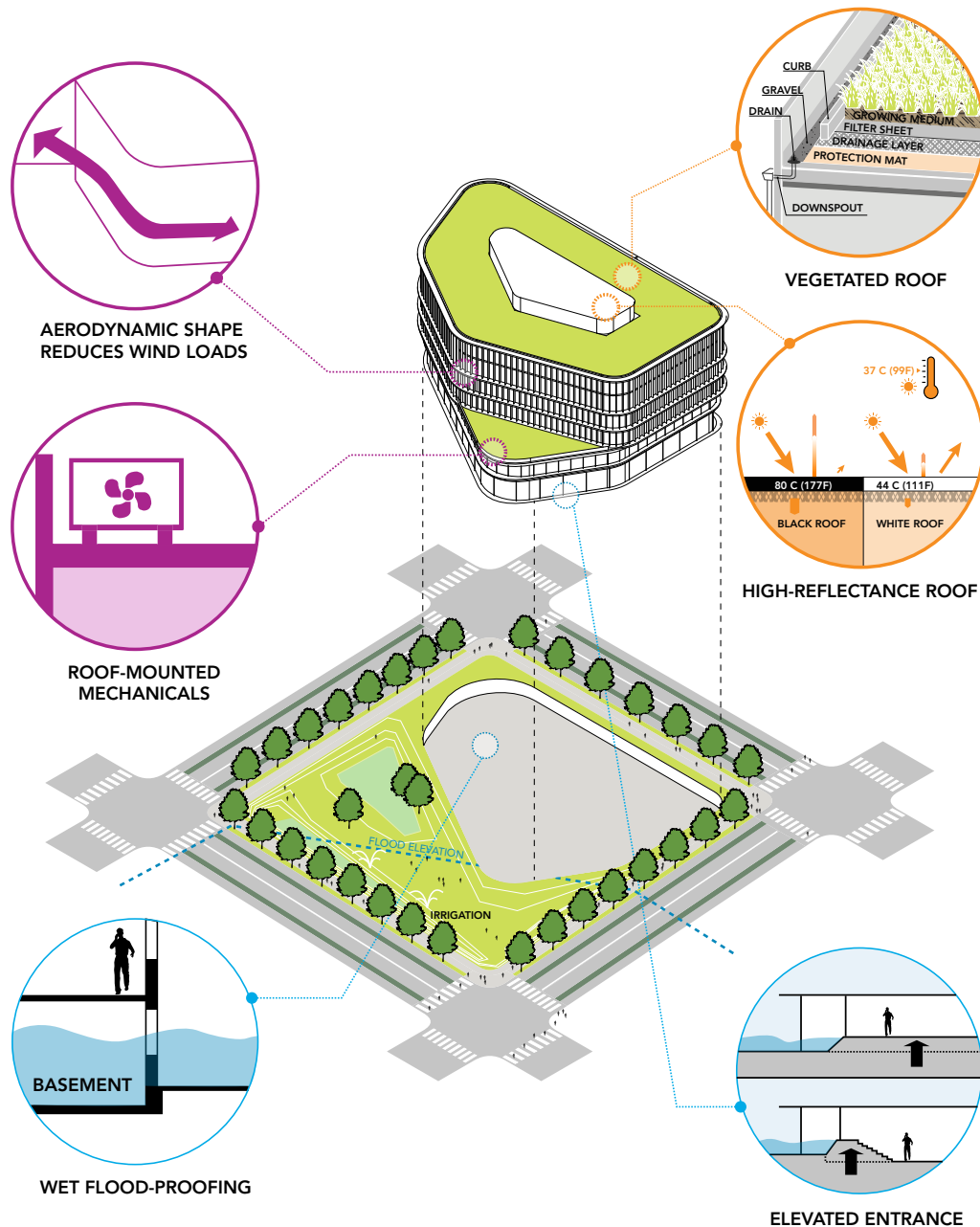
A variety of strategies, illustrated below, will be used to create resilient development parcels. To help manage stormwater, impervious materials, rainwater harvesting systems and rainwater infiltration systems can be introduced. Site grading will relate to stormwater management strategies and influence the base floor elevations of buildings. Planting will help reduce the impact of high temperatures now recorded in the area. Wind resistant trees that can withstand extreme weather conditions can act as a natural barrier and minimize storm debris.



Source: WSP/CBT

Building Strategies

Building strategies that can be used to create resilient facilities are illustrated below. Strategies might differ depending on the risk tolerance for specific buildings. For example, those that must offer shelter versus those that might close in extreme events would employ different tactics. Invaluable research that cannot be replaced will require heightened levels of protection. Elevating mechanical systems, back-up power and extended emergency lighting for use in the event of a power outage can be incorporated regardless of building type. Waterproofing and elevated entrances will reduce flood risk. Use of reflective materials or vegetation on surfaces such as roofs can minimize solar gains and heat island effects. Aerodynamic shapes can reduce wind loads while the ways in which equipment are mounted can minimize storm debris.



Source: WSP/CBT

Utility Corridors/Smart Utilities

Construction of extensive new utility systems are required to support development of the district. This will include new water mains, sanitary sewers, extension of storm drains to a new outfall at the Charles River, a University thermal energy loop originating at the District Energy Facility and supply from private utilities companies (gas, electric and telecom). Utility designs are being coordinated with the Boston Water and Sewer Commission (BWSC), MWRA and private companies. East Drive, Science Drive and Cattle Drive will serve as primary routes for a complex cross-section of utilities below grade.

Science Drive Section

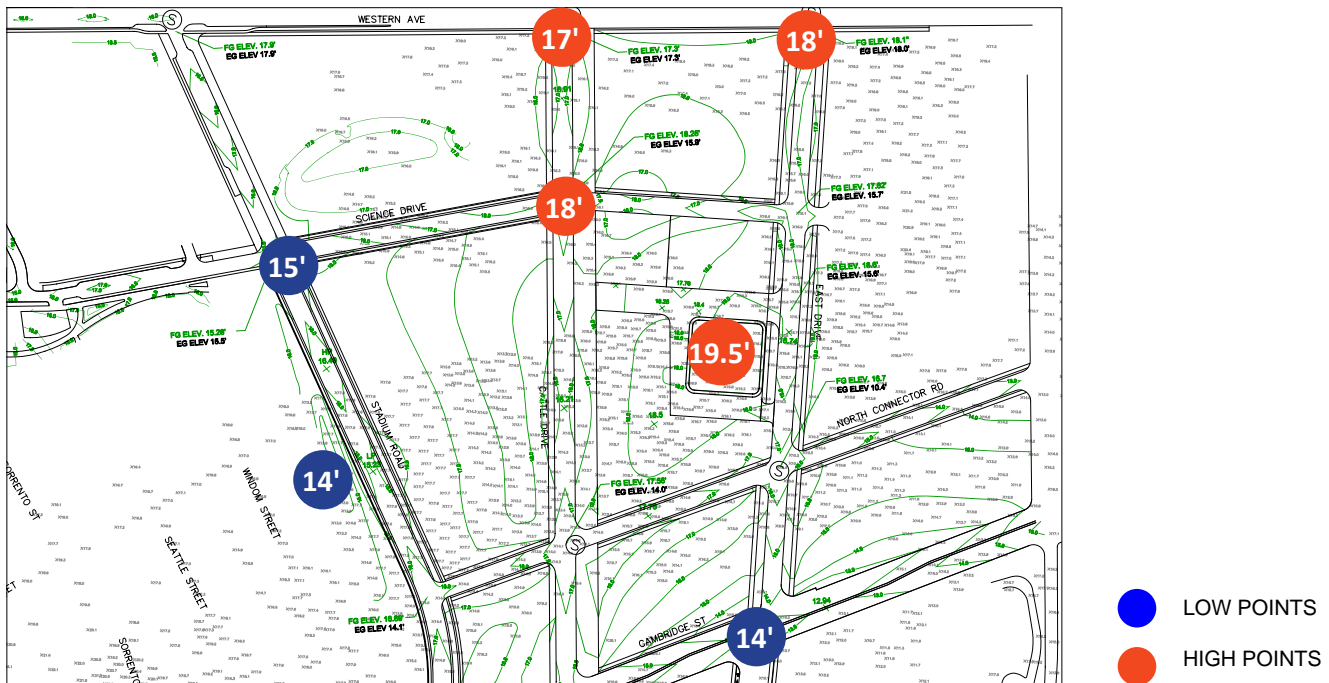


East Drive Section



Conceptual Grading

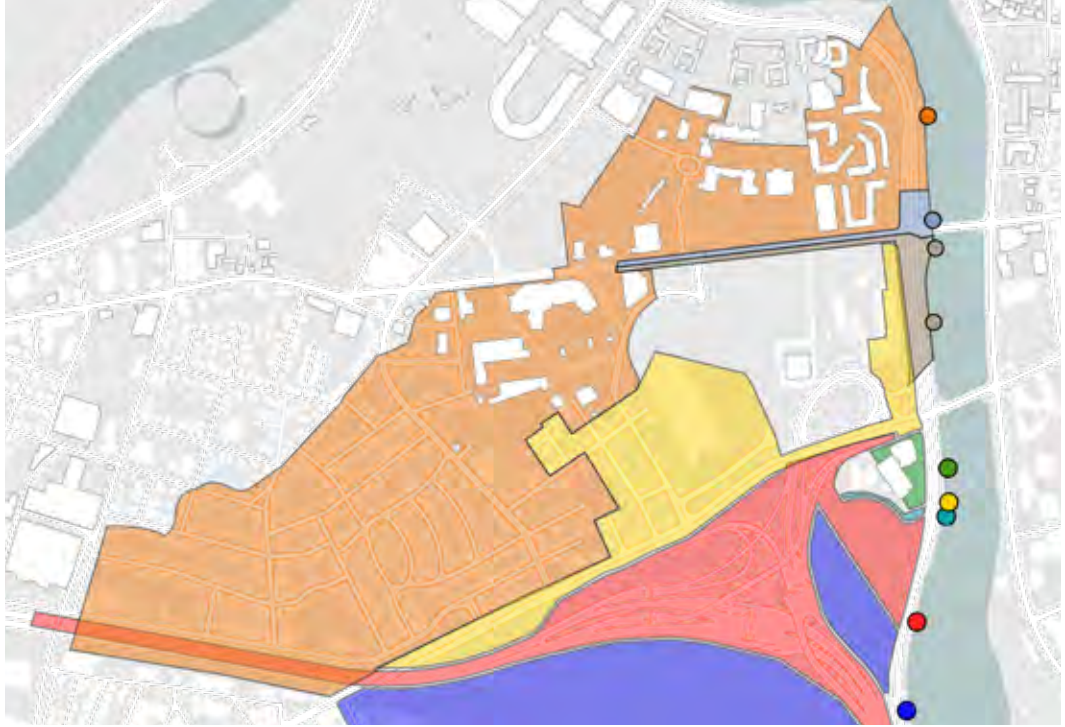
Today, the area is generally flat with little elevation change. Harvard proposes to create a slight elevation change within the ERC to facilitate stormwater run-off and address vertical constraints related to utility crossings in the area around the proposed Cattle Drive and Science Drive intersection. The elevation at this intersection is largely driven by the invert required for the storm drain and soil cover required for the thermal utilities. A base floor elevation of 19.5' (Boston City Base) was chosen for the District Energy Facility based on potential flood models. Elevations at the perimeter of the district are largely driven by existing conditions.



Stormwater Management

Harvard proposes to integrate new gravity-fed infrastructure with landscaped and building design Best Management Practices (“BMPs”) into a comprehensive, multi-level approach that integrates neighborhood, district and development site systems to address stormwater quantity, water quality, and resiliency needs.

An area that has long been void of vegetation will benefit from the establishment of an urban tree canopy and a significant open space network that will play an important role in managing stormwater runoff. As demonstrated by the surface stormwater management features in Ray Mellone Park and Rena Park, working landscapes will be an important part of the system. In addition, Streetscape Guidelines described on page 37 offer guidance on materials and techniques, performance and function, and the achievement of comprehensive environmental benefits.



Existing Outfalls and Corresponding Drainage Basins

- STORMWATER TRUNKLINE
- - NEW STORMWATER TRUNKLINE
- CORRESPONDING DRAINAGE BASIN



Future Drainage Infrastructure

Over the last decade, and at the request of the BWSC, Harvard has been planning, designing and implementing upgrades to the existing trunkline that connects the neighborhood system from a point on North Harvard Street to an existing 36-inch outfall to the Charles River near the John Weeks Bridge. A significant portion of the North Allston neighborhood currently drains northeast, through Harvard Business School, but neighborhood drainage will be better accommodated with ERC development. The future ERC does not currently contain operational drainage infrastructure. The DEF is likely to be connected in a temporary manner to MassDOT drainage.

A 2007 plan proposed to extend the existing BWSC stormwater system by constructing a new 72-inch line from North Harvard Street to Western Avenue via Rena Park and Stadium Way and then to redirect the neighborhood flows to a new 72-inch stormwater trunkline in Western Avenue that would connect to a proposed new BWSC-controlled outfall near the Western Avenue Bridge. Under the 2007 plan, the neighborhood connection to the existing 36-inch line through the Harvard Business School campus would be discontinued upon completion of the new 72-inch trunkline and its new outfall.

Two sections of the trunkline were completed by Harvard, at its own cost, on behalf of BWSC. In 2007/2008 Harvard installed a 72-inch pipe along the periphery of the SEC building. In 2014, Harvard replaced a collapsed BWSC-owned storm drain in Rena Park for BWSC. This provided increased capacity between North Harvard Street and Stadium Way, but still relied on the undersized outfall near the John Weeks Bridge.

As described in Harvard's 2013 IMP, the proposed alignment of the trunkline was modified to the east of Stadium Way. Instead of traveling in Western Avenue, the 2013 IMP proposed to shift the alignment of the trunkline to follow a Science Drive alignment to reach a proposed new outfall near the Western Avenue Bridge. The Greenway was proposed as a complementary feature to the new trunkline and outfall, rather than a replacement of this conveyance system for stormwater from the neighborhood.

Since completing the 2013 IMP, Harvard has developed a multi-tiered approach to accommodate the conveyance of stormwater from the neighborhood to the Charles River and to integrate this new piece of infrastructure with other utility systems and stormwater measures in the ERC. As indicated in MassDOT's I-90 Allston Interchange Improvement Project Draft Environmental Impact Report ("DEIR") and in comment letters from Harvard and BWSC, this system has been and will continue to be coordinated with future stormwater infrastructure improvements to the south of Cambridge Street.

In summary, Harvard will:

- As part of the ERC, on behalf of BWSC, extend the existing BWSC stormwater trunkline from Stadium Road to a new outfall at the Charles River near the River Street Bridge to convey stormwater run-off from the neighborhood and disconnect the neighborhood connection to the existing 36-inch line through the Harvard Business School campus.
- Reduce stormwater flows from the ERC to the new conveyance systems consistent with BWSC requirements to treat and retain on site the first one-inch of rainfall by:
 - Using designated landscaping BMPs along ERC streets and in open spaces that would reduce phosphorus levels in the runoff and provide irrigation options for landscaping including natural filtration systems like rain gardens and infiltration tree pits.
 - Installing structural BMPs that will facilitate the removal of Total Suspended Solids and phosphorous and recharge the ground water table in a way that complements landscaping features.

- Incorporating appropriate sustainable design elements in building and site designs as part of future developments to address stormwater quality and management.
- Use available capacity in the proposed BWSC stormwater trunkline to convey the remaining stormwater from the new ERC district to the Charles River.
- Regrade the area to improve control over the directional flow of surface run-off on streets, within landscape zones and within below grade recharge facilities associated with street plantings, to allow better predictability and planning for stormwater flows associated with extreme weather events, including opportunities to create additional flood storage capacity for these events.

These integrated gravity-fed systems will remove a longstanding impediment to addressing the neighborhood's flooding problems. The combination of landscape and structural stormwater BMPs responds to the limitations imposed by the relatively high water table in the ERC. More detailed technical analysis of the system will be provided as is appropriate in future PDA Development Plan and Large Project Review filings for specific development proposals.

Future PDA Development Plans and Large Project Review filings will undergo Site Plan Approval by BWSC in order to demonstrate compliance with City regulations and consistency with the overall approach presented in the PDA Master Plan. Future PDA Development Plans and Large Project Review filings will undergo review under the City's Article 37 Review process in which projects have to demonstrate compliance with the City's green building and climate resiliency policies and requirements.

9. Public Realm

Planning for the ERC has placed great emphasis on creating a robust public realm. This includes landscape open space, streetscapes, and various aspects of the district's urban design such as ground-level public amenities. The ERC open space will emphasize public access and public use.

Character

The Framework Plan seeks to promote variety—provision of both passive and active space, hard and soft surfaces, and sizes which are intimate as well as those that are large and communal. The system will transition with its surroundings—from a residential park setting to the west to a more urban scale at the core of the district where building heights are greater. Improvements will come with adjacent development necessary to activate the space.

Over time, integration of open space/public realm with proposed land uses will be explored to understand how to best serve existing and new populations and to respond to City goals for open space. Flexible design guidelines will be developed to ensure the network is high-quality and functional— supporting the needs of users as well as addressing stormwater quantity, water quality, and resiliency.

Network

The ERC open space is planned as a comprehensive interconnected network of linear ribbons, extending both east-west from the residential neighborhood and Ray Mellone Park to the Charles River, and north-south from Western Avenue to new parkland to be created along the Charles River with the I-90 project. Harvard's recently constructed Rena Park portion of the Greenway provides an example of this approach in terms of its configuration, its public character, and its high-quality landscape materials. Public realm improvements will be designed and constructed in association with adjacent development projects. This strategy is consistent with the approach advanced as part of the IMP process to improve Western Avenue as adjacent properties are developed and will ensure that the public realm is safe and activated.

Within the PDA area, additional open space has been added to strengthen the east-west connection while maintaining the strong north-south connection provided by the Promenade along Cattle Drive. These open spaces will provide multiple direct bicycle and pedestrian connections from Ray Mellone Park to Western Avenue, utilizing Academic Way, Stadium Way, Hague Street, and Cattle Drive.

East-west, the currently proposed configuration of the Greenway continues a planned program of utilizing Harvard property to create publicly accessible open space that is being implemented from west to east, starting with Ray Mellone Park (completed in 2011) and into Rena Park (completed in 2017). By 2020, this open space network will be expanded through additional green space in the area south of Science Drive, the multi-use path south of Rotterdam Street, and the courtyard of the SEC. When combined, the open spaces that are existing and underway represent approximately eight acres of new publicly accessible open space.

North-south, the Cattle Drive promenade is envisioned as a generous pedestrian and program zone along the east side of Cattle Drive. The functionality of Cattle Drive is described in more detail on page 40. Broadly, the promenade can link the ERC with both Western Avenue and the future circulation networks south of Cambridge Street, West Station and the Charles

River park system. MassDOT's I-90 Interchange Improvement Project creates the opportunity for a new open space destination of approximately two acres along the Charles River, with relocation of Soldiers Field Road onto property currently owned by Harvard.

Riverfront Access

The Plan seeks to create comfortable pedestrian and bike connections to the River at all access points/bridges. Gateways across the river and onto the Reservation exist at Western Avenue and Soldiers Field Road, Cambridge Street and Soldiers Field Road, and in the future to the south with the I-90 interchange improvements. Meaningful riverfront access at existing locations is challenging due to traffic patterns, street/bridge configurations and the minimal landing width on the reservation. The Framework Plan seeks to improve mobility to these key nodes, additional coordination required is described on page 42. Planning principles which frame intent but preserve optionality and flexibility are described on page 59. Particular emphasis has been placed on establishing connection to new riverfront open space planned as part of the DOT project.

Landscape Function

The ERC landscape needs to serve multiple functions. It must relate to both infrastructure and transportation networks that promise to sustain the district's full build-out. Thermal utilities which extend between the DEF and SEC are being placed in the street right-of-way to protect future planting.

Where feasible, the landscape will provide an important drainage function, contributing to area-wide stormwater management systems. Over time, this system will increase the tree canopy coverage throughout the area. The goal is to minimize impacts on water resources, reduce drainage impacts of projects, and improve the quality of stormwater as it reaches the Charles River. As a civic space, it will be a living connective tissue – a continuous landscape that joins residential neighborhoods, parks, public facilities, and campus spaces with the regional recreation, pedestrian and bicycle circuits along the Charles River Reservation.

District-Wide Open Space Commitment

Harvard recognizes that a robust open space network plays an important role in establishing a vibrant, welcoming and attractive place for all users. Harvard commits to a standard of 20% of the total developable land area as publicly accessible open space in the fully built condition of the ERC.

Beyond the ERC area, Harvard has continuously supported and developed the generous open space that currently exists in the area, including Smith Field, Barry's Corner Grove, Ray Mellone Park, Rena Park, as well as future open space such as the new parkland to be provided by Harvard along the Charles River as part of the I-90 Allston Interchange Improvement Project.

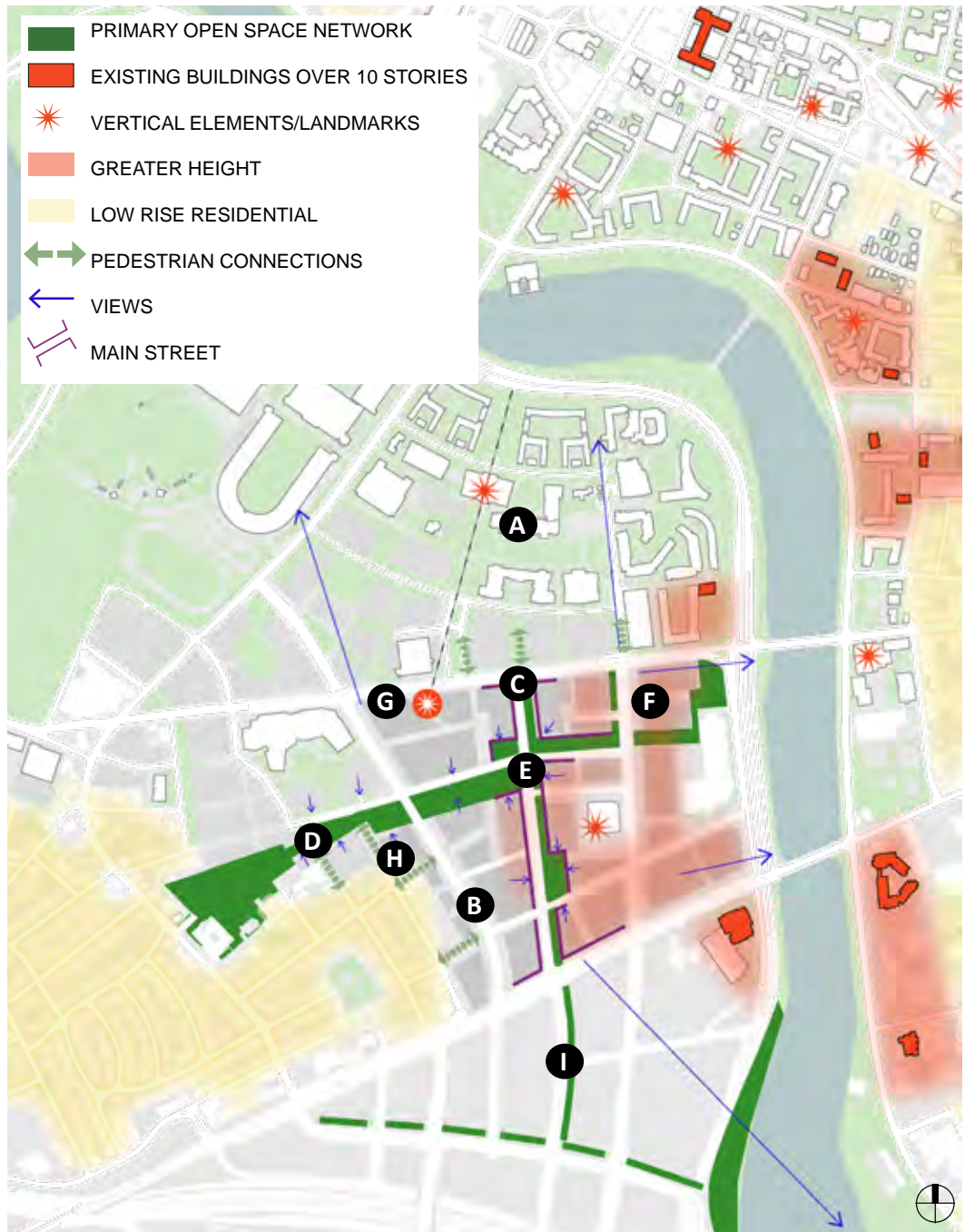
Public Realm Principles

- Create a network of interconnected open space.
 - Create new memorable links within a larger system.
 - Facilitate movement between pedestrian/bike facilities.
 - Convey people to the Charles River..
- Focus on scale and variety.
 - Create an easily understood and legible rhythm.
 - Scale spaces to encourage social interaction.
 - Bring the uses and people necessary to create nodes of activity.
- Create a center of gravity and an early placemaking opportunity.
 - Build on improvements surrounding the SEC including bicycle and pedestrian routes.
 - Complete Western Avenue streetscape.
 - Frame early development phases to feel complete and safe.
- Adapt resilience strategies to topographic and geotechnical conditions.
- Introduce elements of nature and biodiversity into the urban environment.
- Create high-quality public realm and amenities that support the desirability of the development area.
- Provide year-round opportunities for communal activities, enjoyment of the outdoors, and recreation—both programmable and passive.
- Design and program building frontages to activate public space and ensure safety with “eyes on the park”.
 - Maintain manageable fields of vision.
 - Prioritize safety, especially near residential neighborhood (patrol, lighting, etc).

Urban Design Framework

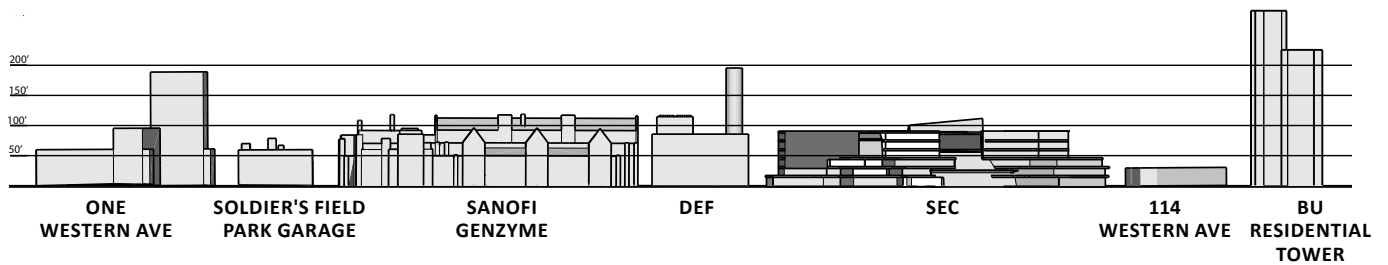
Urban design objectives relate to the existing context, and design intentions for the district. Design guidelines will be developed as planning for the ERC continues.

- A. Reflect a shift in scale from the academic campus to that of an urban district.
- B. Respect the scale and pattern of the existing Allston neighborhood. Transition scale of development downward adjacent to low-rise residential.
- C. Develop gateway treatments at key intersections.
- D. Create a robust network of open space. Facilitate connectivity east-west and north-south.
- E. Center public activities along the main street, Cattle Drive.
- F. Capitalize on river and city views. Also, create new views by providing variability in the skyline.
- G. Create new landmarks with architecture and civic space that will make the district memorable.
- H. Provide permeability into the district.
- I. Extend public realm to I-90 district.



In regards to height and massing, buildings will:

- 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.
- Minimize monolithic massing and break down the scale of large buildings.
- As appropriate, express the base, middle, and top for tall buildings.
- Transition scale of development downwards adjacent to the existing residential neighborhood.
- Comply with guiding principles around the distribution of height and massing throughout the ERC Area. These principles will be developed graphically in a future edition of the Framework Plan.



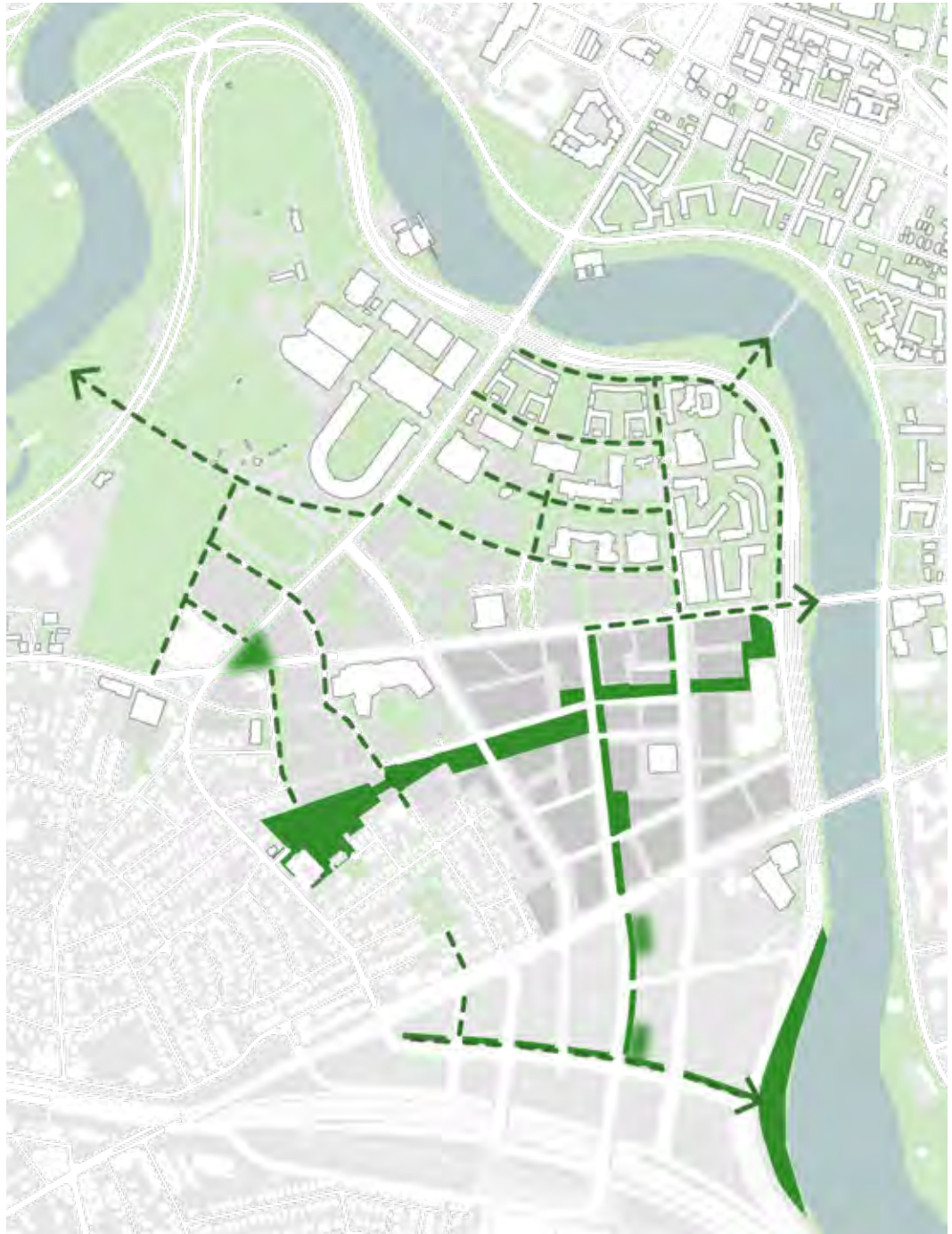
Urban Design Context - Heights

Order does not reflect geographic positions.

Landscape Framework

The location, configuration and connectivity of landscape and streetscape components aims to achieve the following objectives:

- Off-street connectivity to the Charles River.
- Valuable and active open space frontage (not the back of buildings).
- Simple street crossing at Stadium Way.
- Strong visual continuity.
- Activation by adjacencies.
- Implementation over multiple development phases as population grows.
- Potential for early implementation of segments with initial development area along Western Avenue.
- Buffer MassDOT construction zone to south.
- Adaptable over time.
- Distributed east-west and north-south path networks.
- Ability to continue the open space pattern south.



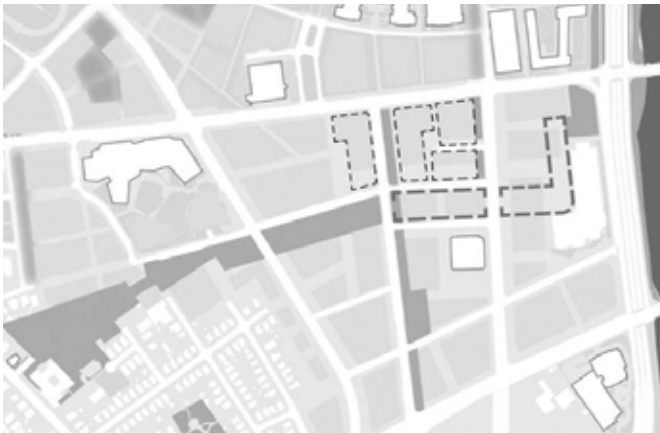
Landscape Framework



The 2017-2018 PDA Master Plan review process included dialogue about various means of connectivity to the riverfront at Western Avenue and Soldiers Field Road and the best configuration of the open space network. Planning principles drawn from the schemes below will guide the multi-phase implementation of the Greenway.



Framework Plan Concept



Boston Civic Design Commission Alternative Concept "Shift South"



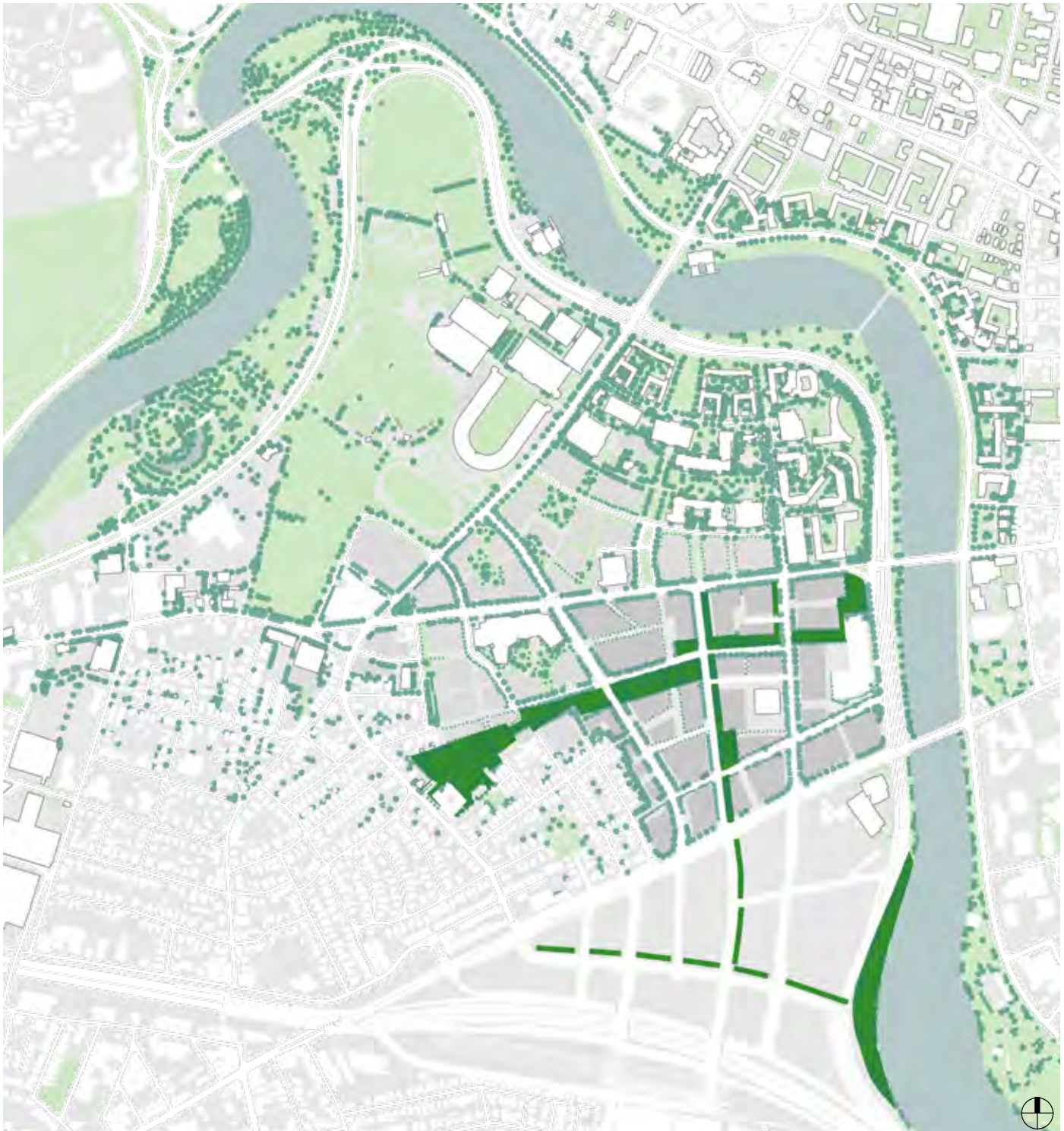
Boston Civic Design Commission Alternative Concept "Straighten Science Drive"



Planning Principles

Long-Term Illustrative Plan

The ERC will provide a robust public realm which supports the vision of the district.



Long-Term Illustrative Plan



BLOCK PLAN



FUTURE SECONDARY LANDSCAPE