# Institutional Master Plan Notification Form
# Project Notification Form

MASSACHUSETTS GENERAL HOSPITAL

## 2019 IMP PROJECTS

Submitted to:
**Boston Planning & Development Agency**
One City Hall Square
Boston, MA 02201

Submitted by:
**Massachusetts General Hospital**
55 Fruit Street
Boston, MA 02114

Prepared by:
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3 Mill & Main Place, Suite 250
Maynard, MA 01754

In Association with:
**NBBJ**
**Leggat McCall Properties**
**Goulston & Storrs**
**VHB**

February 20, 2019

Epsilon ASSOCIATES INC.

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# Chapter 1

## Introduction and General Information

# 1.0 INTRODUCTION AND GENERAL INFORMATION

## 1.1 Introduction

Founded in 1811, Massachusetts General Hospital (MGH) is the third oldest general hospital in the United States, and the oldest and largest in New England. The 1,035 licensed bed, world-renowned medical center offers sophisticated diagnostic and therapeutic care in virtually every specialty and subspecialty of medicine and surgery. MGH repeatedly is named one of the country's top hospitals by U.S. News and World Report, ranking among the top few nationwide since the annual survey began nearly three decades ago. MGH is seen as a health care employer of choice, with a focus on advancing diversity and inclusiveness, and has been recognized repeatedly with best-employer awards, including being named as Indeed.com's #1 hospital to work at in the United States. The hospital's main campus is in downtown Boston, with nearby facilities on Nashua Street and within the Charlestown Navy Yard (see Figure 1-1 for an aerial of MGH's Boston campuses).

As one of the nation's leading academic medical centers and as a health care resource for Boston and far beyond, MGH seeks to preserve its tradition of exceptional care in facilities that are worthy and supportive of this high standard of excellence. MGH is committed to delivering 21st century care in a 21st century environment for the patients and families, staff and the local and global communities it serves.

In recent years, the need for the hospital to rebuild and revitalize its Main Campus has become increasingly clear as demands for care have increased and the required resources to deliver exceptional care have evolved. Today, one-third of inpatient care on the Main Campus is provided in facilities built in 1940 and 1969, and as a result, 61% of routine inpatients currently must share a double room, which is no longer considered to be the highest standard of care. MGH needs a transformative facility if it is to continue to adapt and offer the kinds of rapidly evolving technologies and treatments that are improving and saving more lives, if it is to be able to efficiently and comfortably accommodate those who seek care, and if it is to attract the preeminent health care leaders and trainees who will sustain this level of excellence.

To assess the evolving health care trends and what it would take the hospital to meet them, MGH completed a comprehensive internal planning process to determine programming options for MGH's expansion and growth to ensure it could continue to fulfill the needs of its patients and staff. Priorities included: reducing the number of semi-private beds and creating more single rooms for a higher-quality and safer patient experience; relieving inpatient capacity constraints and the ever-increasing capacity challenges hospital wide, including the overtaxed Emergency Department area; controlling the overall cost of care by embracing a financially responsible plan; creating a resilient facility that can continue providing essential services in the event of a natural disaster or catastrophic event; and being able to complete and bring online any such projects within the next 10 years.

As a result of MGH's planning efforts and an understanding of the projected health care trends and patient care needs, as described above, MGH is proposing two projects — collectively referred to in this document as the "2019 IMP Projects" or "Projects" — including a new Clinical Building and a new Campus Services Building. These Projects are described in more detail in Sections 2.1.1 and 2.1.2.

As shown on Figure 1-2, the site of the Clinical Building is bound by Parkman Street, Blossom Street, North Grove Street and Cambridge Street. The site of the Campus Services Building is bound by Parkman Street to the south, Blossom Street to the east and MGH properties and buildings to the north and west. In addition, MGH proposes an increase in outdoor space on the podium roof available to its staff, visitors and patients as well as an improved and generally active presence along the external streets it fronts. In addition to the 2019 IMP Projects, MGH also proposes a range of campus improvement projects, such as a temporary bike shelter, recladding of buildings, support services relocation, Gray Building rooftop open space and new rooftop emergency generator plant.

It is anticipated that the Projects, as well as the general campus improvement projects, will enable MGH to meet the needs of its patients, staff and visitors, while keeping the hospital at the forefront of health care delivery, research, education and community health. Most days, MGH operates at or near capacity, with patients waiting in the Emergency Department for extended periods of time, often because of the lack of an inpatient bed; the Clinical Building will provide relief for the overtaxed Emergency Department area. In addition, the Clinical Building will allow for the ability to shelter in place for 96 hours, provide continuous operability of critical services during an emergency event, and allow for a phased emergency response plan for recovery of other services after an event. As such, the Clinical Building will be a vital resource for the City and MGH community at times when there are patient surges related to a disaster or disease. The Clinical Building will also serve as a place of refuge for the campus and the MGH community.

The Massachusetts General Hospital and The General Hospital Corporation (together, the Proponent) is pleased to submit this Institutional Master Plan Notification Form/Project Notification Form (IMPNF/PNF) to the BRA, doing business as Boston Planning and Development Agency (herein, the "BPDA" except when referring to activities prior to 2016). With this submission, MGH is initiating the process for approval of a new Institutional Master Plan (IMP) pursuant to Article 80D of the Boston Zoning Code (the Code) and initiating Large Project Review under Article 80B of the Code for the Projects, to enable the development of the proposed Projects.


**Massachusetts General Hospital Boston, Massachusetts**

nbbj

**Figure 1-1**
*MGH Boston Campuses*


**Massachusetts General Hospital Boston, Massachusetts**

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**Figure 1-2**
*Project Sites*

## 1.2 Mission and Objectives

### *1.2.1 Mission & Guiding Principles*

MGH's mission is as stated below:

> *"Guided by the needs of our patients and their families, Massachusetts General Hospital aims to deliver the very best health care in a safe, compassionate environment; to advance that care through innovative research and education; and to improve the health and well-being of the diverse communities we serve."*

MGH sustains synergy among the four components of its mission – patient care, teaching, research and the community. While patient care is the primary mission, the integration of research and teaching programs is critical in both advancing the quality of patient care and distinguishing MGH as a provider. The commitment to improving the health of the communities served – locally, nationally and globally – is intricately linked with the other missions, and in fact, care for the most vulnerable individuals was the foundation on which MGH was built.

MGH looks to the following guiding principles as it adapts to further challenges and opportunities.

**World Class Patient Care** – MGH will provide clinical care that is superior in terms of quality, safety, outcomes, compassion, equity, and value. The hospital is committed to delivering this outstanding care in the most appropriate setting for the level of complexity.

MGH will provide exceptional patient-centered care to all those who seek care and services from the dedicated and skilled team of providers. It will also provide more convenient and timely access to care in high-demand specialties, urgent care, behavioral health, and palliative care. MGH will enable patients to have greater control over their health care, including offering the ability to access their health information online, schedule convenient appointments, and make fully-informed decisions about their care.

MGH will enable its caregivers to spend more time with patients, work at their levels of expertise, measure and continually improve the care they deliver, and work together as a team to provide the highest-quality, safest and efficient care possible.

**A Research Leader** – MGH has the largest hospital-based research program in the nation, with a research budget of over $928 million in 2018, with approximately half of that total coming from the National Institutes of Health. MGH also has been among the top-cited hospitals on the Nature Index, a measure of the relevancy of the research enterprise. The institution will augment this high level of scientific excellence into the future. Enhanced integration of MGH's research and care missions will be an engine for breakthrough therapies and cutting-edge clinical care. New knowledge in such areas as genetics and

genomics, stem-cell science, artificial intelligence and big data will inform the advances in clinical care that will improve and save more lives in the years ahead.

Research will continue to be attracted to MGH, drawn by the tremendous expertise in translational medicine, and the ongoing commitment to working with industry to ensure that knowledge gleaned in the laboratories of the hospital can be moved down the pipeline and turned into therapies and technologies that can help patients and families. MGH will ensure that the process of creating collaborations and relationships is as smooth and seamless as possible. Investigators representing various disciplines and various kinds of expertise will organize as teams to tackle complex research problems to pursue institutional priorities and external funding opportunities.

An Emphasis on Education – As one of the most sought-after academic medical centers in which to train, MGH will ensure that its education programs are both excellent and comprehensive. Because medicine and health care are dynamic fields, to remain current, care providers must continue to learn and develop over the course of their careers. They will engage in offline practice and use feedback to improve the quality of their practice. Interprofessional team care and learning will be core to clinical training, and trainees will be assessed to ensure competency prior to patient encounters. Simulation will be an important and growing tool enabling providers to practice and learn in a safe and controlled environment.

Medical students, residents, fellows and other physician trainees will be afforded best-in-class educational experiences, with educationally rich programs that emphasize sophisticated technology and the most advanced procedures as well as service obligations to communities locally and globally. Extraordinary educational opportunities also will be offered for nurses – students, new graduates and experienced caregivers – as well as others in the increasingly wide range of health professions. MGH education will continue to be supported by exceptional dedicated teachers and mentors. Educational programs will be actively coordinated and advocated across the continuum and incorporating all disciplines.

Reaching Out to the Community - MGH will continue to partner with communities it serves to make significant improvements in health and wellbeing. Community health efforts will be comprehensive and well-coordinated across the hospital's missions and the community. Clinicians and trainees will have the cultural competency to deliver quality, equitable care to all patients and patient populations. A robust community research program will engage the community and will inform the direction of community health improvement efforts.

### *1.2.2 Mission in Practice*

MGH strives to meet the four components of its mission – patient care, research, education and the community, as detailed below.

### *Patient Care*

With respect to patient care on the Main Campus, in 2018 MGH:

- Admitted approximately 50,300 inpatients;
- Handled approximately 1.7 million outpatient visits;
- Recorded more than 108,000 emergency room visits; and
- Delivered more than 3,900 babies.

Since its founding in 1811, MGH has steadily increased its presence in Boston, expanding and evolving to serve the increasing population and employing greater numbers of people from Boston and the region.

### *Research*

The Massachusetts General Research Institute comprises more than 8,500 researchers working across more than 30 institutes, centers, and departments. These bold-thinking scientists study such biological and health issues as cancer, biomedical imaging, cardiovascular systems, computative and integrational biology, genomics, molecular imaging, regenerative medicine, systems biology, integration of medicine and innovative technology, digestive health, vascular systems, clinical data science, disaster medicine, transplant surgery, heart health, and photomedicine.

### *Education*

MGH is the original and largest teaching hospital of Harvard Medical School, where nearly all of its physicians are faculty members. MGH, in fact, was founded in part to provide a teaching hospital where students from Harvard Medical School could learn the art and practice of medicine. MGH has long been committed to training and mentoring the next generation of international leaders in science and medicine, providing opportunities for physicians, nurses and allied health professionals. The hospital also serves as a site for the principal clinical experience as well as a number of other clerkships. MGH offers specialized residencies and fellowships in each of its multidisciplinary care centers and clinical departments. Given its close affiliation with Harvard Medical School, MGH is committed to ensuring that medical students from Harvard have a positive educational experience and achieve their objectives while completing a range of rotations through the hospital. In January 2015, MGH was recognized as the top medical and surgical residency institution in the nation by Doximity, the largest online network for physicians. In addition, MGH provides education at various levels for many clinical disciplines. Nursing students from the MGH Institute of Health Professions and regional colleges are involved in clinical rotations during which they gain clinical experience in a wide range of nursing settings. Through the Norman Knight Nursing Center for Clinical and Professional Development,

nurses engage in continuing education and professional development. Education opportunities at various levels exist for physical therapy, occupational therapy, radiology technologists, laboratory technologists, dietitians, social workers and other fields. In addition, the hospital offers educational programs and fellowships in health care management, finance and other non-clinical areas of health care and hospital administration.

### *Community*

MGH is the second largest provider of charity care to people without means to pay for health care in the Commonwealth. Approximately $43 million of health care services were provided to charity care patients in fiscal year (FY) 2018.

MGH is also a major provider of health care for patients on Medicaid, providing approximately $483 million worth of care in FY2018.

MGH has a long history of caring for vulnerable patients, specifically in the communities of Boston, Chelsea and Revere. MGH is the second largest provider of health care to the uninsured or underinsured in Boston. The funds that will be designated for community benefits from the new construction will enable MGH to build on its strong history of community engagement and its track record of partnering with communities to tackle some of the most pressing public health issues.

A further description of MGH's community efforts is included in Section 1.3 below.

## 1.3 Community Benefits

### *Introduction*

MGH has a deep and long-term commitment to improving health across the City of Boston and achieving health equity. Key strategies to succeed in these goals include providing access to and reducing barriers to high-quality care and addressing the "social determinants of health." These are the economic, environmental and social influences where people live, work and spend time. They extend far beyond biology to include education, employment, housing, air quality, substance use, diet, exercise and family and community safety, as well as access to quality health care. A disparity between communities in the distribution and quality of these resources leads to persistent health inequities, based on race, ethnicity and income.

Since its founding, MGH has invested in improving the health of its surrounding communities. In the City of Boston, MGH has a particular commitment to Charlestown, where it has operated a community health center (Charlestown HealthCare Center) that has delivered comprehensive, family-centered care for nearly 50 years, as well as to East Boston, where it is involved in ongoing long-time collaborations with the community health center in that neighborhood (East Boston Neighborhood Health Center). In each

community, increasingly diverse populations contribute to the vitality of the culture, environment and spirit. In these and other communities, there are high rates of poverty (despite the pockets of wealth in Charlestown) and low educational attainment, along with a disproportionate burden of substance use, violence and obesity. Residents struggle with skyrocketing housing costs, making it difficult to afford other necessities. In addition, the escalating opioid crisis threatens public health and safety. In addition to Charlestown and East Boston, MGH supports a number of other health centers in Boston – most notably Dimock Community Health Center and Mattapan Community Health Center – through financial contributions, clinical collaborations and support for specific activities.

To determine the major public health challenges, MGH partners with local communities to conduct comprehensive participatory community health assessments every three years. For 2019, MGH is engaged with the Boston Public Health Commission, other Boston teaching hospitals and community organizations in conducting the first ever collaborative community health needs assessment and implementation plan for Boston. This unified effort holds promise for more powerful interventions to address health disparities across Boston.

### *Making a Difference: The MGH Model*

MGH, working with all sectors in local communities, has been involved in helping communities make significant progress in recent years. MGH formed the Center for Community Health Improvement (CCHI) to partner with community residents, faith-based organizations, nonprofits, city officials, public schools, police and local businesses to address the communities' health concerns and health disparities across race, ethnicity and economic status. CCHI convenes local groups to develop vision and strategies; test, implement and evaluate successful interventions; advocate for needed systems and policies; and mobilize funding. Over time, these partnerships have fostered a deep and lasting trust that helps sustain MGH's programs and reach more people while leveraging additional resources to maximize the impact that the hospital can have in improving the health of communities.

MGH's work is guided by the deeply held values of a commitment to the underserved, inclusion, health equity, an understanding of the lasting impact of trauma on family health and functioning, the use of evidence-based approaches to prevention and mutual learning and sustainable change. To make sure MGH stays on track, it continually measures progress and outcomes.

CCHI has three evidence-based overarching strategies to address social determinants of health, using a framework developed by the U.S. Centers for Disease Control and Prevention and called the "Health Impact Pyramid." Within each strategy there are multiple programs.

### *Addressing Social Determinants of Individual Patients*

Specialized community health workers reach out to vulnerable patients to help them identify and address barriers to health and health care that are as diverse as navigating the health care system to resolving a housing crisis. The community health workers include: cancer navigators who help patients move through the complex health care system to assure they receive potentially life-saving screenings and diagnostic care; violence prevention advocates for victims of domestic or street violence who work to promote patients' safety; and recovery coaches for those with substance use disorders who are disenfranchised and disconnected from essential supports.

All of these health professionals have shared life experience with their patients. For example, recovery coaches – who have been in recovery themselves for at least two years – help patients connect to treatment and maintain their path to recovery. These staff members bring a special understanding and empathy to their role that helps them build trust and engage with patients.

### *Addressing the Social Determinants for Boston Youth*

Educational attainment is among the most important social determinants of health. MGH works with more than 1,000 mostly Boston Public School students (as well as some students from Chelsea and Revere public schools) each year (grades 3 through college) to promote science, technology, engineering and math (STEM). MGH introduces students to careers in health and science starting in the third grade, primarily through a partnership with the Boys and Girls Clubs of Boston.

By high school, these students engage in a longitudinal relationship with MGH in the intensive career exploration and college preparatory program. Because these young people are often the first in their families to consider college, MGH also works with parents to help them understand the college and financial aid processes. MGH provides students with opportunities for paid school-year and summer internships at the hospital. Last year, MGH was the leading summer employer of youth in the City, with more than 200 young people gaining experience in various aspects of health care. MGH stays with its high school cohort through college, providing financial aid, mentoring and support to promote their college completion. Seventy-six percent (76%) of MGH's first college class is on track to graduate within five years, compared to 52% of a similar Boston Public School cohort.

### *Addressing Social Determinants at the Community Level: Substance Use Prevention and Promotion of Healthy Eating/Active Living*

Multi-sector, community-based coalitions in Charlestown and East Boston were convened by CCHI to address public health challenges and work toward policy and environmental change to prevent illness and reduce disparities. This year, MGH funded the development of a comprehensive youth prevention plan with the Mayor's Office of Recovery and is

funding four additional coalitions in Grove Hall, Chinatown, Allston-Brighton and South Boston. The coalitions have:

- Prevented youth substance use through youth groups and parent sessions using evidence-based curricula, education and social marketing;
- Promoted changes in school drug policy;
- Conducted legislative advocacy;
- Organized prescription take-back days;
- Supported the use of Narcan to prevent overdoses;
- Improved access to treatment via recovery coaches and drug courts; and
- Decreased the stigma about drug use at vigils and community events.

### *Boston Programs to Improve Community Health*

Access to Care

**Community Health Workers/Cancer Navigators** - Community health workers (CHW) help patients – particularly those with multiple chronic diseases, including mental health and substance use disorders – to address barriers to their health, including housing, safety and understanding their medications. CHWs create trusting relationships, navigating patients to important appointments, making follow-up home visits and closely communicating with the provider team. CHWs engage patients in setting their own goals and building their efficacy to take care of their health.

**Boston Health Care for the Homeless Program** - Boston Health Care for the Homeless Program (BHCHP) – with a mission to provide the highest quality health care to homeless people in metropolitan Boston – is woven into the clinical, education and research fabric of MGH. The BHCHP at MGH Primary Care Clinic occurs in the MGH Medical Walk-In Unit five days a week, with Thursday's clinic providing open medical and psychiatric access throughout the day to those who live on the streets rather than in shelters.

**Community Health Center Support** - MGH provides significant operating support to the East Boston Neighborhood Health Center, North End Waterfront Health, and Charlestown HealthCare Center, and provides significant contributions to and has clinical collaborations with the Dimock Center, the Mattapan Community Health Center and other Boston community health centers. One example of such a collaboration has involved a breast cancer screening program with the Mattapan Community Health Center, which has been ongoing since 2001, when MGH received a grant from the Avon Foundation to provide patient navigation to increase breast cancer screening and to provide support during follow-

up on abnormal findings as well as treatment. The Avon program includes two breast health navigators who identify patients due for screening, schedule mammograms in the on-site mammography suite or at local hospitals, provide reminder calls, and follow-up with patients who miss screening appointments. They also work with patients who require follow-up after an abnormal mammogram or clinical breast exam, and they facilitate access to medical and social services for diagnosed patients. Through FY2017, MGH has provided more than $1.4 million from an Avon grant to the Mattapan Community Health Center for this program.

Connect to Wellness - This MGH-operated program provides health and social service coordination and social connection for the low-income residents of three buildings occupied by older adults and individuals with disabilities surrounding the hospital. The goal of this program is to help seniors age in place.

Mobile Health Van of the Kraft Center - The Kraft Center Mobile Health Van program brings together partners in preventive care, addiction services and harm reduction to serve individuals not well-connected to health care, experiencing homelessness and/or living with addiction. The van provides services in Dudley Square and the West End, communities with high numbers of fatal opioid overdoses.

Using an innovative partnership model, the van combats the opioid epidemic with accessible, on-demand care. Experienced staff members from Boston Health Care for the Homeless Program and the Boston Public Health Commission's AHOPE program provide a range of services on the van and connect patients to community health centers, treatment programs or specialty care, including:

- *Addiction Services:* Referrals to opioid treatment programs, in-patient detox and medications for addiction treatment.
- *Harm Reduction:* Naloxone, overdose prevention education, risk reduction counseling and syringe exchange.
- *Preventive Care:* Screenings, immunizations, chronic disease management (including hypertension, diabetes, HIV treatment), and referrals to behavioral health, hepatitis C treatment, specialty medical care and other services based on patient needs and preferences.

Opioid Epidemic

Substance Use Disorder Initiative - The MGH Substance Use Disorders (SUDs) initiative was developed in response to community health needs assessments in which residents identified substance use – particularly opioid use – as the single greatest issue in their community. The initiative was designed to improve the quality, clinical outcomes and value of addiction treatment for all MGH patients with SUDs. To accomplish this mission, patients

must have access to evidence-based treatment that is readily available and standardized across the system. The MGH SUDs initiative is focused on re-designing care at all levels to meet this goal. Components of the initiative include:

- *Inpatient Addiction Consult Team (ACT)* – Provides comprehensive evaluation, treatment recommendations and linkages to community resources for patients on all adult inpatient units identified with SUDs.

- *Bridge Clinic* – Outpatient addiction clinic, which provides transitional care for patients following an inpatient stay or who present in the MGH Emergency Department. Available to all patients in need of continued treatment for their SUDs until appropriate community linkages can be made.

- *Recovery Coaches* – Peers in recovery who assist patients by meeting them wherever they are, both literally and figuratively, helping them overcome barriers to treatment, providing motivational support and serving as key members of the patients' care teams.

- *Enhanced Health Center and Primary Care Practice Treatment* – Innovative care at the MGH Community Health Centers, the primary care practices and the Boston Health Care for the Homeless Program to increase access to evidence-based treatment, including pharmacotherapy and readiness services, and to create collaborative multidisciplinary SUDs care teams.

- *Education and Culture Change* – Broad-based education curriculum to strengthen understanding, identification and treatment of SUDs within the internal MGH community, the broader medical and psychiatric community as well as the broader public. Efforts in education are designed to inspire hope and motivation in caring for this patient population by helping people to understand that SUDs are a chronic, and more important, treatable disease.

- *Prevention* - Continued support for prevention and harm reduction through multi-sector community coalitions that change policies and systems.

- *Research & Evaluation* – A robust research initiative to evaluate the program's impact on patients' cost, utilization, addiction severity, and engagement in treatment, as well as on providers' attitudes and clinical practice.

Violence Prevention

HAVEN - This program provides welcoming, affirming advocacy services to survivors of intimate partner violence, to teens through later in life, including members of the LGBTQ community. Training, education, and consultation to MGH and its surrounding communities are also provided in collaboration with community partners.

**Violence Intervention Advocacy Program (VIAP)** - A VIAP advocate helps guide victims of community violence through recovery from physical and emotional trauma. They may be victims of shootings, stabbings, bar fights, gang violence or other community violence. The goal is to intervene in the cycle of violence and foster connection to community, schools and jobs to prevent future violence.

**Child Protection Team** - This team provides consultation to MGH providers in the assessment and management of possible child endangerment. Consultation, including possible mandated reporting to the Department of Children and Families (DCF), and safety planning for the child and/or family and staff are provided. Team members may serve as liaisons to police, district attorneys, community agencies, appear in court proceedings and help to prepare health care professionals for court testimony. They also provide education and training in the hospital and the community about psychosocial, emotional and medical aspects of child abuse.

**Human Trafficking Initiative** - Most victims of human trafficking experience isolation from their families and friends because they are taken to different cities and have no social support. Many are homeless, and they are high risk for substance use. The Freedom Clinic at MGH provides comprehensive primary care and other supportive services to victims of human trafficking.

Youth Programs

**STEM/BPS Programs** - MGH engages 1,000 young people per year in STEM, career exposure, employment, college readiness and completion. The goal is to promote educational attainment and stimulate an interest in health and science careers for Boston Public School (BPS) students.

- *Grades 3 – 5* - STEM Clubs, in partnership with Boys and Girls Clubs of Boston, aim to develop excitement and engagement in STEM subjects, build confidence in students' abilities to succeed in these subjects and increase exposure to STEM careers.

- *James P. Timilty Middle School Science Fair* – students have been working with MGH employee mentors on science fair projects from concept to completion for almost 30 years. There is also a career exploration initiative for select graduating eighth graders that provides paid summer internships at MGH.

- *Youth Scholars* – Throughout high school, MGH has a longitudinal relationship with about 120 high school students in an intensive career exposure, jobs and college readiness program.

- *Youth Scholar Alumni* – MGH then supports the same youth to enter and complete college with scholarships and mentoring and other support. A total of 76% of MGH

students are graduating from college within five years, compared with a similar cohort of BPS students in which 52% graduated within six years.

- *Summer jobs* – in 2018, MGH was the largest summer employer of Boston youth in the city, with more than 200 youth on the job.

**Boys and Girls Clubs of Boston (BGCB)** - MGH has a robust partnership with the BGCB around health. MGH supports a nurse who develops policies and programs, trains staff around a variety of health issues and manages complex issues. MGH also supplies the nursing staff to Camp Harbor View in the summer.

Community Engagement

MGH is the "backbone" organization to community coalitions in Charlestown and East Boston. Coalitions are comprised of community leaders, representing different sectors of the community, who identify needs and work to change policies and systems so that the healthier choice is the easier choice. The "backbone" supplies staff, best practices, evaluation and support with fundraising. These coalitions have made important progress with increasing community engagement, including efforts to reduce harms from opioids. Also, MGH recently funded four additional coalitions to fight substance use disorders in South Boston, Allston-Brighton, Grove Hall and Chinatown.

Other MGH Activities, Programs and Contributions that Benefit Boston

- *Home Base* – A program founded by the Red Sox Foundation and MGH to provide care, support and resources for veterans and their families who are dealing with deployment-related post-traumatic stress disorder and/or traumatic brain injury.

- *HUBweek* – MGH is a founding sponsor – along with Harvard, MIT and the Boston Globe – of HUBweek, a festival of innovation, technology, science and art. The weeklong slate of events is an opportunity for civic engagement. MGH sponsors community programs in conjunction with HUBweek, including a science presentation competition for Boston Public School students, a community dialogue on gun violence prevention, a conversation about opioids, and discussions related to diversity, inclusion and health disparities.

- *Boston's Way Home Fund* –MGH committed significant support toward the $10 million goal to create 200 units of permanent, supportive housing for homeless men and women. This effort is being led by the City of Boston and the Pine Street Inn.

- *Boston Youth Substance Use Prevention Strategic Plan* – MGH invested $1.3 million to help implement a plan that aims to build upon, sustain and support the coalitions, providers, recovery support organizations and other youth-serving organizations working to prevent substance use disorders.

- *The Maxwell and Eleanor Blum Patient and Family Learning Center* – This free health information resource suite, located off the hospital's main central corridor, offers patients, families, friends and the community a comfortable place to access information about health, disease, prevention, research, treatment options and other issues. Volunteer staff are on hand to help Blum Center users find the most reliable and useful information to respond to their specific needs.

- *Paul S. Russell, MD Museum of Medical History and Innovation* – MGH's Russell Museum is a stand-alone facility on Cambridge Street that offers visitors an opportunity to experience and learn about the story of MGH and medical progress through permanent and temporary exhibits, interactive media displays, artifacts and photographs. Each month the museum hosts a free evening lecture for the community that highlights a timely or relevant topic related to health care, medicine, science, history or innovation.

### *Transportation Programs*

MGH offers several transportation-related programs to area residents. In addition, MGH implements an extensive transportation demand management program that benefits employees, patients, and visitors, as described in more detail in Section 3.1.2.11. Specific transportation programs benefiting area residents include:

- Zipcars – Residents have access to the four Zipcars located in the Fruit Street Garage, and four Zipcars located in the Charles River Plaza garage.

- Parking for Community Residents - MGH offers overnight parking in the Yawkey Garage, and a reverse commute parking program in the Charles River Park garage. Currently, 188 individuals are registered for the Yawkey Garage overnight parking, and 45 individuals are registered for the Charles River Park reverse commute program.

- Improved Wayfinding –MGH will continue to provide improved wayfinding in the vicinity of the hospital to direct patients and visitors.

## 1.4 Job Training and Education

MGH's workforce is its most valuable asset and a critical component in its success. MGH is committed to fostering the highest quality work opportunities for all employees, and nurturing career-long growth in knowledge and skills while providing a fair and safe work environment. MGH is also committed to communicating the information and providing the tools employees need to succeed. Diversity plays a crucial role in shaping MGH as an employer, health care provider, and member of the community. The hospital is committed to recruiting, hiring and promoting people from different backgrounds, and believes that a

diverse workforce is critical to improving access to quality health care, indispensable for quality education, and accelerates advances in both medical and health services research.

In FY2017, MGH invested $41 million in direct workforce development initiatives for Boston resident employees (includes the cost of pre-employment training and jobs). MGH's Training and Workforce Development Office facilitates and promotes employee education, training, and career development opportunities.

Below is a sampling of MGH's workforce development offerings:

**Leadership Academy:** The MGH Leadership Academy provides hospital managers with opportunities for continuing education and professional development. Classes include Coaching Employees, Managing Difficult Conversations, Managing Budgets, Process Improvement and Behavioral Interviewing.

**College Fair and Career Information events:** Held annually, MGH hosts events to connect employees with educational resources that will help them reach their career goals.

**English for Speakers of Other Languages Program:** Held in partnership with Jewish Vocational Services for the last 23 years, the English for Speakers of Other Languages programs have helped hundreds of MGH employees improve their English language skills, better positioning them for career advancement in the organization.

**Computer Training Workshops:** Partners Information Systems Training provides hands-on computer instruction centering on the Partners' standard office productivity programs. Courses include Microsoft Office applications, including Word, Excel, Access and PowerPoint.

**Medical Terminology Classes:** MGH offers two levels of instruction in medical language for allied health professionals. Students learn to analyze, decipher, spell and pronounce medical terms. Emphasis is placed on understanding terms in their proper context as they relate to the anatomy, physiology and pathology of the human body.

**Tuition Assistance Program:** Employees are encouraged to take advantage of educational and training opportunities, which increase their knowledge and skill in their present jobs or prepare them for specific career goals within their departments or within the organization, at large.

In addition to providing learning opportunities for employees, MGH is also committed to connecting employees with the right level of talent, experience and skill with advanced career opportunities. Below are examples of how MGH is developing its talent pipeline.

- Tracking of employees who are about to graduate or who have recently graduated from undergraduate, graduate and certificate programs to align with job opportunities.

- In order to effectively track employees, MGH is looking at systems that can be implemented, in particular an employee management system.
- Faculty Development Awards support the career advancement of physician-scientists and clinician-teachers.
- Department-specific and hospital-wide mentoring and coaching programs.
- Mentoring workshops (The Mentor's Way) are offered twice a year to support mentor best practices for managers.
- Career-growth and networking opportunities through the hospital's employee resource groups.

## 1.5 Employment

MGH has a direct workforce of approximately 26,949 employees. Of this total, approximately 24 percent are Boston residents. Table 1-1 includes a breakdown of employees by job type. The Project will create approximately 1,200 jobs.

**Table 1-1 Employee Statistics (2017)**

| Job Type | Approx. % |
|---|---|
| Physicians | 9% |
| PhDs | 4% |
| Fellows | 5% |
| Officials and Managers | 6% |
| Registered Nurses | 20% |
| Other Professionals | 19% |
| Technicians | 9% |
| Administrative Support | 14% |
| Skilled Trades | 1% |
| Service Workers | 13% |

## 1.6 Economic Benefits

MGH is the largest non-governmental employer in Boston. MGH is a significant contributor to the local economy; the hospital's annual payroll for Boston residents is approximately $432 million. MGH has spent more than $214 million on goods and services from firms within the City of Boston in 2018, including more than $10.7 million from Disadvantaged Business Enterprises, Minority Owned Businesses, Small Businesses, and Women Owned Businesses.

### *Property Taxes/PILOT*

Partners HealthCare is the highest contributor to the City of Boston's Payment in Lieu of Taxes (PILOT) program with over $22 million split between cash and community benefits in FY2018; MGH commitments account for over $14 million of this amount, $7 million in cash contribution and $7 million in community benefits.

### *Estimated Development Impact Payments*

Under Section 80B-7 of the Code, projects that require zoning relief and that will devote more than 100,000 square feet of space to "development impact uses" must make contributions to the City of Boston's Neighborhood Housing Trust and Neighborhood Jobs Trust. MGH will provide housing linkage and job linkage contributions as provided in Article 80B as applicable.

## 1.7 Facilities

The Proponent owns and leases properties in downtown Boston and the Charlestown Navy Yard (CNY). MGH's owned land and leased properties are shown on Figures 1-3 and 1-4 and are detailed in Table 1-2 by area. Owned and leased parking is described in Section 3.1.2.10.

**Table 1-2 Owned Land in Boston**

| Parcel | Land Area (approx. sf) | Approx. GFA (sf) | Approx. FAR |
|---|---|---|---|
| Main Campus | 715,442 | 4,413,493 | 6.17 |
| Nashua Street Area | 257,448 | 190,080 | 0.74 |

The Charles River Plaza buildings are a condominium. The Proponent does not own all of the units in the condominium. The Proponent owns a portion, but not total, interest in the condominium, which includes the same percentage interest in the land of the condominium.

### *1.7.1 Properties Owned in Boston*

Table 1-3 provides a list of the Proponent's owned buildings. The Proponent's owned parking is included in Table 3-3.


**Massachusetts General Hospital Boston, Massachusetts**

nbbj

**Figure 1-3**

*Owned and Leased Buildings in Downtown Boston*


**Massachusetts General Hospital** **Boston, Massachusetts**

nbbj

**Figure 1-4**

*Leased Buildings in Charlestown*

Table 1-3 Owned Buildings and Uses[1]

| Key to Fig 1-3 | Building Name | Address | Current Use(s)[2] | Date of Construction | Floor Area (sf)[3] | Building Height (ft) | Stories Above/ Below Grade | Parking Spaces[4] | Condition | IMP Proposed Action / Use |
|---|---|---|---|---|---|---|---|---|---|---|
| Main Campus | | | | | | | | | | |
| 1 | White Building | 55 Fruit Street | Inpatient (including Emergency Department Services) and Mixed-Use including Retail[5], Research[6] | 1940 | 304,517 | 218 | 16 / 2 | 0 | Fair/Good | Facade to be reclad[7] |
| 2 | Ellison Building (Tower) | 267 Charles Street | Inpatient and Mixed-Use including Retail, Ambulatory | 1990 | 451,524 | 307 | 24 / 2 | 0 | Good | None |
| 3 | Founders Building | 265 Charles Street | Ambulatory, Research, Support Services, including Administration[8] | 1917 | 104,951 | 139 | 9 / 2 | 0 | Poor | None |
| 4 | Warren Building | 275 Charles Street | Ambulatory, Research, Clinical Lab | 1956 | 106,153 | 156 | 14 / 1 | 0 | Fair | None |
| 5 | Blake Building | 273 Charles Street | Inpatient and Mixed-Use including Retail | 1993 | 331,516 | 209 | 16 / 2 | 0 | Good | Rooftop Generator Installation (potential location) |
| 6 | Cox Building | 100 Blossom Street | Ambulatory, Research, Support Services including Administration | 1975 | 119,807 | 138 | 8 / 1 | 0 | Fair | None |
| 7 | Gray/Bigelow Building | 90 Blossom Street | Inpatient, Ambulatory, Mixed-Use including Retail | 1969 | 332,633 | 224 | 16 / 2 | 0 | Fair | None |
| 8 | Gray/Jackson Building | 80 Blossom Street | Research, Clinical Labs, Operating Rooms, Support Services including Administration | 1969 | 203,517 | 224 | 16 / 2 | 0 | Fair | Rooftop Generator Installation (potential location) |
| 9 | Bulfinch Building | 66 Blossom Street | Ambulatory, Research, Support Services including Administration | 1821 | 99,838 | 87 | 5 / 1 | 0 | Fair | None |
| 10 | Edwards Research Building | 60 Blossom Street | Research | 1950 | 58,994 | 126 | 8 / 1 | 0 | Fair | None |
| | Edwards Cardio-Pulmonary Building | 60 Blossom Street | Ambulatory, Research | 1966 | 8,289 | 48 | 1 / 1 | 0 | Poor | None |
| 11 | Thier Research Building | 50 Blossom Street | Research | 1984 | 139,734 | 172 | 12 / 1 | 0 | Fair | None |
| 12 | Bartlett Building | 40 Blossom Street | Research, Support Services Administration | 1963 | 51,879 | 115 | 10 / 1 | 0 | Fair | None |
| 13 | Bartlett Extension | 40R Blossom Street | Research, Support Services including Administration | 1988 | 37,464 | 94 | 7 / 1 | 0 | Fair/Good | None |
| 14 | Service Center Building | 30 Blossom Street | Storage, Waste Disposal, Support Services including Administration, Operations | 1981 | 6,675 | 22 | 1 / 0 | 0 | Fair | Demolition |
| 15 | Wang Ambulatory Care Center Building | 15 Parkman Street | Ambulatory, Support Services including Administration, and Mixed-Use including Retail, Parking | 1981 | 296,799 | 135 | 9 / 1 | 132 | Fair/good | None |
| 16 | Lunder Building | 45 Fruit Street | Inpatient Care, Including Emergency Department Services | 2011 | 642,674 | 185 | 13 / 4 | 10 ambulance bays | Good | None |
| 17 | Burr Proton Therapy Center | 30 Fruit Street | Ambulatory, Support Services including Administration, Diagnostic Treatment | 2002 | 64,151 | 50 | 2 / 1 | 0 | Good | None |

Table 1-3 Owned Buildings and Uses[1] (Continued)

| Key to Figs 1-3 | Building Name | Address | Current Use(s)[2] | Date of Construction | Floor Area (sf)[3] | Building Height | Stories Above /Below Grade | Parking Spaces[4] | Condition | IMP Proposed Action / Use |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Yawkey Center | 32 Fruit Street | Ambulatory, Support Services including Administration, and Mixed-Use including Retail, Parking | 2004 | 446,967 | 120 | 10 / 6 | 700[9] | Good | None |
| 19 | Fruit Street Garage | 55 Fruit Street | Parking | 1972 | 228,487 | 80 | 6 / 1 | 720 | Poor | None |
| 20 | Parkman Street Garage | 10 Parkman Street | Parking | 1972 | 190,482 | 80 | 6 / 1 | 622 | Fair | Demolition |
| 21 | Bike Canopy | Corner of North Anderson and Parkman Street. | Bicycle parking (300 spaces) | 1988 | N/A | N/A | N/A | N/A | Fair | Demolition |
| 29 | MGH-Paul S. Russell MD Museum | 2 North Grove Street | Support Services including Administration, Museum Uses, Historical Exhibits, Space for Recreation, Lecture and Seminar Use | 2011 | 8,000 | 52 | 4 / 1 | 0 | Good | None |
| 27 | Resident Physician House | 1 North Grove Street | Support Services including Administration | 1892 | 3,800 | 56 | 3 / 1 | 0 | Fair/Good | None |
| 22 | 25 North Anderson Street (West End Tenement House) | 25 North Anderson Street | Support Services including Administration | 1910 | 8,257 | 75 | 5 / 1 | 0 | Poor | Demolition |
| 23 | Ruth Sleeper Hall | 24 Parkman Street | Ambulatory, Research, Support Services including Administration | 1884 | 33,144 | 63 | 3 / 1 | 0 | Poor | Demolition |
| 24 | West End Settlement House | 16 Blossom Street | Ambulatory, Research, Support Services including Administration | 1929 | 19,175 | 56 | 3 / 1 | 0 | Fair | Demolition |
| 25 | Professional Office Building | 275 Cambridge Street | Ambulatory, Research, Support Services including Administration, Retail | 1990 | 31,241 | 80 | 5 / 0 | 0 | Good | Demolition |
| 26 | Ambulatory Office Building (aka Lawrence House, Trustees' House) | 10 North Grove Street | Research, Support Services including Administration | 1990 | 9,441 | 56 | 3 / 1 | 0 | Good | Demolition |
| 28 | Connector Building[10] | 35 Fruit Street | Occupied by Mass Eye and Ear Administration | 1927/1954 | 39,502 | 124 | 8 / 1 | 0 | Poor | None |
| 65 | Garden Street Shops (Woodshop) | 12 Garden Street | Support Services, including Administration, Operations and Residential | Unknown | 23,045 | 45 | 3 / 1 | 0 | Fair | None |
| N/A | Connecting Passage (Service Tunnel) | 66 Blossom Street | Support Services including Administration, Operations | 1988 | 10,837 | N/A | 0 / 1 | 0 | Fair | None |
| TOTAL | | | | | 4,413,493 | | | 2,042 | | |
| **Charles River Plaza** | | | | | | | | | | |
| 41 | Charles River Plaza South | 175 Cambridge Street | Support Services including Administration | 2004 | 90,472 | 65 | 6 / 1 | 0 | Good | None |
| 42 | Charles River Plaza East | 165 Cambridge Street | Research, Ambulatory, Support Services including Administration | 1965 | 156,861 | 120 | 10 / 0 | 0 | Good | Façade to be reclad[7] |
| | Charles River Plaza Parking | 165 Cambridge Street | Parking | 1965 | (open air/N/A) | N/A | 1 / 0 | 162 | N/A | None |

Table 1-3 Owned Buildings and Uses[1] (Continued)

| Key to Figs 1-3 | Building Name | Address | Current Use(s)[2] | Date of Construction | Floor Area (sf)[3] | Building Height | Stories Above /Below Grade | Parking Spaces[4] | Condition | IMP Proposed Action / Use |
|---|---|---|---|---|---|---|---|---|---|---|
| | Charles River Plaza Parking Garage | 165 Cambridge Street | Garage Parking | 1965 | 270,232 | N/A – garage podium located below Charles River Plaza Buildings | 1/1 | 792[11] | N/A | None |
| **Nashua Street** | | | | | | | | | | |
| 64 | 125 Nashua Street | 125 Nashua Street | Support Services including Administration | 1968, 1980, 1990 | 190,080 | 105 | 10 / 0 | 98 | Good | None |

1 MGH also has ownership interest in The Clubs at Charles River Park, but due to restrictions, the property cannot be used for institutional purposes.
2 This table lists the primary functions located within each building at the present time. Hospital sub-uses are frequently relocated within buildings to respond to case mix and service changes and to accommodate on-going renovations and do not require an amendment to the IMP whether or not such changes exceed an IMP exemption threshold.
3 As defined in the Boston Zoning Code.
4 A complete list of owned parking is included in Table 3-3.
5 Retail uses may include fitness and health uses, restaurant uses and related accessory uses.
6 Research uses may include research laboratories and related accessory uses.
7 The recladding will not create new Gross Floor Area and will not affect building height.
8 Support Services including Administration uses may include uses serving medical, clinical and research uses and may include medical record storage facilities, physician and staff offices, accounting and financial offices, other administrative and support space and related accessory uses including but not limited to conference spaces, kitchens and eating areas.
9 600 are for use by MGH and 100 are for use by the Liberty Hotel.
10 Partial ownership with Mass Eye and Ear.
11 The Wyndham Hotel has the right to 150 spaces.

### *1.7.2 Properties Leased in Boston*

Table 1-4 provides a list of the Proponent's leased facilities. Table 3-3 provides information on parking facilities the Proponent leases in Boston.

**Table 1-4 Leased Space[1]**

| Map Key to Fig 1-3 | Address[2] | Approx. SF | Principal Use(s) |
|---|---|---|---|
| 40 | 185 Cambridge Street | 354,600 | Research, Administration |
| 66 | 5 Blossom Street | 3,000 | Ambulatory |
| 30 | 10 Emerson Place | 6,300 | Ambulatory, Administration, Support |
| 31 | 0, 2 and 5 Emerson Place | 24,800 | Ambulatory, Research, Administration |
| 32 | 7 Whittier Place | 2,500 | Administration |
| 33 | 75 Blossom Court | 9,900 | Administration, Research |
| 34 | 1, 3 and 8 Hawthorne Place | 7,800 | Administration, Ambulatory |
| 35 | 2 Longfellow Place | 3,900 | Research, Administration |
| 35 | 3 Longfellow Place | 3,500 | Administration |
| 37 | 5 Longfellow Place | 4,400 | Research, Administration |
| 38 | 62 Staniford Street | 2,400 | Administration, Ambulatory |
| 39 | 50 Staniford Street | 121,500 | Ambulatory, Administration, Research |
| 43 | 101 Merrimac Street | 81,800 | Administration, Research, Ambulatory |
| 44 | 25 New Chardon Street | 21,800 | Ambulatory, Administration, Research |
| 46 | 19 Myrtle Street | 11,700 | Residential |
| 48 | 326 Cambridge Street | 14,000 | Administration |
| | 294 Washington Street | 10,800 | Ambulatory |
| 63 | 100 Cambridge Street | 72,600 | Dry Research, Administration, Training |
| | 388 Commonwealth Avenue | 7,300 | Ambulatory |
| 45 | 1 Bowdoin Street | 46,000 | Ambulatory, Administration |

Table 1-4 Leased Space[1] (Continued)

| Map Key to Fig 1-3 and Fig 1-4 | Address[2] | Approx. SF | Principal Use(s) |
|---|---|---|---|
| 61 | 51 Blossom Street | 18,100 | Research |
| 62 | 151 Merrimac Street | 24,500 | Administration, Ambulatory, Research |
| Charlestown | | | |
| 70 | 76 Monument Street, Charlestown | 1,100 | Ambulatory |
| 72 | 1 Constitution Wharf | 26,100 | Ambulatory, Administration |
| 73 | Building #062 | 39,100 | Support Services including Administration |
| 74 | Building #075 | 36,000 | Research |
| 75 | Building #114 | 102,000 | Research, Non-profit Educational Use |
| 76 | Building #149 | 649,800 | Research |
| 77 | Building #199[3] | 577,800 | Parking |
| 78 | 120 2nd Avenue | 12,700 | Research |
| 79 | 15 Green Street | 500 | Administration |
| 79 | 15 Green Street | 700 | Clinical |
| 80 | 73 High Street | 21,700 | Ambulatory |
| | 529 Main Street | 11,400 | Administration |
| 73 | 3 13th Street | 6,100 | Administration |

[1] Leases are leases held by General Hospital Corporation (GHC) and Massachusetts General Physicians Organization (MGPO) and do not include leases held by Partners HealthCare. Lease information is current as of January 26, 2019.

[2] Includes leases proximate to the Main Campus.

[3] Pursuant to the Ground Lease from the BRA/BPDA for Building 199, 500 spaces in this garage shall be available to serve the parking needs of the non-residential buildings within the Historic Monument Area of the Charlestown Navy Yard.

## 1.8 Project Team

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# Chapter 2

## Proposed IMP Projects

# 2.0 PROPOSED IMP PROJECTS

## 2.1 Program Need

### *2.1.1 Clinical Building*

In 2015 MGH leadership initiated a process to analyze, understand and plan for the needs and demands of patient populations into the future. This comprehensive planning process sought to help define, guide and shape the programming options for MGH's projects and growth to ensure that the hospital would continue to fulfill the needs of its patients and families, as well as its staff and the broader community in the years to come. This campus planning process led the hospital to establish the following priorities: reducing the semi-private bed mix and creating more single rooms, which are associated with a higher quality and safer patient experience; relieving the ever-challenging capacity constraints including Emergency Department overcrowding; controlling the overall cost of care by embracing a financially responsible plan; and being able to complete and bring on line such projects expansion within the next 10 years.

MGH used a well-established methodology to project patient volume, and assess clinical and support space needs. These metrics were used to determine the program space required to support the hospital into the foreseeable future. The hospital then moved on to the task of site selection, which involved conducting an evaluation of existing MGH facilities and holdings to establish options for a campus project location and then assessing the feasibility, challenges, benefits and opportunities of each option to determine the best, most cost effective locations.

After a comprehensive review of the collected information, MGH leadership concluded that the area that currently consists of the area bounded by Parkman, North Anderson and Cambridge streets, the Parkman Garage and the Service Building, presented the best location for construction of a new Clinical Building. The site had been contemplated for potential future development in the 2006 IMP. Developing what has been primarily vacant and underutilized land would enable the overall Project to meet the established objectives and be completed within the desired time frame. The opportunity for additional space that new construction provides also would create backfill space in vacated existing facilities, allowing MGH to realign programs that have been fragmented over the years. It also will allow for the relocation of administrative functions to the campus from leased spaces.

The concept of creating new space that will support the highest quality care into the future coupled with a thoughtful backfill plan will enable MGH to address the long-term needs of the campus and establishes a timely pathway for transitioning to the preferred single-room model for inpatient care. Private rooms are the regulatory standard for new construction and many comparable academic medical centers nationally have already achieved this benchmark. Furthermore, the public would benefit significantly through such a plan with an

enlivened Cambridge Street pedestrian experience and an enhanced streetscape with the removal of the above-grade Parkman Street parking garage.

The Clinical Building is proposed to satisfy clinical space needs, relieve the overtaxed Emergency Department area, provide operational improvements, create a resilient facility that can continue provide for operability of critical services in the event of a natural disaster or catastrophic event, and improve facilities as further described below.

Section 2.3.1 details the proposed programming and dimensional elements of the Clinical Building.

#### 2.1.1.1 Clinical Space Needs

*Meeting the Growing Demand for Care*

The demand for clinical services at MGH is high and growing. Most days, MGH operates at or near capacity, with patients waiting in the Emergency Department for extended periods of time, often because of the lack of an inpatient bed. When the occupancy of patients awaiting admission rises significantly, the Department of Public Health (DPH) requires the activation of a "Code Help" plan. In 2018, MGH operated in Code Help 11% of the time, more than double the prior year. Lack of sufficient inpatient beds, however, has a far greater impact than Emergency Department crowding. The downstream effects of overcrowding lead to such daily impacts as:

- Inability to accept transfers of very sick patients from community hospitals;
- Difficulty getting a private bed for patients and families who need one because of infection concerns or because of the wish for privacy for families whose loved one is at the end of life;
- Surgical patients having to remain longer than necessary in operating rooms and recovery rooms waiting for an inpatient bed; and
- Delays in start times of operations and procedures.

*Increasing the Number of Single Bedded Inpatient Rooms*

MGH currently operates 1,035 licensed inpatient beds, and two-thirds of these are currently in double-bedded rooms, with a significant number of these double-bedded rooms in older facilities. The needs and requests for single-bedded rooms most days far exceeds MGH's ability to meet the demand resulting in 20-30 beds taken out of service on average to accommodate clinical needs and cohorting challenges. Single rooms currently are prioritized to those who have the most pressing clinical needs. Most peer hospitals in the nation are moving toward single inpatient rooms and many already have all single rooms. Current regulations require all new beds in new construction to be single-bedded rooms.

A new facility with all single-bedded rooms would allow a much greater percentage of hospital beds to offer patients the kind of privacy, comfort and quiet they need to recover and heal. Single rooms have many significant advantages, including:

- Helping to reduce the incidence of hospital-acquired infection;
- Offering increased privacy, safety and space for patients and families;
- Offering a more comfortable, less stressful and quieter environment, all important aspects of the healing process; and
- Offering a better environment for patient/family education, entertainment and distraction for patients as they recover.

Beyond the increased number of single inpatient rooms that a new facility would offer, such expanded capacity would enable the conversion of some existing double-bedded rooms now housed in existing facilities into single-bedded inpatient rooms.

#### 2.1.1.2 Operational Improvements

The proposed new space will allow for better organization and coordination of connected or related services in a patient/family-friendly way. A more rational and flexible building will mean greater efficiency for staff, and more comfort and convenience for patients and families. Currently, during a visit to MGH, patients and families often must travel between different buildings to get to the related services they need. The Clinical Building will greatly reduce the inconvenience, time and confusion inherent in finding different specialty services on a large campus.

New facilities will enable the hospital to develop centers of excellence – not just virtual centers, but actual physical centers where patients can receive care from teams who are co-located to make for a more efficient and comfortable experience.

There are many studies that indicate that spatial agglomeration benefits both the hospital staff and, in turn — through advancing knowledge — the people it is serving. One such study focused on Harvard authors in four major locations — Longwood Medical and Academic Area, MGH's Main Campus, MGH's CNY Campus, and McLean Hospital. This study suggests that although emerging communication technologies have radically transformed the style and scope of collaboration around the world, physical proximity continues to play a critical role in predicting the impact of scientific research.[1]

[1] Kyungjoon Lee, John S. Brownstein, Richard G. Mills, Isaac S. Kohane. "Does Collocation Inform the Impact of Collaboration?" PLoS One, December 15, 2010.

The Clinical Building will allow for the ability to shelter in place for 96 hours, provide continuous operability of critical services during an event, and allow for a phased emergency response plan for recovery of other services after an event. As such, the Clinical Building will be a vital resource for the City and MGH community at times when there are patient surges related to a disaster or disease. The Clinical Building will also serve as a place of refuge for the campus and the MGH community.

### *2.1.2 Campus Services Building*

Campus resilience and adaption have been major concerns for MGH, as described in more detail in Section 3.14. A major component of MGH's resilience and adaptation strategy is to ensure reliable, efficient, adaptable and resilient utility service to its Main Campus. The Main Campus currently includes connections to the local utility companies, as well as emergency backup systems for each building. Given the number of backup systems and utility connections, MGH has determined that a more centralized approach would provide a more efficient and reliable system, as well as position the hospital to be better able to adapt to future changes affecting the Main Campus. The Campus Services Building may include a cogeneration plant, which is being studied for feasibility.

## 2.2 Project Sites

As described previously, the site of the Clinical Building is bound by Parkman Street, Blossom Street, North Grove Street and Cambridge Street, and is approximately 112,400 square feet (sf). The proposed site of the Campus Services Building is a parcel bound by Parkman Street to the south and Blossom Street to the east and MGH properties to the north and west, and is approximately 10,000 sf. The Project components may include spaces below and above the streets contained within the Main Campus. Collectively, these sites are considered the "Project Sites". Figure 2-1 shows the location of the Project Sites.

Section 2.3.2 details the proposed programming and dimensional elements of the Campus Services Building.

### *Existing Conditions*

The eastern portion of the proposed Clinical Building site includes three masonry buildings (the West End House, Ruth Sleeper Hall and 25 North Anderson Street), a surface lot with stackers for 131 cars, and a bike parking enclosure for 300 bicycles. The West End House, located at 16 Blossom Street, is approximately 19,175 sf and currently houses the West End Clinic, administrative offices and research space. Ruth Sleeper Hall, located at the corner of Parkman Street and Blossom Street, is approximately 33,144 sf and is used for administrative offices. The 25 North Anderson Street building is approximately 8,257 sf and is used in a very limited way for administrative offices, although currently it is largely vacant.


**Massachusetts General Hospital Boston, Massachusetts**

nbbj

**Figure 2-1**
*Project Sites*

The western portion of the site includes two masonry buildings (the Professional Office Building and the Ambulatory Office Building) and the Parkman Street Garage, an above grade parking facility of approximately 190,482 sf and 620 spaces. The Professional Office Building located at 275 Cambridge Street is approximately 31,241 sf, and includes ambulatory care, research, administration and retail uses. The Ambulatory Office Building is located at 10 North Grove Street, is approximately 9,441 sf, and is used for administrative offices.

The existing buildings and structures on the Project Sites — many of which are aged and not fully ADA compliant — will be razed to allow for construction of the Projects, and the current uses will be relocated. The West End Clinic, along with the Substance Use Disorder Bridge Clinic located in the Founders Building, are anticipated to be moved to the first floor of the Cox Building, which will be renovated for the Clinic. The new space, which will be fully compliant with today's regulations and codes, is designed to address major concerns with the West End Clinic's current location, which is not ADA accessible, and does not have clinically designated hallways or corridors to prevent traffic from other departments in clinical space. The new space is also designed to provide more resources to the Bridge Clinic, which currently has a small footprint in an isolated corner of the hospital that proves difficult for patients to access, particularly those patients required to travel back-and-forth between the Bridge Clinic and the Emergency Department. Further, co-locating these clinics will allow greater continuity of care for patients with comorbid substance use disorders and mental health conditions, and allows providers an opportunity for creative synergy on clinical workflows and care models. The new clinic space is anticipated to be accessed from the Main Lobby or the street.

Other research space and administrative offices are anticipated to be relocated to various facilities on campus and in satellite locations where feasible.

The Campus Services Building site is located at 30 Blossom Street, and the current facility is approximately 6,675 sf and is used for support services and MGH operations. This building will be demolished in connection with construction of the Campus Services Building.

Table 2-1 provides an overview of the buildings to be demolished.

A series of enabling projects in other MGH owned or leased buildings will be sequenced to relocate the existing uses on the Project Sites.

Table 2-1 Buildings to be Demolished

| Building | SF |
|---|---|
| Professional Office Building | 31,241 |
| Ambulatory Office Building | 9,441 |
| 25 North Anderson Street | 8,257 |
| Ruth Sleeper Hall | 33,144 |
| West End House | 19,175 |
| Parkman Street Garage | 190,842 |
| Service Center Building | 6,675 |
| **Total** | **298,775** |

## 2.3 Proposed IMP Projects

Table 2-2 provides the proposed program for the Projects.

Table 2-2 Project Program

| Project Element | Approximate Dimension |
|---|---|
| Clinical Building | |
| Clinical and Support | 1,020,000 sf[1] |
| Total Beds / Net New Beds | 456 / 203 |
| Retail[2] / Restaurant | 15,000 sf |
| *TOTAL SF* | *1,035,000 sf* |
| Number of Stories | 12 |
| Height[3] | 200 feet |
| Parking Spaces / Net New Spaces | 1,100 / 449 |
| Campus Services Building | |
| Office | 29,500 sf |
| Mechanical | 29,500 sf |
| Support Services | 22,000 sf |
| *TOTAL SF* | *81,000 sf* |
| Number of Stories | 7 |
| Height[3] | 130 feet |
| | |
| TOTAL SF / NET NEW SF | 1,116,000 sf / 817,225 sf |

[1] Square footage is approximate and is calculated as Gross Floor Area as defined in the Code.
[2] May include Urgent Care.
[3] Calculated in accordance with the Code.

### *2.3.1 Clinical Building*

As shown in Table 2-2, the proposed Clinical Building will include approximately 1,035,000 sf of Gross Floor Area in approximately 12 above grade stories. The Clinical Building will flank both sides of North Anderson Street, which is proposed to be realigned,

with connections above and below the street. The Proponent is also studying the abandonment of North Anderson Street which would allow for a consistent activated street edge along Cambridge Street and associated changes to Main Campus access and circulation. The top stories will be used as an approximately 456-bed clinical care facility. MGH plans to decommission at least 253 existing beds in older facilities such that the net new inpatient capacity will change by approximately 203 beds or fewer. Thus, the total number of licensed hospital inpatient beds on the Main Campus would increase up to 1,238 licensed beds or less. The lower levels of the proposed facility are anticipated to include additional surgical services, examination/treatment rooms, imaging modalities, along with cardio-echo and stress-testing services, ambulatory outpatient operational support, infusion centers, operating rooms, and interventional and catheterization labs, as well as administrative space and a café. Retail space, which may include restaurant or fitness uses, is anticipated to be located on the ground level and may include an urgent care center. Green roofs are also proposed on the podium. A mechanical penthouse will occupy the roof level. The structure will have six below grade stories including approximately 1,100 parking spaces, representing an increase of approximately 449 net new parking spaces. Figures 2-2 and 2-3 show a conceptual massing model of the proposed Clinical Building. All graphic representations of the Projects provided in this chapter are for illustrative purposes only as final designs have not been developed for the Projects.

The new building will be the future home of two important centers of excellence – cancer and cardiac care. The MGH Cancer Center and Heart Center would use the majority of inpatient bed capacity with the remainder shared amongst general medicine, thoracic surgery and vascular surgery.

A well-designed, attractive new facility along Cambridge Street will continue the progress made throughout the past two decades to activate and beautify the neighborhood along this important gateway to the city. The Cambridge Street frontage is described as the "amenity edge" incorporating resources for staff, patients and families allowing for moments of respite and activity during the "in between" times (see Figure 2-4). The building will contribute to the activation of the adjacent public realm. The North Grove Street façade will have an active ground floor frontage that accommodates uses such as gift shop, entrance lobby, café and a public cafeteria. Cambridge Street will be enlivened by ground floor retail and restaurants and potentially an urgent care facility providing activity into the evening.

Some clinical services, including operational support, will relocate from the existing campus buildings to the new Clinical Building. This move will enable clinical services to co-locate, align clinical services and consolidate and right-size these services based on volume projections. As part of this process, at least 253 existing patient beds will be decommissioned from MGH's older clinical buildings.

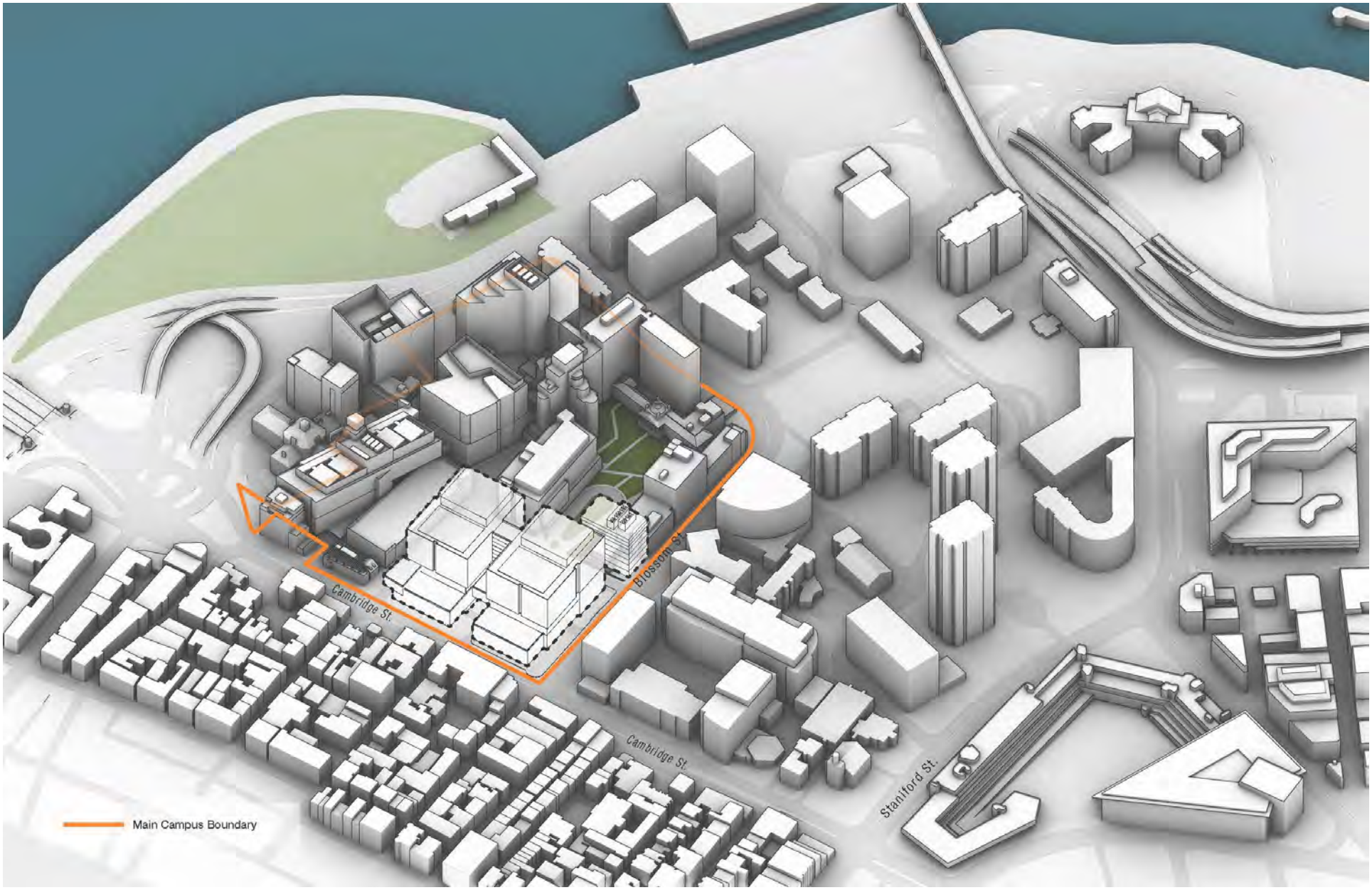


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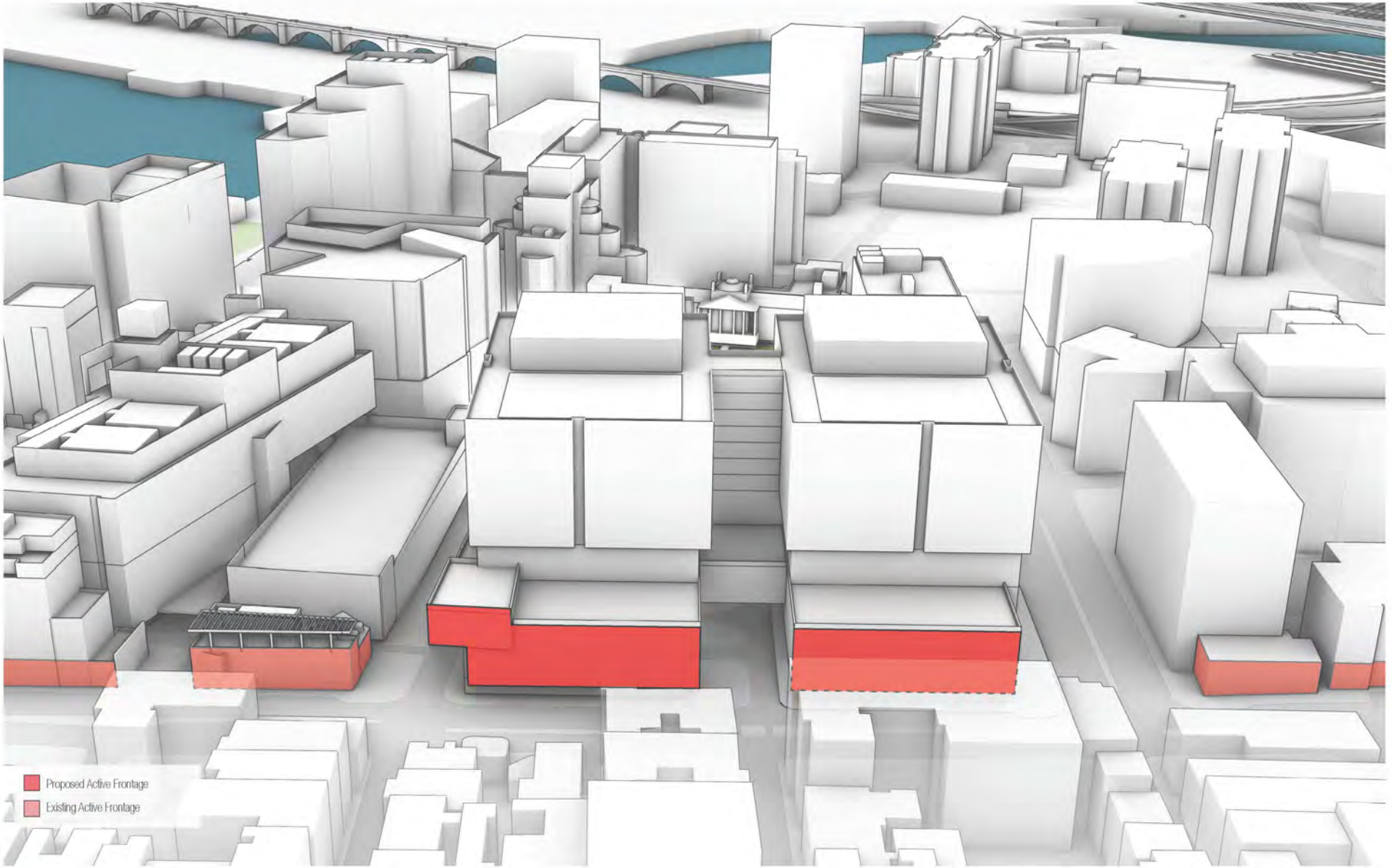
**Figure 2-2**
*Massing Model of Projects*




**Massachusetts General Hospital Boston, Massachusetts**

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**Figure 2-3**
*Clinical Building Conceptual Massing*

Moving several of the hospital's largest services into the new facility will free up significant space in existing buildings on the hospital campus, creating the opportunity for reorganization and growth. These relocations will create the ability for MGH to backfill approximately 83,000 sf of space. It is MGH's intent to backfill the space for clinical, support, and/or administrative use, including options to expand programs in pediatric and adult inpatient mental health services, as well as expansion of the Bridge Program, as discussed in Section 2.2.

#### 2.3.1.1 Campus Connections

*Connection from the Main Campus to the Clinical Building*

The Clinical Building will include a two-level connection extending from the main lobby of the White Building to the Clinical Building across the face of the Wang Ambulatory Care Center and over Parkman Street following North Grove Street, providing a safe, efficient, weather-protected connection (see Figure 2-5). The above grade connection will form a vital link between the existing procedural and medical space in the White Building and new state-of-the-art procedural and medical space in the Clinical Building. The first level will be the link for ambulatory patients and general hospital traffic between the buildings. The second level of the connection will allow for clinicians, services and patient transport to quickly access needed services in all parts of the Main Campus. The connection will also support MGH's resiliency planning by allowing for elevated movement of any patient or material to the modern place of refuge that will be the new Clinical Building.

The connection is intended for internal hospital traffic, while pedestrians and visitors will continue to access the Main Campus at ground level, which, together with pick-up/drop-off activity, will continue to provide important street-level activity.

The Clinical Building also includes tunnels from the Clinical Building to the Campus Services Building and the existing Main Campus buildings.

*Procedural Podium*

The Clinical Building's podium will include an operating room zone at levels two and three, portions of which will extend over North Anderson Street. Safe patient handling during some of their most vulnerable moments at the hospital will be supported by the significant operational efficiencies that are allowed by this continuous podium. The continuous floor will also allow for an increase in efficiency, resulting in 25% more operating and procedural rooms in less space.


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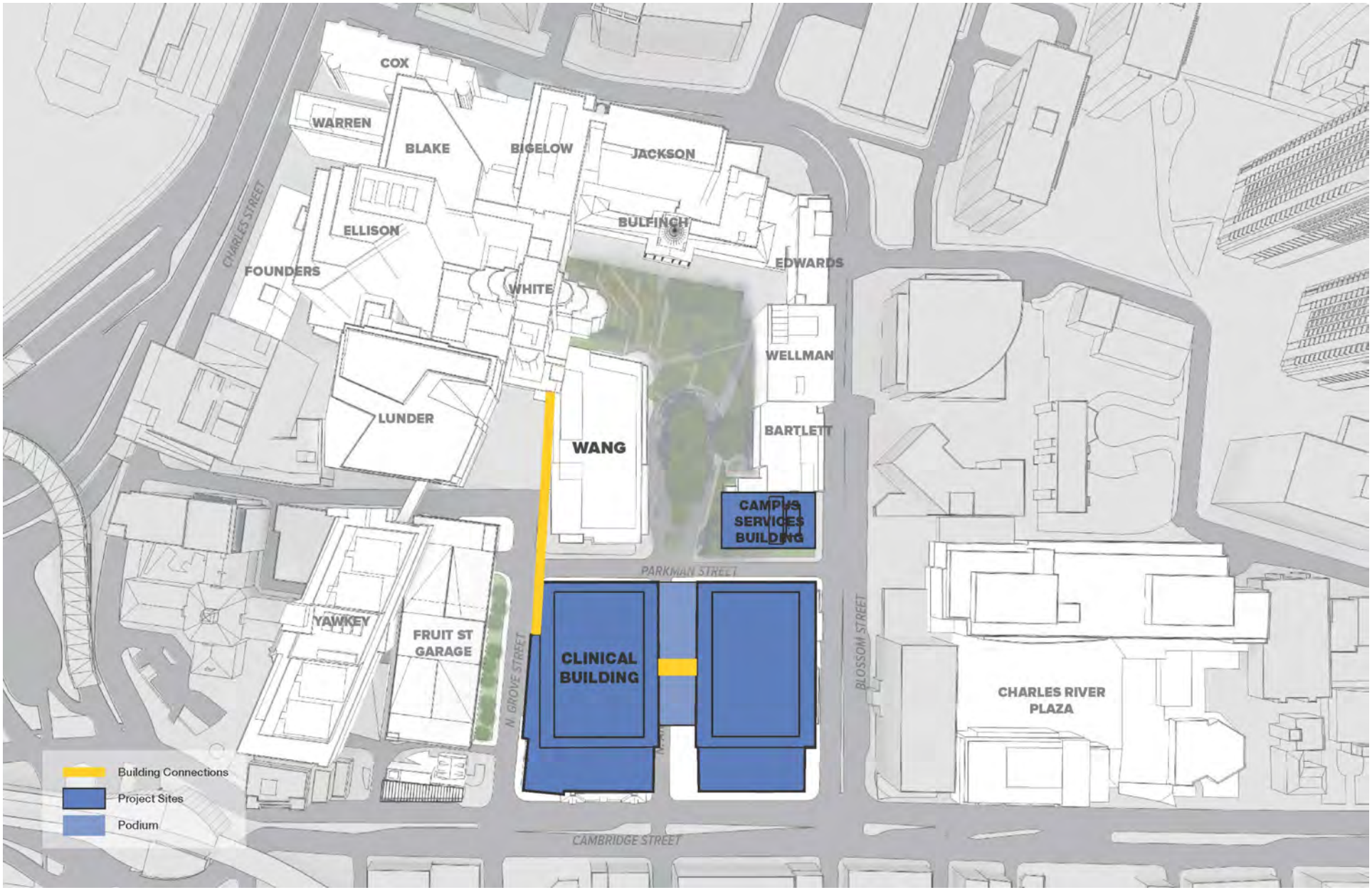
**Figure 2-4**
*Context and Pedestrian Areas*




**Massachusetts General Hospital Boston, Massachusetts**

nbbj

**Figure 2-5**
*Proposed Connectors*

*Inpatient Towers*

Light filled connections are planned at the upper floors of the Clinical Building. These connections will offer places of respite from the bed floors for families, staff and patients and will be filled with sunlight and provide long views to the north and south. In addition, the connections will allow for efficient access between the inpatient towers. The future of care will increasingly rely on multi-disciplinary teams treating patients, and the connections will allow for important staff efficiencies between the two inpatient towers by allowing for the rapid forming of teams moving from case to case across floors, and permit greater flexibility in the assignment of beds to appropriate care teams.

### *2.3.2 Campus Services Building*

As shown in Table 2-2, the Campus Services Building will be a seven-story (with two stories below grade) structure of approximately 81,000 sf of Gross Floor Area, which will be erected on the site north of Parkman Street. The Campus Services Building will contain approximately 29,500 sf of administrative space, approximately 29,500 sf of mechanical space, and approximately 22,000 sf of support services space. The existing loading dock and trash compactors will continue to be on the ground floor of the Campus Services Building.

Locating the Campus Services Building in its own building provides a number of advantages, including:

- Rationalizing campus utilities and services;
- Reducing vulnerability of utilities and services;
- Simplifying and reducing the size of the Clinical Building;
- Reducing the need for vibration mitigation;
- Separating support uses from public uses;
- Providing future flexibility; and
- Providing swing space.

MGH explored the possibility of building a 10 to 16-megawatt cogeneration plant that would make the Main Campus more resilient and help alleviate an overtaxed downtown Boston utility grid. However, Eversource rejected MGH's proposal, citing three obstacles: (1) not wanting any additional fault current contributions to their stations, (2) not allowing any cogeneration to interconnect with their network systems, and (3) exceeding the 1/15th minimum building load requirement per MA DPU 162D. MGH will explore alternative

cogeneration systems that do not parallel directly into the Eversource utility grid to determine feasibility.

### *2.3.3 Schedule*

Construction of the proposed Clinical Building is anticipated to begin in spring 2020 and complete in the fourth quarter of 2026. Construction of the Campus Services Building is anticipated to begin in spring 2020 with completion in spring 2022.

### *2.3.4 Public Benefits*

In addition to the numerous public benefits that MGH provides the City of Boston and local community, the Projects will also provide the following benefits:

- **Funding important programs:** Through DPH fees and City linkages, investment in a new building will mean significant funding for important programs throughout the community.

- **Economic benefits:** Construction of the new facilities will provide about 4,500 construction jobs during the six years to complete the buildings and will mean more permanent jobs once the facilities open.

- **Improving the quality of life in the neighborhood:** A well-designed, attractive new facility along Cambridge Street will fill the gap left by underutilized space and improve the street, and streetscape, with new/expanded retail activity and an improved urban environment.

- **Sustainability and resiliency:** The Projects will be designed for sustainability and energy conservation and will target LEED Gold as a minimum. The resiliency of the Projects is planned to allow continuous operability of all critical services during a catastrophic event.

- **Preserving the legacy and history of Boston's West End:** The MGH Russell Museum of Medical History and Innovation will help preserve and showcase the story of the West End through rotating exhibits, and sponsoring presentations as part of its community programming; recognition of the neighborhood will also be installed in the public space of the Clinical Building.

## 2.4 Campus Improvement Projects

During the term of the IMP, MGH is proposing the following improvement projects, provided here for reference.

- **Temporary Bike Shelter** – As part of the enabling for the Clinical Building, the existing bicycle parking facility will need to be relocated. A temporary bike shelter

will be constructed to house bicycles. The Clinical Building will include a new, secure bicycle storage space for MGH commuters. After the new bicycle storage has been completed, the temporary bike shelter may be repurposed for visitor bike storage.

- **Recladding of White Building** – Because of the condition and general maintenance needs of the White Building façade, the recladding of the building may be required.

- **Recladding of 165 Cambridge Street** – Because of the condition and general maintenance needs of the 165 Cambridge Street façade, the recladding of the building may be required.

- **Gray Building Rooftop Open Space** - The Outdoor Space Build for the Department of Mental Health mandated outdoor access. This project will create a secured, monitored, outdoor space on the roof of the Gray Building for the exclusive use of inpatient psychiatric patients. This project will be undertaken to comply with the Department of Mental Health's January 2017 request to provide patients access to outdoors/fresh air daily. The area will be built on 325 sf of currently non-utilized space.

- **Emergency Generator Plant** - MGH has several diesel-powered generators located on its Main Campus, four of which are at the end of their useful life. MGH proposes to install a new emergency generator plant to replace the four generators with two new 2000-kilowatt diesel generators. They would be installed in a dedicated, sound-attenuated enclosure with paralleling switchgear, to be located on the low roof of the Blake Building, or on the Jackson loading dock roof. This new emergency generator plant and associated distribution is designed to provide a new emergency power source to the Gray Bigelow, Gray Jackson, Bulfinch, Edwards, Founders, Warren and Cox Buildings. New automatic transfer switches and uninterrupted power supply systems would also be installed as part of this plan.

- **Support Services Relocation** - Prior to the commencement of the Campus Services Building construction, certain support services and infrastructure equipment will need to be relocated. The enabling for the Campus Services Building, will require the relocation of oxygen and nitrous oxide storage tanks, a fire pump controller, water treatment systems, trash compactors and an autoclave. The relocation of these items will need to be accommodated within the Main Campus and be subject to all required codes and regulations. If feasible, certain services may be temporarily relocated off site during the duration of construction.

## 2.5 Campus Maintenance

Maintenance projects, which are not subject to IMP review, are continually being completed on MGH properties. Current projects include signage updates and relocation of bicycle storage.

Throughout the term of the IMP, MGH anticipates conducting ongoing building renovation projects and other campus improvements that do not require IMP or Large Project Review. Such facility improvements are essential to the ongoing operation of the hospital and to ensure adequate swing space for future construction projects.

## 2.6 Potential Future Projects

MGH is considering potential opportunities for new parking on Proponent-owned properties. The location, feasibility, schedule and details about this project have not been determined at this time.

## 2.7 Campus Expansion

From time to time during the term of the IMP, the Proponent may purchase or lease facilities located outside of the MGH Main Campus IMP Area. Any such facility, to the extent it exceeds IMP exemption thresholds, will not require an amendment to this IMP provided that the use category of underlying zoning which most closely describes the use of such facility is either allowed as of right by underlying zoning or is allowed by zoning relief.

## 2.8 Zoning

### *2.8.1 Existing Zoning*

#### 2.8.1.1 Existing MGH IMP

*Main Campus*

The existing zoning for the Main Campus, as shown on Figure 2-6, is governed by the Institutional Master Plan that was approved by the BPDA Board in November 2006 and adopted by the Zoning Commission in December 2006, as amended in 2010 for the MGH Museum Project (together, the "2006 MGH IMP"). The 2006 MGH IMP was further amended in 2015 to incorporate the property located at 125 Nashua Street, as described further below, and was renewed for a three-year term in June 2016 (as amended and renewed, the "Existing MGH IMP").

The uses, building heights, gross floor area, floor area ratio (FAR), parking spaces and other zoning information for the Main Campus are set forth in the Existing MGH IMP.


**Massachusetts General Hospital Boston, Massachusetts**

Epsilon ASSOCIATES INC.

**Figure 2-6**
*Existing and Future Campus Areas*

### *125 Nashua Street Parcel (Former Spaulding)*

The 125 Nashua Street Parcel was added to the 2006 MGH IMP by an Institutional Master Plan Amendment that was approved by the BPDA Board in February 2015 and adopted by the Zoning Commission in April 2015 (the "2015 MGH IMP Amendment").

The 2015 MGH IMP Amendment describes the uses, building dimensions, parking and loading applicable to the 125 Nashua Street Parcel.

The 125 Nashua Street Parcel building's uses include a variety of administrative uses serving MGH's medical and clinical operations. The 125 Nashua Street Parcel also includes certain existing passive recreational space open to the public and a publicly accessible dock. The 125 Nashua Street Parcel includes approximately 98 accessory parking spaces, bike racks and two loading dock spaces.

### *239 Cambridge Street Parcel*

The Proponent acquired the parcel of land at 239 Cambridge Street located at the corner of Cambridge Street and Blossom Street in November 2011 (the "239 Cambridge Street Parcel").

The majority of the 239 Cambridge Street Parcel is located within the Cambridge Street North Protection Area and a small portion is located within the Blossom Street Restricted Growth Area both of the Cambridge Street North District governed by Article 47A of the Code. All of the 239 Cambridge Street Parcel is located within the Restricted Parking Overlay District covered by Section 3-1A(c) of the Code.

Allowed uses within the Cambridge Street North Protection Area and Blossom Street Restricted Growth Area of the Cambridge Street North District include business or professional offices; office building; medical or dental office; lunchroom; restaurant; and general merchandise mart. Hospital and accessory research laboratory use are conditional uses. In addition, allowed uses on the ground floor of a building that has street frontage on Cambridge Street are the Ground Level Uses as defined in Appendix A to Article 47A. These Ground Level Uses include lobby space for offices or residences; optician or optometrist establishments; bank branch offices; ATMs; drug stores and food stores (including supermarkets).

The Cambridge Street North Side Protection Area has a maximum allowed building height of up to 65 feet, and a maximum FAR of up to 5 if a project has Ground Floor Use access from Cambridge Street, as described above, and is subject to Large Project Review and has received a Certification of Compliance. The Blossom Street Restricted Growth Area has a maximum building height of up to 100 feet and a maximum FAR of up to 7 if a project is subject to Large Project Review and has received a Certification of Compliance.

Within the Cambridge Street North Side Protection Area, any proposed project for new construction or enlargement/alteration shall be subject to Small Project Design Review under Section 80E-2.1. There are also design guidelines and specific design requirements regarding several design features, including street walls, setback requirements and building materials, in the Cambridge Street North District.

No off-street parking facilities are required in the Cambridge Street North District. Off-street loading facilities must be located so as to be accessed from Fruit Street, Parkman Street, North Grove Street, North Anderson Street, or Blossom Street. The provision and design of off-street loading facilities shall be determined through Large Project Review. A garage or parking space for occupants, employees and visitors not accessory to a residential use is a conditional use both in the Cambridge Street North District and the Restricted Parking Overlay District.

The 239 Cambridge Street Parcel is currently vacant. The 239 Cambridge Street Parcel will be added to the Main Campus through approval of the Institutional Master Plan.

#### 2.8.1.2 Nashua Street Facilities

*99 Nashua Street Parcel*

The 99 Nashua Street Parcel is located within the New Economy Development Area of the North Station Economic Development Area District governed by Article 39 of the Code and the Restricted Parking Overlay District, governed by Section 3-1A(c) of the Code.

Allowed uses within the New Economy Development Area of the North Station Economic Development Area include business or professional offices, office buildings and professional offices accessory to a hospital whether or not on the same lot. A garage or parking space for occupants, employees and visitors not accessory to a residential use is a conditional use both in the New Economy Development Area and the Restricted Parking Overlay District.

The New Economy Development Area has a maximum allowed building height of up to 250 feet and a maximum FAR of 8. There are also specific design requirements regarding street walls and sky plane setbacks in the North Station Economic Development Area. Finally, no structure is to be erected, altered or extended within 35 feet of the existing mean high water mark of the Charles River.

No off-street parking facilities are required in the North Station Economic Development Area. The provision and design of off-street loading facilities shall be determined through Large Project Review.

As noted in Table 1-3, the 99 Nashua Street Parcel is currently used for parking for approximately 480 parking spaces[2], which use was approved by an interpretation from the Board of Appeal that the parking use is a lawful preexisting conditional use. The 99 Nashua Street Parcel will be added to the MGH Institutional Master Plan Area through approval of the Institutional Master Plan.

*100 Nashua Street Parcel*

The 100 Nashua Street Parcel is located within the General Area of the North Station Economic Development Area governed by Article 39 of the Code and the Restricted Parking Overlay District, governed by Section 3-1A(c) of the Code.

Allowed uses within the General Area of the North Station Economic Development Area include business or professional offices, office buildings and professional offices accessory to a hospital whether or not on the same lot. A garage or parking space for occupants, employees and visitors not accessory to a residential use is a conditional use both in the General Area and the Restricted Parking Overlay District.

The General Area has a maximum allowed building height of up to 155 feet and a maximum FAR of up to 10 if a proposed project has completed Large Project Review and has received a Certification of Compliance. There are also specific design requirements regarding street walls and sky plane setbacks in the North Station Economic Development Area. Finally, no structure is to be erected, altered or extended within 35 feet of the existing mean high water mark of the Charles River.

No off-street parking facilities are required in the North Station Economic Development Area. The provision and design of off-street loading facilities shall be determined through Large Project Review.

As noted in Table 1-3, the 100 Nashua Street Parcel is currently used for parking for approximately 102 parking spaces, which use was approved by a conditional use permit issued by the Board of Appeal. The 100 Nashua Street Parcel will be added to the MGH Institutional Master Plan Area through approval of the Institutional Master Plan.

#### 2.8.1.3 Charles River Plaza

The Charles River Plaza property (the "CRP Property"), which is located at 161-209 Cambridge Street, is located within an Urban Renewal Overlay District and governed by the terms of the West End Land Assembly and Redevelopment Project No. UR Mass 2-3, as revised and amended (the "Plan"), and the Land Disposition Agreement between the Boston Redevelopment Authority and DIV Charles Limited Partnership dated as of May 17, 2002,

[2] A portion of the 99 Nashua Street Parcel was taken by the MBTA in 2014 for the North Station Expansion Project. MGH currently has a license to park on the area taken by the MBTA.

as affected and amended (the "LDA"). The CRP Property includes Delivery Parcel 1G(a) as described in the Plan and certain other property deeded to the Redeveloper, as defined in the LDA, by the Boston Planning and Development Agency, as described in the LDA. All of the CRP Property is located within the Restricted Parking Overlay District covered by Section 3-1A(c) of the Code. Pursuant to the LDA, the LDA establishes use and dimensional controls for the CRP Property.

Allowed uses at the CRP Property include retail stores, business and professional offices, restaurants, laboratory and research and development uses whether or not associated with a hospital or other medical institution, and accessory uses to any of the allowed main uses. A garage or parking space for occupants, employees and visitors not accessory to a residential use is a conditional use in the Restricted Parking Overlay District.

The LDA describes the CRP Property as including various buildings and uses. Pursuant to the Plan, no parking spaces are required in connection with buildings at the CRP Property. The provision and design of off-street loading facilities shall be determined by the BPDA.

The CRP Property includes the uses and buildings noted on Table 1-3.

#### 2.8.1.4 Charlestown Navy Yard

The buildings on the Charlestown Navy Yard Properties (as defined herein) were constructed prior to the adoption of Article 42F of the Code and the Urban Renewal Area Overlay District and are owned by the BPDA and ground leased to the Proponent.

The five properties located at 62, 75, 149 and 199 13th Street and 114 16th Street in Charlestown (the "Charlestown Navy Yard Properties") are located within the Historic Monument Area (Special Study Area 1) of the Charlestown Navy Yard Subdistrict of the Harborpark District governed by Article 42F of the Code, and within an Urban Renewal Area Overlay District.

Allowed uses within the Historic Monument Area of the Charlestown Navy Yard Subdistrict include: offices of professional persons; office buildings; laboratories and facilities for teaching and for theoretical, basic, and applied research, product development and testing, prototype fabrication, or production of experimental products; design, development, manufacture, compounding, packaging, processing, fabrication, altering, assembly, repair, servicing, renting, testing, handling, or transfer of products as would be included in Research and Development Uses; and parking garages or lots.

The Historic Monument Area has a maximum building height of three stories or 40 feet, and a maximum floor area ratio of 1.0. As noted above, construction of these buildings predated adoption of Article 42F of the Code and the Urban Renewal Area Overlay District and, as such, these buildings are protected as lawful nonconforming structures. There are also urban design guidelines regarding several design features, including pedestrian and

vehicular circulation and building materials, in the Charlestown Navy Yard Subdistrict. All proposed projects within the Historic Monument Area must also comply with all applicable provisions of Section 106 of the National Historic Preservation Act and the Program of Preservation and Utilization, as amended, referenced in the deed dated July 7, 1978, from the General Services Administration to the Boston Redevelopment Authority.

The Building 199 parking garage is open to the public and therefore may be used by residents of and visitors to the Charlestown Navy Yard, in addition to workers in the commercial buildings within the Historic Monument Area. As such, the use of the garage is not limited to the Proponent and its affiliates. A portion of Building 114 is used by an educational non-profit.

The Charlestown Navy Yard Properties include the uses and buildings noted on Table 1-4.

### *2.8.2 Future Zoning*

The IMP will incorporate by reference the provisions of the Existing MGH IMP, as amended, except to the extent superseded by the IMP. Upon approval of the IMP, all existing and proposed uses and structures described in this IMP, whether undertaken by MGH or any other for-profit or non-profit entity, will be deemed to be in compliance with the use, dimensional, parking and loading requirements of underlying zoning (including special purpose overlay districts) and may be reconstructed after casualty, notwithstanding any provision of underlying zoning to the contrary and without the requirement of further zoning relief. Parking and loading within the MGH IMP Area are further addressed in Chapter 3.

Consistent with discussions with the BPDA, the proposed MGH IMP Area does not include (a) office and related non-hospital uses operated by Partners HealthCare System, Inc., which are exempt from the IMP requirement; and (b) remote MGH facilities of less than 150,000 square feet, such as neighborhood health centers, and 12 Garden Street, a building used for administrative purposes currently owned by MGH located in the Beacon Hill neighborhood. Facilities listed in (a) and (b) are, however, depicted on Figure 2-6 and are described in this IMPNF/PNF. From time to time during the term of this IMP, MGH may elect to purchase or lease additional parking and other non-patient care facilities located outside the MGH IMP Area. While MGH may elect to obtain zoning compliance for remote and/or leased facilities by amending this IMP, no such facility (whether or not it exceeds IMP exemption thresholds) will require an amendment to this IMP as long as the use category of underlying zoning which most closely describes its use is either allowed as of right by underlying zoning or is allowed by zoning relief, which may include a variance.

#### 2.8.2.1 Main Campus

At the time of approval of the IMP, MGH will also seek approval of an amendment to Boston Zoning Map 1B/1J/1K/1L to add the 239 Cambridge Street Parcel to the

Massachusetts General Hospital Institutional Master Plan Area (the "MGH IMP Area"). The proposed Main Campus is depicted on Figure 2-6.

The proposed maximum FAR for the Main Campus, as shown on Figure 2-6, is 7.32, which incorporates the area of the existing Main Campus and the 239 Cambridge Street Parcel. The Clinical Building will include the uses described in Section 2.3.1, will have a Gross Floor Area, as defined in the Code, of approximately 1,035,000 square feet, and will have a maximum height of approximately 200 feet and 12 above grade stories, measured in accordance with the Code. The Campus Services Building will include the uses described in Section 2.3.2, will have a Gross Floor Area of approximately 81,000 square feet, and will have a maximum height of approximately 130 feet and 7 above grade stores, measured in accordance with the Code.

#### 2.8.2.2 Nashua Street Facilities

##### *125 Nashua Street Parcel (Former Spaulding) and 99 Nashua Street Parcel*

At the time of approval of the IMP, MGH will also seek approval of an amendment to Boston Zoning Map 1B/1J/1K/1L to add the 99 Nashua Street Parcel to the MGH IMP Area. The 125 Nashua Street and 99 Nashua Street Parcels are depicted on Figure 2-6.

The maximum FAR for the combined 125 Nashua Street Parcel is 2.19 and maximum building height is approximately 105 feet, both measured in accordance with the Code. There are no proposed projects on either of these parcels. Allowed uses, parking and loading spaces on the 125 Nashua Street and 99 Nashua Street Parcels will include those uses, parking spaces and loading spaces detailed in Table 1-3 and the IMP.

##### *100 Nashua Street Parcel*

At the time of approval of the IMP, MGH will also seek approval of an amendment to Boston Zoning Map 1B/1J/1K/1L to add the 100 Nashua Street Parcel to the MGH IMP Area. The 100 Nashua Street Parcel is depicted on Figure 2-6.

The FAR for the 100 Nashua Street Parcel is zero and the maximum building height is zero, as the parcel consists entirely of a surface parking lot. There are no proposed projects on the 100 Nashua Street Parcel. Allowed uses and parking spaces on the 100 Nashua Street Parcel will include those uses and parking spaces detailed in Table 1-3 and the IMP.

#### 2.3.2.3 Charlestown Navy Yard and Charles River Plaza

The Charlestown Navy Yard Properties and CRP Property include the uses and buildings owned and leased by the Proponent as described herein. Whether such properties are added to the IMP Area will be discussed with the BPDA.

## 2.9 Anticipated Permits and Approvals

Table 2-3 presents a preliminary list of federal, state and local permits and approvals that may be required for the Projects, based on currently available information. Note that each Building in the Projects are expected to require substantially similar permits and approvals, as listed below, except where noted. It is possible that only some of these permits or approvals will be required, or that additional permits or approvals will be required.

**Table 2-3 Preliminary List of Anticipated Permits and Approvals**

| AGENCY | APPROVAL |
|---|---|
| ***Local*** | |
| Boston Planning & Development Agency | Article 80 Large Project Review;<br>Execution of Agreements under Article 80B Large Project Review;<br>Certification of Compliance;<br>Institutional Master Plan Adequacy Determination and Certification of Consistency;<br>Zoning Map Amendment |
| Boston Zoning Commission / Mayor | Institutional Master Plan Approval;<br>Zoning Map Amendment |
| Boston Employment Commission | Boston Residents Construction Employment Plan (as required) |
| Boston Civic Design Commission | Design Review (as required) |
| Boston Landmarks Commission | Demolition Delay Review |
| Boston Transportation Department | Construction Management Plan (as required);<br>Transportation Access Plan Agreement |
| Boston Public Safety Commission Committee on Licenses | Inflammables Storage Permit/Garage License (as required) |
| Public Improvement Commission | Specific Repair Plan approval and License for changes to the public right of way (as required);<br>Vertical Discontinuances;<br>Earth Retention Licenses (as required);<br>Permit/Agreement for Temporary Earth Retention Systems, Tie-back Systems and Temporary Support of Subsurface Construction (as required);<br>Permit for Sign, Awning, Hood, Canopy or Marquee (as required);<br>Widening and Relocation approval |
| Boston Water and Sewer Commission | Site Plan Review;<br>Water and Sewer Connection Permits;<br>Cross Connection Backflow Prevention Approval (as required);<br>Temporary Construction Dewatering Permit (as required) |

Table 2-3 Preliminary List of Anticipated Permits and Approvals (Continued)

| AGENCY | APPROVAL |
|---|---|
| *Local (continued)* | |
| Public Works Department | Curb Cut and Street/Sidewalk Opening Permits |
| Boston Inspectional Services Department | Demolition Permit;<br>Building/Occupancy Permits |
| Interagency Green Building Council | Article 37 Compliance |
| *State* | |
| Executive Office of Energy and Environmental Affairs (MEPA Office) | Review under the Massachusetts Environmental Policy Act, including a Public Benefits Determination (as required) |
| Department of Environmental Protection | Notice of Demolition/Construction;<br>Pre-Asbestos Removal Notice (as required);<br>Environmental Results Program |
| Department of Conservation and Recreation | Access Permit (if required) |
| Department of Public Health | Determination of Need |
| Massachusetts Historical Commission | State Register Review |
| Massachusetts Water Resources Authority | Temporary Construction Dewatering Permit (issued jointly with BWSC, as required);<br>Sewer Use Discharge Permit (as required) |
| *Federal* | |
| Environmental Protection Agency | National Pollutant Discharge Elimination System Permit |
| Federal Aviation Administration | Determination of No Hazard to Air Navigation (for building and cranes) |

## 2.10 Legal Information

### *2.10.1 Legal Judgments Adverse to the Proposed Projects*

To the Proponent's knowledge, there are no legal judgments or actions pending concerning the Projects.

### *2.10.2 History of Tax Arrears on Property*

There are no known tax arrears on property in Boston owned by the Proponent.

### *2.10.3 Site Control / Public Easements*

There are no public easements into, through, or surrounding the Project Sites that would impair the advancement of the Projects other than the public way easement of North

Anderson Street, which the Proponent anticipates will be realigned and partially vertically discontinued in connection with the construction of the Clinical Building.

### *Clinical Building*

The Clinical Building site is owned by the Proponent, as evidenced by the following title instruments recorded at the Suffolk County Registry of Deeds: (i) Quitclaim Deed from The Massachusetts General Hospital dated September 30, 1980 and recorded in Book 9554, Page 320; (ii) Quitclaim Deed from Cambridge Street Community Development Corporation dated July 14, 1981 and recorded in Book 9854, Page 346; (iii) Quitclaim Deed from Wallace B. Greene and Lauretta G. Greene dated December 6, 1985 and recorded in Book 12101, Page 318; (iv) Certificate of Title No. 93147; and (v) Certificate of Title 94311.

### *Campus Services Building*

The Campus Services Building site is owned by the Proponent by virtue of the Quitclaim Deed from The Massachusetts General Hospital recorded at the Suffolk County Registry of Deeds in Book 9554, Page 320.

## 2.11 Public Participation

MGH has been meeting with City agencies, elected officials, abutters and community groups. MGH looks forward to continuing to work with interested parties during the review of this Project.

# Chapter 3

## Assessment of Development Review Components

# 3.0 ASSESSMENT OF DEVELOPMENT REVIEW COMPONENTS

## 3.1 Transportation

### *3.1.1 Introduction*

This section presents an overview of the existing MGH transportation system and a summary of the planned Projects from a transportation perspective. This section generally describes the transportation characteristics of MGH facilities on its Main Campus as well as on its CNY Campus and in the Nashua Street area. It describes the existing transportation infrastructure at MGH, including descriptions of public and private transportation (Partners shuttles), area roadways, parking, patient pick-up/drop-off, loading activities and transportation demand management (TDM) actions that are actively employed by the hospital. Section 3.1.5 provides a preliminary estimate of the Project-generated trips expected to result from the construction of the Projects that would be added to the Main Campus. This document does not contain a detailed assessment of the transportation effects of the Projects. That assessment will be developed and included within a forthcoming Draft Project Impact Report (DPIR).

### *3.1.2 Existing Transportation Conditions*

An evaluation of current transportation conditions near the hospital is helpful to understand how the area's transportation system accommodates existing travel demands. This existing condition summary includes the Main Campus, the CNY Campus, as well as the MGH properties in the Nashua Street area. The components of the transportation system, including pedestrian and bicycle facilities; public and private transit access and availability; on-campus loading/service, ambulance, and taxicab/ridesharing; vehicular circulation in and around the MGH campuses; and parking facilities are addressed in this section. Existing TDM programs that MGH offers are also detailed in this section.

#### 3.1.2.1 Pedestrian Facilities

This section discusses pedestrian facilities adjacent to and on the MGH campuses in Boston. Each location is described separately.

*Main Campus*

Pedestrian facilities throughout the Main Campus include sidewalks along each of the key roadways as well as marked crosswalks at most intersections. The pedestrian facilities outside the hospital's buildings also include internal pathways across the open space south of the Bulfinch Building. The signalized intersections on the edges of the Main Campus feature pedestrian signals and walk/don't walk indicators. Sidewalks along Cambridge Street, Blossom Street, and Charles Street typically range in width from approximately six to ten feet.

Existing pedestrian circulation activity near the Main Campus largely follows the pathways used by area residents, employees, patients and visitors using public transportation to access the area. For the Main Campus, six MBTA stations provide a well-balanced transit network serving the area. The stations include the Charles/MGH Station on the Red Line adjacent to the Main Campus; North Station with commuter rail, the Orange Line, and the Green Line; Haymarket on the Green and Orange Lines; Government Center on the Green and Blue Lines, Bowdoin on the Blue Line, and Science Park on the Green Line. Major pedestrian pathways that serve the Main Campus are along Cambridge and Charles streets, through the abutting neighborhoods and connecting to the Charles/MGH Station. Many neighborhood residents also travel through and across the Main Campus to Cambridge Street, Charles Street and the Charles/MGH Station.

Access to the Charles/MGH Station is provided by a crosswalk across Cambridge Street between the sidewalk at the base of the headhouse and the walkway leading directly to the main entrance of MGH's Yawkey Center.

The primary entrance to the core of the Main Campus is at the northern end of North Grove Street. This area serves as the center of pedestrian activity for the hospital. Pedestrian activity at the main entrance includes pick-up/drop-off activity, people walking between the main entrance and the on-campus parking facilities, transit riders, and employees, patients, and visitors who walk to the campus from nearby buildings, as well as from off-campus parking facilities.

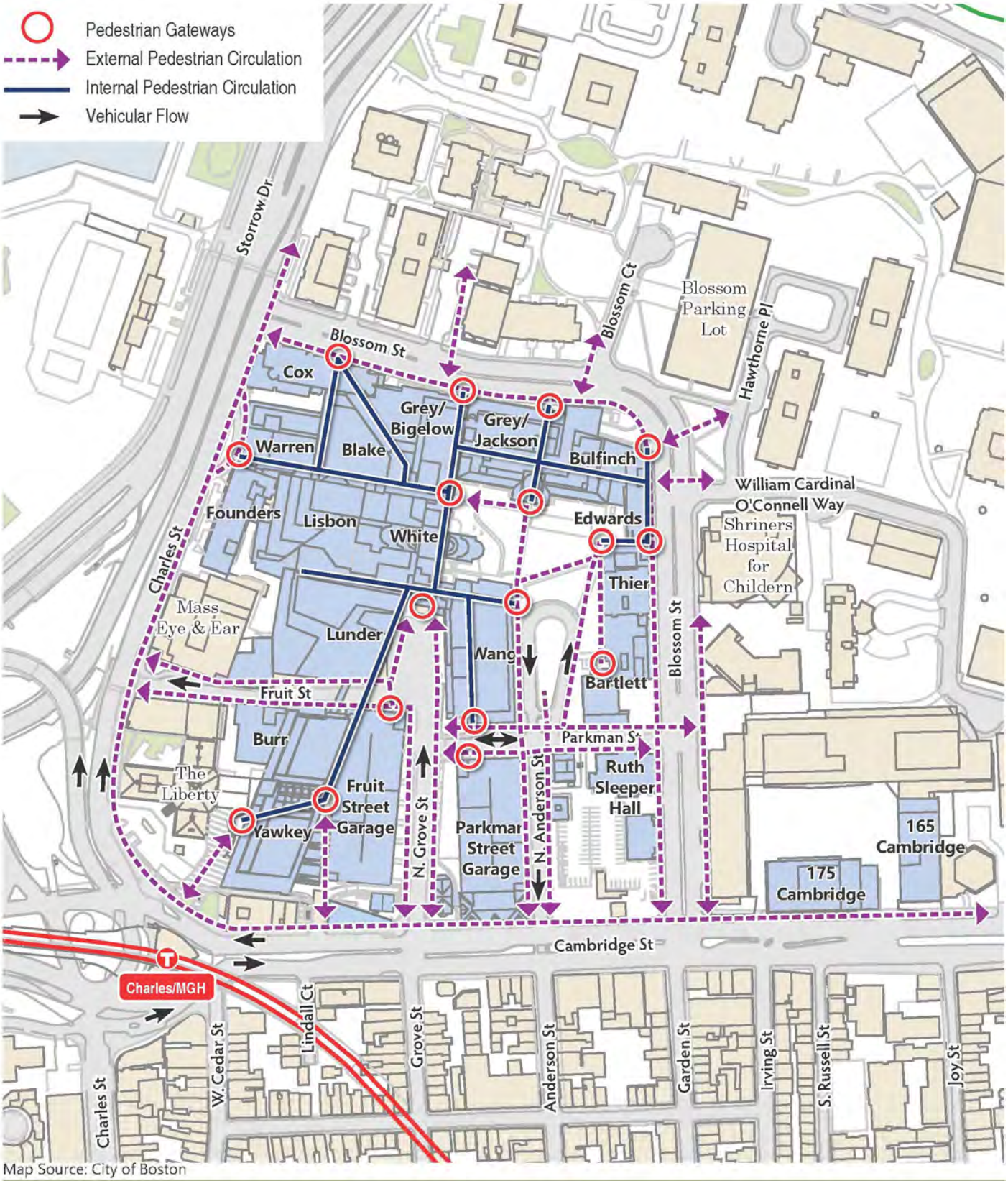
Other busy pedestrian locations on the Main Campus include the crossing of Parkman Street at North Anderson Street, along Charles Street and Fruit Street near Massachusetts Eye and Ear, and along the north side of Cambridge Street, leading to the Charles/MGH Station.

The Yawkey Center project dramatically improved pedestrian accessibility at MGH by strengthening the connection between the campus and the Charles/MGH Station. Before the project, pedestrians from the Charles/MGH Station traveled a long, circuitous route along either Charles Street to Fruit Street, or along Cambridge Street to North Grove Street to enter the Main Campus. In conjunction with the Yawkey Center project, MGH purchased the former Buzzy's restaurant site at Charles Circle and transformed that parcel into a new pedestrian gateway to the hospital. The gateway now allows pedestrians direct access to the hospital from Charles Circle and the Charles/MGH Station.

Figure 3-1 illustrates the existing pedestrian circulation pattern throughout the Main Campus.

### *CNY Campus*

Pedestrian facilities throughout the CNY Campus include sidewalks along key roadways as well as marked crosswalks at most intersections and some mid-block crossings. The existing pedestrian facilities provide access between MGH (and other Partners facilities) including




**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-1**
*Main Campus Major Pedestrian Circulation Routes*

the Building 199 Garage as well as several MBTA bus stops and Partners shuttle stops. The pedestrian facilities also include internal pathways across open space between 3rd and 1st avenues. In addition, several hundred feet from the CNY Campus, pedestrians can enjoy the Harborwalk, a near-continuous 43-mile path stretching from the Neponset River in lower Dorchester to East Boston.

Existing pedestrian circulation activity near the CNY Campus largely follows the pathways used by area residents, employees and visitors using public and private transportation to access the area. Major pedestrian pathways that serve the CNY Campus are along 13th Street, 3rd Avenue, 16th Street, and 1st Avenue from the MBTA bus stops and Partners shuttle stops.

Figure 3-2 illustrates the existing pedestrian circulation pattern throughout the CNY Campus.

*Nashua Street Area*

Pedestrian facilities in the Nashua Street area include sidewalks along the area's roadways as well as marked crosswalks connecting parking areas to the 125 Nashua Street building. In addition, adjacent to the Nashua Street area, pedestrians have access to Nashua Street Park along the Charles River.

Existing pedestrian circulation activity near the Nashua Street area is at a much lower level of activity when compared to the Main and CNY campuses. In the Nashua Street area, a Partners shuttle route supports three remote parking lots: 125 Nashua Street Lot, 99 Nashua Street Lot, and 100 Nashua Street Lot. Much of the pedestrian activity in the area involves people either travelling to and from parking to the 125 Nashua Street building, the Partners shuttle stops, or to the Main Campus (for employees who choose to forgo the shuttle and walk there).

Figure 3-3 illustrates the existing pedestrian circulation pattern throughout the Nashua Street area.

#### 3.1.2.2 Bicycle Accommodations

MGH currently provides covered and secure bicycle storage facilities for its employees, patients and visitors on the Main Campus, the CNY Campus, and in the Nashua Street area. MGH allows employees to register as bicycle users, granting them access to two bike cages on the Main Campus, one on the CNY Campus, and use of showers and lockers. Currently, over 2,000 MGH employees are registered bicycle users.

In addition to personal bicycle parking, Bluebikes offers several stations on or near each MGH campus. Bluebikes is a public bike share program serving Boston, Brookline, Cambridge, and Somerville with over 1,800 dock-based bikes and more than 200 stations. Figures 3-4 through 3-6 show the locations and parking capacities of the bicycle parking

locations as well as Bluebikes stations located near the Main Campus, CNY Campus, and Nashua Street area respectively.

### *Main Campus*

The primary bicycle parking facility that MGH currently provides on its Main Campus for its employees is located on the southeast corner of the intersection of Parkman and North Anderson streets. The secure and enclosed bicycle canopy has the capacity to store approximately 300 bicycles. Another bike cage is provided at 165 Cambridge Street that can store approximately 63 bicycles. MGH provides showers and lockers in the basement of Ruth Sleeper Hall for use by MGH employees who register to use these facilities. Not everyone chooses to secure their bicycles in the canopy. Bicycles can sometimes be found chained to other fixed items outside the canopy, such as signposts and street lights indicating that there are some people who ride their bikes to MGH that are either employees not formally registered with this program or that are visitors to MGH or the area.

In addition to the bicycle canopy for employees, MGH provides covered bicycle parking for its patients and visitors between the entrance and exit lanes of the Parkman Street Garage, in the Founder's Yard, adjacent to Charles Street, outside the Fruit Street Garage and in the Yawkey Garage. Approximately 40, 30, 15 and 15 bicycles can be stored at these locations, respectively.

A Bluebikes station is also located at the corner of Cambridge Street and Joy Street outside of MGH's 165 Cambridge Street in the southwest corner of the Main Campus. The station provides 14 bicycles to be used by the public. A second Bluebikes station is located on Charles Street just south of Charles Circle providing 13 bicycles to be used by the public.

### *CNY Campus*

Covered employee bicycle parking is provided by MGH on its CNY Campus inside the Building 199 Garage. The Building 199 Garage bicycle parking has the capacity for approximately 92 bicycles. In addition, 30 bicycle parking spaces for employees are also available outside of the Building 199 Garage between Building 199 and Building 149, as well as room for 25 bicycles in a storage room inside Building 114.

A Bluebikes station is also located nearby at the Spaulding Rehabilitation Hospital on 16th Street. The station provides 15 bicycles to be used by the public.

### *Nashua Street Area*

Bicycle parking is provided by MGH in the Nashua Street area for its employees located at 125 Nashua Street. It stores approximately 10 bicycles.

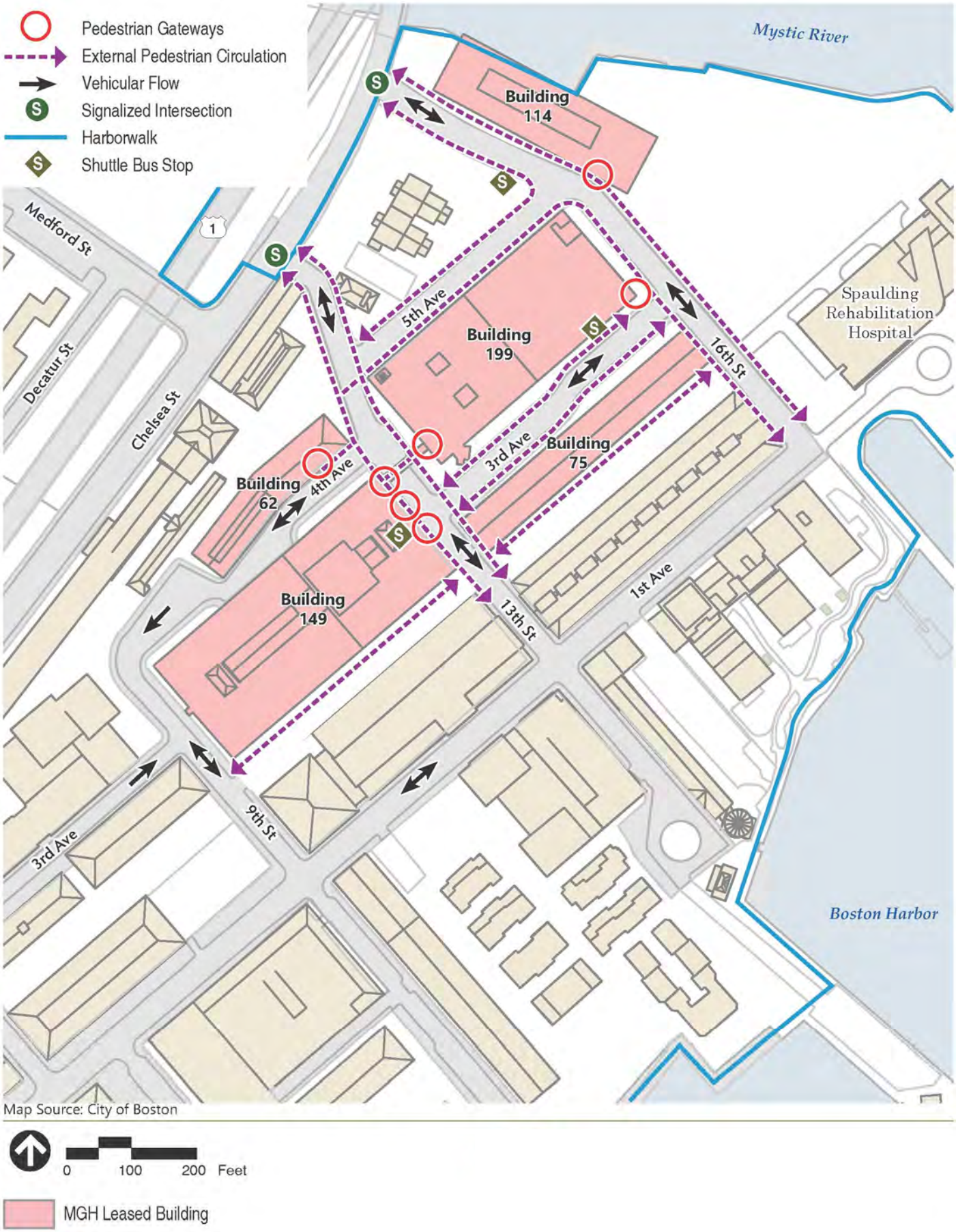



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**Figure 3-2**
*Charlestown Navy Yard Campus Major Pedestrian Circulation Routes*

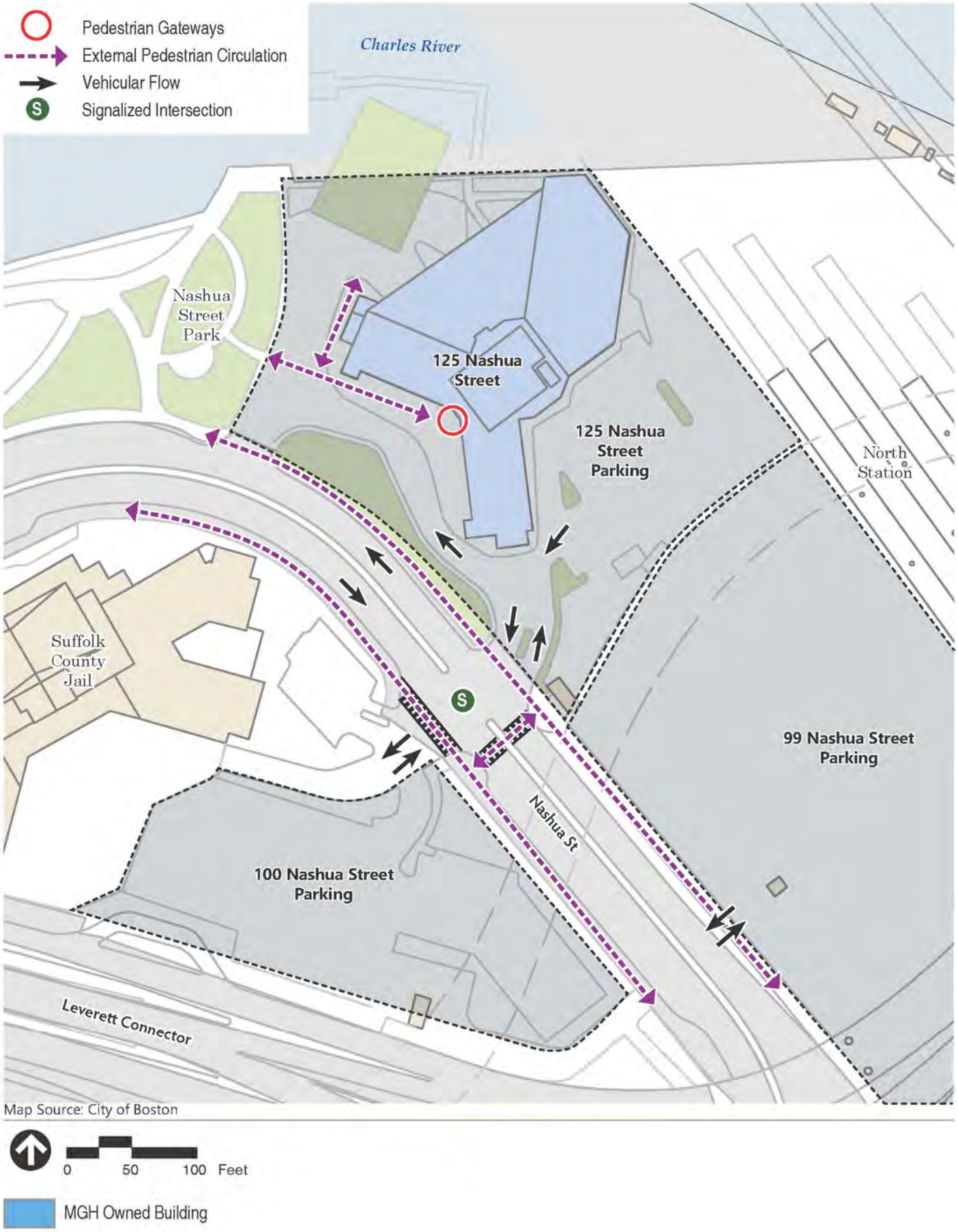


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**Figure 3-3**
*Nashua Street Area Major Pedestrian Circulation Routes*

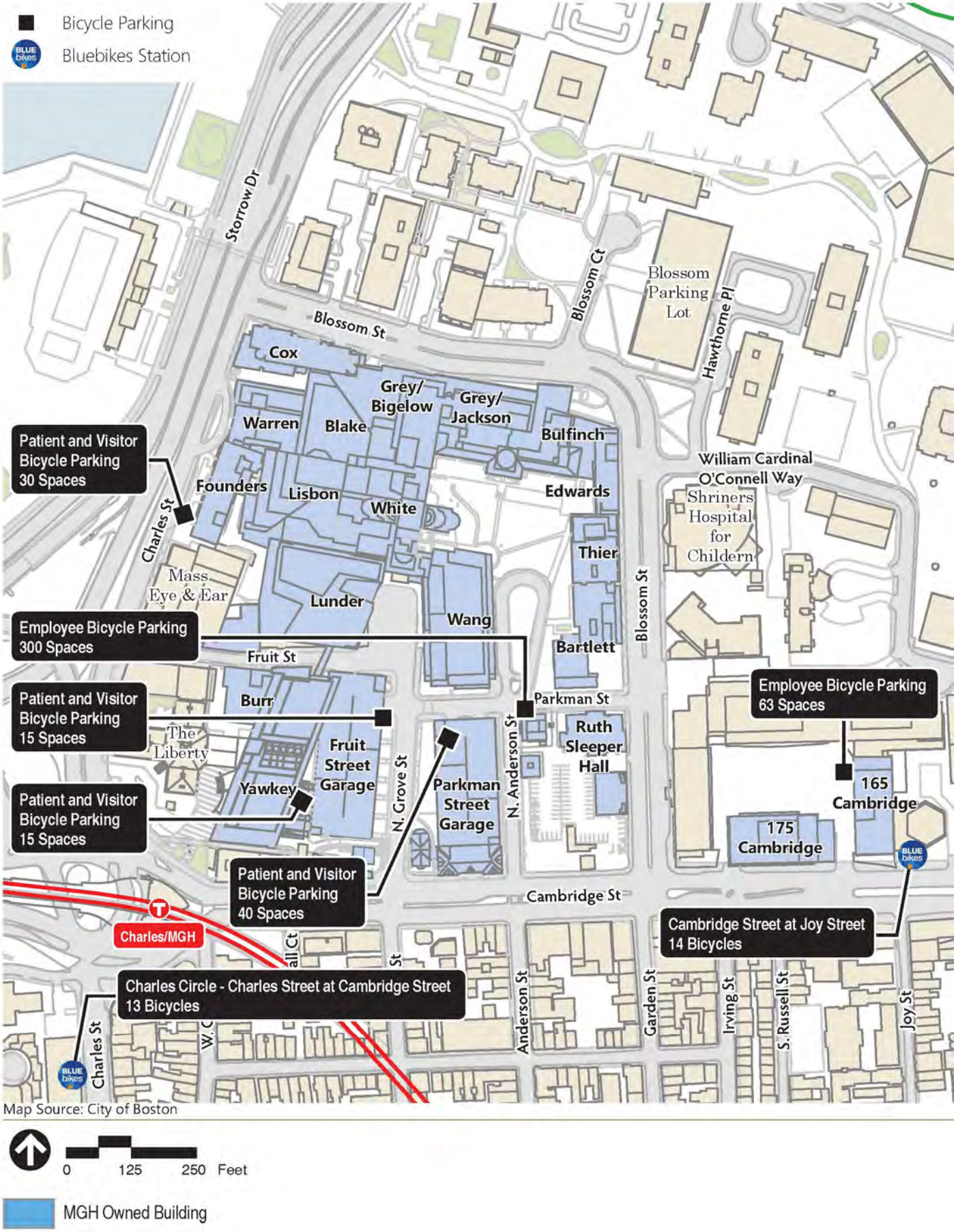


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**Figure 3-4**
*Main Campus Bicycle Parking Supply*

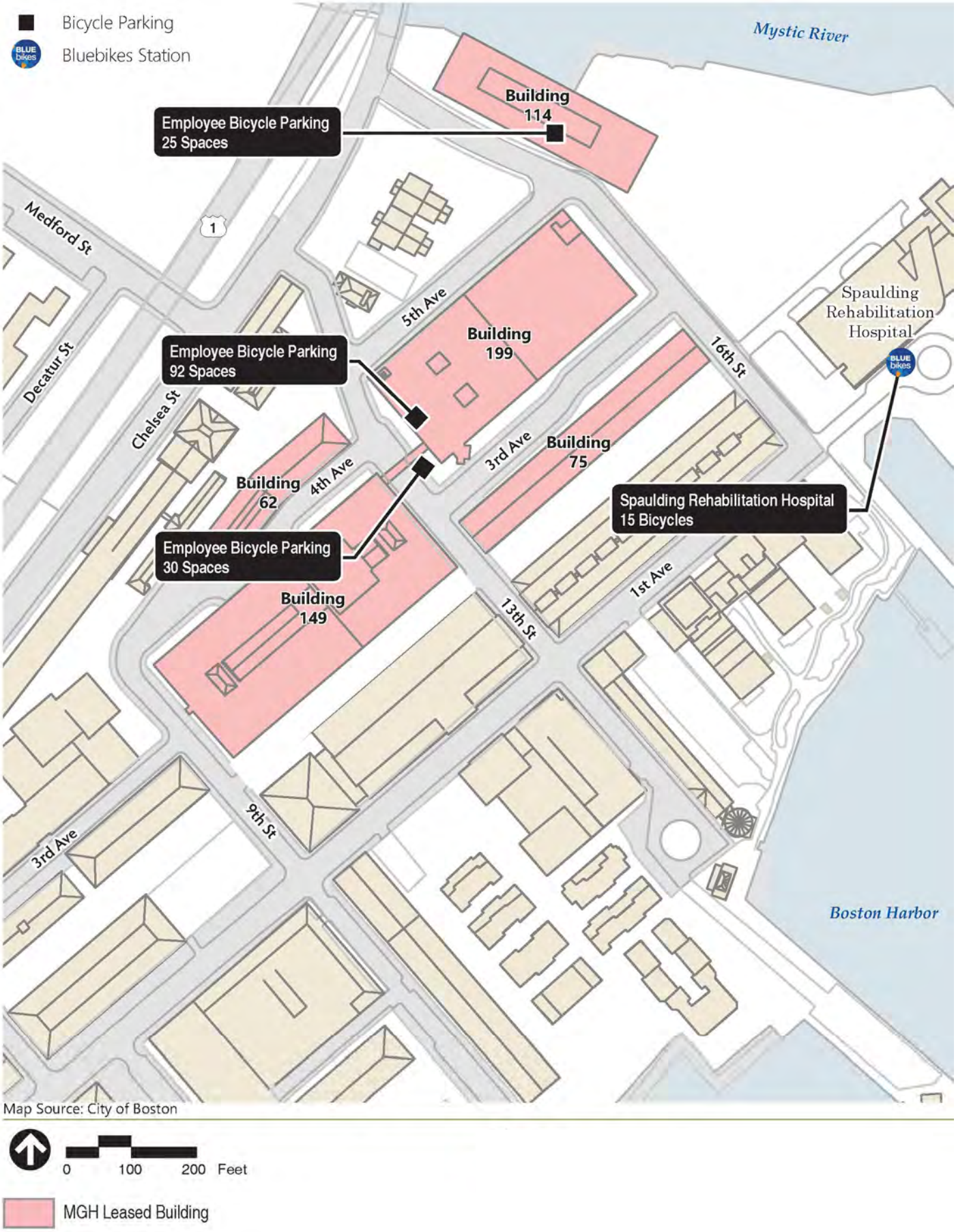


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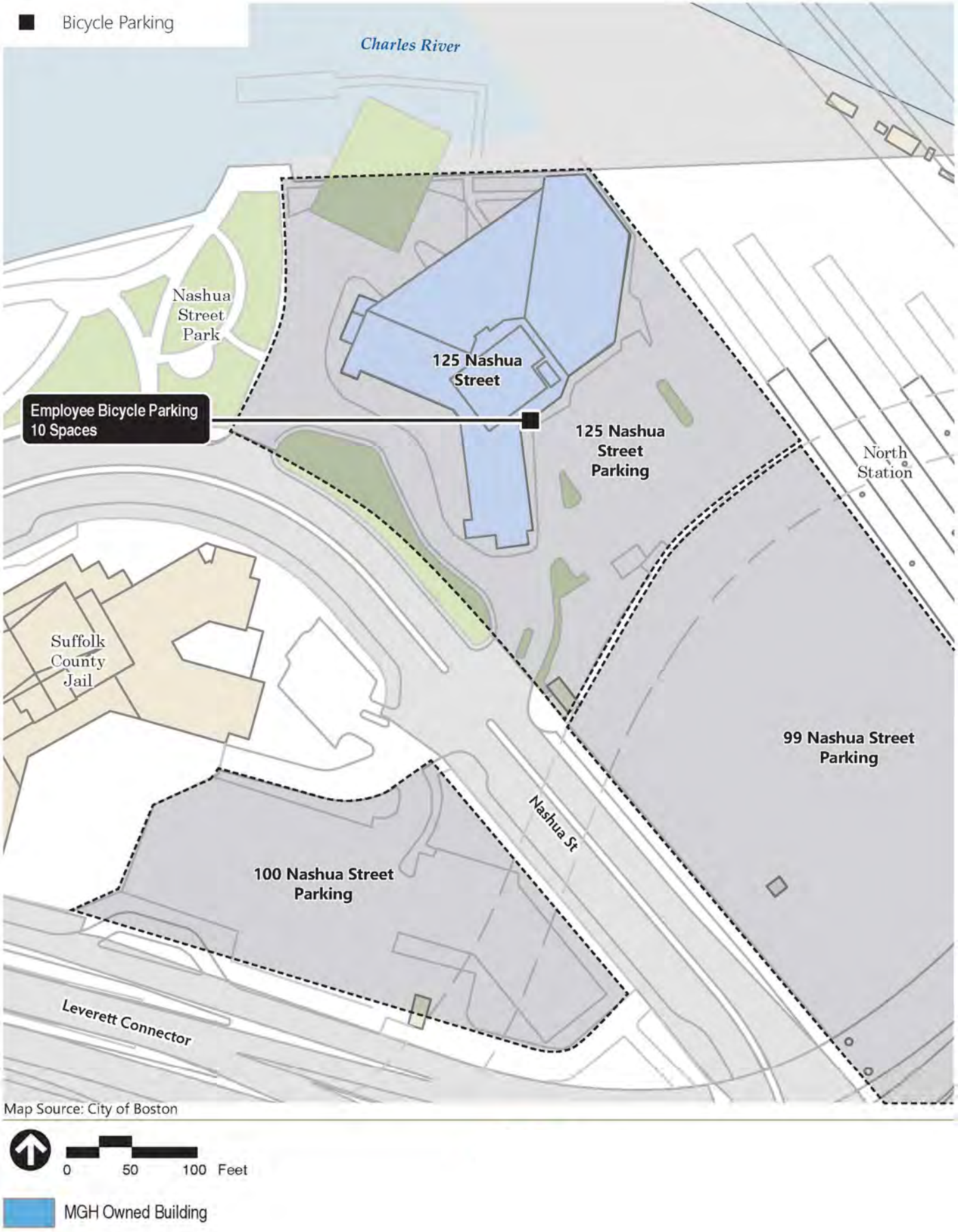
**Figure 3-5**
*Charlestown Navy Yard Campus Bicycle Parking Supply*




**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-6**
*Nashua Street Area Bicycle Parking Supply*

### 3.1.2.3 Transit

MGH's extensive TDM program, coupled with the high cost of the very limited parking in the area, makes travel by alternative modes an essential component of day-to-day transportation operations at MGH. Participation in MBTA monthly pass sales over the years has grown. MGH currently has 9,650 employees (across its campuses) enrolled in the MBTA program. About 64 percent of these employees are enrolled in the MBTA's Monthly LinkPass, which provides access to the local bus and subway systems, and 36% are enrolled in a monthly commuter rail pass program.

*Main Campus*

There are several key public transportation services available to the Main Campus, including MBTA rapid transit, commuter rail service and commuter bus. The Main Campus has direct access to MBTA rapid transit service from the Charles/MGH Station on the Red Line at Charles Circle. The station is located approximately 250 feet from the Yawkey Center entrance. The Red Line connects directly to the Orange Line at Downtown Crossing, to the Green Line at Park Street, and to regional commuter rail service at both South Station and Porter Square.

In 2007, the MBTA undertook a major modernization of the Charles/MGH Station to make it handicap accessible. The project included moving the station and its entrance to the easternmost island in Charles Circle to accommodate new elevators, escalators, and stairs. The modifications required changes in the roadway geometry and traffic signal operation for Charles Circle. The elevated pedestrian walkways to the former station were eliminated and at-grade crosswalks were added to provide improved access to the new station. As part of the transportation mitigation commitment for the Yawkey Center, MGH contributed $2.5 million to the MBTA's modernization project.

MBTA commuter rail service to communities north and west of Boston is provided from North Station which is located within one-half mile of the Main Campus. North Station is also served by the Partners shuttle bus system. Service from North Station includes the Rockport, Newburyport, Haverhill, Lowell, and Fitchburg lines. The Fitchburg Line can also be accessed at Porter Square in Cambridge (which as noted above is also served by a Red Line station). In addition to commuter rail, there is access to the Orange Line and Green Line at North Station. In the future, water ferry service is expected to return to Lovejoy Wharf, which is located west of I-93 near North Station.

Because it is served by the Red Line, there are no designated MBTA bus routes along Cambridge Street. Haymarket Station is approximately one-half mile from MGH. Haymarket Station provides access to the Orange Line and Green Line, and serves as a major bus terminal for express bus service to the North Shore and local bus service to Cambridge, Charlestown and Downtown Boston. Figure 3-7 depicts the existing public transit serving the MGH campuses.


Map Source: MBTA

**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-7**
*Existing Public Transit*

### *Partners Shuttle*

The Partners Passenger Transportation Service provides an extensive and free shuttle bus service for employees, patients, and visitors associated with MGH. The service is operated by the Partners HealthCare System Transportation Department for MGH. The annual cost to operate this shuttle service is estimated at approximately $2.8 million for FY2017/2018. Annual ridership on routes that serve MGH is currently 1.3 million passengers. These services connect the Main Campus with nearby transit hubs (North Station), off-site facilities and neighborhood health centers and remote parking. These shuttle services are a tremendously important part of hospital operations and they are highly effective at reducing automobile trips.

There are 12 weekday shuttle routes and one weekend route serving the Main Campus. Figure 3-8 depicts the shuttle bus routes and locations served by them. Most of the routes connect to the Main Campus. The CNY route provides service to North Station and MGH.

Table 3-1 provides a summary of each route. Most of the routes operate only on weekdays; Only the MGH – CNY route operates seven days a week. As many as 24 shuttle buses and vans are in operation during peak periods.

Public Transportation Usage by Employees

In 2016, for the Massachusetts Department of Environmental Protection (MassDEP) Rideshare Regulation (310 CMR 7.16) a report was developed to indicate how employees commute to work. Data was collected for the Main Campus as well as the CNY Campus. At the Main Campus, approximately 79% of MGH employees use public transportation, walk, or bicycle to work. The remaining 21% of employees drive, carpool, are dropped-off, or take a taxicab or rideshare. Most staff who choose to drive must park off-campus and rely on the Partners shuttle service to get to the Main Campus.

### *CNY Campus*

Serving the CNY Campus, MBTA bus route 93 provides service between Downtown Boston and Sullivan Square Station. The 93 bus route connects to the Orange Line, Green Line and many bus routes at both Haymarket and Sullivan Square stations.

Public Transportation Usage by Employees

At the CNY Campus, employee surveys conducted in 2016 for the MassDEP Rideshare Regulation (310 CMR 7.16) indicate approximately 59% of MGH employees use public transportation, walk, or bicycle to work. The remaining 41% of employees drive, carpool, are dropped-off, or take a taxicab or rideshare.

Table 3-1 Existing Partners Shuttle Service Routes and Ridership Supporting MGH, Fall 2018

| Shuttle Route | Shuttle Stops/Served Areas | Frequency | Shuttle Vehicles (Number) Size | Annual Ridership [1] |
|---|---|---|---|---|
| 1. MGH/North Station/ One Constitution Center/CNY | MGH Main Campus, North Station, One Constitution Center, MGH East Campus at CNY | 15 minutes (5:30 AM to 7:30 PM)<br>30 minutes (7:30 PM to 1:30 AM) | (4 to 6) 43-pass.<br>(1) 34-pass. | 885,568 |
| 2. MGH/Revere Health Center | MGH Main Campus, Revere Health Center, Chelsea Health Center | 90 minutes (8:30 AM to 5:00 PM) | (1) 34-pass. | 25,673 |
| 3. MGH/Chelsea Health Center | MGH Main Campus, Chelsea Health Center, Revere Health Center | 90 minutes (7:30 AM to 5:30 PM) | (1) 34-pass. | 21,832 |
| 4. MGH/Everett Health Center | MGH Main Campus, Everett Health Center, Chelsea Health Center | 75 minutes (8:45 AM to 7:15 PM) | (1) 34-pass. | 51,367 |
| 5. MGH/Parking Lots | MGH Main Campus, Haymarket, Nashua Street Lot, Spaulding Rehabilitation Hospital, Gilmore Lot, Science Museum Lot, MEEI | 20 minutes (5:00 AM to 8:30 AM)<br>20 minutes (9:30 AM to 2:00 PM)<br>15 minutes (2:00 PM to 1:00 AM) | (2) 34-pass.<br>(1) 34-pass.<br>(3) 34-pass. | 110,682 |
| 6. MGH/East Boston Health Center | MGH Main Campus, Winthrop Health Center, East Boston Health Center | 75 minutes (8:00 AM to 5:45 PM) | (1) 34-pass. | 40,980 |
| 7. MGH/Charlestown (Bunker Hill) Health Center | MGH Main Campus, Bunker Hill Health Center, North End Health Center | 10 minutes (6:45 AM to 9:45 AM)<br>10 minutes (11:30 AM to 2:45 PM)<br>10 minutes (3:45 PM to 6:15 PM)<br>10 minutes (3:45 PM to 6:15 PM)<br>Fridays – 10 minutes (3:45 PM to 8:35 PM)<br>M-Thur – 10 minutes (3:45 PM to 7:05 PM) | (1) 14-pass. | 5,926 |
| 8. MGH/65 Landsdowne Street -- MIT | MGH Main Campus, 65 Landsdowne Street, Broad Institute and MIT | 30 minutes (7:00 AM to 7:00 PM) | (2) 14-pass. | 15,934 |
| 9. MGH/Prudential Center/ Brigham and Women's Hospital | MGH Main Campus, Prudential Center, Brigham and Women's Hospital | 30 minutes (6:00 AM to 7:30 AM)<br>15 minutes (7:30 AM to 7:00 PM)<br>30 minutes (7:00 PM to 8:30 PM) | (2) 34-pass.<br>(4) 34-pass.<br>(2) 34-pass. | 136,968 |
| 10. MGH Somerville/ Sullivan Square | MGH Somerville, Sullivan Square | 10 minutes (7:30 AM to 8:30 AM)<br>10 minutes (4:20 PM to 5:30 PM) | (1) 14-pass.<br>(1) 14-pass. | 5,392 |
| 11. Employee Partners Healthcare Assembly - MGH | MGH Main Campus, Assembly Row | 30 minutes (8:15 AM to 5:15 PM) | (2) 14-pass. | 20,881 |

Table 3-1 Existing Partners Shuttle Service Routes and Ridership Supporting MGH, Fall 2018 (Continued)

| Shuttle Route | Shuttle Stops/Served Areas | Frequency | Shuttle Vehicles (Number) Size | Annual Ridership [1] |
|---|---|---|---|---|
| 12. MGH – Chelsea Imaging | MGH Main Campus, Chelsea Health Center, Chelsea Imaging | frequency varies on patient requests (7:00 AM to 6:00 PM) | (1) 7-pass. | 1,554 |
| 13. MGH – Cooley Dickinson | MGH Wang Ambulatory Care Center and 8 Atwood Drive, Northampton, MA | Trip departs Cooley in the Morning<br>Trip departs MGH in the Evening | (1) 11-pass.<br>(1) 11-pass. | 1,105 |
| TOTAL | | | | 1,323,862 |

1 October 1, 2017 to September 30, 2018 total annual ridership data

### 3.1.2.4 Roadway Network

*Main Campus*

The Main Campus is located between and is generally bound by Cambridge Street on the south, Charles Street on the west, and Blossom Street on the north. The Charles River Plaza property, which is considered part of the Main Campus operationally, extends the Main Campus to the east of Blossom Street.

For many years, the sole vehicular entry point to the Main Campus was at the intersection of Cambridge Street and North Grove Street. North Grove Street is a one-way northbound roadway leading into the Main Campus to MGH's front door and its on-campus parking garages. North Anderson Street and Fruit Street are one-way roadways departing the Main Campus, while two-way Parkman Street (formerly a one-way eastbound street) and the Yawkey Center driveway provide for both ingress and egress. The multiple egress roadways help to distribute traffic leaving the hospital onto Cambridge Street, Charles Street and Blossom Street.

To relieve the only entry point at the intersection of Cambridge Street and North Grove Street, MGH widened and reconstructed Parkman Street to accommodate two-way traffic flow. This provided a second major entryway into the Main Campus, accommodating vehicles accessing the campus via Blossom Street. In addition, as part of the Yawkey Center project, a right-turn-in, right-turn-out driveway was provided on Cambridge Street, to the west of North Grove Street. Further, as part of the Liberty Hotel project, a right-turn-in, right-turn-out driveway was provided on Charles Street. In addition, an internal roadway connection between the hotel site and Yawkey Center was also provided.

An overall goal of MGH has been to provide access and egress points to give drivers options and better distribute the hospital's traffic to the surrounding roadway system. Doing so helps relieve congestion at Charles Circle and on Cambridge and North Grove streets.

Figure 3-9 summarizes the existing Main Campus vehicular circulation patterns.

*CNY Campus*

The CNY Campus is in the north end of the Charlestown Navy Yard. This campus is generally bounded by Chelsea Street on the west, 1st Avenue on the east, 9th Street on the south, and the Mystic River on the north.

The primary entry and exit points to the CNY Campus are the intersections of Chelsea Street at 13th Street and Chelsea Street at 16th Street. Both 13th Street and 16th Street operate as two-way roadways providing for ingress and egress.

Figure 3-10 summarizes the existing CNY Campus vehicular circulation patterns.

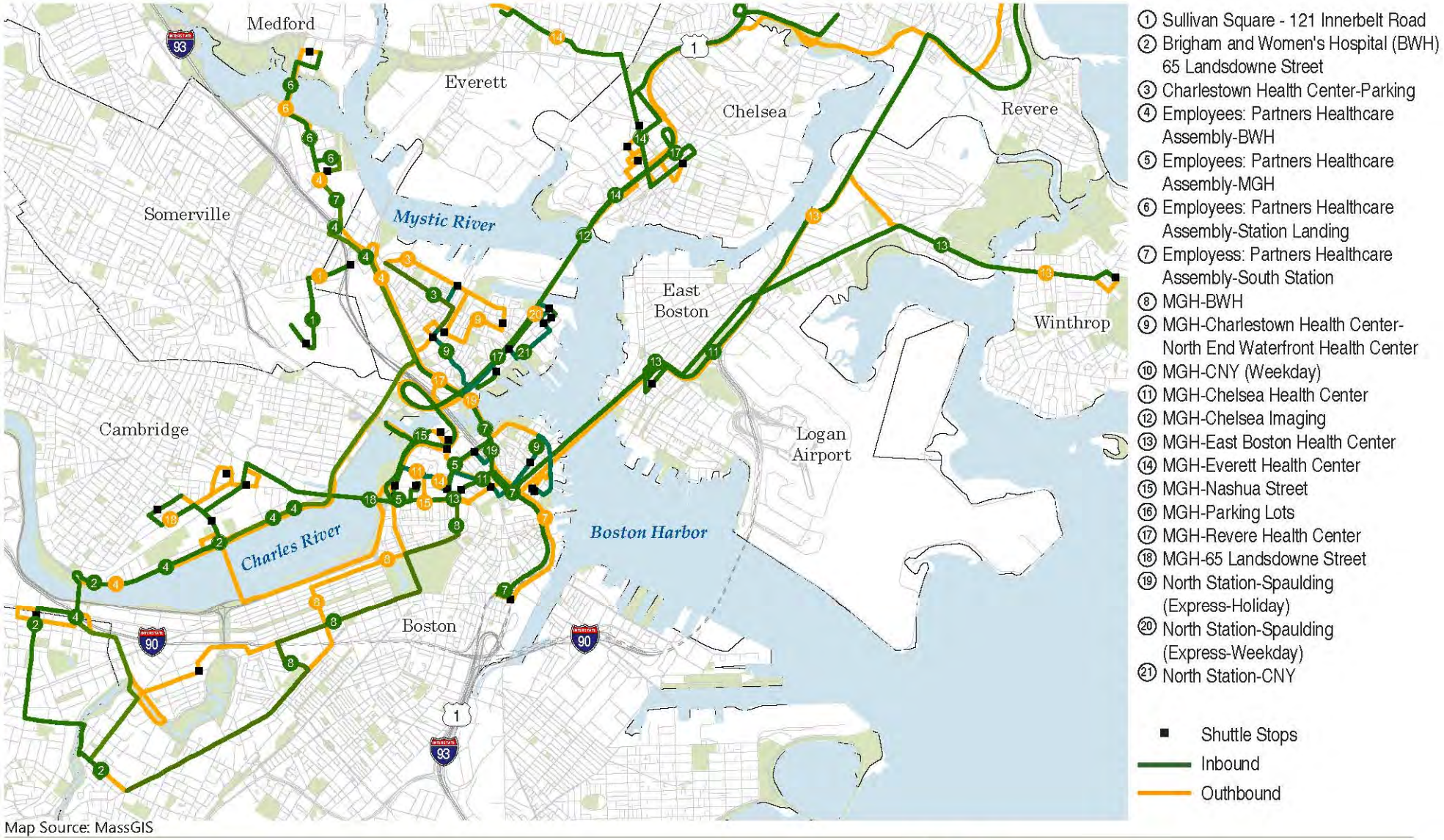



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**Figure 3-8**

*Existing Partners Shuttle Bus Routes*

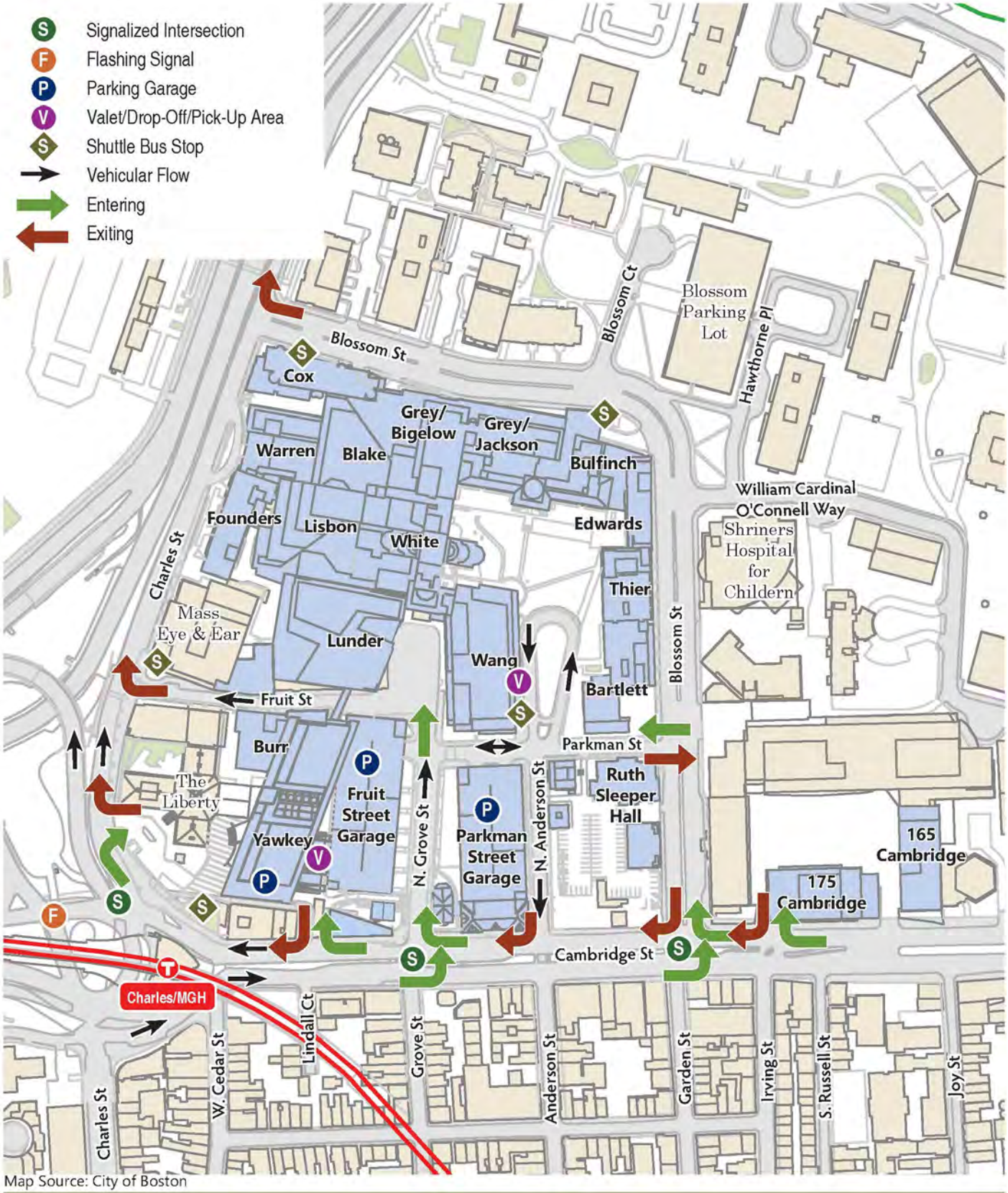


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**Figure 3-9**
*Main Campus Vehicular Circulation*

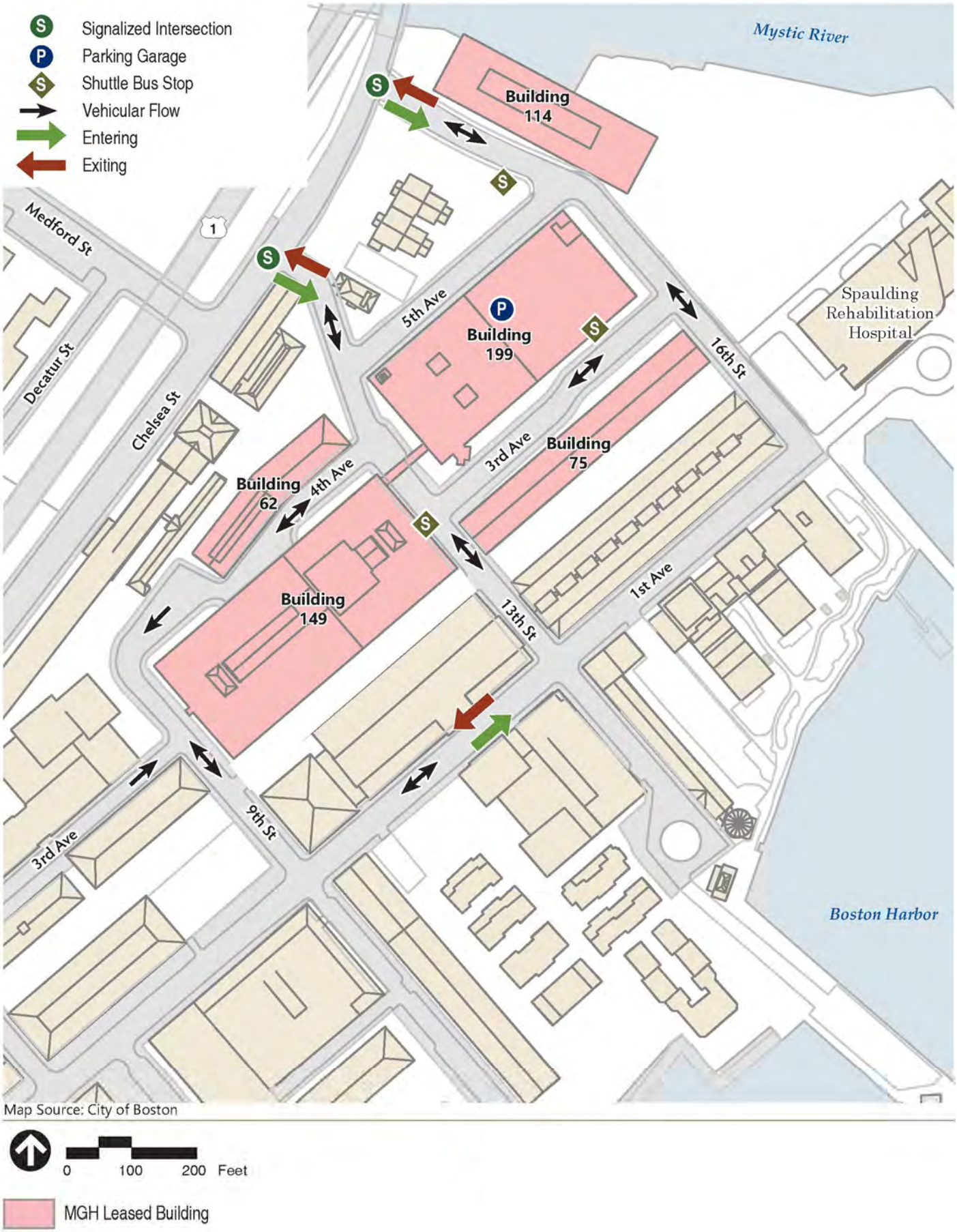


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**Figure 3-10**
*Charlestown Navy Yard Vehicular Circulation*

*Nashua Street Area*

The 125 Nashua Street area is west of North Station. It is bounded by the Leverett Connector on the southeast, I-93 and the North Station train yard on the northeast, and the Charles River and Nashua Street Park on the northwest. Nashua Street itself passes through the middle of the Nashua Street area separating the 100 Nashua Street Lot (south of Nashua Street) from the 125 Nashua Street building and surface parking lot and the 99 Nashua Street Lot.

The driveway serving the 125 Nashua Street building operates as two-way, providing for ingress and egress from both directions. The 99 Nashua Street Lot is accessed from Nashua Street about 250 feet southeast of the 125 Nashua Street driveway. The 100 Nashua Street Lot is accessed by a driveway directly across the street from the 125 Nashua Street driveway.

Figure 3-11 summarizes the existing Nashua Street area vehicular circulation patterns.

#### 3.1.2.5 Loading/Service

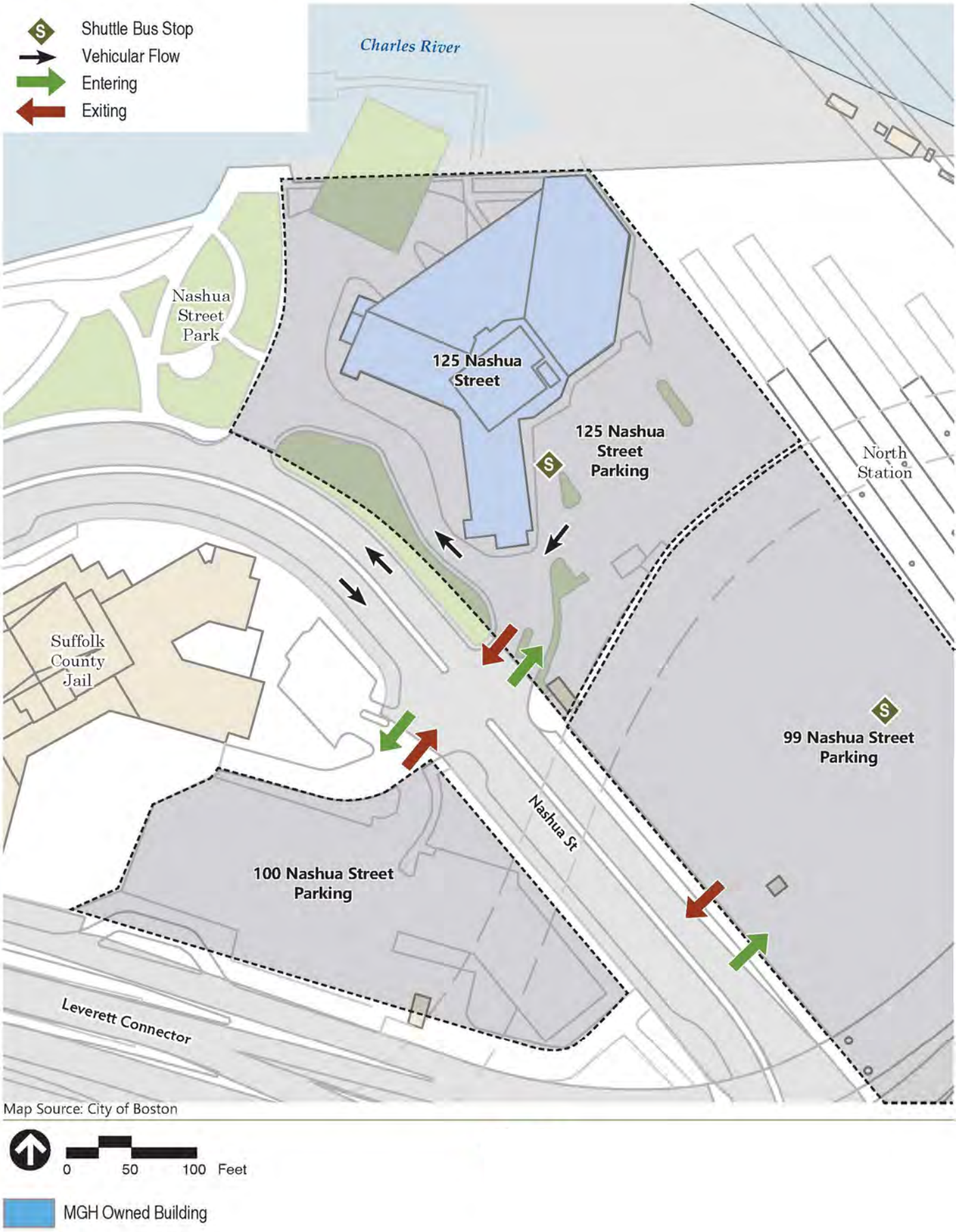
*Main Campus*

A major component of MGH's operations involves managing the hospital's loading and service needs, and scheduling deliveries over the course of each day helps to minimize impacts. There are a total of eight loading areas serving the Main Campus. Goods and deliveries are transported from the loading areas throughout the hospital on hand carts via designated service corridors and freight elevators.

The eight loading areas on the Main Campus are:

- **Jackson Dock** – The Jackson dock is located at 70 Blossom Street and consists of three bays that are used for several functions including materials management, general deliveries, linens, blood bank, US Mail, gas cylinders, Partners vans/truck exchanges, and MGH Buildings & Grounds. Delivery vehicle sizes range from small vans to full size tractor-trailer trucks.

- **Blake Dock** – The Blake dock is located on Blossom Street near the lobby to the Blake Building. It has two bays that are used for MGH's nutrition and food services and for dietary deliveries. The Blake dock is primarily used for dietary deliveries that typically occur early in the morning, between 4:30 and 6:30 a.m. Because the food preparation area within the hospital is near the receiving area of the dock, the time food is handled outside a temperature-controlled environment is minimized.




**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-11**
*Nashua Street Area Vehicular Circulation*

- **Service Dock** – The Service dock is located at the corner of Blossom and Parkman streets. It consists of three bays that are used by MGH's Environmental Services Department. It handles solid waste, including medical waste, and is serviced twice daily by a compactor transfer truck, once in the morning and once in the evening. Medical waste is removed daily in the early morning.

- **Yawkey Dock** – The Yawkey dock is located internal to the campus, south of the Burr Proton Therapy Center. This loading area was designed with one loading bay (that relies on access via a one-way roadway for service vehicles only around the Burr Proton Therapy Center). It handles materials management and dietary deliveries. This loading area only accommodates smaller, single-unit type trucks.

- **Warren Loop** – The Warren Loop is a pullout on Charles Street that ramps up to the lobby of the Warren Building. The Warren Loop is primarily used for pick-up/drop-off and flower deliveries. Because of the grade of the ramp and its narrow width, large trucks cannot access the Warren Loop and most of the activity there is by cargo van. It features two spaces.

- **Blossom Street Curbside Loading** – Curbside loading in designated spaces for commercial vehicles occurs on a segment of Blossom Street near the Jackson/Gray buildings. The curbside area accommodates approximately five vehicles and is used by contractors, vendors and for small deliveries.

- **Charles Street Dock** - The Charles Street dock is located internal to the campus, west of the Lunder Building. The Charles Street dock was designed with five loading bays with access via Charles Street and it features real-time equipment that notifies drivers of the status of each loading bay upon arrival. The Charles Street dock is primarily used for service deliveries and trash removal.

- **Blossom Street Dock** – The Blossom Street dock, serving Charles River Plaza, is located north of the Wyndham Hotel on the east side of Blossom Street. The Blossom Street dock has three bays. The primary function of the Blossom Street dock is to support deliveries for the Simches Research Building (185 Cambridge Street). Limited medical supply deliveries also arrive here supporting MGH practices located at 165 Cambridge Street.

*CNY Campus*

There are three loading areas serving the CNY Campus:

- **Building 149 Dock** – The Building 149 dock is located east of the traffic island at the corner of 4th Avenue and 9th Street. It consists of two bays that are used primarily for materials management, research use and food service.

- **Building 114 Dock** – The Building 114 dock is located north of Building 114 and is accessed via 16th Street between 5th and 3rd avenues. It consists of two bays that are used primarily for materials management/research use.

- **Building 75 Curbside/Driveway Area** – The Building 75 loading area is located at the corner of 13th Street and 3rd Avenue in front of the garage doors serving Building 75. The area provides space for one loading vehicle and is primarily used for materials management/research use.

*Nashua Street Area*

There is one loading area serving the 125 Nashua Street building:

- **125 Nashua Street Dock** – This dock is on the northwest side of the building and it provides two loading bays. Its primary function is to serve materials management and trash removal.

The capacity and function of the loading areas are depicted on Figure 3-12 through 3-14 for the Main Campus, CNY Campus, and Nashua Street area, respectively, and these data are summarized in Table 3-2.

Table 3-2 MGH Loading Areas

| Location | Capacity | Primary Function |
|---|---|---|
| Jackson Dock | 3 bays | Materials management/general deliveries/linens/blood bank/US Mail/gas cylinders/Partners van/truck exchanges and MGH's Buildings & Grounds |
| Blake Dock | 2 bays | Nutrition and food services and dietary deliveries |
| Service Dock | 3 bays | Environmental Services Department |
| Yawkey Dock | 1 bay | Materials management and dietary deliveries |
| Warren Loop | 2 spaces[1] | Pick-up/drop-off and flower deliveries |
| Blossom Street Curbside Loading | 5 spaces[1] | Contractors/vendors and small deliveries |
| Charles Street Dock | 5 bays | Service deliveries and trash removal |
| Blossom Street Dock (serving Charles River Plaza) | 3 bays | Research and limited medical supply deliveries |
| **Main Campus Total** | **24 bays/spaces** | |
| | | |
| Building 149 Dock | 2 | Materials management/research & food services |
| Building 114 Dock | 2 | Materials management/research |
| Building 75 Curbside Driveway Area | 1[1] | Materials management/research |
| **CNY Campus Total** | **5 bays/spaces** | |

Table 3-2 MGH Loading Areas (Continued)

| Location | Capacity | Primary Function |
|---|---|---|
| 125 Nashua Street | 2 | Materials management/trash removal |
| **Nashua Street Area Total** | **2 bays/spaces** | |
| | | |
| **Grand Total** | **31 bays/spaces** | |

1 Approximate capacity

#### 3.1.2.6 Ambulances

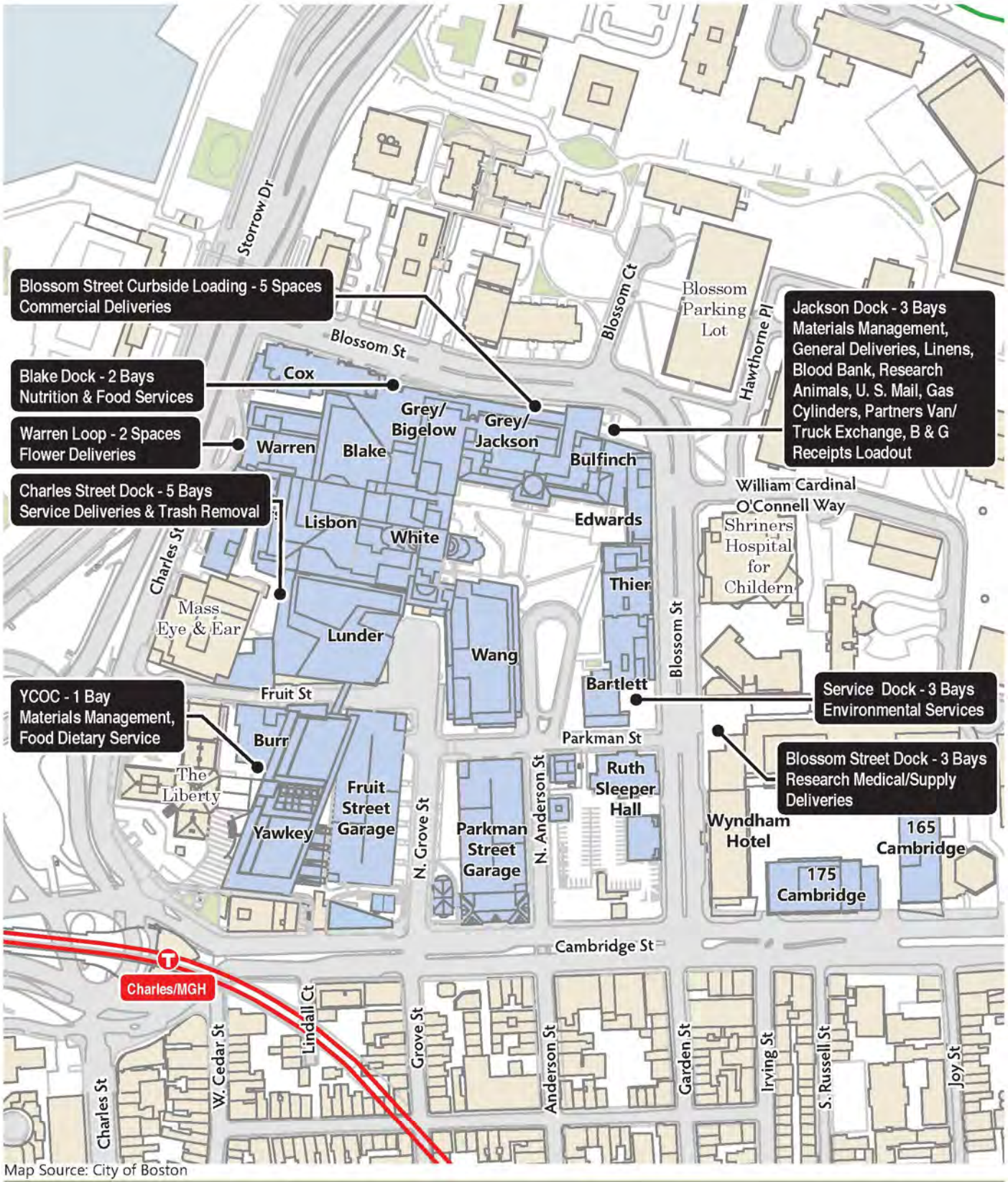
The MGH Emergency Department is located on the Main Campus and is accessed from Fruit Street. Emergency vehicles park under cover, inside the Lunder Building. Ambulances reach this area via North Grove or Parkman streets to Fruit Street. They load/unload in the ambulance bay which has ten ambulance bays. Ambulances departing the ambulance bay depart either westbound or eastbound on Fruit Street. Ambulances also depart from the Cox Building.

#### 3.1.2.7 Taxicabs

Some patients and visitors choose to take a taxicab to get to and from the hospital. There is a taxicab stand on the Main Campus on the east side of North Grove Street. Taxicabs also often use the Wang Ambulatory Care Center (WACC) Valet Loop to pick up and drop off patients and visitors. Both areas are actively managed by MGH staff to help reduce congestion and prevent drivers from leaving their vehicles unattended.

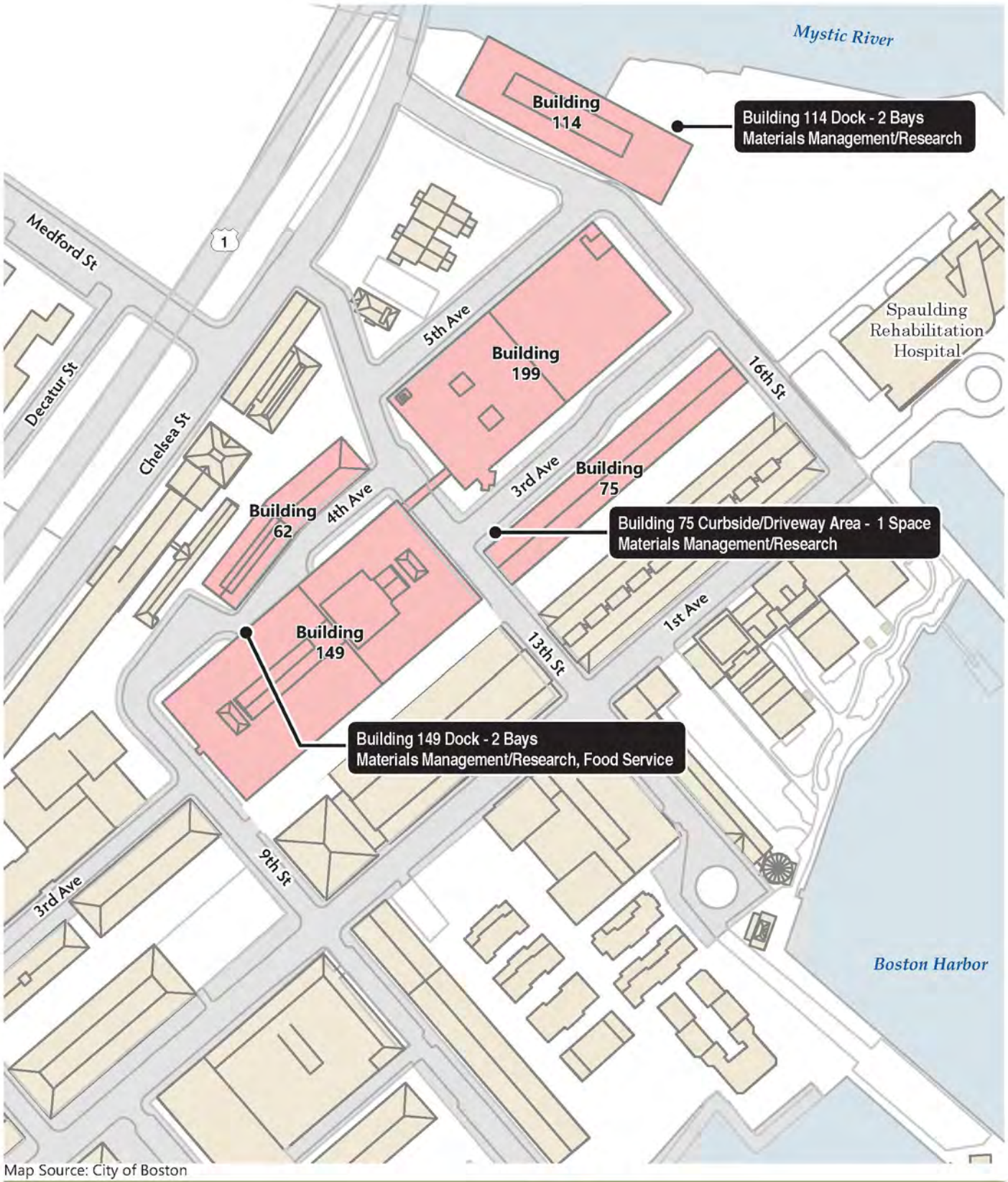
#### 3.1.2.8 Transportation Network Companies (TNCs)

As TNCs are becoming a more utilized mode of transportation in the city, many patients, visitors, and staff are choosing to get to and from the hospital using a ride sharing service. Locations typically used by passengers are summarized below.



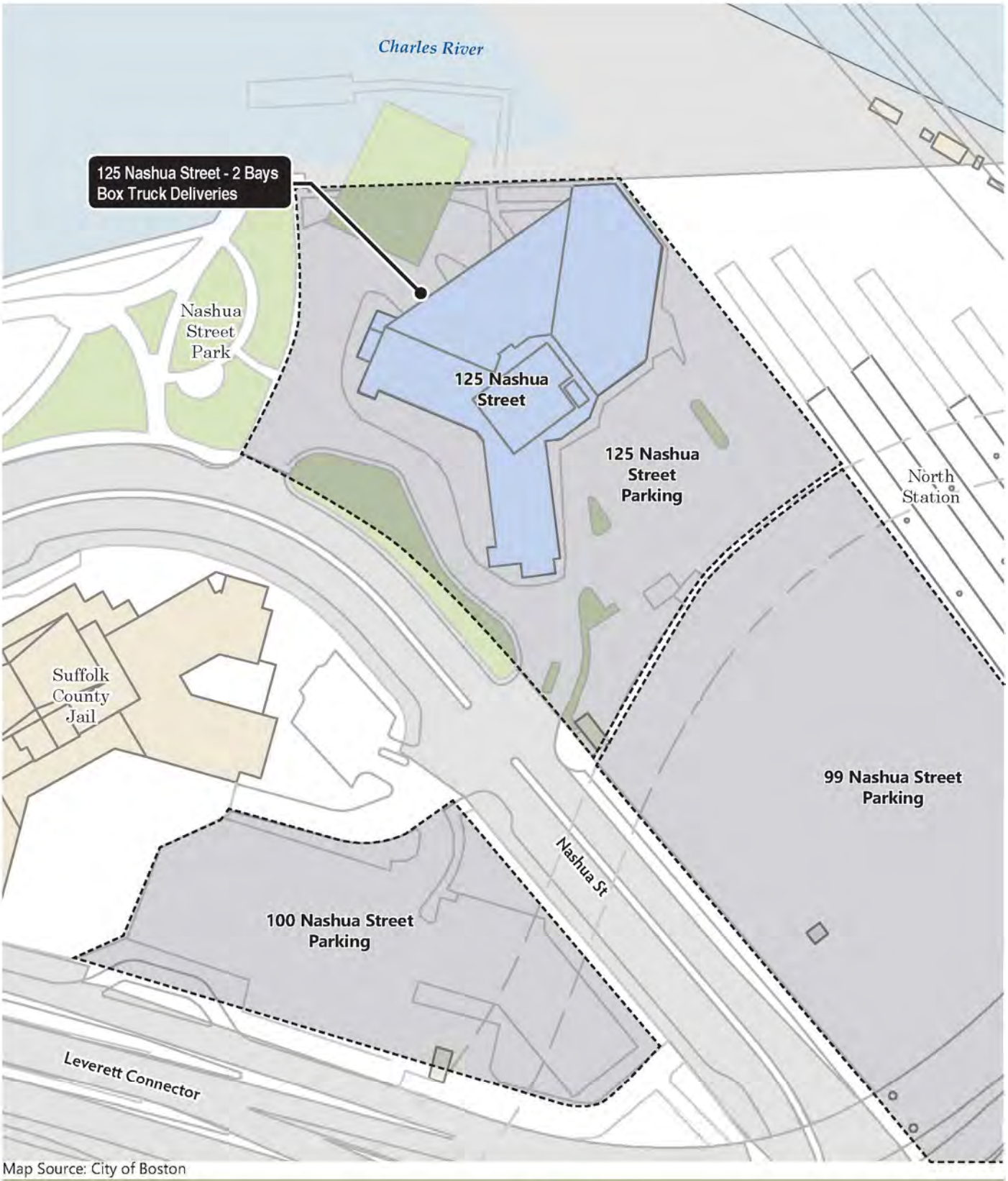

**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-12**
*Main Campus Loading/Services Areas*




**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-13**
*Charlestown Navy Yard Campus*
*Loading/Services Areas*




**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-14**
*Nashua Street Area Loading/Services Areas*

*Main Campus*

When a rider uses a service like Uber or Lyft to travel to or from the Main Campus, designated drop-off/pick-up locations are typically offered so the rider can select the appropriate destination/origin. These locations include:

- Yawkey Center Valet Area;
- White Building Main Entrance;
- WACC Valet Loop;
- Thier Building at 50 Blossom Street; and
- Warren Building Main Entrance (on Charles Street).

*CNY Campus*

When a rider uses a TNC to travel to or from the CNY Campus, unlike the Main Campus, there are no designated pick-up and drop-off areas. Observations of curbside activity in the CNY Campus by VHB indicate there is an increasing presence of TNCs. Many of these vehicles use the curb space in front of Building 149 on 13th Street to drop-off or pick-up passengers.

*Nashua Street Area*

There are no designated pick-up and drop-off areas for TNCs near MGH properties on Nashua Street.

### 3.1.2.9 Parking

The following sections detail MGH's parking supply and the current utilization of the hospital parking.

*Main Campus*

The hospital owns 11 parking facilities and leases parking in 10 other locations that support the Main Campus as shown on Figure 3-15. The inventory of MGH's owned parking areas and leased spaces for the Main Campus is provided in Table 3-3. The table includes location, allocation between patient/visitor and employee parking, and mode of travel to the Main Campus for each facility. As indicated, there are a total of 5,374 owned and leased parking spaces serving the Main Campus. There are presently 2,281 spaces dedicated to patient and visitor parking and 3,093 employee spaces. Most of the employee spaces are located off-campus in remote facilities; only 973 on-campus spaces are dedicated to employees and the bulk of those are at Charles River Plaza. As described earlier, an extensive, free shuttle service transports employees to and from remote parking areas.


**MGH Leased Parking**

| | Location | Spaces |
|---|---|---|
| A | Emerson Garage | 300 |
| B | Hawthorne Place Garage | 26 |
| C | Longfellow Garage | 100 |
| D | Whittier Garage | 1 |
| E | North Station Garage | 500 |
| F | Haymarket/Safe Harbor Garage[1] | 50 |
| G | Garden Garage[2] | 140 |
| H | Merrimack Street Lot | 7 |
| I | Museum of Science Garage | 170 |
| J | Building 199 Garage[3] | 150 |
| | **Total Leased Parking** | **1,444** |

**MGH Owned Parking**

| | Location | Spaces |
|---|---|---|
| 1 | Yawkey Garage[4] | 600 |
| 2 | Fruit Street Garage | 720 |
| 3 | Parkman Street Garage | 622 |
| 4 | WACC Lot | 132 |
| 5 | Hawthorne Place Garage | 176 |
| 6 | Charles River Plaza Garage[5] | 792 |
| 7 | 99 Nashua Street[6] | 480 |
| 8 | Charles River Plaza Deck | 162 |
| 9 | Hawthorne Plaza Deck | 50 |
| 10 | 100 Nashua Street | 102 |
| 11 | 125 Nashua Street | 98 |
| | **Total MGH Owned Parking** | **3,934** |
| | **GRAND TOTAL** | **5,378** |

Map Source: MGH Parking and Commuter Services, September 2017

1 Exact number of MGH spaces varies on a daily basis; 50 is typical.
2 The 140 spaces in Equity Residential's Garden Garage became unavailable for approximately three years starting April 2018 during the construction of the planned 44-story residential building on the site. During the construction period, MGH is temporarily leasing an equal number of spaces from Equity Residential in the Emerson Garage (40 spaces) and the Longfellow Garage (100 spaces).
3 Approximately 150 spaces are made available to Downtown Campus parkers.
4 The Yawkey Center Garage has a total of 700 spaces, 100 of which are allocated for the use of the Liberty Hotel.
5 Three Zipcars operate out of the Wyndham Parking Garage. Zipcars are short-term leased vehicles whereby users may reserve a vehicle for a portion of the day, as discussed in the Transportation Demand Management section.
6 MGH owns approximately 360 spaces in the Orange Lot and uses approximately 120 additional spaces adjacent to the rail tracks through an agreement with the MBTA.

**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-15**
*Existing Parking Supply serving the Main Campus (September 2017)*

On-campus parking for patients and visitors is provided in the Fruit Street Garage, Parkman Street Garage, Yawkey Garage, WACC Lot, Charles River Plaza Garage, Charles River Plaza Deck, Hawthorne Place Parking and the Hawthorne Plaza Deck. The WACC Lot is used for valet parking operated from the curb at the WACC Loop.

MGH makes parking spaces in the Yawkey Garage available for overnight and weekend parking to residents of the Beacon Hill and West End neighborhoods at rates significantly below posted rates. The cost to park is $8.00. In addition, a reverse commute program is provided by MGH in the Charles River Plaza Garage for $150 per month.

The Parkman Garage, Fruit Street and Yawkey garages are the primary large parking facilities for hospital patients and visitors. Spaces in these three garages are heavily used over the course of a typical weekday. They typically operate at or near capacity between 9:00 a.m. and 4:00 p.m. on weekdays.

The relatively limited public parking supply in the area and the hospital's desire to encourage staff to travel by alternative routes is reflected in the monthly parking charges. To help incentivize its staff, parking fees are lower for the spaces that are more distant from the Main Campus.

**Table 3-3 Existing MGH Main Campus Parking Inventory**

| Parking Facility | Location | Number of Spaces | | | Travel Mode to Campus |
|---|---|---|---|---|---|
| | | Total | Patient/ Visitor | Employee | |
| **LEASED SPACES (ADJACENT TO MAIN CAMPUS)** | | | | | |
| Hawthorne Place Parking | Hawthorne Place | 26 | 0 | 26 | Walk |
| Longfellow Place Garage | 60 Staniford Street | 100 | 0 | 100 | Walk |
| Emerson Garage | Blossom Street | 300 | 0 | 300 | Walk |
| Whittier Place Garage | Whittier Place | 1 | 0 | 1 | Walk |
| **LEASED SPACES (OFF-CAMPUS)** | | | | | |
| North Station Garage | 121 Nashua Street | 500 | 0 | 500 | Walk/Shuttle |
| Haymarket/Safe Harbor Garage [1] | Haymarket | 50 | 0 | 50 | Walk/Shuttle |
| Garden Garage [2] | Lomasney Way | 140 | 0 | 140 | Walk |
| Merrimac Street Lot | 101 Merrimac Street | 7 | 0 | 7 | Walk |
| Museum of Science Garage | McGrath-O'Brien Highway | 170 | 0 | 170 | Walk/Shuttle |
| Building 199 Garage[3] | 13th Street, CNY | 150 | 0 | 150 | Shuttle |
| **OWNED SPACES (ON THE MAIN CAMPUS)** | | | | | |
| Fruit Street Garage | 36 North Grove Street | 720 | 720 | 0 | Walk |
| Hawthorne Place Parking | Hawthorne Place | 176 | 0 | 176 | Walk |

Table 3-3 Existing MGH Main Campus Parking Inventory (Continued)

| Parking Facility | Location | Number of Spaces | | | Travel Mode to Campus |
|---|---|---|---|---|---|
| | | Total | Patient/ Visitor | Employee | |
| **OWNED SPACES (ON THE MAIN CAMPUS) (continued)** | | | | | |
| Parkman Street Garage | 10 Parkman Street | 622 | 622 | 0 | Walk |
| Yawkey Garage[4] | 32 Fruit Street | 600 | 600 | 0 | Walk |
| WACC Lot | 15 North Anderson Street | 132 | 127 | 5 | Walk |
| Charles River Plaza Garage[5] | 165 Cambridge Street | 792 | 0 | 792 | Walk |
| Charles River Plaza Deck | 165 Cambridge Street | 162 | 162 | 0 | Walk |
| **OWNED SPACES (OFF-CAMPUS)** | | | | | |
| Hawthorne Place Parking[6] | Hawthorne Place | 176 | 0 | 176 | Walk |
| Hawthorne Plaza Deck | Hawthorne Place | 50 | 50 | 0 | Walk |
| 100 Nashua Street Lot | 100 Nashua Street | 102 | 0 | 102 | Walk/Shuttle |
| 125 Nashua Street | 125 Nashua Street | 98 | 0 | 98 | Walk/Shuttle |
| 99 Nashua Street[7] | 99 Nashua Street | 480 | 0 | 480 | Walk/Shuttle |
| **TOTAL ALL SPACES** | | **5,378** | **2,281** | **3,097** | |

Source: MGH Parking and Commuter Services, September 2017.

1 Exact number of MGH spaces varies on a daily basis; 50 is typical.

2 The 140 spaces in Equity Residential's Garden Garage became unavailable for approximately three years starting April 2018 during the construction of the planned residential building on the site. During the construction period, MGH is temporarily leasing an equal number of spaces from Equity Residential in the Emerson Garage (40 spaces) and the Longfellow Garage (100 spaces).

3 Approximately 150 spaces are made available to Downtown Campus parkers.

4 The Yawkey Garage has a total of 700 spaces, 100 of which are allocated for use by the Liberty Hotel.

5 Three Zipcars operate out of the Charles River Plaza Garage. Zipcars are short-term leased vehicles whereby users may reserve a vehicle for a portion of the day, as discussed in the TDM section.

6 The spaces are owned only.

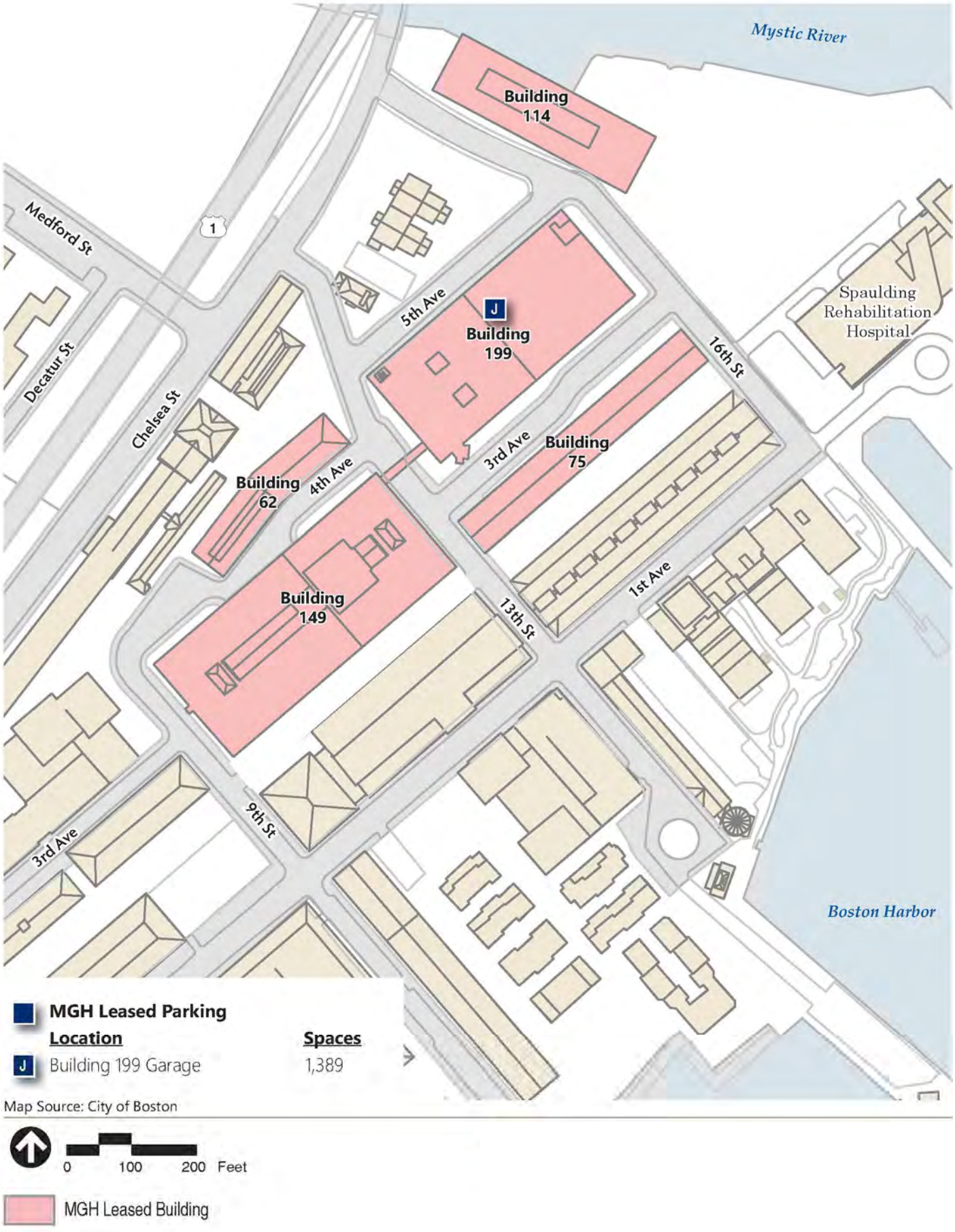
7 MGH owns approximately 360 spaces in the 99 Nashua Street Lot and uses approximately 120 additional spaces adjacent to the rail tracks through an agreement with the MBTA.

### *CNY Campus*

The parking supply serving the CNY Campus is in the Building 199 Garage as shown in Figure 3-16. The garage provides 1,389 parking spaces. A limited number of parking spaces in this garage are available to support the Main Campus. These parkers ride shuttle buses to and from the Main Campus.

### *Nashua Street Area*

The parking supply in the Nashua Street area includes three facilities, the 99 Nashua Street Lot, the 100 Nashua Street Lot, and the 125 Nashua Street Lot. Each of these support Main Campus parkers. Employees of the 125 Nashua Street building acquire parking spaces by the same means as Main Campus employees and are not guaranteed parking in the Nashua Street area. These parking lots were indicated previously in Figure 3-15.




**Massachusetts General Hospital Boston, Massachusetts**

**Figure 3-16**
*Existing Parking Supply Serving the Charlestown Navy Yard Campus (September 2017)*

### 3.1.2.10 Transportation Demand Management

Maintaining a strong and effective TDM program is an important part of everyday operations at MGH. The proximity of MGH to the Charles/MGH Station and other nearby public transportation nodes makes transit an attractive, convenient, and cost-effective mode choice for most employees as well as for some of MGH's patients and visitors.

MGH is a leader in TDM programs in the City. Over the last few years, MGH has been the recipient of many TDM-related awards and recognitions. In 2011, MGH received the ECO Award (Excellence in Commuter Options). Since 2011, MGH has placed and received the Gold Award at the ECO event. In 2016, MGH received the ECO award for Leadership in Commuter Options for its carpool program. In 2017 and 2018, MGH was recognized and awarded for its bicycle participation challenges at MGH.

MGH's extensive TDM program includes:

- **Parking Freeze** – Over the years, the number of MGH employees has grown while the supply of Main Campus parking spaces dedicated to employees has been kept steady. As part of the Yawkey Center and Lunder Building approval, MGH committed to an on-campus employee "parking freeze" and that no new employee parking will be provided on the Main Campus. This commitment will continue into the future. The Fruit Street Garage, Parkman Street Garage, Yawkey Garage, Charles River Plaza Deck, and Hawthorne Plaza Deck are all intended to be used primarily for patient and visitor parking. Because of the restricted supply and high cost of parking, employees have effectively been discouraged from driving to the campus.

- **Free Shuttle Service** – As described earlier, Partners HealthCare System operates an extensive shuttle bus service that links the Main Campus with other MGH facilities at the CNY, with other hospitals in the Boston area (including the Longwood Medical and Academic Area), to off-site health centers, to off-site employee parking areas, and to key transportation nodes in the area.

- **Subsidized Transit Passes** – MGH is a participant in the MBTA Corporate T-Pass Program and the hospital provides subsidized monthly passes to any employee who works at least 20 hours per week. The subsidy is now 30% of the cost of each pass, and the employee's share of the pass cost is deducted directly from employees' paychecks on a pre-tax basis. As an added convenience, monthly transit passes are distributed by the hospital to its staff. Currently, 9,650 employees are enrolled in this MBTA program.

- **Transportation Management Associations** – MGH is a member of the A Better City Transportation Management Association (ABC TMA). Membership in the TMA allows the hospital to participate in the many TDM programs managed by the TMA.

- **Guaranteed Ride Home** – The Guaranteed Ride Home Program is administered through MGH's participation in the ABC TMA. MGH is highly supportive of this program because it provides an additional incentive for transit use and helps retain staff that rely on public transportation. They may on occasion require a ride home for an emergency or because of the need to work late.

- **Ridematching** – Through MGH's participation in the ABC TMA, employees who are looking to join a carpool can use the Ridematching service, which is a database of employees in the area who are either already carpooling or who are interested in joining a carpool.

- **Carpool/Vanpool Incentives** – In addition to providing a ridematching service to help form carpools, MGH also provides carpool and vanpool parking in the 99 Nashua Street Lot.

- **Bicycling Incentives** – As noted earlier, on the Main Campus, MGH has approximately 300 covered and secure bicycle parking spaces in a covered bike cage at the corner of Parkman Street and North Anderson Street, as well as approximately 63 spaces at 165 Cambridge Street. These spaces can be used by registered employees. In addition to the bike cage, bicycle racks with a total of approximately 100 spaces are also provided in the Parkman Street Garage and on Charles Street in front of the Founders building. Shower and locker facilities in Ruth Sleeper Hall are available for employee use. Currently, over 2,000 employees are registered bicycle users. On the CNY Campus, there are approximately 147 bicycle spaces in Building 114 and Building 199. At the Nashua Street area, approximately 10 bicycle spaces are provided.

- **Zipcars** – Zipcar is a subscription car rental service that provides subscribers access to shared cars in many locations in the city for use when needed. The service is designed to help reduce car ownership and provide a vehicle for people who have an occasional need for the use of a car. There are currently three Zipcars that are operated from (and they park for free) in the Charles River Plaza Garage. Zipcar offers affordable 24-hour access to private cars for short-term, round-trip use as added support for regular public transportation use. These Zipcars are also used by residents in the area as well as MGH users. The Zipcar program is promoted to employees through e-mail updates and brochures posted throughout the hospital.

- **Parking Coupon Program** – MGH has a coupon program that provides regular transit riders who occasionally need to drive with a parking space (which they pay for). This accomplishes an important goal of keeping MGH's transit users on the MBTA system most of the time.

- **Promotions** – The MGH Parking and Commuter Services Department hosts many annual events to promote commuting alternatives. An annual commuter fair and a

bike-to-work week are two key events hosted by MGH. Frequent promotions such as free bike tune-ups, a "Fill'er Up" carpool incentive program ($35 per month for gas for six months to new carpoolers), and a Vanpool Seat Subsidy ($220 over six months) are some examples of promotions sponsored by MGH to encourage commuting alternatives to driving alone.

- **On-site ATMs and Dining Facilities** – There are multiple ATMs located within the hospital for the convenience of employees, patients and visitors. There are also several dining facilities within the hospital. These on-site conveniences help reduce the need for mid-day trips and help make it easier for people to use transit.

- **On-site Taxicab Stand** – There is a taxicab stand located on the east curb of North Grove Street. It is there for the convenience of employees, patients and visitors alike.

- **Transportation Coordinator** – MGH has a designated on-site transportation coordinator who administers this TDM program. The coordinator is responsible for assisting employees with commuting alternatives and promoting TDM alternatives. MGH promotes its TDM program at kiosks located throughout the hospital, at annual commuter fairs, in e-mail updates, in the MGH Hotline newsletter, and at orientations for all new employees. The transportation coordinator oversees the TDM programs offered by MGH to help encourage the use of alternative modes for travel to and from MGH.

MGH intends to continue to offer the services described herein to new employees who are added as a result of the Projects.

### *3.1.3 Trip Generation*

Estimating the expected number of new trips that the proposed Projects will generate required a process that considered the existing Main Campus travel patterns. In developing the methodology to estimate how many new trips can be expected, detailed survey information on employee and patient trip-making was relied upon, as well as a system-wide assessment of how the parking system serving MGH is used. The current campus' travel patterns were considered and compared with ITE data to help develop a clear understanding of campus-wide trip-making at MGH. With this in place, estimations of the trip making characteristics of the Projects were made.

Preliminary projected trip generation estimates for the Projects have been developed based on the net-new square footage of the existing Main Campus. Table 3-4 summarizes the size of the existing Main Campus as well as the increase from the Projects which were used to generate the net-new Projects' trips.

Table 3-4 Existing Main Campus and Project Program

| | | |
|---|---|---|
| **Existing Main Campus** | 4,249 ksf | 1,035 beds |
| **Existing Proposed Project Site (removed)** | (-98) ksf | - |
| **Proposed IMP Projects** | 1,064 ksf | 456 beds (up to 203 net-new) |
| **Future Main Campus (Total)** | **5,216 ksf** | **Up to 1,238 beds** |

### 3.1.3.1 Unadjusted Trip Generation

Data from the Institute of Transportation Engineers (ITE) Trip Generation Manual for Land Use Code (LUC) 610 – Hospital was reviewed and compared to existing hospital data to help project future trip making for the Main Campus. MGH provided parking facility activity data for a typical week in September 2018. This data was used to help determine how many vehicles enter and exit the parking facilities serving the Main Campus daily. Following this exercise, it was determined that relying on the ITE *Trip Generation Manual* (10th Edition) rates based on the hospital's square footage offers the best, most reliable, method to estimate the number of trips that are anticipated to be generated by the Projects daily and during both the morning and evening peak hours. A summary of the unadjusted vehicle trips for the Projects is presented below in Table 3-5.

It is important for reviewers of this section to understand that these "unadjusted" trips do not consider the heavy reliance on public transportation and alternative modes of travel (including bicycling or walking) that is the case at MGH. As a result, the methodology below explains how these factors were considered.

Table 3-5 Unadjusted Project Generated Vehicle Trips

| | Existing Main Campus | Future Main Campus (with Proposed IMP Projects) | Net-New Future Campus |
|---|---|---|---|
| **Daily** | | | |
| In | 13,855 | 16,695 | **2,840** |
| Out | 13,855 | 16,695 | **2,840** |
| **Daily Total** | 27,710 | 33,390 | **5,680** |
| **AM Peak Hour** | | | |
| In | 2,224 | 2,710 | **486** |
| Out | 1,047 | 1,275 | **228** |
| **AM Total** | 3,271 | 3,985 | **714** |
| **PM Peak Hour** | | | |
| In | 1,174 | 1,434 | **260** |
| Out | 2,496 | 3,047 | **551** |
| **PM Total** | 3,670 | 4,481 | **811** |

Source: ITE *Trip Generation Manual*, 10th Edition LUC 610 (Hospital)

As shown in Table 3-5, the Projects are anticipated to generate 5,680 daily unadjusted vehicle trips. According to ITE rates, the Projects are expected to generate 714 and 811 unadjusted vehicle trips during the morning and evening peak hours, respectively. As noted above, using ITE rates is a starting point for estimating MGH's new/additional trip making with the construction of the Projects since the Main Campus has multiple alternatives to driving available and a constrained parking supply. These factors all significantly affect and reduce the expected number of new vehicle trips.

#### 3.1.3.2 Person Trip Generation

The first step to convert the unadjusted vehicle trips in Table 3-5 into adjusted vehicle trips (the expected number of actual trips the Projects will generate) is to calculate the number of total person trips from the initial gross unadjusted vehicle trip generation estimate shown in the table. The Federal Highway Administration's 2017 *National Household Travel Survey Summary of Travel Trends* provides national vehicle occupancy rates (VOR) of 1.18 for work trips (employees) and 1.67 for all purposes (patients/visitors).

In order to apply VOR to the unadjusted vehicle trips, the ratio of peak hour arrivals and departures from the existing Main Campus was identified using the previously mentioned garage data. The data included garage activity for both employees and patients/visitors destined to or exiting the Main Campus. This helped determine the mix (the percentages) of employees and patients/visitors that arrive and depart the Main Campus during the peak hours. Table 3-6 summarizes these rates for a typical weekday including parkers using parking facilities serving the Main Campus (see Figure 3-15 to understand where these parking facilities are located).

**Table 3-6 Existing Parking Facility Activity Rates (Serving the Main Campus)**

| | Employees | Patients/Visitors | Total |
|---|---|---|---|
| **AM Peak Hour** | | | |
| In | 49% | 51% | 100% |
| Out | 73% | 27% | 100% |
| **PM Peak Hour** | | | |
| In | 73% | 27% | 100% |
| Out | 55% | 45% | 100% |

Garage data used to identify ratio of employees vs. patient/visitors during the peak hours based on September 2018 data.

The garage activity rates, in Table 3-6, were used to help identify the number of unadjusted vehicle trips, previously presented in Table 3-5, that belong to employees versus patients and visitors. VORs were applied to the unadjusted vehicle trips to estimate person trips. These net-new person trips for the Projects are presented in Table 3-7.

Table 3-7 Project Generated Net New Person Trips

| | Net New Person Trips |
|---|---|
| **Daily** | |
| In | 3,725 |
| Out | 3,725 |
| **Daily Total** | 7,450 |
| **AM Peak Hour** | |
| In | 612 |
| Out | 278 |
| **AM Total** | 890 |
| **PM Peak Hour** | |
| In | 315 |
| Out | 687 |
| **PM Total** | 1,002 |

Source: ITE *Trip Generation Manual*, 10th Edition LUC 610 (Hospital)
FHWA 2017 *National Household Travel Survey Summary of Travel Trends*

As shown in Table 3-7, the Project is anticipated to generate 890 and 1,002 net-new person trips during the morning and evening peak hours, respectively.

#### 3.1.3.3 Mode Shares

Because of the ready availability of public transportation options serving MGH, people travelling to and from MGH have an array of alternative mode and service choices available to them. Parking on the campus is limited and most of the daytime staff that drives parks off-site in remote facilities. Therefore, an adjusted trip generation estimate refines the net new person trips by appropriately assigning those net new person trips to the full range of travel choices, including public transportation, walking, bicycling and driving.

The mode shares used in this analysis and presented in Table 3-8, are again based on survey data for MGH, and observations of current travel patterns. For MGH employees, this analysis assumed that peak hour commuting patterns will match the MGH 2016 Rideshare Report. The vehicle mode share for employees is anticipated to be slightly higher when estimating daily trips due to the availability of evening and overnight parking for employees on campus, and the reduced level of public transportation available. Mode shares for patients/visitors are based on MGH Rideshare Base Report submitted to the MassDEP.

Table 3-8 Mode Shares

| Mode | Employees[1] AM and PM Peak Hour | Employees Daily | Patients/Visitors[2] AM Peak, PM Peak, and Daily |
|---|---|---|---|
| Public Transportation/Bike/Walk | 79% | 60% | 4% |
| Automobile | 21% | 40% | 96% |

[1] MGH 2016 Rideshare Report
[2] MGH Rideshare Base Reports

#### 3.3.3.4 Adjusted Trip Generation

The mode share profile presented in Table 3-8 and the VOR rates presented previously were applied to the net new person trips presented in Table 3-7. Table 3-9 summarizes the adjusted trip generation estimates by mode. These figures in Table 3-9 represent the new trips that are expected due to the Projects.

Table 3-9 Projects' Generated Adjusted Trips by Mode

| | Public Transportation/ Bike/Walk | Automobile |
|---|---|---|
| **Daily** | | |
| In | 1,521 | 1,564 |
| Out | 1,521 | 1,564 |
| **Daily Total** | 3,042 | 3,128 |
| **AM Peak Hour** | | |
| In | 385 | 161 |
| Out | 200 | 59 |
| **AM Total** | 585 | 220 |
| **PM Peak Hour** | | |
| In | 228 | 67 |
| Out | 452 | 171 |
| **PM Total** | 680 | 238 |

Source: ITE *Trip Generation Manual*, 10th Edition LUC 610 (Hospital)
FHWA 2017 *National Household Travel Survey Summary of Travel Trends*

Based on the foregoing analysis, the majority of the Projects' trips are expected to be made by public transportation, bicycling or walking. Peak hour adjusted vehicle trips are estimated to range from 220 net new trips during the morning peak hour to 238 net new trips during the evening peak hour. It is important to understand that not all of these trips will be made to the Main Campus itself. Peak hour employee auto trips will need to be made to remote/off-site parking locations while patient/visitor trips would be accommodated by the expanded parking proposed as part of the Projects on the Main Campus.

### *3.1.4 North Station Area Mobility Action Plan*

In addition to the TDM program, MGH continues to evaluate measures to improve transportation around the Main Campus. The North Station Area Mobility Action Plan completed by the City in September 2017 included a number of suggested transportation improvements for a broad area near North Station, including the MGH campus. As part of its upcoming Institutional Master Plan/Article 80 process, MGH intends to work with the BPDA, the BTD and its neighbors in the community to help determine an appropriate transportation-related mitigation program to help reduce the effects of the planned Projects.

## 3.2 Wind

The Clinical Building will be 13 stories and approximately 200 feet tall, and the Campus Services Building will be seven stories above grade and approximately 130 feet tall. Wind impacts will be analyzed in the DPIR.

## 3.3 Shadow

The sites are located within MGH's dense Main Campus, with no major public open spaces nearby. New shadow may be cast onto Bulfinch Lawn and surrounding streets and sidewalks, though the impacts from net new shadows are anticipated to be limited due to the existing buildings on the sites.

## 3.4 Daylight

The purpose of a daylight analysis is to estimate the extent to which a project affects the amount of daylight reaching public streets in the immediate vicinity of a project site. As mentioned previously, the Projects will be located within the Main Campus on currently developed sites. Although the Projects will be taller than the existing conditions, which will result in increased daylight obstruction, the daylight obstruction is anticipated to be similar to the surrounding area, and typical of a dense urban environment.

## 3.5 Solar Glare

The exterior materials for the Projects have not been determined. Building exteriors are expected to be constructed of a mixture of modern and traditional building materials that include brick, stone, pre-cast concrete, and glass. At this time, reflective glass is not anticipated for the Projects. The Projects will be designed so as not to present an adverse safety impact on Project area traffic as a result of solar glare.

## 3.6 Air Quality

Potential long-term air quality impacts can be generated by the Campus Services Building, the Clinical Building's mechanical equipment, and pollutant emissions from vehicular traffic generated by the development of the Projects. MGH currently has a vehicle trip reduction program which will be implemented for the Projects.

Short-term air quality impacts from fugitive dust may be expected during the demolition and early phases of construction and from site preparation activities. Plans for controlling dust during construction will include wetting during periods of high wind and careful removal of debris by covered trucks. The construction contracts will provide for a number of strictly enforced measures to be utilized by contractors to reduce emissions and minimize impacts. These are expected to include:

- Using wetting agents where needed on a scheduled basis;

- Using covered trucks;
- Minimizing exposed storage debris on-site;
- Monitoring actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Locating aggregate storage piles away from areas having the greatest pedestrian activity where and when possible; and
- Periodic cleaning of streets and sidewalks to minimize dust accumulations.

## 3.7 Noise

Most of the activity associated with the operation of the Projects will occur indoors. The primary operational noise caused by the Projects will be the result of mechanical equipment.

Intermittent increases in noise levels will occur in the short-term during construction. Construction work will comply with the requirements of the City of Boston noise ordinance. Reasonable efforts will be made to minimize the noise impact of construction activities. Mitigation measures are expected to include:

- Using appropriate mufflers on all equipment and providing ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously operating equipment, such as air compressors and welding generators with outdoor exposure;
- Replacing specific construction operations and techniques by less noisy ones where feasible;
- Selecting the quietest of alternate items of equipment;
- Scheduling equipment operations to keep average levels low, to synchronize noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;
- Turning off idling equipment; and
- Locating noise equipment at locations that protect sensitive locations by shielding or distance.

## 3.8 Stormwater/Water Quality

The Projects are located on existing developed sites. The Projects are not expected to result in the introduction of any pollutants, including sediments, into surface waters or local groundwater. The Projects will include measures to infiltrate stormwater to the extent feasible and treat stormwater that is released into the storm drain system. See Section 3.20.3 for more information. See Section 3.20.3 for more information.

## 3.9 Solid and Hazardous Waste

### *3.9.1 Hazardous Waste*

Characterization of the environmental conditions of soil and groundwater at the Project Sites has not been conducted to date. Evaluation of the environmental conditions will be conducted and management of soil and groundwater will be in accordance with applicable local, state and federal laws and regulations.

### *3.9.2 Operational Solid and Hazardous Wastes*

The Projects will generate solid waste typical of other institutional hospital and office uses. Waste will be segregated at the point of origin into separate streams. Solid waste is expected to include wastepaper, styrofoam, cardboard, glass bottles and food. A portion of this waste will be recycled. The remainder of this waste will be compacted and removed by waste haulers contracted by MGH.

In addition, the proposed Clinical Building will also generate biomedical and infectious wastes typical of medical facilities. Management of hazardous waste is highly regulated for the safety of the public, the environment and the hospital community. MGH has an existing hazardous waste collection program, which will be used to handle and dispose of all wastes generated by existing and proposed MGH facilities in accordance with applicable laws and regulations.

## 3.10 Geotechnical and Groundwater Impacts

McPhail Associates completed subsurface exploration programs on the Project Sites. The general subsurface conditions include:

- Fill – Underlying the surficial treatments of concrete or asphalt down to 8 to 19 feet below ground surface;
- Organic Deposit - Underlying the fill layer, from 3.5 to 17.5 feet in thickness, down to 12 to 31 feet below ground surface;
- Glaciofluvial - From 1.5 to 42-foot thick;

- Marine Clay - Underlying the fill, organic and/or portions of the glaciofluvial deposits, varying from about 41 to 64 feet in thickness;
- Glacial Till – From 53 to 93 feet below the existing ground surface; and
- Bedrock - From 71 to 108 feet below ground surface.

Groundwater was observed from about 8 to 10 feet below ground surface. Based upon the soil and groundwater conditions at the site, the groundwater is considered to be "perched" or trapped within the fill deposit above the surface of the relatively impervious organic deposit. It is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, runoff particularly during or following periods of heavy precipitation, and alterations of existing drainage patterns.

## 3.11 Flood Zones and Wetlands

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the site located in the City of Boston - Community Panel Number 25025C0077J indicates the FEMA Flood Zone Designations for the Project Sites. The map shows that the Projects are located outside of the 500-year flood plain.

The Project Sites are developed and do not contain wetlands.

## 3.12 Construction Impacts

The proximity of City streets and the critical importance of the buildings and services in the surrounding area necessitate careful attention to construction activities, including deliveries, hours of construction, and construction-related impacts. Planning with the City and neighborhood will be essential to the successful development of the Projects.

A Construction Management Plan (CMP) will be submitted to the BTD for review and approval prior to issuance of a building permit. The CMP will define the need for lane closures, sidewalk adjustments, and access points. The CMP will also establish truck routes which will help in managing the effects of construction trucks on local streets.

Construction methodologies that ensure public safety and protect nearby businesses will be employed. Techniques such as barricades, walkways, painted lines, and signage will be used as necessary. Construction management and scheduling — including plans for construction worker commuting and parking, routing plans and scheduling for trucking and deliveries, protection of existing utilities, maintenance of fire access, and control of noise and dust — will all help reduce impacts on the surrounding environment.

Throughout construction of the Projects, a secure perimeter will be maintained to protect the public from construction activities.

During construction, a temporary above grade connection is anticipated to be required to connect the first portion of the Clinical Building to the Wang Ambulatory Care Center across Parkman Street. It is anticipated that this temporary above grade connection would be removed following completion of the Clinical Building. This circulation path would be replaced and accommodated within the new completed Clinical Building with the proposed connections over North Anderson Street at midblock either in the podium or in connections above.

## 3.13 Rodent Control

As part of the rodent control program, rodent inspection monitoring and treatment are required before during, and at the completion of all construction work for the Projects, in compliance with the City's requirements. Regular service visits during the construction process are also required.

## 3.14 Wildlife Habitat

The Project Sites are within a fully developed urban area and, as such, the Projects will not impact wildlife habitats.

## 3.15 Tidelands

A portion of the Clinical Building site is located on Landlocked Tidelands. The Campus Services Building site is located outside of Chapter 91 jurisdiction.

## 3.16 Sustainability

Sustainability is considered in every design decision. Enduring and efficient buildings conserve embodied energy and preserve natural resources. As required under Article 37 of the Code, projects that are subject to Article 80B, Large Project Review, shall be U.S. Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) certifiable. The Clinical Building will demonstrate compliance with Article 37 using the LEED for New Construction v4 for Healthcare Facilities rating system. The Campus Services Building will demonstrate compliance with Article 37 using the LEED for New Construction v4 rating system. The LEED rating system tracks the sustainable features of the Project by achieving points in the following categories: Integrative Process; Location and Transportation; Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; Innovation; and Regional Priority Credits.

The Clinical Building is currently targeting 66 points, and the Campus Services Building is currently targeting 62 points. The LEED checklists are included on the next two pages and indicate the credits the Projects anticipate achieving. Although the Project team will strive to achieve Gold level, the Proponent cannot commit to this level of certifiability at this time. This is a preliminary evaluation of the LEED checklists, and applicable credits may change as the building designs advance.

# LEED v4 for BD+C: Healthcare

Project Checklist

Project Name: Clinical Building
Date:

| Y | ? | N | | | |
|---|---|---|---|---|---|
| Y | | | Prereq | Integrative Project Planning and Design | Required |
| 1 | | | Credit | Integrative Process | 1 |

| 6 | 3 | 0 | Location and Transportation | | 9 |
|---|---|---|---|---|---|
| | | | Credit | LEED for Neighborhood Development Location | 9 |
| 1 | | | Credit | Sensitive Land Protection | 1 |
| | 2 | | Credit | High Priority Site | 2 |
| 1 | | | Credit | Surrounding Density and Diverse Uses | 1 |
| 2 | | | Credit | Access to Quality Transit | 2 |
| | 1 | | Credit | Bicycle Facilities | 1 |
| 1 | | | Credit | Reduced Parking Footprint | 1 |
| 1 | | | Credit | Green Vehicles | 1 |

| 6 | 3 | 0 | Sustainable Sites | | 9 |
|---|---|---|---|---|---|
| Y | | | Prereq | Construction Activity Pollution Prevention | Required |
| Y | | | Prereq | Environmental Site Assessment | Required |
| 1 | | | Credit | Site Assessment | 1 |
| 1 | | | Credit | Site Development - Protect or Restore Habitat | 1 |
| | 1 | | Credit | Open Space | 1 |
| 2 | | | Credit | Rainwater Management | 2 |
| 1 | | | Credit | Heat Island Reduction | 1 |
| 1 | | | Credit | Light Pollution Reduction | 1 |
| | 1 | | Credit | Places of Respite | 1 |
| | 1 | | Credit | Direct Exterior Access | 1 |

| 6 | 4 | 1 | Water Efficiency | | 11 |
|---|---|---|---|---|---|
| Y | | | Prereq | Outdoor Water Use Reduction | Required |
| Y | | | Prereq | Indoor Water Use Reduction | Required |
| Y | | | Prereq | Building-Level Water Metering | Required |
| 1 | | | Credit | Outdoor Water Use Reduction | 1 |
| 3 | 4 | | Credit | Indoor Water Use Reduction | 7 |
| 2 | | | Credit | Cooling Tower Water Use | 2 |
| | | 1 | Credit | Water Metering | 1 |

| 20 | 4 | 11 | Energy and Atmosphere | | 35 |
|---|---|---|---|---|---|
| Y | | | Prereq | Fundamental Commissioning and Verification | Required |
| Y | | | Prereq | Minimum Energy Performance | Required |
| Y | | | Prereq | Building-Level Energy Metering | Required |
| Y | | | Prereq | Fundamental Refrigerant Management | Required |
| 6 | | | Credit | Enhanced Commissioning | 6 |
| 10 | 2 | 8 | Credit | Optimize Energy Performance | 20 |
| 1 | | | Credit | Advanced Energy Metering | 1 |
| | 2 | | Credit | Demand Response | 2 |
| | | 3 | Credit | Renewable Energy Production | 3 |
| 1 | | | Credit | Enhanced Refrigerant Management | 1 |
| 2 | | | Credit | Green Power and Carbon Offsets | 2 |

| 9 | 6 | 4 | Materials and Resources | | 19 |
|---|---|---|---|---|---|
| Y | | | Prereq | Storage and Collection of Recyclables | Required |
| Y | | | Prereq | Construction and Demolition Waste Management Planning | Required |
| Y | | | Prereq | PBT Source Reduction- Mercury | Required |
| | 5 | | Credit | Building Life-Cycle Impact Reduction | 5 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Environmental Product Declarations | 2 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Sourcing of Raw Materials | 2 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Material Ingredients | 2 |
| 1 | | | Credit | PBT Source Reduction- Mercury | 1 |
| 2 | | | Credit | PBT Source Reduction- Lead, Cadmium, and Copper | 2 |
| 1 | | 1 | Credit | Furniture and Medical Furnishings | 2 |
| | 1 | | Credit | Design for Flexibility | 1 |
| 2 | | | Credit | Construction and Demolition Waste Management | 2 |

| 11 | 4 | 0 | Indoor Environmental Quality | | 16 |
|---|---|---|---|---|---|
| Y | | | Prereq | Minimum Indoor Air Quality Performance | Required |
| Y | | | Prereq | Environmental Tobacco Smoke Control | Required |
| 2 | | | Credit | Enhanced Indoor Air Quality Strategies | 2 |
| 3 | | | Credit | Low-Emitting Materials | 3 |
| 1 | | | Credit | Construction Indoor Air Quality Management Plan | 1 |
| | 2 | | Credit | Indoor Air Quality Assessment | 2 |
| 1 | | | Credit | Thermal Comfort | 1 |
| 1 | | | Credit | Interior Lighting | 1 |
| 1 | | | Credit | Daylight | 2 |
| 2 | | | Credit | Quality Views | 2 |
| | 2 | | Credit | Acoustic Performance | 2 |

| 5 | 1 | 0 | Innovation | | 6 |
|---|---|---|---|---|---|
| 4 | 1 | | Credit | Innovation | 5 |
| 1 | | | Credit | LEED Accredited Professional | 1 |

| 2 | 0 | 2 | Regional Priority | | 4 |
|---|---|---|---|---|---|
| 1 | | | Credit | SSc4- Rainwater Management | 1 |
| | | 1 | Credit | WEc1 - Indoor Water Use Reduction, 4 pt threshold | 1 |
| 1 | | | Credit | EAc2 - Optimized Energy Performance, 10 pt threshold | 1 |
| | | 1 | Credit | EAc5 - Renewable Energy Production, 2 pt threshold | 1 |

| 66 | 25 | 18 | TOTALS | Possible Points: | 110 |
|---|---|---|---|---|---|

**Certified:** 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

# LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name: Campus Services Building
Date:

| Y | ? | N | | | |
|---|---|---|---|---|---|
| 1 | | | Credit | Integrative Process | 1 |

| 13 | 2 | 1 | **Location and Transportation** | | 16 |
|---|---|---|---|---|---|
| | | | Credit | LEED for Neighborhood Development Location | 16 |
| 1 | | | Credit | Sensitive Land Protection | 1 |
| | 2 | | Credit | High Priority Site | 2 |
| 5 | | | Credit | Surrounding Density and Diverse Uses | 5 |
| 5 | | | Credit | Access to Quality Transit | 5 |
| 1 | | | Credit | Bicycle Facilities | 1 |
| 1 | | | Credit | Reduced Parking Footprint | 1 |
| | | 1 | Credit | Green Vehicles | 1 |

| 7 | 0 | 3 | **Sustainable Sites** | | 10 |
|---|---|---|---|---|---|
| Y | | | Prereq | Construction Activity Pollution Prevention | Required |
| 1 | | | Credit | Site Assessment | 1 |
| | | 2 | Credit | Site Development - Protect or Restore Habitat | 2 |
| | | 1 | Credit | Open Space | 1 |
| 3 | | | Credit | Rainwater Management | 3 |
| 2 | | | Credit | Heat Island Reduction | 2 |
| 1 | | | Credit | Light Pollution Reduction | 1 |

| 6 | 2 | 3 | **Water Efficiency** | | 11 |
|---|---|---|---|---|---|
| Y | | | Prereq | Outdoor Water Use Reduction | Required |
| Y | | | Prereq | Indoor Water Use Reduction | Required |
| Y | | | Prereq | Building-Level Water Metering | Required |
| | 2 | | Credit | Outdoor Water Use Reduction | 2 |
| 3 | | 3 | Credit | Indoor Water Use Reduction | 6 |
| 2 | | | Credit | Cooling Tower Water Use | 2 |
| 1 | | | Credit | Water Metering | 1 |

| 15 | 7 | 11 | **Energy and Atmosphere** | | 33 |
|---|---|---|---|---|---|
| Y | | | Prereq | Fundamental Commissioning and Verification | Required |
| Y | | | Prereq | Minimum Energy Performance | Required |
| Y | | | Prereq | Building-Level Energy Metering | Required |
| Y | | | Prereq | Fundamental Refrigerant Management | Required |
| 6 | | | Credit | Enhanced Commissioning | 6 |
| 5 | 5 | 8 | Credit | Optimize Energy Performance | 18 |
| 1 | | | Credit | Advanced Energy Metering | 1 |
| | 2 | | Credit | Demand Response | 2 |
| | | 3 | Credit | Renewable Energy Production | 3 |
| 1 | | | Credit | Enhanced Refrigerant Management | 1 |
| 2 | | | Credit | Green Power and Carbon Offsets | 2 |

| 5 | 5 | 3 | **Materials and Resources** | | 13 |
|---|---|---|---|---|---|
| Y | | | Prereq | Storage and Collection of Recyclables | Required |
| Y | | | Prereq | Construction and Demolition Waste Management Planning | Required |
| | 5 | | Credit | Building Life-Cycle Impact Reduction | 5 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Environmental Product Declarations | 2 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Sourcing of Raw Materials | 2 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Material Ingredients | 2 |
| 2 | | | Credit | Construction and Demolition Waste Management | 2 |

| 9 | 5 | 2 | **Indoor Environmental Quality** | | 16 |
|---|---|---|---|---|---|
| Y | | | Prereq | Minimum Indoor Air Quality Performance | Required |
| Y | | | Prereq | Environmental Tobacco Smoke Control | Required |
| 2 | | | Credit | Enhanced Indoor Air Quality Strategies | 2 |
| 3 | | | Credit | Low-Emitting Materials | 3 |
| 1 | | | Credit | Construction Indoor Air Quality Management Plan | 1 |
| | 2 | | Credit | Indoor Air Quality Assessment | 2 |
| 1 | | | Credit | Thermal Comfort | 1 |
| 2 | | | Credit | Interior Lighting | 2 |
| | 2 | 1 | Credit | Daylight | 3 |
| | | 1 | Credit | Quality Views | 1 |
| | 1 | | Credit | Acoustic Performance | 1 |

| 4 | 2 | 0 | **Innovation** | | 6 |
|---|---|---|---|---|---|
| 3 | 2 | | Credit | Innovation | 5 |
| 1 | | | Credit | LEED Accredited Professional | 1 |

| 2 | 1 | 1 | **Regional Priority** | | 4 |
|---|---|---|---|---|---|
| | | 1 | Credit | Regional Priority: { Renewable energy production 2 pt threshold | 1 |
| 1 | | | Credit | Regional Priority: { Optimize energy performance 8 pt threshold | 1 |
| | 1 | | Credit | Regional Priority: { high priority site 2 pt threshold | 1 |
| 1 | | | Credit | Regional Priority: { Rainwater mgmt 2 pt threshold | 1 |
| | | | | Regional Priority: { Indoor water use reduction 4 pt threshold | |

| 62 | 24 | 24 | **TOTALS** | Possible Points: | 110 |
|---|---|---|---|---|---|

**Certified:** 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

### *3.16.1 Clinical Building*

#### *Integrative Process*

IP Integrative Project Planning and Design (Prerequisite): An integrative design process will be utilized beginning in the programming and pre-design phase. An Owner's Project Requirements (OPR) document that includes a health mission statement will be prepared, and the team will conduct a preliminary LEED meeting with key project team members.

IP Integrative Process: In addition to the integrative design process described above, a preliminary "Box" Energy Model and Water-use Systems Analysis will be prepared during the schematic design phase.

#### *Location and Transportation*

LT Sensitive Land Protection: The Clinical Building site is a previously developed site in an urban area.

LT Surrounding Density and Diverse Uses: The Clinical Building is located in Downtown Boston and has significant access to community resources. The building easily meets the credit requirement of eight uses within a ½-mile walking distance of the main entrance.

LT Access to Quality Transit: The Clinical Building site is located within a short walk (0.1 miles) of Charles/MGH Station on the Red Line and is an approximately 0.3 mile walk from the Bowdoin Station on the Blue Line.

LT Reduced Parking Footprint: The Clinical Building site includes parking in a below-grade parking garage that will provide less parking than the base parking ratio.

LT Green Vehicles: The Clinical Building parking garage will designate 5% of all parking spaces as preferred parking for green vehicles, and an additional 2% of parking spaces will have electric vehicle charging stations that will be reserved for sole use by plug-in electric vehicles. The City requires 5% of new spaces to have electric vehicle charging stations, with the ability to expand the number of new spaces with electric vehicle charging to 15%.

#### *Sustainable Sites*

SS Construction Activity Pollution Prevention (Prerequisite): The construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA Construction General Permit of the National Pollutant Discharge Elimination System (NPDES). A Stormwater Pollution Prevention Plan (SWPPP) will also be developed in accordance with the requirements for the US EPA's NPDES Construction General Permit. These documents will be used to document compliance with this prerequisite.

SS Environmental Site Assessment (Prerequisite): A Phase I Environmental Site Assessment will be conducted, and if contamination is suspected, a Phase II Environmental Site Assessment will also be conducted. Any contamination will be remediated to meet the local, state, or federal standards.

SS Site Assessment: The team will complete and document an assessment of the following information:

1. Topography – contours and sloping,
2. Hydrology – flood hazards and existing water bodies,
3. Climate – solar exposure and sun angles,
4. Vegetation – vegetation types and greenfield spaces,
5. Soils – soils delineation, prime farmland, and disturbed soils,
6. Human Use – enhanced views, availability of transportation, and future building potential, and
7. Human Health Effects – population assessment, physical fitness, and existing air pollution sources.

SS Open Space: The Clinical Building will provide approximately 30% of the property area in accessible outdoor space, including rooftop garden areas. At least 25% of this will be vegetated.

Figure 3-17 shows the proposed open spaces.

SS Rainwater Management: The Clinical Building will provide a stormwater management system that will detain up to 1.25 inch of rainfall, which is equivalent to a 90$^{th}$ percentile rainfall event.

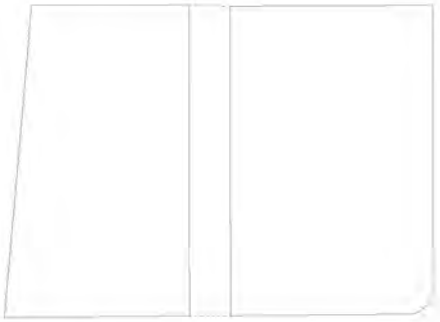
SS Heat Island Reduction: The design will utilize high albedo materials for all hardscapes, including both nonroof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values. In addition, all parking spaces will be under cover. The design is also proposed to include green roofs as well as landscaping at the street level.

SS Light Pollution Reduction: The team will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up-lighting will be utilized, and fixtures will be dimmed at night to keep the Clinical Building safe while minimizing light pollution.

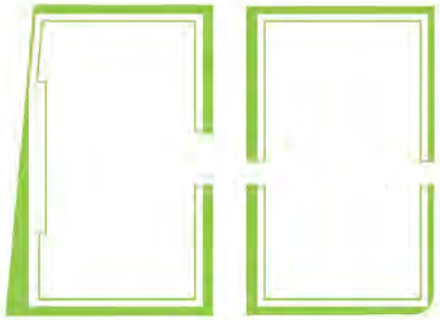
### *Water Efficiency*

WE Outdoor Water Use Reduction (Prerequisite): The design will include ecologically appropriate species that minimize irrigation requirements.

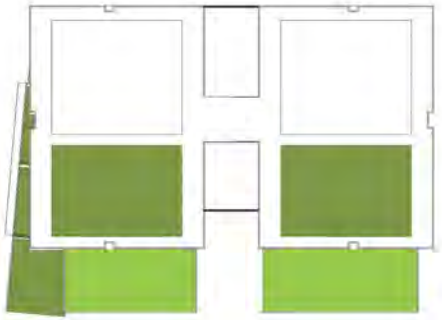
35% of Clinical Building Site is Accessible Green Space
25% of Clinical Building Site is Inaccessible Green Space



Property Area*
112,382.5 Square Feet



Ground Floor Open Space
22,150 Square Feet
21% of Clinical Building Site



Roof and Terrace "Green" Open Space
45,028 Square Feet
40% of Clinical Building Site
38% accessible
62% inaccessible

*excluding North Anderson Street

WE Indoor Water Use Reduction (Prerequisite): The design will reduce demand for potable water through high efficiency fixtures – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures.

WE Building-Level Water Metering (Prerequisite): A water meter will be installed for the building.

WE Outdoor Water Use Reduction: The design will not include a permanent irrigation system or will use efficient drip irrigation coupled with a weather station to ensure at least 50% water reduction.

WE Indoor Water Use Reduction: The design will reduce demand for potable water through high efficiency fixtures – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures.

WE Cooling Tower Water Use: The design will not include cooling towers in the Clinical Building, but will be served by the Campus Services Building.

*Energy and Atmosphere*

EA Fundamental Commissioning and Verification (Prerequisite): The team will include an experienced Commissioning (Cx) Agent - this person will be hired before the end of the design development phase and will provide review services for the Project Basis of Design (BOD) and OPR, as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters. The OPR and BOD will include scope for building envelope commissioning.

EA Minimum Energy Performance (Prerequisite): The design will meet this prerequisite, as well as the current Massachusetts Stretch Energy Code resulting in an ASHRAE 90.1 Appendix G model demonstrating a minimum Energy Use Reduction of at least 20% by cost, below ASHRAE 90.1-2010 (LEED) and at least 10% by energy use, below ASHRAE 90.1-2013 (Stretch Code).

EA Prerequisite – Building Level Energy Metering: The design will include a building-level energy meter for all energy consumption including electricity and natural gas.

EA Prerequisite – Fundamental Refrigerant Management: The HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.

EA Enhanced Commissioning: The team will include an experienced Cx Agent. This person will be hired before the end of the design development phase and will provide review

services for the Project BOD and OPR as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters. The commissioning scope will include envelope thermal performance.

EA Optimize Energy Performance: The design team anticipates an energy reduction of at least 20% by cost, below ASHRAE 90.1-2010 (LEED) and at least 10% by energy use, below ASHRAE 90.1-2013 (Stretch Code).

EA Advanced Energy Metering: The design will include advanced energy metering for all whole-building energy sources used by the building, as well as any individual energy end uses that represent 10% or more of the total annual consumption of the building.

EA Enhanced Refrigerant Management: The design team will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.

EA Green Power: The design team will engage in a contract for a minimum of five years for Green Power and Carbon Offset purchasing to counteract at least 100% of the Clinical Building's energy.

*Materials and Resources*

MR Storage and Collection of Recyclables (Prerequisite): The Clinical Building will provide a designated storage point for recyclable materials.

MR Construction and Demolition Waste Management Planning (Prerequisite): The development team will implement a construction waste management plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.

MR PBT Source Reduction – Mercury (Prerequisite): As part of the recycling collection system, the types of mercury-containing products and devices to be collected will be identified, along with criteria for how they will be handled by a recycling program, and disposal methods for captured mercury.

MR Building Product Disclosure and Optimization – Environmental Product Declarations: The design team will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include confirmed environmental product declaration documents.

MR Building Product Disclosure and Optimization – Sourcing of Raw Materials: The design will select and install materials of at least 25% by cost that demonstrate leadership

extraction practices, such as FSC wood products, recycled content, bio-based materials, extended producer responsibility or other USGBC-approved program.

MR Building Product Disclosure and Optimization – Material Ingredients: The design team will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification.

MR PBT Source Reduction – Mercury: The design team will specify and install fluorescent lamps with both low mercury content and long lamp life in accordance with the criteria for this credit.

PBT Source Reduction – Lead, Cadmium, and Copper: The design team will specify substitutes for materials manufactured with lead and cadmium in accordance with the criteria for this credit. Interior or exterior paints will not contain intentionally added cadmium, and copper pipe applications will reduce or eliminate joint-related sources of copper corrosion.

MR Furniture and Medical Furnishings: At least 30% by cost of all freestanding furniture and medical furnishings will meet the criteria outlined in Option 3.

MR Construction and Demolition Waste Management: The development team is committed to reducing construction waste through at least 75% diversion of four material streams.

### *Indoor Environmental Quality*

IEQ Minimum Indoor Air Quality Performance (Prerequisite): The design team will ensure that all ventilation systems and monitoring programs meet the minimum requirements of this prerequisite.

IEQ Environmental Tobacco Smoke Control (Prerequisite): Smoking will be prohibited inside the building and within 25 feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be displayed via on-site signage.

IEQ Enhanced Indoor Air Quality Strategies: The design will include the following:

- A permanent entryway system at least 10-feet long in the primary direction of travel, and will provide pressurized entryway vestibules at high-volume building entrances;
- Direct exhaust of all areas where hazardous gases or chemicals may be present to prevent cross-contamination; and
- MERV 13 filtration on all ventilation systems.

IEQ Low Emitting Materials: The design team will specify paints, coatings, flooring, adhesives, and sealants that comply with the criteria in this credit.

IEQ Construction Indoor Air Quality Management Plan: The design team will develop and implement an indoor air quality (IAQ) management plan for both the construction and pre-occupancy phases of the building.

IEQ Thermal Comfort: HVAC systems will be designed to meet the requirements of ASHRAE Standard 55-2010. The design will provide individual thermal controls for every patient room, and at least 50% of the remaining individual occupant spaces. Group thermal comfort controls will be provided for all shared multi-occupant spaces.

IEQ Interior Lighting: Individual lighting controls will be provided for at least 90% of individual occupant spaces in staff areas. At least 90% of patient positions will include lighting controls that are readily accessible from the patient's bed. For all shared multi-occupant spaces, multizone control systems will enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes.

IEQ Daylight: The design team will complete a computer simulation demonstrating that at least 75% daylight autonomy for perimeter floor area is achieved throughout the building. Additionally, the simulation will confirm an annual sunlight exposure of no more than 10%.

EQ Quality Views: The design will maximize the views available to inpatient units; at least 75% of the applicable floor area in these spaces will achieve a direct line of sight to the outdoors. Other areas will be configured to meet the criteria outlined in this credit.

### *Innovation in Design*

The design team will seek to achieve at least four Innovation points; potential credits include: Exemplary Performance for Access to Quality Transit and Heat Island Reduction. Additional potential innovation and pilot credits will be considered as the design progresses.

ID LEED Accredited Professional: At least one participant of the Project team is a LEED Accredited Professional.

### *Regional Priority*

Regional Priority Credits (RPCs) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a Project team achieves one of the designated RPCs, an additional credit is awarded to the Project. RPCs applicable to the site include: SS Rainwater Management.

### *3.16.2 Campus Services Building*

#### *Integrative Process*

IP Integrative Process: An integrative process will be utilized beginning in the programming and pre-design phase. An OPR document that includes a health mission statement will be prepared and a preliminary LEED meeting with key project team members will be completed. A preliminary "Box" Energy Model and Water-use Systems Analysis will be prepared during the schematic design phase.

#### *Location and Transportation*

LT Sensitive Land Protection: The Campus Services Building site is a previously developed site in an urban area.

LT Surrounding Density and Diverse Uses: The Campus Services Building is located in Downtown Boston and has significant access to community resources. The building easily meets the credit requirement of eight uses within a ½-mile walking distance of the main entrance.

LT Access to Quality Transit: The Campus Services Building site is located within a short walk (0.2 miles) of Charles/MGH Station and is an approximately 0.3 mile walk from Bowdoin Station.

LT Bicycle Facilities: Both short-term and long-term (staff) bicycle parking will be provided, along with locker and shower facilities for staff housed in the building.

LT Reduced Parking Footprint: The Campus Services Building does not include parking.

#### *Sustainable Sites*

SS Construction Activity Pollution Prevention (Prerequisite): The construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA NPDES Construction General Permit. A SWPPP will also be developed in accordance with the requirements for the EPA's NPDES Construction General Permit. These documents will be used to document compliance with this prerequisite.

SS Assessment: A comprehensive site survey/assessment will be conducted to inform team decisions in early design, including topography, hydrology, climate, vegetation, solids, human use and human health effects.

SS Rainwater Management: The Campus Services Building will provide a stormwater management system that will hold up to 1.25 inch of rainfall, which is more than the 90$^{th}$ percentile rainfall event.

SS Heat Island Reduction: The design will utilize high albedo materials for all hardscapes, including both nonroof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values.

SS Light Pollution Reduction: The team will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up-lighting will be utilized, and fixtures will be dimmed at night to keep the Campus Services Building safe while minimizing light pollution.

### *Water Efficiency*

WE Outdoor Water Use Reduction (Prerequisite): The design will not include a permanent irrigation system.

WE Indoor Water Use Reduction (Prerequisite): The design will reduce demand for potable water through high efficiency fixtures – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures.

WE Building-Level Water Metering (Prerequisite): A water meter will be installed for the building.

WE Indoor Water Use Reduction: The design will reduce demand for potable water through high efficiency fixtures – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures.

WE Cooling Tower Water Use: The design will maximize the number of water cycles through filtration and strict concentration control of calcium, alkalinity, silica, chlorine, and the overall conductivity.

### *Energy and Atmosphere*

EA Fundamental Commissioning and Verification (Prerequisite): The team will include an experienced Cx Agent - this person will be hired before the end of the design development phase and will provide review services for the Project BOD and OPR, as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters.

EA Minimum Energy Performance (Prerequisite): The design will meet this prerequisite, as well as the current Massachusetts Stretch Energy Code resulting in an ASHRAE 90.1 Appendix G model demonstrating a minimum Energy Use Reduction of at least 15% by cost, below ASHRAE 90.1-2010 (LEED) and at least 10% by energy use, below ASHRAE 90.1-2013 (Stretch Code).

EA Prerequisite – Building Level Energy Metering: The design will include a building-level energy meter for all energy consumption including electricity and natural gas.

EA Prerequisite – Fundamental Refrigerant Management: The HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.

EA Enhanced Commissioning: The team will include an experienced Cx Agent. This person will be hired before the end of the design development phase and will provide review services for the Project BOD and OPR as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters. Scope of commissioning will include building envelope.

EA Optimize Energy Performance: The design team anticipates an energy reduction of at least 15% by cost, below ASHRAE 90.1-2010 (LEED) and at least 10% by energy use, below ASHRAE 90.1-2013 (Stretch Code).

EA Advanced Energy Metering: The design will include advanced energy metering for all whole-building energy sources used by the building, as well as any individual energy end uses that represent 10% or more of the total annual consumption of the building.

EA Enhanced Refrigerant Management: The design team will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.

EA Green Power: The design team will engage in a contract for a minimum of five years for Green Power and Carbon Offset purchasing to counteract 100% of the Campus Services Building's energy.

### *Materials and Resources*

MR Storage and Collection of Recyclables (Prerequisite): The Campus Services Building will provide a designated storage point for recyclable materials.

MR Construction and Demolition Waste Management Planning (Prerequisite): The development team will implement a construction waste management plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.

MR PBT Source Reduction – Mercury (Prerequisite): As part of the recycling collection system, the types of mercury-containing products and devices to be collected will be identified, along with criteria for how they will be handled by a recycling program, and disposal methods for captured mercury.

MR Building Product Disclosure and Optimization – Environmental Product Declarations: The design team will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include confirmed environmental product declaration documents.

MR Building Product Disclosure and Optimization – Sourcing of Raw Materials: The design will select and install materials of at least 25% by cost that demonstrate leadership extraction practices, such as FSC wood products, recycled content, bio-based materials, extended producer responsibility or other USGBC-approved program.

MR Building Product Disclosure and Optimization – Material Ingredients: The design team will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification.

MR Construction and Demolition Waste Management: The development team is committed to reducing construction waste through at least 75% diversion of four material streams.

### *Indoor Environmental Quality*

IEQ Minimum Indoor Air Quality Performance (Prerequisite): The design team will ensure that all ventilation systems and monitoring programs meet the minimum requirements of this prerequisite.

IEQ Environmental Tobacco Smoke Control (Prerequisite): Smoking will be prohibited inside the building and within 25-feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be displayed via on-site signage.

IEQ Enhanced Indoor Air Quality Strategies: The design will include the following:

- A permanent entryway system at least 10-feet long in the primary direction of travel, and will provide pressurized entryway vestibules at high-volume building entrances;
- Direct exhaust of all areas where hazardous gases or chemicals may be present to prevent cross-contamination; and
- MERV 13 filtration on all ventilation systems.

IEQ Low Emitting Materials: The design team will specify paints, coatings, flooring, adhesives, and sealants that comply with the criteria in this credit.

IEQ Construction Indoor Air Quality Management Plan: The design team will develop and implement an IAQ management plan for both the construction and pre-occupancy phases of the building.

IEQ Thermal Comfort: HVAC systems will be designed to meet the requirements of ASHRAE Standard 55-2010. The design will provide individual thermal controls for every patient room, and at least 50% of the remaining individual occupant spaces. Group thermal comfort controls will be provided for all shared multi-occupant spaces.

IEQ Interior Lighting: Individual lighting controls will be provided for at least 90% of individual occupant spaces in staff areas. For all shared multi-occupant spaces, multizone control systems will enable occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes.

### *Innovation in Design*

The design team will seek to achieve at least three Innovation points; potential credits include: Exemplary Performance for Access to Quality Transit and Heat Island Reduction. Additional potential innovation and pilot credits will be considered as the design progresses.

ID LEED Accredited Professional: At least one participant of the Project team is a LEED Accredited Professional.

### *Regional Priority*

Regional Priority Credits (RPCs) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a Project team achieves one of the designated RPCs, an additional credit is awarded to the Project. RPCs applicable to the site include: SS Rainwater Management, EA Optimize Energy Performance.

## 3.17 Climate Change Preparedness

### *3.17.1 2019 IMP Projects*

MGH recognizes that it must be able to ensure the safety of its patients, visitors and staff in a disaster, as well as to be able to provide uninterrupted healthcare services to the City as a critical facility within the community. Both Hurricanes Katrina in New Orleans and Sandy in New York have clearly demonstrated the consequences of hospital failures for those communities, and the importance of creating hospitals that can withstand damaging winds, major flooding, seismic activity and other disasters – natural or human-induced.

The Projects will be designed to be resilient. The Clinical Building will serve as a resource and place of refuge for patients, families, staff and the MGH community in times of disasters. Additionally, the Clinical Building will adhere to recent guidelines established through the Health and Human Services Sustainable and Climate Resilient Healthcare Facility Initiatives, which recommend procedures for how health care organizations should design and upgrade facilities to withstand disasters and protect and preserve utilities, water, sewage disposal, communications and vital information infrastructure. The building will not

just adhere to but will exceed the current emergency preparedness requirements set forth by The Joint Commission and the Centers for Medicare and Medicaid Services. The Campus Services Building is proposed to allow for simplified management and better control of the Main Campus' utility needs, and may include a cogeneration plant, which is being studied for feasibility.

Because much of the Main Campus sits on land in the West End that was once water and marsh, this section of the city is vulnerable to flooding and storm surge as sea levels continue to rise. As seen in recent years in the wake of Hurricane Katrina and Hurricane Sandy, the impact of flooding and winds can be devastating for hospitals, and life-threatening for patients, families and staff. The approximate flood elevation at the site is 21.0' to 22.0' (Boston City Base). Based upon up-to-date climate change projections provided to MGH by climate experts at Woods Hole Oceanographic Institution and also external engineering experts who have evaluated flooding risks of the Main Campus in the setting of climate change, the Clinical Building and Campus Services Building will be designed to withstand up to six feet of flooding; this will allow the Clinical Building to serve as a place of refuge for the campus and the MGH community. The resiliency of the buildings will be designed to allow continuous operability of all critical services during a catastrophic event such as a severe nor'easter, hurricane or flood. In addition, the exterior skin and the windows of the buildings will be designed to withstand hurricane force winds. All building services that are located below the potential flood level will either be flood-proofed or be designed to have the ability to recover quickly following a flood event, allowing the building to continue uninterrupted operations.

The Clinical Building will be designed to play a primary role in supporting the resilience of the entire Main Campus in the event of a disaster. It will do this not just by physically protecting patients and staff who are located within the building, but also by supporting other functions across the Main Campus and sustaining patient care. The building's utilities and other support services have been envisioned to support not just the building itself during a disaster, but also to be able to take on additional loads and services to help support other areas of the Main Campus. The basement levels of the building may serve as safe areas to store surgical, medical and other supplies for the whole Main Campus pre-event, giving the hospital a safety margin if supply lines to the hospital are interrupted by the disaster. Because the building will connect to the existing inpatient campus by both tunnel and above grade connections, patients in older, less-hardened buildings are expected to be able to be safely and quickly relocated from other campus locations to the new building in anticipation of, or in response to, a disaster or emergency event. This will allow for accommodation of a surge of inpatients in a disaster and/or movement of inpatients out of more vulnerable areas in the hospital in extreme circumstances and prevent the need for evacuation of the hospital.

Patients from vulnerable buildings can be relocated and refuge provided for staff. It is anticipated that people will be able to shelter in place for 96 hours. The new facility will be

designed to allow continuous operability of all critical services during an event (and a phased emergency response plan for recovery of other services after an event).

With more resilient buildings, utility services, and care spaces, the proposed building will assist MGH in its mission to remain independent of the need for external disaster response assets and remain open and able to serve the community, even in the worst disasters. The addition of the Projects is the next critical step in MGH's efforts to enhance campus resiliency and further advance its emergency preparedness program.

The Climate Change Questionnaires for the Projects are included in Appendix A.

### *3.17.2 MGH's Boston Properties*

Partners HealthCare is currently in the process of evaluating climate and natural disaster risks across its campuses in Massachusetts, including the MGH campuses. This evaluation is considering the impacts of sea level rise, storm surge, precipitation, temperature, wind and seismic events, and will be followed by a capital plan to implement the recommendations. MGH also works extensively on its own on emergency preparedness and resiliency efforts, as described below.

MGH has a long history of leading emergency preparedness efforts that support both the hospital and the community in the City of Boston, and beyond. As an institution, MGH works to continually improve and enhance the hospital's readiness for disasters and emergency situations of all types through risk assessment and mitigation, training and exercise efforts, effective response and recovery activities, critical review of internal and external events, and the ongoing development of innovative research and response programs. MGH has a division within the MGH Department of Emergency Medicine called the Center for Disaster Medicine (MGH CDM) that oversees all preparedness and emergency management efforts at MGH.

The MGH CDM's emergency management efforts are designed to ensure the hospital's ability to care for patients who may be impacted by disaster events through robust programs that protect existing patients and visitors, staff and facilities.

A significant portion of the hospital's emergency planning is focused on efforts that build resiliency throughout the entire hospital that will ensure continuation of critical services during emergency events. MGH firmly believes that it is MGH's responsibility to its patients, staff, and community to be able to function independently and effectively during times of disaster so that MGH may continue to meet patient care obligations and serve as a valued resource to the community.

#### *Specific Areas of Risk and the Threat Environment*

The MGH campuses face a number of risks and threats that are both natural and man-made. MGH's Emergency Preparedness program examines each of these risks in a detailed Hazard

Vulnerability Analysis (HVA) each year as described below. Based upon the most recent HVA, most significant current threats include the impacts of mass casualty events, hazardous materials incidents, severe weather situations (including climate change), information system downtime events and cyber-attacks. MGH continues to study, mitigate against, and plan to respond to each of these threats every year, and endeavor to make its systems, and hospital, as resilient as possible.

### *Efforts to Enhance Resiliency*

Risk Assessment

As mentioned above, in order to ensure that the hospital is fully aware of the threats and risks it may face, and to inform its planning and resource allocation efforts, MGH performs an HVA each year. The HVA looks at 1) the probability of occurrence of each potential threat that can be identified, 2) the expected magnitude or impact of each threat, and 3) existing preparedness for each threat in order to compile its HVA. Each year, the MGH CDM reviews data from as many recent disaster events and after-action reports from incidents around the country and around the world that they can access so that they can find good information to inform the HVA process. When necessary, the hospital also engages other experts to inform the risk assessments. For example, MGH and Partners HealthCare recently engaged scientists from the Woods Hole Oceanographic Institution and engineers and other experts from Arup to examine the predicted impact of climate change on sea level rise, precipitation, heat stress, wind stress, and other changes. The data from these assessments has been used to inform both immediate-term emergency management program efforts as well as medium and long-term facilities renovation and capital planning efforts. All data generated in the HVA process are reviewed by a multidisciplinary group of experts from many different departments within the institution and are scored using a nationally-recognized system to rank the identified threats. The final HVA rank list of threats is reviewed by hospital leadership annually.

Planning

MGH has a comprehensive Emergency Operations Plan (EOP) that is also updated annually and details the structures and mechanisms implemented to execute an effective response to any event that may impact MGH's campuses. The plan uses an all-hazards approach to direct resources and operational activities appropriately for all varieties of incidents. Every department within the institution also has a specific, department level EOP that is consistent with the hospital EOP and directs how department activities should be adjusted and managed during disasters. For specific, unique threats that may impact the hospital, such as hazardous materials, biologic, mass casualty and other events, specialty annexes of the EOP to create detailed sub-plans have been developed.

Training and Exercising

Training on the basic principles of disaster response is critical to build resiliency throughout the organization. Every new employee at MGH receives training on emergency preparedness at new employee orientation. All staff also receive training and resources on how to ensure personal preparedness at home and how to create a plan for themselves and their family. This general orientation is followed by more tailored training on specific disaster response roles and responsibilities as employees join their specific department. Many staff are also invited to participate in various disaster trainings and exercises, and most employees are also eligible to join the internal response teams if they desire. Employees in the departments of the hospital that are most affected by disaster (emergency department, security, intensive care units, operating rooms, etc.) receive additional trainings and participate in an increased frequency of exercises.

Creation of Internal Response Teams

In addition to its hospital-wide efforts to train and exercise, the hospital has also developed specialized internal disaster and emergency response teams. MGH maintains a 70-person team that can effectively manage mass decontamination of arriving victims after a hazardous materials event. A segment of this team is also trained to assist with the safe evacuation of patients should the need arise to evacuate the Main Campus. MGH additionally maintains a team of trained staff who can safely care for patients with Ebola or another high consequence infectious disease and is designated as one of 10 Regional Special Pathogen Treatment Centers in the United States. A group of MGH clinicians and support staff are members of the Biothreats Response Team and have all been specially trained to care for this unique patient population. These highly trained volunteer teams allow MGH to provide specialty services not available at many other local hospitals, and to limit dependence on community resources and public safety agencies during emergency events. MGH also maintains a detailed protocol that governs its use of emergency department staff, surgeons, anesthesiologists and others in a mass-casualty incident to ensure that the hospital mobilizes maximal life-saving resources should such an incident occur.

Personal Preparedness

Like all hospitals, MGH relies on its staff to maintain the ability to report to the hospital to support operations during an emergency event. All staff are considered essential, and during times of crisis may be trained to function in roles different than those they serve in daily. As an institution, MGH is responsible for helping staff feel safe and secure discharging these duties during emergencies, both for their own well-being and to support their ability to assist the hospital. As mentioned above, all MGH staff receive information on personal and family preparedness upon hire, including instructions on creating a family emergency plan and building personal preparedness kits, and receive annual updates and reminders about the importance of personal preparedness.

Hardening of Electrical Supply System

Based on lessons learned from multiple destructive hurricanes in the United States in the past 13+ years, MGH has invested more than $20 million to relocate critical components of the electrical supply and distribution system out of basement and lower level locations to protected locations above ground on the Main Campus. This work has included comprehensive review of all components of the electrical system and identification of innovative solutions to provide a secure and resilient system more capable of supplying electricity without disruption during severe weather events.

Hardening of Oxygen Supply System

In recent years, the hospital's oxygen supply system was identified as a potential hazard of concern given the single location of supply tanks providing oxygen to the Main Campus. A multidisciplinary team of facilities and engineering, operations, clinical, and emergency management personnel conducted a comprehensive Failure Mode and Effects Analysis (FMEA) to identify potential failure points in oxygen supply and delivery system, and the hospital installed a new oxygen supply piping loop to provide redundancy to connected buildings, as well as six back up oxygen manifold systems to automatically provide oxygen to Intensive Care Units and the Emergency Department in the event of a system failure. In addition, eleven automatic isolation control valves were added at critical points to isolate areas and automatically shut down oxygen supply if necessary. A second external connection to accommodate an oxygen supply truck is being added to a location on the opposite side of the Main Campus from the existing location.

Hardening of Glass Surfaces

In order to limit the amount of possible damage that may result from a blast event near to the Main Campus, a number of front-facing glass windows and doors have been fitted with special coatings to limit potential damage and injuries from shrapnel.

## 3.18 Urban Design

### *3.18.1 Land Use*

The existing land uses surrounding the Main Campus are primarily residential, with Beacon Hill and the West End to the south, north, and west (see Figure 3-18). Cambridge Street is predominantly mixed use – retail at the ground floor with offices on the upper floors. Governmental and institutional uses are further to the east including historic buildings such as the Otis House Museum and Old West Church, as well as services such as the Departments of Mental Health, Department of Unemployment and the Boston Municipal Courthouse and Government Center. The significant open space and recreational uses of the Charles River Basin lie to the west.

### *3.18.2 Scale and Massing*

The scale and massing of the Clinical Building is proposed to complement the wider context. MGH's built form steps up from Cambridge Street to a high point in the center of the Main Campus, and then down toward both Blossom Street frontages. The institutional scale and massing of MGH's buildings more closely relate to the residential buildings of Charles River Park and the West End to the north and east, rather than the more fine-grained character of Beacon Hill to the south. Heights of existing buildings in the area are shown on Figure 3-19.

The bulk of the Clinical Building, set back from Cambridge Street, is slightly taller than the Lunder Building, similar to the White and Yawkey buildings, and lower than the Mass Eye and Ear buildings visible beyond on Charles Street (see Figure 3-20). Podiums along Cambridge Street flank the access route between the two wings of the Parkman Building. These podiums, accommodating uses that contribute to the public realm, respect the height of the MGH Museum and the central building of the Charles River Plaza. The podiums are set back from the street edges with the intention of adding a landscaped buffer between the sidewalk and building to improve the quality of the pedestrian experience. Upper floors of the podiums will cantilever over this landscaped area along the lower podium facade.

### *3.18.3 Circulation*

Existing pedestrian circulation activity in the area is largely driven by the pathways used by residents, employees, and visitors using public transportation to access the area (see Figure 3-21). Four MBTA stations, Charles/MGH Station on the Red Line, Science Park, Government Center and North Station on the Green Line, and Government Center/Bowdoin on the Blue Line, plus commuter rail at North Station, provide a well-balanced transit service network to the area.

Major pedestrian pathways that serve the Main Campus occur along Cambridge Street, through the West End and from Charles Street. In addition, many West End residents traverse the Main Campus to Cambridge Street, Charles Street and the Charles/MGH Station. Improving the connectivity, quality of routes and clarity of the Main Campus' internal circulation corridors to better support both entry to, and passage through, MGH by visitors, patients, and local residents is important to the hospital and community.

See Section 3.1.2 for a more detailed description of circulation.


**Massachusetts General Hospital Boston, Massachusetts**

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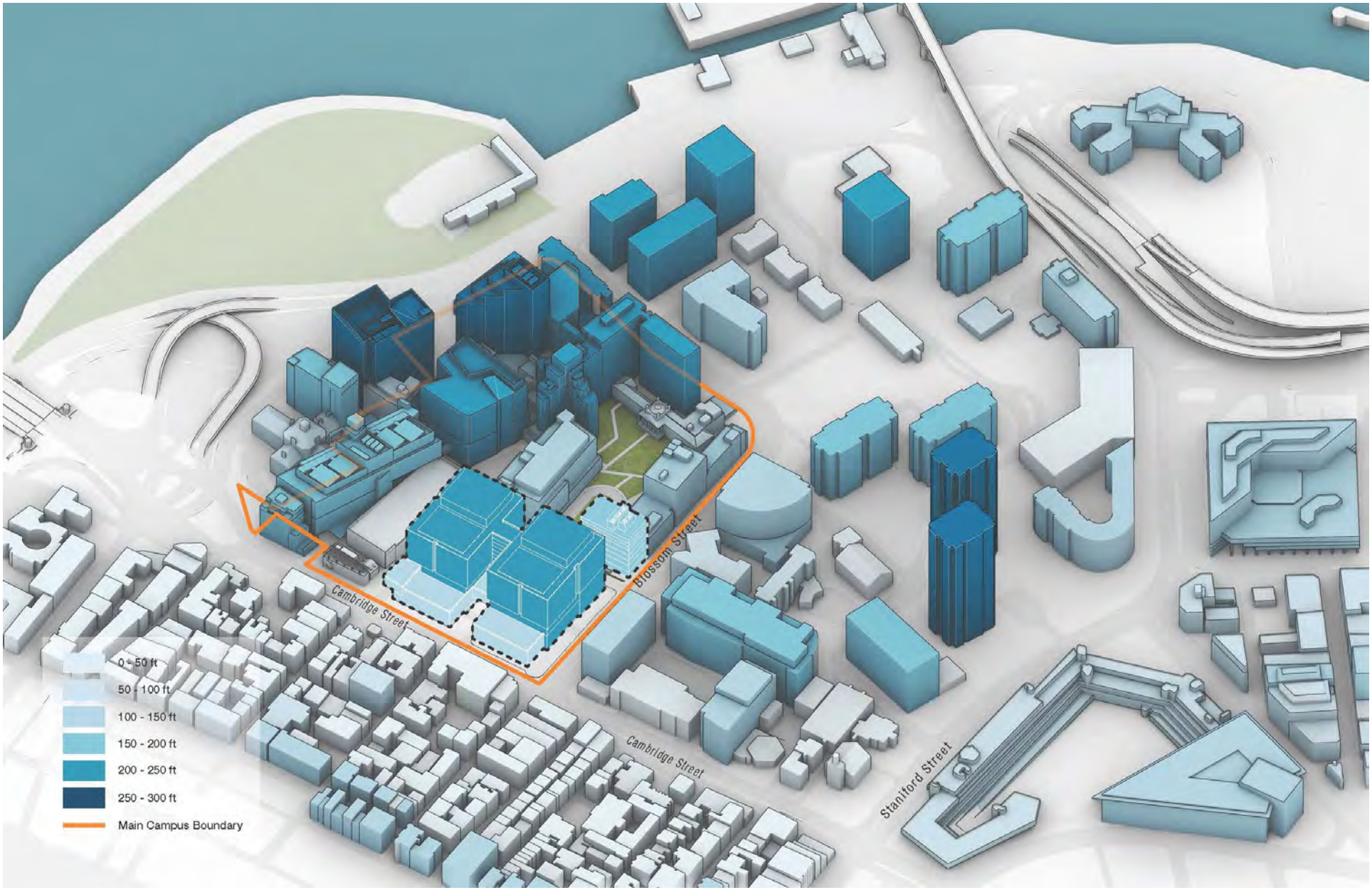
**Figure 3-18**
*Land Use*




**Massachusetts General Hospital Boston, Massachusetts**

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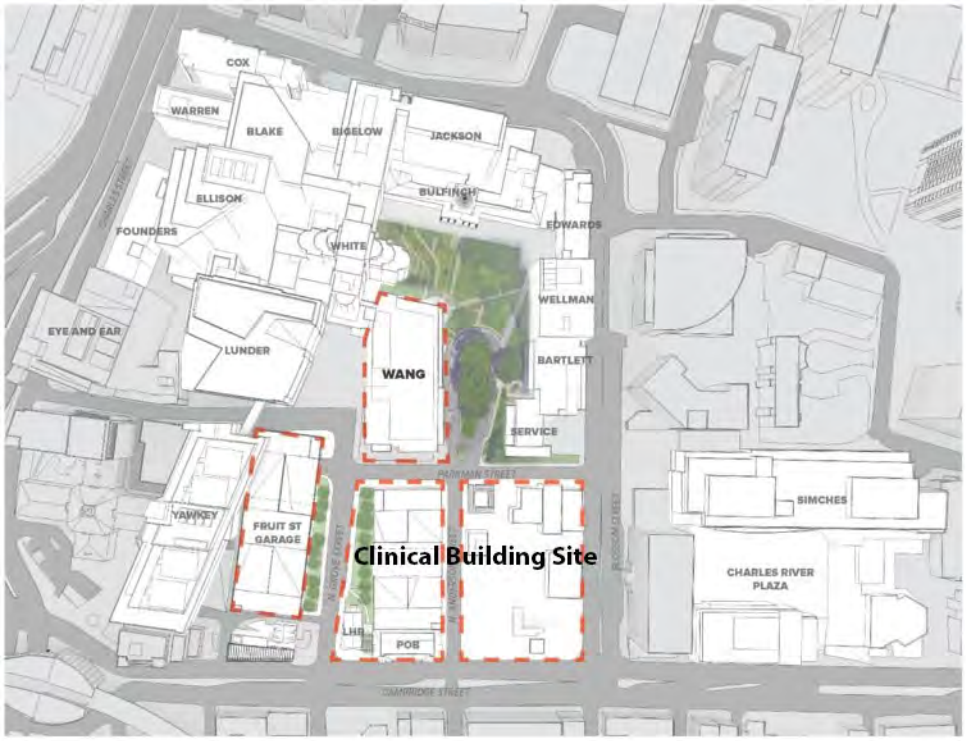
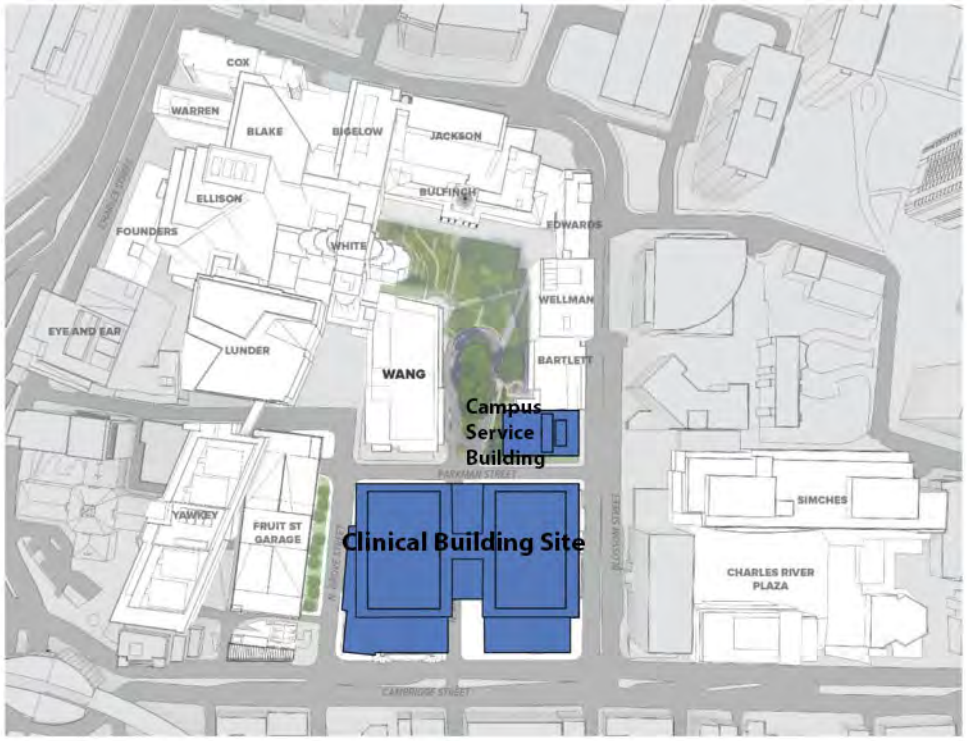
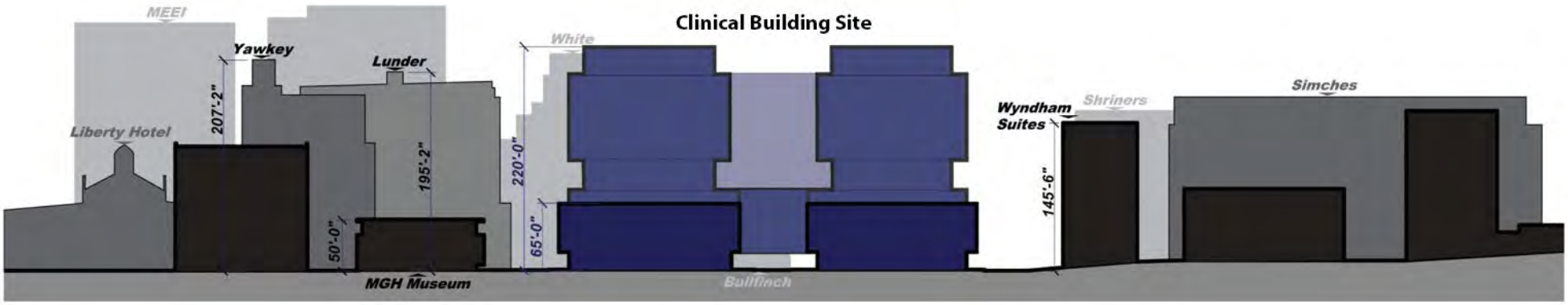
**Figure 3-19**
*Existing and Proposed Projects' Building Heights*




**Massachusetts General Hospital Boston, Massachusetts**

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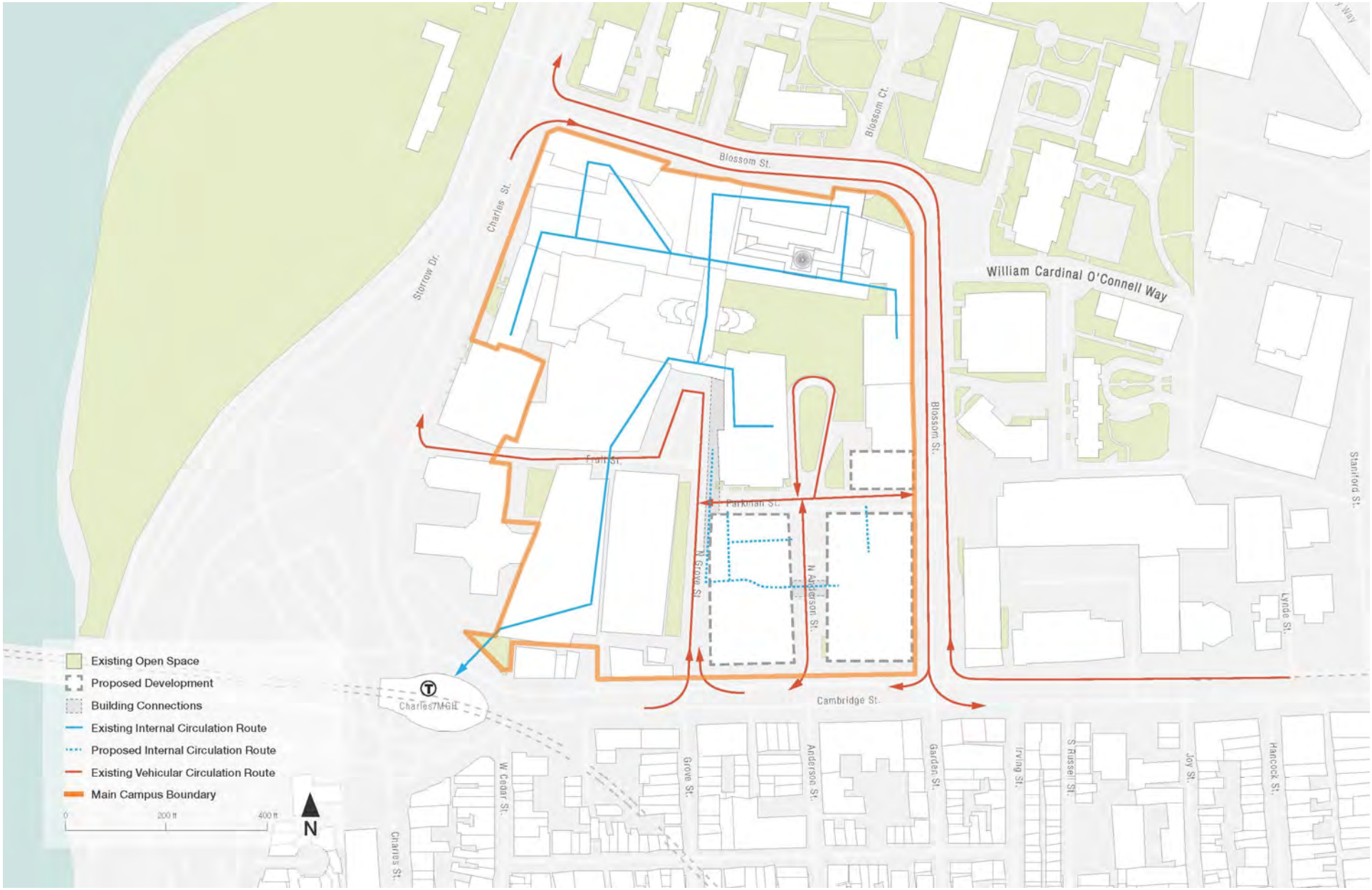
**Figure 3-20**
*Massing Context*




**Massachusetts General Hospital Boston, Massachusetts**

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**Figure 3-21**
*Pedestrian and Vehicular Circulation*

### *3.18.4 Open Space and View Corridors Analysis*

Cambridge Street at Charles Circle is the "gateway" into Boston over the Charles River from Cambridge. At this gateway, people pass through one of the great open spaces in Boston: the Charles River Basin, with its Charlesbank Park to the north and the Esplanade to the south. As a result, MGH's image plays a significant role setting the tone and urban design character of this entry into Boston and its relationship to the existing open spaces.

It should be noted that the Main Campus is located within, and able to connect to, Boston's 'green' network (see Figure 3-21). The Greenlinks initiative, currently being implemented, builds off the Emerald Necklace, introduces planting to existing routes and identifies new 'green' routes. It will, in the longer term, ensure that Cambridge Street and Staniford Street provide well-treed and planted routes. It is also important to recognize that within a 5-10 minute walk it is possible to access several high quality public spaces.

For people entering Boston from Cambridge, whether by subway, bus, bicycle or car, the Main Campus is essentially the first urban agglomeration encountered. View corridors link Beacon Hill, MGH, Charles River Plaza, Charles River Park, and the West End neighborhood and highlight significant structures (see Figure 3-22). These often originate from Cambridge Street where there are discrete glimpses into Beacon Hill, MGH's Bulfinch Green and the White Building, and long, distant views of the edges of the open space of Charles River Park. The new development will contribute to the framing of significant routes within and beyond the campus. It will also allow for the element of surprise, providing contrasting experiences – compressed routes that then open up to reveal generous open space.

## 3.19 Historic and Archaeological Resources

### *3.19.1 Historic Resources in the Project Site*

The Project Sites include four properties which are included in the Inventory of Historic and Archaeological Assets of the Commonwealth (Inventory): the 1929 West End Settlement House (MHC # BOS.4158) at 16-18 Blossom Street, the 1884-1885 Ruth Sleeper Hall (MHC # BOS.4159) at 24 Blossom Street, the 1910 West End Tenement House (MHC # BOS.4156) at 23-25 North Anderson Street and a ca. 1980 open space (MHC # BOS.9428) at 245 Cambridge Street. There are no historic resources on the Project Sites listed in the State and National Registers of Historic Places.


**Massachusetts General Hospital Boston, Massachusetts**

nbbj

**Figure 3-22**
*Area Green Network*


**Massachusetts General Hospital Boston, Massachusetts**

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**Figure 3-23**
*View Corridors*

### *1929 West End Settlement House*

Constructed in 1929 and designed by Coolidge, Shepley, Bulfinch & Abbott as a Settlement House for Boston's immigrant population (MHC # BOS.4158), the three-story brick, Colonial Revival structure features a symmetrical five-bay façade centered on a shallow projecting pavilion with blank bays to each side. Additional details on the façade include a brick water table, brick belt course between the first and second floor and a simple metal cornice below a balustraded parapet. The central recessed entry features a cast concrete surround ornamented with fluted pilasters and a pediment of triglyphs and projecting moldings. Window openings feature metal sash replacements; the first and second floor openings feature brick jack arches and the third floor features brick arches. Boston city permits indicate that the building has been modernized and substantially reconfigured through the removal of interior partitions, enlargement of rooms, and addition of emergency exits.

### *1884-1885 Ruth Sleeper Hall*

The Winchell Elementary School (MHC # BOS.4159) was constructed between 1884-1885 and designed by Arthur H. Vinal for the children of the West End. In 1963, it was bought by MGH and it was used as a school of nursing and renamed Sleeper Hall. The building, which adopts a cruciform footprint, is constructed of brick with brownstone trim. Decorative features include raised brick spandrels between the first and second floor window openings and recessed arched entries on the Blossom and Parkman Street facades. Window openings feature flat granite lintels and sills. There are three exterior metal enclosed fire escapes. Boston city permits indicate that the building has been modernized and substantially reconfigured through the removal of interior partitions, enlargement of rooms, and addition of emergency exits.

### *1910 West End Tenement House*

The brick tenement block at 23-25 North Anderson Street (MHC # BOS.4156) was constructed in 1910 and designed by Silverman Engineering. The five-story building adopts a rectangular plan and features belt coursing between the third and fourth floor and a denticulated pressed metal cornice adorned with fleur des lis. A central entrance on the façade features a cast stone surround comprised of a broken pediment supported by cast stone pilasters. First floor windows to the right of the entry feature lintels with drop pendants, an infilled storefront entry is located to the right with an ashlar stone facing. Second and third floor window openings feature a keystone design, and windows on the fourth floor have flat rectangular lintels. Windows are replacements with some openings, specifically the center bay which historically were tripartite, feature infill at the top and sides of the windows. Several windows at the ground floor are covered with painted plywood. The interior was substantially reconfigured during the mid-twentieth century when the building was converted into apartments.

### *245 Cambridge Street*

The grass area at 245 Cambridge Street is located at the northeast corner of the intersection of North Anderson Street and Cambridge Street. The grass area (MHC # BOS.9428) was constructed in 1980. The area has raised grass beds and concrete and wood seating.

## *3.19.2 Historic Resources in the Project Vicinity*

Historic resources in the vicinity of the Project Sites include portions of the Beacon Hill Historic District and Saint John the Evangelist Mission Church and Rectory to the south, and the Charles River Basin Historic District and Charles River Esplanade to the west, and the Massachusetts General Hospital – Bulfinch Building on Fruit Street and Bulfinch Triangle to the north which are all listed on the State and National Registers of Historic Places.

Table 3-10 lists State and National Register-listed properties and historic districts located within a quarter mile radius of the Project site. Figure 3-24 depicts the locations of these properties and historic districts.

**Table 3-10 State and National Register-Listed Properties and Historic Districts**

| Historic Resource | Address | Designation |
|---|---|---|
| Bulfinch Triangle Historic District | Roughly bounded by Canal, Market, Merrimac, and Causeway Streets | NRDIS |
| Charles River Basin Historic District | Follows the banks of the Charles River in Boston, Cambridge, Watertown, and Newtown | NRDIS |
| Charles River Esplanade | Roughly bounded by Boston University Bridge, Storrow Drive, Embankment Road, Monsignor O'Brien Highway and the Charles River. | NRDIS, LL |
| Beacon Hill Historic District | Roughly bounded by Cambridge, Embankment, Beacon, Bowdoin, Park, and Tremont Streets | LHD |
| Beacon Hill Historic District | Roughly bounded by Cambridge, Embankment, Beacon, and Bowdoin Streets | NHL, NRDIS |
| Saint John the Evangelist Mission Church and Rectory | 33 and 35 Bowdoin St, 44-46 Temple St | LHD, NHL, NRDIS, PR |
| First Harrison Gray Otis House | 141 Cambridge Street | MA/HL, NHL, NRDIS, NRIND, PR |
| Massachusetts State House | Beacon Street | LHD, MA/HL, NHL, NRIND |

Table 3-10 State and National Register-Listed Properties and Historic Districts (Continued)

| Historic Resource | Address | Designation |
|---|---|---|
| MGH – Ether Dome | Fruit Street | NHL, NRIND |
| MGH - Bulfinch Building | Fruit Street | NHL,NRIND |
| Suffolk County Jail | 215 Charles Street | NRIND |

| | |
|---|---|
| NRIND | Individually listed on the National Register of Historic Places |
| NRDIS | National Register of Historic Places historic district |
| MA/HL | Massachusetts Archaeological/Historic Landmark |
| NHL | National Historic Landmark |
| LHD | Local Historic District |
| PR | Preservation Restriction |
| LL | Local Landmark |

### *3.19.3 Archaeological Resources Within the Project Site*

A review of Massachusetts Historical Commission's online archaeological base maps was conducted on June 4, 2018. There are no known recorded archaeological sites located on the Project Sites or within the immediate vicinity. Previous ground disturbance activities and other improvements have likely impacted the potential for the site to yield significant archaeological resources.

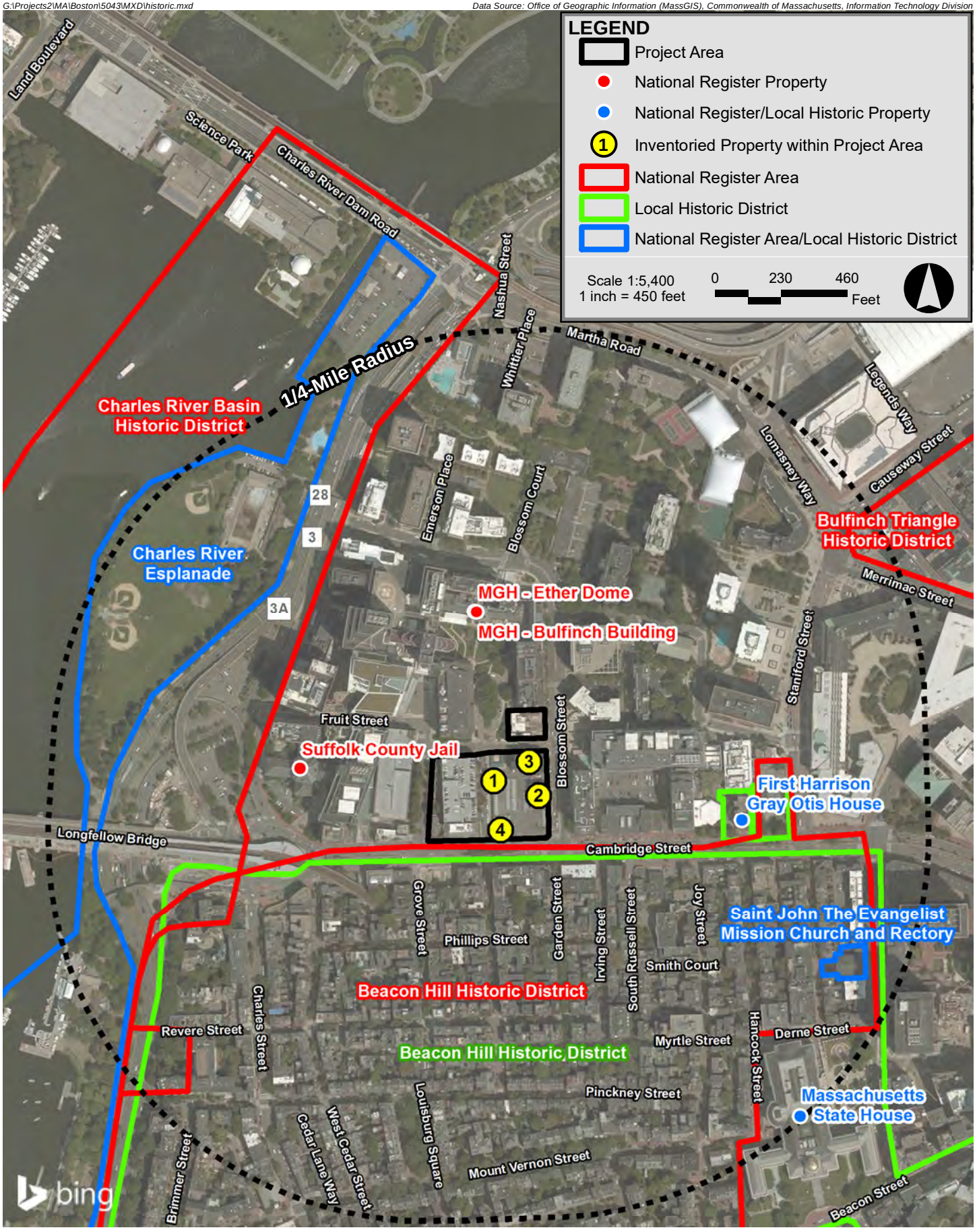
### *3.19.4 Consistency with Historic Reviews*

#### 3.19.4.1 Boston Landmarks Commission

The Clinical Building will require review under Article 85 of the Code as it proposes the demolition of three buildings that are greater than 50 years old; specifically, the 1929 West End Settlement House (16-18 Blossom Street), the 1884-1885 Ruth Sleeper Hall (24 Blossom Street), the 1910 West End Tenement House (23-25 North Anderson Street), and 245 Cambridge Street. This process will be initiated through the filing of an Article 85 application with the Boston Landmarks Commission (BLC). If one or more of the properties are found to be significant, the Article 85 process will require a community meeting and public hearing as part of the review process.

#### 3.19.4.2 Massachusetts Historical Commission

Since it is anticipated that the Project will require state permits or utilize state funding, the Project will be subject to review by the Massachusetts Historical Commission (MHC) under State Register Review (950 CMR 71.00). If MEPA review is required, MHC review will be initiated through the submission of an Environmental Notification Form. If MEPA review is not required, a Project Notification Form will be filed with MHC to initiate MHC review. If any federal funding, licenses, permits and/or approvals are required, the Project will also be subject to review under Section 106 of the National Historic Preservation Act. At this time, no federal action is anticipated.




**Massachusetts General Hospital Boston, Massachusetts**

Epsilon Associates Inc.

**Figure 3-24**

*Historic Resources*

## 3.20 Infrastructure

This section describes the existing infrastructure systems used by MGH at its Main Campus, Nashua Street area and CNY Campus, as well as future demands and proposed system modifications. The infrastructure systems addressed include: sanitary sewer, water supply, stormwater drainage, electrical service, chilled water, natural gas, steam, and telecommunications. Future demands are based on the proposed Projects.

### *3.20.1 Sanitary Sewer*

#### 3.20.1.1 Existing System Conditions

The Boston Water and Sewer Commission (BWSC) owns and maintains the sewer lines in the public ways that service MGH's properties in Boston.

Sanitary sewer systems in the nearby public streets and MGH service roads include systems that are both separated and combined with stormwater collection systems. Within MGH's properties, sanitary sewage flows by gravity through the collection system. Separation of sanitary and stormwater flows both maintains the hydraulic capacity of sanitary sewers during intense rainfall periods and reduces the amount of clean water conveyed through the sewer system and treated at the Deer Island Wastewater Treatment Plant.

The Main Campus is serviced by existing BWSC sanitary sewers in Cambridge Street (12-inch), North Anderson Street (18-inch by 24-inch), Parkman Street (15-inch and 12-inch), and Blossom Street (10-inch and 12-inch). The Main Campus is also serviced by combined sewers in Charles Street (36-inch by 54-inch and 76-inch by 92-inch), North Grove Street (30-inch by 36-inch), Cambridge Street (30-inch by 54-inch), and Blossom Street (20-inch by 24-inch and 24-inch by 26-inch). Wastewater flows to the West Side Interceptor sewer, then through Massachusetts Water Resources Authority (MWRA) interceptors and ultimately to the MWRA Deer Island Wastewater Treatment Plant for treatment and disposal.

The Nashua Street area is serviced by BWSC sanitary sewers located in Nashua Street (10-inch and 12-inch). The Nashua Street area is also serviced by combined sewers in Nashua Street (72-inch by 90-inch) and Lomasney Way (48-inch). Wastewater from the Nashua Street area flows to the West Side Interceptor sewer, then through MWRA interceptors, and ultimately to the MWRA Deer Island Wastewater Treatment Plant.

The CNY Campus is serviced by existing BWSC sanitary sewers in 4th Avenue (10-inch and 6-inch), 5th Avenue (10-inch), 13th Street (10-inch), 2nd Avenue (10-inch), and 16th Street (10-inch). Wastewater flows to the Charlestown Branch sewer, then to the North Metro Trunk Sewer. Sewage then flows to the Chelsea Creek Headworks and finally to the MWRA Deer Island Wastewater Treatment Plant.

#### 3.20.1.2 Future Wastewater Generation and System Modifications

The proposed Clinical Building will contain approximately 1,020,000 sf of clinical and clinical support space (containing 456 beds) and approximately 15,000 sf of retail space. The Campus Services Building will contain approximately 51,500 sf of office and plant support space. Based on wastewater generation rates established by MassDEP (310 CMR 15.203) of 200 gallons per day (gpd) per bed, 50 gpd per 1,000 sf (retail) and 75 gpd per 1,000 sf (office), the Projects are expected to generate approximately 96,000 gpd of sanitary sewage.

As part of the Projects, seven buildings will be demolished. There is approximately 101,000 sf of occupied space in those seven buildings (the total demolition area is approximately 108,000 sf). These occupied spaces are predominantly office spaces and generate approximately 7,600 gpd (at 75 gpd per 1,000 sf) of sanitary sewage. Therefore, the net new sanitary sewage generation is expected to be 88,400 gpd (96,000 gpd proposed less 7,600 gpd existing to be demolished).

The Projects are expected to discharge to adjacent sanitary sewers in Parkman, North Grove, North Anderson, Cambridge and Blossom streets. All proposed connections will be submitted to BWSC for review and approval.

The sanitary sewer in Blossom Street has a flowing full capacity of approximately 900,000 gpd; the sanitary sewer in Parkman Street has a flowing full capacity of approximately 1,360,000 gpd; the sanitary sewer in Cambridge Street has a flowing full capacity of approximately 1,160,000 gpd; the sanitary sewer in North Anderson Street has a flowing full capacity of approximately 4,900,000 gpd; and the sanitary sewer in North Grove Street has a flowing full capacity of approximately 10,000,000 gpd. These sewers have capacities in excess of the Project's net new generation of approximately 88,400 gpd.

### *3.20.2 Domestic and Fire Protection Water*

#### 3.20.2.1 Existing System Conditions

Existing water service for domestic use and fire protection is supplied from water systems owned and operated by the BWSC. Water is delivered to the MGH properties through an interconnected network of water distribution systems, designated by BWSC as the Southern Low Service (SLS) Systems, Southern High Service (SHS) Systems and Northern Low Service (NLS) Systems.

SLS and NLS systems are generally used to meet domestic water needs and street hydrant demand. SHS systems are generally used as the main supply to the low-pressure service system and supplies water for building fire protection systems.

The SLS, NLS and SHS systems are integrally connected to form loops that allow major water demands to be fed from more than one direction. Looping allows each distribution

system to function at optimum efficiency and provides a measure of safety and redundancy in the event of a water main break.

The Main Campus is serviced by existing BWSC water mains in Cambridge Street (two 12-inch SLS), Charles Street (16-inch SLS), Fruit Street (12-inch SLS), North Grove Street (8-inch SLS), North Anderson Street (10-inch) and Blossom Street (12-inch SLS and 16-inch SLS).

The Nashua Street area is serviced by existing BWSC water mains in Nashua Street (12-inch SLS) and Lomasney Way (12-inch SLS).

The CNY Campus is serviced by existing BWSC water mains in 4th Avenue (12-inch NLS), 2nd Avenue (12-inch NLS), 3rd Avenue (12-inch NLS), 13th Street (12-inch NLS), 5th Avenue (12-inch NLS) and 16th Street (12-inch NLS).

#### 3.20.2.2 Future Water Demand and System Modifications

Water demand is based upon an expected net new sewage generation rate of 88,400 gpd plus an additional 10% for consumption, system losses and other usage. The Projects' estimated net new water demand is approximately 97,000 gallons per day. The Projects will connect to water mains in the adjacent streets (North Grove Street, Blossom Street, Parkman Street and Cambridge Street). All proposed connections will be submitted to BWSC for review and approval.

### *3.20.3 Storm Drainage*

#### 3.20.3.1 Existing System Conditions

BWSC owns and maintains the majority of the stormwater drainage systems servicing MGH's Boston properties.

The Main Campus is serviced by Cambridge Street (12-inch), Charles Street (24-inch), Blossom Street (12-inch), Fruit Street (39-inch by 39-inch), North Grove Street (12-inch) and North Anderson Street (18-inch by 18-inch). The stormwater drainage system servicing the Main Campus ultimately discharges into the West Side Interceptor combined sewer.

The Nashua Street area is serviced by Nashua Street (24-inch) and Lomasney Way (36-inch and 42-inch). The storm drainage system servicing the Nashua Street area discharges into the Charles River via a 36-inch and 12-inch outfall.

The CNY Campus is serviced by 4th Avenue (12-inch), 2nd Avenue (36-inch and 48-inch), 13th Street (18-inch and 24-inch), 5th Avenue (15-inch), and 16th Avenue (60-inch). The storm drainage system servicing the CNY Campus discharges north of 16th Street into the Mystic River via three 30-inch outfalls.

### 3.20.3.2 Future Storm Drainage Flows

The Projects seek to reduce stormwater flows discharging from the building sites in accordance with BWSC requirements. Currently, the Projects are proposing a combination of stormwater harvesting, re-use, and groundwater re-charge in a manner to reduce stormwater runoff and improve runoff water quality as required by BWSC. The system will remove nutrients such as phosphorus via both stormwater harvesting, which takes stormwater then re-uses it (then discharges to sanitary sewers), and groundwater recharge.

Under current planning, roof drainage from the Clinical Building will be directed to an approximately 70,000-gallon rainwater harvesting tank located within the building. Under current planning, roof drainage from the Campus Services Building will be directed to an approximately 6,500-gallon rainwater harvesting tank located within the building. These tank volumes are approximately equivalent to a 1.25-inch precipitation event. The primary uses of the harvested water will be mechanical systems. In the event the tanks are full and/or the runoff volume exceeds 1.25 inch equivalent, the system will have a bypass to groundwater recharge wells located outside the building footprints. The system will be designed to empty the tank over a 72 hour period.

These systems, on a building by building basis both independently and combined, are expected to remove over 65% of phosphorus from the building roof areas.

In addition to the building-focused system, the Projects are expecting to provide landscaping and curb-side infiltration systems in accordance with Boston Complete Streets Guidelines.

### 3.20.3.3 Consistency with Massachusetts Stormwater Management Standards

Massachusetts established Stormwater Management Standards in the Massachusetts Stormwater Handbook issued by MassDEP in 1997 and revised in 2008. A brief explanation of each standard and the Project compliance is provided below.

**Standard #1:** No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

*Compliance:* No discharges from the Projects will be made directly to wetlands or waters of the Commonwealth. No untreated stormwater discharges are currently expected.

**Standard #2:** Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

*Compliance:* The existing discharge rate will decrease because of the improvements associated with the Projects. The Projects currently include multiple stormwater management strategies that are expected to reduce discharge rates.

Since the existing system adjacent to the Project Sites does not appear to have capacity issues and the Projects are expecting to reduce flows, there should be a net benefit to adjacent drain capacities.

**Standard #3:** Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to the maximum extent practicable. The annual recharge from the post development project site should approximate the annual recharge from the pre-development or existing project site conditions, based on soil types.

*Compliance:* This Projects are redevelopments and are expected to comply to the extent practicable. The Projects include a planned groundwater recharge system that would introduce excess stormwater flows (those exceeding the harvesting tank volume) back to the groundwater table.

**Standard #4:** For new development, stormwater management systems must be designed to remove 80 percent of the average annual load (post-development conditions) of TSS. It is presumed that this standard is met when: Suitable nonstructural practices for source control and pollution prevention are implemented; Stormwater best management practices (BMPs) are sized to capture the prescribed runoff volume; and Stormwater management BMPs are maintained as designed.

*Compliance:* The Projects will remove a substantial amount of the annual load of TSS by the implementation of BMPs including rainwater harvesting (which includes primary sediment removal), green roofs and groundwater recharge.

**Standard #5:** For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If, through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

*Compliance:* Most of the Project Sites will be occupied by building area that will cover the former uses. As a result, stormwater quality is expected to improve as any incidental water collected from the covered areas will be treated through an oil and gas separator and directed to the sanitary sewer system. The areas not covered by the buildings will be primarily sidewalk and streetscape areas.

**Standard #6:** Stormwater discharge to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resource Waters, shellfish beds, swimming beaches, cold-water fisheries and recharge areas for public water supplies.

*Compliance:* The Project Sites do not discharge within the Zone II or Interim Wellhead Protection Area of a public water supply or near any other critical area.

**Standard #7:** A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

*Compliance:* The Projects are considered redevelopment projects. The Projects will comply with Stormwater Management Standards 1 through 6 to the maximum extent practicable and all other requirements of the Stormwater Management Standards, and as a result will improve upon existing conditions.

**Standard #8:** Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.

*Compliance:* Sedimentation and erosion controls will be employed to prevent construction or land disturbance impacts to groundwater. Erosion and sediment control plans will be submitted to BWSC and the contractor will be required to implement the measures as part of the BWSC general services application process.

**Standard #9:** A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

*Compliance:* An O&M Plan will be developed and implemented. The O&M Plan will be reviewed by the BWSC.

**Standard #10:** All illicit discharges to the stormwater management system are prohibited.

*Compliance:* There are no currently known illicit discharges. All proposed discharges will be reviewed by the BWSC to ensure consistency with this standard.

### *3.20.4 Energy Systems*

#### 3.20.4.1 Existing Electrical System Conditions

Eversource owns and operates the electric facilities that service MGH's properties.

### 3.20.4.2 Future Electrical Requirements

It is anticipated that the Projects will be obtaining power from Eversource. The Projects are expected to have a peak demand of 9.2 megawatts of power (3,500 kW for the Campus Services Building and 5,700 kW for the Clinical Building).

### 3.20.4.3 Existing Chilled Water System Conditions

MGH currently produces chilled water within its Main Campus boundaries.

### 3.20.4.4 Future Chilled Water Requirements

The Project is expected to produce chilled water at the Project Sites.

### 3.20.4.5 Existing Natural Gas System Conditions

National Grid owns and operates the gas facilities that service MGH's properties. The Main Campus is serviced via natural gas mains in Cambridge Street (12-inch), Fruit Street (6-inch), North Grove Street (6-inch), North Anderson Street (6-inch), Parkman Street (4-inch), and Blossom Street (8-inch). The Nashua Street area is serviced via a natural gas main in Nashua Street (6-inch).

### 3.20.4.6 Future Natural Gas Requirements

The Projects are expected to require approximately 40,000 cubic foot per hour of natural gas.

### 3.20.4.7 Existing Steam System Conditions

Veolia owns and operates the steam facilities that service the Main Campus and Nashua Street area. Steam is the primary source of heat for those areas.

### 3.20.4.8 Future Steam Requirements

The Project is expected to have a peak steam demand of approximately 50,000 pounds per hour.

### 3.20.4.9 Existing Telecommunications System Conditions

Verizon and Comcast own and operate telecommunication facilities that service MGH's properties. Information regarding these systems is generally subject to non-disclosure agreements.

### 3.20.4.10 Future Telecommunications System Connections

Depending on the Projects' demands, the Projects will either connect to internal telecommunications infrastructure or obtain service in adjacent streets from one or more of

the providers listed above. Redundant (primary and secondary) service connections for extension of existing MGH campus service (fiber optic cable) will be required. A new Verizon service will be provided from a designated Verizon connection point (manhole, vault or utility pole) to within the Main Technology Distribution Room (TDR) within the Projects.

A new Comcast service will be provided from a designated Comcast connection point (manhole or utility pole) to within the Main TDR within the Projects.

Additionally, an available conduit(s) service connection will be provisioned for connectivity to Crown Castle (alternate Access Provider) connection point (manhole or utility pole) to within the Main TDR within the Projects.

# Chapter 4

## Coordination With Other Government Agencies

# 4.0 COORDINATION WITH OTHER GOVERNMENT AGENCIES

## 4.1 Architectural Access Board Requirements

The Projects will comply with the requirements of the Massachusetts Architectural Access Board and will be designed to comply with the standards of the Americans with Disabilities Act. Appendix B includes the Accessibility Checklists.

## 4.2 Massachusetts Environmental Policy Act (MEPA)

The Projects may be subject to review under the Massachusetts Environmental Policy Act, as the Projects will exceed a review threshold for Transportation. If required, the Proponent will submit an Environmental Notification Form to the MEPA office.

## 4.3 Massachusetts Historical Commission

The MHC has review authority over projects requiring state or federal funding, licensing, permitting and/or approvals that may have direct or indirect impacts to properties listed in the State Register of Historic Places. It is anticipated that MHC review will be required. If MEPA review is required, MHC review will be initiated through the submission of an Environmental Notification Form in compliance with the Massachusetts Environmental Policy Act. If MEPA review is not required, a Project Notification Form will be filed with MHC to initiate MHC review.

## 4.4 Article 85

The Clinical Building will require review under Article 85 of the Code as it proposes the demolition of three buildings that are greater than 50 years old; specifically, the 1929 West End Settlement House (16-18 Blossom Street), the 1884-1885 Ruth Sleeper Hall (24 Blossom Street), and the 1910 West End Tenement House (23-25 North Anderson Street). This process will be initiated through the filing of an Article 85 application with the Boston Landmarks Commission (BLC). If one or more of the properties are found to be significant, the Article 85 process will require a community meeting and public hearing as part of the review process.

# Appendix A

Climate Change Questionnaires

**Boston Planning & Development Agency**

# Climate Resiliency Report Summary

**Submitted:** 02/18/2019 16:28:21

## A.1 - Project Information

| | | | | |
|---|---|---|---|---|
| Project Name: | Massachusetts General Hospital IMPNF PNF - Clinical Services Building | | | |
| Project Address: | The area bound by Parkman Street, Blossom Street, North Grove Street and Cambridge Street | | | |
| Filing Type: | Initial (PNF, EPNF, NPC or other substantial filing) | | | |
| Filing Contact: | Fiona Vardy | Epsilon Associates, Inc. | fvardy@epsilonassociates.com | 978-461-6243 |
| Is MEPA approval required? | No | MEPA date: | | |

## A.2 - Project Team

| | |
|---|---|
| Owner / Developer: | Massachusetts General Hospital |
| Architect: | NBBJ |
| Engineer: | |
| Sustainability / LEED: | |
| Permitting: | Epsilon Associates, Inc. |
| Construction Management: | |

## A.3 - Project Description and Design Conditions

| | |
|---|---|
| List the principal Building Uses: | Retail, Clinical including inpatient and outpatient care |
| List the First Floor Uses: | retail, lobby, cafe, gift shop, clinical |
| List any Critical Site Infrastructure and or Building Uses: | Hospital uses |

**Site and Building:**

| | | | |
|---|---|---|---|
| Site Area (SF): | 112400 | Building Area (SF): | 1035000 |
| Building Height (Ft): | 200 | Building Height (Stories): | 12 |
| Existing Site Elevation – Low (Ft BCB): | 15 | Existing Site Elevation – High (Ft BCB): | 17.5 |
| Proposed Site Elevation – Low (Ft BCB): | 15 | Proposed Site Elevation – High (Ft BCB): | 17.5 |
| Proposed First Floor Elevation (Ft BCB): | 16.5 | Below grade spaces/levels (#): | 6 |

**Article 37 Green Building:**

# Boston Planning & Development Agency
# Climate Resiliency Report Summary

| | | | |
|---|---|---|---|
| LEED Version - Rating System: | LEED v4 for BD+C: Healthcare | LEED Certification: | Yes |
| Proposed LEED rating: | Gold | Proposed LEED point score (Pts.): | 66 |

**Building Envelope:**

When reporting R values, differentiate between R discontinuous and R continuous. For example, use "R13" to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

| | | | |
|---|---|---|---|
| Roof: | 25 | Exposed Floor : | 19 |
| Foundation Wall: | 7.5 | Slab Edge (at or below grade): | U-07.3 |

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

| | | | |
|---|---|---|---|
| Area of Opaque Curtain Wall & Spandrel Assembly: | 50 | Wall & Spandrel Assembly Value: | U-0.055 |
| Area of Framed & Insulated / Standard Wall: | 13 | Wall Value: | R13 batt, R10c.i. |
| Area of Vision Window: | 37 | Window Glazing Assembly Value: | U-0.42 |
| | | Window Glazing SHGC: | 0.40 |
| Area of Doors: | <1 | Door Assembly Value : | U-0.500 |

**Energy Loads and Performance**

| | | | |
|---|---|---|---|
| For this filing – describe how energy loads & performance were determined | An early concept/program energy model with a baseline building and two options has provided the parameters at this time. As design progresses it will become more detailed and accurate to design options as they are chosen, with the goal of increasing efficiency and decreasing emissions and plant size. | | |
| Annual Electric (kWh): | 33228241 | Peak Electric (kW): | 4160 |
| Annual Heating (MMbtu/hr): | 254533 | Peak Heating (MMbtu): | 76960 |
| Annual Cooling (Tons/hr): | 11567600 | Peak Cooling (Tons): | 4940 |
| Energy Use - Below ASHRAE 90.1 - 2013 (%): | 10 | Have the local utilities reviewed the building energy performance?: | No |
| Energy Use - Below Mass. Code (%): | 10 | Energy Use Intensity (kBtu/SF): | 334 |

**Back-up / Emergency Power System**

| | | | |
|---|---|---|---|
| Electrical Generation Output (kW): | 12000 | Number of Power Units: | 6 |
| System Type (kW): | Diesel generators | Fuel Source: | diesel |

**Emergency and Critical System Loads** (in the event of a service interruption)

| | | | |
|---|---|---|---|
| Electric (kW): | 5700 | Heating (MMbtu/hr): | 38000000 |
| | | Cooling (Tons/hr): | |

## B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing greenhouse gas emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon-neutrality by 2050 the performance of new buildings will need to progressively improve to carbon net zero and net positive.

### B.1 – GHG Emissions - Design Conditions

For this filing - Annual Building GHG Emissions (Tons): 2900

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

Building energy performance targets have been set as a programmatic requirement. Each phase will include modeling to inform options for reduced
energy use from both architecture and systems to continue refinement toward
performance EUI targets.

Describe building specific passive energy efficiency measures including orientation, massing, building envelop, and systems:

The building envelope will be designed to for winter (and summer) comfort and energy efficiency. Likely strategies beyond code include additional insulation, reduction of thermal bridging, sunshading to reduce direct beam sunlight on relevant facades and commissioning for airtightness and thermal performance.

Describe building specific active energy efficiency measures including high performance equipment, controls, fixtures, and systems:

Two scenarios have been modeled early, with the most efficient proposed case including VAV patient room systems, CAV isolation patient rooms, active chilled beams for core and patient corridors with energy recovery. Lighting systems will include all LED fixtures, and ongoing design will model improvements to performance at the level of detail appropriate to each design phase.

Describe building specific load reduction strategies including on-site renewable energy, clean energy, and storage systems:

TBD

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

Central energy plant may include cogeneration. Waste steam from adjacent power plant may be used. The Owner purchases 100% carbon free electricity across the campus and will continue to do so.

Describe any energy efficiency assistance or support provided or to be provided to the project:

The Project will work with Eversource to determine what programs and incentives will be available for the Project.

### B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

Currently the campus purchases 100% carbon free electricity, and the goal over time will be to shift loads from natural gas to electricity. Heating systems will be designed to be adaptable over time as equipment is replaced; currently emergency power generators are diesel, but that also will be reviewed for future modification. As design is completed, decisions will be documented and provide a path toward additional efficiency measures and potential energy reductions, as well as future potentials for renewable onsite energy.

### C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

### C.1 – Extreme Heat - Design Conditions

| | | | |
|---|---|---|---|
| Temperature Range - Low (Deg.): | 8 | Temperature Range - High (Deg.): | 91 |
| Annual Heating Degree Days: | 5711 | Annual Cooling Degree Days | 747 |

What Extreme Heat Event characteristics will be / have been used for project planning

| | | | |
|---|---|---|---|
| Days - Above 90° (#): | 60 | Days - Above 100° (#): | 30 |
| Number of Heatwaves / Year (#): | 6 | Average Duration of Heatwave (Days): | 5 |

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

Design strategies for site and neighborhood cooling will include roof gardens and high SRI roof surfaces. Although the site area at grade is minimal, it will also include dense urban planting and relevant low impact development strategies identified as design progresses.

### C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

Energy model will be run to test future climate scenarios and assist in planning for future system modifications. Although the current project will be designed for current conditions, it will also include modular considerations and space to allow for system growth or change as either greater loads or new technologies become available. MGH is a critical institutional epicenter for population heat exposure and disaster healthcare response. Planning for resilient systems is a core responsibility for the hospital and an intrinsic element of design and construction.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

A 96 hour fuel reserve will maintain functionality to island with generators. Design and envelope will create lower energy use requirement to reduce need/extend capability. Although heating and cooling are not provided for on emergency power in general, passive design elements will enable the building to provide greater comfort for longer during an outage. Operable windows will, during certain seasons, provide an alternative as well. Daylight will be maximized to allow greater functionality during daylight hours without electric lighting.
Umbilicals will be provided to allow use of portable power plant for extended outages.

## D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25". There is a significant probability that this will increase to at least 6" by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

### D.1 – Extreme Precipitation - Design Conditions

| | |
|---|---|
| What is the project design precipitation level? (In. / 24 Hours) | 6 |

Describe all building and site measures for reducing storm water run-off:

Roof rainwater will be collected and stored for reuse. Site is constrained with very little site area beyond the building, and GI/LID strategies will be used to extent site area is available.

### D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

Strategies include rainwater harvesting and green roofs, as well as onsite storm retention for what is not captured from building.

**Boston Planning & Development Agency**

# Climate Resiliency Report Summary

## E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

| | | | |
|---|---|---|---|
| Is any portion of the site in a FEMA Special Flood Hazard Area? | No | What Zone: | |
| What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)? | | | |
| Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see SLR-FHA online map)? | No | | |

***If you answered YES to either of the above questions, please complete the following questions.***
***Otherwise you have completed the questionnaire; thank you!***

## E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

| | | | |
|---|---|---|---|
| What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)? | | | |
| What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)? | | First Floor Elevation (Ft BCB): | |
| What are the Site Elevations at Building (Ft BCB)? | | What is the Accessible Route Elevation (Ft BCB)? | |

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

### E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

Thank you for completing the Boston Climate Change Checklist!

For questions or comments about this checklist or Climate Change best practices, please contact:
John.Dalzell@boston.gov

# Boston Planning & Development Agency
# Climate Resiliency Report Summary

**Submitted:** 02/18/2019 16:45:50

## A.1 - Project Information

| | | | | |
|---|---|---|---|---|
| Project Name: | MGH IMPNF PNF - Campus Services Building | | | |
| Project Address: | The parcel bound by Parkman Street to the south and Blossom Street to the east and MGH properties to the north and west | | | |
| Filing Type: | Initial (PNF, EPNF, NPC or other substantial filing) | | | |
| Filing Contact: | Fiona Vardy | Epsilon Associates, Inc. | fvardy@epsilonassociates.com | 9784616243 |
| Is MEPA approval required? | No | MEPA date: | | |

## A.2 - Project Team

| | |
|---|---|
| Owner / Developer: | Massachusetts General Hospital |
| Architect: | NBBJ |
| Engineer: | |
| Sustainability / LEED: | |
| Permitting: | Epsilon Associates, Inc. |
| Construction Management: | |

## A.3 - Project Description and Design Conditions

| | |
|---|---|
| List the principal Building Uses: | Loading dock and materials handling, mechanical and electrical central plant, administrative offices |
| List the First Floor Uses: | Soiled materials management and truck dock |
| List any Critical Site Infrastructure and or Building Uses: | Mechanical Infrastructure |

**Site and Building:**

| | | | |
|---|---|---|---|
| Site Area (SF): | 10000 | Building Area (SF): | 81000 |
| Building Height (Ft): | 130 | Building Height (Stories): | 7 |
| Existing Site Elevation – Low (Ft BCB): | 16 | Existing Site Elevation – High (Ft BCB): | 16 |
| Proposed Site Elevation – Low (Ft BCB): | 16 | Proposed Site Elevation – High (Ft BCB): | 16 |
| Proposed First Floor Elevation (Ft BCB): | 16.5 | Below grade spaces/levels (#): | 2 |

**Article 37 Green Building:**

**Boston Planning & Development Agency**

# Climate Resiliency Report Summary

| | | | |
|---|---|---|---|
| LEED Version - Rating System: | LEED v4 for BD+C: New Construction and Major Renovation | LEED Certification: | Yes |
| Proposed LEED rating: | Gold | Proposed LEED point score (Pts.): | 62 |

**Building Envelope:**

When reporting R values, differentiate between R discontinuous and R continuous. For example, use "R13" to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

| | | | |
|---|---|---|---|
| Roof: | R25c.i. | Exposed Floor : | R19 |
| Foundation Wall: | R7.5c.i. | Slab Edge (at or below grade): | U-0.73 |

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

| | | | |
|---|---|---|---|
| Area of Opaque Curtain Wall & Spandrel Assembly: | 60 | Wall & Spandrel Assembly Value: | U-0.055 |
| Area of Framed & Insulated / Standard Wall: | 15 | Wall Value: | R-13 batt, R10c.i. |
| Area of Vision Window: | 25 | Window Glazing Assembly Value: | U-0.42 |
| | | Window Glazing SHGC: | 0.40 |
| Area of Doors: | <1 | Door Assembly Value : | U-0.500 |

**Energy Loads and Performance**

| | | | |
|---|---|---|---|
| For this filing – describe how energy loads & performance were determined | An early concept/program energy model with a baseline building and two options has provided the parameters at this time. As design progresses it will become more detailed and accurate to design options as they are chosen, with the goal of increasing efficiency and decreasing emissions and plant size. | | |
| Annual Electric (kWh): | 1144532 | Peak Electric (kW): | 368 |
| Annual Heating (MMbtu/hr): | 1050 | Peak Heating (MMbtu): | 1.5 |
| Annual Cooling (Tons/hr): | 386953 | Peak Cooling (Tons): | 200 |
| Energy Use - Below ASHRAE 90.1 - 2013 (%): | 10 | Have the local utilities reviewed the building energy performance?: | No |
| Energy Use - Below Mass. Code (%): | 10 | Energy Use Intensity (kBtu/SF): | 118.5 |

**Back-up / Emergency Power System**

| | | | |
|---|---|---|---|
| Electrical Generation Output (kW): | | Number of Power Units: | |
| System Type (kW): | Diesel generator | Fuel Source: | #2 diesel |

**Emergency and Critical System Loads** (in the event of a service interruption)

Electric (kW): 3500

Heating (MMbtu/hr):

Cooling (Tons/hr): 2200

---

## B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing greenhouse gas emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon-neutrality by 2050 the performance of new buildings will need to progressively improve to carbon net zero and net positive.

### B.1 – GHG Emissions - Design Conditions

For this filing - Annual Building GHG Emissions (Tons): 58

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

Building energy performance targets have been set as a programmatic requirement. Each phase will include modeling to inform options for reduced energy use from both architecture and systems to continue refinement toward performance EUI targets.

Describe building specific passive energy efficiency measures including orientation, massing, building envelop, and systems:

The building envelope will be designed to for winter (and summer) comfort and energy efficiency. Likely strategies beyond code include additional insulation, reduction of thermal bridging, sunshading to reduce direct beam sunlight on relevant facades and commissioning for airtightness and thermal performance. Those portions of the building that are predominantly equipment will have glazing areas tuned for daylight access.

Describe building specific active energy efficiency measures including high performance equipment, controls, fixtures, and systems:

The building is predominantly a central energy plant, designed for efficient delivery of services to adjacent medical functions. In addition, the office floors in this building will be designed with efficient systems, which may include active chilled beams, LED lighting systems, CO2 sensors, occupant controls and daylight sensors on lights as well as active shading.

Describe building specific load reduction strategies including on-site renewable energy, clean energy, and storage systems:

TBD

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

Central energy plant may include cogeneration. Waste steam from adjacent power plant may be used. The Owner purchases 100% carbon free electricity across the campus and will continue to do so.

Describe any energy efficiency assistance or support provided or to be provided to the project:

The Project will work with Eversource to determine what programs and incentives will be available for the Project.

### B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

Currently the campus purchases 100% carbon free electricity, and the goal over time will be to shift loads from natural gas to electricity. Space is currently allocated for system expansion and/or energy source shifts. Heating systems will be designed to be adaptable over time as equipment is replaced; currently emergency power generators are diesel, but that also will be reviewed for future modification. As design is completed, decisions will be documented and provide a path toward additional efficiency measures and potential energy reductions, as well as future potentials for renewable onsite energy.

### C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

### C.1 – Extreme Heat - Design Conditions

| | | | |
|---|---|---|---|
| Temperature Range - Low (Deg.): | 8 | Temperature Range - High (Deg.): | 91 |
| Annual Heating Degree Days: | 5711 | Annual Cooling Degree Days | 747 |

What Extreme Heat Event characteristics will be / have been used for project planning

| | | | |
|---|---|---|---|
| Days - Above 90° (#): | 60 | Days - Above 100° (#): | 30 |
| Number of Heatwaves / Year (#): | 6 | Average Duration of Heatwave (Days): | 5 |

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

Design strategies for site and neighborhood cooling will include high SRI roof surfaces. The CUP rooftop will be predominantly occupied by cooling towers, so little space is available for rooftop gardens. Although the site area at grade is minimal, it will also include dense urban planting and relevant low impact development strategies wherever possible, identified as design progresses.

### C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

Energy model will be run to test future climate scenarios and assist in planning for future system modifications. Although the current project will be designed for current conditions, it will also include modular considerations and space to allow for system growth or change as either greater loads or new technologies become available. MGH is a critical institutional epicenter for population heat exposure and disaster healthcare response. Planning for resilient systems is a core responsibility for the hospital and an intrinsic element of design and construction.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

A 96 hour fuel reserve will maintain functionality to island with generators. Design and envelope will create lower energy use requirement to reduce need/extend capability. Although heating and cooling are not provided for on emergency power in general, passive design elements will enable the building to provide greater comfort for longer during an outage. Operable windows will, during certain seasons, provide an alternative as well. Daylight will be maximized to allow greater functionality during daylight hours without electric lighting.
Umbilicals will be provided to allow use of portable power plant for extended outages.

### D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25”. There is a significant probability that this will increase to at least 6” by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

### D.1 – Extreme Precipitation - Design Conditions

| | |
|---|---|
| What is the project design precipitation level? (In. / 24 Hours) | 6 |

Describe all building and site measures for reducing storm water run-off:

Roof rainwater will be collected and stored for reuse. Site is constrained with very little site area beyond the building, and GI/LID strategies will be used to extent site area is available.

### D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

Strategies include rainwater harvesting and green roofs, as well as onsite storm retention for what is not captured from building.

## E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

| | | | |
|---|---|---|---|
| Is any portion of the site in a FEMA Special Flood Hazard Area? | No | What Zone: | |
| What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)? | | | |
| Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see SLR-FHA online map)? | No | | |

***If you answered YES to either of the above questions, please complete the following questions.***
***Otherwise you have completed the questionnaire; thank you!***

## E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

| | | | |
|---|---|---|---|
| What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)? | | | |
| What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)? | | First Floor Elevation (Ft BCB): | |
| What are the Site Elevations at Building (Ft BCB)? | | What is the Accessible Route Elevation (Ft BCB)? | |

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

### E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

Thank you for completing the Boston Climate Change Checklist!

For questions or comments about this checklist or Climate Change best practices, please contact:
John.Dalzell@boston.gov

# Appendix B

Accessibility Checklists

# Article 80 – Accessibility Checklist

## A requirement of the Boston Planning & Development Agency (BPDA)
## Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

### Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

### Glossary of Terms:

1. ***Accessible Route*** – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. ***Accessible Group 2 Units*** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. ***Accessible Guestrooms*** – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. ***Inclusionary Development Policy (IDP)*** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. ***Public Improvement Commission (PIC)*** – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. ***Visitability*** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

## 1. Project Information:

*If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*

| | |
|---|---|
| Project Name: | **MGH Clinical Building** |
| Primary Project Address: | |
| Total Number of Phases/Buildings: | 1 |
| Primary Contact (Name / Title / Company / Email / Phone): | **Nick Haney, Project Manager, MGH, NHaney@partners.org** |
| Owner / Developer: | **Massachusetts General Hospital** |
| Architect: | **NBBJ** |
| Civil Engineer: | **VHB** |
| Landscape Architect: | |
| Permitting: | **Epsilon Associates** |
| Construction Management: | |

At what stage is the project at time of this questionnaire? Select below:

| | | | |
|---|---|---|---|
| | PNF / Expanded PNF Submitted | Draft / Final Project Impact Report Submitted | BPDA Board Approved |
| | BPDA Design Approved | Under Construction | Construction Completed: |

| | |
|---|---|
| Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain. | No |

## 2. Building Classification and Description:

*This section identifies preliminary construction information about the project including size and uses.*

What are the dimensions of the project?

| | | | |
|---|---|---|---|
| Site Area: | *112,383 SF* | Building Area: | *1,035,000 GSF* |
| Building Height: | *200 FT.* | Number of Stories: | *12 Flrs.* |
| First Floor Elevation: | 16.5 FT BCB | Is there below grade space: | *Yes* |

| | | | | |
|---|---|---|---|---|
| What is the Construction Type? (Select most appropriate type) | | | | |
| | Wood Frame | Masonry | **Steel Frame** | Concrete |
| What are the principal building uses? (IBC definitions are below – select all appropriate that apply) | | | | |
| | Residential – One - Three Unit | Residential - Multi-unit, Four + | **Institutional** | Educational |
| | Business | Mercantile | Factory | Hospitality |
| | Laboratory / Medical | Storage, Utility and Other | | |
| List street-level uses of the building: | *Lobby, Retail, Café, Gift Shop, Loading, Clinical Support Services (Materials Management)* | | | |

## 3. Assessment of Existing Infrastructure for Accessibility:

*This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.*

| | |
|---|---|
| Provide a description of the neighborhood where this development is located and its identifying topographical characteristics: | The Project is located on MGH's Main Campus in the West End of Boston. To the east and west of the Main Campus are other institutional, research, medical and commercial uses. To the north and south are mainly residential uses with open spaces and some commercial spaces. |
| List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops: | The Charles/MGH Station on the MBTA Red Line is less than 500 feet from the site. |
| List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others: | Massachusetts General Hospital, Massachusetts Eye and Ear, Shriners Hospitals for Children – Boston, Boston Children's School, Torit Montessori |
| List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities: | Department of Mental Health, Thoreau Path, Lederman Park |

## 4. Surrounding Site Conditions – Existing:

*This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*

| | |
|---|---|
| Is the development site within a historic district? ***If yes,*** identify which district: | No |
| Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, | Yes, vary from fair to poor. All immediately adjacent will be reconstructed. |

<table>
<tr><td>slopes, materials, and physical condition at the development site:</td><td></td></tr>
<tr><td>Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? If yes, provide description and photos:</td><td>No</td></tr>
<tr><td colspan="2">5. Surrounding Site Conditions – Proposed<br>This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.</td></tr>
<tr><td>Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? If yes, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.</td><td>The proposed sidewalks will be consistent with the Boston Complete Street Guidelines to the extent feasible based on the preliminary determination of Downtown Mixed-Use, Neighborhood Connector and Neighborhood Residential street-types, depending on the street.</td></tr>
<tr><td>What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:</td><td>
<table>
<tr><th>Street</th><th>Frontage Zone</th><th>Pedestrian Zone</th><th>Furnishing Zone</th><th>Total</th></tr>
<tr><td>Cambridge Street</td><td>2’</td><td>10’</td><td>10’</td><td>22’</td></tr>
<tr><td>Blossom Street</td><td>2’</td><td>6’</td><td>4’</td><td>12’</td></tr>
<tr><td>North Grove Street</td><td>4’</td><td>6’ – 14’</td><td>4’ – 22’</td><td>12’- 40’</td></tr>
<tr><td>Parkman Street</td><td>2’</td><td>5’</td><td>3’</td><td>10’</td></tr>
<tr><td>North Anderson Street</td><td>West: 2’<br>East: 2’</td><td>West: 5’-10’<br>East: 8’</td><td>West: 4’ - 10’<br>East: 7’</td><td>West: 16’ - 25’<br>East: 17’</td></tr>
</table>
</td></tr>
<tr><td>List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?</td><td>Pedestrian zone will be city standard concrete. Materials of other zones will be determined in consultation with the BPDA.</td></tr>
<tr><td>Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? If yes, what are the proposed dimensions of the sidewalk</td><td>To be determined. Depending on nature of retail uses, cafes may be included.</td></tr>
</table>

| | |
|---|---|
| café or furnishings and what will the remaining right-of-way clearance be? | |
| If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)? | Yes |
| Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details. | Yes. Pedestrian easement, specific repair, vertical discontinuance, temporary earth support. |
| **6. Accessible Parking:**<br>*See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*. | |
| What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage? | 1,100 spaces in a below-grade garage |
| What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle? | 110 Accessible spaces<br>14 Van accessible spaces |
| Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need? | No |
| Where is the accessible visitor parking located? | Within the parking garage. |
| Has a drop-off area been identified? ***If yes,*** will it be accessible? | Yes. It will be accessible. |
| **7. Circulation and Accessible Routes:**<br>*The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.* | |
| Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator: | Flush condition at each entry |

| | |
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| Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no****,* what is the reason? | Yes |
| ***If project is subject to Large Project Review/Institutional Master Plan,*** describe the accessible routes way-finding / signage package. | Signage will be developed as the design progresses. |
| **8. Accessible Units (Group 2) and Guestrooms: (If applicable)**<br>*In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.* | |
| What is the total number of proposed housing units or hotel rooms for the development? | |
| ***If a residential development,*** how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units? | |
| ***If a residential development,*** how many accessible Group 2 units are being proposed? | |
| ***If a residential development,*** how many accessible Group 2 units will also be IDP units? ***If none***, describe reason. | |
| ***If a hospitality development,*** how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? ***If yes,*** provide amount and location of equipment. | |
| Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes,*** provide reason. | |
| Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? ***If yes,*** describe: | |

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| | |
| **9. Community Impact:**<br>*Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community*. | |
| Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives? | The improvements to be provided will be determined through coordination with the BPDA and the Task Force. |
| What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs<br>in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility? | All spaces for patients, visitors, and public will be fully accessible. |
| Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? ***If no***, explain why not. | Yes, Yes |
| Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments? | No |
| Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible? | No |

| 10. Attachments<br>*Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.* |
|---|
| Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. |
| Provide a diagram of the accessible route connections through the site, including distances. |
| Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) |
| Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. |
| Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project.<br>• <br>• <br>• <br>• |

This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682

# Article 80 – Accessibility Checklist

## A requirement of the Boston Planning & Development Agency (BPDA)
## Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

### Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

### Glossary of Terms:

1. ***Accessible Route*** – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. ***Accessible Group 2 Units*** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. ***Accessible Guestrooms*** – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. ***Inclusionary Development Policy (IDP)*** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. ***Public Improvement Commission (PIC)*** – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. ***Visitability*** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

## 1. Project Information:

*If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*

| | |
|---|---|
| Project Name: | **Campus Services Building** |
| Primary Project Address: | |
| Total Number of Phases/Buildings: | 1 |
| Primary Contact (Name / Title / Company / Email / Phone): | **Nick Haney, Project Manager, MGH, NHaney@partners.org** |
| Owner / Developer: | **Massachusetts General Hospital** |
| Architect: | **NBBJ** |
| Civil Engineer: | **VHB** |
| Landscape Architect: | |
| Permitting: | **Epsilon Associates** |
| Construction Management: | |

At what stage is the project at time of this questionnaire? Select below:

| | | | |
|---|---|---|---|
| | PNF / Expanded PNF Submitted | Draft / Final Project Impact Report Submitted | BPDA Board Approved |
| | BPDA Design Approved | Under Construction | Construction Completed: |

| | |
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| Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain. | No |

## 2. Building Classification and Description:

*This section identifies preliminary construction information about the project including size and uses.*

What are the dimensions of the project?

| | | | |
|---|---|---|---|
| Site Area: | *10,000 SF* | Building Area: | *81,000 GSF* |
| Building Height: | *150 FT.* | Number of Stories: | *7 Flrs.* |
| First Floor Elevation: | 16.5 FT BCB | Is there below grade space: | *Yes* |

| | | | | |
|---|---|---|---|---|
| What is the Construction Type? (Select most appropriate type) | | | | |
| | Wood Frame | Masonry | **Steel Frame** | Concrete |
| What are the principal building uses? (IBC definitions are below – select all appropriate that apply) | | | | |
| | Residential – One - Three Unit | Residential - Multi-unit, Four + | **Institutional** | Educational |
| | Business | Mercantile | Factory | Hospitality |
| | Laboratory / Medical | Storage, Utility and Other | | |
| List street-level uses of the building: | *Loading Docks, Clinical Support Services, Entry Lobby for Staff Office* | | | |

## 3. Assessment of Existing Infrastructure for Accessibility:

*This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.*

| | |
|---|---|
| Provide a description of the neighborhood where this development is located and its identifying topographical characteristics: | The Project is located on MGH's Main Campus in the West End of Boston. To the east and west of the Main Campus are other institutional, research, medical and commercial uses. To the north and south are mainly residential uses with open spaces and some commercial spaces. |
| List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops: | The Charles/MGH Station on the MBTA Red Line is less than 1,000 feet from the site. |
| List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others: | Massachusetts General Hospital, Massachusetts Eye and Ear, Shriners Hospitals for Children – Boston, Boston Children's School, Torit Montessori |
| List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities: | Department of Mental Health, Thoreau Path, Lederman Park |

## 4. Surrounding Site Conditions – Existing:

*This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*

| | |
|---|---|
| Is the development site within a historic district? ***If yes,*** identify which district: | No |
| Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the | Yes, vary from fair to poor. All immediately adjacent will likely be replaced. |

| | |
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| development site: | |
| Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos: | No |
| 5. Surrounding Site Conditions – Proposed<br>*This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.* | |
| Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard. | The proposed sidewalks will be consistent with the Boston Complete Street Guidelines to the extent feasible based on the preliminary determination of Neighborhood Connector and Neighborhood Residential street-types. |
| What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone: | Blossom Street: 2' Frontage Zone, 6' Pedestrian Zone, 4' Furnishing Zone<br>Parkman Street: 2' Frontage Zone, 5' Pedestrian Zone, 3' Furnishing Zone |
| List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way? | Pedestrian zone will be city standard concrete. Materials of other zones will be determined in consultation with the BPDA. |
| Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be? | No |
| If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)? | Yes |
| Will any portion of the Project be going | Yes. Pedestrian easement, specific repair, vertical discontinuance, |

| | |
|---|---|
| through the PIC? ***If yes,*** identify PIC actions and provide details. | temporary earth support. |
| **6. Accessible Parking:**<br>*See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*. | |
| What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage? | Parking will be accommodated in existing parking garages and within the proposed Clinical Building. |
| What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle? | Parking will be accommodated in existing parking garages and within the proposed Clinical Building. |
| Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need? | No |
| Where is the accessible visitor parking located? | Within the Main Campus parking garages. |
| Has a drop-off area been identified? ***If yes,*** will it be accessible? | No drop-off identified, drop-off will be accommodated in the proposed Clinical Building |
| **7. Circulation and Accessible Routes:**<br>*The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors*. | |
| Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator: | Flush condition at each entry |
| Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no,*** what is the reason? | Yes |

| | |
|---|---|
| ***If project is subject to Large Project Review/Institutional Master Plan,*** describe the accessible routes way-finding / signage package. | Signage will be developed as the design progresses. |
| **8. Accessible Units (Group 2) and Guestrooms: (If applicable)**<br>*In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.* | |
| What is the total number of proposed housing units or hotel rooms for the development? | |
| ***If a residential development,*** how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units? | |
| ***If a residential development,*** how many accessible Group 2 units are being proposed? | |
| ***If a residential development,*** how many accessible Group 2 units will also be IDP units? ***If none***, describe reason. | |
| ***If a hospitality development,*** how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? ***If yes,*** provide amount and location of equipment. | |
| Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes,*** provide reason. | |
| Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? ***If yes,*** describe: | |

| 9. Community Impact:<br>*Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.* | |
|---|---|
| Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives? | The improvements to be provided will be determined through coordination with the BPDA and the Task Force. |
| What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs<br>in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility? | No common or social spaces are proposed. |
| Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? ***If no***, explain why not. | No common public spaces will be provided |
| Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments? | No |
| Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible? | No |
| 10. Attachments<br>*Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this* | |

| |
|---|
| *project.* |
| Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. |
| Provide a diagram of the accessible route connections through the site, including distances. |
| Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) |
| Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. |
| Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project.<br>• <br>• <br>• <br>• |

This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

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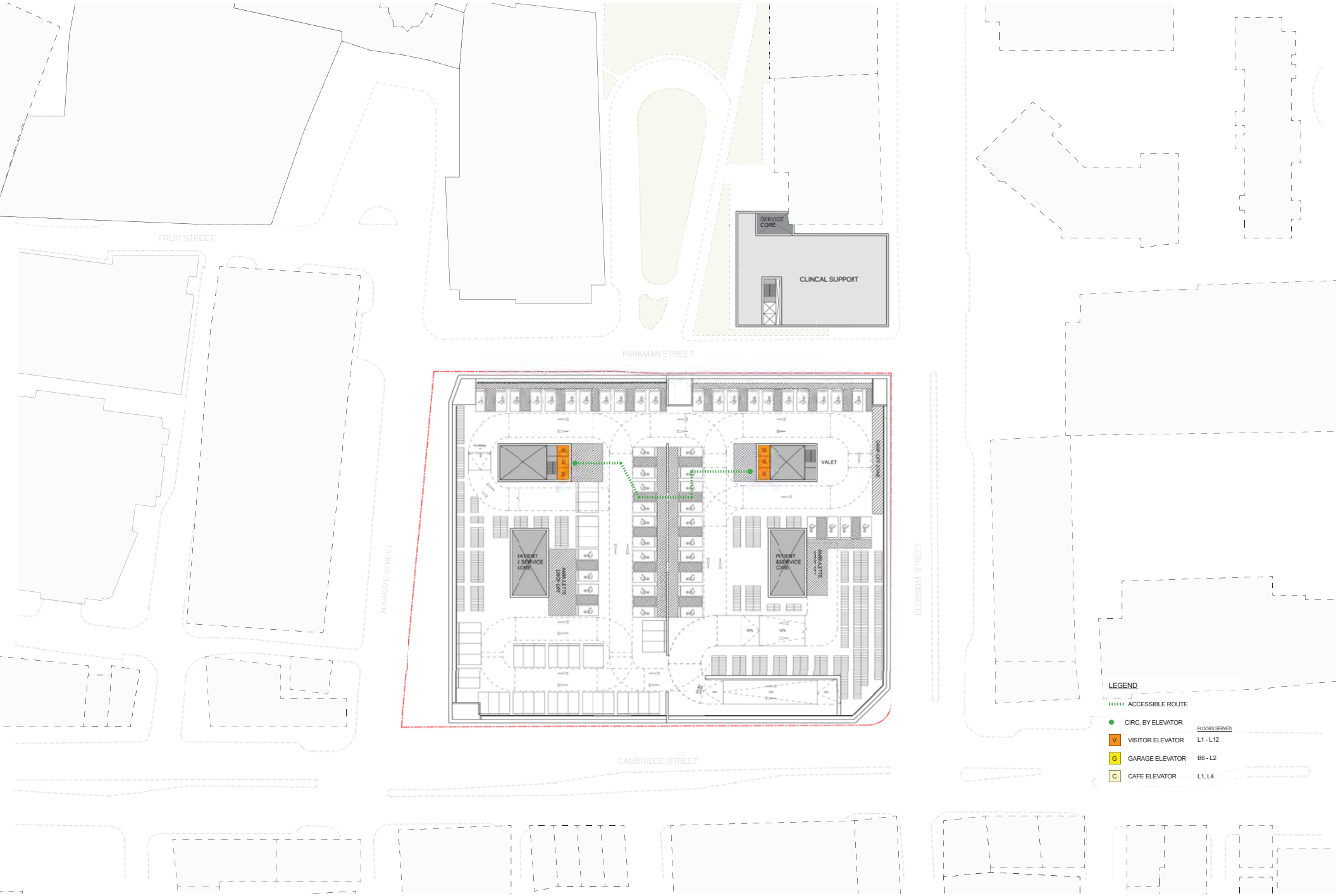
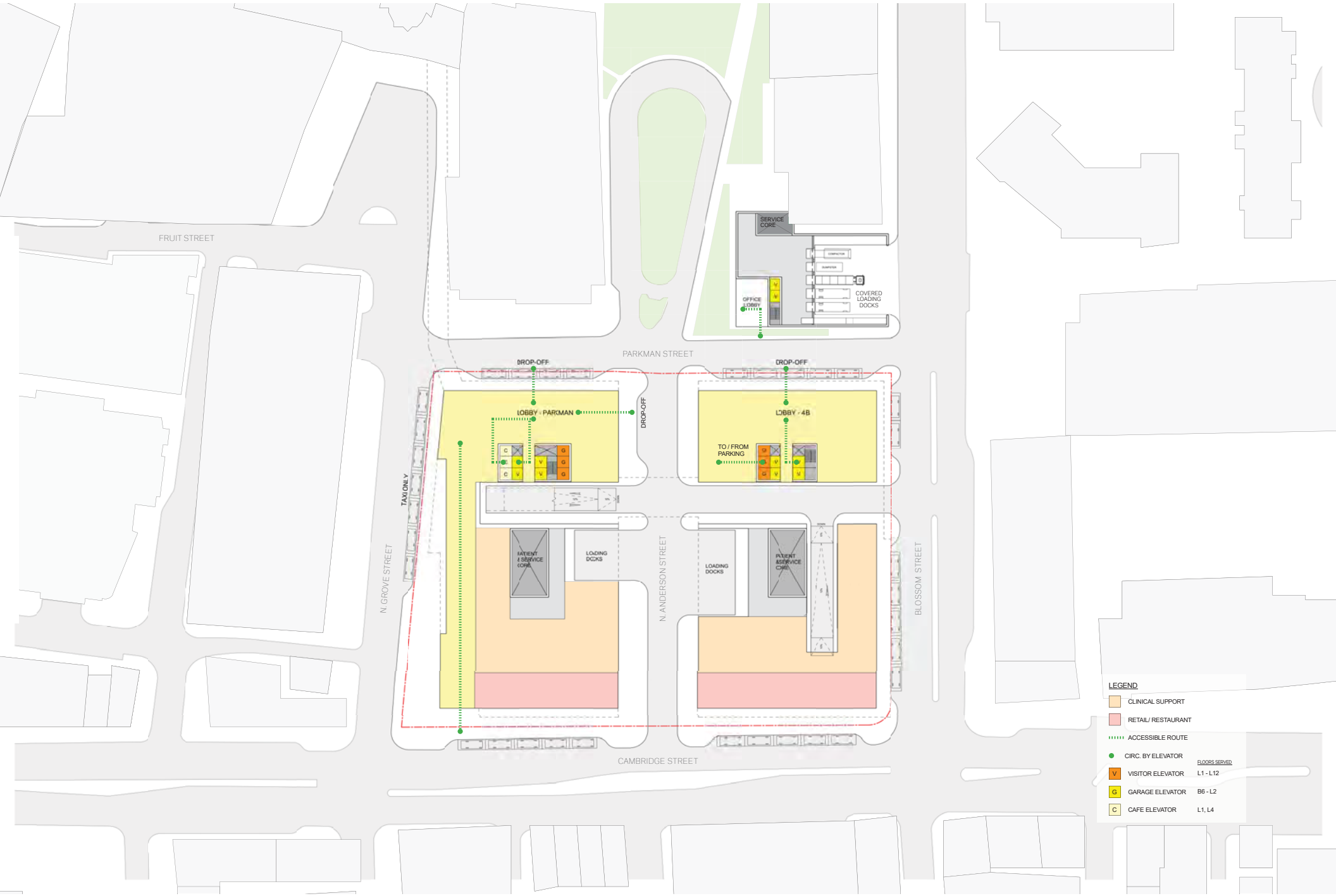

FRUIT STREET
SERVICE CORE
CLINCAL SUPPORT
PARKMAN STREET
VALET
PATIENT & SERVICE CORE
PATIENT & SERVICE CORE
N GROVE STREET
BLOSSOM STREET
CAMBRIDGE STREET
LEGEND
ACCESSIBLE ROUTE
CIRC. BY ELEVATOR
FLOORS SERVED
V VISITOR ELEVATOR L1 - L12
G GARAGE ELEVATOR B6 - L2
C CAFE ELEVATOR L1, L4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COMPACTOR
DUMPSTER
OFFICE LOBBY
COVERED LOADING DOCKS
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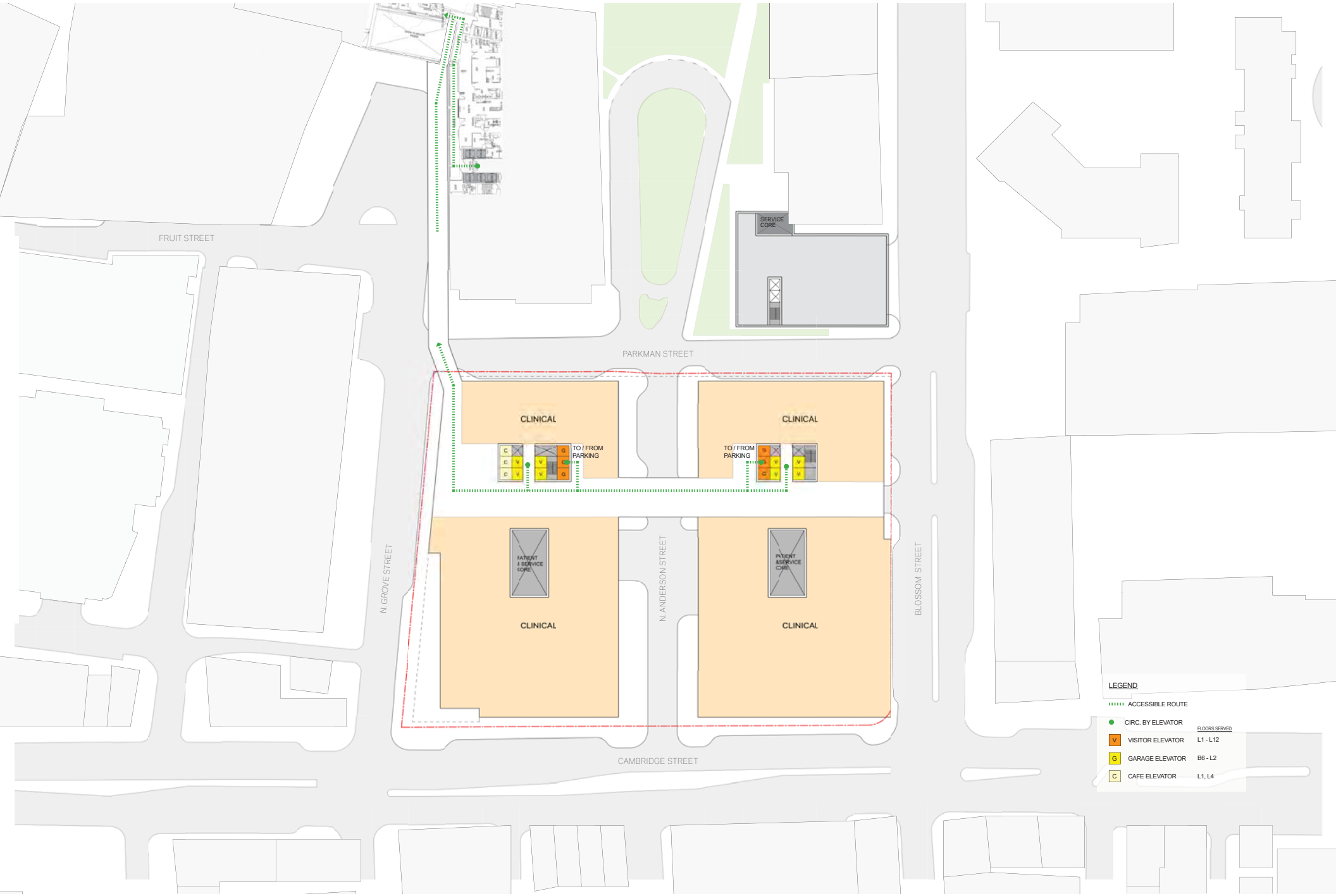
DROP-OFF
DROP-OFF
LOBBY - PARKMAN
LOBBY - 4B
TO / FROM PARKING
TAXI ONLY
N. GROVE STREET
PATIENT & SERVICE CORE
LOADING DOCKS
N. ANDERSON STREET
LOADING DOCKS
PATIENT & SERVICE CORE
BLOSSOM STREET
CAMBRIDGE STREET
LEGEND
CLINICAL SUPPORT
RETAIL/ RESTAURANT
ACCESSIBLE ROUTE
CIRC. BY ELEVATOR
FLOORS SERVED
VISITOR ELEVATOR L1 - L12
GARAGE ELEVATOR B6 - L2
CAFE ELEVATOR L1, L4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TO / FROM PARKING
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N. ANDERSON STREET
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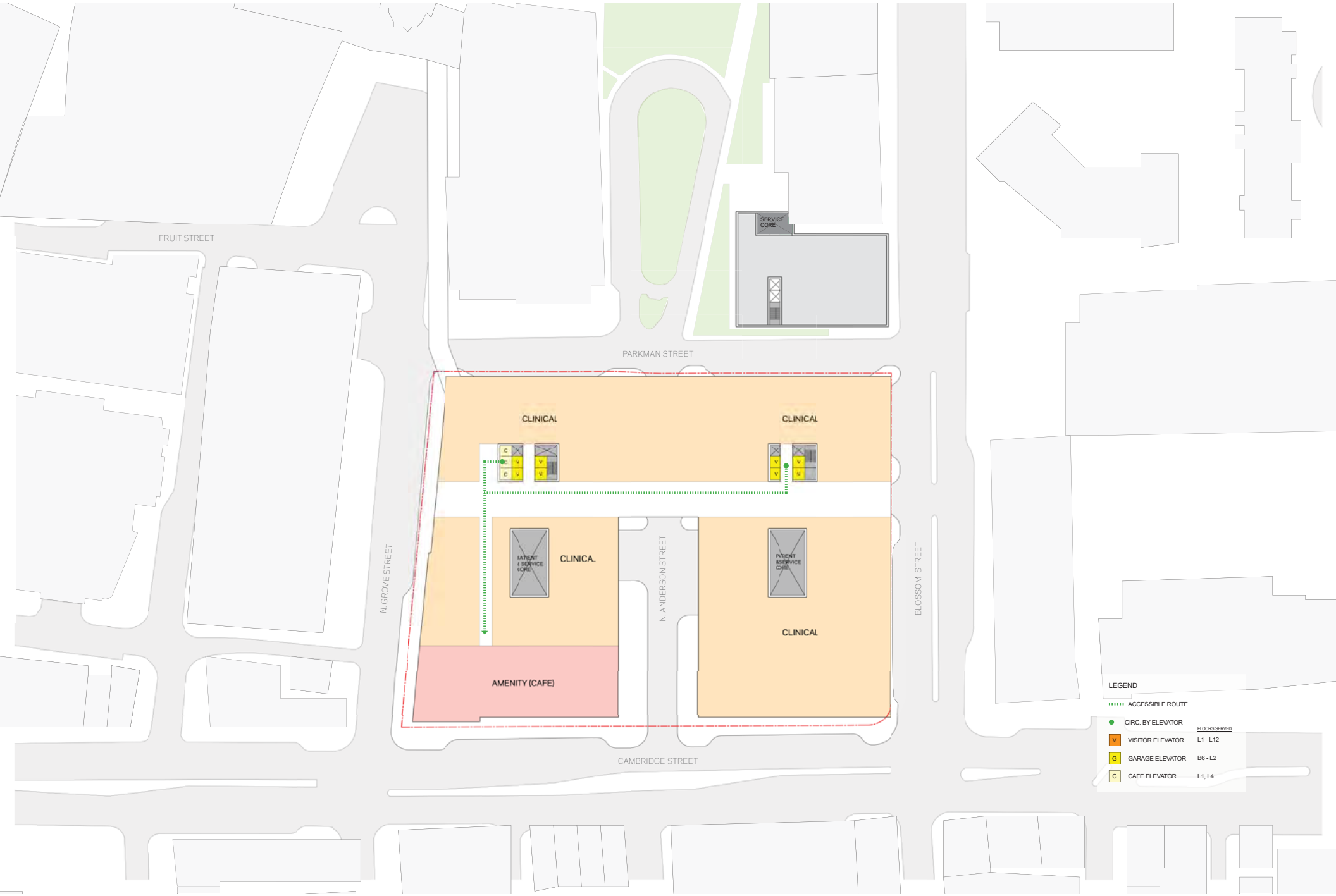
C CAFE ELEVATOR L1, L4


FRUIT STREET
SERVICE CORE
PARKMAN STREET
CLINICAL
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CLINICAL
AMENITY (CAFE)
N. GROVE STREET
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