Institutional Master Plan 2021-2031
Boston Medical Center

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SUBMITTED TO:
Boston Planning and Development Agency
One City Hall Square
Boston, MA 02201

Submitted pursuant to Article 80D of the Boston Zoning Code

SUBMITTED BY:
Boston Medical Center Corporation
One Boston Medical Center Place
Boston, MA 02118

PREPARED BY:
Stantec
226 Causeway Street, 6th Floor
Boston, MA 02114
617.654.6057

IN ASSOCIATION WITH:
Tsoi-Kobus Design
VHB
DLA Piper

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1.0 OVERVIEW

1.1 Introduction

Boston Medical Center (BMC) is a private, not-for-profit, 514-licensed-bed, urban academic medical center located in Boston's Historic South End. BMC emphasizes community-based, accessible care and the mission to provide consistently accessible health services to all in need of care regardless of status and ability to pay. The primary teaching affiliate for Boston University School of Medicine, BMC is the largest safety net hospital and busiest trauma and emergency services center in New England. BMC provides a full spectrum of pediatric and adult care services from primary to family medicine to advanced specialty care.

The BMC campus is currently guided by an Institutional Master Plan (IMP) as previously approved by the Boston Redevelopment Authority (BRA), now the Boston Planning and Development Agency (BPDA). On November 20, 2019, BMC initiated the Article 80 IMP review process with the submission of an Institutional Master Plan Notification Form (IMPNF). The BPDA issued the Scoping Determination on January 8, 2020. Subsequently, the IMP review process was postponed due to the significant impact of the COVID-19 pandemic.

Pursuant to Section 80D-8 of the Boston Zoning Code (the Code) and the BPDA Scoping Determination dated January 8, 2020, Boston Medical Center Corporation (the Proponent), is submitting this Institutional Master Plan (IMP) to resume the BPDA Article 80 IMP review process for the 2021-2031 Institutional Master Plan for the BMC campus. A copy of the BPDA Scoping Determination is included in **Appendix C**.

Figure 1-1 illustrates the general location of BMC's campus.

1.2 Institutional Master Plan History

On May 18, 2000, the BRA, now the BPDA, approved the Boston University Medical Center (BUMC) IMP jointly filed by BMC and Boston University (BU). The BUMC IMP described the two institutions' shared objectives, existing property, and future development plans over a ten-year term. During the first ten-years, IMP Amendments, Notices of Project Change (NPC), and proposals for small additions and rehabilitation projects were approved. The most significant of these were the rehabilitation of the Surgical Building, the replacement of the approved Medical Services Center with the new Moakley Building, and the new Shapiro Ambulatory Care Center.

On July 16, 2009, the 2000 IMP was renewed for a two-year term including a minor expansion to the Menino Pavilion Emergency Department. On January 12, 2010, the BRA approved an IMP Amendment for BU's addition of the Albany Fellows Site and Graduate Student Housing Project. On June 22, 2010, the BRA approved the renewal of the 2010 IMP which included three proposed institutional projects by BMC, including the Energy Facility, the New Administration/Clinical Building, and the demolition of the Dowling Building to be replaced by the New Inpatient Building. In December 2013, the BRA approved the first IMP Amendment to the 2010 IMP. The most significant of the changes were to construct the New Inpatient Building in two phases, the addition of a Patient Transport and Materials Handling Bridge to replace the yellow utility tube, and a small addition to the Moakley Building. In August 2017, the BRA approved the second IMP Amendment for BU's renovation and expansion of the Goldman School of Dental Medicine (GSDM).

The 2000 IMP and 2010 IMP Renewal, and associated IMP Amendments, were joint submissions with the Trustees of Boston University (BU). Following the approval of the 2017 IMP Amendment, and consultations with the BPDA, BMC and BU determined that developing separate IMPs better serve the community and each institutions' unique needs and individual missions. While separate IMPs will be created for the BMC campus and the BU Medical Campus, both institutions remain partners in some instances regarding area planning and will continue to cooperate on Transportation Demand Management and Parking efforts.

A detailed history of prior IMP approvals is provided as **Appendix A**.

1.3 Progress on Approved 2010-2020 IMP Projects

The following projects were approved in the 2010 IMP, and subsequent amendments thereto. Below is the status of the 2010 IMP projects. The approved New Administration / Clinical Building and the approved New Inpatient Building Phase 2 are included in the new 2021-2031 IMP for zoning purposes and are expected to be executed toward the end of the ten-years. **Figure 1-2** shows the Approved 2010 IMP Projects.

- **Energy Facility**

  The new Energy Facility was replaced by the 2-megawatt co-generation plant on the Yawkey Ambulatory Care Center roof. The co-generation plant was completed in April 2017. The co-generation plant is a redundant source of heat and power for BMC's clinical core within the Menino Pavilion campus. The overall program of Energy Efficiency (See **Section 7.1.2**) work that BMC has undertaken has resulted in an approximately 40% reduction in its campus electric consumption. BMC does not have plans to proceed with the new Energy Facility project.

- **Moakley Cancer Care Center Addition**

  The Moakley Cancer Care Center Addition was completed in April 2016. This project was the enabling project for the 2010 IMP projects. It houses departments displaced by the expanded Emergency Department and Trauma Center and the Centralized Surgical Department included in the New Inpatient Building Phase 1 and accommodated an increase for outpatient care.

- **New Inpatient Building Phase 1**

  The New Inpatient Building Phase 1 was completed December 2018. It included the demolition of a portion of the Dowling Building. This phase was the critical step to modernizing critical care areas and allowing for the consolidation of multiple departments within the Menino Pavilion relocated from the now sold Newton Pavilion (the east clinical campus). These departments included the Emergency Department and Trauma Center, Main Radiology Department, Surgical Department and Interventional Procedures, and Intensive Care Unit beds.

- **Patient Transport and Materials Handling Bridge**

  The Patient Transport and Materials Handling Bridge was completed in October 2016 for materials transport and in October 2017 for patient transport. This bridge replaced the yellow utility tube that formerly spanned Albany Street. This project eliminated patient transfer by ambulance between the helipad and the Emergency Department and enabled the central loading and service operations to be relocated in the interim to the Power Plant. The result is significant traffic improvements along Albany Street and a transformation of the look and experience of the Albany Street corridor.

- **New Administration / Clinical Building**

The approved Administration / Clinical Building is approximately 219,000 s.f. and will be constructed on the surface lot located on the north side the Power Plant. This will necessitate the demolition of the Power Plant. This new building will enable the relocation of remaining clinical administrative space from the Dowling Tower (the remaining portion of the Dowling building) which needs to be demolished to construct the New Inpatient Building Phase 2. The New Administration / Clinical Building will enable the loading dock to move to its final location, from the front of the Power Plant, to the rear of the new building. A new below-grade tunnel will be constructed beneath Albany Street to transport materials between the Menino Pavilion and the south side of Albany Street. BMC expects to move forward with this project towards the end of the ten-year term of the 2021-2031 IMP.

- **New Inpatient Building Phase 2**

  The approved Inpatient Building Phase 2 is approximately 323,000 s.f. and will be constructed on the site of the Dowling Tower to connect to the recently completed Inpatient Building Phase 1. Phase 2 will necessitate the demolition of the Dowling Tower at the corner of Massachusetts Avenue and Albany Street. Phase 2 was planned as part of the Phase 1 design and construction to allow the future expansion and continuity of critical care space including inpatient beds, imaging, surgery, and other support functions as inpatient volume increases. BMC expects to move forward with this project towards the end of the ten-year term of the 2021-2031 IMP.

1.4 Goals and Objectives for the 2021-2031 IMP

Following the approval of the 2010 IMP, the healthcare environment continued to dramatically change. In 2018, BMC became a Boston Accountable Care Organization (BACO) (See **Section 2.1.6**). To succeed in this new coordinated care model, which has created a higher demand for BMC's services, while the patient population has increased, BMC must focus on addressing evolving healthcare program needs which require strategic space modifications to:

- Accommodate the increase in outpatient and inpatient volume.
- Redesign healthcare models to integrate medical, behavioral, and social needs of its patients.
- Right size and modernize clinical space to meet current building code and clinical standards.
- Leverage the highest and best use of building resources, owned and leased.

For the upcoming IMP term, BMC expects to pursue the following projects in addition to the approved New Administration / Clinical Building and the approved New Inpatient Building Phase 2:

- Construct approximately 15,500 s.f. addition to Yawkey 6th Floor to right-size inpatient space.
- Construct approximately 6,100 s.f. addition to Menino & Yawkey Lobby to improve patient and visitor circulation.
- Construct approximately 37,000 s.f. addition to Menino 9th Floor to right-size inpatient space.
- Construct approximately 170,000 s.f. new 10 Stoughton Street Building for research.
- Adaptively reuse and renovate approximately 102,000 s.f. Collamore/Old Evans for mixed-use housing, including supportive housing.
- Vacate approximately 110,000 s.f. of leased space.
- Demolish approximately 250,000 s.f. of deficient/unsuitable facilities.
- Potentially Acquire or Lease approximately 75,000 s.f. in Northampton Square.

In response to the BPDA Scoping Determination and the impacts of COVID-19 since submission of the IMPNF, BMC's proposed program of strategic building additions, existing building renovations, and new construction projects over the next ten-years reflect the changes outlined below:

- Remove proposed new Administration/Clinical Building proposed at the Ramp Parcel site - BMC listened to the feedback from the Task Force and neighbors and will not pursue a new building at this location.

- Change use of proposed 10 Stoughton Street from Administration to Research – This new building would provide an alternate location for computational research originally proposed for the Ramp Parcel. In addition, COVID-19 has demonstrated a reduced need for new administration use and the need to provide research programs (clinical-based and laboratory-based) that adequately represent BMC's patient population.

- Change use of existing Collamore / Old Evans from Administration to Mixed Use & Supportive Housing – Providing an innovative housing program that addresses one of BMC's five health priorities to improve access to safe and affordable housing options and establish supportive pathways to BMC's healthcare services. Further, COVID-19 has demonstrated the full depth of disparities that exist for BMC's patient population with lack of access to housing stability.

- Change Yawkey 6th Floor Addition from Outpatient Clinical to Inpatient Clinical – BMC has decided to relocate Women's Health to the existing Shapiro Ambulatory Clinical Center and use the Yawkey 6th Addition to address the increasing acute and complex needs of its adult patients in single bed rooms.

- Include intent to Acquire or Lease portions of Northampton Square during the term of the IMP – This may be an alternate location for outpatient clinical use originally proposed for the Ramp Parcel and to accommodate the relocated administration uses from Collamore / Old Evans. In any agreement reached with the City, BMC would commit to locate its Public Safety Headquarters on the 2nd floor of the commercial storefronts along Massachusetts Avenue, as well as revitalize the commercial storefronts along Massachusetts Avenue and maintain community access and use of the gym and the pool.

1.5 A Measured Approach to Campus Growth and Sustainability

BMC was incorporated as a Massachusetts charitable corporation July 1, 1996 with the merger of Boston City Hospital, Boston Specialty and Rehabilitation Hospital, and the Boston University Medical Center Hospital, referred to as University Hospital. In addition to the challenges of delivering care in existing aging and deficient buildings, the physical remnants of the merger left BMC with inefficient operational challenges by having two clinical zones on the east and west ends of the campus.

BMC has undertaken a measured program of renovation and new construction to ensure its sustainability as an academic medical center. Since 2000, BMC has continually worked to "right-size" its campus to match the ever-evolving healthcare landscape through a dedicated approach to careful building resource planning and site planning. This planning approach has focused on maximizing use of existing building square footage with strategic renovations and additions, adaptively reusing historic buildings for non-clinical uses, and carefully aligning uses that need to be on campus and those that can be off campus. BMC has reserved building new facilities where existing building resources prove to be deficient or significant changes in patient volume demand it.

One of the major goals and objectives executed under the 2010 IMP was consolidating two clinical campuses to create a new clinical core to the west. This established centralized services and complementary use adjacencies that drove operational efficiency. Furthermore, this positioned BMC to better serve its patients in a new healthcare environment that demands cost containment. The actions executed under BMC's prior IMP resulted in significant campus plan improvements, transportation management strategies, and the "greening" of its campus to ensure minimal negative effects on neighbors. This also resulted in a decrease in BMC's total approved IMP campus square footage.

The strategic space modifications outlined in the 2021-2031 IMP include a combination of small building additions, existing building renovations, and one newly proposed building volume. In addition to the approved 2010 IMP projects, these modifications are proposed over a ten-year timeframe. For the most part, BMC is updating and replacing space with uses that already exist on campus but need to be "right-sized".

As BMC looks forward to a new decade, it will continue the measured approach to campus growth. BMC's IMP modestly adds approximately 411,482 square feet of net new building space over ten-years. If BMC constructs all the proposed projects and acquires or leases portions of Northampton Square (approximately 75,000 s.f. included below), the total IMP campus square footage will still be below the previously approved IMP campus square footage.

♦ 2010 – 2020 Approved IMP Square Footage	2,760,000 s.f.
♦ 2021 – 2031 Proposed IMP Square Footage	2,433,000 s.f.
Net Change	***(327,000) s.f.***

As a result of BMC's ongoing successful transportation management strategies, there will be minor traffic changes to area Level of Service intersection conditions resulting in little to no impact associated with the new IMP projects over the 2021-2031 IMP.

1.6 Public Review Process

The Proponent has met with members of the BPDA throughout the planning process and held meetings with the Boston Civic Design Commission, representatives of the South End Landmark District Commission, and the Boston Transportation Department.

Additionally, the Proponent has met with the Task Force designated for the BMC IMP and the public. BMC is committed to an open and inclusive process and will continue to seek input from community representatives, elected officials, neighbors, stakeholders, and the public.

Below is a summary of the public process to date.

➢ Submitted Letter of Intent (LOI)	October 9, 2018
➢ Task Force Meeting #1	November 18, 2019
➢ Submitted IMPNF	November 20, 2019
➢ BPDA City Agency Scoping Session	December 6, 2019
➢ Task Force Meeting #2	December 11, 2019
➢ BPDA Sponsored Public Meeting	December 11, 2019
➢ BCDC Presentation	January 14, 2020

- Boston Transportation Department — February 20, 2020
- South End Landmarks District Commission Staff — February 27, 2020
- Boston Planning & Development Agency — January 29, 2021

1.7 Summary of IMP Public and Community Benefits

BMC will continue its dedicated approach to careful building resource planning and site planning to sensitively maintain the integrity of the urban fabric and the surrounding neighborhoods while continuing to refine a sense of campus and meet the institution's primary mission of healing. Ongoing planning initiatives through the 2021-2031 IMP will include contributions to improving transportation and pedestrian access and circulation, as well as ways to activate ground level retail where feasible in collaboration with neighbors.

In summary, the 2021-2031 IMP projects will allow BMC to:

- Reconfigure internal front hospital entry drop off to reduce spill back onto Harrison Avenue.
- Incorporate a landscaping buffer at the pylon sign at the corner of Massachusetts Avenue and Harrison Avenue.
- Perform historic rehabilitation, renovation, and adaptive reuse of Collamore and Old Evans.
- Support BioSquare Drive access for Exchange South End which will keep additional traffic off Albany Street.
- Support I-93 SB Frontage Road Connection which will keep additional traffic off Albany Street.
- Contribute to the City's Albany Street Redesign / South Bay Harbor Trail.
- Contribute to the City's multi-modal improvements for Massachusetts Avenue.
- Introduce street level retail where feasible with future IMP projects in consideration of neighborhood's input.

Furthermore, Economic Benefits associated with the new IMP projects strengthen BMC's ability to remain in operation which includes adding jobs, providing health care to the city's most vulnerable and underserved patient population, and providing education opportunities and training programs, all of which are directed to City of Boston residents and school children.

Figure 1-1 BMC Campus Plan and IMP Area

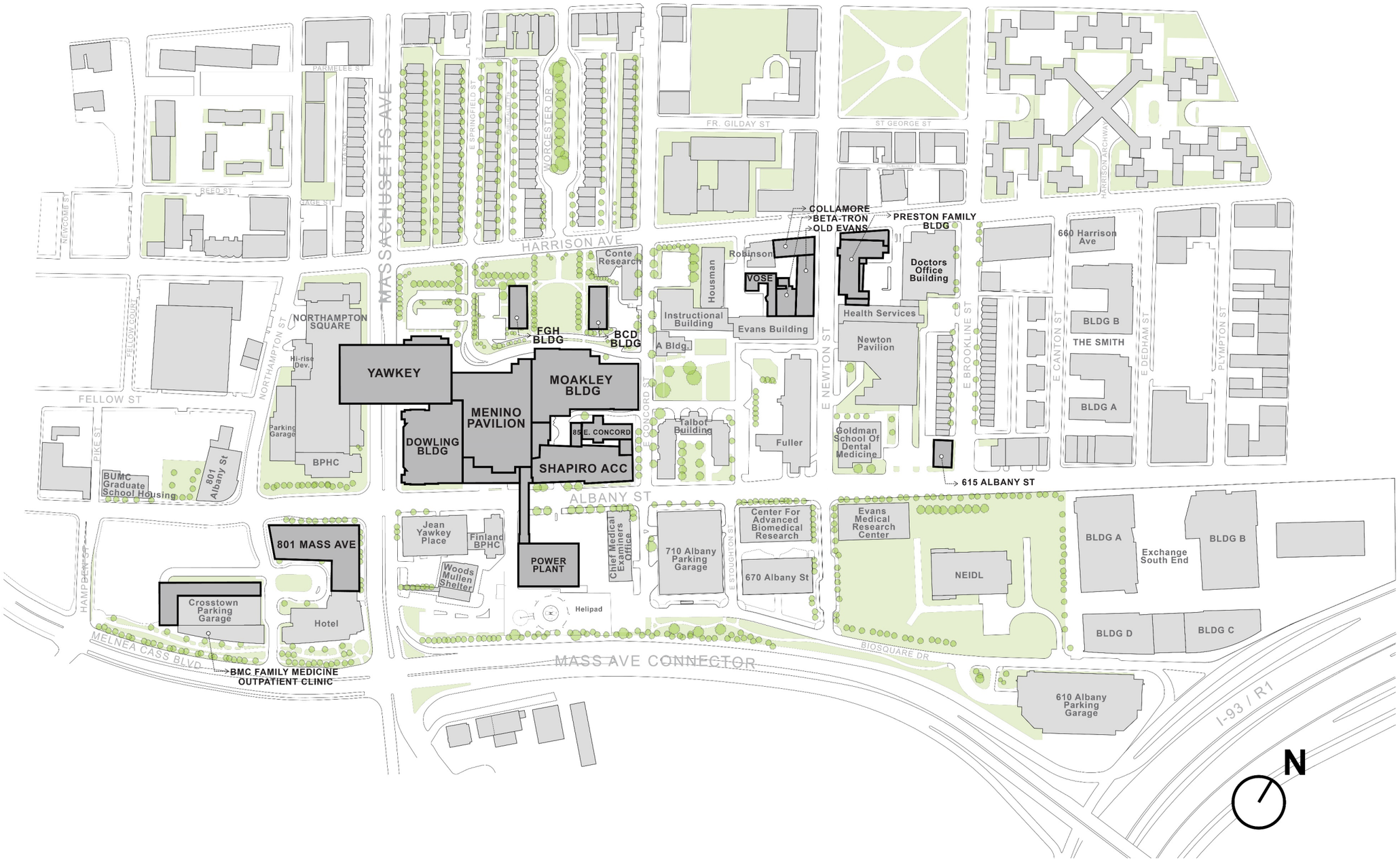
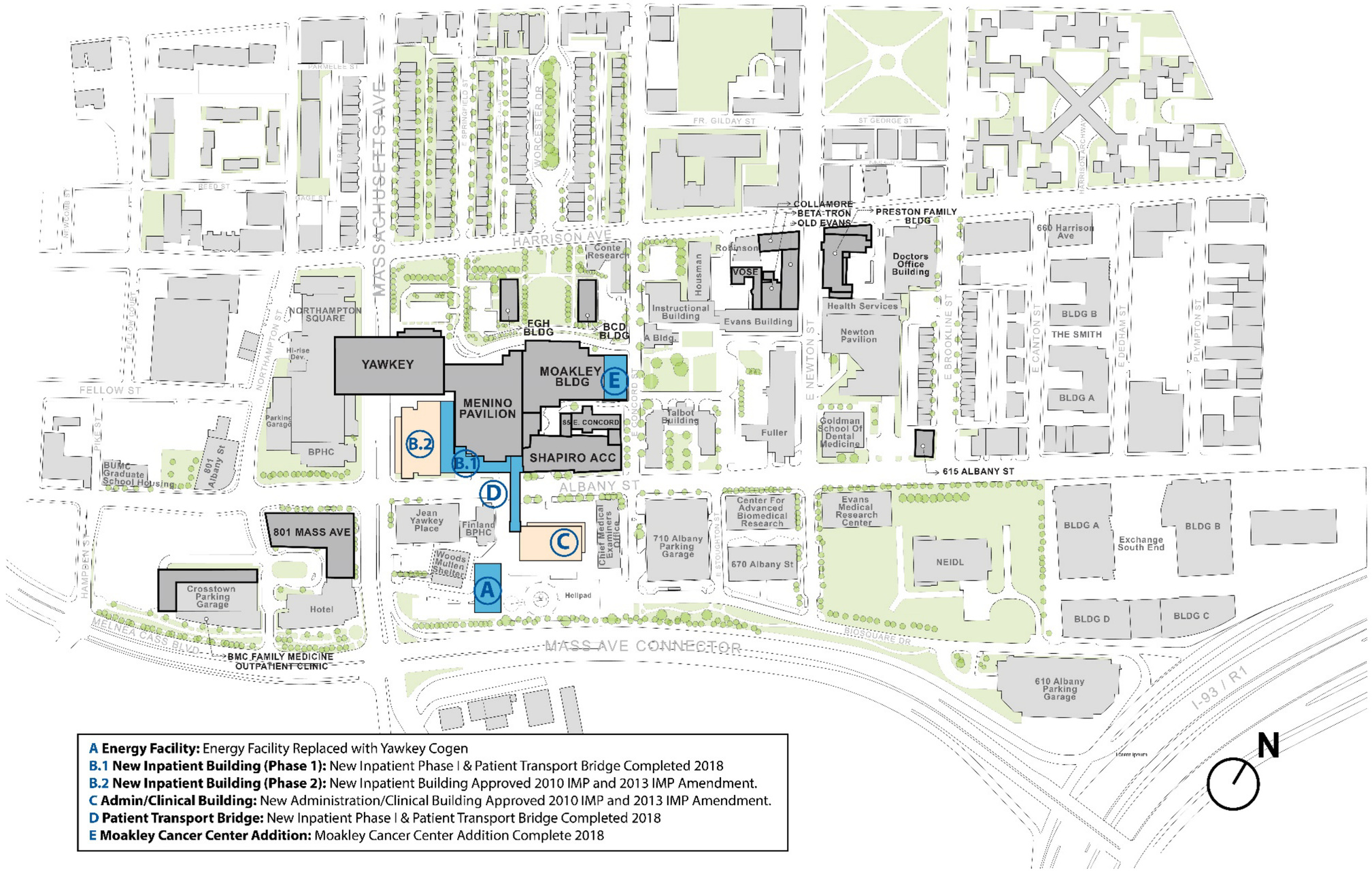


Figure 1-2 Approved 2010 IMP Projects



A Energy Facility: Energy Facility Replaced with Yawkey Cogen
B.1 New Inpatient Building (Phase 1): New Inpatient Phase I & Patient Transport Bridge Completed 2018
B.2 New Inpatient Building (Phase 2): New Inpatient Building Approved 2010 IMP and 2013 IMP Amendment.
C Admin/Clinical Building: New Administration/Clinical Building Approved 2010 IMP and 2013 IMP Amendment.
D Patient Transport Bridge: New Inpatient Phase I & Patient Transport Bridge Completed 2018
E Moakley Cancer Center Addition: Moakley Cancer Center Addition Complete 2018

1.8 Project Team

Project Name:	Boston Medical Center Institutional Master Plan
Address/Location:	The BMC main campus is located in Boston's South End, generally bound by Harrison Avenue, East Newton Street, Albany Street and Massachusetts Avenue. The campus is comprised of 18 BMC-owned or controlled buildings, and a helipad. BMC also leases space in 5 buildings located on and/or proximate to campus.
Proponent:	Boston Medical Center Corporation 750 Albany Street, 1st Floor Boston, MA 02118 617.414.2110 Robert Biggio, Senior Vice President, Facilities and Support Services Brendan Whalen, Senior Director, Design and Construction
Project Manager and Permitting Consultant:	Stantec Consulting Services, Inc. 226 Causeway Street, 6th Floor Boston, MA 02114 617.654.6057 Kristi Dowd, Principal Alison LeFlore, Senior Planner
Architect:	Tsoi/Kobus Design 60 State Street Boston, MA 02109 617.475.4000 Rick Kobus, Senior Principal
Transportation Consultant:	VHB 99 High Street, 10th Floor Boston, MA 02110 617.728.7777 Sean Manning, Director of Transportation Planning and Operations Matthew Duranleau, Project Consultant
Legal Counsel:	Boston Medical Center Corporation Counsel DLA Piper 33 Arch Street, 26th Floor Boston, MA 02110 617.406.6057 John Rattigan, Managing Partner Mark Tang, Partner

2.0 MISSION AND OBJECTIVES

At Boston Medical Center, all are welcome and treated equally. The best and brightest physicians, representing virtually every medical specialty, choose to work here for the opportunity to make a difference in their community and beyond. Unwavering in its commitment to the community, BMC is a private, not-for-profit, 514-licensed-bed, academic medical center located in Boston's historic South End. The hospital is the primary teaching affiliate for Boston University School of Medicine. BMC is the largest safety net hospital and busiest trauma and emergency services center in New England. The Emergency Department had 139,577 visits in 2019.

The mission of BMC is “to provide consistently excellent and accessible health services to all in need of care regardless of status or ability to pay” – exceptional care, without exception.

2.1 Objectives

2.1.1 Patient Care

With more than 25,816 admissions and 1,077,630 patient visits in 2019, BMC provides a comprehensive range of inpatient, clinical, and diagnostic services in more than 70 areas of medical specialties and subspecialties, including cardiac care and surgery, hypertension, neurological care, orthopedics, geriatrics, pediatrics, and women’s health.

Unwavering in its commitment to serve the community, BMC is dedicated to providing accessible health care. Approximately 57% of BMC patients come from underserved populations, such as the low-income and elderly, who rely on government payers such as Medicaid, the Health Safety Net, and Medicare for their coverage, and 32% do not speak English as a primary language.

Through its commitment to serve everyone, BMC offers numerous outreach programs and services such as Health Screenings, Smoking Cessation, Preventive Food Pantry, and Interpreter Services in over 250 Languages, 24 hours a day.

BMC physicians are leaders in their fields with the most advanced medical technology at their fingertips and working alongside a highly skilled nursing and professional staff. No matter who you meet at BMC – from the x-ray technologist to the critical care nurse, the admissions staff to the chief of surgery – everyone is committed to providing quality care to every patient and family member with respect, warmth, and compassion.

BMC’s goal is not only to treat disease, but to question why it persists. Keeping people healthy is no longer about treating acute and chronic disease over and over again; a model in which people spend too much time at the doctors and costs rise.

BMC knows that for many, medical issues exist because of a lack of employment, income, stable housing or food, and limited education. These are sometimes called "root causes upstream" and the health issues they lead to are known as "downstream consequences." BMC is now intervening at the upstream, in order to affect the downstream disease and instability it sees in its clinics and hospital every day.

To do this, BMC is working with its partners in the community and leveraging its collective resources and expertise to break down the structural barriers its patients face and improve things like access to

employment, food, and stable housing. BMC's goal is to help economically stimulate neighborhoods to transform where its patients live and work into sustainable, vibrant communities.

2.1.2 Teaching

As the principal teaching affiliate of Boston University School of Medicine, BMC is devoted to training future generations of healthcare professionals. Every member of the hospital's medical and dental staff holds an academic appointment at the Boston University School of Medicine or at the Boston University Goldman School of Dental Medicine. BMC operates 66 residency training programs and 711 resident and fellowship positions.

2.1.3 Research

BMC is a recognized leader in groundbreaking medical research. BMC is the 15th largest recipient of funding in the U.S. from the National Institutes of Health among independent hospitals. BMC received more than $165 million in budgeted sponsored research funding in 2019 and oversees 617 research and service projects separate from research activities at Boston University School of Medicine. The world-renowned researchers at BMC conduct both basic, laboratory-based biomedical research, and clinical research programs, including substance use disorder, violence intervention, infectious disease, cardiology, Parkinson's Disease, geriatrics, endocrinology, and hematology/oncology.

2.1.4 Boston HealthNet

Focusing strongly on urban health, BMC is a founder of Boston HealthNet, a network affiliation of the medical center, Boston University School of Medicine, and 14 community health centers. Established in 1995, Boston HealthNet is an integrated healthcare delivery system whose partners provide outreach, prevention, primary and specialty care, and dental services at sites located throughout Boston and in nearby communities. Physicians who practice at HealthNet locations provide a wide range of comprehensive healthcare services to adults and pediatric patients, with a focus on disease prevention and health education. Patients receiving primary care at HealthNet sites have access to highly trained specialists and cutting-edge technology at BMC while maintaining individualized and culturally sensitive care in their neighborhoods. In 2019, Boston HealthNet heath center patients accounted for 28 percent of outpatient visits and 35 percent of all inpatient admissions to BMC.

2.1.5 Boston Medical Center HealthNet Plan, Inc.

BMC HealthNet Plan (BMCHP) is a not-for-profit health maintenance organization founded in 1997 by BMC. BMCHP's Massachusetts business, BMC HealthNet Plan, serves over 313,377 members across the state through several product lines that include MassHealth (Medicaid, including CarePlus) and Qualified Health Plan. BMCHP also offers a senior care options plan for individuals age 65 and older who are also eligible for Medicaid.

Because of its ongoing commitment to quality, BMC HealthNet Plan's HMO has been awarded Excellent Accreditation status and is rated 4 out of 5 by the National Committee for Quality Assurance. BMC HealthNet Plan's Medicaid HMO also has been awarded Excellent status. In addition, BMC HealthNet Plan's Qualified Health Plan program has been awarded Accredited status from National Committee for Quality Assurance (NCQA), the highest accreditation level available at this time.

In New Hampshire, BMCHP does business as Well Sense Health Plan. More than 85,000 Medicaid recipients have joined Well Sense Health Plan since New Hampshire began offering managed care

coverage to Medicaid recipients in December 2013. Well Sense Health Plan's Medicaid HMO has received Commendable Accreditation status and is rated 4.5 out of 5 among Medicaid plans in the U.S. by the NCQA. Well Sense is the highest rated Medicaid plan in New Hampshire and one of the highest rated plans nationwide.

Comprehensive coverage for hospital, primary, specialty, and behavioral healthcare are among the benefits and services provided to all members. In addition, members receive extras beyond traditional benefits, such as free car safety seats and bike helmets for kids, manual breast pumps and dental kits (including electric toothbrush), access to a 24/7 Nurse Advice line, and reimbursements for Weight Watchers® and qualified gym memberships.

2.1.6 Boston Accountable Care Organization

BMC, along with its physician practices and BMC HealthNet Plan, is approved as its own Accountable Care Organization (ACO): Boston Accountable Care Organization (BACO). Three other health care organizations, Mercy Medical Center, Signature Healthcare, and Southcoast Health participate in BACO. As part of BACO, BMC receives a fixed amount of money to pay for the care of each MassHealth patient and is responsible for coordinating everything its patients need to stay healthy, both outpatient and inpatient services, as well as community-based services. The result will allow for improved ability to predict patients' health needs and provide more targeted care. BACO's mission is to improve the healthcare of the populations its network serves. Faithful to the spirit of partnership and innovation while fulfilling BMC's mission of Exceptional Care without Exception, the BACO will be a leader in the provision of patient care that:

- Improve its patients' experience of care;
- Improve the health of all patients served;
- Address the specific healthcare needs of vulnerable populations; and
- Reduce the costs of the healthcare it provides.

2.2 Guiding Principles and Planning Assumptions

2.2.1 Healthcare Trends

Several changes have occurred in the healthcare environment over the last ten-years. These changes are having a direct impact on BMC's patient volume and the space it requires to deliver the type of services needed. BMC's inpatient admissions and outpatient visits reflect these current healthcare trends. In general, BMC's patient population requires more services.

Patient Population Growth

BMC has experienced patient volume growth during its campus consolidation efforts alongside Boston's population growth. BMC's catchment area covers the majority of the city with patients coming from South End, Roxbury, Dorchester, South Boston, East Boston, Mattapan, and Roslindale. Since 2015, BMC's patient volume has grown annually. The average increase in inpatient admissions has risen steadily alongside Boston's population; BMC's average annual inpatient volume increase has been 2.10% (Boston's annual population increase has been 1.6%). The outpatient visit rates have increased significantly between 2017 and 2018 at 8.42%, with an average annual increase of 5.71% since 2015.

Accountable Care

In an effort to contain Massachusetts' Medicaid costs, given the state's Medicaid spending per beneficiary was higher than the national average, MassHealth introduced accountable care organizations in March 2018. Accountable Care Organizations (ACOs) are groups of doctors, hospitals, and other healthcare providers that share the goals of providing coordinated high-quality care to their patients, improving the population's heath, and controlling costs. The goal of coordinated care is to ensure that patients, especially the chronically ill, get the right care at the right time while avoiding unnecessary duplication of services and preventing medical errors. As discussed in **Section 2.1.6**, BMC is part of BACO. As result of becoming an ACO, BMC is seeing an increased demand for its services and is focused on developing ways to create models of care that reduce patient use of costly health care services.

Homelessness and Substance Use Disorder

Per the Department of Housing and Urban Development (HUD), the Massachusetts homeless rate has increased 14% from 2017 to 2018 as compared to the national average increase of 0.3%. According to the Massachusetts Department of Public Health (DPH), 2014 is the first year that opioid-related fatal overdoses in Massachusetts were more than twice the national average. In 2015, they were four times higher than in 2000. BMC is experiencing a corresponding high percent of patients who are homeless and/or have substance use disorders. More homeless patients have been admitted, which has a challenging impact on length of stay given their comorbidities, stressing the utilization of inpatient beds.

Health Equity

In accordance with the Centers for Disease Control (CDC), Health Equity is achieved when every person has the opportunity to "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances." Health inequities are reflected in differences in length of life, quality of life, rates of disease, disability, and death, severity of disease, and access to treatment.

BMC is working to intervene at the "root causes upstream", as noted in **Section 2.1.1**, to ensure its patient population will have an equal opportunity to live the healthiest life possible. Through increasing research and redesigning healthcare models that integrate medical, behavioral, and social needs of its patients, BMC will focus on the following priorities and actions:

- **Complex Chronic Diseases** – define a new model of care for complex disease management that improves health outcomes and reduces avoidable healthcare utilization.
- **Substance Use Disorders** – improve access to evidence-based substance use disorder treatment and harm and risk reduction services.
- **Mental Health Disorders** – integrate mental health services into primary care and expand access to mental health services throughout the community.
- **Housing Insecurity and Homelessness** – improve access to safe and affordable housing options and establish supportive housing interventions.
- **Other Key Social Determinants** – sustainably target key social determinants that negatively impact health outcomes in conjunction with community partners.

DPH Requirement for Constructing New Inpatient Beds

Continually evolving building codes and clinical space standards demand larger space to deliver the same care, particularly when it comes to inpatient beds. Since 2010, Department of Public Health (DPH) requirements as set forth in the Facilities Guidelines Institute (FGI) Guidelines for Design and Construction of Hospitals and Outpatient Facilities have required that all new inpatient beds be in single bed (private) rooms. BMC still has existing double bed (semi-private) rooms and will retain these in order to handle surge capacity in response to pandemics like COVID-19.

2.2.2 Campus Planning Challenges and Objectives

An Institutional Master Plan has been created that capitalizes on the work completed under the 2010-2020 IMP and continues a measured approach as discussed in **Section 1.5** of strategic space modifications to allow BMC to better serve its patients over the next ten-years in the new healthcare environment.

The following challenges play a role in addressing the Proponent's program needs:

- Building Age and Obsolescence;
- Campus Use Adjacencies;
- Traffic and Parking Demands;
- Open Space Preservation; and
- Energy Efficiency and Campus Resiliency.

The following planning drivers are critical to the successful realization of BMC's objectives:

- Leverage the highest and best use of its building resources, both owned and leased;
- Re-align clinical services to support integration of a coordinated care model;
- Right size and modernize clinical space for current building code, clinical standards
- Accommodate new technology;
- Address aging buildings;
- Continued centralization of services and ideal adjacencies;
- Enhance campus unification, patient and visitor circulation and accessibility; and
- Develop and activate pedestrian-friendly street edges.

2.3 Summary of Program Needs

As a result of the Healthcare Trends presented in **Section 2.2.1**, BMC has been experiencing occupancy rates of inpatient beds and outpatient services that are stressing its current system. In addition, BMC's coordinated care model and priorities and actions it has identified to ensure health equity for its patient population demand space modifications and new program space to support it. These program needs are expected during the term of the IMP. Looking into the future, and beyond the term of the IMP, BMC acknowledges that additional and different program needs will be warranted as buildings age, leases expire, healthcare trends evolve, and objectives of the coordinated care model are realized.

2.3.1 Inpatient

At the completion of the campus consolidation under the 2010-2020 IMP, BMC's licensed bed capacity reduced from 626 in 2010 to 514 present day, a 112-bed reduction. A bed reduction was the result of two factors: volume projections for inpatient demand were lower during that period and the new inpatient beds created in the New Inpatient Phase 1 were single bed rooms in accordance with DPH requirements. Since 2019, BMC has averaged over a 90% occupancy rate for adult medical/surgical inpatient beds, with some days reaching a 97% occupancy rate: well over the optimal occupancy rate of 85%. The impacts of significantly high occupancy rates lead to temporary boarding in the Emergency Department. To accommodate the increased inpatient volume while meeting the DPH requirements for single bed rooms, new adult medical/surgical inpatient beds are needed. BMC proposes a conservative phased approach to increase adult medical/surgical inpatient bed capacity. This will be done by prioritizing use of existing infrastructure through small additions and interior alterations before building new. The near-term plan will include a two-prong approach. The first is to accommodate approximately 69 single bed rooms with the addition of Yawkey 6th floor within two-years; this will allow the decoupling of existing 52 adult medical/surgical double bed rooms with a minor net new increase of 17 beds. The second is to construct the vertical addition to Menino 9th floor to achieve approximately an additional 48 single bed rooms within five-years. If the inpatient volume continues to grow, the long-term plan will include the approved New Inpatient Building Phase 2. This approved building may also be constructed in phases to accommodate approximately an additional 280 to 330 single bed rooms towards the end of ten-years and beyond. BMC will retain existing double bed rooms to handle surge capacity in response to pandemics like COVID-19.

2.3.2 Outpatient

As a result of becoming an ACO, BMC transitioned its models of care to a team-based model which generally requires more space and decreases the utilization of clinic space. In 2019, BMC was experiencing an average of 70% occupancy rate for its outpatient clinics. The typical academic medical center operates effectively at 60%. To address this issue, BMC is shifting existing outpatient clinics to Crosstown Office Building at 801 Massachusetts Avenue in order to provide the larger space necessary to support this new team-based model of care and accommodate the increases in outpatient volume. BMC purchased the Crosstown Office Building in 2018.

2.3.3 Research

The COVID-19 pandemic has shown the full depth of disparities on BMC's patient population. It has revealed that this community is underrepresented in clinical trials and new research programs are necessary to correct this. To ensure its patient population will have an equal opportunity to live the healthiest life possible, BMC looks to expand its clinical-based and laboratory-based research programs focused on social determinants of health that adequately represent BMC's patient population. BMC is proposing a new research building at 10 Stoughton Street as an alternate location for the computational research originally proposed at the new administration / clinical building at the ramp parcel and include new clinical-based and laboratory-based research programs to support its Health Equity priorities within five-years.

2.3.4 Mixed-Use and Supportive Housing

Many BMC patients are medically complex (living with heart disease, kidney disease, diabetes, and other serious health issues) and they lack housing stability or are homeless. 80% of the time, they have a co-occurring substance use disorder and/or mental health issue. Homelessness prevents chronic physical

health conditions from being addressed, exacerbates mental illness, and makes treatment for substance use disorder difficult.

BMC has piloted supportive housing models over the last two years that have housed between 20 to 30 people through the Boston Housing Authority or through Section 811 vouchers. These case studies have demonstrated that once stabilized in housing and then paired with complex coordinated care management, the use of costly health care services by complex care patients drops dramatically and their health and outcomes improve. Complex coordinated care and social and financial supportive services are usually not able to be provided to this extent, or at all, in a homeless shelter.

COVID-19 pandemic has shown the full depth of disparities on BMC's patient population. It has made housing instability and homelessness worse; housing interventions are necessary to correct this. To have more control over when its patients have access to housing with complex coordinated care, BMC proposes to adaptively reuse the existing Collamore / Old Evans building for mixed-use and supportive housing in proximity to its health care and support services within five-years. BMC's creation of supportive housing is a natural evolution of its housing initiatives to date (See **Section 9.1.3.2**).

2.3.5 Administration

In the short-term, COVID-19 has demonstrated a reduced need for new administration space. In the longer-term, BMC expects to move forward with the approved New Administration / Clinical building at the Power Plant site to support its future clinical administrative office needs and expansion of clinical support services. As approved, this new building is intended to enable the relocation of remaining clinical administrative functions from the Dowling Tower (the remaining portion of the building) which needs to be demolished in order to construct the New Inpatient Building Phase 2 within ten-years.

2.3.6 Campus Experience, Access, and Arrival Operations

With the consolidation of its two clinical campuses to the west, BMC endeavors to enhance the patient arrival experience now directed to a single location. This stresses the need for clear hospital location identifiers, which signify a place of high-quality patient care, and organization of functional zones for patient and visitor arrival, entry, drop-off, and pick-up. To effectively manage future patient demands and efficient flow of movement to and through the BMC campus, geometric and operational adjustments may be required to manage vehicular and pedestrian movement at its front door. To address this need, BMC proposes a new main hospital entry lobby addition connecting the existing Menino and Yawkey lobbies to improve pedestrian and vehicular through-put during the term of the IMP. In addition, BMC will look for opportunities to incorporate new wayfinding signage at key vantage points throughout the campus where feasible and add retail in existing buildings where appropriate to create improved patient and visitor experience and strengthen connections with the community.

2.3.7 Energy Efficiency and Campus Resiliency

BMC has made significant improvements to its overall support infrastructure focused on energy efficient operations through campus consolidation, installation of more energy efficient equipment, and realized a significant reduction in greenhouse gas emissions. As a safety-net trauma center in a coastal city, which serves the area's most vulnerable patient population, going green and building for campus resiliency is critical to BMC delivering on its mission. The events of Hurricane Katrina and Sandy devastated the health care infrastructure in those affected communities. BMC must ensure that it can care for patients and maintain emergency access to critical care services during a natural disaster. This requires making changes to critical care hospital infrastructure to ensure it is insulated from flooding at the ground level.

Over the term of the IMP, BMC will leverage new IMP projects, or pursue independently, opportunities to improve resiliency and maximize energy efficiency through raising electrical infrastructure in buildings, automating the black start islanding of its co-gen plant, energy storage options, assessing the need for remaining utility services in the existing Power Plant, exploring ways to ensure patient transport routes to critical care are insulated from flooding, and other efforts to support its goal of achieving carbon neutrality and strengthening resiliency. See **Section 7.1.2** for a detailed description of BMC's sustainability efforts.

2.3.8 Addressing Aging Buildings

BMC is actively working to prioritize capital investment to determine the highest and best use for its buildings for the short-term and long-term and identify buildings that no longer meet the requirements for state-of-the-art medical care and modern administrative office space. Over the years, BMC has given careful thought to relocating clinical and administrative functions within its existing building resources to suitable building space and adaptively reusing certain buildings where feasible before purchasing or building new. In the last ten-years, BMC has been able to shift uses around its campus without much impact. BMC will continue to do this but is reaching a point where certain actions are required over the next ten-years.

Prior reviews have concluded that the Dowling Tower must be replaced. The approved New Inpatient Building Phase 2 will be constructed in its place. The Doctor's Office Building no longer serves the level of patient care requirements and BMC has downgraded it to administrative use. BMC sold this building in 2015 and now leases primarily for administrative use, with a small portion for its employee health clinic.

The current review includes Vose Hall, Betatron and the Preston Family Building. Vose Hall is an L-shaped 4-story building originally constructed to serve as a nurse's home. Betatron is considered part of the Vose Hall building. It is a small 1-story structure attached to the east elevation of Vose Hall and originally served as a linear accelerator vault. Vose Hall and Betatron have been used as administrative office space in recent years but due to significant deficiencies both have been vacated. These buildings will be replaced by the new 10 Stoughton Street Building. The Preston Family Building continues to house outpatient clinics. Originally built as a hotel, the space is not conducive long term for state-of-the-art clinical care. BMC plans to relocate the outpatient clinics from Preston to the west side of campus during the term of the IMP.

Section 1.4 includes a summary of IMP projects. **Section 4.2** includes detailed descriptions of the IMP projects anticipated during the term of the IMP and clarifies ownership and use changes of existing buildings. Additionally, future program needs are also discussed in **Section 4.3**.

3.0 BMC CAMPUS AND FACILITIES

3.1 Overview of Existing BMC Campus Area

BMC's main campus is located in the South End. It includes the clinical core with more intensive clinical uses located within the Menino, Yawkey and Moakley building cluster bounded by Harrison Avenue, East Concord Street, Albany Street and Massachusetts Avenue. Less intensive outpatient clinical services and administration are located west of Massachusetts Avenue in Roxbury at Crosstown Center bounded by Albany Street, Massachusetts Avenue, Melnea Cass Boulevard and Hampden Street. The combined campus includes 18 BMC owned or controlled buildings, a helipad, and BMC leases space in 5 buildings located on and/or proximate to campus. Total BMC owned or controlled and leased space is approximately 1,946,293 square feet of usable space. Buildings range from 1 to 12 stories in height above ground. The buildings were built between 1864 (BCD/FGH) and 2018 (New Inpatient Building Phase 1).

BMC's main campus in the South End is embedded within an approximately 20-acre campus generally bound by Harrison Avenue to the north, East Newton Street to the east, Albany Street to the south, and Massachusetts Avenue to the west. As shown on **Figure 3-1**, The BMC campus is not entirely contiguous and certain parcels within the campus area are occupied by both BMC-owned facilities and BU-owned, as well as facilities owned by the State.

BMC's efforts over recent years to improve the organization of its campus is discussed below in **Section 3.4** Campus Use Adjacencies. BMC's campus includes buildings constructed over a wide range of yeas. BMC has adaptively reused many of its historic resources. Several aging buildings remain on campus which are discussed in **Section 3.5** Campus Aging Buildings.

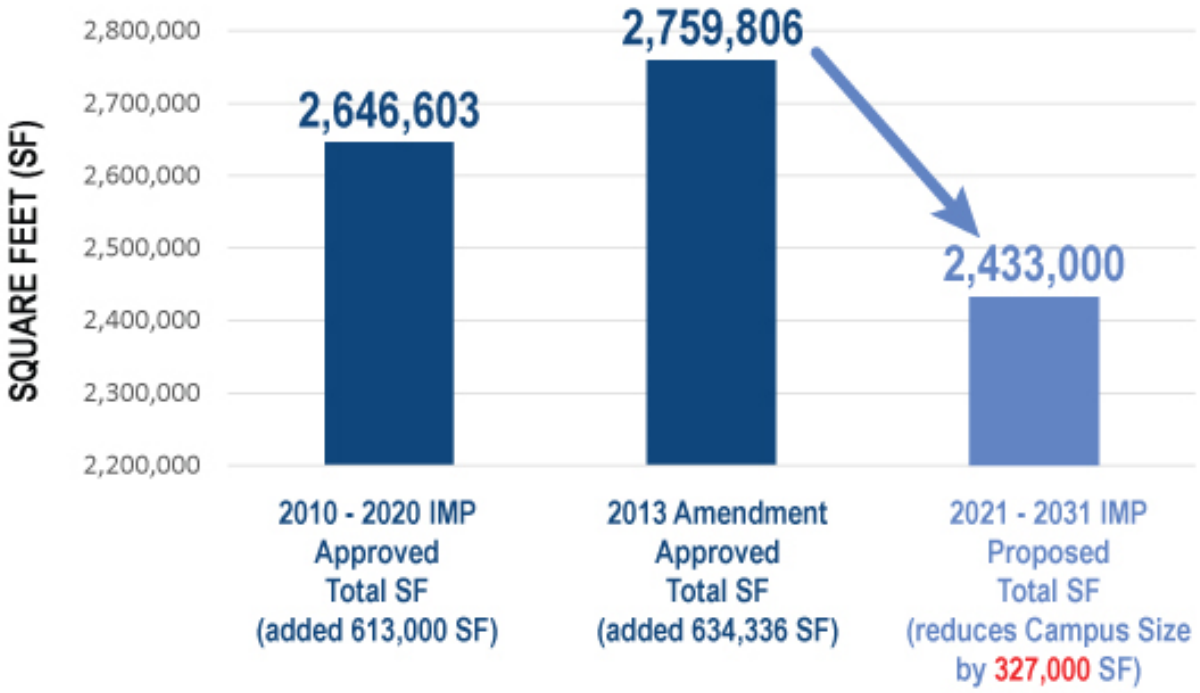
3.2 Ten-Year Evolution of BMC Campus Property and Uses

One of the major goals and objectives executed under the 2010 IMP was consolidating two clinical campuses to create a new clinical core to the west. This established centralized services and complementary use adjacencies that drove operational efficiency. Furthermore, this positioned BMC to better serve its patients in a new healthcare environment that demands cost containment. This was achieved through sale of certain properties and removal of leases in spaces no longer suitable or in alignment with BMC's overall campus sustainability objectives. The actions executed under BMC's prior IMPs resulted in significant campus plan improvements, transportation management strategies, and the "greening" of its campus to ensure minimal negative effects on neighbors. This also resulted in a decrease in BMC's total approved IMP campus square footage.

As BMC looks forward to a new decade, it will continue the measured approach to campus growth. The 2021-2031 IMP modestly adds approximately 411,482 square feet of net new building space over ten-years. If BMC constructs all the proposed projects and acquires or leases portions of Northampton Square (approximately 75,000 SF), the total IMP campus square footage will still be below the previously approved IMP campus square footage.

Table 3-1 below shows the IMP area in the 2010-2020 IMP, as amended in 2013, compared to the proposed IMP area for the 2021-2031 IMP. A detailed comparison is included in **Appendix A**.

Table 3-1 Evolution of IMP Square Footage



3.3 Existing Property and Uses

BMC's existing campus owned and leased property and uses are listed in **Table 3-2** and shown on **Figure 3-1**. **Figure 3-2** shows the Building Primary Uses. The properties and uses listed in **Table 3-2** are incorporated to ensure they are acknowledged and approved for institutional use under the 2021-2031 IMP.

This IMP does not include the area known as BioSquare which is subject to a separate Planned Development Area, but the BMC-owned BioSquare properties are listed in this section for purposes of providing an inventory of other BMC properties owned and leased in the City of Boston.

There are currently 3,531 structured parking spaces in garages and 286 surface parking spaces (3,817 total on-campus and offsite parking spaces). An inventory of owned and leased parking is included in **Section 6.2.7** Parking Operations and **Table 6-3** BMC Parking Space Inventory.

Table 3-2 Campus Owned and Leased Space

Building Name	Address	Year Built	Principal Uses[1]	Stories	Approximate Building Height (in feet)[2]	Approximate Building Height Including Mechanical Penthouse (in feet)[3]	Approximate Building Square Footage[4]
OWNED							
BCD	800 Harrison Avenue	1864	Administration	B+5	55	67	28,174
Betatron	65 East Newton Street	n/a	Administration	n/a	19	27	5,912
Dowling Tower	771 Albany Street	1937	Administration / Outpatient	B+9	122	141	157,376
Preston	732 Harrison Avenue	1967	Outpatient	5	54	63	65,967
FGH	820 Harrison Avenue	1864	Administration	B+5	55	62	29,435
Carl J. & Ruth Shapiro Ambulatory Care Center	725 Albany Street	2011	Outpatient	B+9	120	155	245,000
Menino Pavilion	840 Harrison Avenue	1994	Inpatient / Retail	B+8	132	147	337,340
Power Plant	750 Albany Street	1972	Mechanical / Admin / Support	B+4	126	137	64,064
Surgical Building	85 East Concord Street	1928	Administration / Outpatient	B+8	107	115	66,952
Vose Hall	10 Stoughton Street	1898	Administration	5	51	58	22,695
Old Evans	66 East Newton Street	1942	Administration /Retail	9	114	133	60,070
Collamore	746 Harrison Avenue	1936	Administration /Retail	7	98	121	41,970
Helipad	n/a	n/a	Helipad	n/a	n/a	n/a	n/a
Yawkey Ambulatory Care	850 Harrison Avenue	1972	Inpatient /Outpatient /Retail	B+5	115	133	221,977
Crosstown Office Building	801 Massachusetts Avenue	2006	Administration / Outpatient /Retail	B+7	100	117	236,000
			Areas Leased By Other Tenants	*3rd, 4th*			*101,114*
			Areas Occupied by BMC	*1st, 2nd, 5th, 6th, 7th*			*134,886*
Moakley Building & Addition	830 Harrison Avenue	2006 / 2016	Outpatient	B+3	49	89	161,017
New Inpatient Building Phase I	840 Harrison Avenue	2018	Inpatient	B+5	65	85	105,494
Patient Transport Bridge (w/elevator & stair tower)	n/a	2017	Support	3	51	51	7,800
Naval Blood Building ***Own 50% with BU***	615 Albany Street	1865	Administration / Research /Instruction	B+5	60	72	19,710

Building Name	Address	Year Built	Principal Uses[1]	Stories	Approximate Building Height (in feet)[2]	Approximate Building Height Including Mechanical Penthouse (in feet)[3]	Approximate Building Square Footage[4]
LEASED							
Doctors Office Building (Lease expires December 2022)	720 Harrison Avenue	1969	Administration / Outpatient	B+12	134	159	91,783
Solomon Carter Fuller (Lease annual renewal)	75 East Concord Street	1975	Administration	B+9	127	151	11,000
Gambro (Lease expires December 2022)	660 Harrison Avenue	1990	Administration /Outpatient	3	38	46	17,288
801 Albany Street (Lease expires October 2029)	801 Albany Street	1989	Administration	B+9	47	55	41,198
7 Melnea Cass, Family Medicine (Lease expires September 2027)	7 Melnea Cass Boulevard	2006	Outpatient	1	56	59	7,300

Table Notes

1. The table lists the primary functions located within each building. Hospital sub-uses are frequently relocated within buildings to respond to case mix and service changes and to accommodate ongoing renovations.
2. These are approximate building heights which in some cases may be to the top of the last occupiable floor or to the top of the roof.
3. Approximate height to top of Mechanical Penthouses (whether or not such structures exceed 33 1/3 percent of the total roof areas) is provided.
4. Owned buildings are expressed as approximate Gross Square Feet (without exclusions). Leased buildings (where the Proponent is the Lessee) are expressed in Rentable Square Feet (without exclusions).
5. The designation Own/Lease is included to differentiate between BMC campus buildings which are controlled or owned by the Proponent and buildings which are leased for a term of years by the Proponent.
6. Lease expirations listed are for current lease terms; many have extension options that BMC may exercise. BMC intends to renew the leases for Solomon Carter Fuller, 801 Albany Street, and 7 Melnea Cass. Leases that expire at the Doctor's Office Building and Gambro will be replaced with leases elsewhere in the City of Boston.

In addition to properties listed above, BMC medical staff and researchers utilize research and administrative space at the BioSquare research park south of Albany Street. See **Table 3-3** below. These properties are jointly owned with BU and are subject to a separate Planned Development Area (PDA) Master Plan. They are included here for purposes of providing an inventory of other properties owned and leased in the City of Boston. Reference **Figure 3-1** for location of BioSquare PDA.

Table 3-3 BMC and BU Jointly Owned Properties at BioSquare

Building Name	Address	Year Built	Principal Uses	Stories	Building Square Footage
NEIDL Building Land Parcel	620 Albany Street	n/a	Land	n/a	n/a
Evans Biomedical Research Center "X" Building	650 Albany Street	1999	Academic Administration Research	B+8	196,459
610 Parking Garage	610 Albany Street	2005	Parking	8	497,342
710 Parking Garage	710 Albany Street	2000	Parking	6	315,865
Parcel "E"	630 Albany Street	n/a	Land	0	39,970
Parcel "G"	600 Albany Street	n/a	Land	0	43,069

BMC also leases spaces off-campus within the City of Boston. These are listed below in **Table 3-4.**

Table 3-4 BMC Leased Space within City of Boston

Building Name	Address	Use	Leased SF	Lease Expiration
The Schrafft Center	529 Main Street, Charlestown	Administration	171,800	2026
Boston Medical Center Physical & Occupational Therapy	890 River Street, Hyde Park	Outpatient	3,717	2030

Figure 3-1 Campus Owned and Leased Space

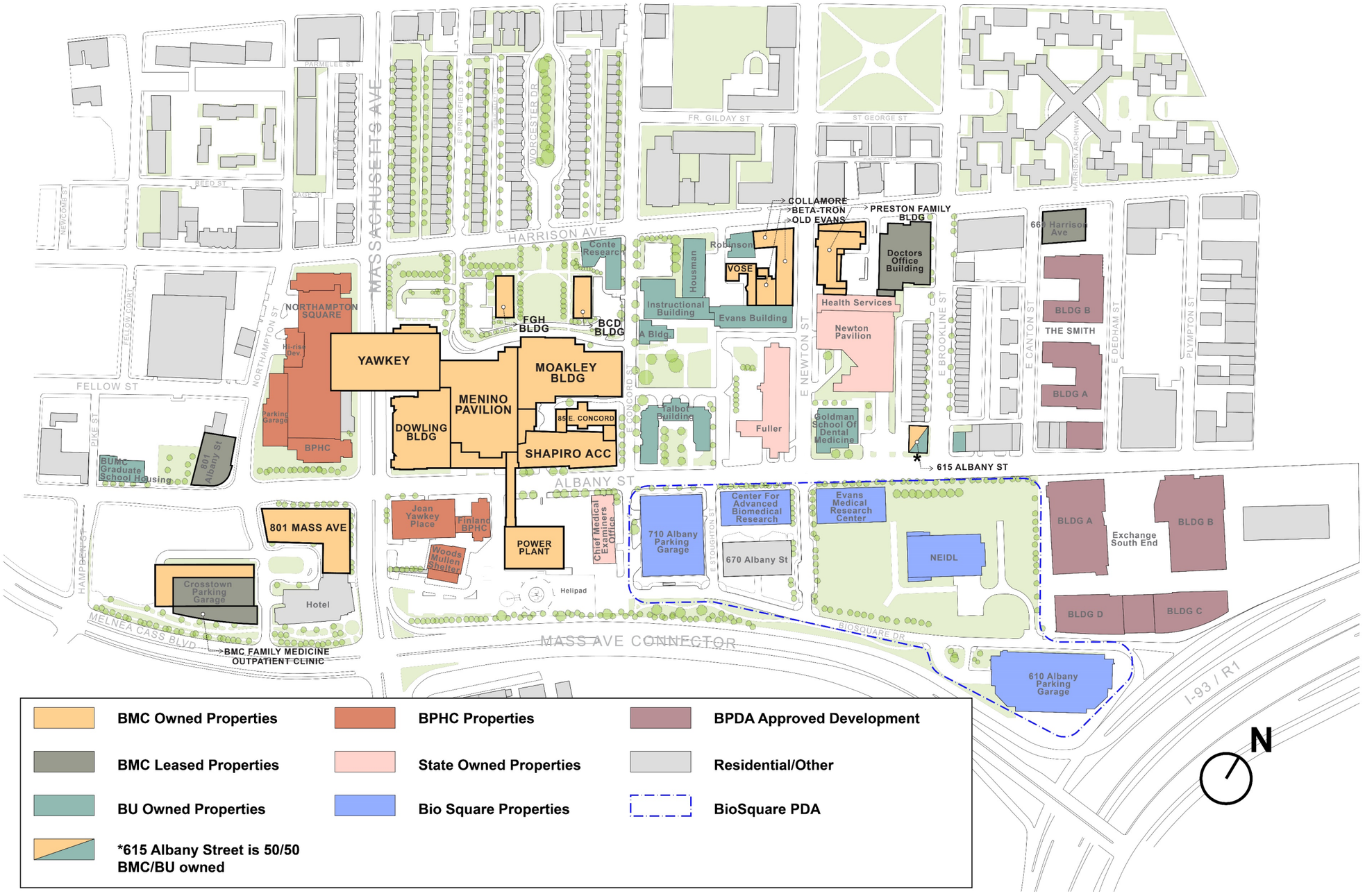
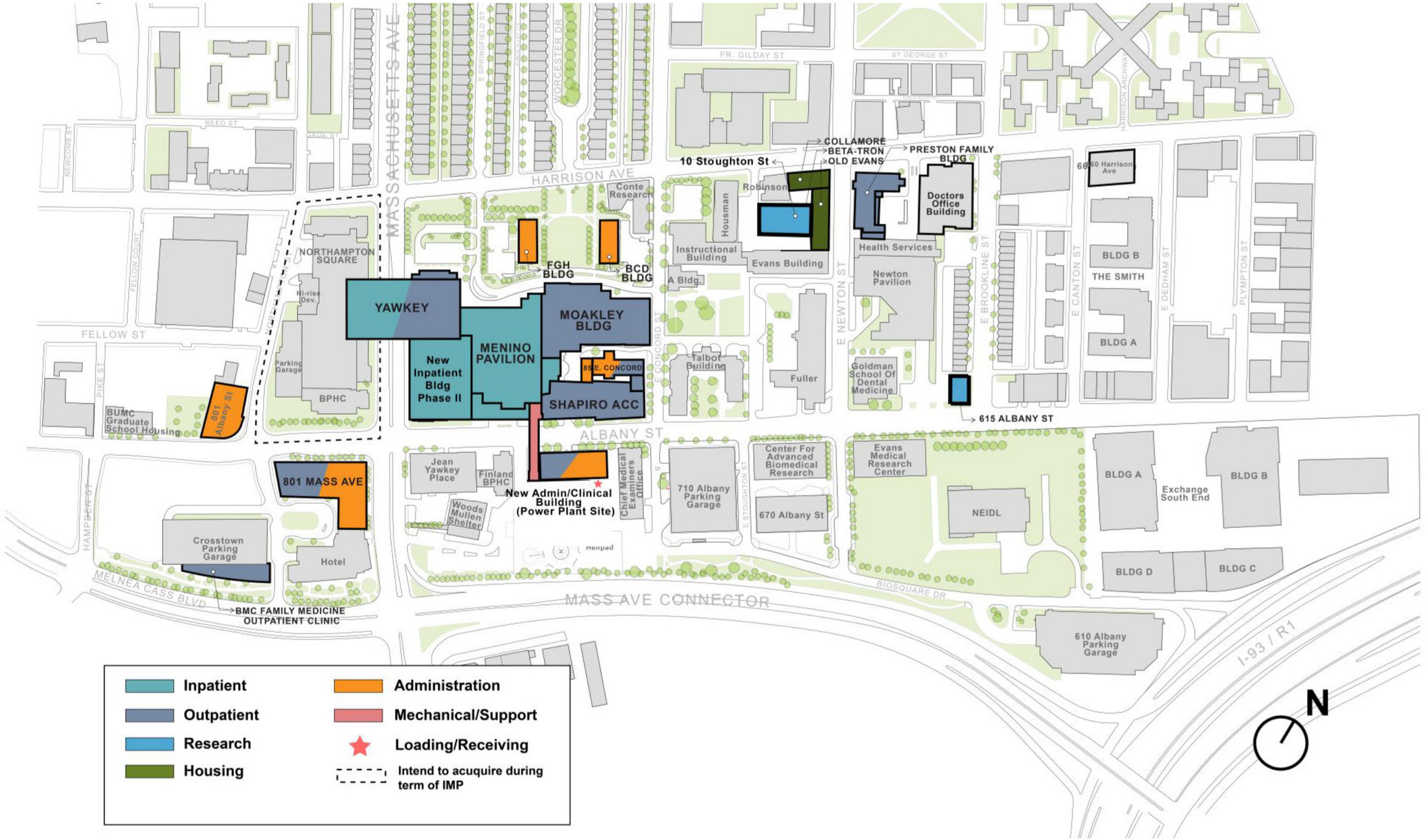


Figure 3-2 Building Primary Uses



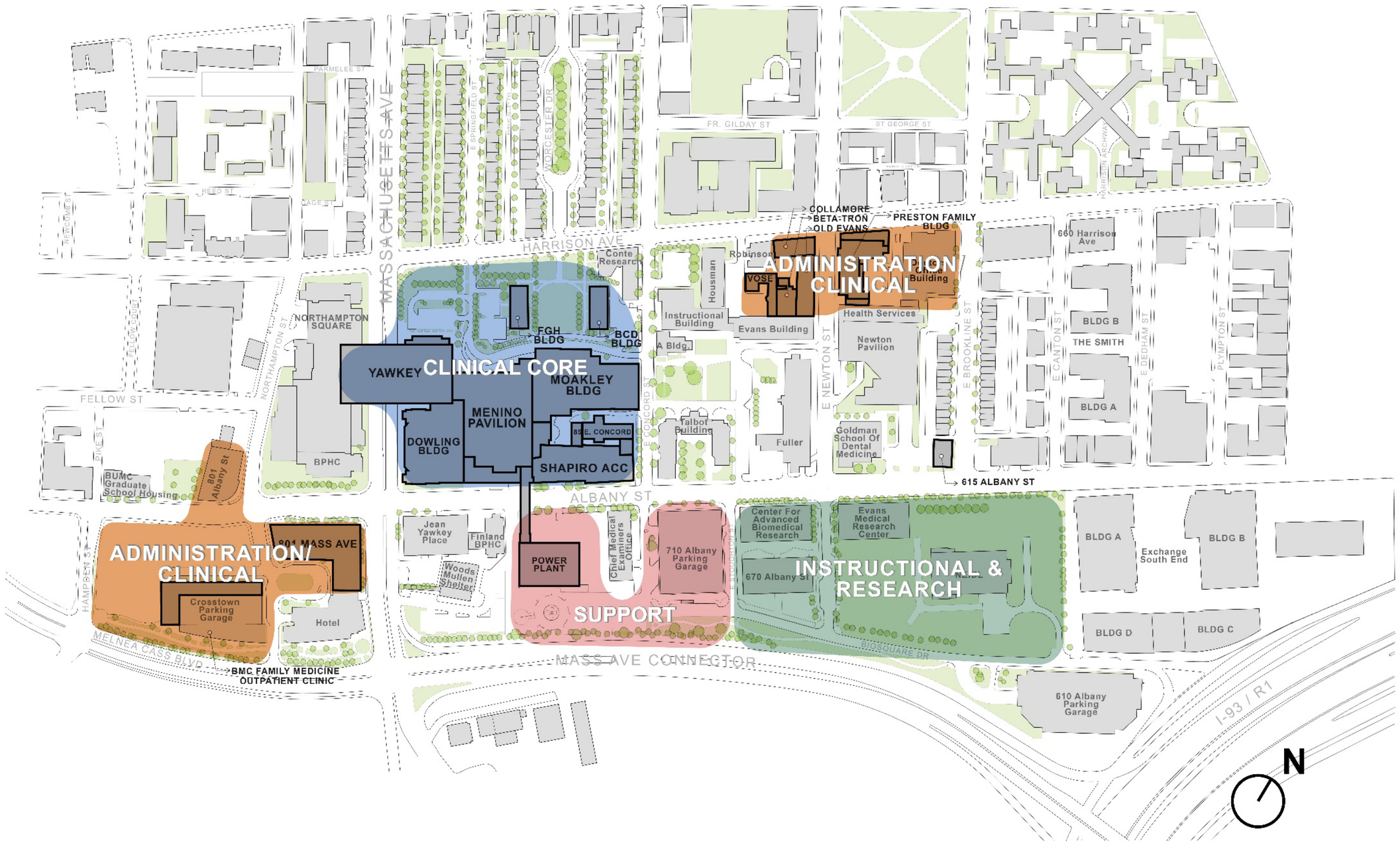
3.4 Campus Use Adjacencies

BMC improved its campus use adjacencies with the completion of the 2010 IMP projects - the Moakley Cancer Center Addition, the New Inpatient Building Phase 1 and the Patient Transport and Materials Handling Bridge. The clinical core is now to the west with more intensive clinical uses within the Menino, Yawkey and Moakley building cluster. Less intensive outpatient clinical services and administration are located west of Massachusetts Avenue (Crosstown Center and 801 Albany Street). Some outpatient clinical services remain on the east in the Preston Family Building. Medical administrative functions are now better positioned in proximity to clinical services, and general administrative functions have been more appropriately located on the campus perimeter and out of the clinical core, but some still remain to the east in the Doctor's Office Building (DOB), Gambro and Solomon Carter Fuller. Other major use zones remain including a Support Zone (Power Plant and Parking) and Research (BioSquare) south of Albany Street. See **Figure 3-2** Campus Major Use Zones.

BMC's campus design goals and objectives are aimed at continuing to position BMC's existing property and uses to support integration of a coordinated care model. This is particularly important to being able to address the medical, behavioral, and social needs of BMC's patient population.

The master planning objectives of leveraging the highest and best use of its building resources, optimizing operational efficiencies through continued centralization of services and ideal adjacencies, and re-aligning and modernizing clinical services are ideal for ensuring BMC's ability to deliver on its mission to continue high quality patient care, accommodate patient volumes and sustain ever changing healthcare trends.

Figure 3-3 Campus Major Use Zones



3.5 Campus Aging Buildings

A facilities assessment was completed to evaluate the physical condition of the major buildings on the campus. The purpose of this assessment was to prioritize capital investments and determine highest and best use for the buildings for the short-term and long-term. The BMC campus is comprised of buildings of various ages and conditions. The assessment concluded that certain buildings contain major deficiencies and require major improvements to function acceptably as clinical, research and/or administrative space. These buildings include:

- Doctor's Office Building
- Dowling Tower
- Vose Hall
- Betatron
- Preston Family Building
- Naval Blood

In determining the highest and best use of BMC's building resources, several factors are weighed for clinical, research and administration buildings and sites. To consider the appropriate location of a building use, the following evaluation criteria is used:

- Adjacency to existing clinical ancillary services;
- Location consistent with BMC master plan objectives;
- Impact on surrounding neighborhoods;
- Ease of access, covered drop-off; and
- Accessibility to parking.

Evaluating criteria for clinical and research buildings:

- Minimum typical floor plate area of 22,000 – 30,000 square feet;
- Minimum floor plate width of 100 feet;
- Minimum 14'-6" floor-to-floor height to accommodate relative mechanical systems;
- Bay spacing 30 x 30;
- Floor loading (diagnostics/treatment): 100- to 150- pounds/square feet;
- Floor loading (inpatient): 50- to 100- pounds/square feet; and
- Minimum 10% to 14% space per floor for MEP and Tel-Data.

Evaluating criteria for administration buildings:

- Minimum typical floor plate area of 10,000 square feet;

- Minimum 12’-0’ floor to floor height to accommodate relative mechanical systems;
- Structural grid should accommodate 10’-0” planning module for offices;
- Minimum 5’-0” corridor width;
- Floor loading for general office use: 50 pounds/square feet;
- Floor loading for corridors: 80 pounds/square feet; and
- Minimum 10% space per floor for MEP and Tel-Data.

BMC sold the Doctor’s Office Building in 2015 and presently leases a small amount of space for its employee health clinic and the majority for administration, which will be vacated during the term of the IMP.

The Dowling Tower was downgraded to administrative use in 1994 due to its deficiencies. Since then, BMC has been relocating outpatient clinical services out of the Dowling building. The outpatient clinics that do remain will be relocated out of the Dowling building during the IMP. The Dowling site was approved in the 2010 IMP, and subsequent amendments thereto, to be replaced with the New Inpatient Building Phase 2.

Vose and Betatron are vacant due to deficiencies making them not suitable for previous administrative use. Due to the facility conditions assessments and the need for extensive renovations to create acceptable clinical, research or administrative space, within five-years BMC intends to demolish both Vose Hall and Betatron and replace them with the new 10 Stoughton Street Building.

The Preston Family Building is not appropriate as a clinical building in the long-term. Outpatient clinics will be relocated from Preston to the Crosstown Office Building during and BMC will evaluate alternative uses during the term of the IMP.

The Naval Blood building is jointly owned with BU. This building is not appropriate for clinical, research or administration use. Considerations have been given to housing options. BMC will continue work with BU to develop a feasible and thoughtful solution.

4.0 PROPOSED INSTITUTIONAL MASTER PLAN

4.1 Introduction

Based upon the guiding principles and planning assumptions presented in **Section 2.2**, and the program needs identified in **Section 2.3**, the Proponent is seeking Article 80D Zoning Approval for five new projects which include a mix of small additions, an adaptive reuse of an existing building and new construction. BMC is carrying forward the approved New Administration / Clinical Building (Power Plant site) and the New Inpatient Building Phase 2 for inclusion in the new 2021-2031 IMP for zoning purposes. In addition to the new and approved projects, BMC anticipates vacating certain leased space and demolition of obsolete buildings; the programs in these facilities will be accommodated within the new IMP projects. As discussed in **Section 1.5** and **Section 3.2**, the 2021-2031 IMP includes a modest addition of new space for uses that already exist on campus and continues BMC's measured approach to campus growth and development.

This section conceptually presents the proposed new institutional projects, includes the previously approved institutional projects, discusses the anticipated timing of these projects during the term of the IMP, as well as other IMP elements, and identifies future programming needs and long-term planning goals.

4.2 Proposed IMP Projects

BMC recognizes an immediate need to address its physical space in order to:

- Accommodate the increase in outpatient and inpatient volume.
- Redesign healthcare models to integrate medical, behavioral, and social needs of its patients.
- Right-size and modernize clinical space to meet current building code and clinical standards.
- Leverage the highest and best use of building resources, both owned and leased.

The proposed IMP Projects will accomplish the following objectives:

- Leverage the highest and best use of its building resources, both owned and leased;
- Re-align clinical services to support integration of a coordinated care model;
- Right-size and modernize clinical space for current building code and clinical standards
- Accommodate new technology;
- Address aging buildings;
- Continued centralization of services and ideal adjacencies;
- Enhance campus unification, patient and visitor circulation and accessibility; and
- Develop and activate pedestrian-friendly street edges.

Table 4-1 outlines the New IMP Projects and Other IMP elements. See **Figure 4-1** for location of IMP Projects.

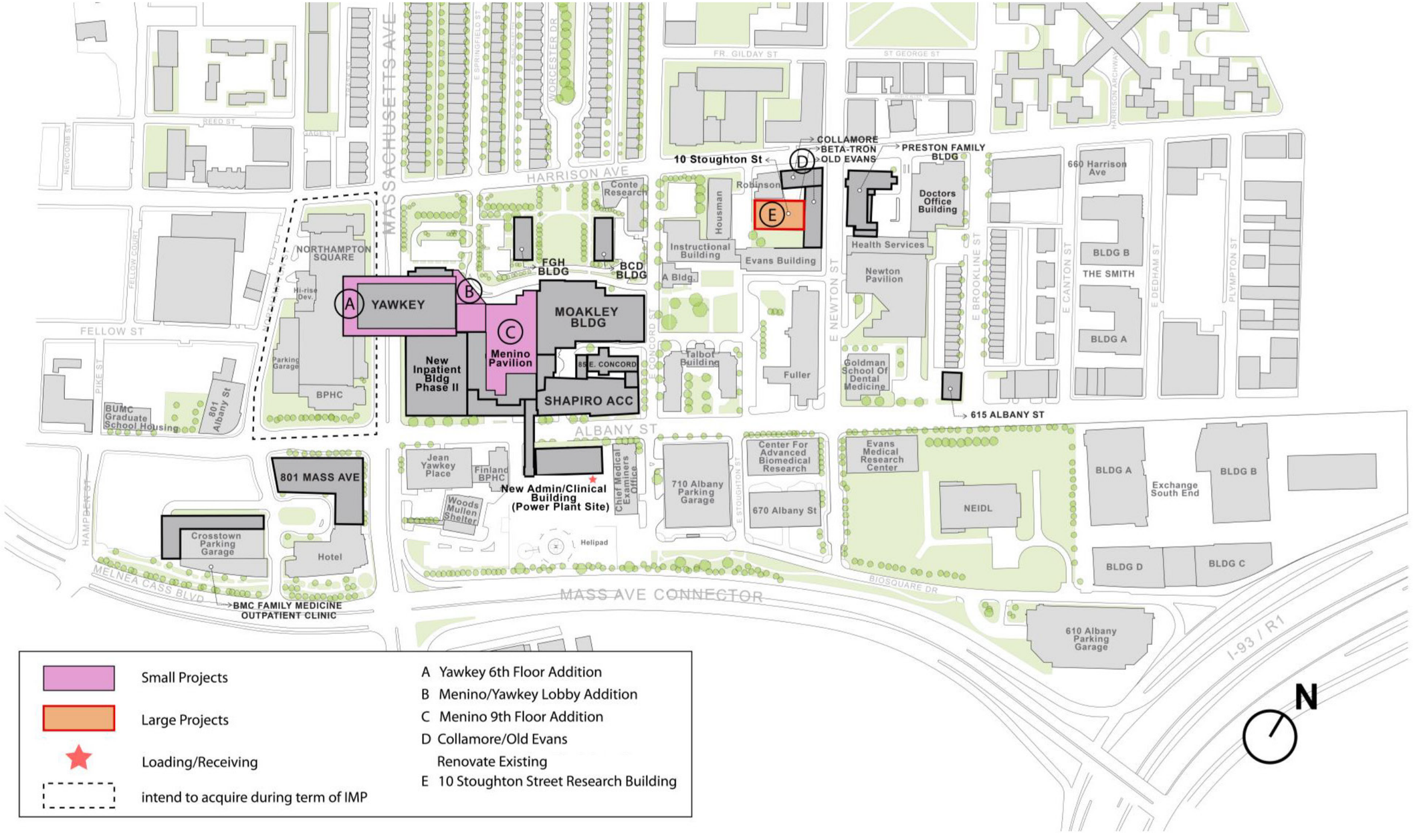
Table 4-1 New IMP Projects and Other IMP Elements

IMP Element	Approximate Size in Square Feet	Use
New IMP Projects		
Yawkey 6th Floor Addition	15,500	Inpatient
Menino & Yawkey Lobby Addition	6,100	Lobby, Circulation, Patient Waiting, Coffee Shop, Gift Shop, Cafeteria
Menino 9th Floor Addition	37,000	Inpatient
Collamore/Old Evans Renovation & Adaptive Reuse	102,000	Mixed-Use and Supportive Housing
10 Stoughton Street	170,000	Research, below grade Parking
Other IMP Elements		
Doctor's Office Building Lease Expiration	(91,783)	Vacate Administration
Gambro Lease Expiration	(17,288)	Vacate Administration
Demolish Vose Hall	(22,695)	Demolish and replace with 10 Stoughton Street
Demolish Betatron	(5,912)	Demolish and replace with 10 Stoughton Street
Demolish Dowling Tower	(157,376)	Demolish and replace with approved New Inpatient Building Phase 2
Demolish Power Plant	(64,064)	Demolish and replace with approved New Administration / Clinical Building
Potential Acquisition/Lease of Northampton Square	75,000	Outpatient, Administration, Retail

Table 4-2 Approved IMP Projects Included in the 2021-2031 IMP

IMP Element	Approximate Size in Square Feet	Use
New Administration / Clinical Building (approved in 2010 IMP and subsequent amendments thereto)	219,000	Administration, clinical, loading/service, materials handling/support
New Inpatient Building Phase 2 (approved in 2010 IMP and subsequent amendments thereto)	323,000	Inpatient beds, Imaging, Surgery, Administration, Support

Figure 4-1 New IMP Projects



4.2.1 New IMP Projects

To succeed in the new coordinated care model, which has created a higher demand for its services, all while the population has increased, BMC is focused on accommodating changing program needs which require strategic space modifications. The following section provides a general description of the new IMP projects BMC anticipates undertaking during the term of the IMP. Concept plans have been included for the proposed new large building volumes (e.g., 10 Stoughton Street) in response to the Scoping Determination.

4.2.1.1 Yawkey 6th Floor Addition

A new addition to the existing Yawkey Ambulatory Care Center is proposed at the 6th level. This addition will total approximately 15,500 square feet to accommodate the need for approximately 69 adult medical/surgical inpatient single bed rooms. The Yawkey 6th Floor addition will be the first step in BMC's conservative phased approach to increase inpatient bed capacity. The addition will also include patient support rooms, staff support rooms, and clinical support rooms.

The addition will be constructed around the existing Level 6 Mechanical Penthouse and is proposed to wrap the three sides of the penthouse and sit on what is now the 5th level roof. This project is designed to take advantage of the existing building structure, infrastructure, and core elements for the vertical expansion. It will not expand the current footprint of Yawkey, and in doing so, minimize the impact at ground level. The existing signage on the Yawkey building, which includes channel cut letters and the BMC name and logo sign, will be relocated to another section of the building façade with this project.

Preliminary design studies for this addition anticipate it will be approximately 95 feet 4 inches above grade and approximately 16 feet 8 inches in height from top of 5th floor roof to top of the new 6th floor roof. Adjustments may be required to existing rooftop equipment which will be determined when the design advances. This project is below Small and Large Project Review thresholds and will seek is subject to Design Review only.

4.2.1.2 Menino and Yawkey Lobby Addition

A new 6,100 square foot lobby addition is proposed to the north side of the Menino Pavilion and Yawkey Ambulatory Care Center to create a unified, cohesive, and identifiable entry to the Hospital. The Menino Pavilion and Yawkey Ambulatory Care Center currently have separate entrances accessed under adjacent canopies, off the Boston Medical Center Place valet parking location. This addition will create a clear entrance for patients and visitors, provide a bright, inviting functional entry sequence and a new extended canopy for improved weather protection / covered drop off. The existing two-story façade at the Menino Building will be replaced as part of this project. In addition, new signage which will include channel cut letters will be added as part of the new lobby addition.

Entrance Lobby functions and circulation, Information Desk, Valet Waiting, Gift & Coffee Shop, Conference Room, Family Rooms, and additional patient spaces will all be accommodated on the ground floor of the addition. The second level will provide additional circulation connections between Menino and Yawkey and interior alterations to the existing Yawkey Cafeteria seating. To accommodate the lobby addition, adjustments will be made to the existing traffic lanes on BMC property to ensure continued and improved through-put operations. BMC will also continue to study the reconfiguration of vehicular

operations at BMC Drive through re-establishment of functional use zones within BMC's property as well as potential geometric changes and improvements to traffic and parking operations management. An existing condition plan and proposed concept of the proposed BMC Drive improvements are shown in **Figures 4-2 and 4-3**.

Preliminary design studies anticipate the lobby addition to be two stories and approximately 31 feet in height. Adjustments may be required to existing rooftop equipment which will be determined when the design advances. This project is below Small and Large Project Review thresholds and is subject to Design Review only.

4.2.1.3 Menino 9th Floor Addition

A new 37,000 square foot addition to the existing Menino Pavilion is proposed on top of the Menino 8th floor. This new addition will accommodate approximately 48 adult medical/surgical inpatient single bed rooms. The Menino 9th Floor addition will be the second step in BMC's conservative phased approach to increase inpatient bed capacity. The addition will also include patient support rooms, staff support rooms, and clinical support rooms. It will also allow for expanded space for mechanical and circulation on top of the existing Menino Pavilion. The addition will be built on top of the partial roof area on Level 8, at the north and south end of the existing mechanical space, which is at Level 9, and will expand the mechanical space and provide connecting stairs up to Level 9. This addition is expected to extend the existing perimeter of Level 8 to occupy the full building footprint.

This project will take advantage of the existing building structure, infrastructure, and core elements for the vertical expansion. The new addition will not expand the current footprint of the Menino Pavilion and in doing so minimize the impact at ground level.

Preliminary design studies for this addition anticipate a vertical addition above grade of approximately 14 feet in height on top of the existing 8th floor. This will bring the overall height of the existing Menino Pavilion to 147 feet which incorporates the existing mechanical penthouse. This project is below Large Project Review threshold. Small Project Review is anticipated.

4.2.1.4 10 Stoughton Street

A new 170,000 square foot building is proposed on the site of the present Vose Hall and Betatron buildings. This new building will necessitate the demolition of the existing 22,695 square foot Vose Hall and the 5,912 square foot Betatron building.

This new building will contain research space. The computational research originally proposed for the Ramp Parcel will be located here and new clinical-based and laboratory-based research programs to support its Health Equity priorities, ensuring its patient population is well represented in clinical studies. The proposed uses are consistent with existing uses in adjacent and abutting BU research facilities, such as the Robinson and Evans buildings, already approved under IMP zoning. The new research building will maintain existing connections at the first and lower levels between the new building and BU's New Evans Building to facilitate institutional collaborations.

Preliminary design studies for this building anticipate approximately 11-story building, 164 feet in height above grade plus a 20-foot-high mechanical penthouse. The typical floorplate will be approximately

14,000 square feet. The proposed building is anticipated to include a below grade parking garage for approximately 72 spaces; a portion of which, approximately 12 spaces, would serve the mixed-use housing at Collamore/Old Evans. The new 72 underground spaces will be offset by the loss of 238 spaces upon the expiration of BMC's lease of the Doctor's Office Building during the term of the IMP. This project will be subject to Large Project Review. Concept diagrams, sections and views are shown in **Figures 4-4 through and 4-13**.

4.2.1.5 Collamore / Old Evans Renovation and Adaptive Reuse

Collamore and Old Evans, two interconnected buildings, will be adaptively reused to accommodate BMC's innovative mixed-use and supportive housing model included ground floor retail and / or service uses. The total interior space to be renovated is approximately 102,000 square feet is comprised of approximately 42,000 square feet in Collamore and approximately 60,000 square feet in Old Evans.

BMC envisions that ground floor retail and / or service uses may be achievable, where accessible on Harrison Avenue, with levels two through seven containing approximately 130 residential units. Portions of the first level would continue to be used as administrative office space but associated with the supportive housing program. Approximately 15-20% of the total residential units would be allocated to supportive housing use and would be considered "deeply" affordable, or below 50% of the Area Median Income (AMI).

The renovation of Collamore / Old Evans will also involve limited exterior improvements such as replacement of old windows and doors with architecturally sensitive energy efficient options, as well as the restoration of the existing façade and other exterior elements, where necessary or feasible, in accordance South End Historic District and Massachusetts Historical Commission design guidelines. Changes to the existing height and footprint are not anticipated. New rooftop equipment may be necessary and will be determined as part of the design development process. This project will be subject to Large Project Review. Preliminary concept diagrams, sections and views are shown in **Figures 4-4 through and 4-13**.

4.2.2 Approved Projects Included in the 2021-2031 IMP

The following approved projects, as described and approved in the 2010 IMP, and subsequent amendments thereto, are included in this IMP.

4.2.2.1 New Administration / Clinical Building (Power Plant site)

A new 219,000 square foot Administration / Clinical Building on the site of the surface lot located to the north of the BMC Power Plant along Albany Street. This new building will necessitate the demolition of the existing 64,000 square foot Power Plant building.

The new building will allow BMC to continue to consolidate clinical administrative functions and improve campus adjacencies to core clinical services and provide modern office space for computer data and analytics. This building will also accommodate clinical and operational support space. The loading dock will be relocated to its final location at the rear of the building and a new below grade tunnel will be constructed beneath Albany Street to transport materials between the Menino Pavilion and the south side of Albany Street. As part of this project, BMC will evaluate an alternative location for the existing helipad

to (1) accommodate the new loading dock location for the new Administration/Clinical Building (2) consider critical care timing needs (e.g., patient transport time from the helicopter to emergency department), and (3) enable long-term resiliency objectives that ensure patient transport routes are protected from flooding.

Preliminary design studies anticipate a 10-story building or 120 feet in height above grade. The typical floorplate will be approximately 21,900 square feet. The anticipated building height does not include the height of a mechanical penthouse. This rooftop equipment will be determined when the design advances. This project will be subject to Large Project Review.

4.2.2.2 New Inpatient Building Phase 2

A new 323,000 square foot inpatient building on the site of the existing Dowling Tower. This project is the second phase of the New Inpatient Building Phase 1 completed in 2018. This new building will necessitate the demolition of the 157,376 square foot Dowling Tower (the remaining portion of the building located at the corner of Massachusetts Avenue and Albany Street). The site's visibility will enable visitors to quickly orient themselves when they arrive on campus and reinforce the Albany Street image.

The new inpatient building will provide appropriately sized modern inpatient spaces that meet current building code and clinical standards and expansion space to accommodate critical care and imaging functions. The location of this building is necessary and important because it provides direct access and adjacency to the surgical and diagnostic platforms as well as accessibility to the Emergency Department and Trauma Center in the abutting Menino Pavilion to which BMC has made substantial investments with the construction of the New Inpatient Building Phase 1. It should be further noted there are no other siting options for this building.

As discussed in **Section 2.3.1**, this is BMC's long-term plan to accommodate future inpatient demand driven by increased patient acuity and population growth. It is anticipated that the approved New Inpatient Building Phase 2 may be constructed in phases to eventually accommodate an additional total of approximately 280 to 330 single bed rooms in ten-years and beyond.

Preliminary design studies for this building anticipate a 323,000 square foot with a typical floorplate of approximately 23,000 square feet. It is anticipated the building will be 14-stories in height of approximately 205 feet above grade. New rooftop equipment may be necessary and will be determined when the design advances. This project will be subject to Large Project Review.

4.2.3 Campus Interior Alterations, Reconfiguration and Relocation Projects

Throughout the IMP term, BMC expects to undertake improvements that are exempt from IMP review, but are incorporated here for reference: (1) internal departmental relocations within its buildings that support a coordinated care model integrating the medical, behavioral, and social needs of its patients, (2) other interior alterations and/or reconfiguration projects that will allow BMC to continue improving the existing departmental adjacencies, patient flow, operational efficiencies, and patient experience and ongoing improvements to inpatient, outpatient and surgery spaces, all subject to the then applicable healthcare and other related building codes, and (3) shift of less intensive outpatient clinical services and administration space located west of Massachusetts Avenue. These improvements may include:

- A minor 1,060 s.f. two-story addition at the rear of the Moakley Building to create a connecting corridor between the Menino and Moakley buildings at the intersection of the two buildings. This will also include a minor 260 s.f. addition to the existing Emergency Department walk-in entry vestibule. A canopy will extend to cover the existing pedestrian sidewalk within Shapiro Drive (an internal campus drive). An image of this has been included in the IMP (See **Figure 4-14** Menino-Moakley Crossing).
- Interior alterations to Yawkey inpatient space.
- Interior alterations to Moakley ambulatory surgery rooms and Yawkey general procedure rooms.
- Relocation of outpatient clinics from Preston, Dowling, and Shapiro to the Crosstown Office Building; relocation of outpatient clinics from Yawkey to Crosstown and Shapiro.
- Interior relocations of outpatient clinics within Shapiro.
- Interior alterations to repurpose underutilized storage space into clinical support space and administrative support space.
- Other interior alterations of newly acquired or lease spaces within or proximate to the campus, or within the City of Boston, as the case may be.

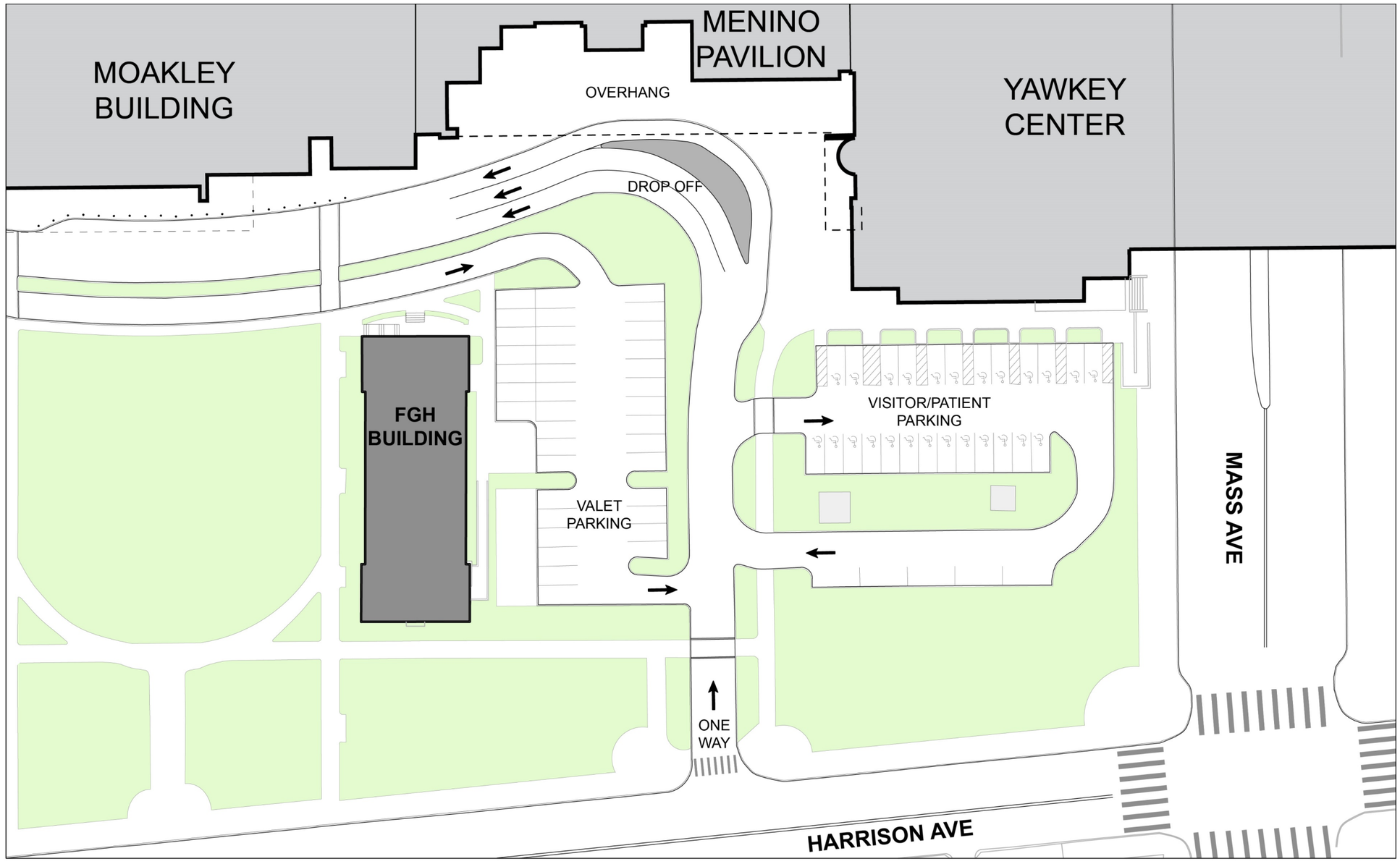
4.2.4 Campus and Building Maintenance Projects

BMC will continue to pursue various building maintenance and open space activities throughout the term of the IMP which are exempt from IMP review but are incorporated here for reference. These include replacing aging infrastructure throughout the campus, upgrading, and replacing finishes in all facilities, replacement, and repairs to building facades and envelopes, such as completing the window replacement on the Yawkey Building, ongoing general operational improvements and continuing to maintain the various landscaped edges and open spaces located throughout the campus. A new landscaped buffer is proposed at the pylon sign at the corner of Massachusetts Avenue and Harrison Avenue. See **Figure 4-15.**

4.2.5 Intent to Acquire or Lease Northampton Square

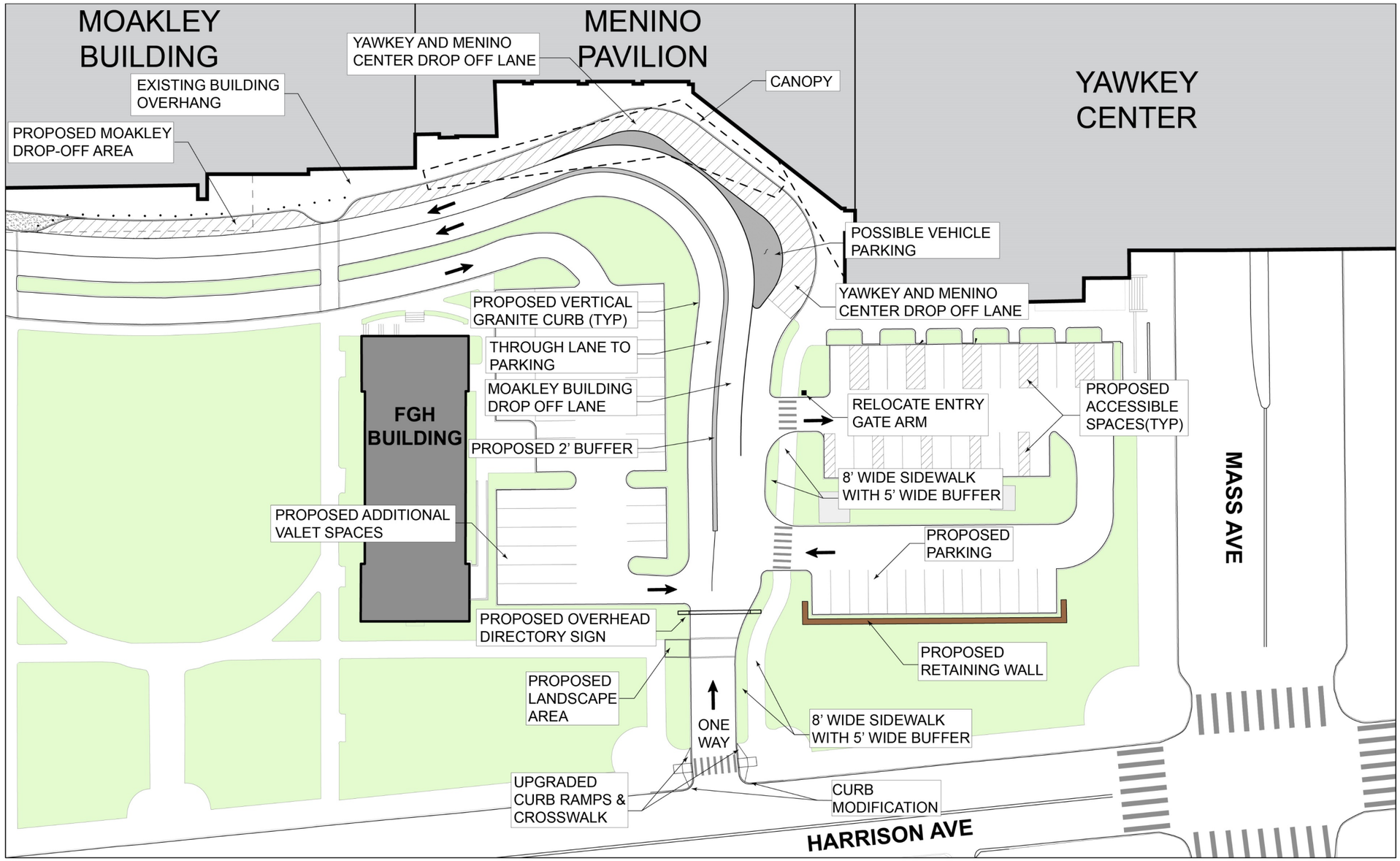
BMC has been discussing opportunities with the City of Boston to potentially acquire or lease approximately 75,000 s.f. during the term of the IMP. This space could be an option to accommodate administration from Collamore/Old Evans or outpatient clinical space originally proposed for the Ramp Parcel. Other options may be administration and outpatient use from the Doctor's Office Building, Gambro, or other locations that may need to be vacated by BMC at the time. If this were to be a viable option, BMC would work with the City to locate Public Safety Headquarters on 2nd floor of the commercial storefronts along Massachusetts Avenue, commit to revitalize the commercial storefronts along Massachusetts Avenue, and maintain community access and use of the gym and the pool. This process involves various approvals, and an exact timeline is yet to be determined.

Figure 4-2 Existing BMC Drive Operations



MENINO DRIVEWAY - EXISTING

Figure 4-3 Proposed BMC Drive Improvements



MENINO DRIVEWAY - PROPOSED

Figure 4-4 10 Stoughton Street & Collamore/Old Evans Existing Site Plan

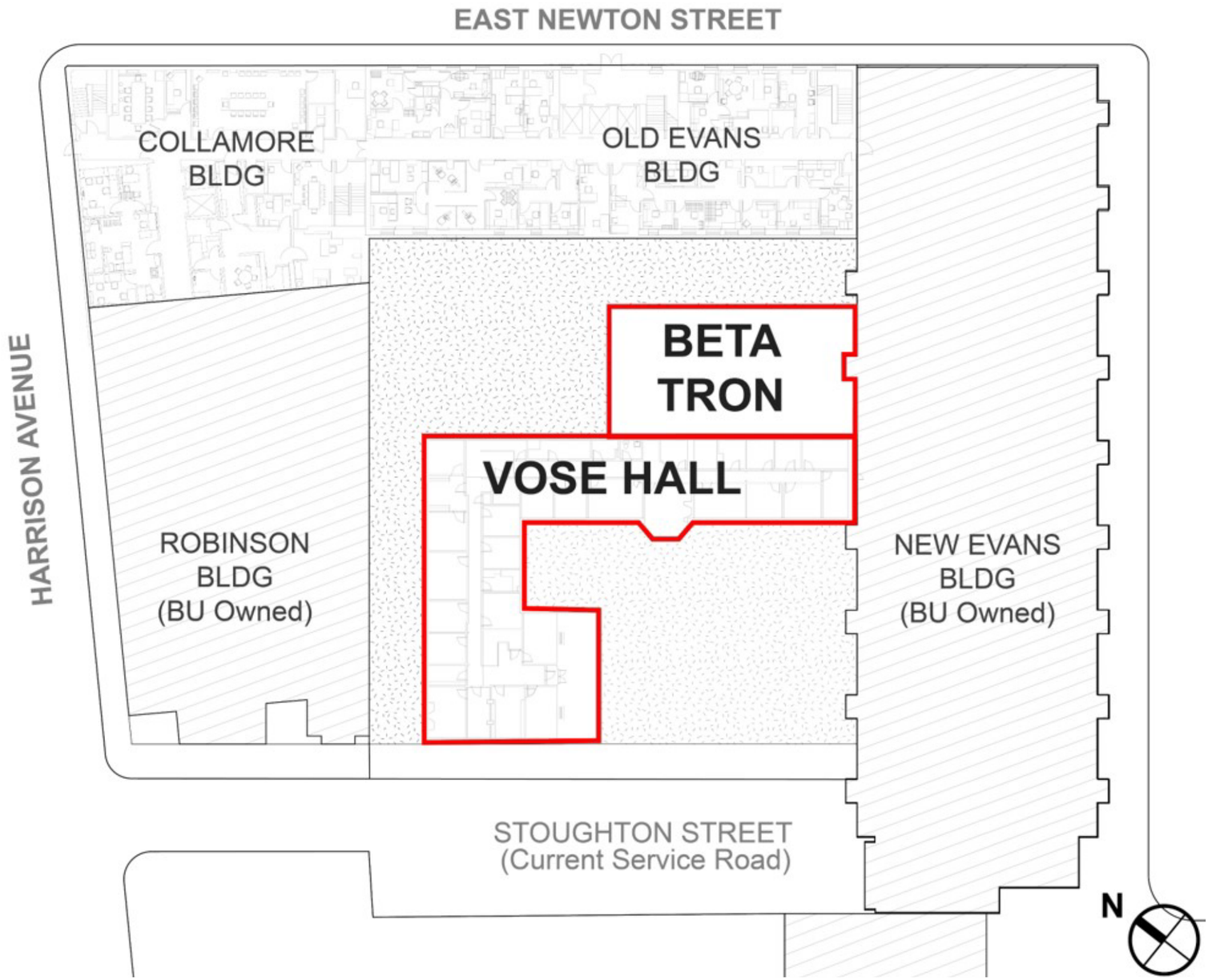


Figure 4-5 10 Stoughton Street & Collamore/Old Evans Proposed Site Plan

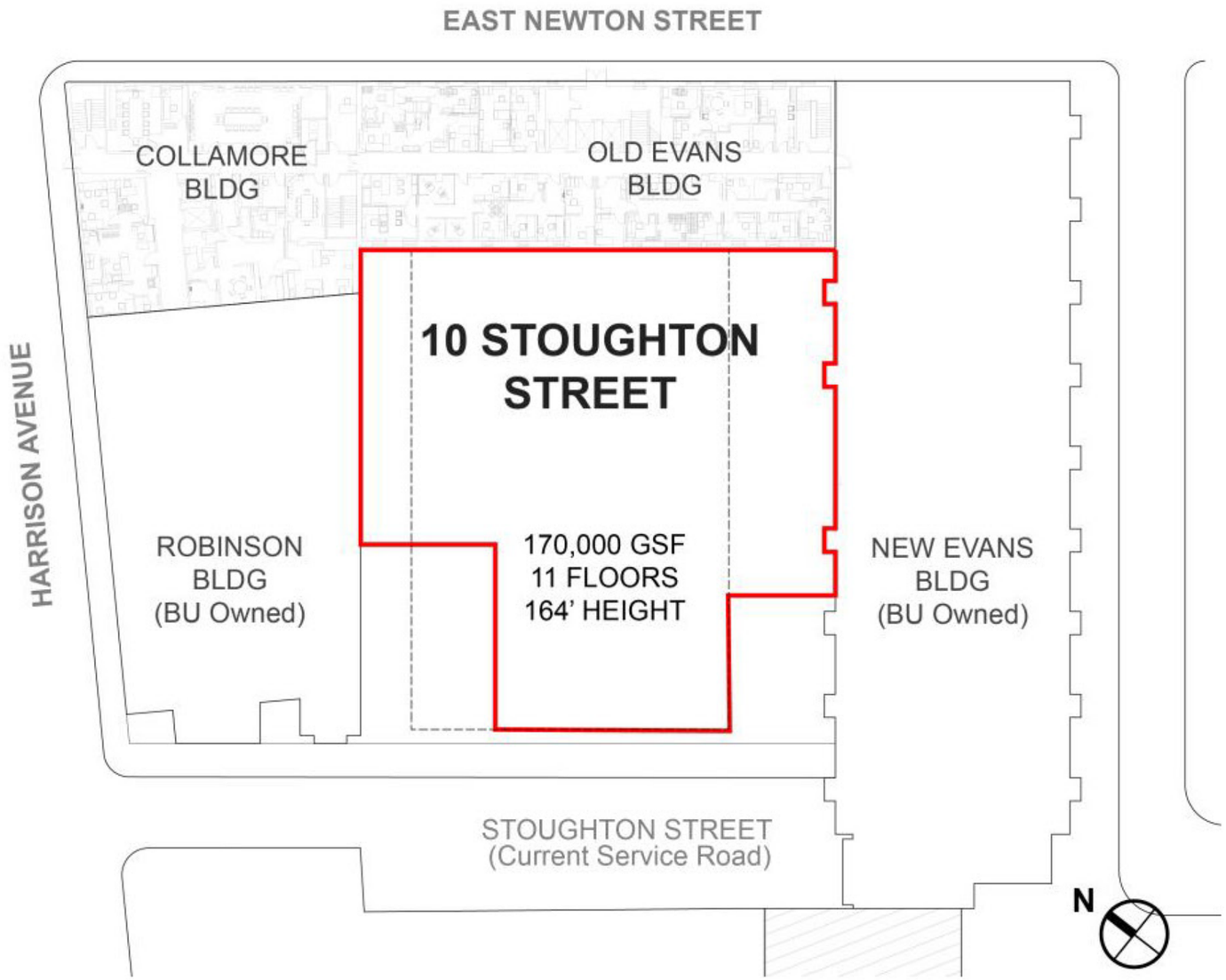


Figure 4-6 10 Stoughton Street & Collamore/Old Evans Ground Floor Plan

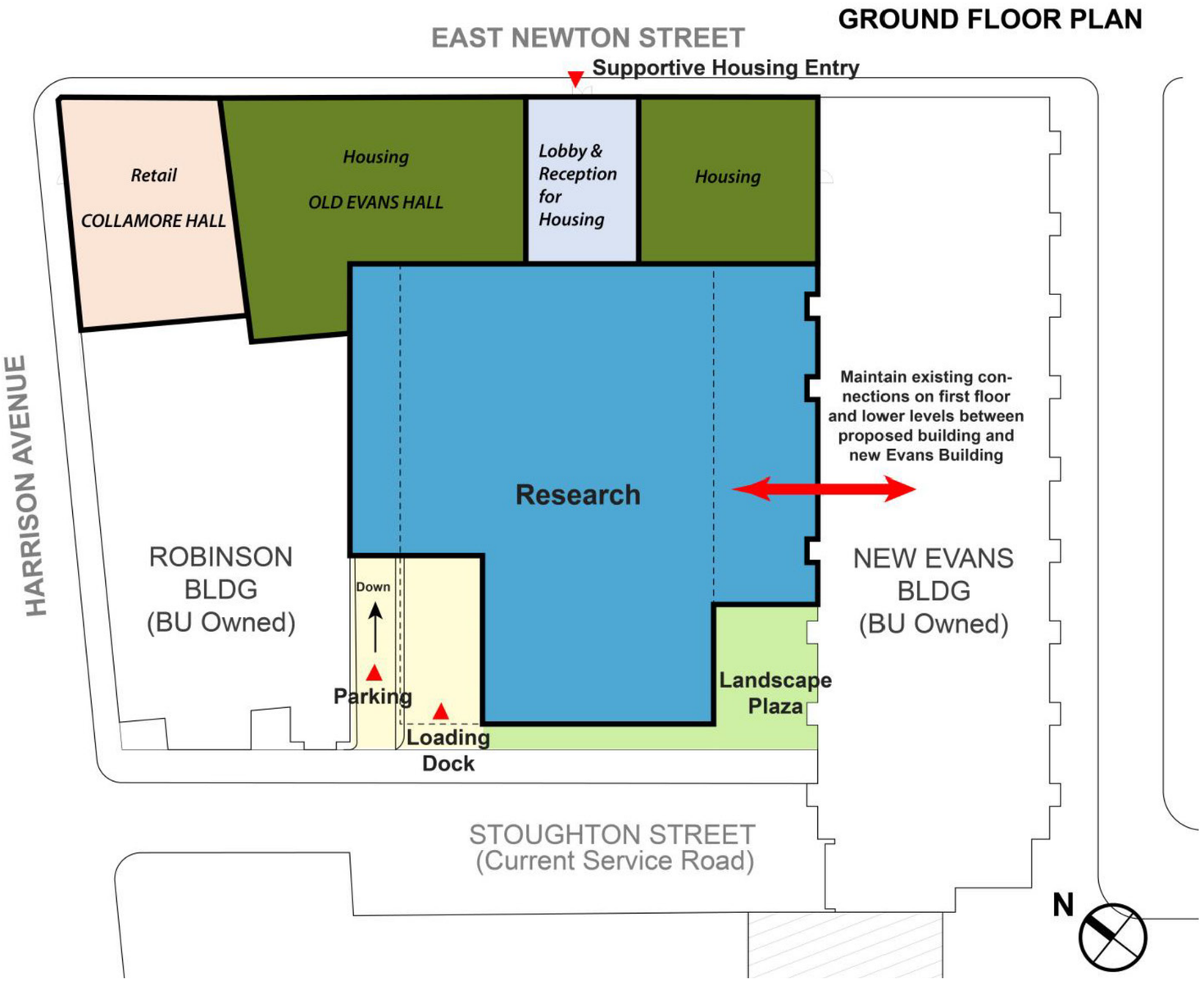


Figure 4-7 10 Stoughton Street & Collamore/Old Evans Typical Floor Plan

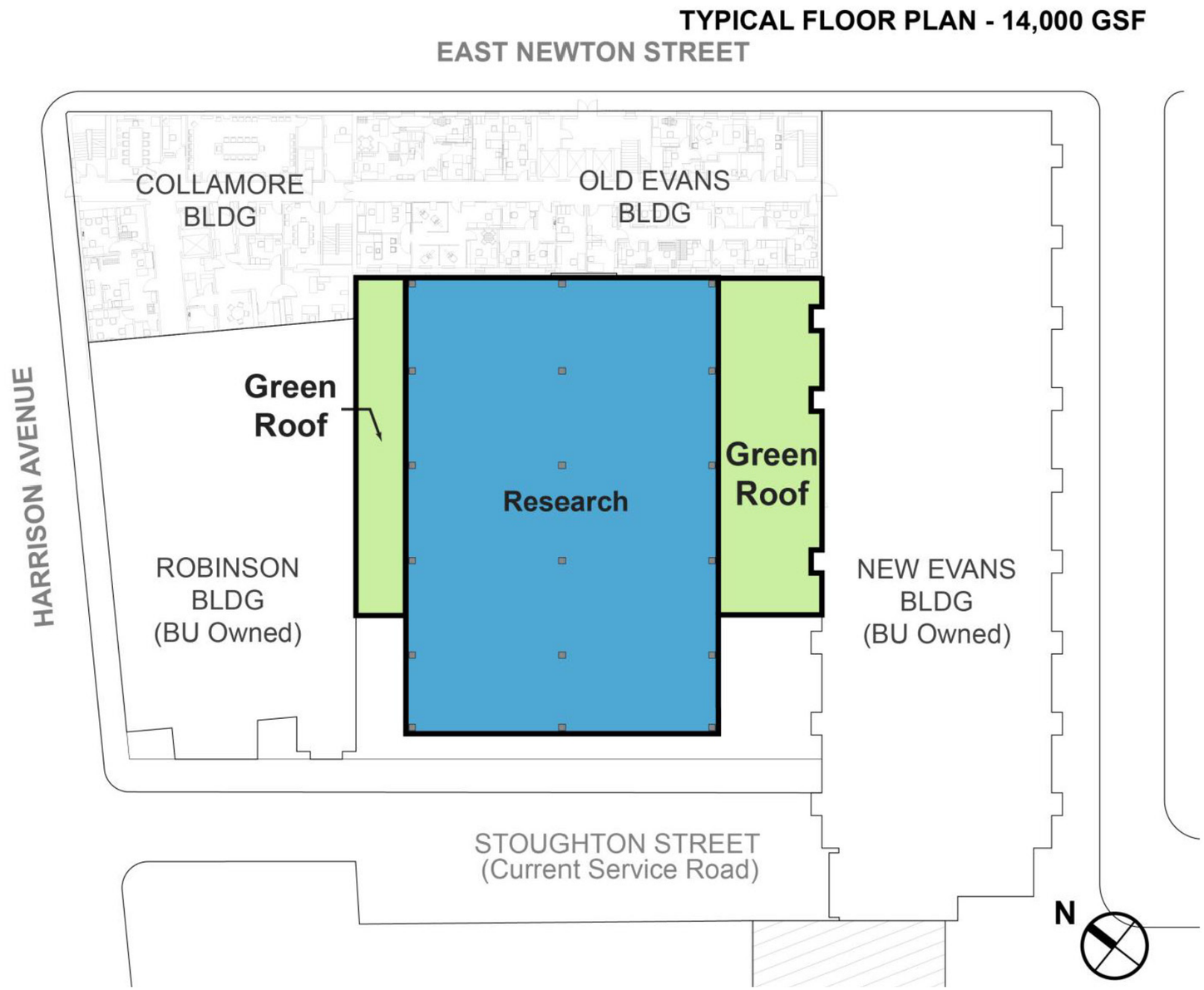


Figure 4-8 10 Stoughton Street & Collamore/Old Evans Section

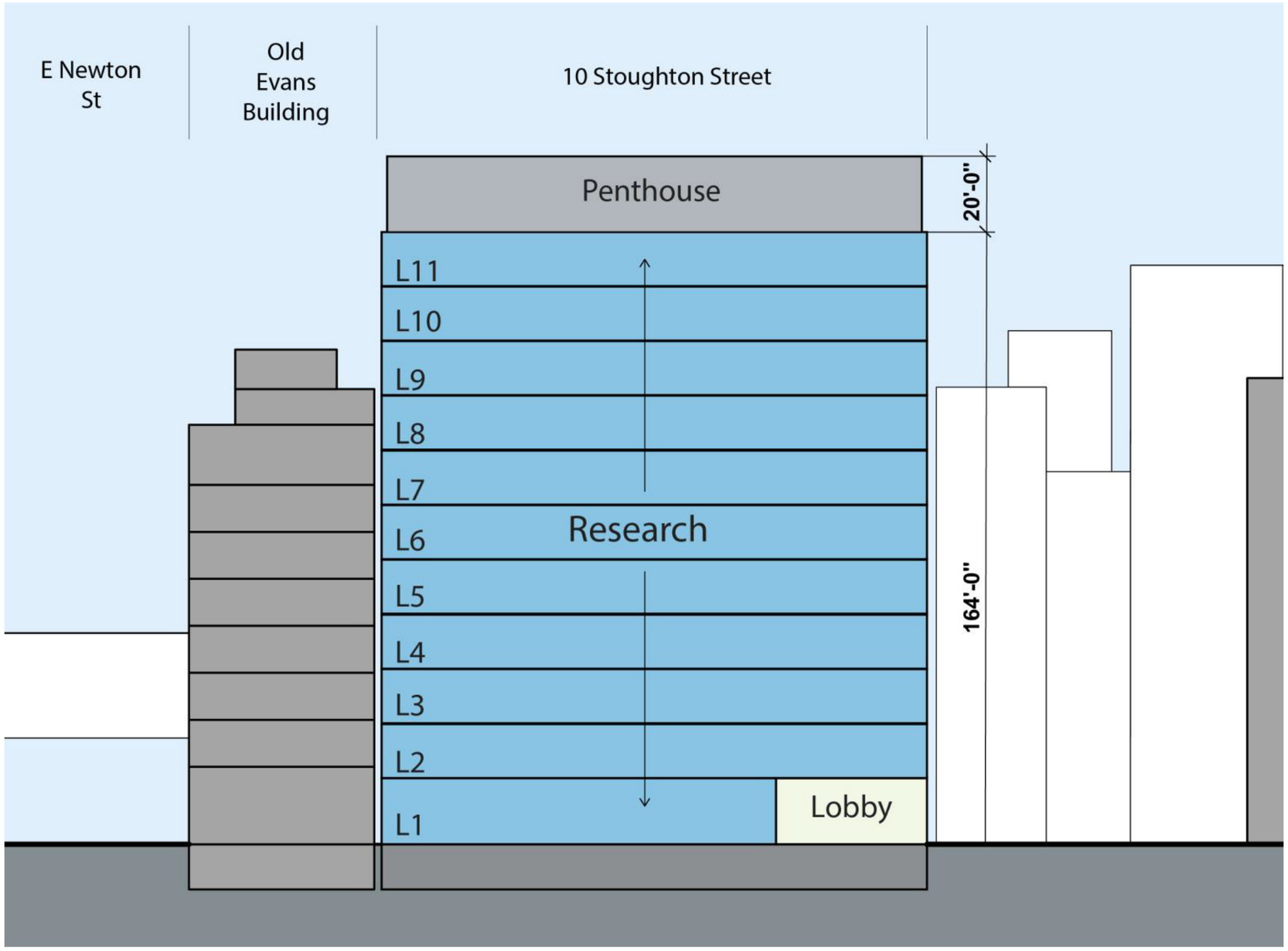


Figure 4-9 10 Stoughton Street & Collamore/Old Evans Existing Aerial View

Figure 4-10 10 Stoughton Street & Collamore/Old Evans Proposed Aerial View

Figure 4-11 10 Stoughton Street & Collamore/Old Evans Perspective

Figure 4-12 10 Stoughton Street & Collamore/Old Evans View from Harrison Ave South

Figure 4-13 10 Stoughton Street & Collamore/Old Evans View from Harrison Ave/East Newton Intersection

Figure 4-14 Emergency Department Entry Reconfiguration

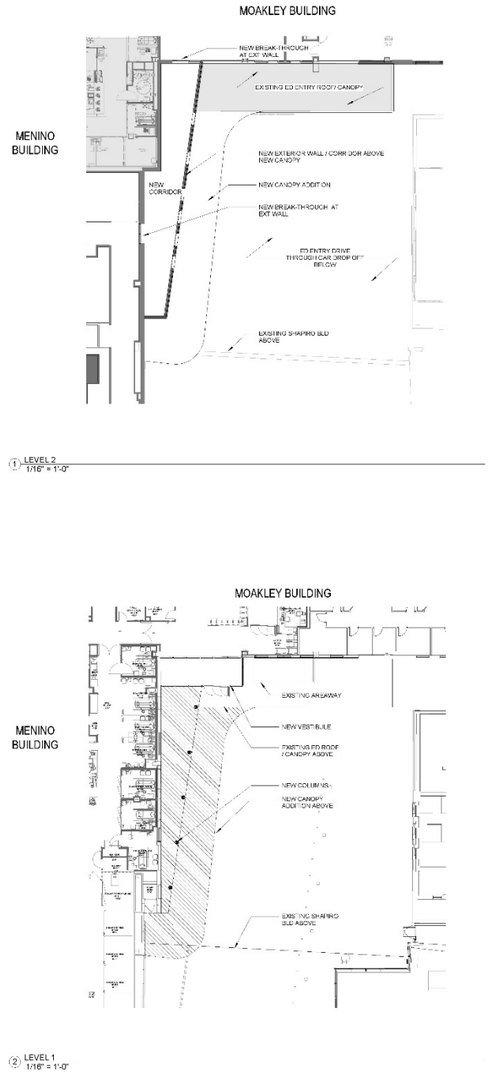


Figure 4-15 10 Landscape Buffer at Pylon Sign

4.3 Future Program Needs and Long-Term Planning

4.3.1 Clinical Services

BMC anticipates a continued need for both inpatient services and outpatient services to accommodate new healthcare trends and population growth that drive changes in patient care volumes and healthcare delivery models. The accountable care model will continue to drive realignment and integration of services to address the medical, behavioral, and social needs of BMC's patient population. As clinical care standards continue to evolve and technology continues to change, they impact space needs and complicate the reuse of many of the older facilities. As a result, existing buildings become functionally obsolete and changing clinical standards will make it harder to reuse many of the older facilities. BMC will continue to evaluate how best to maximize its building resources through renovation and modernization and new construction.

4.3.2 Administration Space

BMC anticipates a future need for administrative space to manage expiring leases, administrative support space for expansion of clinical services, as well as demands of future computer data and analytics to determine best interventions for the care of BMC's patient population.

4.3.3 Leased Space

As future leases expire and if there is further pressure on its building resources to support increased demand for clinical services and administration space, BMC may need to lease space from time to time on and off campus. In addition to being an academic medical center, BMC also administers a non-profit health plan that serves a state-wide population, the BMC HealthNet Plan (BMCHP). To accommodate growth of the BMC's healthcare services, its patient population, and/or the BMCHP, BMC can envision entering into additional leased space of a total of approximately 200,000 s.f. within the City of Boston.

4.3.4 Energy Efficiency and Resiliency

As advancements in energy efficiency and resiliency technologies improve, BMC will continue its infrastructure investments to strengthen the resiliency of its campus. Expanding on its efforts discussed in **Section 7.1.2**, this will include ongoing replacement of aging infrastructure, and planning for climate change and coastal flooding.

4.4 Areas of Interest for Future Expansion

As the Proponent looks into the future as trends continue to change for patient care, BMC must maintain foresight and flexibility to implement necessary or desirable campus expansion plans to ensure that the real estate infrastructure is available, in a timely manner, to accommodate such evolving trends. As such, BMC will continue to evaluate and consider potential opportunities for future expansion. Although there are no current proposals, BMC recognizes the following sites, if available, as ideal locations for future expansion due to the proximity to the existing BMC campus:

- Chief Medical Examiner's Office Building

- Finland Building
- Northampton Square, including Miranda Creamer and two-story commercial storefronts along Massachusetts Avenue
- Future development parcels at Crosstown Center

4.5 Overall Massing and Height

BMC's main campus in the South End is embedded within an approximately 20-acre campus generally bound by Harrison Avenue to the north, East Newton Street to the east, Albany Street to the south, and Massachusetts Avenue to the west. As shown on **Figure 3-1**, the BMC campus in not entirely contiguous and certain parcels within the campus area are occupied by both BMC-owned facilities and BU-owned, as well as facilities owned by the State.

BMC has carefully looked at several key factors that drive the proposed massing, height, and location of the proposed IMP projects. The key factors include programmatic needs, optimization of existing real estate, architectural and existing massing context, and previously established urban planning principles including preserving certain open spaces. These elements balance the needs of the institution while continuing to strengthen and enhance the relationship between the BMC campus and the neighborhood.

Each proposed IMP project will respond appropriately, both individually and collectively, to the established institutional scale and aesthetic. They will also sensitively acknowledge the character of the South End with appropriate materials, massing, and scale. All of the proposed facilities will enrich the overall campus experience as well as enhance the Harrison Avenue, Massachusetts Avenue and Albany Street Urban Corridors.

All proposed IMP projects are in context with the massing and height of adjacent buildings**. Figures 4-16 and 4-17** depict the overall massing and height relationships within the BMC campus. The Floor Area Ratio (FAR) for the combined owned BMC buildings is 4.0.

See **Figures 4-16 and 4-17** for Aerial Views from North and South**.**

Figure 4-16 Aerial View from the North

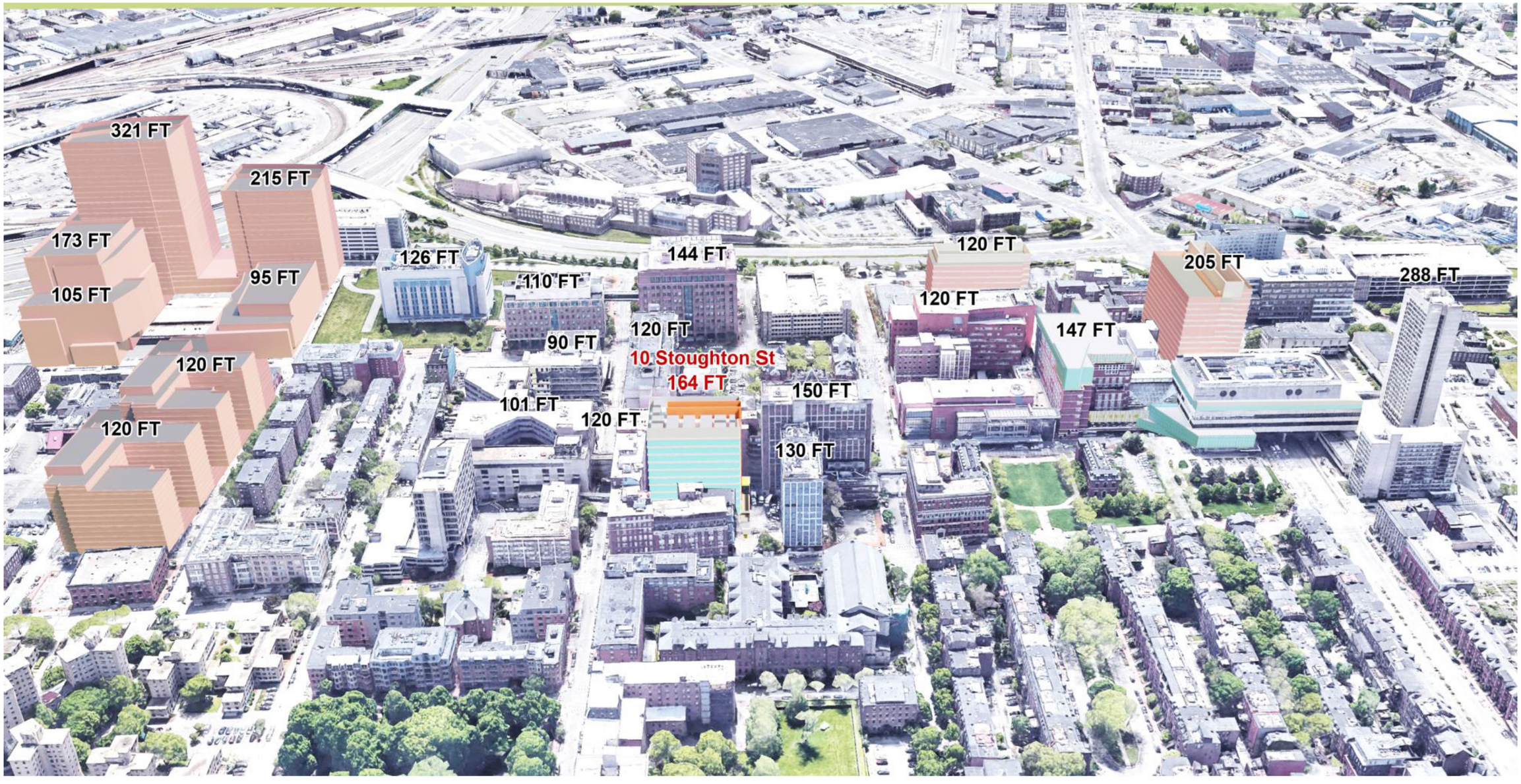


Figure 4-17 Aerial View from the South

4.6 Total Project Cost Estimates

If BMC were to proceed with the projects proposed within the five-year IMP term, it is estimated that the construction costs may be in the range of approximately $100M to $350M, and approximately $500M in estimated construction costs for the projects proposed towards the end of the ten-year IMP term. Estimated construction costs are in 2021 dollars. As project programs are being further defined and design advances, individual construction cost estimates will be prepared and finalized. The construction cost estimates will be provided in individual project submissions to the BPDA, as applicable.

4.7 Development Impact Payments

With the adoption of the new IMP for a new ten-year term commencing upon its approval, BMC and the Boston Planning and Development Agency (BPDA) will enter into a one or more Development Impact Project (DIP) Agreements which will govern the applicable projects which exceed the thresholds set forth in Article 80B of the Code. Each of the Yawkey 6th Floor Addition, the Menino and Yawkey Lobby Addition, and the Menino 9th Floor Addition will not be Development Impact Projects due to their respective project sizes. The gross floor area of Development Impact Uses in excess of 100,000 s.f. for the proposed IMP projects (e.g., 10 Stoughton Street, the New Administration/Clinical building, and the New Inpatient Building Phase 2) will be subject to the Development Impact Project Housing and Jobs Contributions Exactions to be set forth in the applicable DIP Agreements for each such project.

4.8 Anticipated Schedule, Permits, Reviews and Approvals

4.8.1 New IMP Projects

The immediate project during the term of the IMP is the Yawkey 6th Floor Addition. Due to the size of this project, it is below both Large and Small Project Review thresholds and will be subject to Design Review only through the BPDA. BMC anticipates starting the Yawkey 6th Floor Addition in 4th Quarter 2021.

The Menino and Yawkey Lobby Addition and Menino 9th Floor Addition do not have firm timelines for development. BMC expects they will construct these projects within five-years. Each project is independent and may be constructed on different schedules. However, due to their proximity there may be efficiencies in undertaking these projects simultaneously for construction logistics purposes. The Menino and Yawkey Lobby Addition is below both Large and Small Project Review and will be subject to Design Review only through the BPDA. The Menino 9th Floor Addition meets the threshold for Small Project Review but is below Large Project Review.

BMC expects to construct 10 Stoughton Street and renovate Collamore / Old Evans on the same schedule since they will abut and share a below-grade parking garage. These projects do not have firm timelines for development, but BMC expects to undertake these projects within five-years. Both of these projects will be subject to Large Project Review.

4.8.2 Approved Projects Included in the 2021-2031 IMP

The New Administration / Clinical Building is the enabling project to the construction of the New Inpatient Building Phase 2. BMC does not have a firm timeline for the development of these projects but expects that it will undertake the New Administration / Clinical Building first, then followed by the demolition of the Dowling Tower and construction of the New Inpatient Building Phase 2. These projects are anticipated at the end of the ten-year IMP period. Both of these projects will be subject to Large Project Review.

For projects subject to Large Project Review, the Proponent will submit Project Notification Forms (PNF's) to the BPDA to initiate review under Article 80B of the Boston Zoning Code. These PNF's will include a list of potential permits, review, and approvals for each IMP Project.

4.9 Coordination with Other Governmental Agencies

As new and approved IMP Projects move forward, the Proponent will initiate consultation with other governmental agencies as required.

4.9.1 Architectural Access Board Requirements

IMP projects that involve new occupiable space or modifications to the public realm (e.g., sidewalk improvements) will comply with requirements of the Massachusetts Architectural Access Board and will be designed to comply with the standards of the Americans with Disabilities Act.

4.9.2 Massachusetts Department of Public Health

BMC will coordinate review with the Department of Public Health (DPH) for proposed projects that will require a Determination of Need (DON). BMC will also coordinate with DPH's Plan Review process for review and approval of construction documents for the applicable IMP projects.

4.9.3 Massachusetts Environmental Policy Act

The renewal or the approval of a new Institutional Master Plan by the BPDA does not trigger review under the Massachusetts Environmental Policy Act (MEPA) and the Regulations set forth in 301 CMR 11. The filing of the IMP will not require a simultaneous filing with the MEPA office. As in the past, when a proposed institutional project is the subject of a filing with the BPDA as a project within an Institutional Master Plan Application and is subject to MEPA review, BMC will meet with the MEPA Office to coordinate the filing of documentation required by MEPA, including, if necessary, an Environmental Notification Form (ENF), and Environmental Impact Report (EIR), or a Notice of Project Change (NPC) for a proposed project. The ENF, EIR, or NPC will be consistent with the project documentation filed with the BPDA for such proposed institutional project.

4.9.4 Massachusetts Historical Commission / South End Landmark District Commission

In the event that a proposed institutional project requires state permits or receives state funding such as HEFA bond financing, such action will require the filing and consultation with the Massachusetts Historical

Commission (MHC). As in the past, BMC has filed copies of the relevant documentation, including an ENF or PNF, with MHC to seek MHC approval of the proposed project.

The majority of the land and buildings in the BMC IMP are located within the South End Harrison/Albany Protection Area of the South End (Protection Area). Activities relating to demolition, land coverage, height of structure, topography and landscaping are subject to review by the South End Landmarks District Commission (SELDC). BMC will submit an application for a certificate of design approval to the SELDC for each proposed project when Article 80B Large Project Review is initiated for each project and will review small projects and other elements as required with the SELDC.

4.9.5 Boston Civic Design Commission

The Proponent will meet with the Boston Civic Design Commission (BCDC) to review the proposed IMP. The IMP documentation will be submitted to the BCDC in accordance with the provisions of Article 28 of the Boston Zoning Code.

4.9.6 Mayor's Commission for Persons with Disabilities

The Proponent will meet with the Mayor's Commission for Persons with Disabilities to review proposed pedestrian improvement plans as each IMP project moves forward. The Commission will be consulted with to ensure that paths of travel are designed for universal accessibility and will comply with the standards of the Americans with Disabilities Act.

4.9.7 Boston Groundwater Trust

The proposed IMP Projects are located within the Groundwater Conservation Overlay District (GCOD). BMC will incorporate systems into the proposed IMP projects designs that meet the groundwater conservation standards set forth in Article 32 of the Boston Zoning Code. BMC will obtain a written determination from the Boston Water and Sewer Commission as to whether said standards are met and will provide a copy of this letter to the BPDA and the Boston Groundwater Trust prior to the issuance of a Certificate of Consistency. Accordingly, BMC will comply with the requirements of Article 32 and so will not be required to obtain a conditional use permit from the Board of Appeals for its proposed IMP Projects.

4.10 Zoning

The Boston Medical Center main campus is predominantly located within the South End Neighborhood Zoning District shown on Map 1P of the Zoning District Maps of the City of Boston (Zoning Maps). Certain other BMC campus buildings, as shown on **Figure 4-18**, are located in the New Market IDA subdistrict within the abutting Roxbury Neighborhood Zoning District shown on Map 6A/6B/6C of the Zoning Maps but are subject to specific zoning requirements as described below.

Article 64 of the Boston Zoning Code (Code) established the zoning controls for the South End District. Section 64-24 of the Code provides for the establishment of Institutional Subdistricts within the South End Neighborhood District and specifically established the Boston University Medical Center Institutional Subdistrict. The underlying use and dimensional requirements applicable to the Institutional Subdistrict

are set forth in Section 64-25 and Section 64-26 of the Code. Additionally, Section 64-27 of the Code provides that any Proposed Institutional Project located within the South End District that is (or immediately after completion will be) used or occupied for an Institutional Use shall be consistent with an approved Institutional Master Plan approved pursuant to Article 80D of the Code, unless such Proposed Institutional Project is exempt from Institutional Master Plan review pursuant to subsection 2 of Section 64-27 of the Code. Pursuant to Section 80D-2.5, a proponent may elect to subject any exempt project to the provisions of its Institutional Master Plan, in which event such project shall be governed by the provisions of this 80D requiring Institutional Master Plan Review.

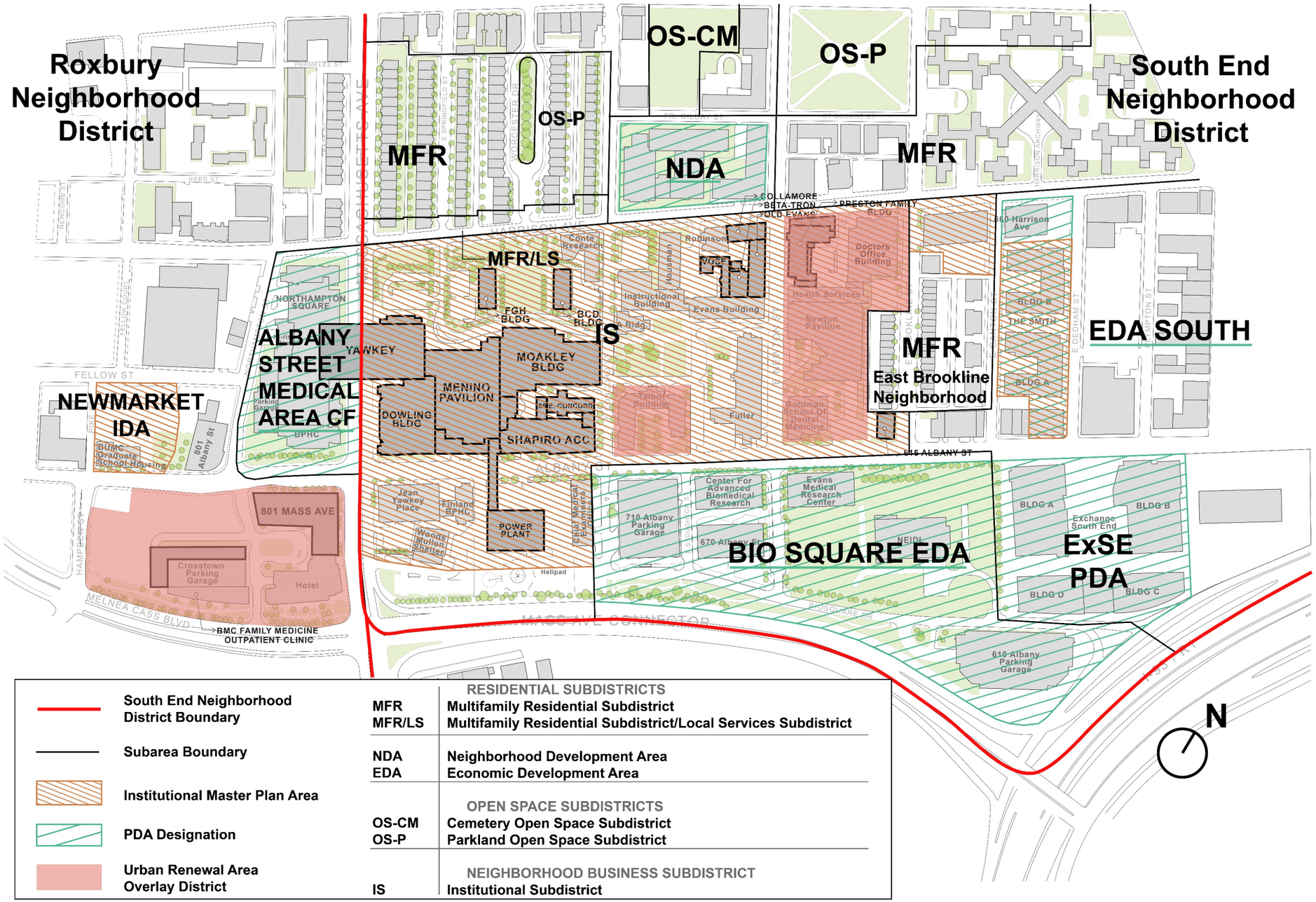
Section 80D-11 of the Code provides that a Proposed Institutional Project shall be deemed to be in compliance with the use, dimensional, parking and loading requirements of the underlying zoning, notwithstanding any provisions of the underlying zoning to the contrary and without the requirement of further zoning relief, upon the issuance of a Certification of Consistency pursuant to Section 80D-10 of the Code and, if applicable, a Certification of Compliance under Large Project Review pursuant to Section 80B.6 of the Code. The approval of Proposed Institutional Projects by the BPDA, the Zoning Commission and the Mayor in accordance with Article 80D of the Code establishes the zoning controls for the Proposed Institutional Project within the Institutional Master Plan Area.

The Crosstown Office building and parking garage (the “Crosstown Facilities”) are in an Urban Renewal Area overlay district within the Roxbury Neighborhood District. The use and dimensional requirements for the Crosstown Facilities are more specifically set forth in that certain Land Disposition Agreement by and between the Boston Redevelopment Authority and Boston Medical Center Corporation dated September 27, 2018 (as the same may be amended from time to time) (the “Crosstown LDA”). Specifically, the Crosstown LDA provides that the allowed uses for the Crosstown Facilities are (1) executive, general, professional and administrative office, research and development (including dry research with subject visits and wet research and clinical and also institutional medical clinical), classroom and laboratory uses, and light manufacturing uses incident to the foregoing, (2) retail, restaurant, commercial and entertainment uses, (3) a parking garage, and (4) hospital uses.

The Northampton Square condominium (e.g., 860 Harrison Avenue, 35 Northampton Street, Miranda Creamer building, Northampton Square parking garage, the Massachusetts Avenue Commercial Space, etc.) (the “Northampton Facilities”) are in a planned development area overlay district within the Albany Street Medical Cultural Facility subdistrict of the Roxbury Neighborhood District. The use and dimensional requirements for the Northampton Facilities are more specifically set forth in that certain Development Plan for PDA No. 97 (as the same may be amended from time to time). The Crosstown Facilities and the Northampton Facilities are being described in this Institutional Master Plan for purposes of providing the context of BMC’s main campus for this Institutional Master Plan.

In accordance with the provisions of Section 80D-8, the Proponent is filing this Institutional Master Plan seeking to bifurcate the existing Boston University Medical Center Institutional Master Plan and seeking approval from the BPDA and the Zoning Commission of this Institutional Master Plan to cover the Boston Medical Center campus as part of the existing Boston University Medical Center Institutional Master Plan Subdistrict for a ten-year period commencing upon its approval in accordance with Section 80D-3 of the Code.

Figure 4-18 Zoning Districts



5.0 PLANNING FRAMEWORK

5.1 Existing Context

The BMC campus is bound by a residential neighborhood to the north along Harrison Avenue, a pocket of residential buildings to the east along East Brookline Street, a growing clinical presence and research and development uses to the south along Albany Street, and rapidly changing formerly light industrial and commercial uses to the east and west. The existing campus is also bordered by major roadways, most notably Massachusetts Avenue. This prominent artery forms an important gateway to the BMC campus and links the institution to the City of Boston. Expansion to the west of Massachusetts Avenue includes acquisition of the Crosstown Office Building and the potential for future control of the Northampton Institutional complex including the commercial storefronts along Massachusetts Avenue. Significant pedestrian routes, such as the East Concord Street corridor, weave through the campus. See **Figure 5-1** for larger neighborhood context from Harrison Albany Corridor Strategic Plan.

The existing architectural context is comprised of a variety of scales, styles, and periods. Building heights range from 2 to 12 stories. Traditional historic buildings such as the BCD and FGH Buildings, were constructed in the late 1800's. The newer Moakley Building and the Shapiro Ambulatory Care Center and recently completed New Inpatient Building Phase 1 and Patient Transport Bridge portray the current, modern campus aesthetic. These diverse buildings represent BMC's sensitivity to historic context through preservation; design that is compatible with this historic context and its commitment to delivering state-of-the-art, patient friendly health care in modern clinical settings.

5.2 Facilities Needs

Section 2.3 discusses the detailed Program Needs.

Following the approval of the 2010 IMP, the healthcare environment continued to dramatically change. In 2018, BMC became a Boston Accountable Care Organization (BACO) (See **Section 2.1.6**). To succeed in this new coordinated care model, which has created a higher demand for BMC's services while the patient population has increased, BMC must focus on addressing evolving healthcare program needs which require strategic space modifications to:

- Accommodate the increase in outpatient and inpatient volume.
- Redesign healthcare models to integrate medical, behavioral, and social needs of its patients.
- Right-size and modernize clinical space to meet current building code and clinical standards.
- Leverage the highest and best use of building resources, owned, and leased.

In addition to the approved New Administration / Clinical Building and the approved New Inpatient Building Phase 2, BMC seeks zoning approval for newly proposed projects so that it may also:

- Construct approximately 15,500 s.f. addition to Yawkey 6th Floor to right-size inpatient space.
- Construct approximately 6,100 s.f. addition to Menino & Yawkey Lobby to improve patient and visitor circulation.

- Construct approximately 37,000 s.f. addition to Menino 9th Floor to right-size inpatient space.
- Construct approximately 170,000 s.f. new 10 Stoughton Street Building for research.
- Adaptively reuse and renovate the existing approximately 102,000 s.f. Collamore/Old Evans for mixed-use housing including supportive housing.
- Vacate approximately 110,000 s.f. of leased space.
- Demolish approximately 250,000 s.f. of deficient/unsuitable facilities.
- Potentially Acquire or Lease approximately 75,000 s.f. in Northampton Square.

5.3 Campus Vision and Identity

5.3.1 Vision and Goals

The Institutional Master Plan aligns with the vision and goals established in the Harrison Albany Corridor Strategic Plan (HACSP) and has been developed to enhance BMC's public service and economic development role in the community. Under earlier master plans, BMC has accomplished preserving and enhancing open space and making significant improvements to the vehicular and pedestrian circulation and experience on both Harrison Avenue and Albany Street through re-directing traffic, eliminating curb cuts, and diminishing the congestion and conflicting traffic patterns. The proposed projects under the current IMP will build upon these improvements. The design of the proposed buildings will blend with the historic and modern BMC campus as well as the adjacent neighborhood. The proposed buildings along Albany Street will be designed to align with the HACSP vision for pedestrian realm improvements including paving, lighting, and wayfinding. Proposed building setbacks and architectural features such as glass facades at the ground level and canopies are intended amenities for the general public. The proposed buildings will be designed as an integral component of a streetscape that will form and enhance the character of the street. Vehicular, bicycle and pedestrian circulation will continue to be evaluated for improved experience. To that end, HACSP streetscape guidelines will be explored along with the goals and objectives of the Albany Street Redesign Project and BMC's planning criteria.

All the proposed IMP projects planned in this IMP will continue to transform the appearance of BMC and its campus edges, thereby reinforcing key access corridors, enhancing the pedestrian experience, and strengthening the connection beyond the boundaries of the BMC campus. For example, one area currently planned for improvement includes installing a landscaped buffer edge behind the existing fence along the front of the Power Plant along Albany Street.

The approved IMP projects along Albany Street - the New Administration/Clinical Building and the New Inpatient Building Phase 2 - will engage the street edge and establish new landscaped open space where feasible. New trees and sidewalk improvements will also be constructed and serve to improve the pedestrian connectivity along east/west Albany Street corridor. As part of the New Inpatient Building Phase 2, BMC will study options to activate the building at the corner of Massachusetts Avenue. As BMC moves further to the west side of Massachusetts Avenue, similar strategies will be considered, and BMC will look to align and coordinate with other BPDA sponsored initiatives.

The adaptive reuse of Collamore/Old Evans and the new 10 Stoughton Street building will provide opportunities to improve the pedestrian realm experience at this block by improving the sidewalks and provide ground level amenities to engage the public.

5.3.2 Campus Edges

As BMC's core clinical services continue to shift to the west campus, it is important to define the role the major streets will play in BMC's planning.

Harrison Avenue

Harrison Avenue has historically been and will remain the hospital's primary public face. As such, it has an obligation to create visual as well as physical links between the campus and neighboring South End. Over the past decade BMC has worked to revitalize this campus edge through extensive landscape, material, and architectural improvements. The Moakley Building, green space, and repurposed historical buildings adjacent to Worcester Square provide a formal gesture back to the residential neighborhood, while maintaining an appropriate buffer to the larger scale buildings on the BMC campus. Future planning for proposed projects along Harrison Avenue will include exploring additional landscaping buffers that form pedestrian-friendly street edges, place-making opportunities at key intersections and ground-level public amenities to establish destination points along this key corridor in order to sponsor district interconnectivity. In addition, these planning efforts will look at ways to improve patient and visitor arrival experience along Harrison Avenue to BMC's front door.

Massachusetts Avenue

As a major campus arrival point, Massachusetts Avenue is the functional artery tying the BMC campus into the broader city and regional context. It is a connecting street traversing many neighborhoods, maintaining continuous walking, cycling and vehicular connections to the BMC campus. Buildings along this street tend to vary in scale, growing larger as they reach the Massachusetts Avenue Connector. Future development along this corridor should relate to this larger scale and be conscious of the smaller pedestrian scale along the street edge. Future planning for proposed projects at the corner of Massachusetts Avenue and Albany Street will explore pedestrian realm improvements which promote connection to the surrounding context and wayfinding opportunities at major street intersections to improve the user quality at this key juncture. Should BMC gain control of the portions of Northampton Square, significant improvements to the streetscape along the west side of Massachusetts Avenue will be possible.

Albany Street

Street clarity and pedestrian safety are critical in achieving a heightened urban experience. Traditionally Albany Street has lacked a clear unifying identity to the campus. A myriad of curb cuts, varying building scales and segmented facades created a condition of confusion and an overall unsafe pedestrian experience along the street corridor. As the west campus advances, this street is underscored as a major access point and entry into the campus. BMC has begun to elevate the image of Albany Street, unite the campus, and provide a better patient and visitor environment through the completion of the public realm improvements with the New Inpatient Building Phase 1 and the New Patient Transport and Materials Handling Bridge. These two projects significantly improved the circulation, traffic, accessibility, and user

experience along the portion of Albany Street closest to Massachusetts Avenue. Continuing to strengthen the unified identity along the entirety of Albany Street will enhance the overall cohesiveness and organization of the corridor, simplifying wayfinding and site orientation.

Future planning for projects along this corridor will promote a simplified urban understanding through visual and material clarity. Continuous façade alignments will provide spaces that are critical to the creation of public realm improvements. Future projects will continue to support the development of this "secondary green path" (established in HACSP) through appropriately placed "pocket" green spaces, street planters and existing tree improvements. Strategically placed campus signage and pedestrian-friendly walking links will maintain relationships to buildings that are outside of the immediate campus core.

Future planning goals will be to invite and bolster pedestrian connectivity throughout the Albany Street, Harrison Avenue and Massachusetts Avenue corridors. The IMP projects will be designed to align with the HACSP vision for the enhancement of pedestrian circulation, creation of place-making and continual green space expansion to further strengthen the campus' connection to its surrounding context.

Figure 5-1 Neighborhood Districts

5.4 Urban Design

5.4.1 Urban Design Principles and Objectives

The primary urban design objective of BMC is to create a cohesive medical campus thoughtfully integrated into the surrounding urban fabric and neighborhoods. Since the merger of Boston City Hospital and University Hospital in 1996, BMC has endeavored to implement sensitive design, careful open space planning, and conscientious site and streetscape enhancements along the campus periphery to support this objective. The broader issue of sea level rise has compelled BMC to think proactively in terms of both Resiliency and Sustainability resulting in BMC being one of the most advanced campuses in the Nation today.

Significant campus improvement projects implemented under the previous 2000 and 2010 Institutional Master Plans refined the presence and aesthetic of the BMC campus, specifically along Harrison Avenue and Albany Street.

Similar master planning design goals are relevant for the next ten-years to support future development on the BMC campus and these include:

- Create a clear and welcoming sense of arrival;
- Strengthen the identity and visibility of BMC;
- Complement the existing context massing, scale, and materials;
- Enhance campus unification, circulation, and accessibility;
- Enable connectivity between parking and existing buildings;
- Enhance open spaces on the campus, both short- and long-term;
- Develop and activate pedestrian-friendly street edges;
- Recognize how the social determinants of health status influence patient's perspectives
- Integrate sustainable design principles and energy efficient and resilient operations; and
- Plan proactively for future growth and transformation.

BMC's master plan goals combined with urban design principles will enrich the physical image of the BMC campus, improve the integration with the surrounding neighborhood, and elevate the perceptions of BMC by its users. Ultimately, the institution strives for consistency, compatibility, and connectivity in the design and location of its buildings, open spaces, streetscapes, pedestrian access, and overall campus circulation.

5.5 Public Realm

The below represents the guidelines established under the 2010 IMP and 2013 Amendment and will continue to guide campus development in the 2021-2031 IMP.

5.5.1 BMC Public Realm Guidelines

- **Reinvigorate Campus Connectivity and Streetscapes -** Provide visual cues and design features that physically and symbolically connect the different streetscapes of the campus.
    - Public sidewalks should provide a direct and continuous pedestrian network connecting blocks and buildings to each other with a clear, unobstructed pedestrian pathway that is designed to accommodate the needs of a broad range of users, including the elderly, those with disabilities, and young children.
    - Areas encouraging rest, respite, and campus/community collaboration should be planned for a provided where possible, through the use of appropriate green space, xeriscaping, and other opportunities to optimize open space.
- **Respect Campus Context -** Buildings should continue to complement existing context mass, scale, and materiality, while reinforcing the public realm.
    - New buildings should be clearly defined and engage the streetscape to provide a consistent urban street edge.
    - Appropriate setbacks where possible should be provided to allow for proper public realm enhancements.
- **Maximize Definition of Campus Gateways -** Create well-defined gateways that announce arrival and improve wayfinding at key points.
    - Aesthetically pleasing and informative signage shall be provided throughout the campus to help in wayfinding and encourage safe and efficient travel.
    - Public signage should be used to announce entry into the campus at key intersections.
    - Employ public signage for vehicular, pedestrian, and cyclist wayfinding that is consistent in color, shape, and graphic image.
    - Employ public signage which incorporates public health messaging.
- **Encourage Community Engagement -** Enliven the streetscape, invite connectivity, and provide green respite to the public.
    - Wherever possible promote positive street activity, both day and night, through retail and /or after-hour program functions.
    - In addition to accommodating pedestrian circulation, public sidewalks should provide spaces for more passive activities, where people can remain to observe or participate in public outdoor activities. Seating can be either formal (e.g., chairs and benches, such as those found at a café or transit stop) or informal.
    - Integrate the pedestrian experiences of medical students, faculty, staff, visitors, residents, and patients.

- **Promote Safety and Comfort -** Provide a safe and pleasant environment for all users.
    - Limit conflicts between pedestrian and motor vehicles through reduction of curb cuts (where possible) and by creating clearly marked service zones to limit unsafe pedestrian conditions.
    - Universal accessibility principles should be applied to all proposed and future projects in accordance with ADA guidelines.
    - Adequate street lighting to maintain a safe environment at night.
    - Sidewalk upgrades, planting, and other improvements that make the streetscape comfortable for pedestrians.
    - Landscape areas along the street edge for tree and planter improvements to add visual interest, soften urban edges, and provide pedestrians with buffer from traffic.

5.5.2 Campus Plan Improvements

As clinical care trends have evolved over the years, so have the physical parameters necessary to support them. Buildings with larger footprints and uninterrupted floor plates are often required. These large-scale designs sometimes result in unfortunate impacts on the urban fabric, such as the elimination of roadways and open spaces. While addressing the ever-changing aspects of clinical care, BMC utilizes a balanced master planning approach with minimal collateral loss to existing infrastructure through its commitment to historical precedents, maximizing the highest and best use of its existing building resources, and open space strategies.

Ongoing planning initiatives sensitively maintain the integrity of the urban fabric and the surrounding neighborhoods while continuing to define a sense of campus and meet the institution's primary mission of healing. As a result, many of the original streets of the historic urban fabric have been retained and enhanced to better integrate the campus with the neighborhood.

The Moakley Building is an example of integrating the campus with the neighborhood. This structure was strategically located and oriented to reinforce the significant pedestrian connection between the east and west campuses and the centrally positioned medical school. Moakley Green, located north of the Moakley Building, strengthens the urban axis of Worcester Square, and provides a landscaped transition between the campus edge and the residential neighborhood. Moakley Green is accessible to the public and provides pedestrian access to the campus from the north.

Recent significant building and circulation improvements were made under the previous IMP. Moakley Cancer Center Addition engages the streetscape at the east facade and helps further define the prominent north/south pedestrian corridor connecting the campus with the surrounding residential neighborhood to the north. The integrated bus stop and canopy provides a clear arrival point for medical students, faculty, staff, and visitors accessing the campus via public transportation.

With the completion of the New Inpatient Building Phase 1 and the New Patient Transport and Materials Handling Bridge, the most impactful of the campus plan improvements have been realized. These projects allowed repositioning of two major vehicular functions to create a simplified streetscape condition by eliminating several existing curb cuts. The existing West Campus loading dock was relocated to the existing Power Plant, separating operational service zones from public circulation areas. The Emergency

Department patient drive and drop-off was moved to the south side of the Moakley Building via Shapiro Drive. These actions instantly improved pedestrian experience by reducing pedestrian/vehicular conflicts along the north side of Albany Street. And for the first time in years, and internal north-south corridor links the Harrison Ave. entrances with the Albany Street entrances associated with the Shapiro Building and the Emergency Department.

The New Inpatient Phase 1 building infilled gaps in the Albany Street face and better-defined circulation paths by engaging the public street zone. These improvements now create a visual link promoting a unified campus image and established a much-needed visual order to the street edge. This order has heightened the experience through easier patient wayfinding and created an enhanced entry image as viewed from Massachusetts Avenue. Replacing the existing utility tube with the new Patient Transport and Materials Handling Bridge along the Albany Street corridor provides further visual comprehension to a congested and confusing street corridor. See **Figure 5-2** Completed Campus Plan Improvements.

5.5.3 Campus Access and Connectivity

An individual's experience with the BMC campus begins with their approach. The arrival sequence must be clear, and the architecture and open spaces should impart an immediate and welcoming sense of arrival and place. The arrival experience should also convey the image and identity of the institution as a leader in healthcare and research.

The BMC campus is well connected to regional and district roadways while several MBTA bus and rapid transit routes service the area. The intersections of Massachusetts and Harrison Avenues and Massachusetts Avenue and Albany Street form key entry points to BMC. About half of the visitors arriving at the BMC campus by car will go directly to the parking garage located on Albany Street.

Once on the campus, users encounter a range of choices for navigating to their destinations. Wayfinding must be clarified through the careful design and manipulation of building massing and materials, tree planting, sidewalk improvements, and a unified signage system.

Massachusetts Avenue, East Concord Street, East Newton Street, and East Brookline Street are the major north/south vehicular and pedestrian throughways that connect the campus to the neighborhood. East Concord Street is the most important north/south vehicular and pedestrian connection due to its axial relationship with the public parking garage at 710 Albany Street and its central location to the east and west ends of the campus and connection with the BMC campus. Given the East Concord Street importance, it is vital to ensure vehicular and pedestrian through-put operations are functionally efficient. The conveyance of the Newton Pavilion to the Commonwealth, and the decision not to build on the Ramp Parcel signals BMC's continued concentration of the majority of its clinical functions to the west of East Newton Street and signals an appreciation to maintain a buffer for the East Brookline Street residential neighborhood.

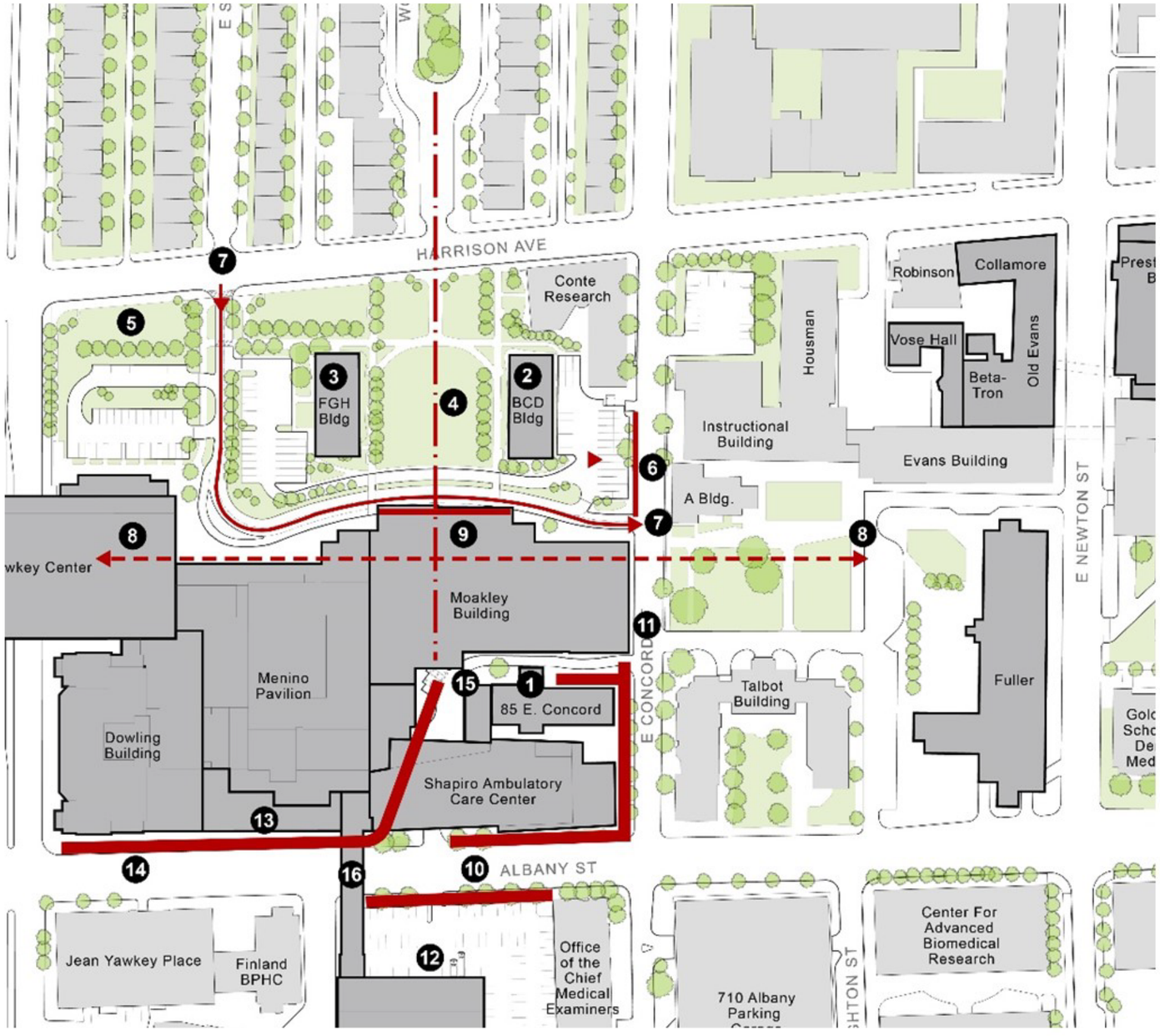
Harrison Avenue and Albany Street are the major east/west vehicular and pedestrian throughways that connect the campus to Massachusetts Avenue (and I-93) and the neighborhood. Albany Street will provide connectivity to BMC's administrative and clinical services in Crosstown and link future developments and medical and bio-tech clusters to the east and west as envisioned in the Harrison/Albany Study.

On the southern perimeter of the BMC campus, pedestrian pathways facilitate staff movement between the 610 Albany Street parking garage, BioSquare, and the main medical center. The South Bay Harbor Trail also joins the network of BMC connections where it intersects with Massachusetts Avenue.

Pedestrian pass-through connections exist via access corridors at the Menino Pavilion and the Moakley Building. The Moakley Building public corridor through the Menino Pavilion links the walk-in Emergency Department entry with the Menino Lobby. A through building connection also exists for staff and visitors between the Power Plant and the Menino Pavilion the Patient Transport and Materials Handling Bridge. There is a limited-access corridor for wheelchair/stretcher patients through the Moakley Building that unites the Moakley/Shapiro Ambulatory Care Center south entry court with the Moakley Lobby. The consolidation of BMC's clinical services from the east campus to the west campus as part of the previous master plan has improved the experience for patients, staff, and visitors by simplifying movement and connectivity because users now navigate to one campus instead of two.

See Figure 5-3 Existing Major Vehicular Access and Major Entry Points, **Figure 5-4** Campus Connectivity and Open Space, and **Figure 5-5** Pedestrian Connectivity.

Figure 5-2 Completed Campus Plan Improvements



1. Preservation of 85 East Concord Street Building
2. Historical restoration and National Trust renovation of BCD Building completed
3. Historical restoration and National Trust Renovation of FGH Building Completed
4. Landscaped open space between BCD and FGH on axis with Worcester Square
5. Landscaping improvements and parking lot screening at Harrison Ave
6. Reconstruction of historic brick wall along East Concord Street
7. Campus Access redesign, shifting sway from Harrison Avenue and South End Historic District
8. Enhanced east/west pedestrian connection
9. Moakley Building design modifications in response to Worcester Square axis
10. SACC streetscape improvements including new paving, planters, trees, and landscaping
11. New Integrated Bus Stop and Canopy
12. Consolidated Loading
13. Reduced curbs Cuts and Simplified Drop Off
14. Albany Streetscape improvement from Mass Ave to new ED entrance. New paving, planters, trees, and landscaping
15. Relocated ED walk-in and drop-off entrance
16. Replaced yellow utility tube with new bridge to improve the Albany Street image

Figure 5-3 Existing Major Vehicular Access and Major Entry Points

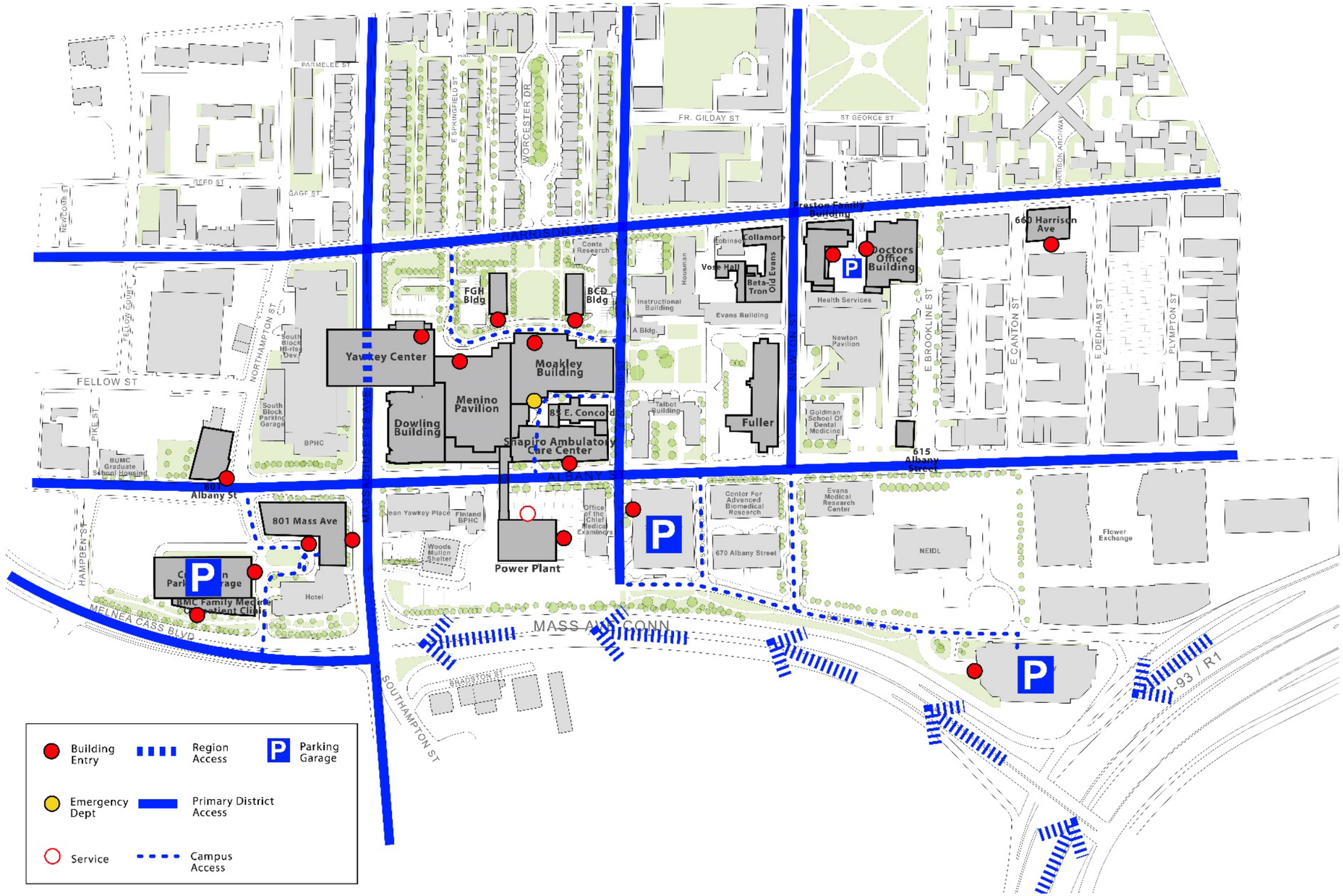


Figure 5-4 Campus Connectivity and Open Space

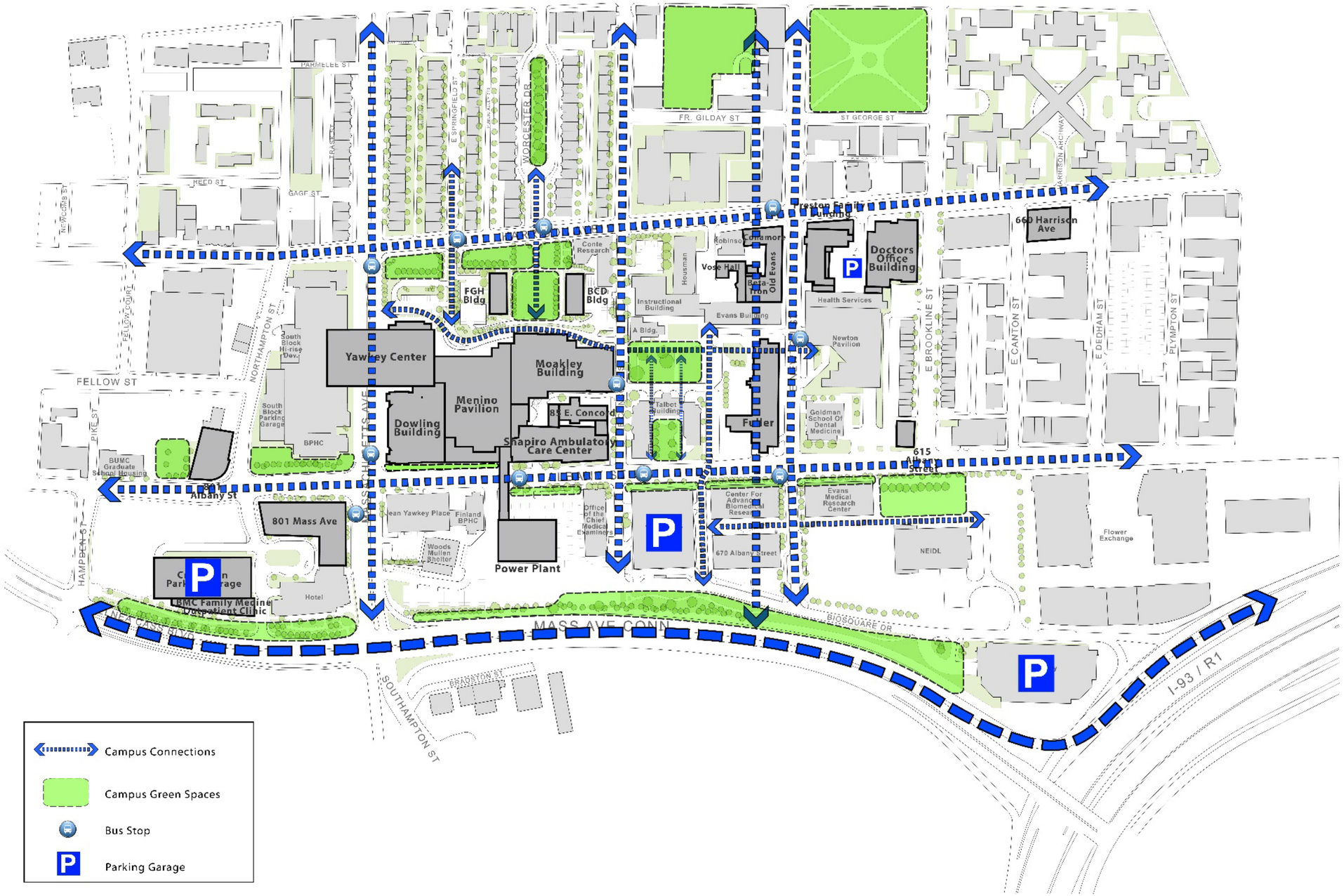
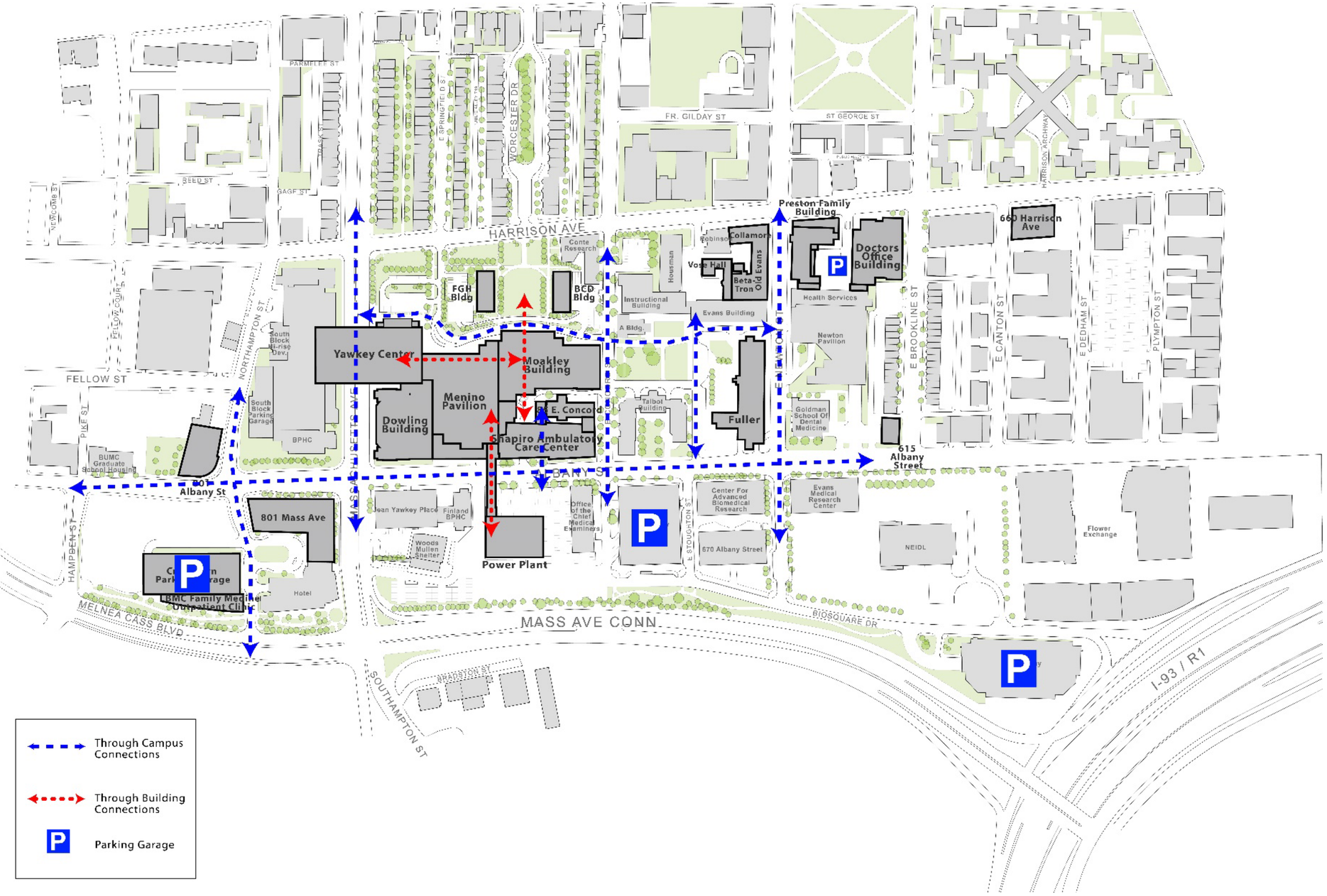


Figure 5-5 Pedestrian Connectivity



In addition, BMC has a very active bicycle program that further promotes movement and connectivity throughout the medical center. See **Transportation Section 6.1.3.4** for more information. See also **Figure 6-12** for BMC campus Bicycle Facilities.

5.5.4 Campus Open Space

Open spaces play a pivotal role in clarifying wayfinding and enhancing the user's experience. They furnish visual cues for circulation and provide effective linkages between city streets and campus pathways. One of the unique characteristics of BMC's campus is the amount and quality of its open spaces, virtually unprecedented on urban hospital campuses. See **Figure 5-4.**

While examining equivalent medical institutions within the City of Boston, it is evident that the amount of green space on the BMC campus is comparable and, in some cases, much greater than what is being provided elsewhere. Over recent years the completion of master plan improvements has significantly expanded the green space throughout the campus further defining and enhancing the pedestrian experience

The existing network of open spaces features various nodes where the campus and community come together. Examples include the Moakley Green and landscaped public street edges along Harrison Avenue, BU's Talbot Building, and BioSquare. The open spaces also provide gathering areas for medical students, faculty, and staff. In particular, the lawn between the BU's Talbot Building and the BU School of Medicine enables multi-purpose programming for campus events and accommodates pedestrians, bicycles, and vehicles.

With the completion of the Moakley Building and renovations to the BCD and FGH buildings in 2006 and 2007, an enhanced arrival sequence and landscaped open spaces improved the north edge of the West Campus. These modifications benefit both the campus and surrounding neighborhoods through better design, welcoming aesthetics, and greater connectivity. The location of the Moakley Building, with its three-story atrium facing the green to the north, also reinforces an existing east/west pedestrian link. This further unifies the campus both physically and symbolically.

With the completion of the Moakley Cancer Care Addition, the New Inpatient Building Phase 1 and the New Patient Transport and Materials Handling Bridge, landscape buffers, planting areas and furnishing zones have been created. Benches were installed at the corner of the Moakley Building to generate places of interaction.

As per the institutional design goals and objectives, the BMC will continue to complement and animate its open space network through additional streetscape refinements and landscaped areas as part of its IMP projects. One area currently planned for immediate improvement includes installing a landscaped buffer edge behind the existing fence along the front of the Power Plant along Albany Street.

5.5.5 Campus Accessibility Improvements

BMC is committed to coordinating with the Boston Center for Independent Living (BCIL) and Ms. Kristen McCosh, Commissioner of the Mayor's Commission for Persons with Disabilities, to address existing areas within and around the perimeter of the campus to remove barriers and create universal accessibility. As part of the previous IMP, BMC integrated accessibility planning early in the design

process for the IMP projects and will continue to do so for all future IMP projects. BMC will continue to consult with the Institute for Human Centered Design to review new streetscape improvements proposed as part of the new IMP.

BMC's vision is to implement and manage initiatives that promote and maintain accessibility. The following are the strategic objectives of that vision:

- Continuously evaluate and improve existing conditions.
- Enhance organizational understanding of physical and visual barriers.
- Partner with key stakeholders to drive enhanced experience and promote functionality or renovated and new projects.
- Ensure a structured and methodological approach is in place to incorporate human centered design.
- Streamline process from identification of barriers to resolution.
- When feasible, address new regulatory requirements.

In coordination with BCIL, BMC has made significant efforts in completing barrier removal priorities established in the previous IMP. BMC continues to work with a 3rd party review consultant who reviews all proposed projects over $1M to ensure they are designed without barriers. BMC continues to take the opportunity to make accessibility improvements throughout its campus as new projects are implemented.

5.5.6 Campus Wayfinding and Signage

A campus signage master plan has been developed and will be submitted to the BPDA under separate cover. This section provides an overview of BMC's current campus signage program.

BMC, in partnership with BU Medical Campus, developed a comprehensive medical center signage and wayfinding plan several years ago. The goals of the BMC campus medical center signage plan were to strengthen existing signing programs beyond the site in coordination with Federal, State and City authorities, to implement a program of gateway, directional, and street name signing, and coordinate and strengthen private signing to clarify the identity of each member institution of the medical center. These signage efforts were coordinated with neighbors including representatives of Crosstown, Newmarket Business Association, and the BPDA.

The architectural variation and intensive vehicular traffic in the general area of the BMC campus can present navigational difficulties for a visitor who is unfamiliar with the medical center. To address this issue, BMC, in coordination with BU Medical Campus, implemented a program focused on four primary elements: off-site signing, on-site signing, area identification, and inner and outer loop campus signing. The program includes:

- Installation of trailblazer signage, in coordination with regulatory authorities, which displays the "H" hospital symbol reinforced by the BMC campus logos;
- Installation of a Gateway Pylon which serves as a directional sign, as well as a landmark, to indicate the point of entry into the BMC campus at the intersection of Massachusetts Avenue and Harrison Avenue;

- Installation of channel letters on the main hospital pavilions for area identification; and
- Installation of directional signage for the inner campus loop that links all the individual medical institutions within the inner campus, and outer loop signage that identifies, BMC, BU Medical Campus, and BioSquare.

Building identifiers were also placed near entrances to each campus building. BMC buildings are distinguished with blue and silver leaf signage and BU Medical Campus buildings are distinguished with red and gold-leaf signage.

Parking area identification is standardized since BMC, BU Medical Campus, and BioSquare share the same parking facilities. A “P” parking symbol consistent with the City of Boston standard is located at the entrance of each parking facility. In addition, the name of the institution served by the parking facility is listed below the parking symbol.

For pedestrians, map retainer displays are located at key points on the BMC campus. The maps identify each institution and display information regarding roadways, transportation routes, landmarks, public transportation, parking, and other public amenities.

The signage plan allows for future implementation and independent facility updates for each medical center member institution.

The most recent expansion of the signage program was BMC’s inclusion of additional large monoliths and pedestrian monoliths for the New Inpatient Building Phase 1 project to direct patients and visitors to the relocated emergency department vehicular and pedestrian drop off location. In addition, channel letters were added for building naming of the New Inpatient Building Phase 1 and the new emergency department entrance. Updates were made to all existing wayfinding signage to direct patients to one consolidated campus location to the west and removed wayfinding to the Newton Pavilion.

BMC intends to make further enhancements and expand its campus wayfinding and signage plan during the term of the IMP to incorporate improved wayfinding signage to its administrative and ambulatory clinic locations across Massachusetts Avenue, at Crosstown (801 Massachusetts Avenue) and 801 Albany Street. As building additions and new construction projects are implemented during the term of the IMP, the plan will be updated to include changes to pedestrian and vehicular circulation patterns and cyclist wayfinding and relocate or add new channel letters and BMC name and logo signage.

Immediate planned changes to BMC’s campus wayfinding and signage plan include Yawkey Ambulatory Care Center and Crosstown Center. BMC will relocate the channel cut letters and the BMC name and logo sign on the Yawkey Ambulatory Care Center. BMC will replace the Brigham and Women’s channel cut letters on the Crosstown (801 Massachusetts Avenue) building façade with BMC’s channel cut letters and/or name and logo, replace the existing street level signage for ZC Boston restaurant with BMC signage, and add BMC window scrim at the street level storefront glass. This street level change is particularly important for street level wayfinding to BMC’s new ambulatory clinics located at Crosstown. BMC will present signage changes for proposed IMP projects during future design review.

5.6 Safety and Security

The Department of Public Safety (DPS) provides security to Boston Medical Center (BMC) twenty-four hours a day, 365 days a year (24/7). The DPS employs healthcare security best practices in the security and monitoring of the medical campus. This multipronged approach includes a combination of; well-trained uniformed Public Safety personnel comprised of approximately 95 uniformed Public Safety Officers, Detectives and Command Staff, electronic access control and approximately 500 CCTV cameras, active DPS Officer patrols of the exterior of the campus by foot, bike and motor vehicle 24/7, Blue Light call boxes positioned along common travel routes including parking facilities, DPS provides an employee shuttle from the 610 Albany St. parking garage during shift change in the day and evening hours, and safety and security awareness training to medical center staff. The safety and security of our staff, patients and visitors is a top priority for Boston Medical Center. The Department of Public Safety at BMC continues to monitor the environment to ensure a safe environment for all those that work and visit the campus. In addition, due to the close proximity and shared spaces between BU and BMC, BU police/public safety also actively staff and patrol the same areas 24/7.

BMC collaborates with external law enforcement agencies including the Boston Police Department (BPD), the Massachusetts State Police (MSP), the Boston Public Health Commission Police (BPHCP), and Boston University Medical Center Public Safety and Police to respond to quality-of-life issues along Massachusetts Avenue and Melnea Cass Boulevard (Mass and Cass) effected by people experiencing homelessness and substance use disorder. If BMC is able to acquire or lease portions of Northampton Square during the term of the IMP, in any agreement with the City, BMC would commit to locate its Public Safety Headquarters on the 2nd floor of the commercial storefronts along Massachusetts Avenue.

BMC works with the Boston Healthcare for the Homeless providing resources through BMC's Grayken Center for Addiction. As discussed throughout this document, one of BMC's five health priorities over the next decade is to improve access to safe and affordable housing options and establish supportive housing interventions. No one project alone can solve the challenging situation along Mass and Cass, but BMC's community health improvement activities, provision of community benefits, and redesigning healthcare models that integrate medical, behavioral, and social needs of its patients, are steps forward in that journey.

6.0 TRANSPORTATION

6.1 Introduction

The Transportation Access Plan component of the IMP includes analyses of the effects of the IMP projects on transportation systems within and surrounding the BMC campus. The transportation systems analyzed include pedestrian, transit, bicycle, loading/service, ambulance and taxicab activity, traffic, and parking. The analyses address the comments in the Boston Planning and Development Agency (BPDA) Scoping Determination dated January 8, 2020, in response to the filing of the Boston Medical Center (BMC) Institutional Master Plan Notification Form (IMPNF). The focus of this chapter is on addressing transportation-related comments from City agencies and the community.

This chapter presents an overview of the existing BMC Campus transportation system and a summary of the planned IMP Projects from a transportation perspective. In addition, this chapter provides an analysis of the existing transportation conditions, future transportation conditions without the planned IMP Projects, and future transportation conditions with the planned IMP Projects. This transportation study has been developed to understand the holistic transportation impacts of all the IMP Projects that are proposed on the BMC campus within the ten-year time frame of the IMP.

The summary of the existing transportation characteristics of BMC facilities on and around its campus includes descriptions of public and private transportation, area roadways, pedestrian and bicycle facilities, parking, patient pick-up/drop-off, and loading activities. A discussion of anticipated transportation-related construction management actions and transportation demand management (TDM) measures that are expected to be employed during the term of the IMP are also included in this chapter.

As noted previously in this report, the Boston Medical Center campus has experienced several changes since the previous IMP approved in 2010 and amended in 2013. The biggest change is the decision to have BMC and Boston University file separate IMPs. While the 2013 IMP Amendment assessed the combined transportation impacts of BMC and the BU Medical Campus, this IMP will focus solely on the existing and future transportation conditions at BMC and the potential transportation-related impacts related to its proposed development projects.

6.1.1 Project Overview

Within the ten-year term of the IMP there are several new additions and buildings that are expected to be constructed, as well as changes and renovations to some existing space on-campus. Based on discussions with the City of Boston, this traffic study will focus on the impacts of all Projects within the ten-year IMP timeframe, as the Projects which may be undertaken within the two-year and five-years timeframes are expected to have negligible impacts on the transportation network. The IMP Projects included in the IMP and analyzed in this transportation study are listed below:

- **Yawkey 6th Floor Addition**: An addition to the existing Yawkey Building of approximately 15,500 s.f.
- **Menino and Yawkey Lobby Addition**: An addition to the Menino and Yawkey lobbies adding approximately 6,100 s.f. of lobby space. BMC will also study the need to reconfigure pick-up and drop-off operations along BMC Place in front of this addition.
- **Menino 9th Floor Addition**: A vertical addition to the existing Menino Pavilion of approximately 37,000 s.f.

- **10 Stoughton Street**: New building of approximately 170,000 s.f. that requires the demolition of the existing Vose Hall and Betatron buildings. Approximately 72 underground parking spaces will be included beneath this building with the parking area being accessed from a driveway off of the existing Stoughton Street service road.
- **Renovation of Collamore / Old Evans Buildings**: Conversion of the existing 102,000 s.f. Collamore and Old Evans buildings from hospital administration space to approximately 130 residential units.
- **New Administration / Clinical Building (Power Plant Site)**: New approximately 219,000 s.f. building as approved in the 2010 IMP and subsequent amendments thereto. This project will require the demolition of the existing Power Plant building.
- **Phase 2 New Inpatient Building**: New approximately 323,000 s.f. building as approved in the 2010 IMP and subsequent amendments thereto. This project will require the demolition of the existing Dowling Tower.

It should be noted that within the first five-years of the IMP, the leases on the Gambro Building and the Doctor's Office Building are set to expire, resulting in a combined loss of 109,071 sf of space on the BMC campus. When considering the addition of all the IMP Projects listed above as well as the lease expirations and the demolitions of existing buildings, at the end of the ten-year term of the IMP, the BMC campus is expected to contain approximately an additional 411,482 sf of development over existing conditions. The transportation impacts analyzed in this study are based on that ten-year change in overall campus square footage as well as the conversion of 102,000 sf of hospital administrative space to 130 residential units.

In addition, the number of parking spaces on campus is not expected to increase from the existing number of spaces within the ten-year term of the IMP. There are currently 3,817 parking spaces serving the BMC campus. While the proposed project at 10 Stoughton Street is anticipated to include 72 new parking spaces, the lease on the 238 parking spaces in the Doctor's Office Building Garage is expected to expire within the five-year term of the IMP resulting in an overall decrease in parking capacity compared to existing conditions. While the final number of parking spaces on-campus at the end of the IMP term is not known due to the potential to lease additional spaces in nearby garages or the potential to reconfigure valet parking facilities to improve efficiency, the final parking count is not expected to exceed the existing 3,817 parking spaces currently provided.

It should be noted that over the past decade the BMC campus has completed several expansion and consolidation projects that have resulted in an overall net decrease in square footage on campus. Since 2010, the overall campus size has decreased by approximately 179,177 s.f. in owned, controlled and leased space. Some of the new space expected to be constructed within the next ten-years is intended to replace space that was taken out of service between 2010 and 2020. In addition, BMC's originally approved total IMP square footage was approximately 2,760,000 s.f. including proposed projects. The total IMP square footage with proposed projects is now approximately 2,433,000 s.f. The future transportation projections are based on the existing condition of the campus as of today including the new and approved IMP projects during the ten-year term.

6.1.2 Methodology

The following transportation analyses has been performed in general conformance with City of Boston Transportation Department guidelines and the Massachusetts Executive Office of Environmental Affairs (EEA)/Executive Office of Transportation (EOT) guidelines. Prior to completing this study, the Project

team developed a Transportation Analysis Approach memorandum and met with City of Boston BPDA and BTD staff to receive concurrence on the overall scope of the transportation study. This study has been prepared in response to that discussion as well as in response to the Scoping Determination dated January 8, 2020.

The transportation analysis was conducted in three stages. The first stage, Existing Conditions, involved collecting pedestrian, bicycle and vehicular volume data and quantifying and describing existing transportation conditions near the BMC campus. This included the transportation infrastructure, pedestrian and bicycle facilities, transit operations, on-campus loading, ambulance, taxicab, and rideshare operations, traffic operations, vehicle crash data, parking, and BMC's transportation demand management programs.

The second stage of the study, Future Conditions, involved projecting and comparing future transportation conditions with and without the IMP Projects. Trips generated by the IMP projects were estimated by mode and vehicle, transit, and walk/bike trips were distributed to the roadway network. Traffic and transit capacity analyses were conducted during the weekday morning and weekday evening peak hours for the following conditions:

- 2021 Existing Condition – All of the existing various transportation modes serving the campus are described in this analysis. The traffic analysis uses existing geometric conditions on study area roadways and intersections to evaluate traffic operations. In addition, traffic volume data collected in late 2019 is assessed under this condition represented a pre-pandemic condition of vehicle, pedestrian, and bicycle volumes.

- 2031 No-Build Condition – The forecast of future traffic volumes without the IMP Projects has been determined by increasing the existing traffic volumes by including expected traffic growth from other nearby city-approved projects in the area. Planned infrastructure improvements are also included in the No-Build Condition.

- 2031 Build Condition – The Build traffic forecast was determined by adding IMP Project-related traffic and infrastructure modifications to the 2031 No-Build Condition. Impacts of the IMP projects on other transportation services and facilities are also described.

The final stage of the study, Mitigation, presents measures to address the IMP project-related impacts. The proposed mitigation measures include further strengthening BMC's existing comprehensive transportation demand management program (designed to discourage employee singular occupant vehicular travel to the campus) and a set of important infrastructure enhancements to help improve conditions near the BMC campus through the term of the IMP.

6.1.3 Key Findings

The key finding of this Study is that the overriding transportation impacts associated with the BMC IMP Projects are relatively modest. BMC proposes improvements and mitigation to improve transportation infrastructure for patients, visitors, and employees traveling to their campus. In connection with improvements to Boston Medical Center Place, BMC will continue to proactively manage drop-off and valet parking activities to reduce adverse traffic impacts on area streets, particularly along the adjacent Harrison Avenue.

BMC is also committed to bicycle and pedestrian-oriented improvements in connection with the IMP – either in connection with the implementation of specific projects or via the support and participation in other city-led area improvement efforts. Finally, BMC will continue to expand its proactive transportation demand management measures (TDM) to its employees to encourage the use of transit and other alternative forms of transportation and reduce reliance on single occupant driving.

6.1.3.1 Traffic Impacts

The effects of the project, including a detailed analysis of intersection level of service (LOS), were examined at 14 intersections, specified by the Boston Transportation Department, during the study area's morning and evening peak commuter hours for the 2021 Existing Conditions. In addition, a baseline future traffic analysis was conducted for 2031, which considers background growth and growth attributable to area projects that are proposed by others during the term of the IMP. The future 2031 Build Condition analyses were developed in order to evaluate future transportation conditions in the study area with all of the IMP Projects in place.

The results of the capacity analyses indicate that the proposed IMP Projects would result in only minor changes to area Level of Service (LOS) conditions. The project-generated trips are expected to have minimal impacts on the operations of the signalized and unsignalized study area intersections. While some of the overall intersections and specific intersection movements already operate at challenging conditions at LOS E or F without the IMP Projects, the addition of the IMP Project-generated trips is not expected to significantly change these operations. The change in overall delay at the signalized intersections between the 2031 No Build Conditions and the 2031 Build Conditions are minimal or non-existent, with no intersection seeing an increase in overall delay greater than three seconds.

6.1.3.2 Public Transportation Impacts

The bus crowding analysis indicates that approximately one daily bus trip serving the area around BMC will exceed crowding thresholds per MBTA criteria. This bus trip will result in crowding threshold being exceeded by approximately 2 additional passengers. This is a nominal impact on the bus service in the area as this accounts for one of approximately 587 daily bus trips that serve the BMC campus directly and falls well within the daily fluctuation of transit usage. The build condition analysis results indicate that bus service schedule or frequency changes from pre-COVID conditions are not warranted. The MBTA should continue to monitor ridership and assess its service as part of its regular and periodic service planning process.

6.1.3.3 Parking

As stated previously, there are currently 3,817 parking spaces serving the BMC campus and that number is anticipated to remain within the total over the next ten-years. While the proposed project at 10 Stoughton Street is anticipated to include 72 new parking spaces, the lease on the 238 parking spaces in the Doctor's Office Building Garage is expected to expire within the ten-year term of the IMP resulting in an interim decrease in parking capacity compared to existing conditions. BMC believes that it can appropriately accommodate future parking demands associated with the current supply it manages and will continue to manage with its existing supply during the term of the IMP.

6.1.3.4 Pedestrian and Bicycle Access

BMC has invested in significant pedestrian improvements in recent years along Albany Street in connection with the completion of the New Inpatient Building Phase 1 and relocation of their primary loading and service facility across the street to the Power Plant. These investments have resulted in the provision of a much more pedestrian friendly corridor, which is accessible with direct connection into the hospital (via the Shapiro entrance) and is no longer blocked by parked trucks at the former loading dock.

In coordination with its transportation management association, BMC continues to encourage cycling as a healthy, inexpensive, and environmentally positive alternative to driving alone and provides many amenities and programs to support bicycle use, including:

- Providing a secure, weather protected bike parking facility at the 710 Albany Street Garage with 300 dedicated bicycle parking stalls;
- Providing a bicycle lock loan program for cyclists;
- Providing showers for cyclists;
- Providing umbrellas for walkers and cyclists if it rains;
- Organizing free bike safety and mechanical check-ups at least annually;
- Registering bikes on-line;
- Installing new racks and repairing existing bike racks located throughout the campus;
- Working with Boston's Director of Bike Programs to identify ways to improve bicycle use;
- Providing parking for gas-powered and electric-powered scooters in the 610 and 710 Albany Street Garages.

BMC will continue to promote walking and biking as alternative modes of travel for employees by continuing to provide bicycle and pedestrian friendly amenities.

6.1.3.5 Transportation Demand Management

Boston Medical Center has consistently worked to reduce the number of drive- alone trips to the medical area. As indicated in this chapter, existing employees at BMC have a significantly lower auto use than the BTD mode share rates, at only 29 percent. This rate reflects the strong and effective transportation demand management program that is in place. BMC will continue to encourage and assist its employees, as well as patients and visitors to use many of the demand management and trip reduction programs offered. These are listed below.

- Boston Medical Center offers a 50 percent transit subsidy through payroll deduction to full-time employees who do not have parking permits.
- Full-time employees who work on the Medical Campus may sign up for monthly MBTA passes through pre-tax payroll deduction. Up to $230 per month is tax deductible.
- On-site non-discounted transit pass sales and schedules are provided.
- On-line transit and rideshare information is provided on the BMC web site.
- A transit rider "read and ride" library is provided for commuters in the Transportation Management Association's office.
- BMC's Transportation Management Association operates a "borrowed belongings program" where members of the BMC community may borrow an umbrella or bicycle lock for up to 48-hours.
- BMC's Transportation Management Association works with the MBTA and BTD to improve bus service, wayfinding, and pedestrian safety around the campus.
- Boston Medical Center provides an evening shuttle route to connect employees with nearby transit stations and the surrounding neighborhood.

- Preferential parking is provided for Carpool/Hybrid program participants and hybrid / electric vehicles on the first level of the 610 and 710 Albany Street Garages.

- Two Zipcars are provided on East Newton Street for employees who commuted via public transportation, walking, or biking, but may need a private vehicle during the day.

- BMC's Transportation Management Association provides a Guaranteed Ride Home program for carpoolers, ensuring that carpoolers will have a ride home in case of emergency.

- BMC's Transportation Management Association participates in Bay State Commute, a free website/app and tool provided by MassDOT to reward travelers for taking "green" trips – i.e., walk, bike, telecommute, carpool, vanpool, subway, train, bus, or ferry trips, or even working a compressed week. Travelers log their transit, bus, or walk trips to work on the website or app and are rewarded with discounts to stores, restaurants, entertainment, etc. Bay State Commute also serves as the state's rideshare database for finding carpool partners.

- Designated gas-powered and electric-powered scooter parking is provided in the 610 and 710 Albany Street Garages.

- BMC and its Transportation Management Association offers sheltered and secured bicycle parking at several locations, participation in the Annual Bike to Work/School week, a free Cyclists' Luncheon, and a free Bike Safety Checkup.

- BMC's Transportation Management Association publishes a medical area walking map and offers neighborhood walks for the South End's medical history and South of Washington Area (SOWA) at lunchtime for employees and others. Besides designating short and long "neighborhood walking" loops covering areas like the Southwest Corridor Park, Discover Roxbury, Medical History, and the SOWA arts district, this map shows restaurants and community services such as ATM's and dry cleaners, as well as the mileage from BMC to the neighboring MBTA stations.

- BMC's Transportation Management Association has a website that advertises and provides information on alternative commuting resources and includes an email group list for interested employees.

BMC is committed to continuing to provide these transportation demand management strategies in order to maintain the low-auto mode share currently attributed with employees and patients of the medical center.

6.1.3.6 Mitigation

BMC proposes to implement the following array of mitigation and improvement actions to reduce the impact of the hospital on area-wide traffic operations.

BMC Main Entrance Access/Circulation Improvements
BMC is closely studying improvement efforts aimed at supporting more effective patient and visitor access and circulation. These efforts include improvements to the pick-up/drop-off areas in front of Yawkey Center, Menino Pavilion, and Moakley Building. Ongoing planning for improvements to this location will include consideration to the following key design parameters:

- Accommodate expected future patient demands: The curbside drop-off zone, when supported by other key operational provisions within the BMC complex, will be right-sized to accommodate expected future patient demands. The functionality of the drop-off zone will be dependent on its efficient operation by BMC, and as required, provision to accommodate some drop-off uses

elsewhere. For example, chair cars and transfer ambulances may be directed to load and unload at an alternate location. Similarly, valet operations may be adjusted to maximize utilization of the curbside area and reduce vehicle queuing.

- Avoid impeding Harrison Avenue traffic: The modified BMC drop-off will continue to be accessed by Harrison Avenue. Thoughtful solutions will be put in place to reduce and/or eliminate queuing back onto this corridor, which can happen at times during peak patient arrival periods under existing conditions.

- Attract drivers to the drop-off area: The newly designed entrances and valet operations will be studied such that main entrance doors will be located as close to the end of the drop-off area as possible (downstream) to maximize its utilization. Drivers will naturally gravitate to the door location and tend to not fully utilize drop-off area downstream of the door location.

- Provide adequate pedestrian space: Consideration will be given to generously sized sidewalks in this new zone, allowing for comfortable interchange between automobile movement and pedestrian travel into the facility that the amenity is serving. These walking areas are envisioned to be flush to the curb to allow for the most flexible accessible access scheme for all motorists who intend to drop-off at this location.

- Provide dedicated space for taxicabs and buses: Taxicab and TNC operators will be accommodated with designated curbside access.

Improvements Bicycling, Walking and Transit Accommodations
Future implementation of the IMP Projects provides many opportunities to make walking, biking, and taking transit to/from BMC better options. The goal is to have patients, visitors, staff, and physicians feel they have better connections and options and improved infrastructure that supports their non-automobile modes. The list below outlines these actions:

- The construction of new and/or improved public sidewalks adjacent to IMP Project sites when those projects are constructed.

- Provision of additional long-term (covered/secured) and short-term bicycle parking spaces in connection with the net new square footage based on large-scale IMP Projects that complies with City of Boston Bicycle Guidelines as shown in **Table 6-20**.

- Provision of additional showers and lockers in connection with the net new square footage based on large-scale IMP Projects that complies with City of Boston Bicycle Guidelines as shown in **Table 6-20**.

- Coordinate with the City to support the construction of at least one additional Bluebikes Station nearby BMC's Campus in connection with the first major IMP Project that is constructed during the IMP term. The Bluebikes Station will be, at minimum, a 19-dock station that complies with City of Boston Bicycle Guidelines as shown in **Table 6-20**.

- Coordinate with the City to support improvements to identified nearby crosswalk and sidewalk deficiencies.

Signage and Wayfinding
To assist in providing for better and clearer access to the campus, BMC is considering the study and implementation of improved directional signage and wayfinding for some portions of its campus. This could include updating directions on its website for both vehicular drivers and transit users and

developing new directional sign plans for the campus. Wayfinding plans are also being studied in connection with drop-off improvements to the Menino and Moakley Pavilions.

Support of Ongoing Area Transportation Initiatives
BMC is committed to supporting the City of Boston's ongoing initiatives to foster an improved bicycle and pedestrian transportation infrastructure. To that end, BMC will work with the BPDA and the BTD to understand how to appropriately participate and contribute to the following:

- Albany Street/South Bay Harbor Trail Project
- Proposed multi-modal improvements for Massachusetts Avenue

Support of these specific efforts will help to continue to encourage the use of alternative modes of transportation and limit single-occupant driving. These efforts also provide opportunity to remedy identified operational and connectivity deficiencies near the BMC campus.

6.2 Existing Conditions

An evaluation of existing transportation conditions near the BMC campus is important to understanding how the area's transportation system accommodates existing travel demands by patients, visitors, staff, and physicians, and how it can accommodate future anticipated growth on campus. Each element of the existing conditions is described in detail below.

6.3 Study Area

BMC is located in the South End of Boston and is generally bounded by Massachusetts Avenue, Harrison Avenue, Albany Street, and East Brookline Street. These roadways provide local and regional access to the campus. As noted previously, BMC in the past decade has consolidated on the west side of the campus between Massachusetts Avenue, Harrison Avenue, Albany Street, and East Concord Street, and has also shifted some operations to the west side of Massachusetts Avenue, most notably within the nearby Crosstown Center. A locus map of the BMC campus is show in **Figure 6-1**.

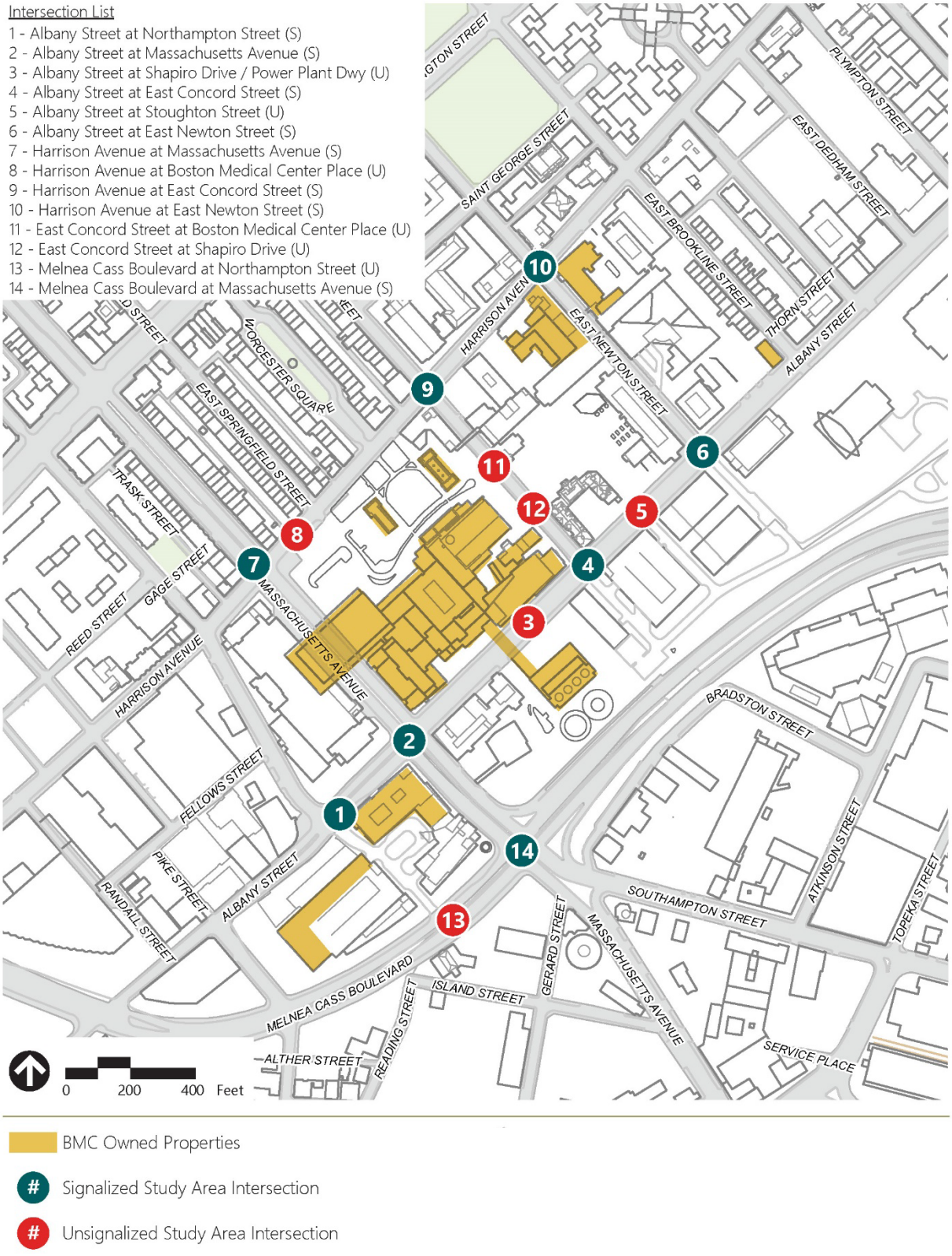
Based on discussions with BMC and City of Boston BPDA and BTD staff, a study area was specifically established. The study area is consistent with projects of similar sizes in the area and includes BMC driveways as well as key intersections near the Site. Based on this approach, the study area consists of the following 14 intersections:

1. Albany Street at Northampton Street
2. Albany Street at Massachusetts Avenue
3. Albany Street at Shapiro Drive / Power Plant Driveway
4. Albany Street at East Concord Street
5. Albany Street at Stoughton Street
6. Albany Street at East Newton Street
7. Harrison Avenue at Massachusetts Avenue
8. Harrison Avenue at Boston Medical Center Place / East Springfield Street
9. Harrison Avenue at East Concord Street
10. Harrison Avenue at East Newton Street
11. East Concord Street at Boston Medical Center Place
12. East Concord Street at Shapiro Drive
13. Melnea Cass Boulevard at Northampton Street
14. Melnea Cass Boulevard / Massachusetts Avenue Connector at Massachusetts Avenue

A map of the study area intersections is provided in **Figure 6-2**. These study area intersections were evaluated in detail using standard traffic engineering analysis techniques following BTD guidelines to identify incremental impacts of future traffic growth and site-generated traffic.

Figure 6-1 Locus Map

Figure 6-2 Study Area Intersections



6.3.1 Roadway Network

All the roadway segments within the study area, excluding the Massachusetts Avenue Connector, are under City of Boston jurisdiction. The City of Boston passed legislation designating all roadways within the City of Boston as 25 mph unless otherwise posted. The study area includes the following roadways, which are categorized according to the Massachusetts Department of Transportation Office of Transportation Planning functional classifications:

Massachusetts Avenue is an urban principal arterial, running north–south from Cambridge in the northwest to Columbia Road in the southeast. Within the study area, Massachusetts Avenue features two travel lanes in each direction, divided by a narrow concrete median. Additional turning lanes are provided at the intersections with Harrison Avenue and Albany Street. Metered on-street parking is provided in the northbound direction between Albany Street and Harrison Avenue, while resident parking is found in both directions of Massachusetts Avenue north of Harrison Avenue. Bus stops are located regularly on both sides of Massachusetts Avenue. Sidewalks are present along both sides of the road within the vicinity of the site. Land uses along Massachusetts Avenue consists of a mix of medical, retail, office, and residential uses.

Albany Street is an urban minor arterial roadway that runs east-west parallel to Harrison Avenue within the study area from Herald Street in the east to Eustis Street in the west. East of East Concord Street Albany Street provides one travel lane in each direction with no median and west of East Concord Street Albany Street provides two lanes of travel in each direction with a median provided west of Massachusetts Avenue. Parking is allowed on both sides of the street, with various uses including metered spaces, emergency vehicle parking, and unrestricted parking. Sidewalks are present along both sides of the road within the vicinity of the site. Land use along Albany Street consists of a mix of research, educational, city services, medical uses, and in and outpatient medical uses.

East Concord Street is a local roadway running one-way south. Metered parking exists on both sides of East Concord Street from Harrison Avenue to Albany Street. Two bus shelters—one near Boston Medical Center Place and one near Albany Street—serve several MBTA routes and the Boston University Medical Center shuttle routes within the campus. Sidewalks are present along both sides of the road within the vicinity of the site. BMC Campus buildings are located along both sides of the street.

East Newton Street is an urban minor arterial roadway running one-way north. Metered parking exists on both sides of East Newton Street. Bus stops are located along East Newton Street with a bus shelter south of Stoughton Street and a bus shelter just north of Harrison Avenue. Sidewalks are present along both sides of the road within the vicinity of the site. BMC Campus buildings are located along both sides of the street.

Harrison Avenue is an urban minor arterial roadway running northeast-southwest, providing access between Essex Street in the east to Warren Street in Roxbury. Harrison Avenue provides one travel lane in each direction near the BMC Campus. Parking is permitted on both sides of the street, and additional travel lanes are provided at the intersection with Massachusetts Avenue. Bus stops are located regularly on both sides of Harrison Avenue. Sidewalks are present along both sides of the road within the vicinity of the site. Land use north of Harrison Avenue is primarily residential while the south side of Harrison Avenue hosts the BMC Campus.

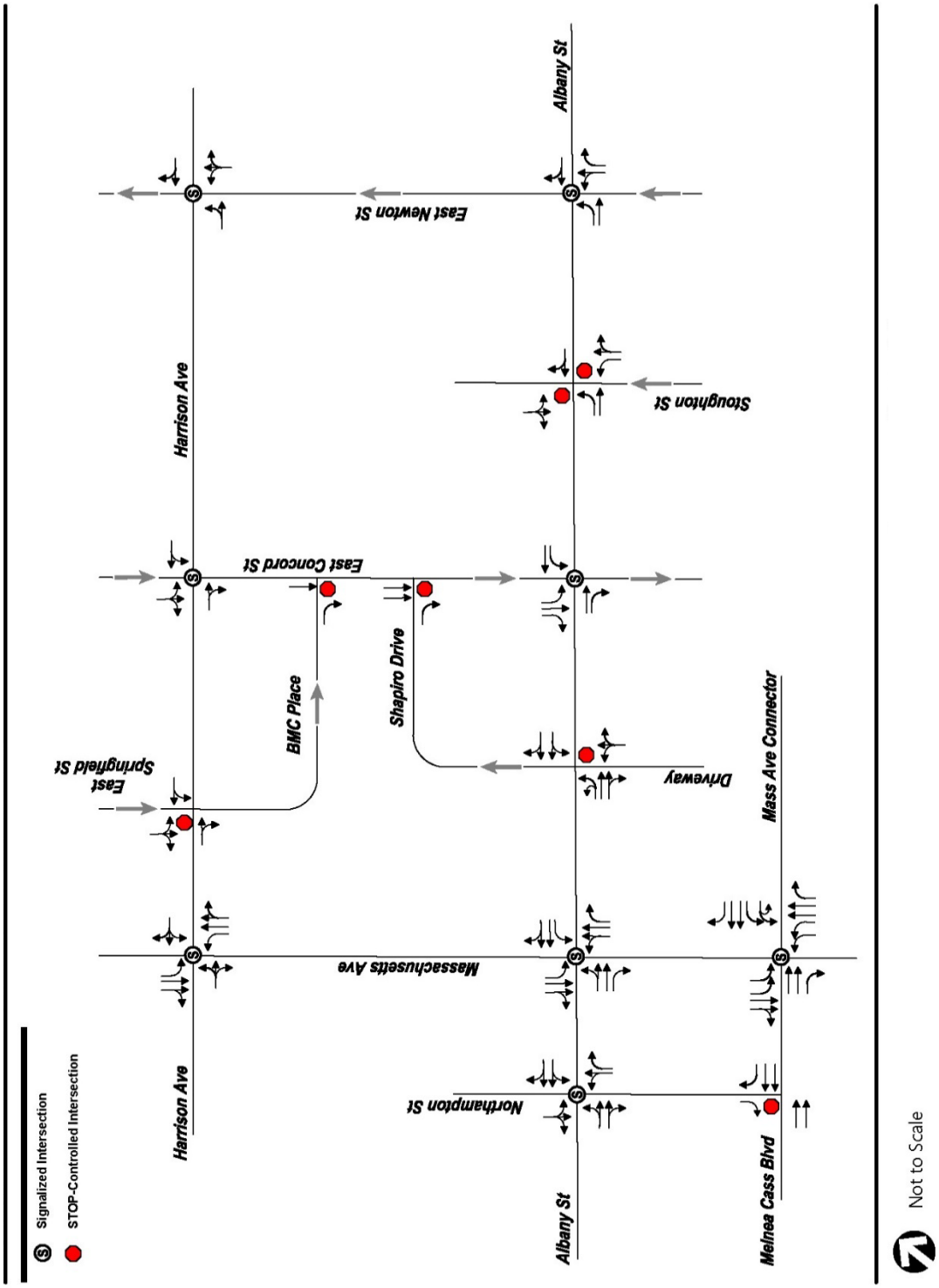
Boston Medical Center Place is a 20-foot-wide local street running one-way south- southeast from Harrison Avenue to East Concord Street. There is no parking on either side of the road. Sidewalks exist along both sides of the roadway. Boston Medical Center Place provides access to the BMC Campus and serves the pick-up/drop-off operations for the Menino Pavilion and the Moakley Building. BMC Campus buildings and green space are located along both sides of the street.

Shapiro Drive is a 20-foot-wide entrance only driveway located on Albany Street and serves pick-up/drop-off operations for the Shapiro Ambulatory Care Center. The 18-foot-wide exit driveway is located on East Concord Street. The signage specifies that this is a drop-off and pick-up only driveway. There is no parking on either side of the driveway; sidewalks exist on both sides of the roadway. The Shapiro Ambulatory Care Center is located on the east and the Menino Pavilion along the west of the driveway.

6.3.2 Intersection Conditions

Detailed descriptions of each of the 14 study area intersections are provided below. A graphic that schematically illustrates the lane geometry and traffic control for the approaches to each intersection is provided in **Figure 6-3**.

Figure 6-3 Intersection Lane Geometry and Traffic Control



6.3.2.1 Signalized Intersections

Albany Street at Northampton Street

Albany Street generally runs in the east-west direction and is bisected by Northampton Street from the north and south to form a four-legged signalized intersection. The eastbound and westbound approaches consist of a shared left-turn/through lane and a shared through/right-turn lane respectively. The northbound approach consists of one shared left-turn/through lane and one exclusive right-turn lane. The southbound approach consists of one general purpose lane. Crosswalks and pedestrian pushbuttons and indications are provided on all approaches. Wheel-chair ramps are provided on the northwest and southeast corners of the intersection. Shared bike lane markings exist along both Albany Street approaches.

Albany Street at Massachusetts Avenue

Albany Street generally runs in the east-west direction and is bisected by Massachusetts Avenue from the north and south to form a four-legged signalized intersection. The eastbound approach provides a shared left-turn/through lane, a through lane, and an exclusive right-turn lane. The westbound approach provides an exclusive left-turn lane, a through lane, and a shared through/right-turn lane. The northbound provides two through lanes and one exclusive right-turn lane. The southbound approach provides one exclusive left-turn lane, one through lane, and one shared through/right-turn lane. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. The northbound leg provides an exclusive bike lane while the other three legs provide shared bike lane markings.

Albany Street at East Concord Street

Albany Street generally runs in the east-west direction and is bisected by East Concord Street from the north and south to form a four-legged signalized intersection. The eastbound approach consists of a through lane and an exclusive right-turn lane. The westbound approach consists of an exclusive left-turn lane and a through lane. The northbound approach consists of one receiving through lane and one receiving 60-foot-long left-turn lane into the 710 Albany Garage. The southbound approach consists of one left-turn lane, one through lane, and one right-turn lane. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. An exclusive pedestrian phase is provided. Both Albany Street approaches have dedicated bike lanes.

Albany Street at East Newton Street

Albany Street generally runs in the east-west direction and is bisected by East Newton Street from the north and south to form a four-legged signalized intersection. The eastbound approach consists of an exclusive left-turn lane and a through lane. The westbound approach consists of one through lane and one exclusive right-turn lane. The northbound approach consists of a shared left-turn/through lane and an exclusive right-turn lane. The southbound approach consists of one receiving lane. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. Both Albany Street approaches have dedicated bike lanes.

Harrison Avenue at Massachusetts Avenue

Harrison Avenue generally runs in the east-west direction and is bisected by Massachusetts Avenue from the north and south to form a four-legged signalized intersection. The eastbound and westbound approaches consist of one general-purpose lane respectively. The northbound and southbound approaches consist of an exclusive left-turn lane, a through lane, and a shared through/right-turn lane respectively. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. Dedicated bike lanes exist on both sides of both Massachusetts Avenue approaches.

Harrison Avenue at East Concord Street

Harrison Avenue generally runs in the east-west direction and is bisected by East Concord Street from the north and south to form a four-legged signalized intersection. The eastbound and westbound approaches consist of one general-purpose lane respectively. The northbound leg consists of one receiving lane. The southbound approach consists of one general-purpose lane. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. There is a BlueBike station on the northbound leg of the intersection. No other bicycle accommodations exist within the vicinity of this intersection.

Harrison Avenue at East Newton Street

Harrison Avenue generally runs in the east-west direction and is bisected by East Newton Street from the north and south to form a four-legged signalized intersection. The eastbound and westbound approaches consist of one general-purpose lane respectively. The northbound approach consists of one general-purpose lane while the southbound leg consists of one receiving lane. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. No bicycle accommodations exist within the vicinity of this intersection.

Melnea Cass Boulevard / Massachusetts Avenue Connector at Massachusetts Avenue

Massachusetts Avenue generally runs in the north-south direction with Melnea Cass Boulevard intersecting from the west and the Massachusetts Avenue Connector intersecting from the east to form a four-legged signalized intersection. The Massachusetts Avenue Connector provides direct access to I-93 via Exit 18. The eastbound approach consists of two through lanes and one exclusive right-turn lane. The westbound approach consists of two exclusive left-turn lanes, two through lanes, and one channelized right-turn lane. The northbound approach consists of two exclusive left-turn lanes, two through lanes, and one channelized right-turn lane. The southbound approach consists of two exclusive left-turn lanes, one through lane, and one shared through/right-turn lane. Crosswalks, wheelchair ramps, and pedestrian pushbuttons and indications are provided on all approaches. The southbound approach has shared bike lane markings, and a dedicated bike lane exists just north of the intersection on Massachusetts Avenue heading northbound.

6.3.2.2 Unsignalized Intersections

Albany Street at Shapiro Drive/Power Plant Driveway

Albany Street generally runs in the east-west direction and is intersected by Shapiro Drive from the north and the Power Plant Driveway from the south to form a four-legged unsignalized intersection. The northbound Power Plant approach is STOP-sign controlled with an entering and exiting lane accessed via permit. The southbound Shapiro Entrance is a one-way single lane entrance for patient pick-up/drop-off only. The eastbound Albany Street approach provides an exclusive left-turn lane and a shared through/right-turn lane. The westbound Albany Street approach provides a shared left-turn/through lane and a shared through/right-turn lane. There are no crosswalks at this location. There exists a dedicated bike lane on the westbound approach and shared bike lane markings on the eastbound approach. The dedicated bike lane stops west of Shapiro Drive and becomes a shared bike lane. Just east of Shapiro Drive the shared bike lane becomes a dedicated bike lane and vehicular travel lane.

Albany Street at Stoughton Street

Albany Street generally runs in the east-west direction and is bisected by Stoughton Street from the north and south to form a four-legged unsignalized intersection. The eastbound approach consists of an exclusive left-turn lane and a through lane. The westbound Albany Street approach consists of a shared through/right-turn lane. The northbound Stoughton Street approach is under STOP-sign control and consists of one shared left-turn/through lane and one right-turn lane. The southbound Stoughton Street approach is under STOP-sign control and consists of one shared left-turn/right-turn lane. There are

crosswalks on the northern, southern, and western legs of the intersection. There are no wheelchair ramps or pedestrian push buttons and indications. There exists a dedicated bike lane on both the eastbound and westbound Albany Street approaches.

Harrison Avenue at BMC Place/East Springfield Street

Harrison Avenue generally runs in the east-west direction and is intersected by East Springfield Street from the north and BMC Place from the south to form a four-legged unsignalized intersection. The eastbound and westbound approaches consist of one general-purpose lane respectively. The northbound BMC Place approach is a one-way single lane entrance for patient pick-up/drop-off only. The southbound East Springfield Street approach consists of one general-purpose lane under STOP-sign control. Crosswalks exist across the northern and eastern legs. Wheelchair ramps are provided on all four corners of the intersection. There are no bicycle accommodations within the vicinity of this intersection.

East Concord Street at BMC Place/Walkway

East Concord Street runs one-way in the southbound direction and is intersected by BMC Place from the west to form a three-legged unsignalized intersection. A pedestrian walkway intersects from the east. The southbound East Concord Street approach consists of one through lane and one receiving lane south of BMC Place. BMC Place is a one-way, right-turn only, exit driveway under STOP-sign control. There is one crosswalk provided from the pedestrian walkway across the southern leg of the intersection. There are wheelchair ramps on the northwest and southwest corners of the intersection. There are no bicycle accommodations within the vicinity of this intersection.

East Concord Street at Shapiro Drive

East Concord Street runs one-way in the southbound direction and is intersected by Shapiro Drive from the west to form a three-legged unsignalized intersection. The southbound East Concord Street approach consists of one through lane and splits into three receiving lanes just south of Shapiro Drive. Shapiro Drive is a one-way, right-turn only, exit driveway under STOP-sign control. There are no crosswalks provided at this intersection. Wheelchair ramps exist on either side of Shapiro Drive. No bicycle accommodations exist within the vicinity of the intersection.

Melnea Cass Boulevard at Northampton Street

Melnea Cass Boulevard generally runs in the east-west direction with Northampton Street intersecting from the north to form a three-legged unsignalized intersection. Melnea Cass Boulevard is one-way in the westbound direction with two through lanes and one exclusive right-turn lane. The eastbound leg has two receiving lanes. The southbound Northampton Street approach consists of one right-turn only lane under STOP-sign control. There is an unsignalized pedestrian crossing across the southbound approach, but it is not striped. There are no wheelchair ramps nor bicycle accommodations provided at this intersection.

6.3.3 Traffic Volumes

Daily traffic volumes were collected on Harrison Avenue and Albany Street over a 24-hour period on Thursday, December 5, 2019 using automatic traffic recorders (ATR). This date represents a typical weekday for traffic count purposes (non-holidays) while schools were in session. It should be noted that these traffic volumes were conducted prior to the impacts of the COVID-19 pandemic on the transportation network and therefore represent a pre-pandemic level of conditions. To be conservative, the 2019 volumes were not adjusted to reflect the change in travel patterns cause by the COVID-19 pandemic.

The daily traffic volumes are summarized in **Table 6-1**. The raw traffic count data are included in the **Appendix D** to this document.

Table 6-1 Existing Traffic Volume Summary

Location	ADT [a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Volume	K Factor [b]	Dir. Dist. [c]	Volume	K Factor	Dir. Dist.
Albany Street, east of Mass Ave	15,700	1,070	6.8%	67% EB	1,055	6.7%	61% WB
Harrison Avenue, east of BMC Place	10,000	720	7.2%	69% EB	660	6.6%	53% EB

Based on automatic traffic recorder counts conducted on December 5, 2019.
Note: Peak hours do not necessarily coincide with the peak hours of turning movement counts.
a. Average Daily Traffic volume expressed in vehicles per day.
b. Represents the percent of daily traffic that occurs during the peak hour.
c. Directional distribution of peak hour traffic.

As shown in **Table 6-1**, Albany Street carries approximately 15,700 vehicles on a typical weekday with the peak hours accounting for 6.8 percent (morning peak hour) and 6.7 percent (afternoon peak hour) of the weekday daily traffic flow. Traffic flow along the roadway is heavier in the eastbound direction during the morning peak hour and in the westbound direction during the evening peak hour. Harrison Avenue carries approximately 10,000 vehicles on a typical weekday with the peak hours accounting for 7.2 percent (morning peak hour) and 6.6 percent (afternoon peak hour) of the weekday daily traffic flow. Traffic flow along the roadway is heavier in the eastbound direction during both peak hours.

Concurrent with the ATR counts, turning movement counts (TMCs) were conducted at the study area intersections in December 2019 prior to the impacts of the COVID-19 pandemic on traffic conditions and during the weekday morning peak period from 7:00 AM to 9:00 AM and the weekday afternoon peak period from 4:00 PM to 6:00 PM. The TMC data indicates that the weekday morning peak hour generally occurs between 7:30 AM and 8:30 AM and the weekday afternoon peak hour occurs between 4:15 PM and 5:15 PM.

6.3.3.1 Seasonal Adjustment

The traffic data collected for the study area was obtained during the month of December 2019. To quantify the seasonal variation of traffic volumes in the area, historic traffic data available from MassDOT were reviewed. Specifically, 2018 monthly traffic volumes were reviewed at MassDOT permanent counting station AET13, located along Interstate 90, the Massachusetts Turnpike, east of Carlton Street in Allston (the closest MassDOT permanent count station to the Site). Based on the review, traffic volumes in December are 5-percent lower than average-month conditions. To present a conservative analysis, the traffic volumes were adjusted to reflect average-month conditions. The seasonal adjustment factors are included in the **Appendix D** to this document submitted under separate cover.

As noted above, the 2019 volumes were not adjusted to account for the impact of the COVID-19 pandemic and therefore the 2021 Existing Conditions represent a pre-pandemic traffic condition. This is consistent with recent TIA guidelines from both MassDOT and the Boston Traffic Department to use recent pre-pandemic traffic volumes, when available, to represent existing conditions.

The resulting 2021 Existing Conditions weekday morning and weekday evening peak hour traffic volumes are presented in **Figures 6-4 and 6-5,** respectively.

Figure 6-4 2021 Existing Conditions Weekday Morning Peak Hour Traffic Volumes

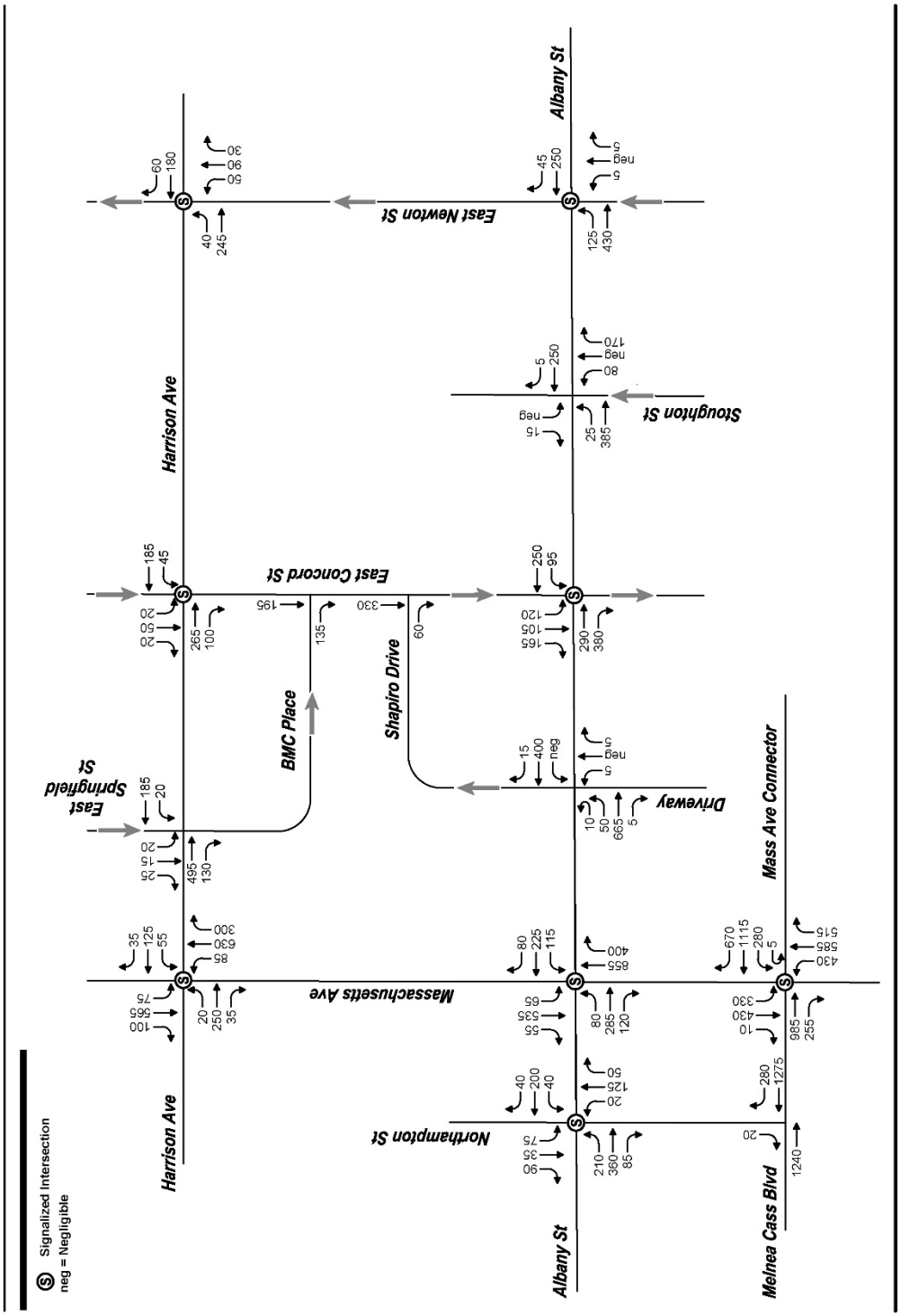
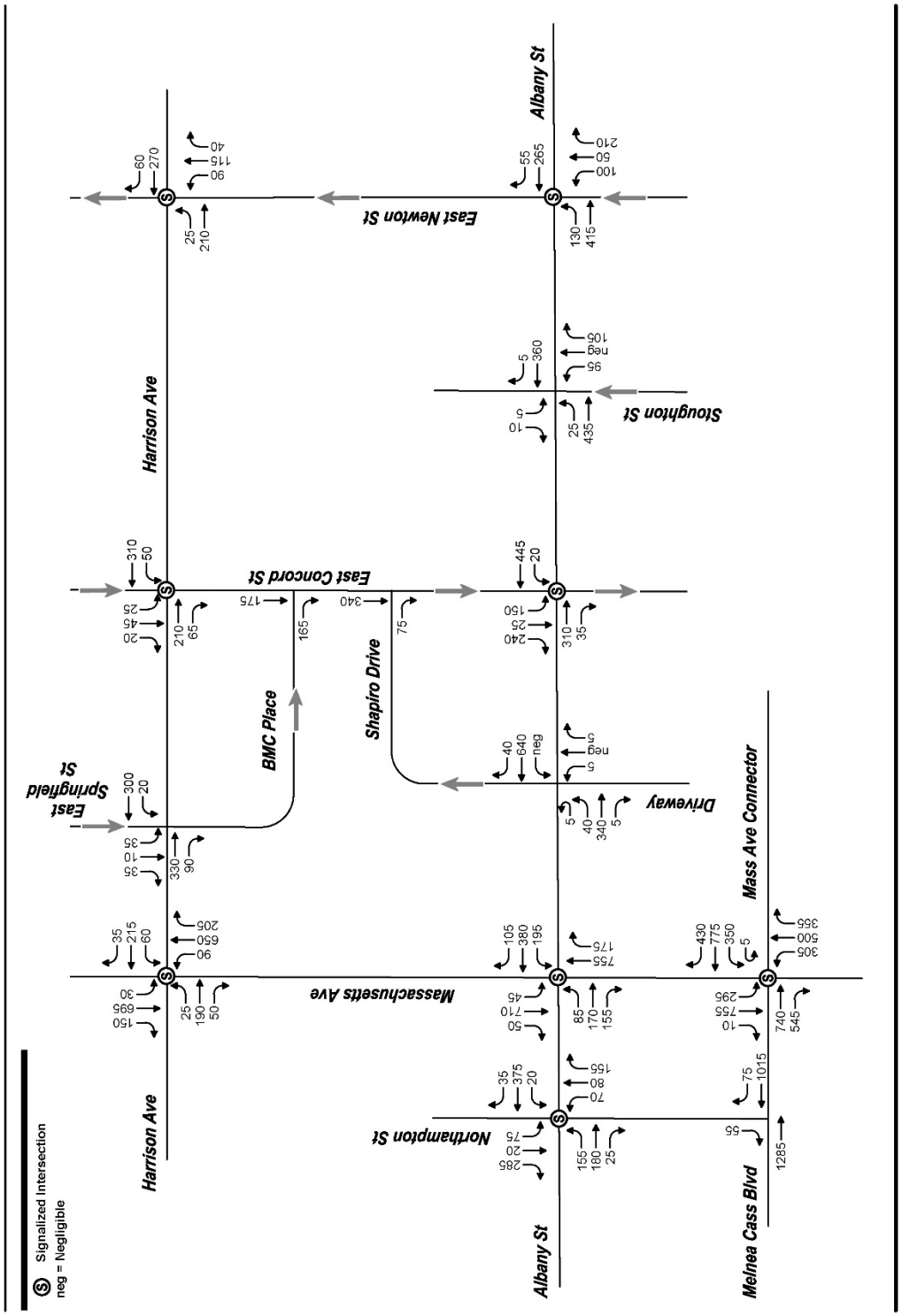


Figure 6-5 2021 Existing Conditions Weekday Evening Peak Hour Traffic Volumes



6.3.4 Crash History

To identify potential vehicle crash trends in the study area, reported vehicular crash data for the study area intersections was obtained from MassDOT for the years 2014 through 2018, the most recent five-year history available. The crash data summary is presented in **Table 6-2.**

In addition to summarizing the crash history, VHB also calculated crash rates for the study area intersections. Intersection crash rates are calculated based on the number of crashes at an intersection and the volume of traffic traveling through that intersection daily. The MassDOT average intersection crash rate for District 6 (the MassDOT district designation for Boston) is 0.71 for signalized intersections and 0.52 for unsignalized intersections. In other words, on average, 0.71 crashes occurred per million vehicles entering signalized intersections throughout District 6. The crash rate worksheets are included in the **Appendix D** submitted under separate cover.

Table 6-2 Crash Summary

	Albany Street at Northampton Street	Massachusetts Avenue at Albany Street	Albany Street at Shapiro Drive/ Power Plant Driveway	Albany Street at East Concord Street	Albany Street at Stoughton Street
Signalized	Yes	Yes	No	Yes	No
MassDOT Avg. Crash Rate	0.71	0.71	0.52	0.71	0.52
Calculated Crash Rate	0.11	0.36	0.15	0.09	0.05
Year					
2014	0	2	0	0	1
2015	0	2	0	0	0
2016	1	6	0	0	0
2017	1	5	1	2	0
2018	1	4	2	0	0
Total	3	19	3	2	1
Collision Type					
Angle	0	5	0	0	0
Head-on	0	0	0	0	0
Rear-end	0	0	1	0	0
Rear-to-rear	0	0	0	0	0
Sideswipe, opposite direction	0	0	1	1	0
Sideswipe, same direction	1	3	0	0	0
Single Vehicle Crash	2	5	1	0	1
Not reported	0	6	0	1	0
Severity					
Fatal Injury	0	0	0	0	0
Non-Fatal Injury	0	9	2	1	0
Property Damage Only	2	6	0	0	0
Unknown/Not Reported	1	4	1	1	1
Time of day					
Weekday, 7:00 AM - 9:00 AM	1	2	1	0	0
Weekday, 4:00 – 6:00 PM	0	3	0	0	0
Saturday, 11:00 AM – 2:00 PM	0	0	0	0	0
Weekday, other time	2	9	2	2	1
Weekend, other time	0	5	0	0	0
Pavement Conditions					
Dry	2	12	3	2	1
Wet	1	2	0	0	0
Snow	0	0	0	0	0
Ice	0	0	0	0	0
Slush	0	0	0	0	0
Unknown/Not reported	0	5	0	0	0
Non-Motorist (Bike, Pedestrian)	2	12	1	1	1

Source: MassDOT Crash portal accessed in February 2021

	Albany Street at East Newton Street	Massachusetts Avenue at Harrison Avenue	Harrison Avenue at E. Springfield Street/ BMC Place	Harrison Avenue at East Concord Street	Harrison Avenue at East Newton Street
Signalized	Yes	Yes	No	Yes	Yes
MassDOT Avg. Crash Rate	0.71	0.71	0.52	0.71	0.71
Calculated Crash Rate	0.09	0.18	0.19	0.00	0.00
Year					
2014	2	1	0	0	0
2015	0	0	0	0	0
2016	0	0	1	0	0
2017	0	6	0	0	0
2018	0	1	2	0	0
Total	2	8	3	0	0
Collision Type					
Angle	0	1	0	0	0
Head-on	0	1	0	0	0
Rear-end	0	0	1	0	0
Rear-to-rear	0	0	0	0	0
Sideswipe, opposite direction	0	2	0	0	0
Sideswipe, same direction	0	0	1	0	0
Single Vehicle Crash	1	3	1	0	0
Not reported	1	1	0	0	0
Severity					
Fatal Injury	0	0	0	0	0
Non-Fatal Injury	1	6	2	0	0
Property Damage Only	0	1	1	0	0
Unknown/Not Reported	1	1	0	0	0
Time of day					
Weekday, 7:00 AM - 9:00 AM	0	0	0	0	0
Weekday, 4:00 – 6:00 PM	0	1	1	0	0
Saturday, 11:00 AM – 2:00 PM	0	0	0	0	0
Weekday, other time	2	6	2	0	0
Weekend, other time	0	1	0	0	0
Pavement Conditions					
Dry	1	7	3	0	0
Wet	0	1	0	0	0
Snow	0	0	0	0	0
Ice	0	0	0	0	0
Slush	0	0	0	0	0
Unknown/Not reported	1	0	0	0	0
Non-Motorist (Bike, Pedestrian)	1	6	1	0	0

Source: MassDOT Crash portal accessed in February 2021

	East Concord Street at BMC Place/ Walkway	East Concord Street at Shapiro Drive	Melnea Cass Blvd at Northampton Street	Melnea Cass Blvd / Mass Ave Connector at Massachusetts Ave
Signalized	No	No	No	Yes
MassDOT Av. Crash Rate	0.52	0.52	0.52	0.71
Calculated Crash Rate	0.00	0.00	0.00	0.54
Year				
2014	0	0	0	7
2015	0	0	0	4
2016	0	0	0	6
2017	0	0	0	21
2018	0	0	0	15
Total	0	0	0	53
Collision Type				
Angle	0	0	0	11
Head-on	0	0	0	1
Rear-end	0	0	0	14
Rear-to-rear	0	0	0	0
Sideswipe, opposite direction	0	0	0	0
Sideswipe, same direction	0	0	0	5
Single Vehicle Crash	0	0	0	16
Not reported	0	0	0	6
Severity				
Fatal Injury	0	0	0	1
Non-Fatal Injury	0	0	0	22
Property Damage Only	0	0	0	27
Unknown/Not Reported	0	0	0	3
Time of day				
Weekday, 7:00 AM - 9:00 AM	0	0	0	2
Weekday, 4:00 – 6:00 PM	0	0	0	5
Saturday, 11:00 AM – 2:00 PM	0	0	0	1
Weekday, other time	0	0	0	36
Weekend, other time	0	0	0	9
Pavement Conditions				
Dry	0	0	0	40
Wet	0	0	0	7
Snow	0	0	0	1
Ice	0	0	0	1
Slush	0	0	0	0
Unknown/Not reported	0	0	0	4
Non-Motorist (Bike, Pedestrian)	0	0	0	13

Source: MassDOT Crash portal accessed in February 2021

As shown in **Table 6-2**, none of the study area intersections have calculated crash rates over the district average. It should be noted that the crash data were obtained from MassDOT and the City of Boston may not report every crash that occurred at each intersection to MassDOT. Therefore, there may be additional crashes that occurred at these intersections that are not included in the database.

Most crashes at the study area intersections are angle, rear-end collisions, sideswipe same-direction, and single vehicle crashes resulting in non-fatal injury and property damage. No fatalities were reported at these intersections within this time frame. Crashes involving non-motorists (bike, pedestrian) occurred at nine of the study area intersections with the intersection of Melnea Cass Boulevard/Massachusetts Avenue Connector at Massachusetts Avenue experiencing the highest number of pedestrian/ bicycle crashes with 13 reported over the five-year time frame.

The Highway Safety Improvement Program (HSIP[1]) identifies crash clusters that are eligible for possible safety funding. The following intersections are listed as HSIP-eligible clusters:

- Massachusetts Avenue at Albany Street – *2008-2017 HSIP Pedestrian Cluster*
- Massachusetts Avenue at Harrison Avenue - *2008-2017 HSIP Pedestrian Cluster*
- Harrison Avenue at E Springfield Street / BMC Place - *2008-2017 HSIP Pedestrian Cluster*
- Melnea Cass Boulevard/Massachusetts Avenue Connector at Massachusetts Avenue – *2015-2017 HSIP Cluster & 2008-217 HSIP Pedestrian Cluster*

It should be noted that a road safety audit was conducted at the intersection of Melnea Cass Boulevard/Massachusetts Avenue Connector at Massachusetts Avenue in July 2016 and can be accessed on the MassDOT website. No other study area intersections are HSIP eligible clusters.

6.3.5 Campus Vehicle Circulation

The BMC campus is in the South End neighborhood of Boston and is comprised of two areas which are separated by Massachusetts Avenue and Albany street. West of Massachusetts Avenue, the campus is generally bound by Albany Street in the north, Hampden Street in the west, Melnea Cass Boulevard in the south, and Massachusetts Avenue in the east. Opposite the intersection of Massachusetts Avenue and Albany Street, the campus is generally bound by Harrison Avenue in the north, Massachusetts Avenue in the west, Albany Street in the south, and East Brookline Street in the east.

Regional access to the BMC campus via I-90 from the east and west and I-93 from the north and south is provided via Exit 18 on I-93 and the Massachusetts Avenue Connector. South of the BMC campus, the Massachusetts Avenue Connector intersects Massachusetts Avenue, providing access to Albany Street, Harrison Avenue, and the designated parking and pick-up/drop-off areas on campus.

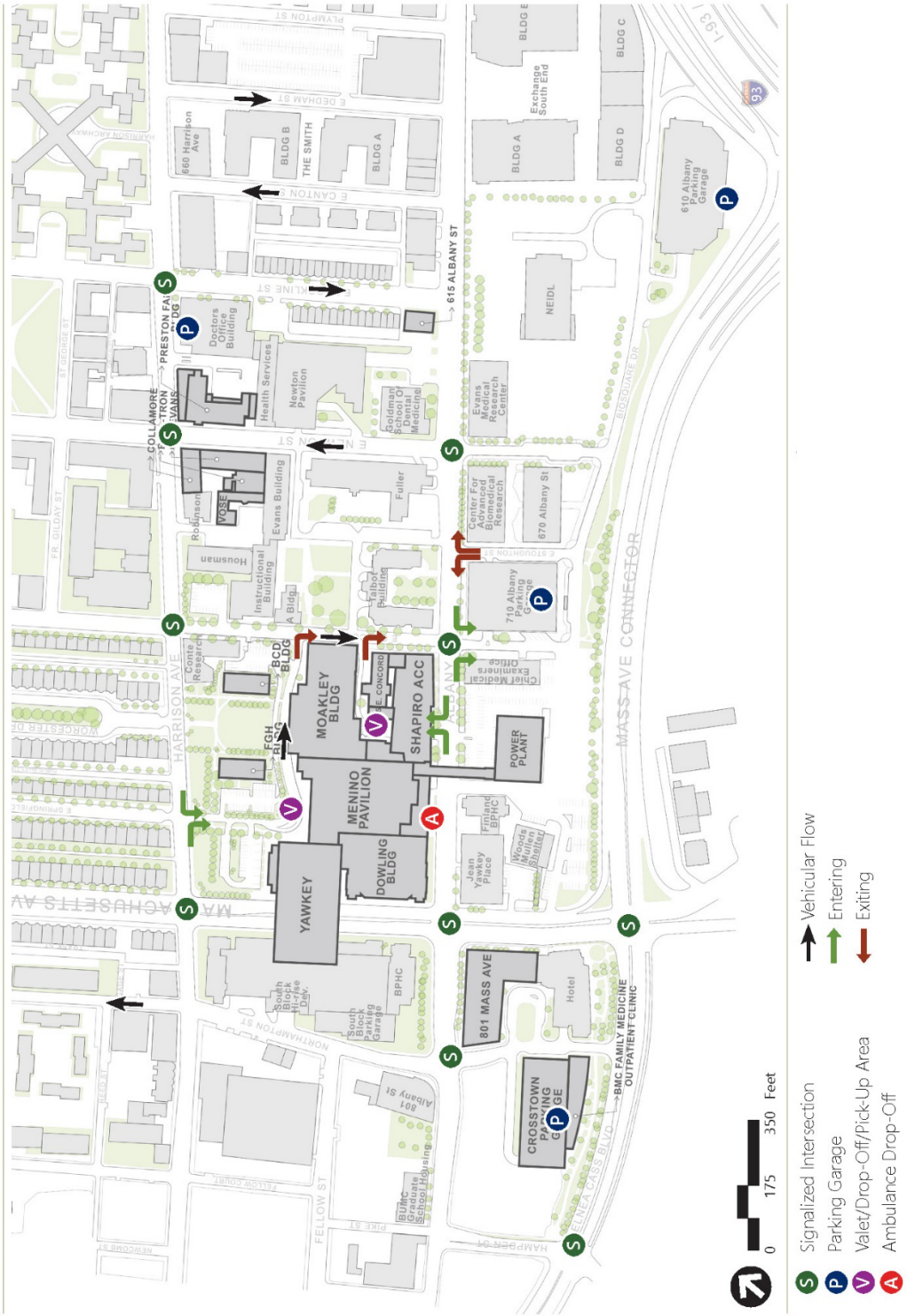
[1] According to MassDOT, "an HSIP-eligible location is a crash cluster that ranks within the Top 5% of each Regional Planning Agency, based on a combination of factors including crash incidence and severity (Using the Equivalent Property Damage Only (EPDO) index where Property Damage Only crashes = 1 Point; Injury crashes = 21 Points; Fatal crashes = 21 points)."

Once at the BMC campus, different buildings and parking areas are accessed directly via Massachusetts Avenue, Albany Street, Harrison Avenue, Northampton Street, East Concord Street, and East Newton Street. Massachusetts Avenue, Albany Street, Harrison Avenue, and Northampton Street are all two-way roadways while East Concord Street is one-way southbound and East Newton Street is one-way northbound.

Internal to the site are Boston Medical Center Place and Shapiro Drive. Both of these roadways are under control of BMC and serve as the main pick-up/drop-off areas on campus for BMC patients. Boston Medical Center Place is one-way from Harrison Avenue to East Concord Street while Shapiro Drive is one-way from Albany Street to East Concord Street. A description of the specific pick-up/drop-off operations is described later in this report.

The key existing campus vehicular circulation patterns are presented in **Figure 6-6.**

Figure 6-6 Existing Campus Vehicle Circulation



6.3.6 Parking Operations

This section documents the existing off-street parking facilities owned or controlled by BMC. The parking inventory distinguishes between spaces allocated to BMC staff/physicians, and patients/visitors. Parking spaces in the Northampton Garage used extensively by BMC staff and physicians have been included in the parking count. BMC intends to enter into a formal lease agreement for these spaces during the term of the IMP.

Figure 6-7 illustrates the locations of the existing off-street BMC-owned and leased parking garages and surface lots. Currently, BMC owns three parking garages and four surface parking lots and leases parking in two additional nearby parking garages. The respective parking supply and users of each facility are summarized in **Table 6-3.**

Table 6-3 BMC Existing Parking Space Inventory

Map Key	Facility	Existing Spaces	Control	User
A	610 Albany Garage	1,400	BMC/BU Shared Ownership	Staff/Physicians
B	710 Albany Garage [1]	1,036	BMC/BU Shared Ownership	Patients/Visitors [2]
C	BioSquare Lot	80	BMC/BU Shared Ownership	Staff/Physicians
D	Yawkey HP Lot	30	BMC Owned	Patients (Accessible)
E	Menino Valet Lot	73	BMC Owned	Patients / Valet
F	Power Plant / Shapiro Valet Lot	95	BMC Owned	Patients / Valet
G	Crosstown Garage	615	BMC Owned [3]	Mixed Use
H	Doctor's Office Building Garage [4]	238	BMC Leased	Mixed Use
I	Northampton Garage	250	BMC Utilized[5]	Staff/Physicians
	Total Parking	**3,817**		

Source: BMC 10/23/2019
1 – Including 14 reserved spaces outside garage
2 – Approximately 17-percent of these spaces are permitted for staff as well
3 – BMC owns 600 parking spaces in the Crosstown Garage and leases another 15 parking spaces
4 – Including 8 reserved spaces located outside the garage
5 -- BMC intends to enter into a formal lease agreement during the term of the IMP.

As shown in **Table 6-3**, Boston Medical Center controls 3,817 parking spaces today, of which 3,314 spaces (87-percent) are owned and 503 spaces (13-percent) are leased / utilized off-site. Of the total, 3,517 spaces (92-percent) are found in parking garages and 300 spaces (8-percent) are found in surface lots.

Figure 6-7 Existing BMC Campus Parking Supply

The BMC campus currently has approximately 2,087 public parking spaces (including accessible and valet parking) available for patients and visitors to the campus. The Doctor's Office Building Garage, the 710 Albany Garage, and the Crosstown Garage are open to the public on a market rate, hourly basis, although approximately 17-percent of the 710 Albany Street Garage and 70-percent of the Crosstown Garage is permitted for staff parking. The BMC website and signage on campus directs patients to the three garages listed above, as well as the two valet parking locations in front of the Menino Pavilion entrance and the Shapiro Center entrance. Valet vehicles dropped-off at the Menino and Moakley Pavilions are parked in the Menino Valet Lot and valet vehicles dropped-off at the Shapiro Center are parked in the Power Plant/Shapiro Valet Lot. When the Menino Valet Lot reaches its capacity, valet vehicles from the Menino Pavilion are also parked in the Power Plant/Shapiro Valet Lot. The 610 Albany Garage is reserved for medical center employees who pay market rate for spaces on a monthly basis.

Of the three parking facilities shared by BMC and BU Medical Campus, the 610 Albany Street Garage consists of approximately 80-percent BMC staff and 20-percent BU Medical Campus staff while the BioSquare Lot consists of approximately 10-percent BMC staff and 90-percent BU Medical Campus staff. The 710 Albany Street Garage is available to patients and guests of both BMC and BU Medical Center, with the 17-percent of staff parking split between BMC staff and BU Medical Campus staff. BMC and BU Medical Center continue to monitor the usage of each parking facility and modify the number of employee permits provided for the 610 Albany Street, 710 Albany Street, and Crosstown Garages accordingly.

Due to BMC's location in the South End of Boston, there are many opportunities for patients and employees to use alternative modes of transportation instead of driving a personal vehicle, which may influence the parking occupancy rates at the medical center's parking facilities. Based on data from the 2018 DEP Rideshare Survey jointly conducted by BMC and BU Medical Campus, approximately only 29-percent of employees use an automobile to commute to and from campus, while 52-percent use public transit and 19-percent walk, bike, or telecommute. Due to the varied mode share of patients and employees, it should be noted that parking is only part of the transportation equation along with pick-up/drop-off facilities, sidewalks, and transit accommodations.

6.3.6.1 Electric Vehicle Parking Stations

There is currently a total of 26 parking spaces designated for electric vehicles on the BMC campus, with plans to add 6 more spaces in the near future. Four electric vehicle charging stations (serving eight parking spaces) are provided in both the 610 and 710 Albany Street garages and five electric vehicle charging stations (serving ten parking spaces) are provided in the Power Plant / Shapiro Valet Lot. Three more electric vehicle charging stations (serving six parking spaces) are anticipated to be added to the 610 Albany Street Garage in the near future.

6.3.7 Public Transportation

Public transportation in Boston is served by the Massachusetts Bay Transportation Authority (MBTA). The BMC campus is served directly by bus service, with Silver Line bus rapid transit service provided nearby. A map of the nearby public transportation routes near the BMC campus is presented in **Figure 6-8** and **Table 6-4** lists the routes and the rush hour frequency of each route serving the campus. It should be noted that the descriptions of existing public transportation options in the study area represent service levels prior to the start of the COVID-19 pandemic and may not represent temporary changes in service because of the pandemic.

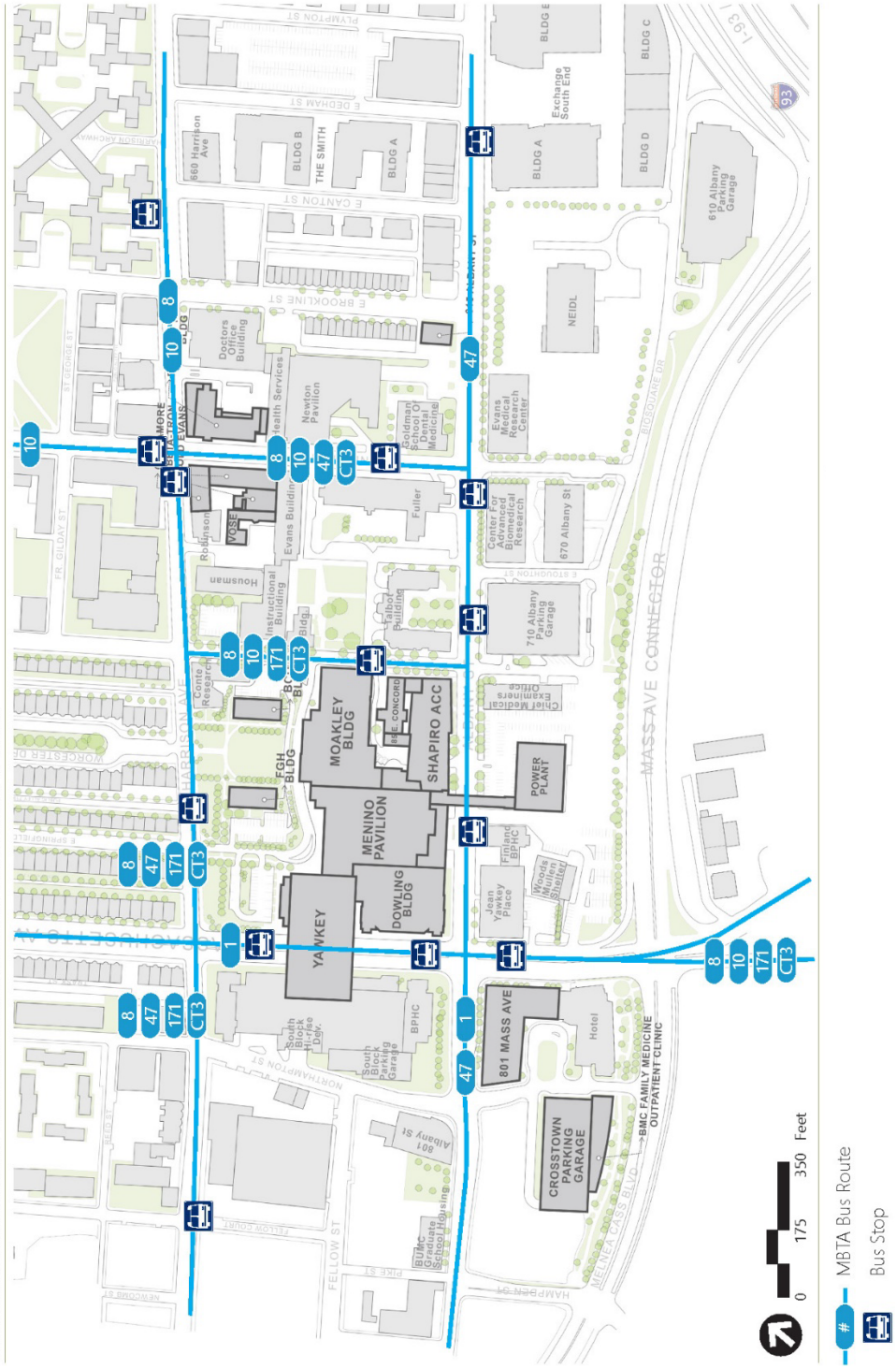
Table 6-4 Existing MBTA Service in the Study Area

Bus	Origin–Destination	Rush-hour Frequency
SL4	Nubian Square – South Station	12
SL5	Nubian Square – Downtown Crossing	8
CT3	Beth Israel Deaconess – Andrew Station	20
1	Harvard – Nubian Square	9-10
8	UMass – Kenmore Square	15-30
10	City Point – Copley Square	20-30
47	Central Square – Broadway	10-15
170 (PM)	Central Sq., Waltham – Nubian Square	60
171 (AM)	Nubian Square – Logan Airport via Andrew Sta.	30

Source: MBTA

MBTA bus routes CT3, 1, 8, 10, 47, and 171 have stops directly on the BMC campus, while the nearest stop on route 170 is on Washington Street at Massachusetts Avenue or Worcester Street. The closest stops for the Silver Line SL4 and SL5 routes are up to a half-mile north of the BMC campus (up to a 10-minute walk) at the intersection of Washington Street at Worcester Street, with additional nearby stops at the intersection of Washington Street at Massachusetts Avenue and Washington Street at East/West Newton Street.

Figure 6-8 Existing Public Transit Routes



6.3.7.1 MBTA Silver Line Service Profiles

The BMC campus is served by two MBTA Silver Line routes: SL4 and SL5. SL4 runs from Nubian Station to South Station with a 12-minute headway during the peak hours. SL5 runs from Nubian Station to Downtown Crossing at an 8-minute headway during the peak period. Both Silver Line routes travel on dedicated bus lanes along Washington Street, resulting in headways of less than 8 minutes for any Silver Line bus between Nubian Square and downtown.

Highlights from MBTA's route profiles representing pre-pandemic conditions for the two Silver Line routes are presented below. The full profiles are included in the Appendix for reference.

Route SL4 Nubian Station – South Station at Essex Street: This is a Silver Line Bus Rapid Transit (BRT) route between Nubian Station and South Station**.** Highlights for the route include:

- On a relative scale of 0 to 10, the route score is 7.1. the score is a weighted number that takes into consideration overall ridership, transit dependent ridership, and its value to the transit network (which reflects the number of people who are uniquely served, the number of jobs and other important destinations, and the number of transferring passengers).
- The route carries 5,800 riders per weekday, 3,100 riders per Saturday, and 2,500 riders per Sunday.
- Inbound ridership numbers at East Newton Street stop, closest to BMC, are 370 boardings and 150 alightings
- On Route SL4, 97% of passenger minutes are in comfortable conditions, which is above the MBTA target of 96%
- Weekday reliability of 78% for the route is above the MBTA's minimum standard of 70% despite a relatively high percentage of dropped trips (2.2%)
- MBTA notes that the route coordination with Route SL5, which produces very irregular schedules along Washington Street between Nubian Square and Chinatown

Route SL5 Nubian Station – **Downtown Crossing:** This is also a Silver Line BRT route between Nubian Station and South Station**.** Highlights for the route include:

- The route score is 8.9. mostly owing to its overall ridership
- The Route carries 10,300 riders per weekday, 6,900 riders per Saturday, and 5,200 riders per Sunday
- Daily boardings at East Newton Street stop, closest to BMC, is 621
- Over 97% of passenger minutes are in comfortable conditions, which is above the minimum and target MBTA standards of 92% and 96%
- Route SL5's weekday reliability is 77%, which is above the MBTA's minimum standard of 70%. The route suffers from a relatively high percentage of dropped trips, with an average of 2.5%. Saturday and Sunday reliability, 75% and 78% exceed and meet the target of 75% reliability on the weekends
- MBTA notes that its greatest weaknesses are that it is slow and its on-time performance is slow for a BRT route, and that service is not coordinated with Route SL4, which operates along most of the same alignment

6.3.7.2 MBTA Bus Service Profiles

Highlights from MBTA's bus route profiles representing pre-pandemic conditions for full-service routes serving the BMC area are presented below. The full profiles, including those for limited-service routes 170/171, are included in the **Appendix D** for reference.

Route CT3 Beth Israel Deaconess or BU Medical Campus: This is a crosstown Local route that operates between the Longwood Medical Area and Andrew Station via Northeastern University, Ruggles Station, and the Boston University (BU) Medical Campus**.** Highlights for the route include:

- The route score is 4.1 on a scale of 10, and serves approximately 1,280 riders per weekday
- It meets the service span and frequency standards on weekdays. However, it does not meet the standards for weekends
- 210 passengers board and 40 alight at the two stops near BU Medical Campus; 130 passengers board and 40 alight at Massachusetts Avenue at Albany Street
- 94.7% of passenger minutes are in comfortable conditions, which is above the minimum standard of 92%, but below the target of 96%
- At 43%, Route CT3's reliability is very poor and among the worst of any MBTA bus route

Route 1 Harvard – Nubian Station: This is a Key Bus route that provides crosstown service between Harvard Station and Nubian Station. It primarily operates along Massachusetts Avenue via Central Square, MIT, Back Bay, South End, and the BU Medical Campus. Highlights for the route include:

- The overall route score is 9.4
- Route 1 is one of the MBTA's highest ridership bus routes, carrying about 12,000 daily riders on weekdays, 9,600 riders on Saturdays, and 6,700 riders on Sundays.
- On weekdays, inbound from Harvard Station, the two stops on Massachusetts Avenue that serve BMC (at Harrison Street and at Albany Street) serve a total of 511 boardings and 1,120 alightings, which are considered as very high ridership numbers by the MBTA
- Due to high ridership turnover along the route, no trips exceed the MBTA's peak period maximum load standard. However, average maximum loads on many trips come close, and so when there are service issues, trips could become overcrowded
- Reliability for the route is within MBTA's standard on weekdays and close to the standard on weekends, but many trips are late. Missed trips are also an occurrence on the route.
- On weekdays, 90.3% of passenger minutes on Route 1 are in comfortable conditions, which is below the MBTA minimum standard. Weekend comfort levels are significantly lower, with 79.6% on Saturdays and 75.2% on Sundays which ranks the lowest of all MBTA routes for comfort on weekends.

Route 8 Harbor Point/UMass – Kenmore Station: This is a Local route that provides crosstown service between the UMass/Boston campus on Columbia Point and Kenmore Square via Boston University Medical Campus area and the Longwood Medical Area (LMA). Highlights for the route include:

- The overall route score is 5.8. A key reason for the relatively low rating is route duplication with other routes (i.e., with Route 19, Route 47 and CT3)
- It carries 3,050 passengers on weekdays, 1,270 on Saturdays, and 920 on Sundays

- 110 passengers board and 120 alight at the five stops near the MBC Campus area
- 98% of passenger minutes are in comfortable conditions, which is above the target of 96%
- Route 8's weekday overall reliability is very poor at only 51%. Weekend reliability is better, but below the minimum standard of 70%
- Route 8 is circuitous as it deviates to provide front door service to many different locations in the BMC campus area and the LMA. This contributes to very slow service and poor reliability

Route 10 City Point – Copley Square: This is a Local route that operates between City Point in South Boston and Copley Square via South Bay Center, the Boston Medical Center area, and the South End. Highlights for the route include:

- The overall route score is 5.5
- Route 10 carries over 2,900 passengers on weekdays, 1,550 passengers on Saturday, and 800 passengers on Sundays
- The three stops around BMC, on Albany Street and East Newton Street serve 175 boardings and 185 alightings
- On weekdays, 99.3% of passenger minutes on Route 10 are in comfortable conditions, which is well above the target of 96%. On Saturdays and Sundays, 100% of passenger minutes are spent in comfortable conditions
- On weekdays, Route 10 trips leave on-time 61% of the time and arrive on-time 76% of the time. On weekends, 70% of Saturday trips are completed on time and on Sundays, only 62% of trips are completed on time

Route 47 Central Square, Cambridge – Broadway Station: This is a Local route that provides crosstown service between Central Square in Cambridge and Broadway Station in South Boston. Highlights for the route include:

- The overall route score is 6.4
- Ridership on Route 47 is 4,800 daily riders on weekdays, 1,800 riders on Saturdays, and 1,000 riders on Sundays
- 190 passengers board and 190 alight at the three stops that serve Boston Medical Center and the BU Medical Campus
- 90% of passenger minutes are in comfortable conditions, which is below the minimum standard mainly caused by crowding issues resulting from off-schedule performance
- Only 50% of weekday trips are completed on-time, with service often running behind schedule and at uneven frequencies
- MBTA considers service on the route is relatively infrequent, considering the route's high ridership.

Transit impact analyses based on bus usage under the existing and future conditions are presented in **Section 6.4.2**.

6.3.7.3 MBTA Rapid Transit and Commuter Rail Service

The closest commuter rail stations to the BMC campus are located at Newmarket Station (serving the Fairmount and Franklin Lines) and Ruggles (serving the Needham, Providence/Stoughton, and Franklin Lines). Ruggles is also a stop on the Orange Line. Newmarket Station is located approximately three-quarters of a mile southeast of the BMC campus adjacent to the South Bay Center. Newmarket is easily accessed by MBTA bus routes 8 and 10 or by walking or biking from BMC. Ruggles Station is approximately three-quarters of a mile northwest of the BMC campus adjacent to the Northeastern University campus. This station can be accessed by walking, biking, or by bus routes 8, 47, and CT3 from BMC.

The closest MBTA rapid transit stations to the BMC campus are Massachusetts Avenue Station on the Orange Line and Andrew Station on the Red Line. The Massachusetts Avenue Station is approximately two-thirds of a mile northwest of the BMC campus and can be accessed by walking, biking, or by bus route 1. Andrew Station is approximately three-quarters of a mile southeast of the BMC campus and can be access by walking, biking, or by bus routes 10 and CT3.

6.3.8 Pedestrian Facilities

The medical campus generates a significant number of pedestrian trips throughout the area, including walking trips along and across many of the area roadways and through the campus itself. Pedestrian facilities throughout the campus include sidewalks along each of the key roadways as well as marked crosswalks at most intersections. In general, the sidewalks on Albany Street, Massachusetts Avenue, and Harrison Avenue are in good condition and are of adequate width. In particular, BMC has invested in significant pedestrian improvements along Albany Street in connection with the completion of the New Inpatient Building Phase 1 and relocation of their primary loading and service facility across the street to the Power Plant. These investments have resulted in the provision of a much more pedestrian friendly corridor, which is accessible with direct connection into the hospital (via the Shapiro entrance) and is no longer blocked by parked trucks at the former loading dock. Most sidewalks are 8 to 10 feet wide. Signalized intersections on the edges of the BMC Campus feature pedestrian signals and walk/don't walk indicators; many include exclusive pedestrian phasing.

Existing pedestrian circulation activity near the campus largely follows the pathways used by employees, patients, and visitors using public transportation or accessing area parking garages. Several MBTA bus routes stop adjacent to the BMC campus. Major pedestrian pathways that serve the campus are along Massachusetts Avenue, Albany Street, Harrison Avenue, and East Concord Street. In addition, there are also several pedestrian paths internal to the BMC campus, including the sidewalk along Boston Medical Center Place connecting Yawkey Center, Menino Pavilion, and the Moakley Center.

Heavily used roadway crossings include the crosswalk on East Concord Street at Boston Medical Center Place connecting BMC to the BU Medical Campus (which sees approximately 366 and 473 pedestrian crossings during the weekday morning and weekday evening peak hours, respectively), the crosswalks across Albany Street at East Concord Street and Stoughton Street connecting to the 610 and 710 Albany Street parking garages (which see approximately 91-to-275 and 95-to-302 pedestrian crossings during the weekday morning and weekday evening peak hours, respectively), and the crosswalks at the intersection of Albany Street and Massachusetts Avenue (which see approximately 127-to-301 and 154-to-333 pedestrian crossings during the weekday morning and weekday evening peak hours, respectively). It should be noted that these pedestrian volumes are from December 2019 and represent pre-pandemic conditions.

A key feature of BMC are several overhead pedestrian walkways that connect internal buildings across roadways without the need to go outside and cross a roadway. Elevated internal pedestrian accommodations include the overhead walkway connecting the Power Plant and Menino Pavilion over

Albany Street, the Yawkey Center which was built over Massachusetts Avenue, and the overhead walkway connecting Old Evans Hall and the Preston Family Building over East Newton Street. In particular, the overhead walkway connecting the Power Plant and the Menino Pavilion allows BMC to operate a sizable, off-street loading and service facility that does not impact traffic flow along Albany Street, and supports patients with immediate, severe medical needs arriving by helicopter to access the rest of the BMC campus without crossing Albany Street.

Existing campus major pedestrian circulation patterns are shown in **Figure 6-9** and existing weekday morning and weekday evening pedestrian volume networks for the study area intersections are shown in **Figures 6-10 and 6-11**, respectively.

Figure 6-9 Existing Campus Major Pedestrian Circulation

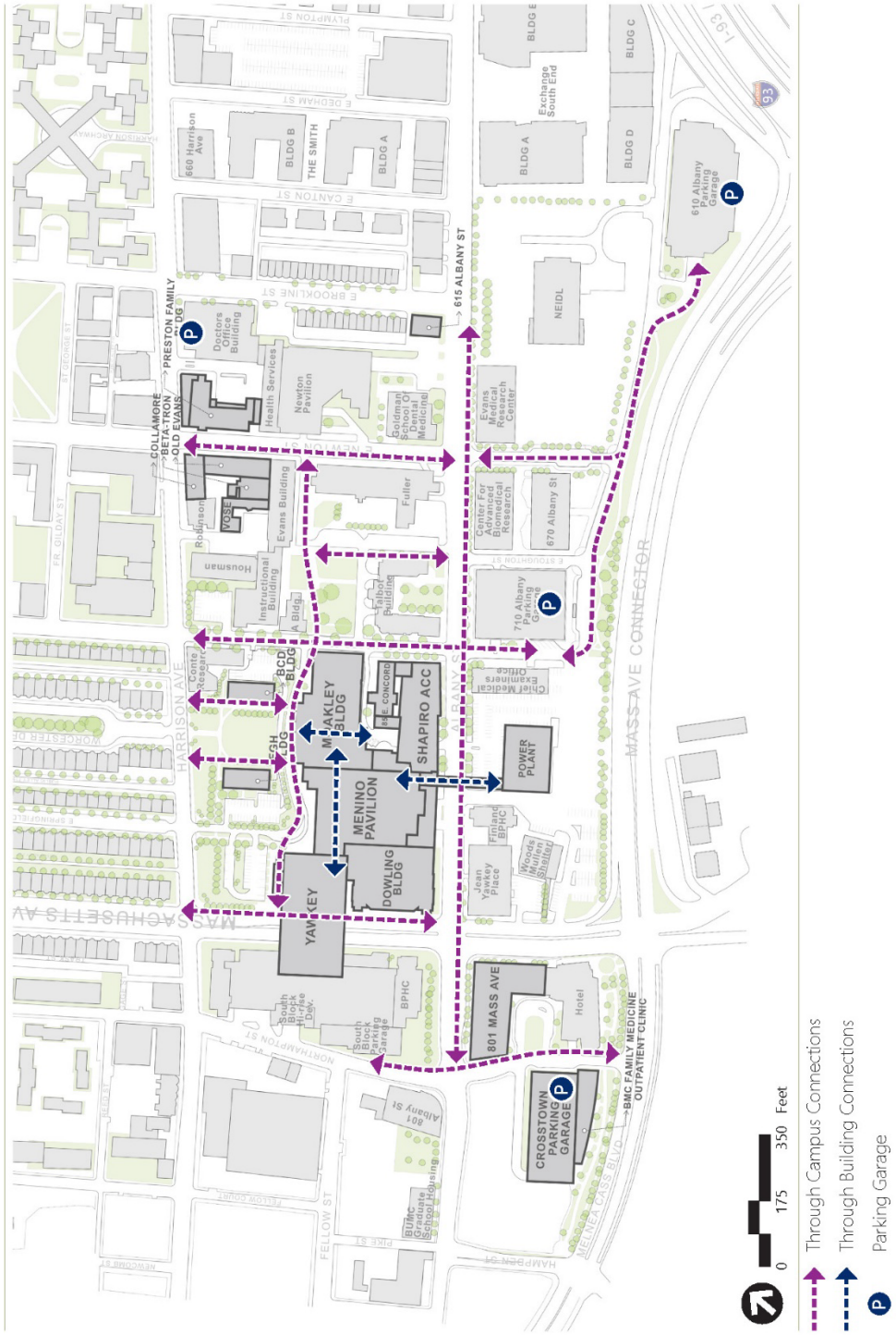


Figure 6-10 2021 Existing Conditions Weekday Morning Peak Hour Pedestrian Volumes

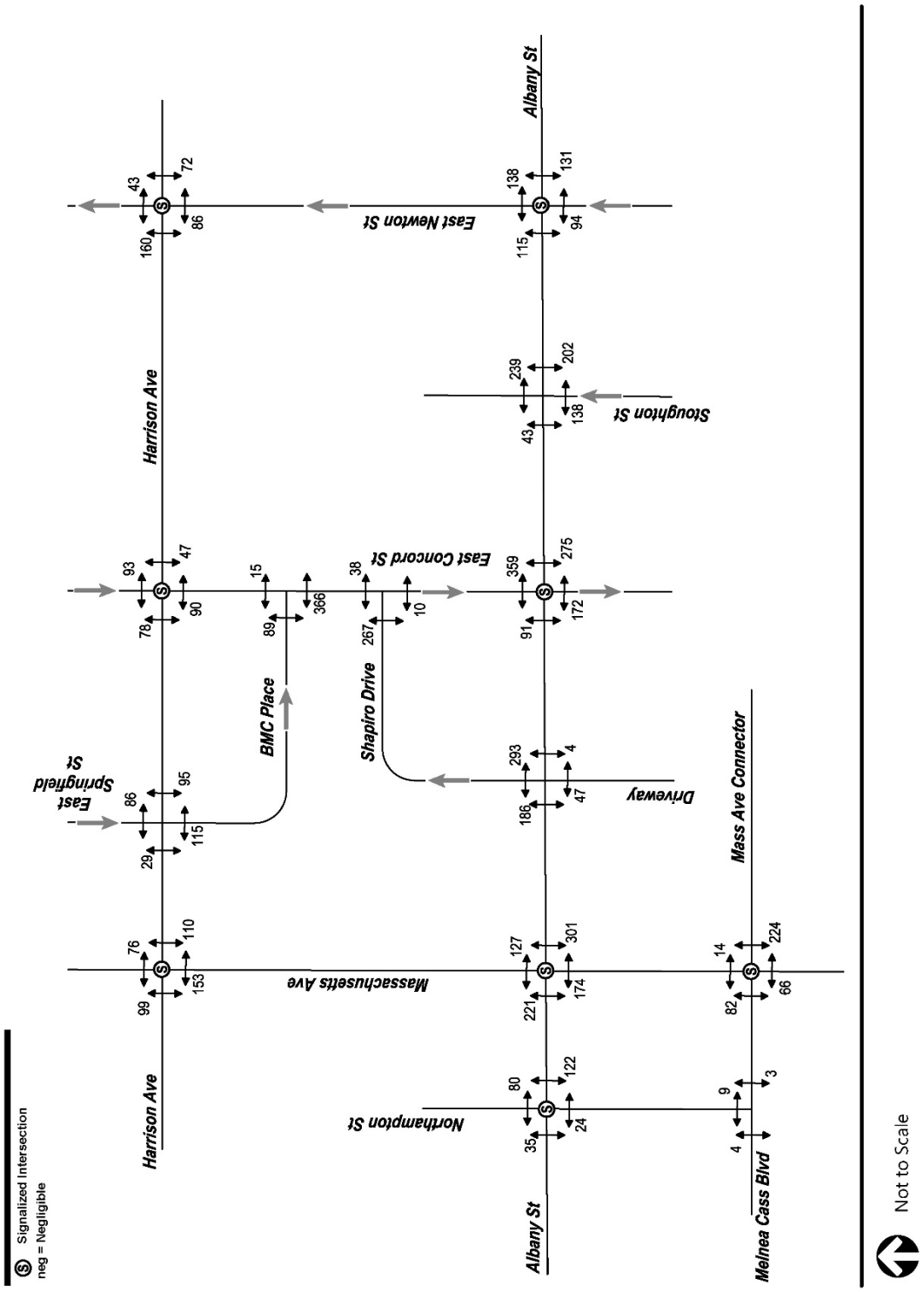
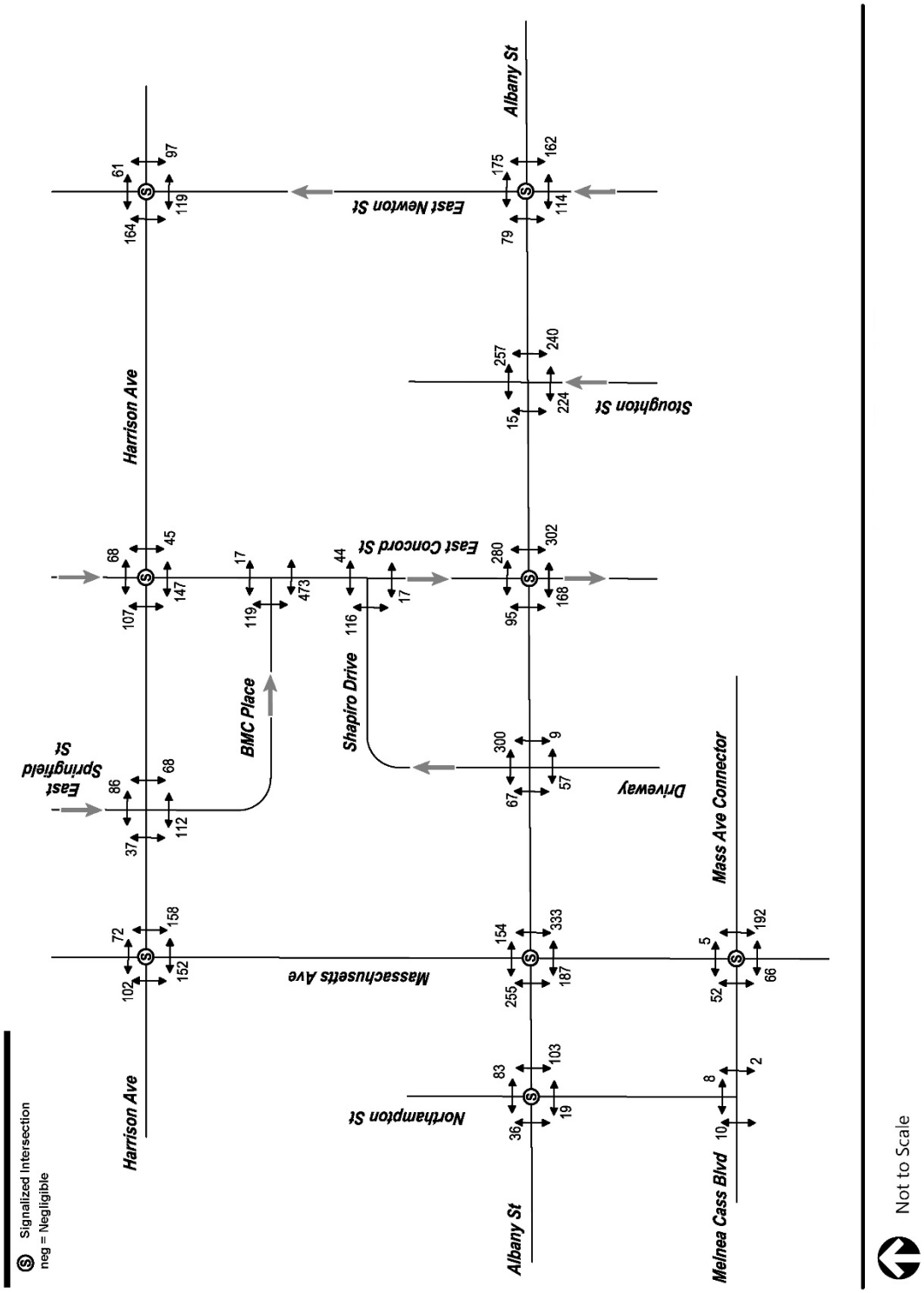


Figure 6-11 2021 Existing Conditions Weekday Evening Peak Hour Pedestrian Volumes



6.3.9 Bicycle Accommodations

Albany Street and Massachusetts Avenue are defined on-street bicycle routes in this area including marked bike lanes and marked shared-travel bike lanes (where geometric limitations do not allow for accommodation of an exclusive bike lane). No defined bicycle accommodations are provided on Harrison Avenue or East Concord Street. The bicycle lanes on Massachusetts Avenue are a main corridor in Boston's bicycle network running from Melnea Cass Boulevard in the south to Cambridge and the Charles River in the north. The Southwest Corridor bike path can be reached via Massachusetts Avenue as well as via Melnea Cass Boulevard.

BMC, in coordination with its transportation management association, continues to encourage cycling as a healthy, inexpensive, and environmentally positive alternative to driving alone and provides many amenities and programs to support bicycle use, including:

- Providing a secure, weather protected bike parking facility at the 710 Albany Street Garage with 300 dedicated bicycle parking stalls;
- Providing a bicycle lock loan program for cyclists;
- Providing showers for cyclists;
- Providing umbrellas for walkers and cyclists if it rains;
- Organizing free bike safety and mechanical check-ups at least annually;
- Registering bikes on-line;
- Installing new racks and repairing existing bike racks located throughout the campus;
- Working with Boston's Director of Bike Programs to identify ways to improve bicycle use;
- Providing designated parking for gas-powered and electric-powered scooters in the 610 and 710 Albany Street Garages.

The BMC campus has a total of 138 secured, weather-protected bicycle spaces in a bicycle parking facility at the Menino Pavilion. In addition, there are several additional outdoor bicycle racks throughout the campus that are free to use and available to the public on a first-come, first-served basis.

Figure 6-12 identifies bicycle accommodations within the study area and the location of short-term bicycle-parking, long-term bicycle parking, and nearby Bluebikes stations. **Figures 6-13 and 6-14** show the existing weekday morning and weekday evening bicycle volume networks through the study area intersections, respectively.

Under existing conditions, bicycle volumes were found to be fairly low through the study area with less than 15 through bicycle trips observed on each study area roadway during the weekday morning and weekday evening peak hours. However, the bicycle volumes were observed concurrently with the traffic counts in December 2019, so the bicycle volumes may be higher in the warmer months.

6.3.9.1 Bicycle Share Program

Bluebikes, Metro Boston's public bike share program now has more than 300 stations with 3,000 bicycles available throughout 10 municipalities in Metro Boston. Near the BMC campus, there are three Bluebikes stations and each station accommodates between 10 and 20 bicycle docks, as identified in **Figure 6-12**.

- East Concord Street at Harrison Avenue

- Albany Street at East Brookline Street
- Harrison Avenue at East Dedham Street

Figure 6-12 Existing Campus Bicycle Accommodations and Bike Parking Supply

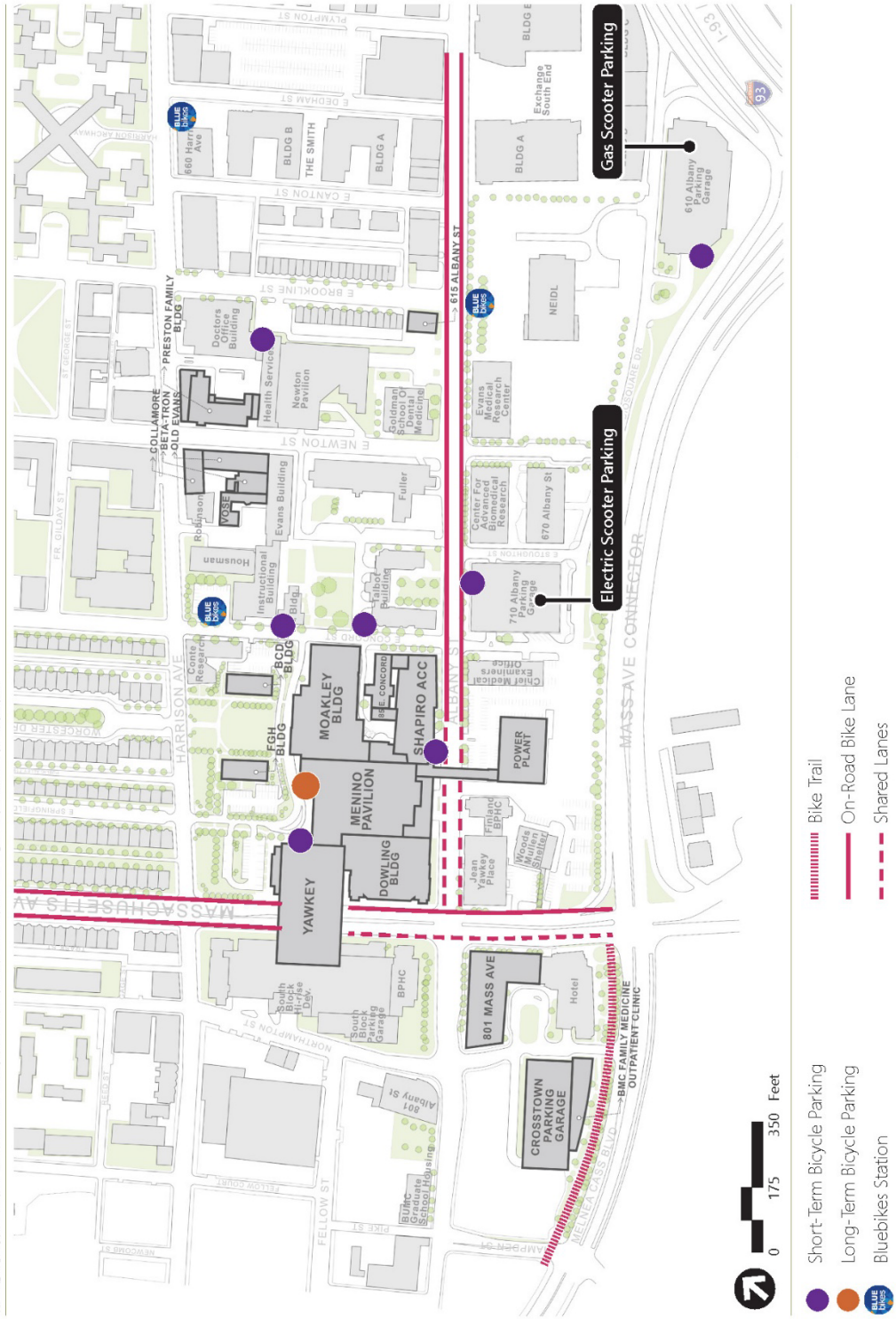


Figure 6-13 2021 Existing Conditions Weekday Morning Peak Hour Bicycle Volumes

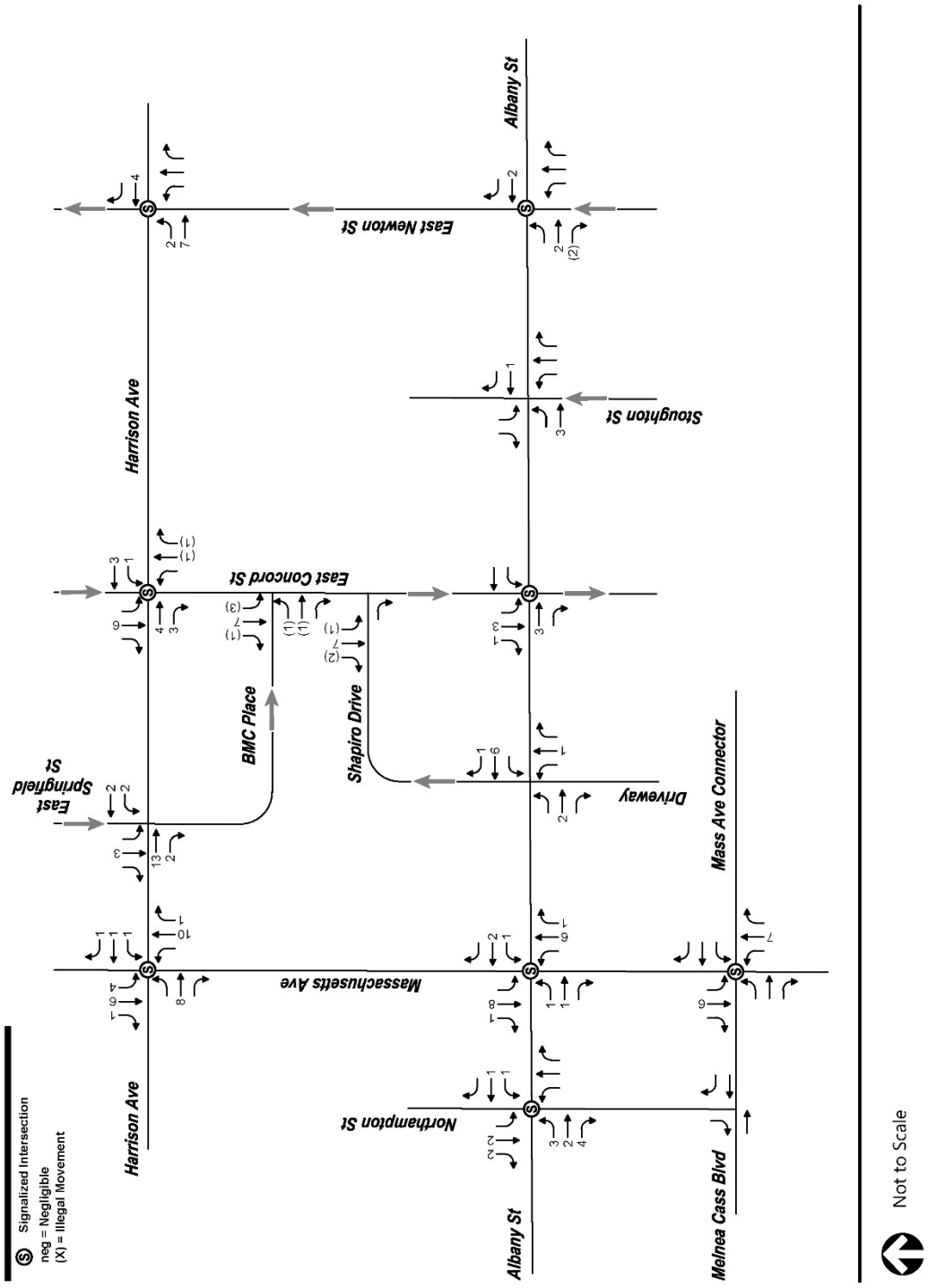
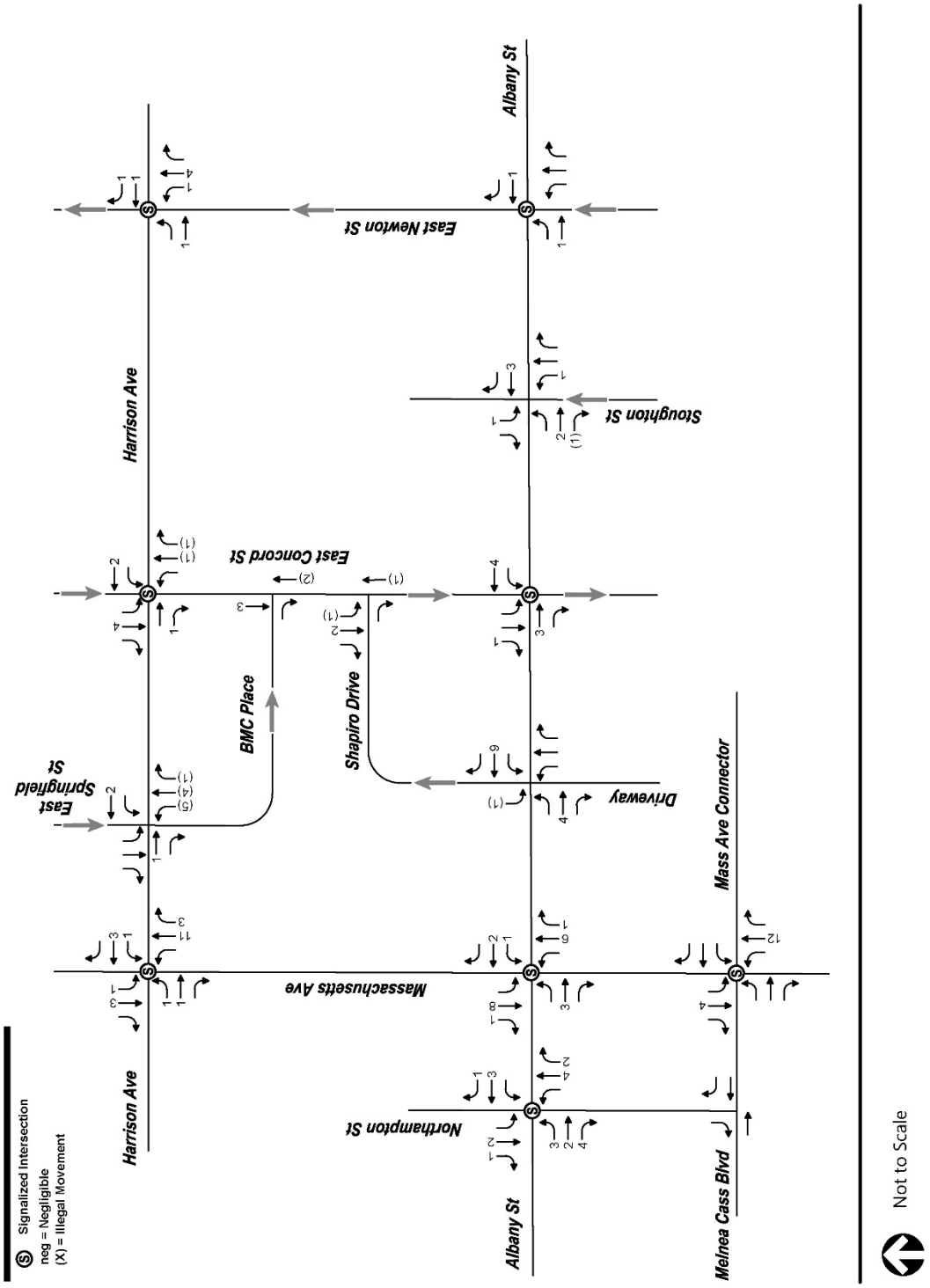


Figure 6-14 2021 Existing Conditions Weekday Evening Peak Hour Bicycle Volumes



6.3.10 BMC Campus Transportation Operations

The following section describes additional existing transportation operations that support and occur within the BMC campus, including pick-up/drop-off operations, loading/service areas, ambulance activity, taxicab and transportation network company operations, and details on BMC's transportation demand management (TDM) plan, which is aimed at encouraging the use of alternative modes of transportation and reducing single-occupant driving.

6.3.10.1 Pick-Up / Drop-Off Operations

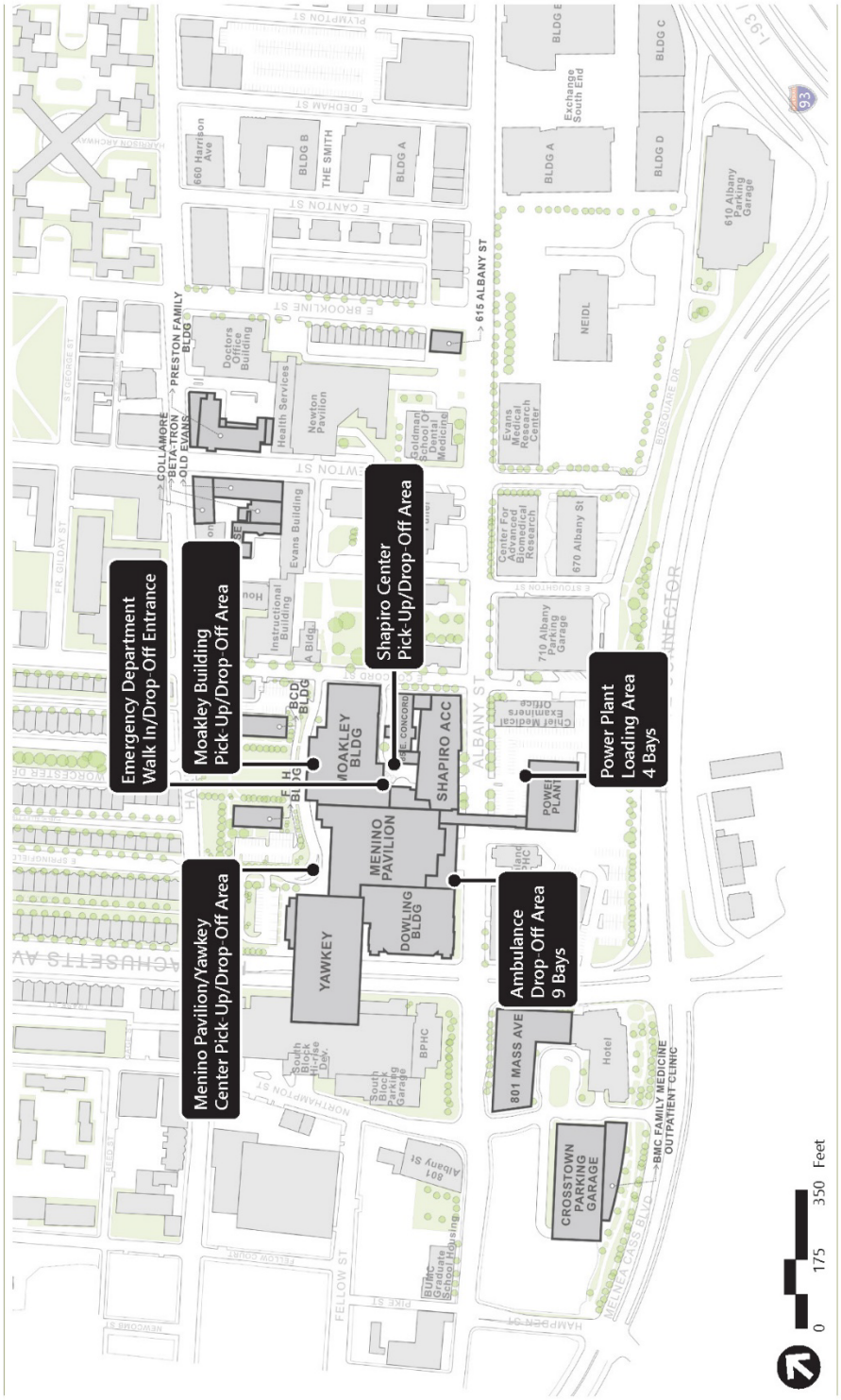
BMC has two main pick-up/drop-off areas on campus, on Boston Medical Center Place and on Shapiro Drive. The pick-up/drop-off areas on Boston Medical Center Place serve the Yawkey Center, Menino Pavilion, and Moakley Building, while the pick-up/drop-off area on Shapiro Drive serves the Shapiro Ambulatory Care Center. Curbside accommodations are designated near the main doors of each facility for vehicles to pick-up and drop-off patients and visitors. Both driveways allow for one-way traffic flow, with Boston Medical Center Place accessed via Harrison Avenue and Shapiro Drive accessed via Albany Street. Vehicles exit both pick-up/drop-off areas onto East Concord Street, which is one-way southbound toward Albany Street.

Valet services are provided in front of the Shapiro Ambulatory Care Center and in front of the Menino Pavilion. Patients and visitors are directed to leave their vehicles with valet attendants at these locations, and the valet attendants will move the vehicles to designated nearby valet parking lots. Patients are able to pick up their vehicles in the same location where they dropped them off.

BMC is planning geometric and operational enhancements to the Yawkey Center/Menino Pavilion pick-up/drop-off area in order to improve the efficiency of vehicle operations and circulation. These actions are intended to support an improved, premiere arrival experience for their patients and visitors. A more detailed description of these planned improvements is described later in this chapter.

Figure 6-15 illustrates the location of the pick-up/drop-off areas, as well as the loading dock and ambulance areas described in the following sections.

Figure 6-15 Existing Campus Loading/Service Areas and Drop-Off Zones



6.3.10.2 Loading / Service Areas

A major component of BMC's operations involves managing the hospital's loading and service needs, and scheduling deliveries over the course of each day helps to minimize traffic impacts. BMC is served by one centralized, primary loading dock located at the Power Plant off of Albany Street. The loading dock has four dedicated bays, with room for smaller delivery vehicles to park and unload to the sides of the loading dock off-street. Delivery trucks are able to turn into the Power Plant parking lot from Albany Street and maneuver to park/back-up within BMC property and off-of Albany Street. Its operating hours are 6:00 AM to 4:00 PM, Monday through Friday, with one additional delivery service around 8:00 PM. The Power Plant dock accommodates vehicles ranging from a small van to a 53' truck.

Goods and deliveries are transported from the service facility in the Power Plant throughout the hospital on hand carts via the Patient Transport and Materials Handling Bridge across Albany Street connecting the Power Plant building to the Menino Pavilion and through designated service corridors and freight elevators. The Patient Transport and Materials Handling Bridge was constructed within the last five years and allowed for all primary loading and service to be relocated from across the campus to the Power Plant.

6.3.10.3 Ambulances

The BMC Emergency Department is located on the BMC campus at the Menino Pavilion. Emergency vehicles bring patients to the rear of the Menino Pavilion at Albany Street. Emergency vehicles can park under cover in the Ambulance-Only, designated drop-off area located to the west of Shapiro Drive constructed as part of the New Inpatient Building Phase 1. Ambulances reach this area from either direction on Albany Street and can pull off of the roadway into the ambulance area to maneuver to park. The ambulances unload in the covered area, which has 9 ambulance bays, and then can depart in either direction on Albany Street.

Since Boston Medical Center is a Level 1 trauma center accepting trauma patients from across the region, it is critical to have an efficient ambulance drop-off area. The current ambulance drop-off area was constructed within the last five years and provides an improved circulation and flow through the drop-off area as compared to the previous ambulance drop-off area.

6.3.10.4 Taxicabs and Transportation Network Companies (TNCs)

Some patients and visitors choose to take a taxicab or TNC to get to and from the hospital. Taxicabs often pick up and drop off patients and visitors on Boston Medical Center Place, in front of the Menino Pavilion or Moakley Center, or on Shapiro Drive. Taxis are directed to the designated pick-up/drop-off areas in order to contain all activity in the designated areas and to reduce conflicts of vehicles stopping and idling on local roadways, such as Albany Street, Massachusetts Avenue, and Harrison Avenue.

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 medical campus using these ride-hailing services. TNC activity is directed to occur on Boston Medical Center Place, in front of the Menino Pavilion or Moakley Center, or on Shapiro Drive. Similar to taxicabs, TNC activity is encouraged in these areas to prevent drivers from blocking through operations on local roadways surrounding the medical campus.

6.3.10.5 Transportation Management Association

As of March 2020, Boston Medical Center is a member of the A Better City Transportation Management Association (TMA). A Better City serves as the TMA for over 50 organizations in Massachusetts representing more than 80,000 employees and residents. BMC and it's TMA work to bring more frequent

and accessible public transportation to the Medical Center community and provides information on transportation services in the area.

6.3.10.6 Existing Shuttle Services

BMC and it's TMA provide the following shuttle services for patients and employees:

- **VA Shuttle** – The VA shuttle operates direct between the VA Hospital in Jamaica Plain and 85 East Concord Street on the BMC Campus. The shuttle operates hourly between 10:00 AM and 5:00 PM, departing the VA Hospital at the top of every hour and departing BMC on the half-hour.
- **Evening Shuttle** – The evening shuttle service travels on request from a central stop at 710 Albany Street on the BMC Campus to MBTA subway stations at Andrew, Broadway, Ruggles, Back Bay and Copley stations, and to nearby South End neighborhood locations. The shuttle runs hourly from 5:15 PM to 12:15 AM.
- **BU Charles River Campus Shuttle** – The BU Medical Campus bus travels between the main Boston University Campus on the Charles River and the BU Medical Campus. While the shuttle is operated by Boston University, it is free for BMC employees. The shuttle runs every 10-20 minutes between 7:00 AM and 11:30 PM during the school year, with reduced service on Saturdays and when school is not in session.
- **East Boston Neighborhood Health Center Shuttle** – A HealthNet shuttle is provided between BMC and the East Boston Neighborhood Health Center at 20 Maverick Square in East Boston. The service is provided for patients of the East Boston Neighborhood Center with appointments at BMC. The shuttle runs direct between the two facilities from 6:30 AM to 8:00 PM, with headways of 30 minutes between 8:00 AM and 6:00 PM and headways of 60 minutes earlier in the morning and later in the evening.

It should be noted that the shuttle services described above represent pre-pandemic conditions and do not include any temporary reductions in service that may be in effect.

BMC also provides evening and weekend escort service for commuters and visitors to all BMC parking facilities as well as the Broadway Station of the MBTA. The escort service is available all day on weekends and between 12:00 AM and 6:00 AM Monday through Friday. The escort service can be requested at the Menino Pavilion security desk.

In the past, the TMA used to provide shuttle services direct to neighborhood health centers in Mattapan, Roxbury, and Dorchester. That service has been replaced with a free Uber ridership program where patients under the HealthNet Plan insurance at local neighborhood health centers with appointments at BMC are eligible for free Uber rides to and from the hospital. The free Uber program is provided between BMC and the following neighborhood health centers presented in **Table 6-5**.

Table 6-5 HealthNet Uber Ridership Program Neighborhood Connections

Eligible Neighborhood Health Center	Neighborhood	Distance from BMC
Codman Square Health Center	Dorchester	3.6 miles
The Dimrock Center	Roxbury	1.9 miles
Dorchester House Multi-Service Center	Dorchester	2.6 miles
Greater Roslindale Medical and Dental Center	Roslindale	4.5 miles

Harvard Street Neighborhood Health Center	Dorchester	2.5 miles
Mattapan Community Health Center	Mattapan	4.9 miles
South Boston Community Health Center	South Boston	1.8 miles
Upham's Corner Health Center	Dorchester	2.1 miles
Whittier Street Health Center	Roxbury	1.2 miles

6.3.10.7 Transportation Demand Management (TDM)

Boston Medical Center has consistently worked to reduce the number of drive- alone trips to the medical area, both through efforts of the individual institution and through the area's Transportation Management Association. As indicated previously, existing employees at BMC have a significantly lower auto use than the BTD mode share rates, at only 29 percent. This rate reflects the strong and effective transportation demand management program that is in place. Through the participation in a Transportation Management Association, BMC will continue to encourage and assist its employees, as well as patients and visitors to use many of the demand management and trip reduction programs offered. These are listed below.

- Boston Medical Center offers a 50 percent transit subsidy through payroll deduction to full-time employees who do not have parking permits.
- Full-time employees who work on the Medical Campus may sign up for monthly MBTA passes through pre-tax payroll deduction. Up to $230 per month is tax deductible.
- On-site non-discounted transit pass sales and schedules are provided.
- On-line transit and rideshare information is provided on the BMC web site.
- A transit rider "read and ride" library is provided for commuters in the Transportation Management Association's office.
- BMC's Transportation Management Association operates a "borrowed belongings program" where members of the BMC community may borrow an umbrella or bicycle lock for up to 48-hours.
- BMC's Transportation Management Association works with the MBTA and BTD to improve bus service, wayfinding, and pedestrian safety around the campus.
- Boston Medical Center provides an evening shuttle route to connect employees with nearby transit stations and the surrounding neighborhood.
- Preferential parking is provided for Carpool/Hybrid program participants and hybrid / electric vehicles on the first level of the 610 and 710 Albany Street Garages.
- Two Zipcars are provided on East Newton Street for employees who commuted via public transportation, walking, or biking, but may need a private vehicle during the day.
- BMC's Transportation Management Association provides a Guaranteed Ride Home program for carpoolers, ensuring that carpoolers will have a ride home in case of emergency.
- BMC's Transportation Management Association participates in Bay State Commute, a free website/app and tool provided by MassDOT to reward travelers for taking "green" trips – i.e., walk, bike, telecommute, carpool, vanpool, subway, train, bus, or ferry trips, or even working a

compressed week. Travelers log their transit, bus, or walk trips to work on the website or app and are rewarded with discounts to stores, restaurants, entertainment, etc. Bay State Commute also serves as the state's rideshare database for finding carpool partners.

- Designated gas-powered and electric-powered scooter parking is provided in the 610 and 710 Albany Street Garages.
- BMC and its Transportation Management Association offers sheltered and secured bicycle parking at several locations, participation in the Annual Bike to Work/School week, a free Cyclists' Luncheon, and a free Bike Safety Checkup.
- BMC's Transportation Management Association publishes a medical area walking map and offers neighborhood walks for the South End's medical history and South of Washington Area (SOWA) at lunchtime for employees and others. Besides designating short and long "neighborhood walking" loops covering areas like the Southwest Corridor Park, Discover Roxbury, Medical History, and the SOWA arts district, this map shows restaurants and community services such as ATM's and dry cleaners, as well as the mileage from BMC to the neighboring MBTA stations.
- BMC's Transportation Management Association has a website that advertises and provides information on alternative commuting resources and includes an email group list for interested employees.

BMC is committed to continuing to provide these transportation demand management strategies in order to maintain the low-auto mode share currently attributed with employees and patients of the medical center.

6.4 Evaluation of Long-Term Transportation Impacts

Traffic volumes in the study area were projected to a ten-year planning horizon to reflect the term of the IMP. Independent of the IMP Projects, peak hour volumes on the roadway network under the future No-Build conditions were assumed to include existing traffic and new traffic resulting from background traffic growth. Under the Build condition, Project generated traffic volumes were added to the No-Build volumes to reflect the Build conditions within the Project study area.

6.4.1 Background Traffic Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. Several methods can be used to estimate this growth. A procedure frequently employed is to estimate an annual percentage increase and apply that increase to study area traffic volumes. An alternative procedure is to identify estimated traffic generated by planned new major developments that would be expected to impact the project study area roadways. For the purpose of this assessment, the latter method was utilized to formulate the 2031 future No Build Conditions, as specified in BTD guidelines[2].

[2] Traffic Counts During and Post Pandemic Memo, January 21, 2021, Boston Transportation Department and Public Works.

6.4.1.1 Site-Specific Growth

To quantify the growth in traffic between 2021 and 2031, the traffic associated with other planned and/or approved developments near the Site was considered. Based on research by VHB and discussions with the City of Boston, it was determined that there are several planned development projects within the vicinity of the study area. The planned/approved projects are described below in detail and the projected traffic volumes expected to be generated by each project were estimated based on published traffic studies if available or ITE projections and added to the study area roadways based on existing travel patterns. The associated traffic volumes and ITE projection worksheets are included in the **Appendix D** to this report.

- **Harrison Albany Block:** The project involves the construction/renovation of approximately 687 residential units, 76,800 sf of office space, and 19,700 sf of retail/cultural space. The project is located in the block bounded by Harrison Avenue, Albany Street, East Canton Street, and East Dedham Street and completed construction in late 2020, after the existing traffic counts were conducted in December 2019.

- **Hotel Alexandria:** The project involves the restoring the façade of the historic Hotel Alexandria and constructing a new 150-room hotel with ground floor restaurant space and a rooftop level restaurant. The project is located on the corner of Washington Street and Massachusetts Avenue and has been approved by the Boston Planning and Development Agency (BPDA).

- **Exchange South End:** The project involves the construction of approximately 1,468,390 sf of mixed-use office, commercial, and/or research space, 22,430 sf of ground floor retail, and 30,000 sf of civic space on the site of the former Boston Flower Exchange. The project is located at 540 Albany Street between East Newton Street and East Canton Street and has been approved by the BPDA.

- **One Newcomb Place:** The project involves the construction of a new building comprised of 23 residential units. The project is located on Newcomb Street south of Washington Street and has been approved by the BPDA.

- **771 Harrison Avenue:** The project involves the conversion of a former church into 63 residential units. The project is located on Harrison Avenue between East Concord Street and East Newton Street and has been approved by the BPDA.

- **1950 Washington Street:** The project involves the construction of a new building comprised of 31 residential units, approximately 4,500 sf of ground floor restaurant/retail space, and approximately 800 sf of office space. The project is located on the corner of Washington Street and Thorndike Street and is currently under construction.

- **Shattuck Hospital:** The project involves the relocation of the state-owned Lemuel Shattuck Hospital from Morton Street in Jamaica Plain to the vacated 257,019 sf Newton Pavilion formerly occupied by BMC. The project is located on East Newton Street and is still in the planning stages.

- **BU Henry Goldman School of Dental Medicine:** The project involves the renovation of up to 65,000 sf in the existing dental school building and the addition of up to 50,000 sf of new floor area. The project is located on the corner of Albany Street and East Newton Street and completed construction in early 2021, after the existing traffic counts were conducted in December 2019. It should be noted that this project is mentioned for informational purposes only as there is not expected to be a significant increase in the student or faculty population due to the expansion. Therefore, no site-generated trips were added to the roadway network due to this project.

6.4.1.2 Roadway Improvement Projects

In assessing future traffic conditions, proposed roadway improvements within the study area were considered. Based on research by VHB and discussions with the City of Boston, it was determined that there are several planned roadway improvement projects within the vicinity of the study area. Several of these projects originate from the Harrison Albany Corridor Strategic Plan developed by the City in 2012, which looked at the Harrison Avenue and Albany Street corridors and included a series of short-term, medium-term, and long-term transportation improvements. The planned/approved projects are described below in detail.

- **BioSquare Drive Connection to I-93 Southbound Frontage Road:** Efforts are currently underway to connect Biosquare Drive to the I-93 Southbound Frontage Road. Biosquare Drive runs parallel to Albany Street providing access to the 610 and 710 Albany Street parking garages and currently dead-ends east of the I-93 Southbound Frontage Road. This project will connect Biosquare Drive with the I-93 Southbound Frontage Road, providing additional access to I-93 from BMC and the South End and helping to relieve congestion on Massachusetts Avenue and Massachusetts Avenue Connector. This project has been incorporated into all future analyses, and a portion of existing traffic using Massachusetts Avenue Connector or Albany Street to access I-93 has been rerouted through this new connection. Calculations of the redistributed volumes are provided in the **Appendix D** to this report.
- **Albany Street redesign:** The City of Boston is in the initial planning stages to redesign and reconstruct the Albany Street corridor to help make it friendly to pedestrians and bicycles. The design is still in its initial stages and it is not yet known what the limits of work or the final cross section of the roadway will look like. Since the final design is not yet known, the project is included for informational purposes only and is not incorporated into any future analyses.
- **East Concord Street Extension to Mass Avenue Connector:** Listed as a long-term recommendation in the Harrison Albany Corridor Strategic Plan is a proposal to connect East Concord Street with the Mass Avenue Connector in order to help relieve congestion along Massachusetts Avenue. However, this connection is not actively being pursued at this time and is not expected to be completed in the term of the IMP. Therefore, this project is included for informational purposes only and is not incorporated into any future analyses.
- **South Bay Harbor Trail:** Once complete, the South Bay Harbor Trail is expected to cross the southern portion of the BMC campus and provide enhances bicycle and pedestrian connections from BMC to the Fort Point Channel and the Seaport in the east and to Roxbury in the west. On the BMC campus, the trail will run on the north side of Melnea Cass Boulevard and the Massachusetts Avenue Connector and will connect to Albany Street through the proposed Exchange South End site. While portions of the trail are complete, including the segment along the north side of Melnea Cass Boulevard next to the Crosstown Center, most of this trail is either under construction or is still in the planning stages.
- **Melnea Cass Boulevard redesign:** The City of Boston was planning a reconstruction of Melnea Cass Boulevard from Massachusetts Avenue to Columbus Avenue. The redesign was to include wider sidewalks, separated bicycle lanes on each side of the roadway, new traffic signals and new timings, and upgraded bus stops. However, the project was officially canceled in January 2021 and therefore is not included in any future conditions.

Transit improvements are discussed separately in **Section 6.4.2.2**.

6.4.2 No-Build Traffic Volumes

The No-Build traffic volumes were developed by adding in the background projects and roadway improvement projects described above to the Existing Conditions. The resulting 2031 No-Build weekday morning and weekday evening peak hour traffic volume networks are shown in **Figures 6-16 and 6-17,** respectively.

Figure 6-16 2031 No Build Conditions Weekday Morning Peak Hour Traffic Volumes

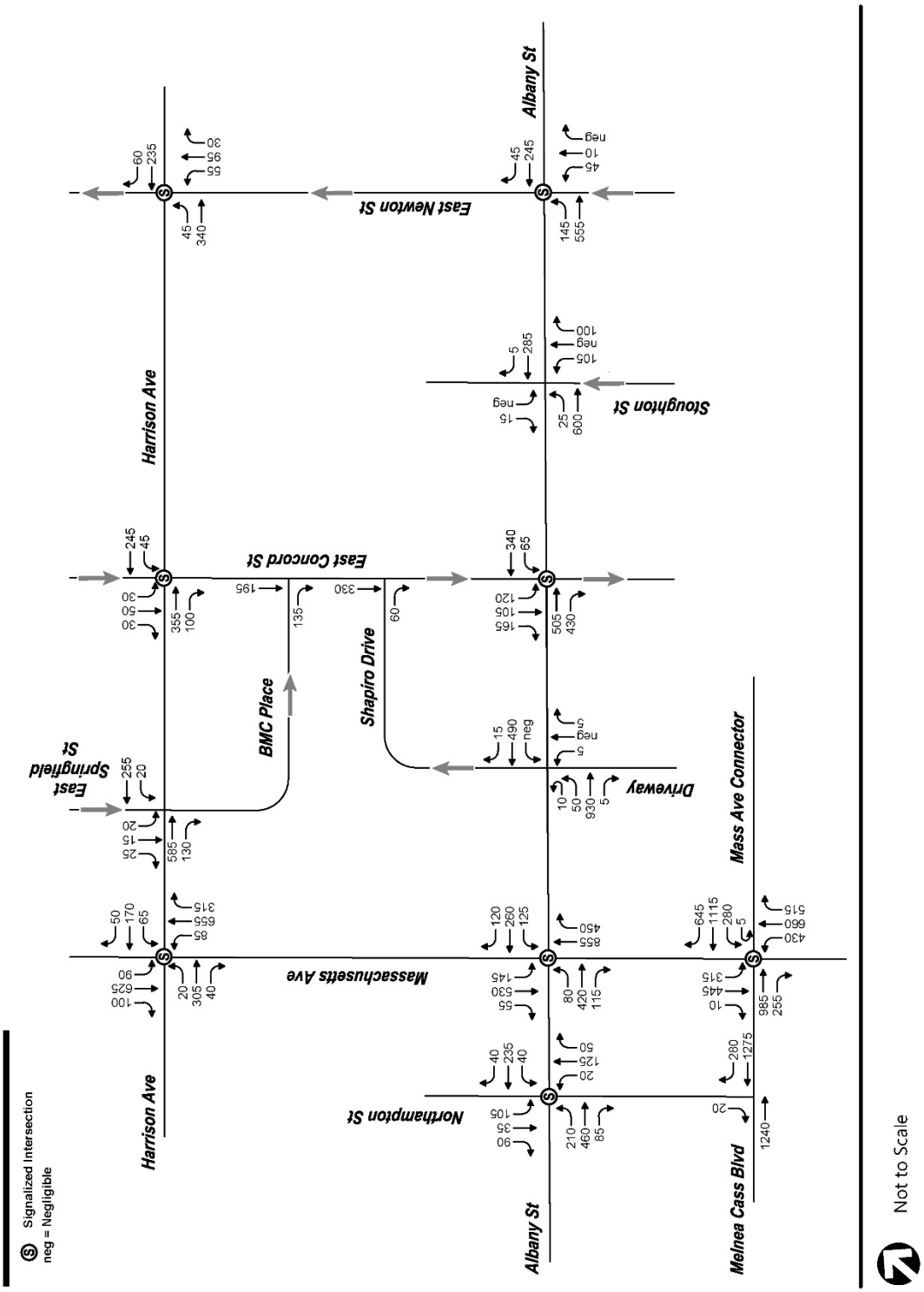
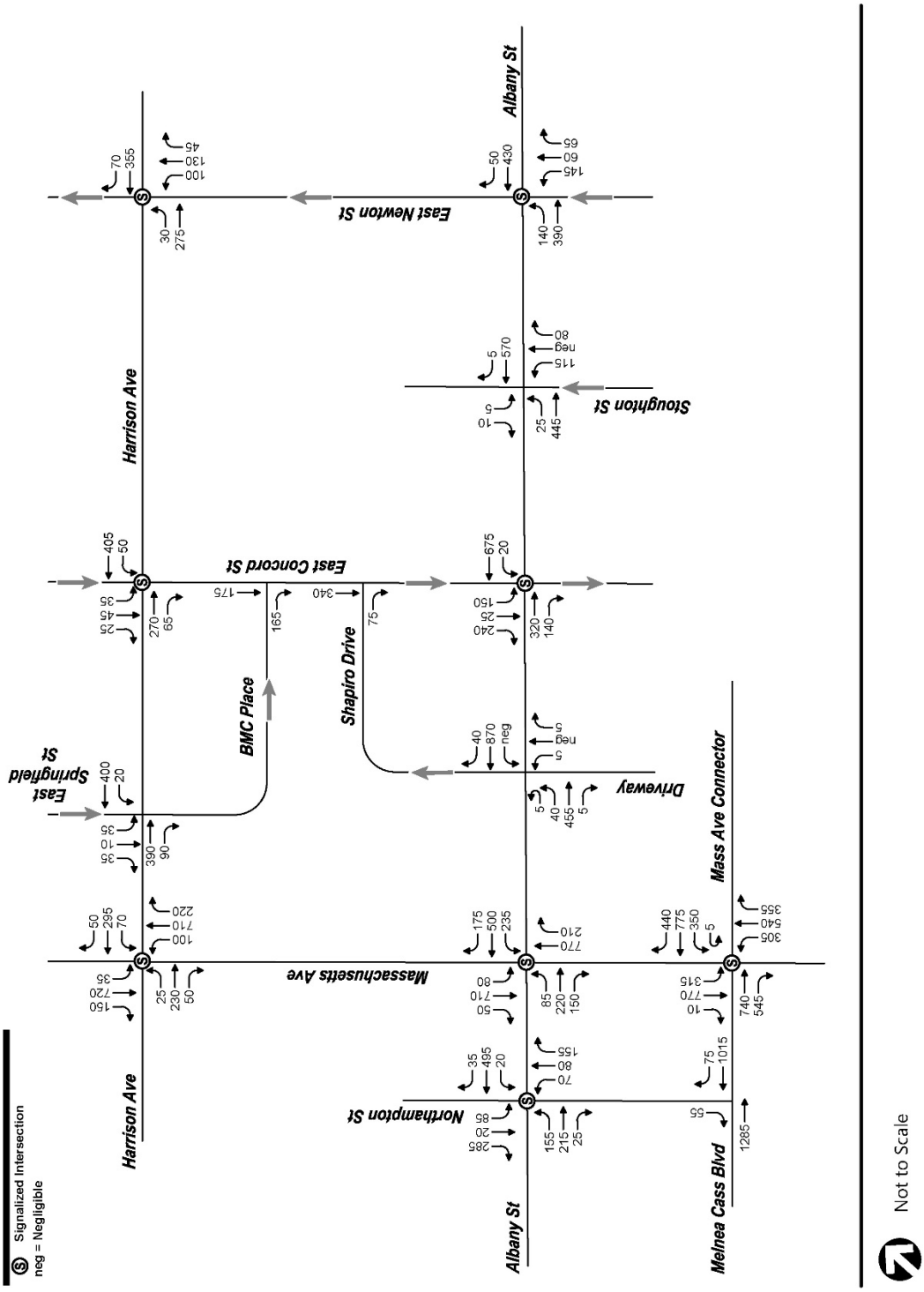


Figure 6-17 2031 No Build Conditions Weekday Evening Peak Hour Traffic Volumes



6.4.3 Trip Generation

To assess the impact of the proposed IMP Projects, trip estimates were based on standard Institute of Transportation Engineers (ITE) trip rates published in ITE's Trip Generation manual. The trip generation estimates are based on the proposed projects expected to be constructed within the term of the IMP.

6.4.3.1 BMC IMP Projects

There are several projects planned by BMC over the term of the IMP. Projects are generally categorized as being within a five-year time frame or being within a ten-year time frame. Note that some of the ten-year projects were previously approved as part of the 2010 IMP, and subsequent amendments thereto. **Table 6-6** outlines the proposed IMP projects and the change in overall square footage associated with each project.

Table 6-6 BMC IMP Projects

Five-Year Projects	SF
Yawkey Center 6th Floor Addition	15,500
Menino Pavilion / Yawkey Center Lobby Addition	6,100
Menino Pavilion 9th Floor Addition	37,000
Gambro Lease Expiration	(-17,288)
Doctor's Office Building Lease Expiration	(-91,783)
Total Five-Year Projects	**(-50,471)**
Ten-Year Projects	**SF**
10 Stoughton Street (requires Vose Hall / Betatron demo)	170,000
Collamore / Old Evans Buildings Adaptive Reuse	n/a [1]
New Inpatient Building Phase 2 (requires Dowling demo)	323,000
New Admin / Clinical Building (requires Power Plant demo)	219,000
Dowling Demolition	(-157,376)
Power Plant Demolition	(-64,064)
Vose Hall Demolition	(-22,695)
Betatron Demolition	(-5,912)
Total Ten-Year Projects	**461,953**
Total Change due to IMP Projects	**411,482**

1 – Collamore / Old Evans adaptive reuse will convert existing administrative space to 130 residential units but will not impact the total square footage.

Future analyses and assessments of the potential traffic impacts have only been conducted for the ten-year time frame, as the total square footage of the hospital is expected to actually decrease and the impacts on the transportation network are expected to be lower than current conditions within the five-year time frame. This approach was confirmed with the City of Boston. Including the demolition of existing buildings on the future sites of the ten-year IMP Projects, the ten-year projects are expected to increase the overall square footage of the BMC campus by 461,953 sf. When considering the reduction in square footage on campus due to the five-year projects, the BMC campus is expected to contain approximately an additional 411,482 sf over existing conditions. The trip generation estimates below are based on this increase over existing conditions.

As noted previously, one of the ten-year IMP projects is to convert the existing administrative space in the Collamore / Old Evans Buildings into 130 residential units. While this will not change the overall square footage of the campus, the shift from hospital use to residential use will impact the trip generation patterns of the BMC campus, as residential uses have different trip generation characteristics than hospital uses. Therefore, the future trip generation potential of the hospital does not include the square footage of the Collamore / Old Evans buildings and the residential-generated trips from these buildings are considered separately. It should be noted that the residential trip generation analysis is conservative since the portion of units for supportive housing (approximately 15-20%) will likely not drive.

It should also be noted that many of the proposed projects are intended to right-size and update outdated building space for existing hospital programs, such as replacing existing semi-private patient rooms with private rooms. Therefore, some of the building area to be constructed will not necessarily generate additional incremental patient load or related traffic increases, and the actual transportation impact of these projects may be overstated. However, to present a conservative analysis, the proposed site-generated trips were estimated based on the total proposed square footage of the hospital, including any additions that do not directly add capacity to the hospital.

6.4.3.2 Unadjusted Project-Generated Trips

The Institute of Transportation Engineers (ITE) Trip Generation Manual[3] was used as the basis for trip generation estimation. ITE Land Use Codes (LUC) 610 (Hospital) and 221 (mid-rise residential) were used to estimate the volume of new trips generated by the proposed IMP projects. LUC 610 (Hospital) includes all building uses on the hospital campus, including inpatient, outpatient, and administrative uses, except for the proposed residential units, which is included in LUC 221 (mid-rise residential)

Since the proposed IMP Projects are an expansion of the BMC existing campus, hospital trip generation was estimated for the entire campus with and without the new projects using the regression equations. The difference between these two values yields the “net-new trips” specifically associated with the new hospital projects. Because most of the core building staff (i.e., security, janitorial, etc.) is already located within the campus, the proposed hospital projects will not be generating as many trips as a new stand-alone facility.

It is important to recognize that patient trips occur throughout the day. While some patient trips occur during the peak hours, there is a steady flow of patient and visitor trips between 8:00 AM and 7:00 PM.

[3] Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, Washington D.C., 2017

The trip generation estimate (based on ITE) assumes a concentration of peak hour trips because the trip rates account for new employee trips when adjacent street traffic volumes are the highest. However, as mentioned previously, no new parking will be provided within the term of the IMP, so the actual trip results are expected to be lower than reported below. For these reasons, the hospital trip generation estimate presented below is conservative.

Table 6-7 summarizes the total number of unadjusted (raw ITE) vehicle trips to be generated for an average weekday and during the morning and evening peak hours. It is important to note that these "unadjusted" trips do not take into account the heavy reliance on public transportation and alternative modes of travel used at BMC, which is discussed in the following sections. The trip generation worksheets are included in the **Appendix D**.

Table 6-7 Unadjusted New Project-Generated Trips

Time Period	New Hospital Unadjusted Vehicle Trips	New Residential Unadjusted Vehicle Trips	Total New Unadjusted Vehicle Trips
Weekday Daily			
Entering	910	353	1,263
Exiting	910	353	1,263
Total	1,820	706	2,526
Weekday Morning Peak Hour			
Entering	156	12	167
Exiting	73	33	106
Total	229	45	273
Weekday Evening Peak Hour			
Entering	83	35	118
Exiting	117	22	199
Total	260	57	317

Source: ITE Trip Generation, 10th Edition for LUC 610 (Hospital) and LUC 221 (mid-rise residential)

As shown in **Table 6-7,** the new projects are anticipated to generate 2,526 daily unadjusted vehicle trips and 273 and 317 unadjusted vehicle trips during the weekday morning and evening peak hours, respectively. As stated previously, these trips do not account for the heavy reliance on public transportation and alternative modes of travel, which is discussed below.

6.4.3.3 Mode Shares

Separate mode shares were developed for patients, employees, and residents. This approach provides a more accurate representation because of the documented low auto use by Boston Medical Center employees.

Boston Transportation Department (BTD) mode split data for the Medical Area (BTD Area 15) was used to estimate the patient mode share. The "All Purposes" category was used to capture the travel patterns of patients. BMC employee mode shares were derived from 2018 DEP Rideshare Survey data of its employees. The survey is conducted to determine travel patterns at Boston Medical Center and BU Medical Campus, as required by the Massachusetts Department of Environmental Protection. Residential mode share is based on the 2019 American Community Survey (ACS) five-year estimates from the U.S. Census Bureau for census tract 711.01 (the census tract that BMC and the adject South End neighborhood is in).

Table 6-8 below summarizes the mode shares for patients and employees at BMC and for the proposed new residents in the Collamore / Old Evans Buildings.

Table 6-8 Mode Shares

Mode	Patient Mode Share [1]	Employee Mode Share [2]	Residential Mode Share [3]
Auto	56%	29%	24%
Public Transportation	17%	52%	31%
Walk / Bike / Other	27%	19%	45%
Total	100%	100%	100%

1 – Based on BTD mode split data for BTD Area 15 for the "All Purposes" category
2 – Based on 2018 DEP Rideshare Survey of BMC and BU Medical Center Employees
3 – Based on US Census Data (2019 ACS 5-Year estimates) for Census Tract 711.01

The daily mode shares, shown in **Table 6-8**, were used to estimate the vehicle, public transit, and walk/bike trips generated by patients and employees to BMC and for the residential units in the renovated Collamore / Old Evans buildings. As the table indicates, existing employees have a significantly lower auto use than reflected by the BTD mode share rates for patients. The survey results reflect the strong transportation demand management program and low auto use in effect at BMC. However, with a lack of more detailed mode-share data available for BMC patients, the BTD mode share data provides a conservative estimate.

In addition, the 2019 ACS five-year estimates for Census Tract 711.01 were used for the residential mode share as opposed to the BTD Access Boston data in order to provide the most accurate and current understanding of residential mode share in the adjacent South End neighborhood. It is assumed that the residents in the renovated Collamore / Old Evans buildings will have similar mode share characteristics as existing residents of the South End and will take advantage of the existing walking, biking, and transit infrastructure, and therefore the low auto mode share reflects the alternative transportation options nearby.

6.4.3.4 Adjusted Trip Generation Summary

The mode shares presented above, and vehicle occupancy rates (VOR) based on Federal Highway Administration's 2017 National Household Travel Survey Summary of Travel Trends were applied to the unadjusted trip generation volumes to develop the change in adjusted Site-generated trips based on the IMP projects. The proportion of hospital trips that are assumed to be employee trips and therefore were assigned the employee mode shares as compared to patient/visitor trips was based on the existing proportion of assigned employee parking spaces on campus versus assigned patient parking spaces. **Table 6-9** summarizes the total projected new Site vehicle trips, transit trips, and walk/bike trips for all uses. Trip generation calculations and a breakdown of proposed vehicle, transit, and walk/bike trips by use are included in the **Appendix D** to this report.

Table 6-9 Adjusted New Project-Generated Trips

Time Period	Vehicle Trips	Transit Trips	Walk/Bike Trips
Weekday Daily			
Entering	430	595	473
Exiting	430	595	473
Total	860	1,190	946

Weekday Morning Peak Hour			
Entering	62	84	56
Exiting	35	49	41
Total	97	133	97
Weekday Evening Peak Hour			
Entering	41	57	44
Exiting	72	98	67
Total	113	155	111

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

As shown in **Table 6-9**, the new BMC projects during the term of the IMP are collectively anticipated to generate approximately 860 new vehicle trips (430 entering/430 exiting) over the course of a typical weekday, with 97 new vehicle trips (62 entering/35 exiting) during the weekday morning peak hour and 133 new vehicle trips (41 entering/72 exiting) during the weekday evening peak hour. As stated previously, with no new parking expected to be added on campus over the next ten-years and with some of the new construction expected to replace/upgrade existing services, it is likely that the actual number of vehicle trips generated will be less than what is reported above. In addition, to present a conservative analysis, no shared trip credit was taken between the residential use and the hospital uses even though some residents of the proposed residential units may work at or be patients at BMC.

The projects are also expected to generate approximately 1,190 new transit trips (595 entering/595 exiting) over the course of a typical weekday, with 113 new transit trips (84 entering/49 exiting) and 155 new transit trips (57 entering/98 exiting) during the weekday morning and weekday evening peak hours, respectively. These transit trips are expected to mostly utilize existing MBTA bus service to access BMC, as outlined in the transit capacity analyses presented in **Section 6.4.2**.

In addition, the new IMP projects are expected to generate approximately 946 new walk/bike trips (473 entering/473 exiting) over the course of a typical weekday, with 97 new walk/bike trips (56 entering/41 exiting) and 111 new walk/bike trips (44 entering/67 exiting) during the weekday morning and weekday evening peak hours, respectively. These new walking and bicycle trips are expected to use the existing and future sidewalk and bicycle accommodations to access BMC, including the extended South Bay Harbor Trail.

6.4.4 Trip Distribution

The directional distribution of the traffic approaching and departing BMC is a function of population densities, the location of residential and workplace opportunities, existing travel patterns, and the efficiency of the roadway system. Due to the varying trip characteristics of employees, patients/visitors, and residents, each use is expected to experience a different distribution pattern.

Zip code data provided by BMC for employees and patients were used to determine a regional distribution pattern for peak hour trips to and from the campus. These trips were assigned to the most convenient local corridor. The results show that the majority of patients at BMC come from within the City of Boston, with the most patients living in Dorchester, Roxbury, the South End, and Mattapan. Employees are more likely to commute from a farther distance to reach BMC, with employees living throughout eastern Massachusetts. These trends are reflected in the trip distribution patterns and the employee and patient home origins are depicted in **Figures 6-18 and 6-19**, respectively.

For the proposed residential development, Access Boston trip distribution data from BTD was utilized to estimate the origins and destinations of the residential-generated trips. The regional vehicle trip

distribution used for the transportation analyses are shown in **Figure 6-20** and summarized below in **Table 6-5**. The trip distribution calculations are included in the **Appendix D** to this report.

Figure 6-18 Employee Home Origin Map

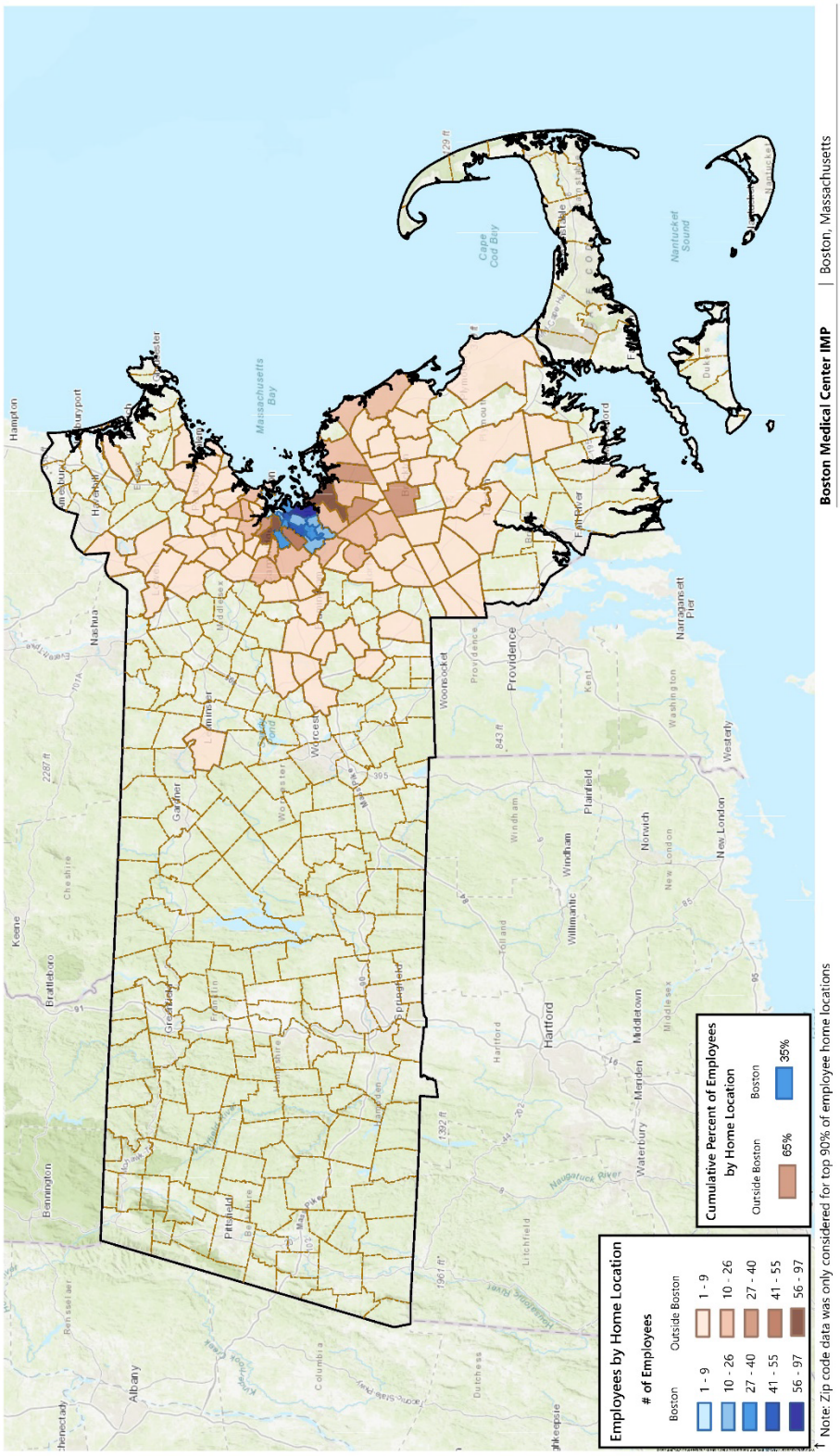


Figure 6-19 Patient Home Origin Map

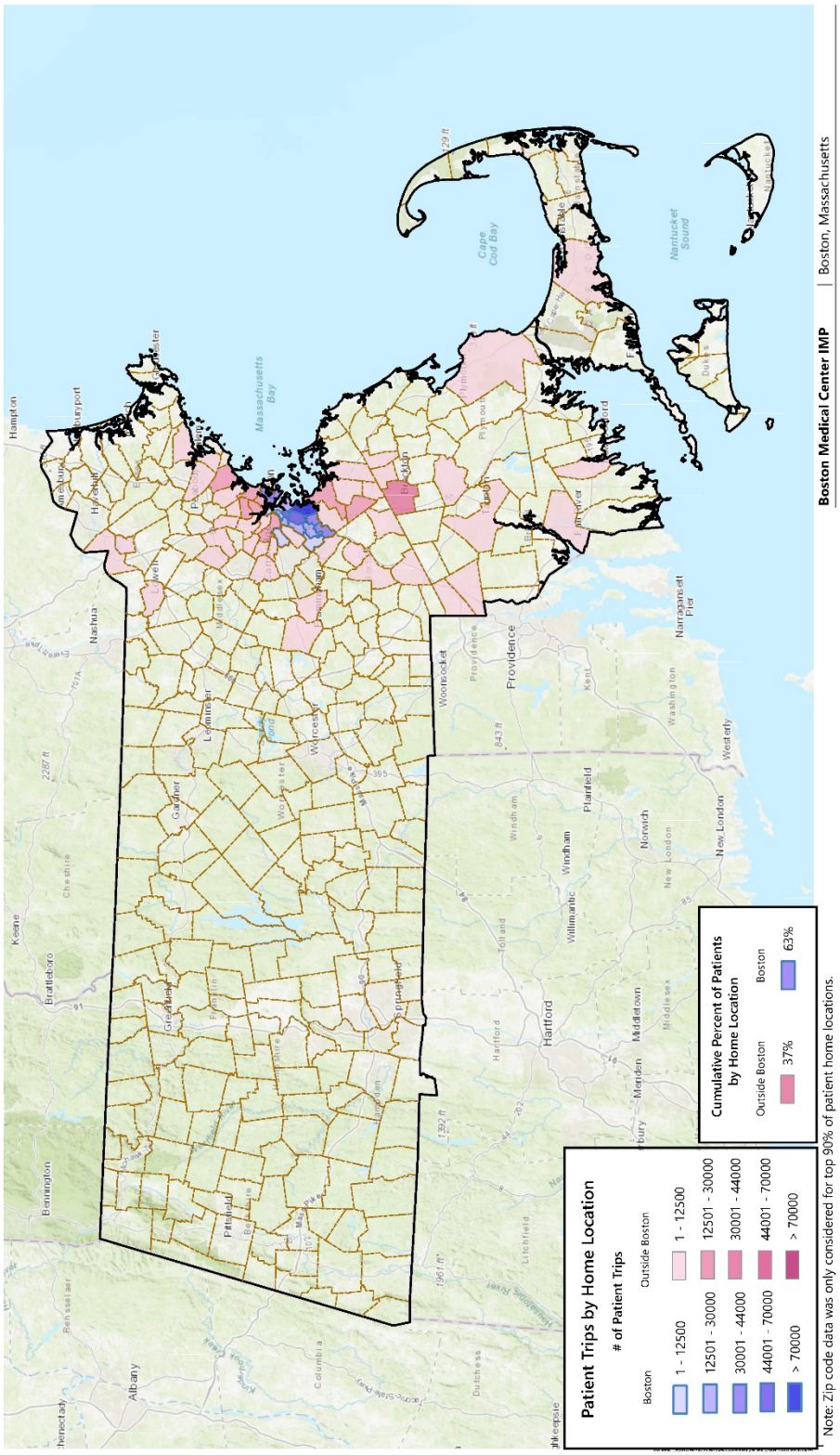


Figure 6-20 Regional Trip Distribution

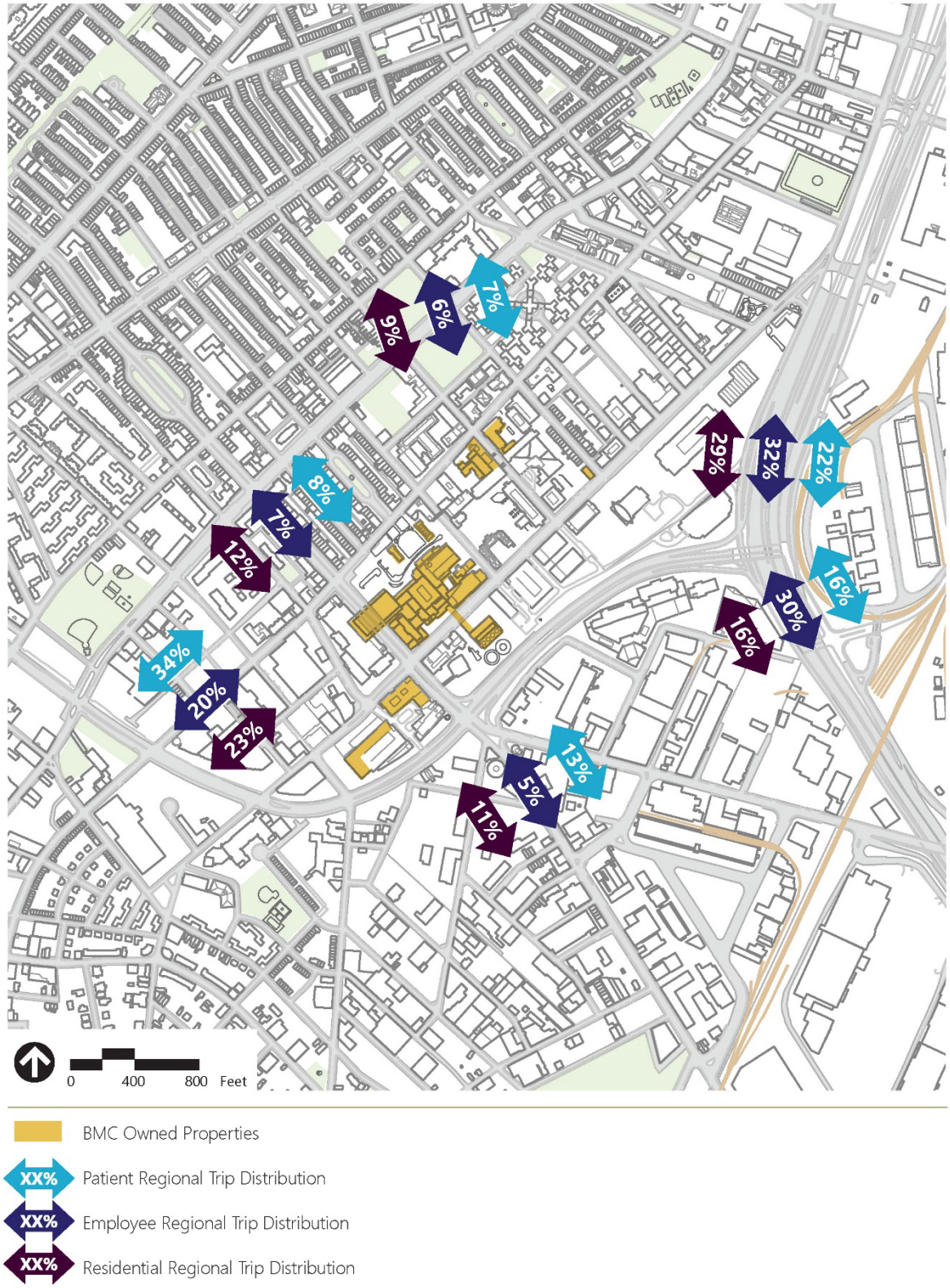


Table 6-10 Regional Trip Distribution

Travel Route	Direction	Employee Trips	Patient Trips	Residential Trips
Massachusetts Avenue	North	7%	8%	12%
Massachusetts Avenue	South	5%	13%	11%
I-93	North	32%	22%	29%
I-93	South	30%	16%	16%
South End Local Street [1]	North	6%	7%	9%
Harrison Avenue / Albany Street	West	20%	34%	23%
Total		100%	100%	100%

1 – South End local street include East Springfield Street, East Concord Street, East Newton Street, and Harrison Avenue
Source: Based on zip code data provided by BMC and Access Boston data from BTD

Trips to and from I-93 are expected to approach and depart the BMC campus from Massachusetts Avenue Connector, the new Biosquare Drive connection to the I-93 Southbound frontage road, or Albany Street north of the campus, depending on the internal destination of each trip. Based on the configuration of the local roadway network and the access points to/from I-93, The majority of trips entering the campus from I-93 are expected to use Massachusetts Avenue Connector while the majority of trips exiting the campus to I-93 are expected to use the new Biosquare Drive connection.

Once in the study area, trips were routed to their final destinations internal to the BMC campus based on the existing parking supply and the existing traffic volumes. For example, employee trips were routed to parking areas based on the number of designated employee parking spaces in each parking area and patients were routed to either patient-designated parking spaces or the pick-up/drop-off areas based on the total number of patient parking spaces and the percent of traffic that uses each facility under existing conditions.

As stated previously, the lease on the Doctor's Office Building garage is expected to expire in the term of the IMP, so no trips were routed to that garage. In addition, as part of the proposed 10 Stoughton Street project, approximately 72 underground parking spaces will be added below the new building. These parking spaces are expected to be used by employees of BMC and by residents of the proposed housing in the Collamore/Old Evans buildings and is not expected to be open to patients. Therefore, all residential trips and a small amount of employee trips were routed to this new parking area.

The internal trip distributions for the employees, patients, and residents are summarized in **Table 6-11** and are illustrated in figures included in the **Appendix D** to this report.

Table 6-11 Internal Trip Distribution Destinations/Origins

BMC Destination/Origin	Employee Trips	Patient Trips	Residential Trips
10 Stoughton Street [1]	5%	-	100%
610 Albany Street Garage	70%	-	-
Northampton Garage	15%	-	-
Crosstown Garage	10%	15%	-
710 Albany Street Garage	-	40%	-
BMC Place [2]	-	30%	-
Shapiro Drive [3]	-	15%	-
Total	100%	100%	100%

Source: Based on number of designated parking spaces for employees and patients in each parking area and the percent of existing traffic that uses BMC Place and Shapiro Drive.
1 – Proposed new 72 parking spaces to be located under 10 Stoughton Street. Assumed all residential parking will be located here with the remainder of the spaces to be used by employees.
2 – Trips routed to/from BMC Place include patients for pick-up/drop-off and patients for valet parking.
3 – Trips routed to/from Shapiro Drive include patients for pick-up/drop-off and patients for valet parking.

6.4.5 2031 Build Condition Peak Hour Traffic Volumes

The project-related traffic volumes for the 2031 Build Condition are assigned to the study area roadway network based on the trip distribution patterns shown in **Tables 6-10 and 6-11**. The specific routing to/from each parking area and pick-up/drop-off location is based on the regional distribution and the efficiency of the local roadway network. The assigned volumes are then added to the 2031 No Build peak hour traffic volume networks to develop the 2031 Build Condition weekday morning and weekday evening peak hour traffic volume networks. The site-generated traffic volume networks for the weekday morning and weekday evening peak hours are presented in **Figures 6-21 and 6-22**, respectively, and the 2031 Build Condition traffic volume networks for the weekday morning and weekday evening peak hours are shown in **Figures 6-23 and 6-24**, respectively.

Figure 6-21 Weekday Morning Peak Hour Site-Generated Traffic Volumes

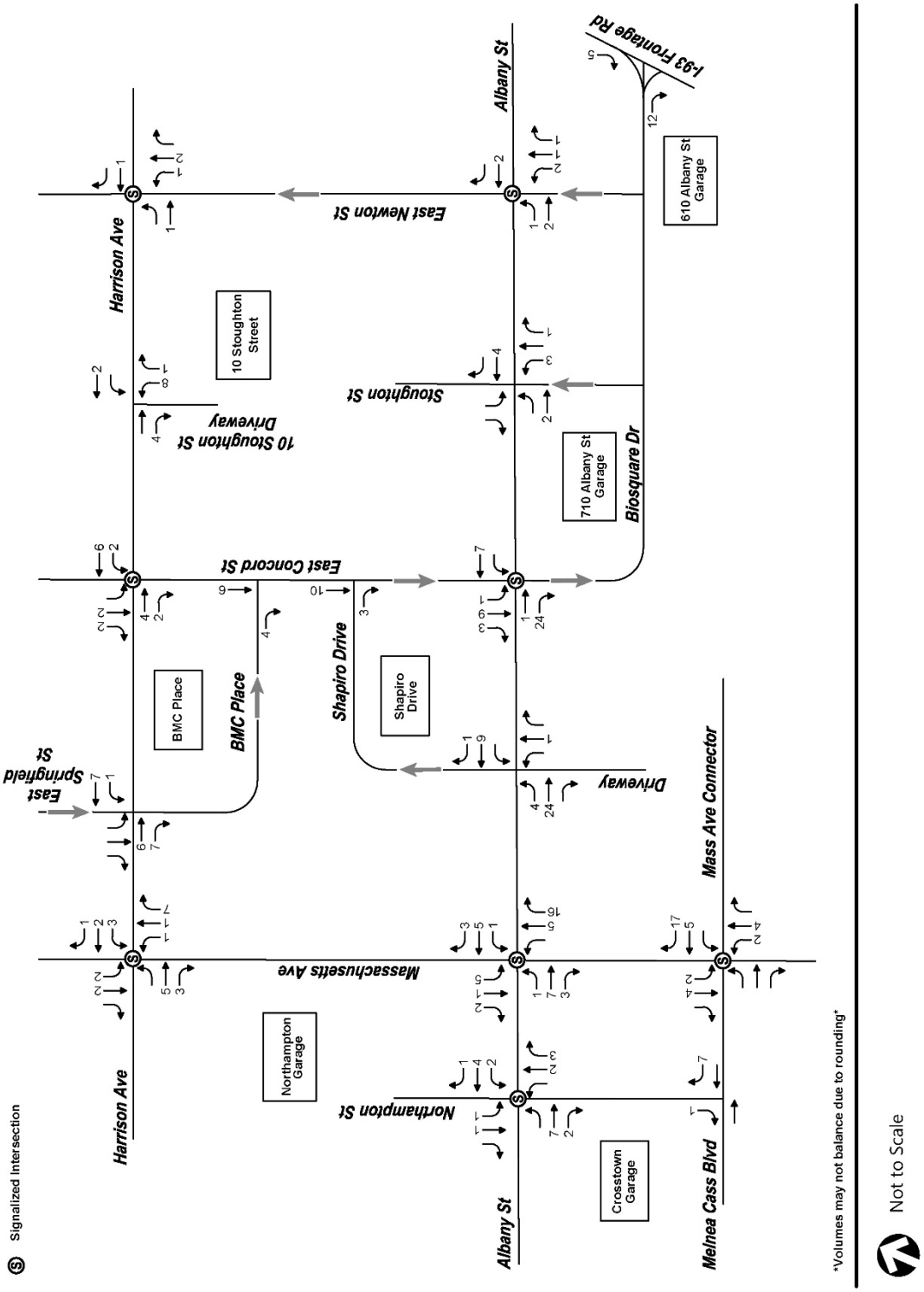


Figure 6-22 Weekday Evening Peak Hour Site-Generated Traffic Volumes

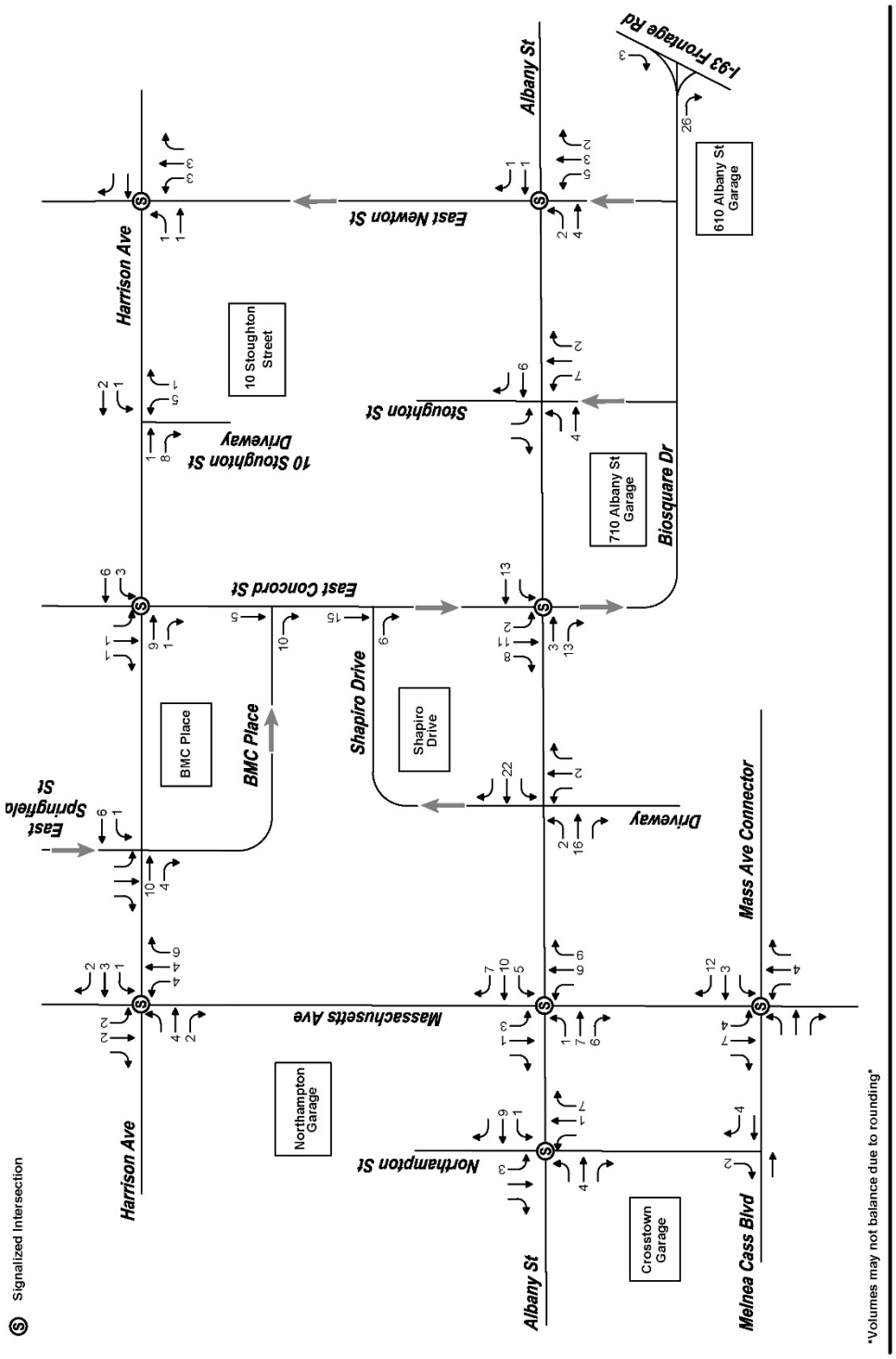


Figure 6-23 2031 Build Conditions Weekday Morning Peak Hour Traffic Volumes

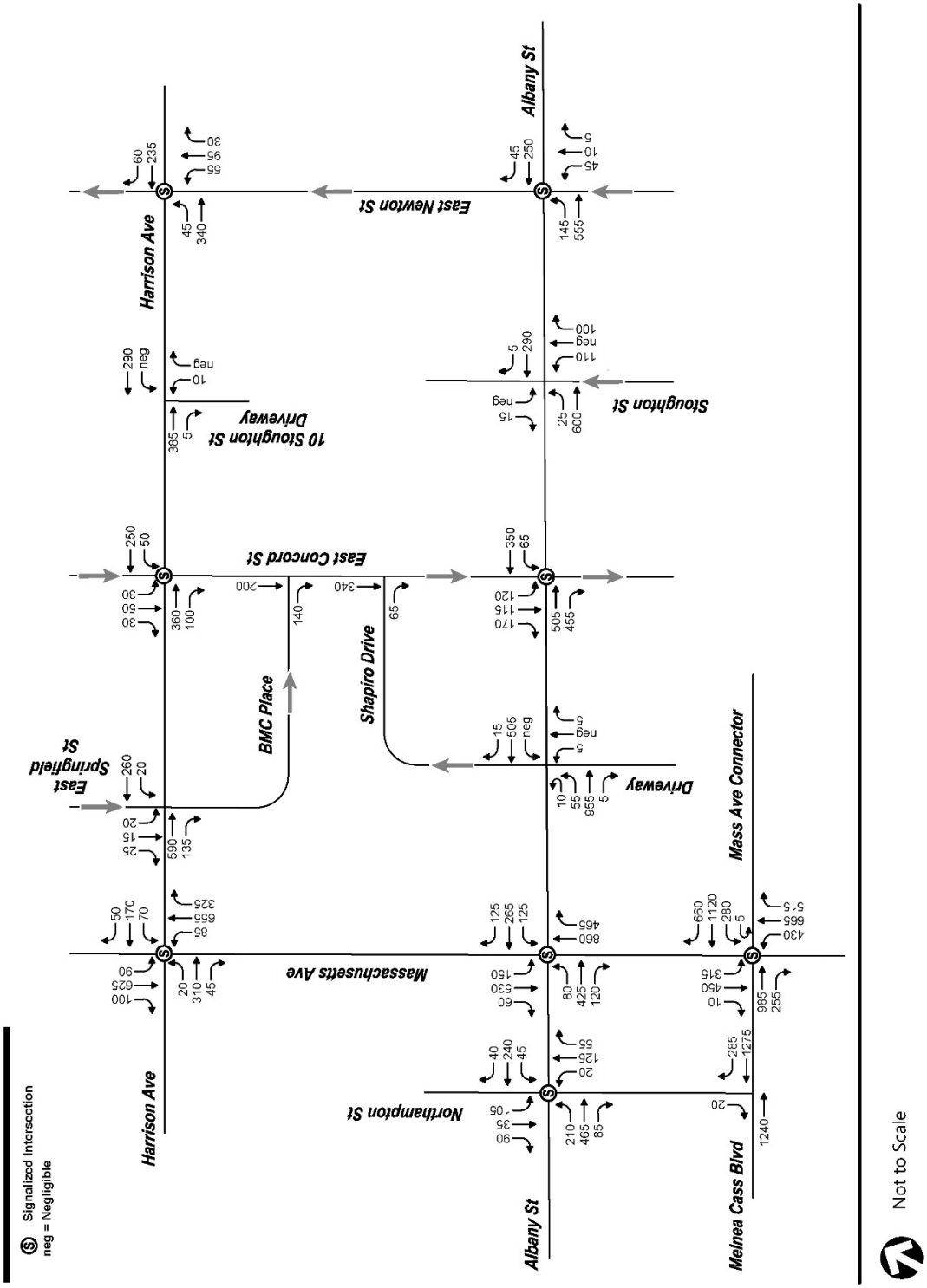
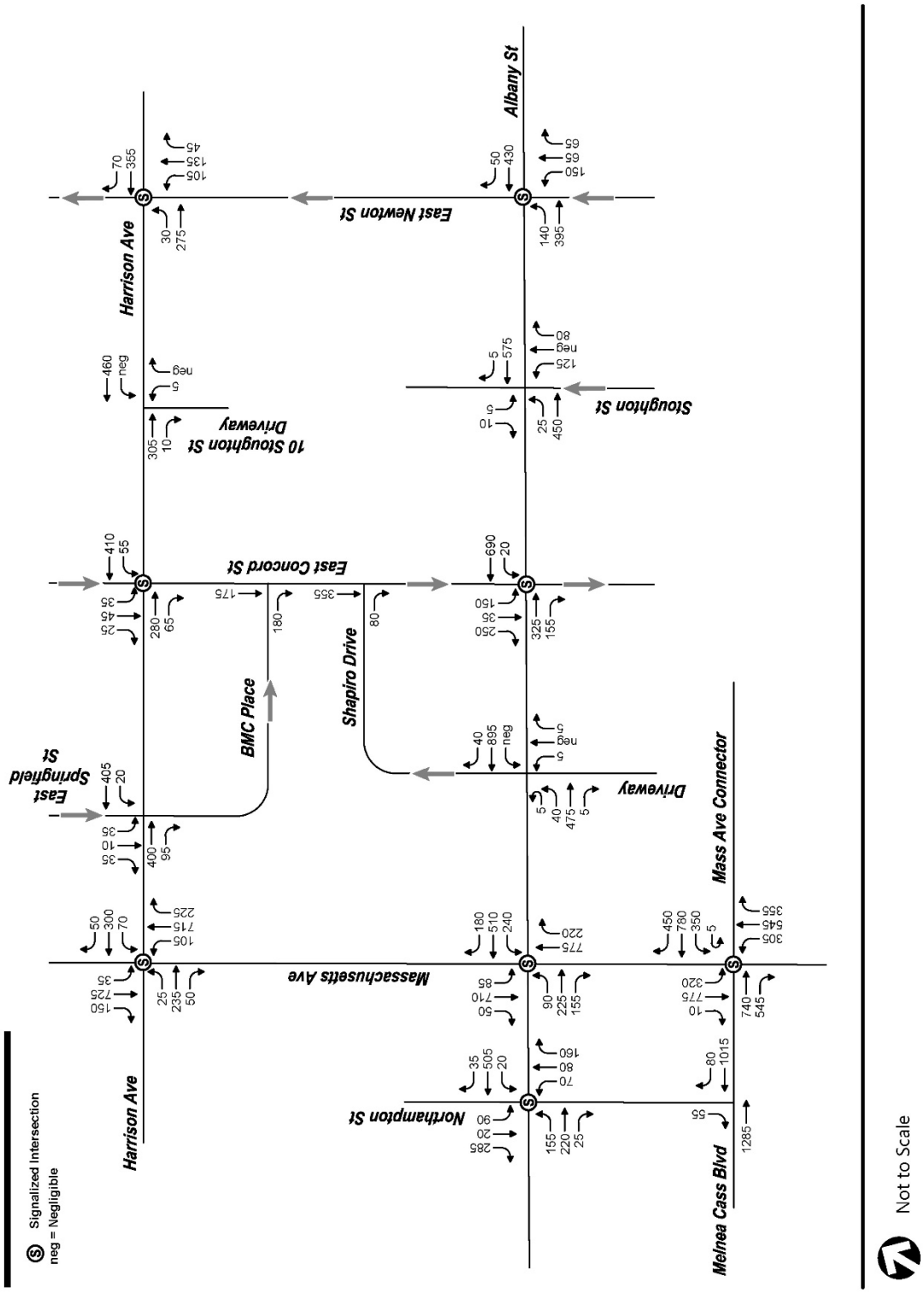


Figure 6-24 2031 Build Conditions Weekday Evening Peak Hour Traffic Volumes



6.5 Transportation Operations Analyses

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic flow within the study area. To assess quality flow, intersection and transit capacity analyses were conducted with respect to the 2021 Existing Conditions, 2031 No Build Conditions, and 2031 Build Conditions. Intersection capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them while transit capacity analyses indicate how well the transit facilities serve the passenger demands placed upon them.

6.5.1 Intersection Capacity Analyses

The evaluation criteria used to analyze area intersections in this traffic study are based on the Highway Capacity Manual 6.0 (HCM)[4]. The term 'Level of Service' (LOS) is used to denote the different operating conditions that occur on a given roadway segment under various traffic volume loads. It is a qualitative measure that considers several factors including roadway geometry, speed, travel delay and freedom to maneuver. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

In addition to LOS, two other measures of effectiveness are typically used to quantify the traffic operations at intersections; volume-to-capacity ratio (v/c) and delay (expressed in seconds per vehicle). For example, an existing v/c ratio of 0.90 for an intersection indicates that the intersection is operating at 90 percent of its available capacity. A delay of 15 seconds for a particular vehicular movement or approach indicates that vehicles on the movement or approach will experience an average additional travel time of 15 seconds. For a given LOS letter designation there may be a wide range of values for both v/c ratios and delay. Comparison of intersection capacity results therefore requires that, in addition to the LOS, the other measures of effectiveness should also be considered.

The LOS designations, which are based on delay, are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, however, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus, the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or site driveway.

Table 6-12 below presents the LOS delay threshold criteria as defined in the Highway Capacity Manual. A LOS D is typically considered acceptable in an urban environment.

[4] Transportation Research Board, Highway Capacity Manual, 6th Edition, Washington D.C, 2016

Table 6-12 Level of Service Criteria

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

Source: HCM 6.0

It should be noted that the analytical methodologies typically used for the analysis of unsignalized intersections use conservative analysis parameters, such as long critical gaps. Actual field observations indicate that drivers on minor streets generally accept shorter gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. The analysis methodologies also do not fully take into account the beneficial grouping effects caused by nearby signalized intersections. The net effect of these analysis procedures is the over-estimation of calculated delays at unsignalized intersections in the study area. Cautious judgment should therefore be exercised when interpreting the capacity analysis results at unsignalized intersections.

6.5.1.1 Signalized Intersection Capacity Analysis

Capacity analyses were conducted for the signalized study area intersections. Consistent with BTD's guidelines, Synchro 10 software was used to model LOS operations at the signalized study area intersections. **Table 6-8** summarizes the results for the 2021 Existing, 2031 No-Build, and 2031 Build Conditions. All capacity analysis worksheets are included in the **Appendix D**. For reference, it should be noted that in all capacity analysis tables Albany Street and Harrison Avenue are referenced as running east-west while Northampton Street, Massachusetts Avenue, East Concord Street, and East Newton Street are referenced as running north-south.

Table 6-13 Signalized Intersection Capacity Analysis Summary

Location / Movement	2021 Existing Conditions					2031 No-Build Conditions					2031 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Albany Street at Northampton Street															
Weekday Morning															
EB L/T/R	0.59	23	C	182	250	0.73	29	C	236	300	0.73	29	C	238	302
WB L/T/R	0.54	33	C	110	158	0.74	45	D	121	#178	0.80	50	D	126	#207
NB L/T	0.51	65	E	134	m164	0.42	63	E	129	m152	0.42	63	E	129	m151
NB R	0.14	8	A	1	m3	0.12	7	A	1	m2	0.14	8	A	1	m3
SB L/T/R	0.92	82	F	135	#252	0.96	89	F	174	#338	0.96	89	F	174	#338
Overall		38	D				44	D				45	D		
Weekday Evening															
EB L/T/R	0.50	26	C	110	142	0.53	26	C	113	154	0.54	27	C	115	156
WB L/T/R	0.62	30	C	163	197	0.71	29	C	193	268	0.72	30	C	195	274
NB L/T	0.72	58	E	111	m#220	0.64	50	D	106	m187	0.64	49	D	105	m186
NB R	0.33	12	B	20	m69	0.33	12	B	20	m67	0.34	12	B	22	m71
SB L/T/R	1.14	118	F	~371	#439	1.01	79	E	~263	#481	1.03	86	F	~293	#498
Overall		55	D				41	D				42	D		
Albany Street at Massachusetts Avenue															
Weekday Morning															
EB L/T	0.63	29	C	156	195	0.77	30	C	214	m242	0.78	30	C	216	m244
EB R	0.33	7	A	37	m56	0.30	5	A	27	m30	0.31	5	A	29	m32
WB L	1.13	>120	F	~122	m#237	1.14	>120	F	~125	#261	1.14	>120	F	~124	#262
WB T/R	0.29	14	B	55	92	0.33	11	B	57	94	0.34	11	B	57	97
NB T	0.70	30	C	320	396	0.70	29	C	331	m390	0.71	30	C	334	m392
NB R	0.73	16	B	127	m274	0.88	28	C	242	m#234	0.91	31	C	254	m#269
SB L	0.32	21	C	13	m51	0.71	50	D	75	m#166	0.73	51	D	78	m#142
SB T/R	0.28	11	B	44	80	0.27	12	B	32	m83	0.27	12	B	32	m82
Overall		27	C				30	C				30	C		
Weekday Evening															
EB L/T	0.52	29	C	74	m98	0.61	30	C	82	m125	0.63	31	C	86	m139
EB R	0.42	7	A	18	m49	0.38	6	A	13	m43	0.39	6	A	15	m47
WB L	0.78	73	E	126	221	0.87	80	E	165	m#327	0.89	82	F	172	m#332
WB T/R	0.34	11	B	44	89	0.47	11	B	67	122	0.48	11	B	70	125
NB T	0.76	34	C	282	370	0.83	37	D	300	395	0.83	38	D	302	398
NB R	0.30	6	A	51	68	0.38	8	A	78	107	0.40	9	A	86	121
SB L	0.21	13	B	8	m14	0.43	37	D	28	m50	0.46	40	D	32	m55
SB T/R	0.39	9	A	53	81	0.40	9	A	50	m82	0.40	9	A	50	m83
Overall		22	C				24	C				25	C		

a Volume to capacity ratio.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
f Improvements from Existing Conditions to No Build Conditions due to using a universal PHF of 0.92 under all future conditions, as outlined in MassDOT TIA guidelines
~ Volume exceeds capacity, queue is theoretically infinite
# 95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.

Location / Movement	2021 Existing Conditions					2031 No-Build Conditions					2031 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Albany Street at East Concord Street															
Weekday Morning															
EB T	0.47	24	C	157	245	0.79	37	D	339	m#445	0.79	36	D	340	m442
EB R	0.46	4	A	16	38	0.50	5	A	17	m57	0.52	5	A	19	m55
WB L	0.23	6	A	17	27	0.18	7	A	13	m25	0.18	7	A	13	m25
WB T	0.29	6	A	46	62	0.36	8	A	75	102	0.37	8	A	77	105
SB L	0.71	71	E	100	164	0.70	72	E	98	163	0.70	72	E	98	163
SB T	0.56	61	E	85	145	0.56	61	E	85	143	0.62	64	E	94	155
SB R	0.56	14	B	0	67	0.56	14	B	0	67	0.57	14	B	0	68
Overall		20	B				24	C				24	C		
Weekday Evening															
EB T	0.52	30	C	158	256	0.58	36	D	186	288	0.59	37	D	195	298
EB R	0.06	0	A	0	m1	0.23	9	A	10	57	0.25	9	A	11	62
WB L	0.04	10	A	5	m11	0.04	8	A	5	m8	0.04	8	A	5	m8
WB T	0.49	13	B	131	m177	0.72	19	B	185	m201	0.73	20	B	195	m211
SB L	0.72	66	E	126	189	0.71	66	E	123	185	0.71	66	E	123	185
SB T	0.11	44	D	19	45	0.11	44	D	19	44	0.15	45	D	27	56
SB R	0.61	11	B	0	74	0.61	12	B	0	73	0.62	12	B	0	75
Overall		24	C				25	C				26	C		
Albany Street at East Newton Street															
Weekday Morning															
EB L	0.38	16	B	50	68	0.35	21	C	58	m92	0.35	21	C	58	m92
EB T	0.59	20	B	285	304	0.60	26	C	316	428	0.60	26	C	315	428
WB T/R	0.57	40	D	217	323	0.56	39	D	212	317	0.57	40	D	217	323
NB L/T	0.05	41	D	7	16	0.27	46	D	40	82	0.27	46	D	40	82
NB R	0.03	0	A	0	0	0.01	0	A	0	0	0.02	0	A	0	0
Overall		25	C				30	C				30	C		
Weekday Evening															
EB L	0.33	23	C	50	99	0.44	33	C	73	139	0.44	34	C	73	142
EB T	0.46	25	C	202	372	0.45	27	C	205	372	0.46	28	C	219	378
WB T/R	0.81	55	D	279	#477	1.05	97	F	~461	#777	1.07	104	F	~476	#777
NB L/T	0.54	52	D	118	181	0.70	58	E	162	239	0.72	59	E	171	248
NB R	0.69	16	B	0	80	0.28	4	A	0	9	0.28	4	A	0	9
Overall		35	C				58	E				61	E		
Harrison Avenue at Massachusetts Avenue															
Weekday Morning															
EB L/T/R	0.69	45	D	236	331	0.78	51	D	277	#441	0.81	53	D	288	#464
WB L/T/R	0.66	46	D	153	249	0.97	84	F	231	#428	1.03	101	F	~254	#452
NB L	0.31	9	A	12	m19	0.33	9	A	14	m19	0.33	9	A	14	m19
NB T/R	0.87	17	B	78	#90	0.90	20	B	86	#113	0.91	21	C	87	#121
SB L	0.38	31	C	32	59	0.46	37	D	38	66	0.47	38	D	38	66
SB T/R	0.58	29	C	220	283	0.63	31	C	247	315	0.63	31	C	247	315
Overall		27	C				35	C				38	D		
Weekday Evening															
EB L/T/R	0.62	40	D	193	279	0.67	43	D	217	331	0.68	44	D	221	338
WB L/T/R	0.76	50	D	220	#357	1.09	108	F	~387	#609	1.11	116	F	~397	#624
NB L	0.43	20	B	21	m39	0.48	22	C	24	m40	0.51	22	C	26	m41
NB T/R	0.76	41	D	251	317	0.84	45	D	291	360	0.85	46	D	296	365
SB L	0.15	21	C	13	31	0.19	24	C	15	33	0.19	24	C	15	33
SB T/R	0.75	36	D	320	403	0.76	36	D	323	406	0.77	36	D	326	410
Overall		39	D				51	D				52	D		

a Volume to capacity ratio.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
~ Volume exceeds capacity, queue is theoretically infinite.
# 95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.

Location / Movement	2021 Existing Conditions					2031 No-Build Conditions					2031 Build Conditions				
	v/c [a]	Del [b]	LOS [c]	50 Q [d]	95 Q [e]	v/c	Del	LOS	50 Q	95 Q	v/c	Del	LOS	50 Q	95 Q
Harrison Avenue at East Concord Street															
Weekday Morning															
EB T/R	0.48	14	B	110	183	0.59	17	B	157	252	0.59	17	B	159	255
WB L/T	0.36	6	A	38	54	0.42	5	A	33	48	0.46	5	A	36	52
SB L/T/R	0.38	33	C	48	83	0.40	32	C	47	100	0.40	32	C	47	100
Overall		14	B				15	B				15	B		
Weekday Evening															
EB T/R	0.35	12	B	72	125	0.43	13	B	100	166	0.45	14	B	104	172
WB L/T	0.52	6	A	50	47	0.61	6	A	50	m78	0.63	7	A	53	m86
SB L/T/R	0.37	33	C	41	89	0.43	35	D	47	#114	0.43	35	D	47	#114
Overall		11	B				12	B				13	B		
Harrison Avenue at East Newton Street															
Weekday Morning															
EB L/T	0.56	19	B	67	121	0.73	25	C	89	#187	0.73	25	C	90	#187
WB T/R	0.43	21	C	85	150	0.55	24	C	119	198	0.55	24	C	119	198
NB L/T/R	0.38	24	C	74	130	0.38	24	C	75	136	0.38	24	C	75	136
Overall		21	C				25	C				25	C		
Weekday Evening															
EB L/T	0.45	14	B	55	80	0.69	20	B	64	92	0.69	20	B	64	92
WB T/R	0.63	26	C	145	233	0.78	34	C	197	#347	0.78	34	C	197	#347
NB L/T/R	0.55	28	C	121	189	0.57	29	C	127	214	0.59	30	C	133	#230
Overall		24	C				28	C				28	C		
Massachusetts Avenue at Melnea Cass Boulevard / Massachusetts Avenue Connector															
Weekday Morning															
EB T	0.99	69	E	404	#551	1.07	90	F	~483	#617	1.07	90	F	~483	#617
EB R	0.41	14	B	66	128	0.44	15	B	77	142	0.44	15	B	77	142
WB L	0.85	75	E	115	#189	0.90	82	F	124	#207	0.90	82	F	124	#207
WB T	0.72	29	C	362	445	0.76	30	C	398	487	0.77	31	C	401	491
WB R	0.76	20	B	289	426	0.78	21	C	303	447	0.80	22	C	316	468
NB L	1.19	>120	F	~214	#320	>1.20	>120	F	~230	#338	>1.20	>120	F	~230	#338
NB T	0.79	52	D	234	303	0.93	67	E	287	#403	0.94	69	E	290	#409
NB R	>1.20	>120	F	~379	#601	>1.20	>120	F	~420	#643	>1.20	>120	F	~420	#643
SB L	0.95	82	F	146	m#217	0.94	80	F	144	m#213	0.94	80	F	144	m#214
SB T/R	0.62	44	D	153	m177	0.67	45	D	172	m186	0.67	45	D	174	m188
Overall		66	E				75	E				75	E		
Weekday Evening															
EB T	0.88	56	E	291	365	0.91	58	E	313	#415	0.91	58	E	313	#415
EB R	0.89	42	D	276	#444	0.93	47	D	304	#554	0.93	47	D	304	#554
WB L	0.99	97	F	149	#250	1.03	107	F	~164	#265	1.03	107	F	~164	#265
WB T	0.54	27	C	232	288	0.55	26	C	243	304	0.55	26	C	245	306
WB R	0.51	13	B	147	211	0.53	13	B	157	231	0.54	14	B	163	239
NB L	0.78	65	E	125	175	0.79	66	E	129	180	0.79	66	E	129	180
NB T	0.58	42	D	194	258	0.67	45	D	222	287	0.68	46	D	224	290
NB R	0.77	25	C	85	#262	0.81	29	C	99	#282	0.81	29	C	100	#283
SB L	0.78	62	E	131	176	0.81	62	E	142	m186	0.82	63	E	145	m186
SB T/R	0.89	64	E	304	#461	0.95	73	E	~381	#474	0.96	73	E	~385	m#475
Overall		48	D				51	D				51	D		

a Volume to capacity ratio.
b Average total delay, in seconds per vehicle.
c Level-of-service.
d 50th percentile queue, in feet.
e 95th percentile queue, in feet.
~ Volume exceeds capacity, queue is theoretically infinite.
# 95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.

As shown in **Table 6-13**, the project-generated trips are expected to have minimal impacts on the operations of the signalized study area intersections. While some of the overall intersections and specific intersection movements already operate at challenging conditions at LOS E or F without the IMP Projects,

the addition of the IMP Project-generated trips is not expected to significantly change these operations. It should be noted that no signalized intersection is expected to experience an increase in overall delay of more than three seconds due to the addition of the IMP-generated trips.

Only one intersection (the intersection of Harrison Avenue at Massachusetts Avenue) is expected to see an overall drop in level of service between the 2031 No Build and the 2031 Build Conditions (from LOS C to LOS D during the weekday morning peak hour), and that is due to the intersection under the 2031 No Build Conditions being on the upper threshold of the LOS C range. The increase in overall delay between the 2031 No Build Conditions and the 2031 Build Conditions is only three seconds, from 35 seconds to 38 seconds.

As stated previously, it is expected that the actual impacts due to the project-generated trips will be less than what is stated above. This is due to the conservative mode share that was used for patients of BMC, the fact that not all of the proposed buildings will generate new uses, and the fact that no additional parking will be added to the BMC campus. Therefore, the results of the 2031 Build Conditions should be considered as a conservative “worst-case” scenario.

6.5.1.2 Unsignalized Intersection Capacity Analysis

Capacity analyses were also conducted for the unsignalized study area intersections and the intersection of Harrison Avenue at the driveway for the proposed parking area at 10 Stoughton Street. Consistent with BTD’s guidelines, Synchro 10 software was used to model LOS operations at the unsignalized study area intersections. **Table 6-14** summarizes the results for the 2021 Existing, 2031 No-Build, and 2031 Build Conditions. All capacity analysis worksheets are included in the **Appendix D**. For reference, it should be noted that in all capacity analysis tables Albany Street and Harrison Avenue are referenced as running east-west while Northampton Street, Massachusetts Avenue, East Concord Street, and East Newton Street are referenced as running north-south.

Table 6-14 Unsignalized Intersection Capacity Analysis Summary

Location / Movement	2021 Existing Conditions					2031 No-Build Conditions					2031 Build Conditions				
	D [a]	v/c [b]	Del [c]	LOS [d]	95 Q [e]	D	v/c	Del	LOS	95 Q	D	v/c	Del	LOS	95 Q
Albany Street at Power Plant Driveway/Shapiro Drive															
Weekday Morning															
EB L	50	0.09	10	B	8	50	0.09	11	B	8	55	0.10	11	B	8
WB L	1	0.00	15	B	0	1	0.00	18	C	0	1	0.00	19	C	0
NB L/T/R	10	0.12	43	E	10	10	0.16	66	F	13	11	0.18	73	F	15
Weekday Evening															
EB L	40	0.08	12	B	8	40	0.10	13	B	8	40	0.11	14	B	8
WB L	3	0.00	8	A	0	3	0.00	9	A	0	3	0.00	9	A	0
NB L/T/R	10	0.05	17	C	3	10	0.05	22	C	3	12	0.06	23	C	5
Albany Street at Stoughton Street															
Weekday Morning															
EB L	25	0.03	10	A	3	25	0.03	10	A	3	25	0.03	10	A	3
NB L	80	0.59	38	E	85	105	0.65	56	F	93	110	0.68	61	F	103
NB T/R	170	0.80	43	E	173	100	0.37	25	C	43	100	0.37	25	C	43
SB L/R	17	0.30	54	F	30	17	0.10	26	D	8	17	0.10	26	D	8
Weekday Evening															
EB L	25	0.04	11	B	3	25	0.05	12	B	5	25	0.05	12	B	5
NB L	95	0.50	38	E	63	115	0.82	89	F	133	125	0.90	107	F	158
NB T/R	107	0.36	22	C	40	82	0.29	21	C	28	82	0.29	21	C	30
SB L/R	15	0.29	60	F	28	15	0.22	68	F	20	15	0.23	70	F	20
Harrison Avenue at BMC Place/East Springfield Street															
Weekday Morning															
WB L	20	0.03	10	A	3	20	0.03	10	A	3	20	0.03	10	B	3
SB L/T/R	60	0.20	15	C	18	60	0.18	17	C	18	60	0.19	18	C	18
Weekday Evening															
WB L	20	0.02	9	A	3	20	0.02	9	A	3	20	0.02	9	A	3
SB L/T/R	80	0.24	16	C	23	80	0.25	19	C	25	80	0.25	19	C	25
East Concord Street at BMC Place															
Weekday Morning															
EB R	135	0.31	15	C	33	135	0.28	15	C	30	140	0.30	15	C	30
Weekday Evening															
EB R	165	0.38	18	C	45	165	0.39	18	C	45	175	0.42	18	C	50
East Concord Street at Shapiro Drive															
Weekday Morning															
EB R	60	0.09	10	B	8	60	0.08	10	B	8	65	0.09	10	B	8
Weekday Evening															
EB R	75	0.13	10	B	13	75	0.10	10	B	8	80	0.11	10	B	10
Melnea Cass Boulevard at Northampton Street															
Weekday Morning															
SB R	20	0.12	18	C	10	20	0.07	17	C	5	20	0.07	17	C	5
Weekday Evening															
SB R	55	0.19	15	C	18	55	0.14	15	C	13	55	0.14	15	C	13

a Demand.
b Volume to capacity ratio.
c Average total delay, in seconds per vehicle.
d Level-of-service.
e 95th percentile queue, in feet.

Location / Movement	2021 Existing Conditions					2031 No-Build Conditions					2031 Build Conditions				
	D [a]	v/c [b]	Del [c]	LOS [d]	95 Q [e]	D	v/c	Del	LOS	95 Q	D	v/c	Del	LOS	95 Q
Harrison Avenue at 10 Stoughton Street Driveway															
Weekday Morning															
WB L	*10 Stoughton Street Parking Garage Does Not Exist Under Existing Conditions*					*10 Stoughton Street Parking Garage Does Not Exist Under No Build Conditions*					neg	0.00	0	A	0
NB L/R											11	0.04	17	C	3
Weekday Evening															
WB L											1	0.00	9	A	0
NB L/R											6	0.03	19	C	3

a Demand.
b Volume to capacity ratio.
c Average total delay, in seconds per vehicle.
d Level-of-service.
e 95th percentile queue, in feet.

As shown in **Table 6-14**, the addition of the IMP projects is expected to have minimal impacts on the operations of the unsignalized study area intersections. None of the movements at any of the intersections are expected to degrade in level of service between the 2031 No Build and the 2031 Build Conditions, except for the westbound left movement at Harrison Avenue at BMC Place / East Springfield Street which is expected to degrade from LOS A to LOS B during the weekday morning peak hour. In addition, no queue is expected to increase by more than one vehicle length.

The driveway serving the proposed parking area at 10 Stoughton Street from Harrison Avenue is expected to operate at acceptable conditions, with the driveway stop-approach operating at LOS C and queues of less than one vehicle length during the weekday morning and weekday evening peak hours.

6.5.2 Public Transportation Operations

As shown in **Table 6-15**, the proposed IMP projects are expected to generate approximately 133 and 155 new transit trips during the weekday morning and weekday evening peak hours, respectively. **Table 6-15** shows a breakdown of the transit trip increase by user type. Approximately 70-percent of the estimated increase in transit usage during the peak hours is related to employees' trips and the remaining 30-percent is due to estimated growth in patients/visitors and the proposed residential units on-site.

Table 6-15 Estimated Increase in Transit Trips (Passenger Boardings)

Time Period	Employees Trips	Patient/Visitor Trips	Residential Trips	Total Transit Trips
Weekday Daily				
Entering	372	94	129	**595**
Exiting	372	94	129	**595**
Total	744	188	258	**1,190**
Weekday Morning Peak Hour				
Entering	64	16	4	**84**
Exiting	30	7	12	**49**
Total	94	23	16	**133**
Weekday Evening Peak Hour				
Entering	35	9	13	**57**
Exiting	72	18	8	**98**
Total	107	27	21	**155**

Table 6-4 listed existing MBTA bus and Silver Line service with stops either directly on the BMC campus (MBTA bus routes CT3, 1, 8, 10, 47, and 171) or at nearby intersections along Washington Street (Bus Route 170 and Silver Lines SL4 and SL5), which is located up to a half-mile north of the campus. **Figure 6-8** shows the bus routes and stops on study areas streets adjacent to BMC occupied buildings. Commuter rail lines including the Fairmont, Franklin, Needham, and Providence-Stoughton lines are also located within 0.8 miles from the BMC campus, which can be accessed either by walk or by some of the bus lines noted above).

To provide a conservative analysis on the bus services that directly serve the BMC campus, the analyses presented below focus on the bus routes that travel through the study area and have stops located on or next to the campus (MBTA bus routes CT3, 1, 8, 10, 47, and 171). While some employees, patients/visitors, and residents may also use the Silver Line or nearby rail service, it is assumed that most transit riders will utilize the routes that have stops on or next to the BMC campus without needing to walk an additional 10-20 minutes to access the Silver Line or rail service.

The local buses serving these routes near the campus each have a seated capacity of 38 passengers. Utilizing the vehicle load standard specified by MBTA Service Delivery Policy,[5] they have an average policy capacity (hereafter referred to as the recommended passenger crowding threshold) equal to 53 passengers during the peak periods and equal to 47 passengers during off-peak periods.[6] The MBTA Service Delivery Policy defines a passenger comfort standard for the percent of passenger travel time experienced in comfortable conditions. According to the policy, the minimum passenger comfort standard is 92 percent of travel time per bus passenger while the target is 96 percent of travel time per bus passenger.[7]

For purposes of this analysis, the recommended passenger crowding threshold was compared against the maximum load (the maximum number of people on the bus at any given point along the route) to determine which trips would operate over capacity.[8] Project-generated transit trips are distributed to each of the bus routes that serve the BMC directly, which accounts for riders transferring to local buses from the connecting rapid transit and commuter rail stations.

6.5.2.1 Existing Conditions – MBTA Buses

Table 6-16 summarizes the existing conditions by route, including an assessment of each full-service bus route's passenger comfort metric and existing trip-level crowding. In addition, charts illustrating the Existing passenger loads at the peak load point on each route by trip relative to the passenger crowding threshold are provided in the **Appendix D** to this report.

Table 6-16: Route-Level Summary of Passenger Comfort and Crowding

Route	Passenger Comfort Metric [a]	Daily Trips serving Project Site	Trips in Excess of Crowding Threshold [b]	Total Passengers in Excess of Crowding Threshold [b]
Route CT3	94.7%	59	0	0
Route 1	90.3%	258	0	0
Route 8	98.0%	79	0	0
Route 10	99.3%	81	0	0

[5] MBTA, *Service Delivery Policy, 2017 Update*, Approved January 23, 2017.

[6] MBTA, Average Fleet Seating – CY2017. Note that the capacities displayed are rounded down to the nearest whole number and maximum loads displayed are rounded to the nearest whole number.

[7] MBTA, *Service Delivery Policy, 2017 Update*, Approved January 23, 2017.

[8] Route 171 operates two trips on each day of service solely in the outbound direction – from Nubian Square to Logan Airport. These trips leave Nubian Square at 3:50 AM and 4:20 AM. As a supplemental route, Route 171 is not subject to any Span of Service or Frequency Standards within the MBTA's 2017 Service Delivery Policy, and thus, is not evaluated for bus passenger crowding.

Route 47	90.0%	110	0	0
Total	**-**	**587**	**0**	**0**

a – Source: MBTA Service Delivery Policy Comfort Metric, Fall 2018, as reported in each of the route's Better Bus Profile documents
included in the Appendix to this report.
b – Source: VHB calculations based on MBTA Ridership Data, FY2018 and MassDOT OPMI/MBTA analysis method; MBTA, *Service*
Delivery Policy, 2017 Update, Approved January 23, 2017; and MBTA, Average Fleet Seating – CY2017. Per the OPMI method,
the analysis segment consists of the bus route between the project site and the nearest rapid transit station (or end/begin of line); crowding can occur in segments beyond the study's analysis segments.

As shown in **Table 6-16**, Routes 1 and 47 fall below the MBTA's minimum of 92 percent of bus passenger minutes in comfortable conditions, while Route CT3 falls below the target of 96 percent. Routes 8 and 10 exceed both the minimum as well as the MBTA's target of 96 percent of bus passenger minutes in comfortable conditions. For the analysis segments (between the project site and the stop service the nearest rapid transit station), these routes do not have any trips that exceed the MBTA's passenger crowding thresholds.

6.5.2.2 No-Build Condition – MBTA Buses

Transit Improvement Projects

Based on research by VHB, it was determined that there are several planned transit improvement projects within the vicinity of the study area. It should be noted that these improvements were announced prior to the COVID-19 pandemic. These projects are discussed below.

- **Fairmount Line Improvements:** There are several efforts underway to improve service on the Fairmount Line of the MBTA commuter rail. The Newmarket Station of the Fairmount Line is under three-quarters of a mile southeast of the site and is easily accessed by MBTA bus routes 8 or 10 or walking from BMC. Short-term improvements on the Fairmount Line announced in January 2020 include the addition of eight new trips a day on the line and the addition of fare machines at each of the stations on the Fairmount Line allowing passengers to pay with a Charlie Card and transfer to the bus for free. Long-term improvements on the line were summarized in the MBTA's Rail Vision project, which looked at ways to improve the entire commuter rail system and included six different alternatives with different tiers of improvements. Specific improvements along the Fairmount Line include electrification of the line and subway-levels of frequency with service up to every 15-minutes. The long-term plans are not yet funded and there is no timeline on when they will be completed. To present a conservative analysis and due to the already high transit share of employees and patients at BMC, no increase in transit mode share was estimated as a result of these improved services.
- **Better Bus Project**: The MBTA is currently undergoing a review of all bus operations throughout the service area as part of the Better Bus Project. The project is reviewing all bus lines and operations in the system and determining ways to improve operations for passengers and employees. The first round of improvements were initiated in September 2019 and included 47 specific changes to MBTA bus operations, including the elimination of the CT1 route by merging it into Route 1. While no additional specific changes have currently been announced that may affect bus service in the BMC area, the Better Bus Project continues through 2022 and additional improvements are expected to be announced. No increase in transit mode share was estimated as a result of any potential increase in bus service.

6.5.2.3 Line Haul (Bus Crowding) Analysis – MBTA Buses

To estimate the number of passengers on each route under the 2031 No Build Conditions, an annual growth rate of 0.22 percent was applied to ridership on all trips on bus routes CT3, 1, 8, 10 and 47 and escalated to 2031. The growth rate is based on annualized growth by bus mode as reflected in the Boston Region MPO's long-range transportation plan, *Destination 2040*.[9]

A summary of passenger crowding by bus route under the 2031 No Build Conditions is presented in **Table 6-17** below. As noted in the table, similar to the existing conditions none of the routes exceed capacity thresholds in the 2031 No-Build condition.

Table 6-17: 2031 No-Build Bus Growth Summary of Passenger Crowding

Route	Number of Trips Exceeding Threshold	Increase from Existing Conditions	Total Excess Passengers Over Threshold	Increase from Existing Conditions
Route CT3	0	0	0	0
Route 1	0	0	0	0
Route 8	0	0	0	0
Route 10	0	0	0	0
Route 47	0	0	0	0
Total	**0**	**0**	**0**	**0**

6.5.2.4 2031 Build Conditions – MBTA Buses

To develop the 2031 Build Condition transit passenger volumes, the transit trips generated by the IMP projected were added onto the 2031 No Build Condition volumes during the peak hours and throughout the course of the day. The Site-generated transit trips were distributed among the different MBTA bus routes based on the number of passengers that board and alight each route at the stops near the BMC campus under existing conditions and based on the number of trips per route that serve the campus during the peak periods. The existing boarding and alighting data are based on pre-COVID conditions and is included in the **Appendix D** to this report.

[9] Source: Boston MPO, Destination 2040: The Long-Range Transportation Plan for the Boston Region MPO, Annual Growth 2016-2040, change in MBTA local bus passenger trips.

Table 6-18 summarizes the Project impacts on bus services close to the BMC campus under the 2031 Build Conditions and charts illustrating the future passenger loads at the peak load point on each route by trip relative to the passenger crowding threshold are provided in the **Appendix D** to this report.

Table 6-18: Route-Level Summary of Changes in Passenger Comfort and Crowding (Build)

Route	Trips Serving Project Site	Number of Trips Exceeding Threshold	Increase from No-Build	Total Excess Passengers Over Threshold	Increase from No-Build
Route CT3	59	1	1	2	2
Route 1	258	0	0	0	0
Route 8	79	0	0	0	0
Route 10	81	0	0	0	0
Route 47	110	0	0	0	0
Total	**587**	**1**	**1**	**2**	**2**

As shown in **Table 6-18**, the analyses indicate that under the 2031 Build Conditions there is expected to be approximately one bus trip per day that serves the Site that will exceed crowding thresholds. This bus trip is expected to be on the Route CT3 in the outbound direction during the early morning period and will result in crowding threshold being exceeded by two additional passengers. Since this accounts for one bus trip out of 548 daily trips that serve the Site, this can be considered a nominal impact on the bus service in the area and falls well within the daily fluctuation of transit usage of the buses serving the BMC campus.

Table 6-19 summarizes the changes in passenger comfort and crowding metrics between the current and future conditions with and without the project. The build condition analysis results indicate that bus service schedule or frequency changes from pre-COVID conditions are not warranted. The MBTA should continue to monitor ridership and assess its service as part of its regular and periodic service planning process.

Table 6-19: Summary of Changes in Passenger Comfort and Crowding

Route	Number of Daily Trips at (near) Site	Existing		2031 No-Build		2031 Build	
		Number of Trips Exceeding Threshold	Total Passengers Over Threshold	Number of Trips Exceeding Threshold	Total Passengers Over Threshold	Number of Trips Exceeding Threshold	Total Passengers Over Threshold
Route CT3 IB	30	0	0	0	0	0	0
Route CT3 OB	29	0	0	0	0	1	2
		Avg:	0	Avg:	0	Avg:	2
Route 1 IB	128	0	0	0	0	0	0
Route 1 OB	130	0	0	0	0	0	0
		Avg:	0	Avg:	0	Avg:	0
Route 8 IB	40	0	0	0	0	0	0
Route 8 OB	39	0	0	0	0	0	0
		Avg:	0	Avg:	0	Avg:	0
Route 10 IB	41	0	0	0	0	0	0
Route 10 OB	40	0	0	0	0	0	0
		Avg:	0	Avg:	0	Avg:	0
Route 47 IB	55	0	0	0	0	0	0
Route 47 OB	55	0	0	0	0	0	0
		Avg:	0	Avg:	0	Avg:	0

In summary, the detailed transit analyses presented in this section indicates that the BMC IMP projects will have a negligible effect on area transit operations in the 2031 Build conditions. BMC will continue to promote public transportation for its employees by maintaining a 50-percent transit subsidy for all employees. The cost of passes is deducted on a pre-tax basis, resulting in an additional cost savings to employees.

6.5.3 Pedestrian and Bicycle Operations

The proposed IMP projects are expected to generate approximately 97 walk and bike trips during the weekday morning peak hour and 111 walk and bike trips during the weekday evening peak hour, as shown in **Table 6-20.** These new walking and bicycle trips are expected to be accommodated by the existing and future sidewalk and bicycle accommodations, with Melnea Cass Boulevard and Albany Street both expected to be reconstructed in the future to better accommodate pedestrians and bicyclists. In addition, the proposed extension of the South Bay Harbor Trail will provide enhanced pedestrian and bicycle connections between the BMC campus and the Seaport and Roxbury.

BMC will continue to promote walking and biking as alternative modes of travel for employees by continuing to provide bicycle and pedestrian friendly amenities, such as secure, weather-proof bicycle racks, showers on-site for pedestrians and bicyclists, an umbrella loan program if it is raining, and other amenities.

6.5.3.1 Future Bicycle Parking Supply

To support the future bicycle needs of the campus, additional bicycle parking spaces, showers, lockers, and bikeshare stations will be added in connection with the proposed IMP Projects. The additional bicycle amenities will be added in accordance with the City of Boston's Bike Parking Guidelines, which are provided in the **Appendix D** for reference.

Table 6-20 outlines the additional bicycle parking and amenities that will be added in accordance with the proposed IMP large projects. Specific details of the proposed bike parking for each building will be outlined during the large project review for each project.

Table 6-20: IMP Large Projects Required Bike Parking

Building [1]	Visitor Parking Spaces (short-term)	Employee / Resident Parking Spaces (long-term)	Showers	Lockers	Bikeshare Stations [3]	Minimum Bikeshare Contribution
Phase 2 New Inpatient Building [1]	67	67	9	83	Space for a 19-Dock Station	$75,000
New Admin/ Clinical Building (Power Plant Site) [1]	62	62	8	78	Space for a 19-Dock Station	$75,000
10 Stoughton Street [1]	57	57	8	71	Space for a 19-Dock Station	$75,000
Collamore / Old Evans Renovation [2]	26	130	n/a	n/a	Space for a 19-Dock Station	$75,000

Source: Based on City of Boston "Bike Parking Guidelines" January 2020 Version 2.0 for institutional and residential uses.
1 Bike parking calculations based on net new square footage added to the BMC campus per each large project.
2 Bike parking calculations based on 130-unit multi-family residential redevelopment.
3 BMC will coordinate with the City of Boston to determine the final location and number of new bikeshare stations.

As shown in **Table 6-20**, each of the new hospital buildings on campus will require between 57 and 67 additional visitor and employee bike parking spaces. The conversion of the Collamore and Old Evans buildings into 130 residential units will be supported by 26 new visitor bike parking spaces and 130 residential bike parking spaces, one per each unit.

6.5.4 Future Vehicle Parking Supply

As stated previously, there are currently 3,817 parking spaces serving the BMC campus and that number is not expected to increase within the next ten-years. The largest change in parking supply expected within the next ten-years is the loss of 238 parking spaces in the Doctor's Office Building garage. The lease on these parking spaces will expire within the ten-year term of the IMP and the lease is not expected to be renewed.

As part of the proposed 10 Stoughton Street project, approximately 72 underground parking spaces will be added below the new building. These parking spaces are expected to be used by employees of BMC and by residents of the proposed housing in the Collamore/Old Evans buildings and is not expected to be open to patients.

With the loss of 238 parking spaces in the Doctor's Office Building garage and the addition of 72 parking spaces at 10 Stoughton Street, the BMC campus is expected to experience an interim net decrease of 166 parking spaces within the ten-year term of the IMP resulting in a total of 3,651 parking spaces across the campus. While the final number of parking spaces on-campus at the end of the IMP term is not known due to the potential to lease additional spaces in nearby garages or the potential to reconfigure the Menino Valet Lot to improve efficiency, the final parking count is anticipated to remain within the total of 3,817 parking spaces currently provided.

By not increasing the total number of parking spaces on campus beyond the number provided under Existing Conditions, BMC will be following recent initiatives in the City of Boston to reduce dependency on driving by limiting the number of parking spaces available. BMC believes that it can appropriately accommodate future parking demands associated with the current supply it manages and does not envision the need to increase its supply during the term of the IMP. However, BMC also understands the need to maintain adequate parking for critical care staff, doctors, nurses, and other employees who are unable to commute via alternative modes of transportation and will be sure to continue to provide the right balance of parking for the needs of the hospital over the long-term.

6.5.5 Loading and Service Operations

All main loading and service activity on the BMC campus takes place at one centralized, primary loading dock located at the Power Plant off Albany Street. Delivery trucks are able to turn into the Power Plant parking lot from Albany Street and maneuver to park/back-up within BMC property and off-of Albany Street. All loading and service activities are expected to continue to use the primary loading dock at the Power Plant until the loading and service operations move to the rear of the New Administration / Clinical Building towards the end of the ten-year IMP term. This move will further improve this operational condition on campus.

6.5.6 BMC Project Construction Management

BMC will develop a detailed evaluation of potential short-term construction-related transportation impacts in connection with their proposed IMP projects, including construction vehicle traffic, parking supply and demand, and pedestrian access to the campus. A detailed Construction Management Plan will be developed and submitted to BTD for its approval. A summary of the potential construction impacts is provided below.

6.5.6.1 Construction Vehicle Traffic

Construction vehicles will be necessary to move construction materials to and from the Project site. BMC recognizes that construction traffic is a concern to area residents, other institutions, and to the medical center itself. Every effort will be made to reduce the noise, control fugitive dust, and minimize other disturbances associated with construction traffic. It is anticipated that Massachusetts Avenue and Albany Street will serve as the principal construction traffic routes to the BMC campus, and that trucks will be routed to avoid nearby residential areas. Truck staging and lay-down areas for each Project will be carefully planned. The need for street occupancy along roadways adjacent to the Project site is not known at this time.

6.5.6.2 Construction Parking Issues

Contractors will be encouraged to devise access plans for their personnel that de-emphasize auto use (such as seeking off-site parking, provide transit subsidies, etc.). Construction workers will also be encouraged to use public transportation to access the BMC campus because no new parking will be provided for them. BMC will work with BTD and Boston Police Department to ensure that parking regulations in the area and in designated residential parking areas is enforced. It is expected, as has been the case in past construction projects, that this will be a considerable disincentive.

6.5.6.3 Pedestrian Access During Construction

During the construction period, pedestrian access on the BMC campus may need to be re-routed around the construction site. A variety of measures will be considered and implemented to protect the safety of pedestrians traversing those portions of the campus affected by construction. Where necessary, protective barriers around the construction site, replacement of walkways, appropriate lighting, and new directional and informational signage to direct pedestrians around the construction site will be provided. After construction is complete, finished pedestrian sidewalks will be permanently reconfigured around the new building to connect to other parts of the BMC campus and the neighborhood. This reconfiguration of pedestrian paths will be carefully considered as each project proceeds.

6.5.6.4 Construction Monitoring

As the planning progresses for the IMP projects, BMC will work with representatives of the City of Boston to develop and ensure the effectiveness of the program of measures to minimize short-term, construction-related transportation impacts.

6.6 Transportation Mitigation

Based on the analyses contained in this Transportation Study, the BMC IMP Projects are anticipated to have relatively small impacts on traffic conditions and public transit services on and around the campus. BMC has committed to an extensive set of TDM measures, roadway and driveway improvements, patient drop-off and valet parking amenities, and improved pedestrian and cyclist conditions – which have all been aimed at improving surrounding existing and projected traffic conditions and fostering a premiere patient arrival experience to BMC. This section outlines the measures that BMC proposes to implement the following array of mitigation and improvement actions to reduce the impact of the hospital on area-wide traffic operations.

6.6.1 BMC Main Entrance Access/Circulation Improvements

BMC is closely studying improvement efforts aimed at supporting more effective patient and visitor access and circulation. See **Figures 4-2 and 4-3** in **Section 4.0**. These efforts include improvements to the pick-

up/drop-off areas in front of Yawkey Center, Menino Pavilion, and Moakley Building. A description of this effort is described below.

At the beginning of a patient's experience, the drop-off/pick-up area is often the place where they first step out and absorb the environment. The functionality of a well-designed and managed drop-off/pick-up zone is often overlooked by patients and visitors, while a poorly operating drop-off/pick-up zone never goes unnoticed and adds to the stress and frustration of a sick patient. Well-designed curbside drop-off/pick-up areas are critical to the functionality of any major healthcare campus. These amenities provide the opportunity for patients and visitors to quickly reach the location where patient care services are being provided, without the need to park their vehicle or walk long distances, often times unprotected from adverse weather conditions. Certain healthcare environments, such as ambulatory/outpatient care centers, will tend to experience higher curbside demands for patient drop-off/pick-up activities because this type of patient care often involves shorter visits and higher turnover. Conversely, inpatient care centers have less turnover, but more patients with urgent medical concerns who need a higher level of site accessibility. In addition to general patient access and egress by private vehicles, the BMC Menino and Moakley Pavilions will also experience other demands created by taxis, transfer ambulances, short-term deliveries (e.g., flowers, etc.), and staff, wherein vehicles do not necessarily park or valet.

Under existing conditions, the Moakley Building and the Menino Pavilion share one driveway along Boston Medical Center Place, which has geometric and operational constraints and frequently backs up onto Harrison Avenue. BMC plans to improve the geometric and operational constraints while maintaining the same flow of movement through the BMC campus. The ongoing planning for improvements to this location will include consideration to the following key design parameters:

- Accommodate expected future patient demands: The curbside drop-off zone, when supported by other key operational provisions within the BMC complex, will be right sized to accommodate expected future patient demands. The functionality of the drop-off zone will be dependent on its efficient operation by BMC, and as required, provision to accommodate some drop-off uses elsewhere. For example, chair cars and transfer ambulances may be directed to load and unload at an alternate location. Similarly, valet operations may be adjusted to maximize utilization of the curbside area and reduce vehicle queuing.

- Avoid impeding Harrison Avenue traffic: The modified BMC drop-off will continue to be accessed by Harrison Avenue. Thoughtful solutions will be put in place to reduce and/or eliminate queuing back onto this corridor, which can happen at times during peak patient arrival periods under existing conditions.

- Attract drivers to the drop-off area: The newly designed entrances and valet operations will be studied such that main entrance doors will be located as close to the end of the drop-off area as possible (downstream) to maximize its utilization. Drivers will naturally gravitate to the door location and tend to not fully utilize drop-off area downstream of the door location.

- Provide adequate pedestrian space: Consideration will be given to generously sized sidewalks in this new zone, allowing for comfortable interchange between automobile movement and pedestrian travel into the facility that the amenity is serving. These walking areas are envisioned to be flush to the curb to allow for the most flexible accessible access scheme for all motorists who intend to drop-off at this location.

- Provide dedicated space for taxicabs and buses: Taxicab and TNC operators will be accommodated with designated curbside access.

6.6.2 Improvements Bicycling, Walking and Transit Accommodations

Future implementation of the IMP Projects provides many opportunities to make walking, biking, and taking transit to/from BMC better options. The goal is to have patients, visitors, staff, and physicians feel they have better connections and options and improved infrastructure that supports their non-automobile modes. The list below outlines these actions:

- The construction of new and/or improved public sidewalks adjacent to IMP Project sites when those projects are constructed.
- Provision of long-term (covered/secured) and short-term bicycle parking in connection with the net new square footage based on large-scale IMP Projects that complies with City of Boston Bicycle Guidelines as shown in **Table 6-20.**
- Provision of showers and lockers in connection with the net new square footage based on large scale IMP Projects that complies with City of Boston Bicycle Guidelines as shown in **Table 6-20**.
- Support and coordinate with the City for the construction of at least one additional Bluebikes Station nearby BMC's campus in connection with the first major IMP Project that is constructed during the IMP term. The new Bluebikes Station will be, at minimum, a 19-dock station that complies with City of Boston Bicycle Guidelines as shown in **Table 6-20**.
- Support and Coordinate with the City for improvements to identified nearby crosswalk and sidewalk deficiencies.

6.6.3 Signage and Wayfinding

To assist in providing for better and clearer access to the campus, BMC is considering the study and implementation of improved directional signage and wayfinding for some portions of its campus. This could include updating directions on its website for both vehicular drivers and transit users and developing new directional sign plans for the campus. Wayfinding plans are also being studied in connection with drop-off improvements to the Menino and Moakley Pavilions.

6.6.4 Transportation Demand Management

Consistent with the City's goals to reduce auto-dependency, the proposed IMP Projects and BMC will continue to provide TDM measures that are both consistent with and expand on the hospital's existing TDM commitments. BMC's goal is to increase usage of public transportation, cycling, and walking as much as possible while discouraging auto usage for those staff who have alternatives.

6.6.5 Support of Ongoing Area Transportation Initiatives

BMC is committed to supporting the City of Boston's ongoing initiatives to foster an improved bicycle and pedestrian transportation infrastructure. To that end, BMC will work with the BPDA and the BTD to understand how to appropriately participate and contribute to the following:

- Albany Street/South Bay Harbor Trail Project
- Proposed multi-modal improvements for Massachusetts Avenue

Support of these specific efforts will help continue to encourage the use of alternative modes of transportation and limit single-occupant driving. These efforts also provide opportunities to remedy identified operational and connectivity deficiencies near the BMC campus.

7.0 ENVIRONMENTAL SUSTAINABILITY

7.1 Overview

BMC's leadership as a safety-net provider embeds a focus on keeping its community healthy into its DNA. A healthy community starts with a healthy environment. Studies have shown that the impacts of climate change disproportionately impact its most vulnerable populations. Caring for its communities' environment aligns with BMC's Health Equity priorities where every person has the opportunity to "attain his or her full health potential". Going green provides an opportunity for BMC to proactively engage with the younger, healthier members of its community in a way that providing healthcare cannot. It is a critical part of BMC's mission as a safety-net trauma center which is located in a coastal city sited on over 5,000 acres of man-made land.

7.1.1 BMC Sustainability Administrative Structure

BMC's sustainability initiatives are led through BMC's office of Real Estate and Support Services and the Design and Construction Department. They oversee the direction, development and implementation of sustainable programs and policies and work with various BMC departments who develop organization-specific environmental initiatives. Environmental and financial results of improvement programs are tracked and continuously reviewed to improve existing programs or to identify new improvement projects. Through effective communication, status of the green programs is related throughout the organization to increase awareness and participation in campus environmental programs and initiatives. BMC's sustainability leadership, it has implemented significant sustainable design and construction elements through all of BMC's capital projects.

7.1.2 The Greening of BMC's Campus

In 2018, BMC completed a clinical campus redesign that reduced greenhouse gas emissions by 90 percent, positioning BMC to meet its objectives of achieving carbon neutrality for all its energy sources well ahead of City and State goals.

BMC has partnered with Eversource on more than 30 energy efficiency projects in the past several years, achieving more than 20 million kilowatt hours in annual energy savings. The hospital also partnered with Veolia on a 20-year thermal energy agreement to use recycled 'green steam' as a byproduct of electricity generation to provide heat to the hospital campus. BMC has reduced its utility bill from $17.2 million in 2011 to a budget of under $10 million in 2019, money put back into patient care.

In October 2016, BMC announced a solar energy purchase with Massachusetts Institute of Technology and the Post Office Square Redevelopment Corporation that enabled the construction of a 650-acre, 60-megawatt solar facility in North Carolina. This is the largest renewable energy project ever built in the U.S. by an alliance of diverse buyers. BMC's solar purchase is the equivalent of 100 percent of BMC's expected electricity consumption. The solar farm began delivering power into the mid-Atlantic grid in January 2017.

In spring 2017, the hospital began generating much of its electricity and heat through a natural gas-fired, 2-megawatt combined heat and power plant on the roof of its Yawkey Ambulatory Care Center. The cogeneration plant, the size of a tractor trailer, will save $1.5 million a year in energy efficiency, money that can be put back into patient care. The cogeneration plant provides a redundant source of heat and power for the Menino Pavilion campus generating 43% of electric consumption and providing 33% of total heating capacity needs. The cogeneration plant also has 'black start' capability. BMC was the first academic medical center in Massachusetts to install this technology. With its 'black start' capability, BMC can be powered on an island for months at a time if the electric grid goes down, as long as the hospital has a supply of natural gas.

In 2020, BMC began construction of a battery storage farm located behind the Power Plant. This is a type of energy storage power station that uses a group of batteries to store electrical energy. BMC will use the battery storage for short-term peak power and ancillary services to provide operating reserve and frequency control to minimize the chance of power outages.

The hospital's green efforts also extend to areas of patient care: all of BMC's Operating Rooms now recycle blue wrap, with more than 12,000 pounds recycled since the program was launched in May 2015.

BMC has joined the Northwest Atlantic Marine Alliance and Health Care Without Harm's Healthy Food in Healthcare Program to buy local seafood whenever possible, benefitting both local fishing communities and the marine ecosystem.

Since BMC rolled out a biodigester in December 2015, the hospital has diverted more than 110 tons of food waste, rather than throwing it in the trash.

In the summer of 2017, BMC launched the first hospital-based rooftop farm in Massachusetts, which provided 15,000 pounds of fresh, healthy food to hospital patients and visitors to date, with 5,000 pounds provided in the 2019 growing season. The food is served to patients, and also through cafeterias and the hospital's food pantry.

The completion of BMC's consolidation into a single clinical campus in 2018 resulted in the reduction of an additional 11-million-kilowatt hours of electricity consumption.

BMC, a member of the Green Ribbon Commission's ("GRC") Health Care Working Group, has been recognized nationally for its efficiency and sustainability efforts. Becker's Hospital Review named BMC one of the 50 greenest hospitals in America, and BMC received three prestigious awards from Practice Greenhealth in 2017: The Top 25 Environmental Excellence Award, the higher honor Practice Greenhealth bestows on hospitals, as well as the Greening the OR Recognition Award and the Circle of Excellence award in the energy category. In 2018, BMC received Top 25 Environmental Excellence Award and Circles of Excellence Award from Practice Greenhealth.

Complete List of Awards:

- Becker's Hospital Review 60 Greenest Hospitals in America – 2017
- Becker's Hospital Review 68 Greenest Hospitals in America – 2018
- Becker's Hospital Review 100 Great Hospitals in America – 2017, 2018
- Becker's Hospital Review 150 Top Places to Work in Healthcare – 2017, 2018, 2019

- CHIME and Modern Healthcare Custom Media present HealthCare's Most Wired Level 7 Certification: Hospitals – 2019
- Forbes Magazine list of best midsized employers in the United States – 2017
- Greater Boston American Heart Association awarded BMA with the Community Impact Grant Award – 2017-2018
- Practice Greenhealth: Top 25 Greenest Hospitals Nationally – 2017
- Practice Greenhealth: Top 25 Environmental Excellence Awards – 2017, 2018, 2019
- Practice Greenhealth: Circle of Excellence in Climate Circle – 2018, 2019
- Practice Greenhealth: Circle of Excellence in Energy – 2017, 2018
- Practice Greenhealth: Circle of Excellence in Green Building – 2018
- Practice Greenhealth: Greening the OR Excellence Award – 2017
- Silver Level WorkWell MA Award Winner – 2017, 2018

7.1.3 Compliance with Article 37 and Resiliency Policy

The applicable new and approved IMP projects will comply with Boston Zoning Code Article 37, particularly the requirement that projects meet the US Green Building Council's LEED v4.1 rating system, both for New and Existing Construction (BD+C) and New and Existing Interiors (ID+C), where applicable to project scope.

BMC commits to demonstrating, at minimum, Silver equivalency through design and construction practices that meet the intent of all prerequisites plus at least 55 of 110 possible points within each respective system. It is not the intent of the project to register and certify these projects with the GBCI. The proposed IMP projects are in the preliminary stage of planning and more detail with a description of strategies for each proposed project and LEED scorecards per each applicable project will be provided in subsequent Article 80B Large Project Review documentation. Strategies that will be evaluated will include materials and resources, energy, water management, indoor environmental quality, and other area of opportunity for high performance green buildings.

As project designs advance which are applicable Article 80B Large Project Review, BMC will consider ways to incorporate building strategies to eliminate, reduce and mitigate impacts due to changing climate conditions. BMC will also consider ways to integrate Smart Utility Technologies where feasible for applicable projects.

7.1.4 Long Term Energy Efficiency and Campus Resiliency

BMC has made significant improvements to its overall support infrastructure focused on energy efficient operations through campus consolidation, installation of more energy efficient equipment, and realized a significant reduction in greenhouse gas emissions (See **Section 7.1.2**).

As a safety-net trauma center in a coastal city, which serves the area's most vulnerable patient population, going green and building for campus resiliency is critical to BMC delivering on its mission. The events of Hurricane Katrina and Sandy devastated the health care infrastructure in those communities. BMC must ensure that it can care for patients and maintain emergency access to critical care services during a natural disaster. This requires making changes to critical care hospital infrastructure to ensure it is insulated from flooding at the ground level.

Over the term of the IMP, BMC will leverage new IMP projects, or pursue independently, opportunities to improve resiliency and maximize energy efficiency through raising electrical infrastructure in buildings, automating the black start islanding of its co-gen plant, energy storage options, assessing the need of remaining utility services in the existing Power Plant, exploring ways to ensure patient transport routes to critical care are insulated from flooding, and other efforts to support its goal of achieving carbon neutrality and strengthening resiliency.

7.2 Environmental Protection

Material impacts to water quality, groundwater, flooding, and hazardous materials are not anticipated as a result of the proposed projects. Environmental analyses of proposed projects will be evaluated in detail as part the BPDA's Article 80 Large Project Review process. The Proponent intends to file Project Notification Forms, as applicable, for each Institutional Master Plan Project when the design of individual projects has progressed.

Please refer to **Section 7.1.2** for the significant efforts BMC has made to reduce its campus' environmental impact.

7.2.1 Wind

The proposed Yawkey 6th Floor Addition will not increase the overall height of the building. The Menino 9th Floor Addition maintains the existing height of the 9-stories. The Menino & Yawkey Lobby Addition involves the replacement of the existing canopy and reshaping of the northern façade at the 1st and 2nd floors. The Dowling Building will be replaced by the 14-story New Inpatient Building Phase 2. The New Administration/Clinical Building (Power Plant site) and New Administration/Clinical Building (ramp site) will both reach 10-stories. 10 Stoughton Street will reach a total of 11-stories and will be located in an area that is enclosed on all sides by the existing buildings and therefore sheltered from prevailing winds. Collamore/Old Evans buildings are existing. Individual or separate wind studies will be presented in the Project Notification Forms for each applicable project as required as part of the BPDA's Article 80 Large Project Review process.

7.2.2 Daylight

The project sites are located within a dense urban environment surrounded by buildings of similar height and massing as the proposed projects. Daylight impacts from the proposed projects are expected to be minimal. A detailed daylight impact analysis will be presented as required as part of the BPDA's Article 80 Large Project Review process for applicable projects.

7.2.3 Shadow

The IMP Projects are proposed on sites currently occupied by buildings or surrounded by buildings of similar height in a developed urban environment that is part of the BMC campus. The new and approved IMP building volumes are shown in the shadow analysis and include Yawkey 6th Floor Addition, Menino/Yawkey Lobby Addition, Menino 9th Floor Addition, 10 Stoughton Street, and the approved New Administration/Clinical Building and approved New Inpatient Building Phase 2. See **Appendix E**. The times studied include March 21st at 9am, Noon, and 3pm; June 21st at 9am, Noon, 3pm and 6pm;

September 21st at 9am, Noon, 3pm, and 6pm; and December 21st at 9am, Noon, and 3pm. Of the times studied, there is minor impact limited to December 21 at 9am where net new shadow extends into the residential area across Harrison Avenue onto portions of the street on Public Alley 716, on the roofs of a few rowhouses and a sliver of East Springfield Street, and a small section on the street of Public Alley 719; and minor impact limited to December 21 at 12 Noon on a portion of BMC's existing open space, Moakley Green. In all other times studied, net new shadow is primarily limited to BMC buildings, abutting building roofs, internal BMC campus streets and BMC parking lots, with some impacts to a small section of Albany Street in between the Ambulance Entry and the Power Plant.

7.2.4 Solar Glare

The Proponent does not anticipate the use of reflective glass or other highly reflective materials on the building facades that would result in solar glare from the proposed additions and new buildings. Detailed review of the proposed façade materials will be presented in the Project Notification Forms as required as part of the BPDA's Article 80 Large Project Review process for applicable projects.

7.2.5 Air Quality

Potential long-term air quality impacts that could result from emissions from vehicular traffic generated by the proposed projects, as well as emergency generators and other energy infrastructure upgrades, are expected to meet applicable air quality standards.

All medical exhaust systems in the buildings will be designed and vented in accordance with applicable air pollution control regulations.

Short-term air quality impacts from fugitive dust may be expected during the early phases of construction from demolition activities, site preparation work, and below grade construction. The construction contract will provide for a number of strictly enforced measures to be utilized by contractors to reduce potential emissions and minimize impacts. Detailed air quality studies will be presented during the Article 80 Large Project Review process for applicable projects.

7.2.6 Noise

Most of the activity associated with the operation of the proposed projects will occur indoors. Operational noise from buildings of this nature may be expected from mechanical equipment that is located outdoors and will be equipped with appropriate noise attenuation mechanisms. Noise impacts associated with new energy infrastructure will be analyzed further as part of the Large Project Review documentation for applicable projects.

Intermittent increases in noise levels will occur in the short-term during construction of the proposed projects. Construction work will comply with the requirements of the City of Boston noise ordinance and noise management measures will be developed and implemented as appropriate. If there are noise impacts associated with future projects, BMC will conduct the appropriate studies as part of the BPDA's Article 80 Large Project Review process for applicable projects.

7.2.7 Water Quality / Wetlands

The proposed projects are located on existing developed sites. The projects are not expected to result in the introduction of any pollutants, including sediments, into the surface waters or local groundwater.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the Projects' sites (City of Boston, Community Panel Number 25025C 0079G; Effective Date 3/16/2016). The map shows that the Projects' sites are located outside of the 500-year flood plain. The project sites do not contain any wetlands.

7.2.8 Geotechnical / Groundwater

Subsurface conditions for all future projects will be investigated as design progresses. The need for temporary excavation support systems will be evaluated as the designs for the additions and new buildings progress. If needed, the temporary earth support systems will be compatible with subsurface conditions and will be designed in order to provide adequate support and protection of the adjacent streets and utilities. Construction methodology that ensures the protection of existing surrounding buildings will be followed. Dewatering may be required for subsurface construction; if so, all applicable permits will be obtained, and mitigation requirements met. The planned additions will re-use existing foundations to the greatest extent possible. Some supplemental foundations may be required to support portions of the new additions, and those new foundations will extend down to competent soils, below the groundwater level, will be solid, discontinuous, discrete elements that will not cause the groundwater to raise, pond or be lowered.

The proposed IMP Projects are located within the Groundwater Conservation Overlay District (GCOD). The designs for each project will comply with Article 32 and City standards by establishing design and construction methodology which protects groundwater. The Projects will demonstrate that the permanent construction results in no negative impacts to groundwater levels through engineering evaluations. An engineer's report will be submitted to BWSC demonstrating that the standards have been met. Methods to assure these standards include use of fully waterproofed basement (walls and lowest level floor slabs) for the portion of the structure that extends below groundwater levels which will be designed to resist hydrostatic uplift pressures. Design criteria for the Projects will include the provision that no long-term groundwater pumping will be allowed. BMC will conduct the appropriate studies as part of the BPDA's Article 80 Large Project Review process for applicable projects.

7.2.9 Solid Waste, Hazardous Waste and Recycling

The proposed IMP Projects will generate solid waste from employees such as wastepaper, cardboard, glass bottles, aluminum cans, etc. Recycling of this material will be encouraged and managed through BMC's active campus recycling program. Staging areas with recycling bins will accommodate the recyclable material from the projects.

The Projects with clinical programs may involve the generation and processing of 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. BMC has an existing hazardous waste collection program which will be utilized to handle and dispose of all wastes in accordance with applicable laws and regulations.

Demolition and construction activities at the project sites will generate construction debris. The construction contractor will be responsible for off-site disposal of this debris in accordance with applicable public health and safety and environmental laws.

Solid waste generated by construction will consist of excavated material and debris. Excavated material will be composed of miscellaneous fill and underlying natural deposits. Excavation and off-site disposition will be conducted in accordance with a Soil Management Plan developed for the Projects and included in the Construction Documents. The Soil Management Plan will describe procedures for identification, management, and off-site transport of any contaminated soils. Management of soil during excavation and construction will be conducted in accordance with applicable local, state, and federal laws and regulations.

Construction dewatering will be conducted in accordance with a Groundwater Management Plan that will be included as part of the Construction Documents. The Groundwater Management Plan will describe the procedures for maintenance of groundwater levels and for treatment (if necessary) and discharge of effluent from dewatering activities. BMC will conduct the appropriate studies as part of the BPDA's Article 80 Large Project Review process for applicable projects.

7.2.10 Integrated Pest Management Plan

The Construction Management Plan will include a plan to manage pests. A rodent extermination certificate will be filed with the building permit application to the City. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work for the proposed Projects, in compliance with the City's requirements. Rodent extermination prior to work start-up will consist of treatment of areas throughout the site. During the construction process, regular service visits will be made.

7.2.11 Wildlife Habitat

The site is within a fully developed urban area and, as such, the proposed IMP Projects will not impact rare, threatened, or endangered wildlife habitats as shown on the National Heritage and Endangered Species Priority Habitats of Rare Species or Estimated Habitats for Rare Wildlife.

7.2.12 Construction Management Plan

A Construction Management Plan (CMP) will be submitted to the Boston Transportation Department (BTD) for review and approval prior to issuance of a building permit for proposed and approved IMP projects. The detail of the CMP will be developed and will be presented and reviewed by the community and neighbors during the Article 80B Large Project Review submissions for applicable projects to ensure a thoughtful process and development of the plan with their input.

The CMP will define truck routes which will help minimize the impact of trucks on local street, the construction contractor will be required to comply with the details and conditions of the approved CMP. 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 minimize impacts on the surrounding environment.

The Construction Management approach for transportation related impacts is detailed in **Section 6.4.6.**

Construction of Foundations and Monitoring

The CMP will define foundation construction methodologies that ensure public safety and protect nearby by residential structures and nearby businesses. Detailed feasible methodologies will be reviewed with the neighbors. BMC will also work closely with the City to determine if the proximity of the proposed IMP project will be a concern for construction impacts to abutting residential structures. If any are deemed a concern based on proximity, the Proponent will develop a conditions assessment and monitoring plan.

Construction Schedule and Coordination

The detailed construction schedule for each applicable IMP Project will be submitted along with the Article 80B Large Project Review. The CMP will include typical construction hours from 7:00 am to 6:00 pm, Monday through Friday, with most shifts ordinarily ending at 3:30 pm. No sound-generating activity will occur before 7:00 am. If longer hours, additional shifts, or Saturday work is required, the Construction Manager will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. Notification should occur during normal business hours, Monday through Friday. It is noted that some activities such as finishing activities could run beyond 6:00 pm to ensure the structural integrity of the finished product. (Certain components must be completed in a single pour and placement of concrete cannot be interrupted.)

Proper planning with the City neighborhood and developers of other projects under construction in the area will be essential to the successful construction of the future IMP projects. The construction contractor will be responsible for coordinating construction activities during all phases of construction with City of Boston agencies to minimize potential scheduling and construction conflicts with other ongoing construction projects in the area.

Construction Staging and Public Safety

Primary staging will be on-site. For each project a proposed construction staging plan be designed to isolate the construction while providing safer access for pedestrians and vehicle during normal day-to-say activities and emergencies. The staging areas will be secured by chain-link fencing to protect pedestrians from entering these areas.

Although specific construction and staging details will be finalized during Article 80B Large Project Review, the Proponent and its construction management consultants will work to ensure that staffing areas will be located to minimize impacts to pedestrian and vehicular flow. Secure fencing and barricades will be set to isolate construction areas from pedestrian traffic adjacent to the site. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to protect pedestrians and ensure their safety. If required by BTD and the Boston Police Department, police details will be provided to facilitate traffic flow. Construction procedures will be designed to meet all Occupational Safety and Health Administration (OSHA) safety standards for specific site construction activities.

Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the project. However, increased community sounds levels are an inherent consequence of construction activities. Construction work will complete with the requirement of the City of Boston Noise Ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities.

Construction Air Quality

Short-term air quality impacts from fugitive dust may be expected during the early phases on construction and during excavation. Plans for controlling fugitive dust during demotion, construction and excavation include mechanical street sweeping, wetting portions of the site during period of high wind, and carefully removing debris in covered trucks. The construction contract will provide for multiple strictly enforced measure to be use by contractors to reduce potential emissions and minimize impacts.

Construction Waste

The Proponents will reuse or recycle construction materials to the extent feasible. Construction procedure will allow for the segregation, reuse, and recycling of materials. Materials that cannot be reused or recycle will be transported in covered trucks by a contract hauler to a licensed facility, per the Mass DEP regulations for Solid Waste facilities.

Protection of Utilities

Existing public and private infrastructure located within the public right-of-way will be protected during construction. The installation of proposed utilities within the public way will be in accordance with MWRA, BWSC, Boston Public Works Department, the Dig Safe program, and the governing utility company requirement. All necessary permits will be obtained before the commencement of specific utility installation. Specific methods for construction of proposed utilities, where they are near to, or connect with existing water, sewer and drain facilities will be reviewed by BWSC as part of its Site Plan Review process.

7.3 Historic and Archaeological Resources

7.3.1 Historic Resources

Boston Medical Center (BMC) is located within the South End Harrison/Albany Protection Area, which was established to maintain an architecturally compatible boundary adjacent to the southeast border of the South End National Register and the South End Landmark districts. The present BMC was formed in 1996 as a result of the merger of Boston City Hospital and Boston University Medical Center Hospital, referred to as University Hospital. Boston University Medical Center Hospital was the former Massachusetts Memorial Hospitals. As a result of the merger, BMC now owns some buildings that were originally part of Boston City Hospital and some buildings that were originally part of Boston University Medical Center Hospital (former Massachusetts Memorial Hospitals), with the majority of the other buildings owned by Boston University (BU).

For clarification purposes, historic buildings owned by BMC are separated into two groups: those buildings built as part of Boston City Hospital, and those buildings which operated as part of the Massachusetts Memorial Hospitals. This distinction is as follows:

Boston City Hospital

- BDC Building
- FGH Building
- Dowling Tower
- Surgical Building
  Yawkey Ambulatory Care Center
- Power Plant

Massachusetts Memorial Hospitals

- Anna White Vose Hall
- Helen Collamore Memorial
- Old Robert D. Evans Memorial
- Preston Family Building

One building, the Smith American Organ Company (Naval Blood Research Center), jointly owned by BMC and BU, but was not built as one of the original hospital buildings.

BMC has updated its Preservation Plan, previously submitted to the South End Landmarks District Commission; it is included in **Appendix B**. The purpose of the Preservation Plan is to identify historic resources, which include buildings owned by BMC 50 years of age or older, to research the historical significance and to determine to what extent each resource retains its architectural integrity. The Preservation Plan provides recommendations and guidelines to incorporate preservation planning into the master planning process for BMC buildings and properties and identifies potential challenges to preservation in the near term and long term. In addition, it details the reuse and renovation challenges of the Dowling Tower, Vose Hall and Betatron Building, which are proposed to be demolished. The Preservation Plan is being incorporated into the IMP and will be updated along with the IMP.

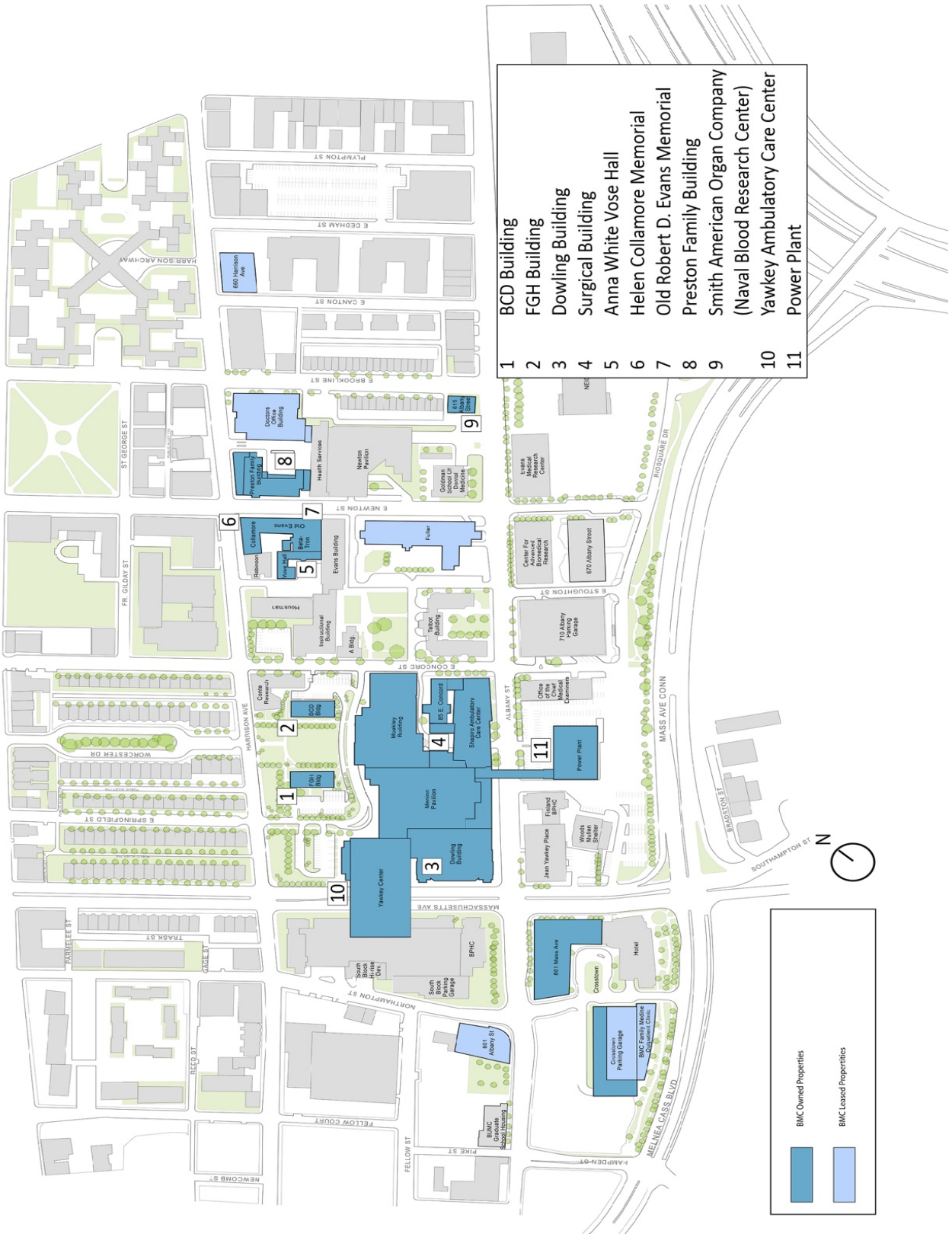
The BMC campus is subject to review by the South End Landmarks District Commission (SELDC) in accordance with the regulations applying to the South End Harrison/Albany Protection Area. Demolition of a structure within the Protection Area Boundaries is subject to review by the South End Landmarks Commission (General Standards and Specific Standard #1). Projects undertaken within the BMC campus are subject to review by the Massachusetts Historical Commission in the event of funding or permitting by a state agency (MGL Chapter 9, Section 26-27c, as amended by Chapter 254 of the Acts of 1988) or in the event the project will require MEPA review. According to the MEPA regulations, demolition of a structure included in the *Inventory of Historic and Archeological Assets of the Commonwealth* will be reviewed by MHC and the owner will engage in consultation with MHC to avoid or mitigate adverse effects to historic structures.

Table 7-1 below provides a list of BMC-owned buildings, additions and structures that have reached and will reach an age of 50 years or older during the term of the IMP. See **Figure 7-1** Historic Resources Map.

Table 7-1 Buildings 50 Years or Older

No.	Name	Date
1	BDC Building – Surgical Pavilion, 800 Harrison Avenue	1864
2	FGH Building – Medical Pavilion, 820 Harrison Avenue	1864
3	Dowling Tower, 771 Albany Street	1937
4	Surgical Building, 85 East Concord Street	1928
5	Anna White Vose Hall, 10 Stoughton Street	1898
6	Helen Collamore Memorial, 746 Harrison Avenue	1936
7	Old Robert D. Evans Memorial, 66 East Newton Street	1942
8	Preston Family Building, 732 Harrison Avenue	1967
9	Smith American Organ Company, 615 Albany Street	R 1865
10	Yawkey Ambulatory Care Center, 850 Harrison Avenue	1972
11	Power Plant, 750 Albany Street	1972

Figure 7-1 Historic Resources Map



7.3.2 Archaeological Resources

A review of the *Inventory of Historic and Archeological Assets of the Commonwealth* identified no previously known archaeological resources within the project site. No archaeological resources are anticipated within IMP project sites, as they are all on previously disturbed urban land parcels.

7.4 Infrastructure Systems

This section provides an overview of the existing infrastructure systems that will support BMC's proposed projects. Please refer to **Section 7.1.2** for BMC's extensive efforts in replacing aging infrastructure with energy efficient solutions and achievements in sustainability and resiliency.

Based on initial investigations, the existing infrastructure systems are expected to be able to accommodate incremental increase in demand associated with the proposed projects, but demand for these services will be further evaluated and determined with the utility companies as the design advances for each project.

The design process for the proposed projects will include the required engineering analyses and will adhere to applicable protocols and design standards, ensuring that the proposed Project is properly supported by and properly uses the City's infrastructure.

The systems discussed below include those owned or managed by the Boston Water and Sewer Commission (BWSC), private utility companies, and on-site infrastructure. There will be close coordination between these entities and the project team during subsequent reviews and the design process. All improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC site plan review process. This process includes a comprehensive design review of the proposed service connections, assessment of system demands and capacity and establishment of service accounts.

7.4.1 Regulatory Framework

In addition to a description of existing and future infrastructure connections, below is an outline of the regulatory framework of utility connection reviews and standards. All connections will be designed and constructed in accordance with city, state, and federal standards.

- In the City of Boston, BWSC is responsible for all water, sewer, and stormwater systems.
- The Boston Fire Department (BFD) will review the Proposed Project with respect to fire protection measures such as siamese connections and standpipes.
- Design of the site access, hydrant locations, and energy systems (gas, steam, and electric) will also be coordinated with the respective system owners.
- New utility connections will be authorized by the Boston Public Works Department through the street opening process, as required.
- New steam and water and power conduits between campus buildings, within city streets, will require permitting with the City of Boston Public Improvements Commission (PIC).
- BMC will also comply with the Smart Utilities Policy for Article 80 Development Review, which calls for the integration of five (5) Smart Utility Technologies (SUTs) into Article 80

developments. As the design of the IMP projects advance, BMC will use the Smart Utilities Checklist to assess the requirements for each project and submit with the future Article 80 Large Project Review filings for applicable projects.

7.4.2 Existing Wastewater

Local sewer service in the City of Boston is provided by the BWSC. Wastewater generated at the BMC campus is collected by various sewer mains within the surrounding streets and conveyed to the Massachusetts Water Resources Authority (MWRA) facility on Deer Island via a 66” x 68” combined sewer located in Albany Street.

7.4.3 Domestic Water and Fire Protection

Existing Water Supply System

The BMC campus is located in the South End service area of the BWSC public water supply. Albany and East Concord Streets are served by 12-inch high- and low-pressure lines. Hydrant test data will be updated at the time when the proposed projects are ready to advance design.

7.4.4 Stormwater Management

Existing Conditions

BMC is served by numerous BWSC drain lines. Harrison Avenue contains a 72-inch storm drain. Massachusetts Avenue contains a 108-inch storm drain. East Concord Street contains 18-inch and 24-inch storm drains. Albany Street contains an 18-inch storm drain. BMC is located within the Groundwater Conservation Overlay District (GCOD). Stormwater management practices the IMP projects will be selected as designs for the projects advance. At this time, it can be expected that the initially explored approach for stormwater management will be infiltration in accordance with BWSC and GCOD requirements and BWSC and GCOD approvals will be achieved. As site conditions are investigated and designs are advanced, BMC will work with BWSC and other City Agencies to explore ways to go beyond requirements to mitigate additional run-off to consider ways to reduce stormwater discharge from sites into the storm sewers.

7.4.5 Anticipated Energy Needs

Natural Gas Service

Natural gas for the proposal projects will be provided by National Grid from their existing gas mains from within Albany Street. The specific gas service needs for each project will be determined and coordinated with National Grid during the design phase.

Electrical Service

BMC purchases electricity from Eversource in bulk and redistributes from the existing Power Plant Building to other BMC campus buildings.

In addition, BMC produces 2-megawatt of power through its Yawkey building rooftop natural gas-fired combined heat and power plant (CHP or Cogen). Proposed projects within the Menino Pavilion cluster will be an extension of this existing utility and Cogen electrical infrastructure. BMC will continue to evaluate additional ways to reduce energy use as future IMP projects progress.

Steam

Steam is currently provided by Veolia Energy and distributed to the BMC campus from the existing Power Plant building. The specific steam needs for each project will be determined and coordinated with Veolia during the design phase.

Telecommunications

Verizon will provide telephone and telecommunication services to the proposed projects. There are existing fiber optic services located in Albany and East Newton Streets with sufficient capacity to service new projects.

8.0 ECONOMIC DEVELOPMENT

8.1.1 Employment, Workforce Development, and Educational Opportunities

BMC is a major employer in the City of Boston and is committed to promoting employment opportunities for Boston residents, particularly individuals living in adjacent neighborhoods. BMC employs a diverse workforce, with 9,068 full-time and part-time employees, including per diems, temporary staff, and 7,168 full-time equivalent employees (FTEs) who work to provide the highest quality, patient-focused care (See **Table 8-1** below). Thirty- five percent of BMC's employees live within the City of Boston and 10% live in six core workforce neighborhoods (Mattapan, North Dorchester, Roxbury, South Dorchester, South Boston, and the South End). BMC offers employees competitive wages and benefits, educational assistance and tuition reimbursement, and skill-based training seminars including cultural diversity forums.

Table 8-1 BMC Employment (FY19)

	Full-Time	Part-Time	Total
Total Employees	7,168	1,901	9,068
Residents of Boston	2,610	548	3,157
Core Neighborhoods*	821	59	926
*** Zip Codes 02210, 02111, 02118, 02119, 02120, and 02121**			

BMC provides a wide range of workforce development and educational opportunities for its current employees and people wishing to gain the skills necessary to become BMC employees. BMC's workforce development program results compare favorably to benchmarks established by the Massachusetts Department of Education and the U.S. Department of Labor.

BMC connects profoundly to its slogan, "we are the community that we serve," and strives to fulfill this mission by addressing the following:

- BMC encourages broad neighborhood economic development that connects with residents one at a time;
- BMC targets workforce development programs to reach BMC employees from the six Core Workforce Neighborhoods – Mattapan, North Dorchester, Roxbury, South Dorchester, South Boston, and the South End;
- BMC tracks a cohort model – from youth to pre-college to graduate level – thereby increasing expectations, peer support, and performance;
- BMC strives to increase the number of minority health care professionals in Boston;

- BMC mirrors the career advancement “road map” recommended by the Institute of Medicine/National Academy of Sciences; and

- BMC focuses on professions related to volume goals via enhanced patient access for minorities and the underserved (Medical Interpreter, Patient Access Representative, and Health Care Manager).

BMC attempts to break down workforce development barriers with calibrated, neighborhood-oriented opportunities by including:

- On-site courses introducing health care job skills;

- On-site college prep, certificate, and degree programs;

- Up-front payments to colleges and money for books, childcare, and “unrecognized” educational expenses through President Scholarships;

- Win/Win tuition reductions, including bulk purchase of courses by BMC to reduce costs per credit; and

- Promotion of “BMC Employee Scholarships” and connections with a diverse audience who reside in or grew up in Boston.

BMC reaches many objectives through its commitment to expanding workforce options and educational opportunities for its staff. Since April 2005, the following achievements were documented:

- BMC/PATH Partnership (“Youth Pipeline”): nine students completed the first cycle of internships in challenging roles;

- On-Site College: 161 BMC employees participated in courses located at the BMC campus;

- Off-Site College: 500 employees participated in college courses at affiliated institutions (Cambridge College, Northeastern University, and Roxbury Community College) or at Boston University MET College;

- President’s Scholarships: BMC awarded 36 scholarships totaling $75,000 (average award: $2,083). Nineteen recipients are Boston residents, of whom 16 live in the Core Workforce Neighborhoods of Boston;

- Development: Over a 5-year period (FY 2005 – FY 2010), BMC will have engaged 1,720 employees in Workforce Development;

- Career Advising: 425 employees have participated in career advising services;
- Associate Degree Course Enrollments: 350 employees are enrolled in associate degree courses;

- Bachelor and Graduate Degree Course Enrollments: 188 employees have been or are enrolled in programs since April 2006.

BMC supports its employees' career and educational goals by providing access to tuition reduction programs at partnering schools, which can then be combined with BMC's tuition reimbursement programs.

- Drexel University: In 2011, BMC established a partnership with Drexel University Online to offer educational opportunities to staff and their family members. BMC staff can earn a top-ranked degree or certificate and receive special tuition rates when they enroll in one of Drexel's distinguished online programs. Employees may also be eligible for tuition assistance for job-related programs through BMC's benefits policy and deferred tuition payment plans through Drexel.

- Boston University Metropolitan College: In 2006, BMC and Boston University's Metropolitan College established a preferred educational partnership. This relationship has allowed BMC professionals to refine their skills and enhance their careers at one of the nation's most prestigious academic institutions. Metropolitan College offers a wide range of on-campus course to BMC employees at a 50 percent tuition reduction.

- Utica College: Through Boston Medical Center's partnership with Utica College, staff can earn an advanced degree entirely online. The flexible online format allows staff to take classes at their own pace, on their own time. Develop new skills and abilities that can apply immediately to current roles in the organization.

- Walden University: In 2019, BMC has partnered with Walden University providing an opportunity for employee to pursue a degree in a diverse array of settings, including healthcare services, research, and education.

- Regis College: BMC has entered a partnership with Regis College. Staff receive certificates such as the Perioperative Nursing Certificate Program, masters, and doctoral degrees offered by the college. Regis is known for its nursing programs, but also offers programs in health administration, organizational communication, occupational therapy, and counseling.

- Tuition Reimbursement: BMC offers tuition reimbursement to eligible employees. Depending on their status, employees may receive up to $5,000 per academic year for college studies related to a BMC career.

- Both represented and non-represented employees can use tuition reimbursement benefits to attend the accredited college or university program of their choosing. Benefits can be applied to participation in a certificate- or degree-granting program or can be used for individual classes that enhance an employee's skills or provide career or educational exploration. **Table 8-2** shows Tuition Reimbursement Utilization**.**

Table 8-2 Tuition Reimbursement Utilization

FY19	Associate	Baccalaureate and Above	Certificates
Nursing Union	0	79	14
Non-Union	0	132	15
Total	0	211	29
FY20	**Associate**	**Baccalaureate and Above**	**Certificates**
Nursing Union	n/a	160	18
AFSCME Union	0	33	0
Non-Union	0	139	15
Total	0	332	33

BMC employees who are represented by 1199SEIU-Service are eligible for tuition reimbursement and other educational costs through the Training and Upgrading Fund.

The Training and Upgrading Fund is a fund supported by the service union 1199SEIU and BMC funds to provide education and training for BMC employees who are in service unions. This includes most entry level employees (general cleaner, unit coordinator, and patient access rep, for example). **Table 8-3** shows utilization of these benefits.

Table 8-3 Training and Upgrading Fund Utilization

	Career Advising	Cohort Classes*	Associate	Baccalaureate and Above
FY10	33	4	120	75
FY11	36	55	52	50
FY12	78	58	98	73
Total	147	117	270	198
*** Cohort classes include: ESOL, Basic Computer Skills, College Prep**				

In addition to Tuition Vouchers and Tuition Reimbursement, the Training and Upgrading Fund provides a variety of educational and career-enhancing opportunities for its members. These opportunities include career advising to help employees explore their career goals while also providing information on healthcare careers with projected growth; College Prep courses which include topics such as time management, test-taking, and developmental math and English; English for Speakers of Other Languages; Basic Computer Skills; and classes for allied health professionals (Medical Terminology, Spanish for Healthcare Providers, CPR/First Aid). **Table 8-4** shows utilization of these benefits.

Table 8-4 Tuition Reimbursement Utilization

FY19	Full-Time	Part-Time	Grand Total
Associate's Degree	60	28	88
Bachelor's Degree	18	7	25
Master's Degree	10	0	10
Grand Total	88	35	123

As a leading partner in the community, BMC continues to foster relationships with community organizations, professional organizations, schools, and community centers to ensure that the hospital is a respected and integral part of the Boston community and to encourage the support and education of Boston's youth.

BMC demonstrates its commitment in the following ways:

- Exercising corporate social responsibility by promoting and providing training opportunities to youth who live in and attend schools within city neighborhoods so they may gain a better understanding of the business of healthcare and help to influence their career choices and their futures.
- Supporting community events and activities.
- Engaging in a variety of outreach activities that bring value to the community and promote BMC's reputation as an attractive employer and as an "Exceptional" healthcare provider.

BMC has established relationships with schools, school programs, community organizations, and professional organizations. Below are some examples of programs that BMC participates in:

Youth Programs and School Partnerships

- Christo Rey Boston Corporate Work Study Program where students provide services for the organization while gaining valuable work skills and exposure to working in a business environment. Most (65%) of the students live in Boston and are from diverse backgrounds.

- Madison Park/Possible Project is an innovative partnership to ensuring students gain hands on training in clinical assessment and support service roles at BMC. Following their training, students can apply and receive employment at the end of the academic year.

Community Partnerships/Organizations

- Morgan Memorial Goodwill Industries provides exemplary job training and related services to help individuals with disabilities and other barriers to self-sufficiency to achieve independence and dignity through work. BMC staff members serve on the general board of trustees, advisory board, and attend career workshops.

- Patient and Family Advisory Council (PFAC) was established to meet BMC's mission of providing "Exceptional Care, Without Exception" through enhanced partnership between patients, families, caregivers, and staff. Members of the PFAC are members of the community BMC serves, employees, patients, and their families.

- YMCA Training, Inc. provides adults with job skills training to help them obtain living-wage employment. Fifty percent of Training, Inc.'s participants are Boston residents. Of the Boston residents, 82% are people of color. BMC and YMCA Training, Inc. have enjoyed a mutually beneficial partnership for more than 12 years by participating in customer service training for interns, offering internship opportunities, and providing a BMC representative to serve on the Partners Council. BMC hired 65 graduates of YMCA Training, Inc. since 1999 and hosted more than 33 interns in the past 5 years. BMC has been Training, Inc.'s Employer of the Year for 6 consecutive years.

- Big Sisters of Boston hosts annual recruitment of Big Sisters from the BMC Campus. More than 40 BMC leaders sign up each year to participate in the Big Sister recruitment event.

- Boston Area Health Education Center has a unique partnership with BMC and send interns to work at BMC for a period of 6 weeks. These are high school students looking to gain clinical experience in healthcare.

- YearUp has BMC as a corporate partner that provides internship and work opportunities or participants in the YearUp program.

Professional Organizations/Partnerships

- Asian American Civic Association (AACV), operating since 1967, provides limited English speaking and economically disadvantaged people with education, occupational training, and social services enabling them to realize lasting economic self-sufficiency.

- Association of Latino Professionals in Finance and Accounting (ALPFA) provides a venue for outreach to Latino professionals and managers. BMC is a corporate member of the Boston Chapter and participates in networking events throughout the year.

- Commonwealth Compact is an initiative embraced by several companies and organizations to make Massachusetts a location of choice for people of color by (1) increasing the representation of people of color and women throughout organizations,

especially in management, senior management, and board governance positions; (2) retaining and promoting people of color and women; and (3) encouraging organizations to reflect, and connect with, the diversity of the communities and customers we serve. BMC is one of the 111 original signers of 2007 and maintains an active presence at meetings and events sponsored by the Commonwealth Compact.

- New England Regional Black Nurses Association, Inc. (NERBNA) is a part of the national effort to unify, educate, and increase the number of African American Nurses in this country. NERBNA is dedicated to investigating, defining, and determining the health care needs of African Americans throughout New England. BMC participates in the annual "Excellence in Nursing-Black Nurses Day" recognition award program and recruits at the annual conference.

- YMCA Achiever Award is presented each year to a select group of diverse individuals who are nominated by their employer for their career accomplishments in their profession and in their service to the community. This award recognizes employees, with an emphasis on African American, Hispanics/Latinos, and South Asians, who, in partnership with their employers, commit time and talents to the development of young people. BMC has participated in this program since 1996.

- National Association of Health Services Executives (NAHSE) is a non-profit association of Black health care leaders and elevates the quality of health care services rendered to minority and underserved communities. BMC is a corporate member and has been a supporter of NAHSE on a national and local level by hosting and attending programs and local chapter meetings, recruiting and placing student interns and fellows, and hiring them as employees.

Awards and Recognition

BMC's exceptional work was recognized with a variety of awards and accolades in FY2019

- For the first time, BMC Health System was named a Top Woman-Led Business in Massachusetts by The Boston Globe and Commonwealth Institute
- BMC was named one of the 150 Top Places to Work in Healthcare by Becker's Hospital Review and was also named one of the Top 100 ACOs to Know
- BMC received Top 25 Environmental Excellence Award and Circles of Excellence Award from Practice Greenhealth
- BMC was awarded an 'A' Spring 2019 Safety Grade from The Leapfrog Group and received an 'A' in patient safety from The Leapfrog Group's Fall 2018 Safety Grade
- BMC was among 64 organizations to achieve "Top Performer" status on giving and Benchmarking from the Association for Healthcare Philanthropy
- BMC was named a LGBTQ Healthcare Equity Leader by the Human Rights Campaign
- BMC was recognized among 22 organizations by the American Medical Association for efforts to address physician burnout
- BMC won Innovator of the Year and a silver level achievement award from WorkWell Massachusetts

8.1.2 Projected Employment over the Term of the IMP

BMC estimates approximately 200 to 400 FTE's may be added for the proposed clinical projects anticipated during the first five-years of the IMP term (e.g., Yawkey 6th Floor Addition, Menino 9th Floor Addition). As a result of redesigning healthcare models to integrate the medical, behavioral and social needs of its patients, this may require new FTE's for outpatient services which require a more team-based care model.

It is likely that if the larger new construction clinical projects are undertaken towards the end of the ten-year IMP term, (e.g., the New Inpatient Phase 2 and New Administration/Clinical Building), approximately 900 to 1500 FTE's may be added.

9.0 PUBLIC BENEFITS

Boston Medical Center (BMC) provides numerous public benefits to the City of Boston. The IMP projects will directly enhance the Proponent's ability to administer the services that support its mission within the community.

9.1.1 Community Benefits Introduction

As previously noted, BMC's mission is to "provide consistently excellent and accessible health services to all in need of care regardless of status and ability to pay." Approximately 57 percent of BMC's patients come from underserved populations, including low-income families, elders, people with disabilities, and immigrants. Fifty-seven percent of all patients are from racial and ethnic minority populations and 32 percent do not speak English as a primary language. Unwavering in our commitment to address the health needs of our diverse patient population, BMC provides a wide range of services beyond the traditional medical model. Core to fulfilling our public health mission and consistent with the Community Health Needs Assessment (CNHA) findings, the goals of our community benefits program are to improve access to health services and improve health outcomes for underserved populations in our community. Key findings that emerged from the CHNA included health care access, chronic disease and risk factors, mental health and substance abuse, and violence. Driven by the social determinants of health that impact health outcomes among our patients and community, the goal of our community health improvement activities, or community benefits, is to improve community health.

These programs, including but not limited to, patient navigation, interpreter services, and a food pantry, help reduce barriers to accessing health services and eliminate disparities in health care among the various populations BMC serves.

With more than 25,816 admissions and 1,077,630 patient visits per year, BMC provides a comprehensive range of inpatient, clinical, and diagnostic services in more than 70 areas of medical specialties and subspecialties. The largest 24-hour Level I trauma center in New England, BMC's Emergency Department has more than 139,577 patient visits annually.

BMC serves the urban community of Greater Boston. The majority of the communities that BMC serves are Boston census tracts that are federally designated medically underserved populations. Although Massachusetts' universal care enables individuals to seek care at any hospital, BMC remains the largest safety net provider in Boston and New England. The implementation of universal care did not reduce the real number or percent of underserved communities served by BMC. An estimated 20.5% of Boston residents live below the federal poverty level.

BMC values its diverse patient population and is committed to honoring their ethnic, religious, and cultural differences. For those who do not speak enough English to safely receive their medical information and care in English, or those who have visual, speech, or hearing impairments, BMC's Interpreter Services Department works to ensure effective communication between our staff and patients. The Interpreter Services program at BMC is the most extensive in New England as well as one of the largest and oldest in the United States. A team of 60 professional medical interpreters or language facilitators are here to help patients in many languages. Professional person to person medical interpretation services are available in more than 16 languages 24/7 so that patients have the opportunity to speak with their

providers in their preferred language. The program uses the latest advances in technology, such as telephonic and video interpreting, to provide services in 250 languages. Last year, BMC handled approximately 200,000 requests for interpreter services.

BMC is committed to addressing health disparities, an issue for the Boston health care community that has been brought to the forefront by several reports and government commissions in recent years. This commitment is reflected in investment in new facilities, technology, and equipment to ensure that patients have access to state-of-the-art care; in cultural competency training for clinical and non-clinical staff and managers; and in specific projects reaching into the community or addressing disparities within disease areas.

In addition to health care services, BMC provides a wide range of social services to meet the basic needs of the many vulnerable people it serves. Leveling the health care playing field for patients goes beyond commitment to providing exceptional health care without exception: BMC realizes that it must work in a multidisciplinary fashion and at multiple levels of patients' needs to help secure its patients' health. BMC services have evolved over many years, including at its predecessor institutions, to provide benefits and services in light with its public health mission. Many programs that started at BMC – like the Reach Out and Read program and the Medical Legal Partnership I Boston – are now nationally replicated models to improve the health and development of vulnerable populations.

BMC's Community Benefits program is not formalized in a specific Community Benefits Plan. The BMC Board of Trustees, BMC senior management, the Boston HealthNet Board of Directors, and individual department leaders annually prioritize programs and services for the vulnerable populations they serve. BMC categories Community Benefits programs by the themes of ensuring access to health care for underserved populations and securing the fundamentals of health in key areas of public health concern. These programs receive significant, dedicated budgetary support from the hospital, Boston HealthNet health centers, or BMC departments in addition to philanthropic or grant funds. There are numerous other community services provided at BMC and in the community by BMC employees and medical staff to foster community health. Many of these programs are supported at the departmental level or through grants, philanthropy, or volunteerism.

9.1.2 Needs Assessment

Unwavering in our long-standing commitment to address the health needs of our community, Boston Medical Center (BMC) has developed programs and initiatives beyond the traditional medical model. Core to fulfilling our public health mission and vision for health equity, our Community Benefits Programs and Initiatives aim to improve health outcomes among underserved populations in our community.

In 2019, BMC conducted a comprehensive Community Health Needs Assessment as a collaborator in the Boston CHNA-CHIP Collaborative, a new initiative created by a number of stakeholders—community organizations, health centers, community development corporations, hospitals, and the Boston Public Health Commission. The Collaborative aimed to undertake the first large-scale collaborative city-wide Community Health Needs Assessment (CHNA) and Community Health Improvement Planning (CHIP) process.

The Collaborative CHNA focused on the social determinants of health using a health equity lens. The influences of race, ethnicity, income, and geography on health patterns are often intertwined. In the

United States, social, economic, and political processes ascribe social status based on race and ethnicity, which may influence opportunities for educational and occupational advancement and housing options, two factors that profoundly affect health. Institutional racism, economic inequality, discriminatory policies, and historical oppression of specific groups are many of the root factors that drive the health inequities we see in the U.S. today.

The CHNA used a participatory, collaborative approach that engaged the community through different avenues. Over 100 Collaborative members representing health care, public health, education, community development, social service, and community-based organizations provided input throughout the CHNA process and played an integral role in data collection efforts. Data collection efforts were focused on engaging hard-to-reach populations who are not typically engaged in these processes or represented in the secondary data.

Existing data were drawn from national, state, and city sources, such as the U.S. Census, Massachusetts Department of Public Health, and Boston Public Health Commission, including datasets such as the Boston Behavioral Risk Factor Surveillance System (BBRFSS). For new data collection, over 91 organizations and 2,404 individuals were engaged in and completed a CHNA community survey administered online and in-person in seven languages, 13 focus groups with a total of 104 community residents, and 45 interviews with organizational and community leaders to gauge their perceptions of the community's needs, strengths, and opportunities.

BMC, other Collaborative members, community members, and community stakeholders undertook a transparent process to distinguish the most pressing community health needs based on the data collected for the CHNA.

A 100-member work group, comprised of representatives from the health care, public health and social service sectors together with community leaders and residents, selected the following shared values to guide prioritization of the CHNA findings: 1) burden: how much does this issue affect the health of Boston; 2) equity: will addressing this issue substantially benefit those most in need; 3) impact: can working on this issue achieve both short- and long-term change; 4) feasibility: is it possible to address this issue given infrastructure, capacity and political will; and 5) collaboration: are there existing groups across sectors willing to work together on this issue? Guided by these shared values, the work group distilled 19 issues identified by the CHNA into four key issues. These shared priorities informed BMC's 2019 Implementation Strategy which serves as our roadmap for Community Benefits Programs and Initiatives for the next three years. BMC has identified six key issues, including the four identified by the Collaborative, which our community benefits programs and initiatives will address over the next three years:

- Access to Services
- Housing
- Financial Security and Economic Mobility
- Violence and Trauma
- Behavioral Health and Substance Use Disorder
- Food Insecurity

9.1.3 Promotion of Community Health

Health Care Access

Birth Sisters and Centering Pregnancy

BMC has developed two programs, Birth Sisters and Centering Pregnancy, to improve health outcomes of childbearing women at risk for poor maternal and infant outcomes. Birth Sisters are women who are trained to provide social support and education to mothers from their own communities during pregnancy, labor, and the postpartum period. The Birth Sisters program has been linked to significantly higher breastfeeding rates and fewer cesarean deliveries. Centering Pregnancy is an innovative and proven model of care that offers prenatal care in 12 two-hour group sessions using a curriculum modified to meet the complex social needs of BMC's population. At these sessions, beginning early in the second trimester, patients receive health visits, prenatal and parenting education, and peer group support all in one visit. The programs served over 253 patients in FY19.

Boston Center for Refugee Health and Human Rights (BCRHHR)

The mission of the BCRHHR is to provide comprehensive health care for refugees and survivors of torture and related trauma, coordinated with legal aid and social services; to educate and train agencies and professionals who serve these communities; to advocate for the promotion of health and human rights in the United States and worldwide; and to conduct clinical, epidemiological, and legal research for the better understanding and promotion of health and quality of life for survivors of torture and related trauma. The BCRHHR served 484 patients in FY19.

Child Life Program (CLP)

The Child Life Program assists children and families in managing the stresses associated with hospitalization and illness. The CLP team members are all trained developmental specialists, aiming to support children and families through the hospital experience. The goals of the CLP are to: help children express their feelings through play in a safe and supportive environment; advocate for children, offering support to effectively work through pain management; offer children developmentally appropriate choices that increase feelings of independence, self-esteem, and trust; and assist with implementation of coping techniques during stressful situations. The CLP currently covers the areas of Inpatient Pediatrics and the Pediatric Intensive Care Unit, Pediatric Ambulatory Care Clinic, Pediatric Emergency Department, and Pediatric Otolaryngology/OR; we will be adding a position in 2019 for Radiology. The team remains a consult service to children of adult families as needed.

Clothing Bank

BMC's social workers access the clothing bank in real time when a provider contacts Social Work about a basic clothing need (sweatpants, shirts, underwear, socks, shoes, and winter coats) for a low-income patient.

Center for the Urban Child and Healthy Family

The Center for the Urban Child and Healthy Family was established by the Department of Pediatrics in 2016 to develop innovative ways to meet the complex health and social needs of children and their families. The Center's mission is to achieve dramatic improvements in outcomes for children and families facing adversity such that all children have an equal opportunity to be healthy, ready to learn, and to achieve their full potential. This will be achieved through developing, testing, and scaling novel health

delivery approaches that serve children with their caregivers and that bring communities, child-serving sectors, and health providers together across disciplines. The Center aims to build the Pediatric Practice of the Future through fundamental systems change - creating & scaling novel health delivery approaches and working with families, inter-disciplinary colleagues, communities, and other family-serving sectors.

The Center has set a goal that by 2028, all children cared for by BMC Pediatrics are healthy and ready to learn—with adequate supports to thrive—by age five. To achieve this goal, the Center co-developed a new model of pediatric primary care- the Pediatric Practice of the Future - with families and pediatric providers. This model supports whole family development with attention to factors influencing well-being and bringing together care in a systematic, equitable way to promote wellness throughout the life course. The Center is piloting the new model with families with newborns and collecting data to understand its impact. The pilot launched in January 2020 and has enrolled 20 of the target 50 families. Ultimately, a financially sustainable model will be scaled to the larger primary care practice. In addition, the Center is partnering with BMC HealthNet Plan, BMC's health insurance program, to test alternative payment models to ultimately redefine value in pediatric care.

Elders Living at Home Program (ELAHP)

The goal of ELAHP is to help older adults who are homeless or at risk for homelessness secure and maintain a permanent residence and live as independently as possible. ELAHP served 262 clients during the 2019 fiscal year. Of this number, 128 received housing search and placement services; 101 received housing stabilization services; 72 received homelessness prevention assistance; 38 received nutritional assistance; and 75 clients were served through the Living Well at Home Project, a community-based complex care management pilot designed to improve health outcomes for frail residents of an elderly/disabled housing complex in Roxbury. Some clients received more than one type of service. All clients suffer from at least one chronic illness, and 252 suffer from two or more disabling medical conditions. Remarkably, all of the program clients who were placed in housing and all who received stabilization services have remained safely housed during this period. Of those clients who received homelessness prevention services, all but one case was successfully resolved. One client was too far along in the eviction process for us to intervene successfully; however, we were able to assist her in relocating to Maine to live with her daughter. Over the last ten-years, the success rate of ELAHP's stabilization services is 98%.

Grow Clinic

The Grow Clinic was founded in 1984 within BMC's Dept. of Pediatrics. The primary goal of the Grow Clinic is to provide comprehensive multidisciplinary medical, nutritional, social services and developmental support to children from the Greater Boston area diagnosed with Failure to Thrive (FTT). Children with FTT have significant difficulty growing because of malnutrition associated with illness, poverty, and other family stressors. The effects of FTT include shortened attention spans, emotional problems, delayed cognitive development, lasting growth failure, and frequent serious illness, which can result in hospitalization. The Grow Clinic provides medical treatment, nutritional assessment, home health education, social service advocacy, developmental referrals, access to BMC's therapeutic food pantry, nutritional supplements, children's clothes, diapers, books, and educational toys, among other services. There are approximately 200 children treated annually by the Grow Clinic. In FY2019 there were 90 new patients. Twenty-three percent (23%) of clinic patients were 12 months of age or younger; the average age at referral was 32 months; and the average length of treatment was 24 months. There were 1,010

total clinic visits during this period. Approximately 6% of patient families were homeless and living in shelters. Clinicians made 523 home visits in FY19. All patients demonstrated improved growth, and 80% demonstrated significant weight improvement.

Immigrant Health Center

For over 20 years, the *Boston Center for Refugee Health and Human Rights* (BCRHHR) in the Department of Psychiatry has lived this mission, providing not only trauma-informed mental health care to one of BMC's most vulnerable patient populations – survivors of torture – but also working with their clients to address some of their most pressing social needs such as housing, food security and career development services. For many patients, BCRHHR has become not just a medical clinic, but a health home where they are welcomed, safe, respected and cared for. Despite the difficult experiences and circumstances BCRHHR's clients have endured, their resiliency is continually inspiring, as many have gone on to launch careers, get green cards, achieve remission from PTSD and lead healthy, happy, and fulfilling lives. From day one, the BCRHHR has been a key partner in visioning the BMC Immigrant Health Center (IHC), lending their decades of experience to inform the development of this center.

The BMC Department of General Internal Medicine has also been a leader in caring for newly arrived immigrant and refugee patients through the *Immigrant and Refugee Health Program* (IRHP). The program serves the complex needs of these patients in a culturally sensitive and multidisciplinary setting, offering integrated medical and mental health, medical case management, women's health specialty services, and care coordination. The IRHP has a broad mandate to improve the physical health of any immigrant or refugee patient who comes to the program through the provision of culturally appropriate and trauma-informed primary care services, while also addressing those social factors that are an inextricable part of our patients' health stories such as immigration legal needs, health literacy or English language skills. The Immigrant & Refugee Health Program provides comprehensive primary care services to immigrant and refugee patients. The team of clinicians takes care of general healthcare needs through regular check-ups, immunizations, and screenings, as well as through providing care for illnesses and injuries. If needed, the team will coordinate patient care with a specialist for a more serious health issue. Foreign and sign language interpreters are available to help patients communicate with the staff. The practice provides on-site interpreters and over the phone interpreters for more than 250 languages. The program also offers access to psychiatric and case management support to provide care for the wide range of patient needs. Boston Medical Center's Immigrant and Refugee Health Program sees over 400 new immigrant, refugee, and asylum seeker patients per year and has an overall long-term primary care patient population of about 2,200.

Because these programs share a vision and perspective that whole health must include physical, mental, and social wellbeing, it was natural that they should integrate together in order to build one cohesive BMC Immigrant Health Center. In launching the Immigrant Health Center (IHC), we created a single-entry point where any immigrant or refugee patient can go and be quickly connected with all of the physical, mental, and social services they need to heal, rebuild, and thrive. By joining our programs under one medical home model, we ensure that all clients are offered a full menu of services, access these services in an efficient way, and are supported by knowledgeable, caring staff who will walk with them to navigate the healthcare system.

Integrative Medicine

Started in 2004, the Program for Integrative Medicine and Health Care Disparities at BMC combines conventional medical treatment, complementary therapies, and lifestyle changes. The core purpose of this program is to pioneer a widely accessible, multicultural, cross-disciplinary, national model of integrative health for all through clinical services, education, research, and advocacy. Complementary therapies include yoga, massage, acupuncture, herbal therapy, dietary supplements, meditation, hypnosis, chi gung, tai chi, and reiki. The program offers all clinical services and classes at little or no cost.

Margaret M. Shea RN Adult Day Health Program

The program holds a license under the Department of Public Health #D06M and offers families peace of mind and a support system to help them care daily for a family member unable to function alone during the day. The program offers intervention programs that provide services in an ambulatory, home-like setting for adults who do not require 24-hour institutional care but, because of physical and/or mental impairment, are not completely able to live independently or remain at home, allowing family members the opportunity to continue to work while their loved one is at a program during the day. A referred participant can look forward to program offerings such as nursing interventions, social services, therapeutic activities, and transportation to and from the program. The program serves 60 individuals with a daily census of 42 patients; participants attend the program up to five times per week with a minimum requirement of two days a week.

Pediatric Assessment of Communication Clinic (Autism Program)

The Autism Program at BMC is a multidisciplinary, multi-tiered, comprehensive, and culturally competent program that is uniquely equipped to meet the complex needs of patients and families. Our team, comprised of a Program Coordinator, Autism Resource Specialist, multilingual Family Navigator (FN) and Transition Navigator (TN), offers specialized outreach, training, and advocacy services, forms effective partnerships with schools, collaborates with local support organizations and draws upon a deep knowledge base of social service agencies to facilitate linkages to resources. Our FN works intensely with patient families to help ensure timely and appropriate treatment for children, which often includes facing financial and economic concerns, language and cultural issues, patient-provider communication, health care system obstacles, transportation problems, and bias/stigma. Our TN provides transition-aged youth (14-22 years old) and their families with information, guidance, and resources regarding the transition from school services to adult life and discusses topics such as goal setting, school IEP planning, adult services, and life skills development. The BMC Autism Program also has a well-established social media presence on Facebook, Twitter, Pinterest, and Tumblr—which each serve as further venues to provide resources, information, and guidance to families. The Autism Program has supported over 8,000 family referrals since its inception in 2007 and approximately 1,200 in FY19.

Pediatric Comprehensive Care Program (CCP)

CCP served a panel of approximately 575 children with special health care needs and their families in FY19. The clinical staff integrates primary care with specialty care and social services for children with neurodevelopmental and emotional/behavioral needs related to pre-term birth, congenital syndromes, and chronic health conditions, and/or have experienced trauma as a result of abuse/neglect, parental abandonment, domestic violence, and parental substance abuse. Most of the children seen in the CCP have complex overlapping health, development, and emotional/behavioral issues. Many low-income parents of special needs children tend to engage haphazardly and episodically with the healthcare

system and fail to receive appropriate follow-up care and intervention. These parents often face economic hardships, educational barriers, psychosocial stigma, and social isolation as they try to cope with their children's needs and attempt to maintain stability for their families. The CCP, with its multidisciplinary approach, sees from 6 to 8 patients per provider per session, considerably less than the 10-12 patients per session in a regular pediatric clinic. Additionally, these team primary care visits allow for attention to routine health maintenance as well as updating complex care coordination; patients may also see a neurologist, pulmonologist, nutritionist, gastroenterologist, and/or a pediatric endocrinologist, when indicated. The program also utilized two family navigators as mainstays of their capacity to achieve high-touch care management and address the social determinants of health. This "one stop shopping" model of care promotes communication between all members of the child's healthcare team.

Pediatric Pain Clinic

The Pediatric Pain Clinic at BMC manages acute, complex, and chronic pain in children from infancy to age 22. Our team of experts work closely with each patient's primary care physician, striving to help children regain normal lives and participate in typical age-appropriate activities. The Pediatric Pain Clinic is able to treat a wide variety of conditions and offer a variety of specialized therapies. Each patient is given a personalized pain management plan to best fit their needs. Strategies and parenting support are also offered for families who may travel a long distance to receive this specialized care. The team communicates with schools and outside providers to ensure comprehensive and collaborative care. In FY19, the clinic treated approximately 100 new patients.

Preventive Food Pantry and Teaching Kitchen

The Preventive Food Pantry and Teaching Kitchen address hunger-related illness and malnutrition among a low-income, largely underserved, and vulnerable patient population of Greater Boston. Individuals at risk of malnutrition are referred to the program by BMC or Boston HealthNet physicians or nutritionists who provide "prescriptions" for supplemental food that best promotes physical health, prevents future illness, and facilitates recovery. The pantry staff members are fluent in four languages and has been essential in assisting BMC's many refugee and immigrant patients. The Food Pantry now provides nutritional food prescriptions to approximately 6,794 people each month. In FY19, the Pantry provided nutritious food for more than 83,000 Greater Boston residents. Approximately 12,000 to 18,000 pounds of food supplies are required weekly to stock the Pantry shelves at BMC. This equates to approximately 8lbs. of groceries per person. The Teaching Kitchen complements the work of the Pantry by educating patients about nutrition through cooking methods that are compatible with their medical and dietary needs, as prescribed by their physicians. An annual survey conducted by the Pantry resulted in a 93% satisfaction rating by patients for 2019.

Rooftop Garden

In April 2017, BMC opened its Rooftop Farm, to meet the growing need to provide our patients with more fresh produce. The Rooftop farm has 2,400 ft2 of growing space located on top of BMC's Albany Street power plant. The farm produces crops such as spinach, collards bok choy, radishes, Swiss chard, kale, tomatoes and much more. In addition to produce, the farm also has 2 beehives which provide 70-150 pounds of honey to the hospital each season. The farm saw over a thousand visitors last year who came for tours, volunteering, summer camp and educational classes, which are all offered for free to the community. The farm produces between 5,000-6,000 pounds of fresh produce each growing season, which is used in the Teaching Kitchen, Cafeterias, Food Pantry, and in-hospital Farmers Market.

Shuttle Buses/Taxis/Uber

Community access to BMC is enhanced through a free shuttle bus service. Four buses circulate throughout the system on established routes, from 7am-7pm Monday through Friday, bringing patients to BMC. A Pilot Uber program has been implemented to service 10 additional Boston HealthNet Health Centers. There is also a direct taxi and van hospital-to-home service for specific cases.

StreetCred

BMC's StreetCred program addresses child poverty by linking low- to moderate-income pediatric patient families to anti-poverty safe-net programs. StreetCred provides free tax-preparation services through well-trained staff and volunteers, who work with families to prepare their taxes and access the EITC and other tax-based programs—for example, SNAP or the FAFSA—for which they may be eligible. The United States Federal Earned Income Tax Credit (EITC) is a refundable tax credit for low- to moderate-income working individuals, particularly those with children. In FY19, the StreetCred program filed over 1,000 returns and provided over $2,000,000 in tax refunds. These tax refunds can have a profound positive impact on a family's household budget and, in cases of financial stress, alleviate significant financial burden.

Housing

At Boston Medical Center, we see firsthand the impact housing insecurity has on the health and wellbeing of our patients. Whether patients and families are homeless, or worried about where they will sleep next week, housing insecurity is intractably linked to food and job insecurity, as well as serious health impacts such as substance use disorder, behavioral health, hypertension, and in children, asthma and failure to thrive. Without housing, it's difficult for patients to maintain regular health care and take their medications, and for children to go to school. When patients and families come through our hospital doors, what they often need is a prescription for housing, not for medicine.

Determination of Need (DoN)

In December 2017, BMC announced it would devote its entire $6.5 million Determination of Need (DoN) community health benefit toward housing partnerships to support a variety of approaches, from new, mixed-income housing construction to supportive clinical care in existing housing. The success of BMC's DoN initiative has led to a number of key partnerships, investments, and collaborative programs that have been leveraged to build community trust and has demonstrated BMC's leadership in addressing challenges around housing stability.

Bartlett Station, a development by Nuestra Comunidad Development Corporation and Windale Developers, is an innovative urban mixed-use development with 323 housing units (market rate and affordable rental) and 46,000 ft^2 of retail, green space and public plaza located in Roxbury's Dudley Square. BMC provided year 1 of an operating subsidy for an outreach manager to build relationships and engage with the community in anticipation of the opening of Good Food Market, a grocery store dedicated to developing retail solutions that work in, and for, food desert communities. Additionally, BMC provided a $1.4 million zero interest loan to support the Good Food Market, which is expected to open in summer 2021.

The Waldeck Building, acquired by Codman Square Neighborhood Development Corporation, is a 59-unit distressed property that is located in Fields Corner, Dorchester. Three buildings located on Waldeck

Street provide 35 units of permanent supportive housing for individuals with mental health and/or disability issues. BMC is providing an operating subsidy.

New Franklin is a housing development located in Franklin Field, Dorchester. BMC is supporting one full-time Community Life Program Coordinator (sometimes known as resident services), a new position that serves New Franklin residents and those who live in the surrounding community and provides supervision and data tracking. BMC has worked with The Community Builders and the Community Life Program Coordinator to understand the health and wellness needs of the New Franklin development community and create linkages to healthcare and supportive services.

Smith House, at Madison Park Community Development Corporation, provides 132 apartments for the elderly. BMC is supporting one nurse, and one full-time Elders Living at Home Program senior care coordinator, a new position located at Smith House, who helps clients maintain a permanent residence and live independently.

BMC is supporting one full-time service coordinator, a new position at Madison Park Village's *Dewitt Community Center*, whose role is to provide health and wellness programming to residents and community members. The Dewitt Center is a new facility with 21,374 square feet of community space at Madison Park Village in Lower Roxbury and has become an important part of Madison Park Village community life offering programming for children, youth, families, adults, and elders, including Technology Classes, Health and Wellness Workshops, and Senior Fitness Classes.

Through BMC's Elders Living at Home Program (ELAP), a Community Wellness Advocate (CWA) and registered nurse are embedded at both Smith House and Madison Park Village to improve health outcomes for residents and increase access to services and supports. We have learned much from this project, which has become the template for our newest partnership at the Manning Apartments in Cambridge.

This model has been so successful, that BMC is partnering with the Cambridge Housing Authority and Cambridge Health Alliance to place a DoN-funded Cambridge Health Alliance Registered Nurse (RN) and an ELAP CWA onsite at Cambridge Housing Authority's *Manning Apartments* in Central Square, Cambridge.

In coordination with *Boston Housing Authority (BHA)*, BMC invested in modest upgrades to BHA units across Boston to address reasonable accommodations that resulted in more flexible units that better meet residents' health needs, enabling elderly and disabled residents to continue to live independently. BMC also invested in a *Housing Prescriptions* Community Wellness Advocate who is situated at BMC and liaises with BHA when patients are in need of services or eviction prevention.

BMC invested in the *Healthy Neighborhood Equity Fund*, a $22.35 million private equity fund led by the Conservation Law Foundation and the Massachusetts Housing Investment Corporation, is based on a socially responsible investment model that considers the community, environmental, and health benefits as well as the financial risks and returns. Boston projects include Treadmark, Ashmont, Dorchester and Bartlett Station, Dudley Square, Roxbury. This was a one-year investment made in FY18.

In addition to the Healthy Neighborhood Equity Fund, BMC added the *Boston Impact Initiative* to its Social Impact Fund portfolio and is starting the process to make a Solidarity 3 note investment of $10,000 (open to accredited investors and institutions with a 3% annual return over 3 years).

Innovative Stable Housing Initiative (ISHI)

In collaboration with Boston Alliance for Community Health (BACH), Health Resources in Action (HRiA), and the Center for Community Health, Education, Research, and Service (CCHERS), BMC launched the Innovative Stable Housing Initiative (ISHI). With partner hospitals, Boston Children's Hospital and Brigham and Women's Hospital, the $3 million Innovative Stable Housing Initiative investment was created to fund strategic approaches to increase housing stability in Boston.

Three funding streams have been identified: the Flex Fund supports swift access to resources for individuals and families to maintain or attain stable housing; the Upstream Fund supports policy and systems change efforts around stable housing; and the Resident-Led Fund supports a democratized process addressing root causes of housing instability.

The Flex Fund's Total Grant Funds are $1,533,400; it is funded by BMC, Boston Children's Hospital, and Brigham and Women's Hospital. In Year 1, up to $166,200 was available to three agencies/community-based organizations. The first three recipients each received approximately $166,200: *Casa Myrna Vasquez, Inc.*, *Urban Revival, Inc.*, and *Homestart, Inc*.

The Upstream Fund has a total of $927,800 available, funded by BMC and Boston Children's Hospital. Its Year 1 funding totals $600,000 for up to 4 awards. Up to $150,000 for a one-year grant period.

The Resident-Led Fund has a total of $100,000 available, funded by BMC. The first grant (of $100,000) was awarded to the *Center for Economic Democracy*, *Boston Ujima Project*, and *Right to the City* to plan and implement a democratized process that will seek additional grant funding.

Since BMC's initial Determination of Need Investment, BMC has leveraged the opportunity to bring other health systems to the table – most notably through ISHI. With the success of its housing support services collaborations, BMC has been able to use its findings and project model to leverage grant funding toward further expansion of services and housing partnerships.

Housing to Health

The Housing to Health program within the BMC Pediatrics Department deploys a multipronged strategy and set of services designed to meet families where they are and provide tailored assistance and resources to address their specific housing crisis. The program supports housing navigators, social workers, and case managers at BMC and enabled us to develop a partnership with Family Aid Boston to assist patient access to Housing Choice Vouchers and stabilization services. Through the success of this program, 603 families have received multiple services toward achieving and maintaining housing stability.

Complex Care Management/Housing Rx

The Housing Rx program, in partnership with Boston Housing Authority, City of Boston, Cambridge Housing Authority, Medical-Legal Partnership Boston, and a number of non-profit housing providers, creates pathways to housing stability for clinically complex individuals and families. Support includes

housing navigators, legal consultations and advocacy, assistance with public housing application process, access to Section 811 rapid housing units, and post-housing stabilization support.

Boston Opportunity System (BOS) Collaborative

In October 2020, JPMorgan Chase awarded $5 million to the BMC-led Boston Opportunity System Collaborative to bring job training and 250 new and preserved affordable housing units to historically underinvested Boston neighborhoods over the next three years, including Black and Latinx communities.

Chronic Diseases and Risk Factors

Avon Breast Health Initiative

From 2001-2019, the Avon Breast Health Initiative supported BMC's breast program in reducing delays in breast cancer care by addressing patient-level barriers to care through patient navigation. BMC's patient navigation model continues to serve its most vulnerable population and works to mitigate racial and ethnic disparities in breast cancer diagnosis and treatment. Under Dr. Tracy Battaglia's leadership, the patient navigation model has been recognized regionally, nationally, and internationally for its use of evidence-based practices to improve breast care delivery. Since the program's inception, more than 35,000 women have been served. In FY19, the program supported 2,473 patients.

Cancer Support Groups

In 2006, BMC established the Cancer Patient Support Services Fund to provide crucial services and programs to complement patients' clinical care. The fund is used for survivorship programs such as support groups and celebrations, assistance with transportation costs to and from the hospital, patient navigation, and the provision of complementary therapies such as yoga and massage. In FY 2019, there were 14 onsite monthly cancer-specific and population-specific support groups, 2 weekly bereavement groups, and a weekly Amyloidosis support group. There were 4 different exercise classes (from gentle Yoga to Zumba) meeting twice per week to once per month, along with monthly classes in mindfulness, cooking, knitting, and arts & crafts. There was the "Spring-into-Summer" series of 8 special art workshops, along with quarterly feature programs, such as trips to the Museum of Fine Arts, painting workshops, etc. And there were several major annual events, highlighted by the Weekend of Hope retreat in Stowe, VT, where over 150 BMC survivors and guests participated, and the Survivors Celebration luncheon, attended by over 300.

Patient Navigation (PN)

BMC's Cancer Center Patient Navigation (PN) Program was launched in 2005. The main focus of this program is to identify and overcome barriers that play a key role in a patient's treatment compliance and completion. Patient navigators do this by providing advocacy and case management to oncology patients who have at least one identified barrier to care and are undergoing active cancer treatment. PNs work to empower patients by linking them to a broad range of services including, but not limited to, oncology support services, transportation, financial assistance, and appropriate community resources.

Violence

Child Witness to Violence Project (CWVP)

CWVP is a nationally recognized and award-winning mental health counseling, outreach, and consultation program. CWVP specializes in intervention with very young children exposed to domestic or community violence. The program offers both short- and long-term evidence-based treatments that

represent best practice in serving the needs of traumatized children and their families. The program provides a flexible combination of services, including resource advocacy to link families to basic services including health care, childcare, housing, and after-school programs. The CWVP provided referrals, advocacy, assessment, short-term, and/or longer-term clinical care to approximately 315 families each year. In addition to its clinical services, CWVP is engaged in extensive local, statewide, and national training efforts to raise the standard of care for young children experiencing the traumatic effects of violence. The staff have delivered numerous trainings across multiple states and abroad to mental health and other providers across several service sectors and settings, including a presentation at a conference in Prague.

Community Violence Response Team (CVRT)

The Community Violence Response Team addresses the great need for services for victims of community violence and their families, as well as family survivors of homicide victims from the Greater Boston area. Free culturally sensitive and family-focused clinical services provided by the CVRT include crisis intervention, advocacy, case management, and trauma-focused counseling for adults, adolescents, and children (with a focus on age eight and over). CVRT seeks to reduce the effects of trauma by providing therapeutic support throughout the recovery process and ultimately minimizing mental health trauma. CVRT staff reflects the diversity of BMC's patient population. In FY19 the CVRT served approximately 1,000 people.

Domestic Violence Program (DVP)

The DVP provides direct advocacy services for victims of domestic violence, as well as training and education for staff, students, and community groups interested in learning more about domestic violence, its impact on health across the lifespan, and the role we all can play in addressing it. In FY19 the multi-lingual team of 4 Safety and Support Advocates assisted 431 victims and survivors with a range of services including crisis intervention/counseling; risk assessment and safety planning; assistance with accessing protective orders and victim compensation; accompaniment to court, legal, medical, housing and other appointments; referral to community-based DV advocacy/rape crisis counseling, medical/mental health services; emergency financial assistance; and other support as needed. 75% of those served were existing BMC patients, 5% were BMC employees, and 20% were self-referrals from the community. Support groups for women were offered in English, Spanish and (for the first time) Haitian Creole; the English and Haitian-Creole speaking groups were offered in a community-based setting in collaboration with our partners at Codman Square and Mattapan Health Centers.

Throughout FY19, the DV Program Manager provided monthly DPH-approved trainings on Domestic and Sexual Violence to 20-40 BMC nurses per session in order to facilitate their compliance with the MGL Ch. 260 health care provider licensure requirement. In addition, the DVP continued its routine training and consultation on how to support survivors of domestic violence safely and effectively to providers, interns, and students alike from multiple disciplines across the institution, including nursing, law enforcement, medicine, and mental health. Additional consultation and training partners during FY19 included Child Protection Team members as well as those providing services related to STD/HIV counseling and treatment, substance use disorder, and patient navigation/care coordination.

Violence Intervention Advocacy Program (VIAP)

Conceived in 2006 to help stem the tide of Boston's gun and knife violence, BMC's Violence Intervention Advocacy Program (VIAP) has become a vital component of violence intervention in the city and beyond. VIAP's purpose is to help victims heal so they can avoid future violence and build a positive future. To accomplish this, patient victims and their families are paired with a team comprised of a case manager, a mental health clinician, and a family support advocate to help them overcome barriers and turn their lives around. BMC treats 70% of the city's gunshot and stabbing victims, an average of 450 victims per year, with 68% being boys and young men of color. A powerful VIAP innovation is that the intervention with the patient begins in the safety of the hospital, where they are visited by a Violence Intervention Advocate within 48 hours of admission to initiate case management, taking advantage of the "teachable moment" associated with violent injury. As the victim heals, the VIAP team continues a 360-degree treatment program that includes safety planning, counseling, job and educational training, mental health, and family support services. To date, nearly 6,000 victims of violence have been served by this critical program, and while statistics show that the national rate of recidivism (re-presenting to the ED as a victim of violence) averages 30-40% annually, VIAP's recidivism rate is now 7%, showing a significant decline over the past few years.

Mental Health and Substance Abuse

CATALYST Clinic

In May 2016, Boston Medical Center launched the CATALYST Clinic (Center for Addiction Treatment for AdoLescent/Young adults who use SubsTances), a program designed to treat young people aged 25 and under who are struggling with substance use, or who have experimented with drugs and alcohol and may be at risk for developing an addiction.

The CATALYST Clinic team works to provide interdisciplinary, team-based care that includes physicians, a nurse, a social worker, a community outreach navigator, and a program manager. The CATALYST Clinic team works together to offer assessment, diagnosis, and treatment of various substance use disorders, as well as a transition from adolescent to adult care when appropriate. In Fiscal Year 2019, the CATALYST Clinic received approximately 98 referrals to the clinic; 552 have been received since the program's inception.

Grayken Center

Through innovative treatment, education, and research programs, the Grayken Center for Addiction is committed to making long-term recovery a reality for every patient. From policy makers to clinicians to patients and families in crisis, people across the country turn to BMC for expertise in caring for patients with addiction. The Center was launched in 2017 with a generous gift from the Grayken family. This was the largest private gift in the United States in the last decade in the addiction field. Today, the Center serves as the umbrella for all of BMC's work in addiction and is a national resource for revolutionizing addiction treatment and education, replicating best practices, and providing policy, advocacy, and thought leadership in the field. Since the initial $25 million award, the Grayken center has received multiple awards. BMC was one of four sites awarded an $89 million grant from the National Institute on Drug Abuse to lead the MassHEAL initiative. This study aims to reduce opioid deaths by 40% in some of the most heavily impacted Massachusetts communities over the next three years. Through this study, BMC will partner with sixteen communities to bridge gaps in prevention, treatment, and recovery services by

testing the implementation of a suite of tailored programs in order to create a national model aimed at curbing the opioid crisis.

The Grayken Center's mission is to (1) increase BMC's reach in developing and testing new care models, bringing together experts to establish metrics against which outcomes can be tracked and more advanced data and analytics infrastructure developed; (2) join with key government agencies, lawmakers, and addiction medicine experts to reduce barriers to addiction treatment; (3) increase the pace of innovative research at BMC, already one of the most highly respected addiction research programs in the country, with a body of published work that has transformed addiction care.

Mental Health Diversion Initiative (MHDI)

In FY19, the MHDI has worked with nearly 1,038 individuals with mental health and/or co-occurring mental health and substance dependence whose associated behavior brings them to the attention of law enforcement and courts. The MHDI collaborates with the police and courts to first and foremost identify individuals with these risk factors, and then to connect them with appropriate services and treatment as alternatives to arrest and incarceration. The MHDI trains Boston Police Department and Massachusetts Bay Transit Authority officers to identify individuals with mental illness and how to refer individuals to services instead of arresting them. At the court level, approximately 72 MHDI participants have successfully completed probation rather than being incarcerated.

Faster Paths

Faster Paths rapidly evaluates, motivates, and refers patients with substance use disorders to a comprehensive care network of inpatient and outpatient detoxification, treatment, and aftercare services integrated with mental health and medical care. The goal of Faster Paths is to incorporate and build upon the existing substance use services provided by BMC, filling the gaps in care to create a seamless continuum. Backed by 24/7 access via the BMC Emergency Department (ED), Faster Paths enhances existing capacity to: triage patients into medical care; provide medical and psychiatric examinations to match patients with the right level of care; and ensure access to medication therapy. Licensed Alcohol and Drug Counselors from BMC's Project ASSERT from 8 am to 12 am daily provide intake, psycho-social assessments, and referrals to an array of addiction treatment services and shelters, overdose prevention education and naloxone, harm reduction services, and transportation. A key feature of the center is weekday access to Medication for Addiction Treatment (MAT) in the Faster Paths Outpatient Clinic. Addiction Nurses oversee the office initiation of MAT, including buprenorphine/naloxone induction and injectable naltrexone, with Monday-Friday buprenorphine/naloxone administration available for patients who need MAT and are awaiting placement in an OBAT or a methadone maintenance program. Boston Public Health Commission's (BPHC's) PAATHS (Providing Access to Addiction Treatment, Hope, and Support) recovery navigator assist with linkages to external MAT programs and other community services. 581 patients were initiated on medications/ MAT and of these, 159 were transferred to maintenance programs, and 483 were placed and transported to acute treatment programs/detox. In FY19, the clinic had 7,243 visits.

Project ASSERT

Project ASSERT (Alcohol & Substance Abuse Services, Education, and Referral to Treatment) was established in 1988 to provide greater access to substance use treatment in the Emergency Department (ED) setting and has expanded to include a variety of social and community healthcare support services. Based in the ED, Project ASSERT counsels patients whose alcohol and/or drug use was directly and

indirectly implicated in their need for emergency services. Licensed Alcohol and Drug Counselors (LADCs) consult and collaborate with hospital staff to offer ED patients alcohol and drug screening, brief intervention, and referrals to health and social resources such as substance abuse treatment and primary care services. During the BMC FY19, Project ASSERT served 2700 whom had 5103 LADC visits. As a result of negotiations with the patients, the following services were provided: 1361 unique patients were placed in detox/acute treatment services and because of multiple visits there were a total of 2197 detox placement among these patients); 1766 unique patients were referred to NA/AA; 624 were provided with transportation services. Shelter services were provided during 749 visits. Project ASSERT LADCs also educated patients at risk for opioid overdose and distributed 142 naloxone rescue kits to patients and 705 were offered and refused. A total of 976 patients receive overdose education on how to recognize and prevent an opioid overdose. 2778 medical evaluations were performed. In addition, 581 patients were referred and seen in our MAT Medication for Addiction Treatment Clinic and these patients visited the clinic 3392 times.

Project RESPECT

Project RESPECT (Recovery, Empowerment, Social Services, Prenatal care, Education, Community and Treatment), is a high risk obstetrical and addiction recovery medical home at BMC and Boston University School of Medicine. Project RESPECT provides a unique service of comprehensive obstetric and substance use disorder treatment for pregnant women and their newborns in Massachusetts. The majority of Project RESPECT patients are in recovery from opioid addiction. In-patient, monitored, acute substance withdrawal treatment and induction of opioid maintenance therapies for pregnant woman seeking addiction treatment are provided. Intensive, individualized out-patient treatment plans are outlined for each patient based on the severity of their disease and their recovery progress. The out-patient medical home model provides on-site, collaborative, and multidisciplinary care for pregnant and post-partum women in recovery. The program supports more than 100 mother/child dyads per year.

SOFAR

The goal of SOFAR (Supporting Our Families through Addiction and Recovery) is to create a medical home in the pediatric primary care clinic for mothers in recovery and their children. SOFAR houses a multidisciplinary team of physicians, social workers, patient navigators, nurse practitioners, and coordinators who provide high-quality, coordinated medical and psychosocial care for families to maximize their ability to successfully navigate parenting and substance use recovery. SOFAR expands on the multidisciplinary prenatal care provided by Project RESPECT for pregnant women with opioid use disorder. SOFAR provides ongoing support for families to enhance child development as well as ongoing support for recovery, with access to specialty care and social services. In FY19, SOFAR served 130 families, with 88 mother-child dyads.

TEAM UP

The Child Mental Health Initiative - TEAM UP - is a partnership between BMC and three community health centers (Codman Square Health Center, Lowell Community Health Center, The Dimock Center) that combines mental health care with primary care for children so that families can receive all care in one place. Engagement with the TEAM UP model occurs: when a parent brings in a child with behavioral health issues; when a primary care provider refers a child with behavioral health issues; when a primary care provider expresses concerns about a family; when a child or family experiences a new major stressor (e.g., parental separation, diagnosis of a serious illness); and after a comprehensive psychosocial and behavioral health assessment during a well-child visit in the primary care setting. The

goal of TEAM UP is to promote positive child health and well-being through innovation and consistent delivery of evidence-based integrated care.

9.1.4 Affiliated Health Care System: Boston HealthNet Health Care System

BMC HealthNet Plan

BMC HealthNet Plan is a non-profit health plan that provides health insurance coverage to Massachusetts residents, including low income, underserved, disabled and elderly populations. We were established in 1997 by BMC, the largest safety net hospital in New England and have more than 20 years of experience delivering accessible care to complex populations. We also provide health coverage to Medicaid members in New Hampshire, where we operate as Well Sense Health Plan. BMC HealthNet Plan serves over 330,000 members across Massachusetts.

Boston HealthNet (BHN)

Established in 1995, Boston HealthNet (BHN) is an integrated health care delivery system comprised of BMC, the Boston University School of Medicine, and 14 community health centers (CHCs). The partnership has become a national model for community health care networks. Physicians who practice at HealthNet locations provide a wide range of comprehensive health care services to adult and pediatric patients, with a focus on disease prevention and health education. All physicians working in the health centers must be credentialed as members of BMC medical staff. Patients receiving primary care at HealthNet sites have access to highly trained specialists and cutting-edge technology at BMC while maintaining individualized and culturally sensitive care in their neighborhoods. Now in its 25th year, BHN and its CHC partners have extended BMC's presence into Boston-area neighborhoods, significantly impacting the health of their residents.

The accomplishments of the network are evidenced by: the high volume of CHC admissions to BMC; the collaborative development of quality improvement initiatives, clinical protocols, and standards of practice; increased access to specialty services; and the significant coordination of BHN's information technology programs and services.

In 2015 and in collaboration with BMC, nine of the BHN CHCs began the process of implementing a new EHR and practice management system that facilitates CHC and BMC provider access to mutual patients' EHRs. The implementation of the new EHR, OCHIN, greatly enhanced the care coordination efforts between Boston HealthNet CHCs and the specialty clinics at Boston Medical Center.

Grants: Boston HealthNet partners with the Massachusetts League of Community Health Centers to participate in a federal Health Center Controlled Network grant, a $900,000 three-year grant (2019 - 2022) that supports quality improvement, data quality, reporting, and clinical EMR training.

Research

A BHN Research Subcommittee was set up in 2005 to review all research projects that are proposed at the health centers; 250 projects have been reviewed to date.

Increasing Patient Access

Community Access to BMC is enhanced through a free shuttle bus service and an Uber program. One shuttle bus is provided to the East Boston Neighborhood Health Center (EBNHC) that circulates twice and hour and the Uber program is to allow patients greater access to appointments for patients at 10 other health centers. On average, the shuttle bus transports over 210,000 patients and their families between BMC and the EBNHC on an annual basis. The UBER Health program, implemented to service 10 Boston HealthNet Health Centers, transports about 2,200 patients to BMC each year.

Advancing Medical Education

A number of Boston HealthNet community health centers also serve as the primary community-based training sites for Boston University School of Medicine pediatric, family medicine, psychiatry, and general medicine residents. Boston HealthNet facilitates community health center engagement with nearly 240 Boston University School of Medicine students to provide community-based education programs. BUSM students and physician assistants round at community health centers to supplement their training with direct patient contact. Community health center participation in the BMC residency training program has placed 80 residents at community health centers in the 2020 academic year.

Boston Accountable Care Organization

Currently, nine Boston HealthNet community health centers participate in BACO. BACO enters into risk arrangements with government programs and commercial insurers and the BACO participants are collectively accountable for the quality and cost of the care they provide. BACO's most significant risk arrangement is with the MassHealth ACO program. With its participation in the MassHealth ACO program BACO became clinically and financially integrated with BMC Health System - which includes Boston Medical Center, Boston University Medical Group, and BMC HealthNet Plan - and the parties engage in joint decision making over all substantive decisions regarding participation in the program.

9.1.5 Other Economic Benefits

BMC's community goals are to continue to provide effective and accessible services to vulnerable populations in the Boston community and to continue to expand efforts that deepen relationships with the communities they serve. In Fiscal Year 2019, BMC invested $12,535,838 in Community Benefits Programs (as reported to the IRS on Form 990 Schedule H, Part I, Line 7e, *net community benefit expense*).

BMC contributes to the local economy through employment of Boston residents and the purchase of goods and services from Boston businesses. BMC spent approximately $188,187,877 in Fiscal Year 2018.

BMC HealthNet plan, founded in 1997, is the largest MassHealth and Commonwealth Care managed care organization in Massachusetts providing health insurance to 313,377 members who are served by participating providers in Greater Boston and in Southeastern and Western Massachusetts. The Plan offers comprehensive coverage, interpreter services, membership cards, and personal physicians providing care for the whole family. It furnishes other member benefits (beyond the mandated benefits) including free car seats, bike helmets, manual breast pumps for nursing mothers, and a member/provider hotline.

10.0 RESPONSE TO COMMENTS

The below section incorporates response to comments received in the BPDA Scoping Determination dated January 8, 2020.

BPDA Scoping Determination Preamble & Submission Requirements

BPDA 1 **Construction Impacts.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel. Please see **Section 7.2.12** for a discussion on the Construction Management Plan.

BPDA 2 **Ramp Parcel.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

BPDA 3 **Meetings with Local Residents, Elected Officials, Abutters, City & State Agencies.**

BMC is committed to an inclusive and transparent public process. Please see **Section 1.6**.

BPDA 4 **Boston Transportation Department.**

BMC has met with BTD (**See Section 1.6**) and will continue to meet with BTD to review the TDM program. Please see **Section 6.0** for a detailed discussion on Transportation.

BPDA 5 **Vehicular Trips.**

Please see **Section 6.0** for a detailed discussed on Transportation.

BPDA 6 **Signage and Wayfinding Plan.**

BMC will submit its campus signage and wayfinding master plan under separate cover. Please see **Section 5.5.6** for a discussion on its current program.

BPDA 7 **Mission and Objectives.**

Please see **Section 2.0** for a detailed discussion on Mission and Objectives.

BPDA 8 **Existing Property and Uses.**

Please see **Section 3.0** for a detailed discussion on Existing Property and Uses.

BPDA 9 **Proposed Future Projects.**

Please see **Section 4.0** for a detailed discussion on Proposed Future Projects.

BPDA 10 **Planning Framework.**

See **Section 5.0** for a detailed discussion on Planning Framework.

BPDA 11 **Transportation and Parking Management/Mitigation Plan.**

See **Section 6.0** for a detail discussed on Transportation and Parking Management/Mitigation Plan.

BPDA 12 **Economic Development.**

See **Section 8.0** for a detailed discussion on Employment and Workforce Development.

BPDA 13 **Community Benefits.**

See **Section 9.0** for a detailed discussion on Public Benefits.

BPDA 14 **Environmental Sustainability.**

See **Section 7.0** for a detailed discussion on Environmental Sustainability.

BPDA Staff Comments

BPDA 15 **10 Stoughton Street.**

Conceptual floor plan diagrams, massing and view perspectives are included in **Section 4.2.1.4**. Please reference **Figures 4-4 through 4-13.**

BPDA 16 **Ramp Parcel.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

BPDA 17 **Public Realm and Open Space.**

Please see **Section 5.5** for a detailed discussion on Public Realm and Open Space. As per the institutional design goals and objectives, BMC will continue to complement and animate its open space network through additional streetscape refinements and landscaped areas as part of its IMP projects.

BPDA 18 **Materials.**

11 x 17 formatted plans are included in the IMP sections as referenced. BMC will work with the BPDA to submit additional materials as needed for review during the IMP review process.

BPDA 19 **Transportation.**

See **Section 6.0** for a detail discussed on Transportation and Parking Management/Mitigation Plan.

Boston Groundwater Trust

BGwT 1 **Design Criteria / Standards.**

Applicable new and approved IMP projects will comply with Article 32 of the Boston Zoning Code. BMC will work with BWSC and BGwT to ensure compliance.

BGwT 2 **Copies of Available Foundation Data.**

BMC has searched its records and has not recovered foundation plans or data for older, wood pile supported structures it owns. It is likely, given the estimated year built, the following buildings have wood piles: Vose Hall (1898), which is proposed to be demolished and replaced with 10 Stoughton Street, and the Naval Blood Building (1865). BCD (1864) was fully rehabilitated in 2006 and FGH (1864) in 2007; both sit on rubble foundations.

L. Fernando Requena, Task Force Member

LFR 1 **BMC Growth Based on Boston's Population. Other Resources, Such As Neighborhood Health Centers Should be Used; Services Should Not Be Concentrated in South End.**

BMC's growth needs are multi-faceted when it comes to the patient population that BMC serves. BMC serves the urban community of Greater Boston. The majority of the communities that BMC serves are Boston census tracts that are federally designated medically underserved populations. As discussed in **Section 2.2.1.1**, BMC's catchment area covers the majority of the city with patients coming from South End, Roxbury, Dorchester, South Boston, East Boston, Mattapan, and Roslindale. As the population increases in this catchment area, it has a direct impact on BMC's inpatient admissions and outpatient visits. In addition, there are a number of Healthcare Trends discussed in **Section 2.2.1** including BMC becoming an Accountable Care Organization (ACO), experiencing a high percentage of patients impacted by homelessness and substance use disorder, a focus on targeting social determinants of health, and effects of space planning due to evolving design and construction regulatory requirements. All of these factors stress the utilization of BMC's inpatient and outpatient resources creating occupancy rates which are above the ideal percentages (See **Sections 2.3.1 and 2.3.2**).

BMC has focused on relocating non-critical care services out of its clinical core (e.g., IT, administration) over the last decade to ensure that it can maintain its core clinical services at its main campus where its patient population has access. If BMC were to relocate its core clinical services outside of the South End/Roxbury community, it would create a significant disadvantage to its already underserved and underrepresented patient population.

In addition to its core clinical services, BMC also reaches its patients through its 14 community health centers in other communities as discussed in **Section 2.1.4**.

Please see **Sections 9.1.1 through 9.1.4** for BMC's reach of services across the City.

LFR 2 **The Planned Building H should be Relocated to the area of the Power Plant in Albany Street.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

LFR 3 **IMPNF Indicates the New Inpatient Building is Necessary to Support Increased Inpatient Volume; This Implies Additional Beds and Services in the Campus with Consequent Impacts to the Area.**

Section 2.3.1 includes a detailed discussion of the reduction of BMC's licensed bed capacity from 2010 to present day. Even with the increasingly acute and complex needs of BMC's patient population and DPH requirements to build new single bed rooms, BMC is presenting a conservative phased approach to increase adult medical/surgical inpatient bed capacity by first leveraging existing space and infrastructure to accommodate inpatient needs before it constructs new. There is further pressure to retain existing double bed rooms for the flexibility to handle surge capacity in response to pandemics like COVID-19. If healthcare trends continue to evolve, BMC will undertake the approved New Inpatient Building Phase 2 as a final step. The location of this building is critical because it provides direct access and adjacency to the surgical and diagnostic platforms as well as accessibility to the Emergency Department and Trauma Center located in the abutting Menino Pavilion, where BMC made major investments with the construction of the New Inpatient Building Phase 1. It should be further noted there are no other siting options for this building.

As discussed in **Section 3.2**, BMC's approved IMP square footage has decreased.

LFR 4 **Public Benefits for the City at Large are Obtained at the Expense of the Neighborhood; Other Locations Should be Sought for Additional Services.**

BMC's new and approved IMP projects replace existing services provided within its clinical core and "right-sizes" them. BMC provides a number of services outside of the South End and in other City of Boston neighborhoods as discussed in **Sections 9.1.1 through 9.1.4**.

New and approved IMP projects will result in continued improvements to the South End neighborhood which are discussed in **Section 1.7 and Section 5.3 through 5.5**.

LFR 5 **Addition of 2 Million Square Feet to Campus Should be Reduced Drastically.**

BMC's new and approved IMP projects account for a net new addition of approximately 411,482 square feet over ten years. Please see **Sections 1.5 and 3.2**.

Desmond Murphy, Task Force Member

DM 1 **Neighbors are Concerned About Overall Medical Facility Growth.**

BMC's new and approved IMP projects replace existing services provided within its clinical core and "right-sizes" them. The new and approved IMP projects account for the net new addition of approximately 411,482 square feet over ten-years. Please see **Sections 1.5 and 3.2.**

BMC has evaluated the long-term impacts of development projects proposed in the medical area in addition to its new and approved IMP projects. Those are discussed in detail in **Section 6.0** which includes the Transportation and Parking Management/Mitigation Plan. Specifically, **Sections 6.3.1.1, 6.3.1.2 and 6.4** include an evaluation of the approved projects in the medical area and the results demonstrate that these projects and BMC's new and approved projects have minimal impacts over existing conditions and future built conditions for the ten-year term of the IMP.

DM 2 **BMC Assumptions for Why Growth is Necessary.**

BMC's growth needs are multi-faceted when it comes to the patient population that BMC serves. BMC serves the urban community of Greater Boston. The majority of the communities that BMC serves are Boston census tracts that are federally designated medically underserved populations. As discussed in **Section 2.2.1.1**, BMC's catchment area covers the majority of the city with patients coming from South End, Roxbury, Dorchester, South Boston, East Boston, Mattapan, and Roslindale. As the population increases in this catchment area, it has a direct impact on BMC's inpatient admissions and outpatient visits. In addition, there are a number of Healthcare Trends discussed in **Section 2.2.1** including BMC becoming an Accountable Care Organization (ACO), experiencing a high percentage of patients impacted by homelessness and substance use disorder, a focus on targeting social determinants of health, and effects of space planning due to evolving state design and construction regulatory requirements. All of these factors stress the utilization of BMC's inpatient and outpatient resources creating occupancy rates which are above the ideal percentages (See **Sections 2.3.1 and 2.3.2**).

DM 3 **Safety and Security.**

Please see **Section 5.6** for a detailed discussion on BMC's work to contribute to a safe and secure campus environment and neighborhood.

DM 4 **Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

DM 5 **Support for Vose / Betatron Demolition and New Building. Defer to SELDC Review for Vose / Betatron Demolition and Rebuild.**

BMC has prepared a Preservation Plan for submission to the SELDC (included in **Appendix B**). This document provides a detailed analysis on the condition of the Vose and Betatron buildings. BMC will meet with the SELDC to review the demolition of these buildings and the proposed new 10 Stoughton Street project to receive a Certificate of Design Approval as part of the future Article 80B Large Project Review.

DM 6 **10 Stoughton Shadow Study and Understanding of Building's Massing Relative to Adjacent Buildings.**

A copy of the Shadow Study for 10 Stoughton Street is included in **Appendix E**. The shadow study demonstrates minimal impact as a result of this new building. Net new shadow impacts are on roofs of existing buildings with minimal impacts to existing streets and sidewalks. Conceptual floor plan diagrams, sections and view perspectives are included in **Section 4.2.1.4, Figures 4-4 through 4-13**.

DM 7 **Dowling Replacement Entrances on Mass Ave. and Albany Street Or Major Retail on the Ground Floor.**

The approved New Inpatient Building Phase 2 will require the demolition of the existing Dowling Tower.

When the design advances for this building, BMC will present this in the Article 80B Large Project Review submission to the BPDA and review in detail with the Task Force and neighbors. BMC is committed to working with the neighbors on improving the corner of Massachusetts Avenue and Albany Street. The feasibility of building entrances at this corner needs to be carefully considered for the safety of pedestrians. It is likely that the ground level will be reserved for critical care spaces that link to the completed New Inpatient Building Phase 1. BMC is interested in improving the two-level commercial storefronts across the street at Miranda Creamer and other appropriate and accessible locations on campus with input by the neighbors.

DM 8 **Dowling Replacement Shadow Study.**

A copy of the Shadow Study for the approved New Inpatient Building Phase 2 is included in **Appendix E**. Please see the discussion included in **Section 7.2.3**. Of the times studied, there is minor impact limited to December 21 at 9am where net new shadow extends onto portions of the street on Public Alley 716, on the roofs of a few rowhouses and a sliver of East Springfield Street, and a small section on the street of Public Alley 719. In all other times studied, net new shadow is primarily limited to BMC buildings, abutting building roofs, internal BMC campus streets and parking lots.

DM 9 **Dowling Replacement Prioritize This Project for First Half of IMP Period.**

The timing for development of this approved project will be in accordance with the approach discussed in **Section 2.3.1**. BMC is presenting a conservative phased approach to increasing adult medical/surgical inpatient bed capacity by first leveraging existing space and infrastructure to accommodate inpatient needs before it constructs new. There is further pressure to retain existing double bed rooms for the flexibility to handle surge capacity in response to pandemics like COVID-19. If healthcare trends continue to evolve, BMC will undertake the approved New Inpatient Building Phase 2 as a final step. The location of this building is critical because it provides direct access and adjacency to the surgical and diagnostic platforms as well as accessibility to the Emergency Department and Trauma Center located in the abutting Menino Pavilion, where BMC made major investments with the construction of the New Inpatient Building Phase 1. It should be further noted there are no other siting options for this building.

DM 10 **615 Albany Street Naval Blood Building Maintenance Plan.**

615 Albany Street is jointly owned with BU. BMC will continue to coordinate with BU to address this.

DM 11 **Yawkey Building Replace the Façade.**

Yawkey has been included in **Section 3.2 of the Preservation Plan** in **Appendix E**. At this time, the significant expense to replace the building façade is not within BMC's plans which are focused on direct positive impact to patient care. This would require a comprehensive design review process with the BPDA and SELDC. BMC is proposing to make significant investments in the adaptive reuse and historic rehabilitation of the Collamore/Old Evans buildings. Through BMC's proposed Menino and Yawkey Lobby Addition project, the aesthetic of the façade will be upgraded at the first two levels while maintaining the existing façade of Yawkey at the upper levels that is in context with the Northampton Square campus.

DM 12 **Coordinate and Encourage BU to Add Ground Floor Entrances or Retail on Harrison Avenue (Conte, Housman, Robinson, Preston, and Collamore).**

BMC does not own or control Conte, Housman, and Robinson. BMC will consider ground floor retail along Harrison Avenue where feasible and accessible in buildings it owns and controls with input by the neighbors. One such example is the study of proposed retail space at the ground floor of the Collamore building when it is converted to housing. BMC is considering the long-term use of Preston after outpatient clinics are relocated during the term of the IMP. This consideration will include the feasibility of ground floor retail. BMC will collaborate with BU on shared planning initiatives.

DM 13 **Miranda Creamer Building and 2-Story Retail.**

The reference is to the two-story commercial storefronts that start at the Miranda Creamer building and span under the Yawkey Ambulatory Care Center along Massachusetts Avenue. It does not include the brick row houses.

DM 14 **Encourage BMC to Purchase or Lease the Miranda Creamer Building to Have Single Entry Control that Corridor of Mass Ave and Have Compassionate Street Level Activation.**

As noted in **Sections 1.4 and 4.2.5**, BMC intends to acquire or lease portions of Northampton Square during the term of the IMP which includes a commitment to revitalize the two-story commercial storefronts along Massachusetts Avenue.

DM 15 **Plans for Buildings With Expiring Leases (801 Albany, 7-11 Melnea Cass, Fuller).**

BMC will renew leases at 801 Albany, 7-11 Melnea Cass and Solomon Carter Fuller during the term of the IMP.

DM 16 **Signage.**

A detailed discussion is included in **Section 5.5.6**. A campus signage master plan is being prepared and submitted to the BPDA under separate cover. BMC will review with the Task Force when submitted. In addition, BMC is proposing a landscaped buffer at the existing pylon sign at Massachusetts Avenue and Harrison Avenue. Please see **Figure 4-15** in **Section 4.0.**

DM 17 **LED Sign.**

BMC has removed the LED billboard sign from the IMP. BMC will look for other ground level opportunities in coordination with the City.

DM 19 **Traffic Concerns With Exchange South End, State Use of Newton Pavilion, BMC Growth, Changes in Newmarket, and BU's Plans.**

BMC has evaluated the long-term impacts of development projects proposed in the medical area in addition to its new and approved IMP projects. Those are discussed in detail in **Section 6.0** which discusses the Transportation and Parking Management/Mitigation Plan. Specifically, **Sections 6.3.1.1, 6.3.1.2 and 6.4** include an evaluation of the approved projects in the medical area and the results demonstrate that these projects and BMC's new and approved projects have minimal impacts over existing conditions and future built conditions for the ten-year term of the IMP.

BMC is making the following mitigation commitments to assist in transportation improvements in the medical area, as well as other mitigation discussed in **Section 6.5**.

- Support BioSquare Drive access for Exchange South End which will keep additional traffic off Albany Street.
- Support I-93 SB Frontage Road Connection which will keep additional traffic off Albany Street.
- Contribute to the City's Albany Street Redesign / South Bay Harbor Trail.
- Contribute to the City's multi-modal improvements for Massachusetts Avenue.

DM 20 **Plans for Traffic Adjustments in Front of Harrison, Moakley, and Menino.**

See **Figures 4-2 and 4-3** in **Section 4.0.**

DM 21 **Opening Mass Ave Connector to Stoughton Street.**

In previous years BMC coordinated with BTD on a similar proposal which was a block over at East Concord Street. This is identified as a long-term plan in the Harrison-Albany Corridor Strategic Plan (HACSP). The proposal in previous years did not gain support by the Massachusetts Department of Transportation (MassDOT), who has jurisdiction, noting safety concerns with vehicle conflicts between the connector off-ramp and queuing of vehicles at the traffic light at Massachusetts Avenue and Melnea Cass Boulevard. BMC supports the City goals for new connections to the regional highway.

DM 22 **Prevent Pedestrians Crossing Mass Ave Without Signal or Crosswalk.**

BMC will discuss with Boston Transportation Department ways in which it can support the City's plans for this area.

DM 23 **Community Benefits Program.**

BMC is committed to continued partnerships with neighboring organizations and institutions to provide the support and resources necessary to make a positive impact on the quality-of-life conditions for those in need near BMC. Not any one organization or institution alone can solve the challenging situation along Mass and Cass; this requires local, state and federal partnerships. BMC intends to make significant investments directly in this neighborhood over the term of the IMP that redesigns its healthcare models to address the medical, behavioral and social needs of its patients. BMC's approach is a step forward in committing to solve these challenges, but similar approaches need to be replicated throughout the city to have a long-term impact on homelessness and substance use disorder.

Form Letter

1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Nadia Huancahuari, 103 E Brookline Street

In addition to Form Letter

NH 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Ida Jones, 85 E Brookline Street Owner

In addition to Form Letter

IJ 1 **Tenant Has Reported Damage to Condo.**

The construction project impacts referenced are understood to have occurred during the Boston University Goldman School of Dental Medicine Addition and Renovation. This was not a project undertaken by BMC.

Joshua Lakin, 108 E Brookline Street

In addition to Form Letter

JL 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

David Meguerdichian, 103 E Brookline Street

In addition to Form Letter

DM 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Ken O'Donoghue, 108 E Brookline Street

In addition to Form Letter

KO 1 **Study Alternative Sites for Building H**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Marie O'Shea, 103 E Brookline Street

In addition to Form Letter

MO 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Kathryn Pyne, 108 E Brookline Street

KP 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Helaine Simmonds, 49 E Springfield Street

HS 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Cinda Stoner, 107 E Brookline Street

In addition to Form Letter

CS 1 **Opposition to Building H.**

In consideration of the comments received from the Task Force and neighbors, BMC has removed the proposed Administration / Clinical Building on the Ramp Parcel.

Michael Cahill, 51 Dwight Street

MC 1 **Full Support of BMC's IMP; Being a Non-Profit Organization, I Understand How They Need to Capitalize On Their Real Estate to Support Their Growth and Care For Their Patients**

BMC appreciates the support. As a non-profit health care provider to the community's most underserved and underrepresented patient population, being able to leverage existing real estate assets that helps it deliver on its mission of 'Exceptional Care without Exception' is paramount.

Institutional Master Plan 2021-2031
Boston Medical Center

APPENDIX

UNDER SEPARATE COVER

Appendix A
Boston University Medical Center Institutional Master Plan Background / History

Appendix B
Preservation Plan

Appendix C
BPDA Scoping Determination

Appendix D
Transportation

Appendix E
Shadow Studies