INSTITUTIONAL MASTER PLAN NOTIFICATION FORM / PROJECT NOTIFICATION FORM

BOSTON UNIVERSITY MEDICAL CENTER

JUNE 7, 2013

SUBMITTED TO:

BOSTON REDEVELOPMENT AUTHORITY
ONE CITY HALL SQUARE
BOSTON, MA 02201

SUBMITTED PURSUANT TO ARTICLE 80D OF THE BOSTON ZONING CODE

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1.0 IMP Amendment

1.1 Introduction

Boston University Medical Center is comprised of Boston Medical Center Corporation ("BMC") and Boston University Medical Campus ("BU Medical Campus") which includes three of Boston University's health science schools – the School of Medicine, the Henry M. Goldman School of Dental Medicine, and the School of Public Health. Boston Medical Center Corporation and the Trustees of Boston University (collectively known as the "Proponents") are pleased to submit this Institutional Master Plan Amendment Notification Form / Project Notification Form to initiate the Boston Redevelopment Authority ("BRA") Article 80 Institutional Master Plan Review and Large Project Review Process for the BMC IMP project modifications. With this submission, the Proponents request that the BRA issue two separate Scoping Determinations: one for this Amendment to the Institutional Master Plan and one for the Large Project Review.

The purpose of this IMP Amendment is to obtain approval for modifications to projects previously approved in the 2010 Institutional Master Plan ("IMP") and the addition of approximately 17,136 square feet for Boston Medical Center. These modifications will allow for critical campus alignment and growth, the reduction of ambulance traffic and materials deliveries along Albany Street, and the replacement of the existing yellow utility tube spanning Albany Street with a simple bridge to handle patient transfer and materials handling.

On June 22, 2010, the BRA approved the Boston University Medical Center Institutional Master Plan Renewal. As outlined in the approved 2010 IMP, BMC recognizes an immediate need to address space and physical constraints of its existing campus and respond to clinical trends through new construction, demolition and renovation. BMC seeks to amend the approved 2010 Institutional Master Plan to incorporate minor modifications consisting of:

- An addition to the existing Moakley Cancer Center (to facilitate the relocation and expansion of outpatient services);
- Minor footprint, massing, and phasing revisions to the 2010 IMP New Inpatient Building (to include the expansion of the Emergency Department and Trauma Center);
- Relocation of the 2010 IMP Energy Facility;
- Replacement of the existing yellow utility tube across Albany Street with a new Bridge (to service patient transport and materials handling); and
- Inclusion of the acquisition of the Perkin Elmer site.

The proposed IMP project modifications are consistent with BMC's previously stated planning assumptions in the approved 2010 IMP. These modifications are necessary to consolidate and right-size clinical services to support new trends in health care delivery and patient volume, upgrade and expand the Emergency Department and Trauma Center, and move the core of the clinical campus to the west. The benefits of these modifications include:

- Elevated quality of care as a result of new and upgraded facilities and technology;
- Increased organizational efficiencies due to centralized services and improved operational adjacencies;

- Improved energy infrastructure that increases energy efficiency and reliability, reduces environmental impact, and lowers operating costs;
- Refined pedestrian experience along Albany Street through site improvements, reduction of curb cuts, and the replacement of the yellow utility tube with a new bridge; and
- Improved delivery of patient care and reduced operational costs through significantly decreasing patient transfers by ambulance and construction of a new patient transport bridge.

Figures 1-1 and 1-2 illustrate the general location of the Boston University Medical Center Campus ("BUMC Campus").

Figure 1-3 illustrates the Boston University Medical Center Campus ("BUMC Campus") approved 2010 IMP.

1.2 Summary of Proposed IMP Modifications

1.2.1 Moakley Cancer Center Addition

The Moakley Cancer Center Addition is the enabling project for all proposed IMP projects. This project will house departments displaced from the expanded Emergency Department and Trauma Center, and the Centralized Surgical Department, and will accommodate increased volume in outpatient care. The addition will contain approximately 27,800 square feet.

1.2.2 New Inpatient Building

The New Inpatient Building, as discussed in the 2010 IMP, will address the need to meet current clinical care standards, improve the patient care environment by modernizing critical care areas, and allow for the consolidation of multiple departments, including the Emergency Department and Trauma Center, Main Radiology Department, Surgical Department and Interventional Procedures, and additional Intensive Care Unit beds, and provide vital connections to adjacent campus buildings and the helipad. BMC is currently proposing to move forward with Phase 1 of the project. The New Inpatient Building Phase 1 will contain approximately 78,800 square feet. Phase 1 will necessitate demolition of a portion of the Dowling Building.

The second phase of the New Inpatient Building containing approximately 323,000 square feet is proposed on the site of the Dowling Tower, directly adjacent to the Phase 1 of the New Inpatient Building. This will necessitate the demolition of the Dowling Tower (the remaining portion of the Dowling Building located at the corner of Massachusetts Avenue and Albany Street).

Phase 2 of the New Inpatient Building will provide appropriately sized modern inpatient spaces that meet modern clinical standards and expansion space to accommodate future critical care and imaging functions. Together with Phase 1 and the Shapiro Ambulatory

Care Center, this new building will enhance medical functions to meet programmatic needs and reinforce the Albany Street campus image.

1.2.3 Boston Medical Center Energy Facility

A 48,000 square foot state-of-the-art combined heat and power facility was approved by the BRA on June 22, 2010. The new Energy Facility was proposed to be located to the east of the existing Power Plant. Since that time, BMC has reevaluated the location and other project data of the approved Energy Facility and now proposes to relocate it to the west side of the existing Power Plant to take advantage of existing utility connections. The Energy Facility is proposed to be slightly smaller at approximately 38,500 square feet.

1.2.4 New Patient Transport Bridge

BMC proposes to replace the existing yellow utility tube spanning Albany Street with a new Bridge to provide patient transport from the existing helipad to the emergency room and accommodate the transfer of clean materials. Patient transfer by ambulance between the helipad and the Emergency Department will be eliminated, thereby diminishing vehicular traffic along Albany Street. This, in turn, enables more efficient and direct patient transport to the Emergency Department thusly improving the delivery of patient care. Currently, Med Flight patients arrive by helicopter at the south side of the existing Power Plant. Patients are transferred from the helipad via ambulance to the Emergency Department in the Menino Pavilion located on the north side of Albany Street.

BMC explored other options to improve patient transport while also decreasing ambulance traffic on Albany Street. Options explored involved the re-use of existing below grade tunnels. Two existing tunnels are located beneath Albany Street. The first tunnel located between the existing Power Plant and the Shapiro Ambulatory Care Center is used solely as a utility tunnel and houses the high pressure steam lines serving the north side of Albany Street. The tunnel is too narrow to support the transfer of patients (and materials) and further, transferring patients alongside utilities presents unsafe conditions. The second tunnel located at the basement of the Menino Pavilion below the Emergency Department entrance is constrained by low ceiling heights and has a steep slope which makes for hazardous conditions in transferring patients. Additionally, the tunnel is circuitous from the helipad necessitating additional time to travel to the Emergency Department. Finally, the tunnel would require traveling through non-patient transport corridors flanked by the Morgue and the Central Processing Department, and support departments.

1.2.5 Centralized Loading and Materials Handling

The current loading dock for the West Campus will be relocated away from hospital entrances to an interim central location within the existing Power Plant in order to separate service areas from patient care areas. This will provide for a reduction in curb cuts along Albany Street and contribute to an improved pedestrian experience, one of the Proponents' long term planning objectives. Due to the relocation of the loading dock, a new below grade tunnel is proposed beneath Albany Street to transport soiled materials from the Menino Pavilion to the Power Plant. This new tunnel will replace the current function provided at the

existing loading dock that will be relocated to the interim location at the existing Power Plant. The new Bridge and proposed new tunnel will allow BMC to separate the transport of clean materials and soiled materials in order to meet regulatory requirements for avoiding cross-contamination of materials handling. The new tunnel will be used for transporting soiled materials, including medical waste and trash, while clean materials will be transported through the new Bridge providing for improved safety in material handling operations.

When the Administration / Clinical Building is ready to move forward, the final loading dock location would move to the rear of this new building. Additionally, BMC will further explore the final configuration and alternatives to the site access and drop-off for this proposed building.

1.2.6 Albany Fellows

On January 12, 2010 the BRA approved an IMP Amendment to incorporate the Albany Fellows site which is approximately 1.7 acres consisting of 3 parcels: Parcel 1 contains approximately 15,324 square feet; Parcel 2A contains approximately 38,920 square feet, and Parcel 2B contains approximately 20,766 square feet. The total development includes 442,800 square feet of gross floor area.

Boston University completed the nine story 84,033 square foot building providing 104 housing units for 208 graduate students of the Boston University Medical Campus with approximately 12,000 square feet of landscaped open space and approximately 5,000 square feet of ground floor retail space, now occupied by a child-care (daycare) provider. The building opened in June 2012.

The future development of Parcels 1 and 2B (including the remainder of Parcel 2A not used for the open space or the graduate student housing) will be limited to approximately 358,500 square feet of above grade building space and up to 322 parking spaces. Potential uses for the future facilities may include: housing (either student housing or housing for faculty and staff of Boston University or Boston Medical Center), ground level retail, office, backstreets, research & development, and academic space.

For purposes of ensuring that the remaining parcels of the approved Albany Fellow Site continue to be included in the IMP the projects have been included in the IMP Amendment but do not require zoning approval under this amendment.

1.2.7 Clarification of Ownership

In addition to the IMP project modifications, the Proponents request to incorporate the acquisition of the Perkin Elmer site located at 100 East Canton Street, 123 East Dedham Street, and 575 Albany Street for a total of 129,461 square feet.

1.2.8 Update in Use

Newton Pavilion

The Newton Pavilion is classified as "Inpatient" in the 2010 IMP. With the consolidation of clinical services to the West Campus, the potential future use of the Newton Pavilion may also include Administration/Research/Instruction.

1.2.9 Removal of Leased Space

Since the filing of the 2010 IMP, the Proponents are no longer leasing space that has been approved for institutional use.

BMC wishes to remove the following buildings from the Boston University Medical Center IMP as institutional use:

- Removal of the Northampton Street lease of 10,000 square feet.

BU Medical Campus wishes to remove the following buildings from the Boston University Medical Center IMP as institutional use:

- Removal of 761 Harrison Avenue, Harrison Court Apartments/Offices lease (effective September 30, 2013) of 122,922 square feet.

Table 1-1 Summary of IMP Project Modifications

Project	2010 Approved IMP (in square feet)	2013 IMP Amendment (in square feet)	Change (in square feet)
Moakley Cancer Center Addition	0	27,800	27,800
New Inpatient Building Phase 1	0	78,800	78,800
New Inpatient Building Phase 2	405,000	323,000	-82,000
Energy Facility	48,000	38,500	-9,500
New Patient Transport Bridge	0	7,100	7,100
Administration / Clinical Building	160,000	219,000	59,000
Demolition of Power Plant	0	-64,064	-64,064
Totals	**613,000**	**630,136**	**17,136**

Figure 1-4 illustrates the Boston University Medical Center Campus ("BUMC Campus") proposed IMP Amendment projects (both Article 80D for IMP Review and Article 80B for Large Project Review).

Ultimately these projects will enhance BMC's mission "to consistently provide excellent and accessible health services to all in need of care, regardless of status or ability to pay."

The improvements are consistent with BMC's guiding principles and planning assumptions outlined in the 2010 IMP:

- Accommodate changes in patient volume;

- Consolidate clinical services;
- Upgrade and expand the Emergency Department and Trauma Center; and
- Move the core of the clinical campus to the west.

At this time BMC is initiating Large Project Review for the following projects:

- Moakley Cancer Center Addition
- New Inpatient Building Phase 1
- Energy Facility
- New Patient Transport Bridge

The projects are interdependent and together will help BMC achieve multiple master planning goals (outlined in the approved 2010 IMP) within the next five years.

The sequence of the proposed projects begins with the construction of the Moakley Cancer Center Addition. Once this project is complete, departments to be displaced by the planned expansion and consolidation of multiple departments, which include the Emergency Department and Trauma Center, Main Radiology Department, Surgical Department and Interventional Procedures, and Intensive Care Unit, will be moved to this facility enabling the construction of the New Inpatient Building Phase 1. The new Energy Facility will be constructed and the existing yellow utility tube can be replaced with the new Bridge. Materials handling will move to an interim location in the existing Power Plant.

Once this five year plan is complete, BMC may then construct Phase 2 of the New Inpatient Building and the new Administration / Clinical Building.

See Section 2 for more information on the Large Project Review Projects.

This IMP Amendment and Large Project Review will allow BMC to begin the construction of campus upgrades necessary to address immediate needs for improved and expanded facilities. These upgrades are necessitated by changes in health care service delivery and volume trends. Due to the interdependent nature of the proposed improvements, BMC is initiating one Large Project Review.

Figure 1-1 Boston University Medical Center Locus Plan

Boston University Medical Campus (BUMC) Boston, MA

Epsilon Associates Inc.

Figure 1
Aerial Locus Map

Figure 1-2 BUMC Campus Plan

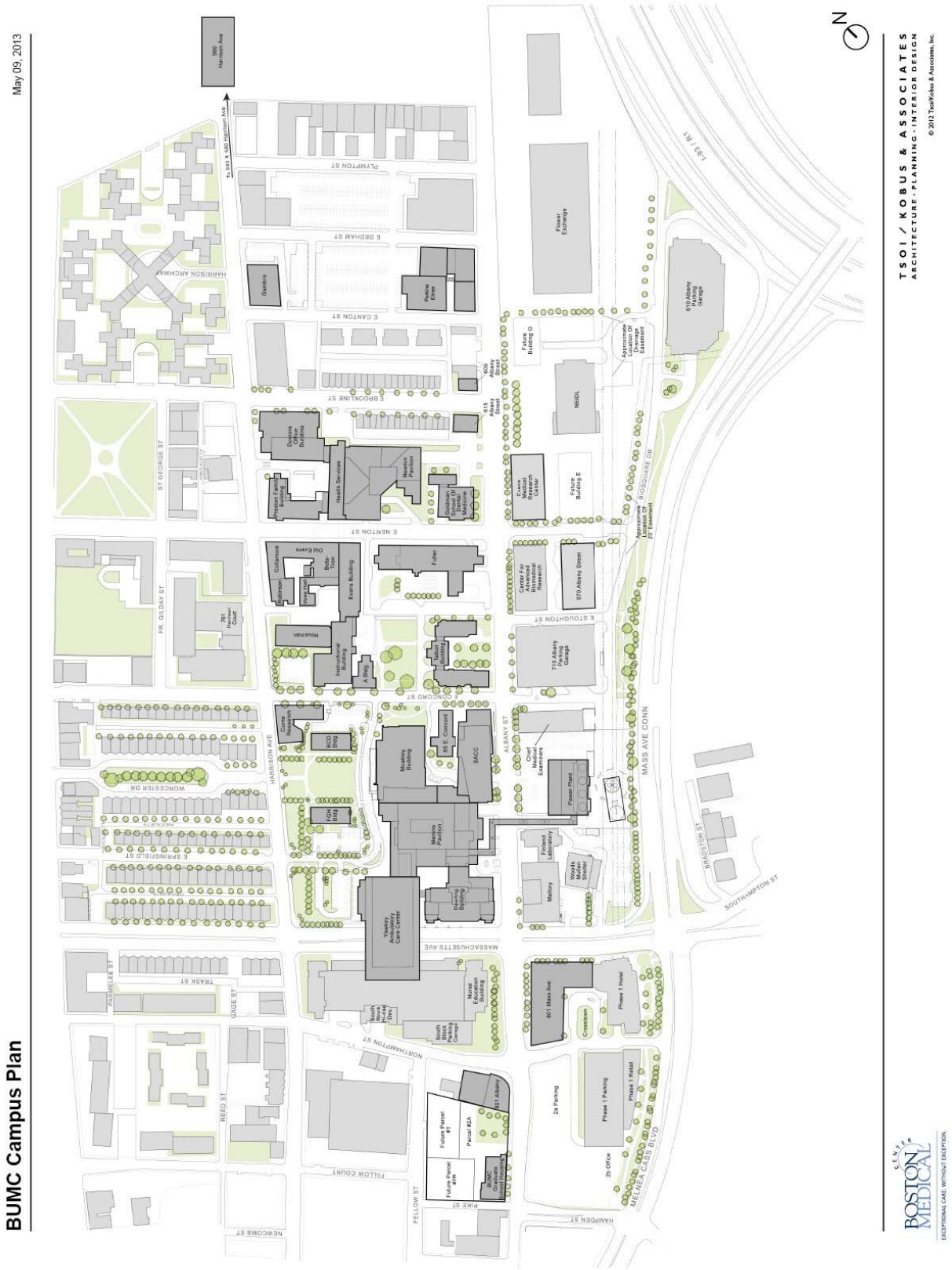


Figure 1-3 BUMC Campus Approved 2010 IMP Projects

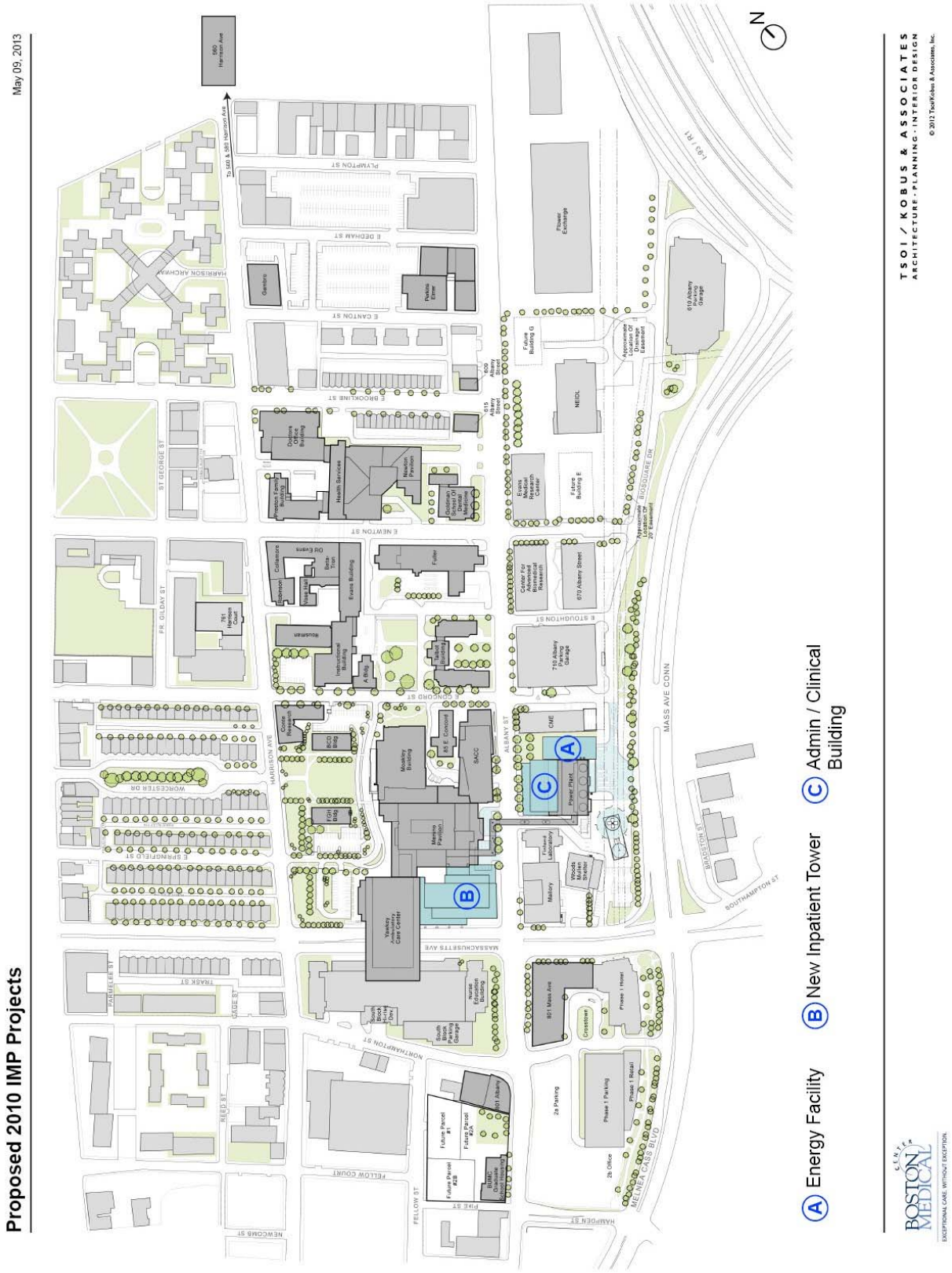
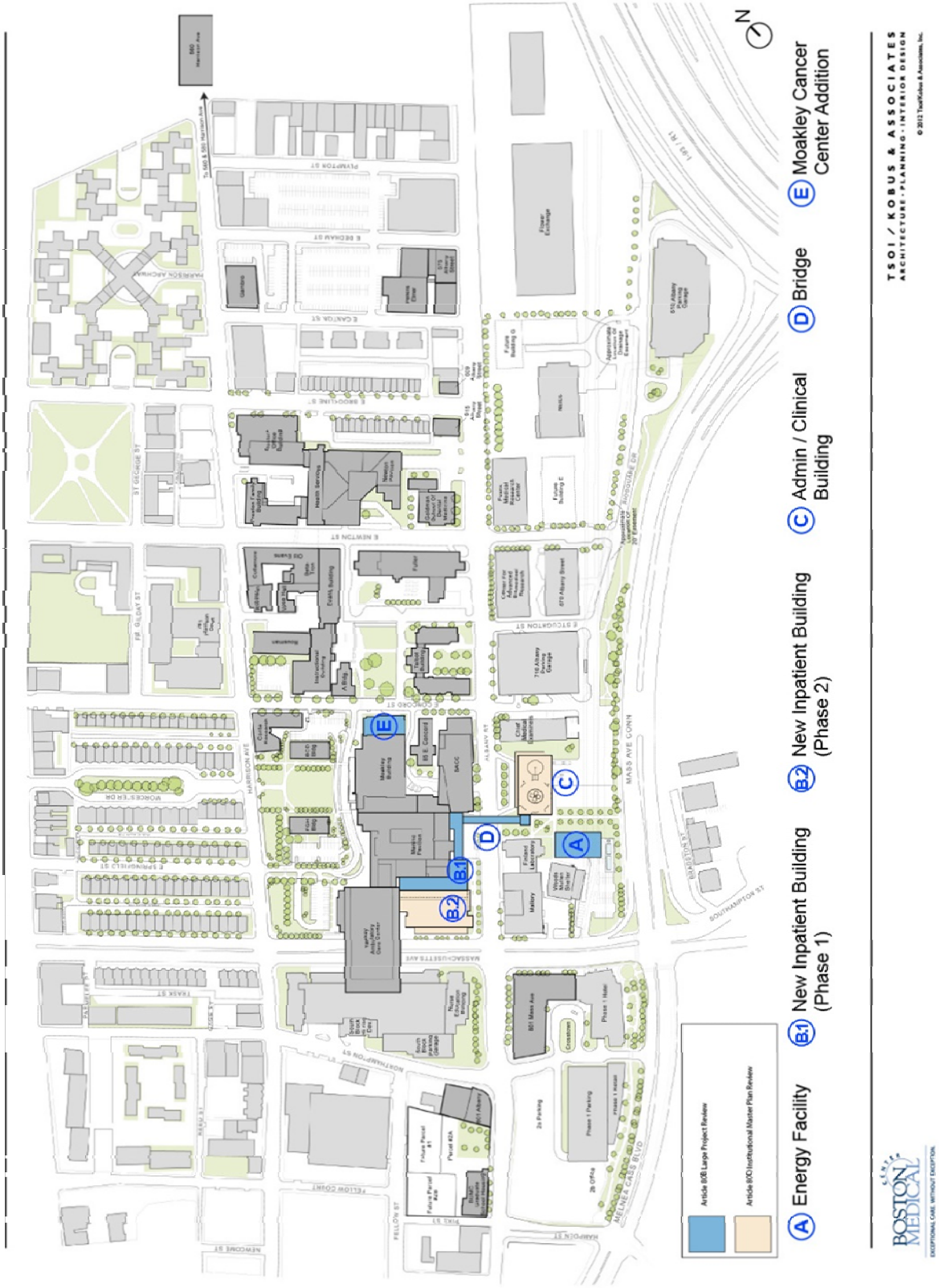


Figure 1-4 BUMC Campus Proposed 2013 IMP Amendment Projects



1.0 IMP Amendment

1.3 Project Identification

Project Name: Boston University Medical Center IMPNF Amendment/PNF

Address / Location: The BUMC Campus is located in Boston's South End. The campus is comprised of approximately 20 acres including 33 BUMC Campus-owned or controlled buildings, a helipad, and development parcels. BMC and BU Medical Campus also lease space in 8 buildings located on and/or proximate to campus.

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1.4 Boston Medical Center Mission and Objectives

Boston University Medical Center is dedicated to serving the needs of the community. Comprised of BMC and BU Medical Campus, the synergy among these institutions and the incorporation of teaching and research with the clinical programs is essential to improving health for the general public.

1.4.1 Boston Medical Center

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. BMC is a private, not-for-profit, 496-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. Boston Medical Center emphasizes community based care, with its mission to provide consistently accessible health services to all. The largest safety net hospital in New England, Boston Medical Center provides a full spectrum of pediatric and adult care services, from primary

care and family medicine to advanced specialty care. BMC is the largest and busiest provider of trauma and emergency services in New England. The Emergency Department had 129,714 visits in 2012.

With more than 26,132 discharges and 1,025,202 total outpatient visits in 2012, 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, and women's health.

Unwavering in its commitment to serve the community, BMC is dedicated to providing accessible health care. Approximately 73% of BMC patients come from underserved populations, the low-income and the elderly, and 30% do not speak English as a primary language.

With its strong focus on urban health, in 1995 BMC was a founding partner in Boston HealthNet, an integrated service delivery network that includes BMC, Boston University School of Medicine, and 14 community health centers throughout the greater Boston area. In FY 2012, Boston HealthNet patients comprised 32% of all inpatient admissions to BMC.

Boston Medical Center HealthNet Plan, Inc. (BMCHP) is a not-for-profit health maintenance organization founded by Boston Medical Center in 1997. BMCHP's Massachusetts business, BMC HealthNet Plan, serves nearly 260,000 members across the state through three product lines: MassHealth (Medicaid), Commonwealth Care and a commercial product for small businesses and individuals. It is the largest MassHealth health plan in Massachusetts. BMC HealthNet Plan was recognized for its ongoing commitment to quality when it was named one of the top ten Medicaid health plans in the country according to the National Committee for Quality Assurance (NCQA) Medicaid Health Insurance Plan Rankings 2012-2013. In addition, it has maintained Excellent Accreditation from NCQA for its Massachusetts Medicaid plan since its initial accreditation in 2009.

BMC is a recognized leader in groundbreaking medical research. BMC received more than $132 million in sponsored research funding in 2012, and oversees 540 research and service projects separate from research activities at Boston University School of Medicine.

BMC is a major employer in the City of Boston and is committed to promoting employment opportunities for Boston residents. See Section 1.9.1.2 - Employment, Workforce Development, and Educational Opportunities for more information.

The mission of BMC is "to consistently provide excellent and accessible health services to all in need of care, regardless of status or ability to pay." The objective of BMC is to meet the health needs of the people of Boston and its surrounding communities by providing high quality, comprehensive care to all, particularly mindful of the needs of the vulnerable populations through an integrated delivery system in an ethically and financially responsible manner. The goals of the integrated system of care are to promote health and well-being, meet the medical and public health needs of all served, and educate future physicians and caregivers.

In compliance with the mission statement above and in an effort to create a community-based system of services in collaboration with Boston HealthNet BMC has committed itself to seven equally important values. BMC will:

- Serve patients and their families, physicians, staff and communities with dignity;
- Integrate public health, preventative, emergency and rehabilitative programs with a full range of primary to tertiary medical service;
- Serve the ever-changing need of urban and suburban populations, while honoring their ethnic, religious and cultural differences;
- Apply a high degree of medical, nursing and technical management in a professional and accountable manner;
- Collaborate with Boston University, its schools and other institutions to support a premier learning environment for all members of the community;
- Conduct research that will lead to major improvements in health care and health status for all people, and further scientific advances in medicine; and
- Develop and participate in community-based and managed care programs that promote affordable, responsible and high-quality health care.

1.4.2 Boston University Medical Campus

BU Medical Campus has a rich history dating back to 1848 when its School of Medicine began as the New England Female Medical College, the first institution in the world to offer medical education to women and graduated the first black woman physician. In 1873, the medical college merged with Boston University, becoming the first coeducational medical school in the nation. In addition to the School of Medicine ("BUSM", with its Division of Graduate Medical Sciences), the BU Medical Campus is also comprised of the Goldman School of Dental Medicine ("SDM") and the School of Public Health ("SPH").

Renowned for the quality of teaching and research and for service to the community, these schools provide education and training in the most current thinking and techniques in their fields, with a particular focus on serving the disadvantaged, underserved and indigent populations. Together the schools employ a total of 3,100 faculty members (including full-time, part-time and adjunct), many who are leading experts in their fields, and train a diverse group of approximately 3,500 students.

1.4.3 Boston University School of Medicine

The mission of the Boston University School of Medicine is to educate physicians who will have the knowledge, skills, and dedication needed to provide the best care to every patient from all communities in a diverse society, within an ever-changing health care environment. Other specific objectives are:

- The Vision – Patients, peers, and mentors will recognize the BUSM graduate as an exemplary clinician who maintains the highest standards of medical care and professional conduct and who is fully prepared for postgraduate training;

- Clinical Arts - The graduate will: possess excellent diagnostic skills, a broad foundation of medical knowledge, and the clinical experience needed to deliver effective and efficient medical care; demonstrate excellence in communicating with and educating patients from diverse cultures, races, and ethnicities; work effectively and collaboratively within interdisciplinary teams; use information technology effectively to find and evaluate the best clinical evidence to guide patient care; be dedicated to preventing illness and improving the health of the community in which he or she practices while responsive to the family, psychosocial, cultural, and spiritual/religious determinants of health and illness; and
- Professionalism – The graduate will treat all patients in a caring, compassionate, and altruistic manner; adhere to the highest ethical standards of medical practice; possess the attitudes, abilities, and self-knowledge necessary for leading a life-long pattern of learning; support improvements in access to health care for all populations, a reduction in racial and ethnic disparities in health status, and improvements in the social conditions of disadvantaged populations; and contribute to the advancement of scientific knowledge.

BUSM promotes these qualities via: establishment of a supportive, respectful, and nurturing educational environment; maintenance of the highest standards of student performance; commitment to achieving and supporting a diverse student body; engagement of students in curricular evaluation; maintenance of a curriculum inclusive of evidence-based educational methods and through leadership in developing, applying, and evaluating innovative methods of medical education.

To achieve a dynamic curriculum responsive to rapid social and biomedical changes, and to insure that student and curricular goals are met and the highest educational standards of excellence are maintained, BUSM continuously evaluates its learners, faculty, programs, and its mission and goals.

1.4.4 Goldman School of Dental Medicine

The mission of the Henry M. Goldman School of Dental Medicine is to provide excellent education to dental medicine professionals throughout their careers; to shape the future of dental medicine and dental education through research; to offer excellent health care services to the community; to participate in community activities; and to foster a respectful and supportive environment. Other specific objectives include:

- Educate DMD and postdoctoral candidates to pursue basic science and clinical science research on the academic level; and
- Support faculty development, thereby improving the quality of dental education, research and clinical care; and
- Contribute to advances in oral biology and dental medicine by pursuing basic, applied and clinical research and disseminating important findings to the dental community; and

- Provide high quality cost-effective, accessible dental care for children and adults, with an emphasis on prevention.

1.4.5 School of Public Health

The mission of the School of Public Health is to improve the health of local, national and international populations, particularly the disadvantaged, underserved and vulnerable, through excellence and innovation in education, research and service. In keeping with the SPH's service-oriented philosophy, each department combines research and academics with a practicum requirement, resulting in a rigorous, well-rounded curriculum enhanced by work experience in the public health environment. Strategic themes of the SPH include:

- Involved: Emphasize real-world involvement and meaningful partnerships
- Interconnected: Emphasize interdisciplinary efforts and integrated programs
- Global: Emphasize global health issues and perspectives.

Through longstanding collaborations with such institutions as the Massachusetts Department of Public Health, the Boston Public Health Commission, and the Veterans Affairs Administration; and international alliances with the Red Cross, the Peace Corps, and foreign governments, the students, faculty, and alumni draw on their own diverse backgrounds to carry out the SPH's mission in a variety of settings.

1.5 Existing Campus and Facilities

The BUMC Campus is located in Boston's historic South End. The main campus includes 33 Boston University Medical Center owned or controlled buildings, a helipad and development parcels that are individually-owned or controlled and shared facilities associated with each or both of the institutions. In addition to the property owned or controlled by the Proponents, each institution also leases office, instructional, and/or clinical space in 8 buildings located on and/or proximate to the campus. Total Boston University Medical Center owned or controlled and leased space is approximately 3,316,500 square feet of usable space. Buildings range from 2 to 14 stories in height above ground. The buildings were built between 1864 (BCD/FGH), 2011 (Carl J. and Ruth Shapiro Ambulatory Care Center), and 2012 (Albany Fellows Phase 1 BU Medical Campus Graduate Student Housing). The Dr. Solomon Carter Fuller Mental Health Center, a state mental health facility, is also located on the BUMC Campus.

There are currently 2,940 structured parking spaces in garages and 482 surface parking spaces (3,422 total on-campus and offsite parking spaces).

See Table 1-2 and Figure 1-5 for Ownership and Leases.

Table 1-2 Boston University Medical Center Building and Land Ownership / Leases

Facility	Year Built	Principal Uses	Floors Above / Below Grade	Building SF*	Own/ Lease**
Boston Medical Center					
Newton Pavilion	1986	Inpatient/Administration/Research/Instruction	B+8	257,019	Owned
Yawkey Ambulatory Care	1972	Outpatient	B+5	218,477	Owned
BCD	1864	Administration	B+5	28,174	Owned
Betatron	NA	Administration	NA	5,912	Owned
Dowling	1937	Administration/Outpatient	B+9	157,376	Owned
Doctors Office Building	1969	Administration/Outpatient	B+12	91,783	Owned
Preston	1967	Outpatient	5	65,967	Owned
FGH	1864	Administration	B+5	29,435	Owned
Health Services	1973	Inpatient Support/Outpatient	B+6	73,651	Owned
Carl J. & Ruth Shapiro Ambulatory Care Center	2011	Outpatient	B+9	245,000	Owned
Menino Pavilion	1994	Inpatient	B+8	337,340	Owned
Power Plant	1972	Mechanical	B+4	64,064	Owned
85 East Concord Street	1928	Administration	B+8	66,952	Owned
125 East Concord Street, Solomon Carter Fuller Mental Health Center	1975	Administration	B+9	11,000	Leased
Vose Hall	1898	Administration	5	22,695	Owned
Old Evans	1942	Administration	9	60,070	Owned
Collamore	1936	Administration	7	41,970	Owned
Gambro (660 Harrison)	1990	Administration/Outpatient	3	35,000	Owned
Helipad	NA	Helipad	NA	NA	Owned
560 Harrison Avenue	NA	Administration	G	19,000	Leased
Perkin Elmer (North – 575 Albany)	NA	Administration	6	12,000	Owned
Perkin Elmer (South – 575 Albany)	NA	Administration	5	44,000	Owned
Perkin Elmer (123 E. Canton St.)	NA	Administration	NA	9,258	Owned

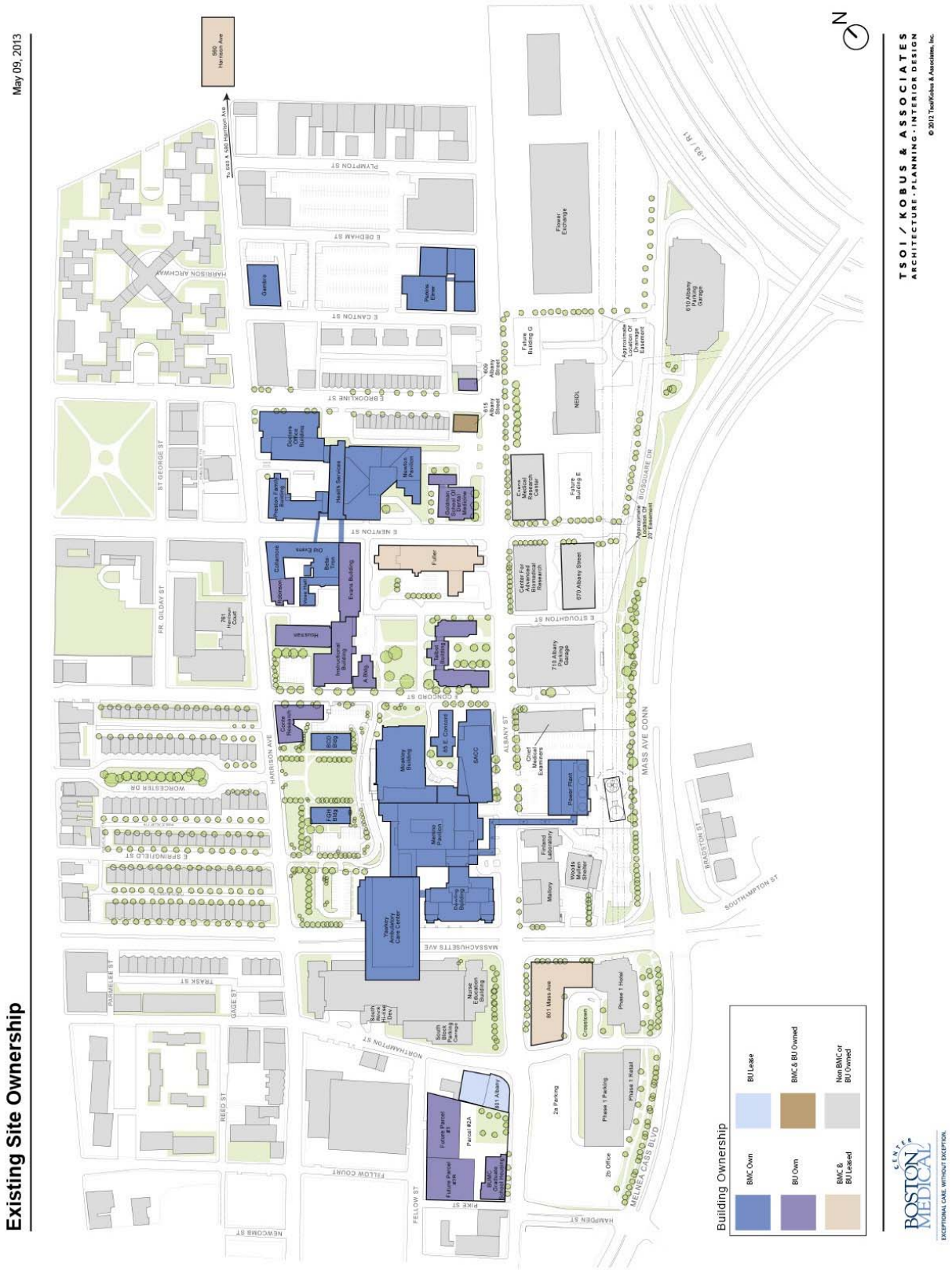
Perkin Elmer (100 E. Canton St.)	NA	Administration	B, 1st, 3rd	64,203	Owned
801 Massachusetts Avenue, Crosstown Center	2006	Administration	1st	12,197	Leased
Moakley Building	2006	Outpatient	B+3	133,217	Owned
Boston University Medical Campus					
Albany Fellows, Parcel 1	2012	Administration/Research/Instruction/Residential/Retail	15,234 s.f. (Land)	***	Owned
Albany Fellows, Parcel 2B	2012	Administration/Research/Instruction/Residential/Retail	20,766 s.f. (Land)	***	Owned
609 Albany Street, Dermatology ("J") Building	1990	Administration/Research/Instruction	B+6	34,692	Owned
615 Albany Street, Naval Blood ("N") Building (jointly owned w/BMC)	ca. 1865	Administration/Research/Instruction	B+5	19,710	Owned
801 Albany Street, Gilmore/Nine Building	1989	Administration/Research/Instruction	B+4	41,198	Leased
815 Albany Street, Medical Student Residence	2012	Residential/Retail	B+10	102,283	Owned
70 East Concord Street, Medical School Instructional ("L") Building	1968	Administration/Research/Instruction	B+14	215,002	Owned
80 East Concord Street, Medical School ("A") Building	1912	Administration/Research/Instruction	B+5	25,931	Owned
82 East Concord Street, Talbot ("T") Building	1876/1884/1891	Administration/Research/Instruction	B+4	87,080	Owned
125 East Concord Street, Solomon Carter Fuller Mental Health Center	1975	Administration/Research/Instruction	B, 4, 8, 9, 10	43,589	Leased
75 East Newton Street, Evans ("E") Building	1972	Administration/Research/Instruction	B+9	180,099	Owned
100 East Newton Street, Goldman Dental School ("G") Building	1969	Administration/Research/Instruction	B+7	89,406	Owned
76 Harrison Avenue, Collamore Building	1936	Administration	7th	1,500	Leased
560 Harrison Avenue	1894	Administration/Research/Instruction	3rd	14,786	Leased
680 Harrison Avenue, Robinson ("B") Building	1915	Administration/Research/Instruction	B+6	56,487	Owned
778 Harrison Avenue, Housman ("R") Building	1959	Administration/Research/Instruction	B+10	119,987	Owned
790 Harrison Avenue, Conte ("K") Building	1905 / ca.1922-1928	Administration/Research/Instruction	B+7	77,886	Owned
801 Massachusetts Avenue, Crosstown Center	2006	Administration/Research/Instruction	2nd, 3rd, 4th	101,114	Leased

* Owned buildings are expressed as approximate Gross Square Feet (without exclusions). Leased buildings (where the Proponents are the Lessee) are expressed as Rentable Square Feet (without exclusions).

** The designation "Own/Lease" is included to differentiate between BUMC Campus buildings which are controlled or owned by the Proponents and buildings which are leased for a term of years by the Proponents.

*** The Albany Fellows Site was the subject of an IMP Amendment approved by the BRA on January 12, 2010 and the Zoning Commission on February 10, 2010.

Figure 1-5 Building and Land Ownership and Leases



1.6 Guiding Principles and Planning Assumptions

The approved 2010 Institutional Master Plan allows the Proponents to create a campus supportive not only of the institutions' common goals, but also of their unique needs and individual missions now and in the future. BMC endeavors to sustain the highest expected standard of patient care while BU Medical Campus strives to maintain an exceptional environment for students interested in basic science, clinical investigation, or public health and health services oriented research, and medical educational programs. Aging buildings, deficient infrastructure components, and inefficient operational adjacencies create challenges for each institution to keep up with current advancements in health care and academic trends. As a result, campus modifications will be necessary over the next 10 years, including but not limited to, constructing new facilities, demolishing obsolete buildings, renovating existing structures, and improving infrastructure.

1.6.1 Shared Planning Assumptions and Objectives

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

- Building age (and obsolescence);
- Traffic demands;
- Parking needs;
- Open space preservation; and
- Utilities, power plant, and other energy infrastructure upgrades.

The Proponents acknowledge the following planning design drivers as elements critical to the successful realization of their objectives:

- Planning for long-term future growth and transformation;
- Transformation of the Albany Street campus image;
- Sensitivity to context through massing, scale and materials;
- Creation of a clear and welcoming sense of arrival;
- Implementation of unified site signage and enhanced wayfinding;
- Development of pedestrian-friendly street edges; and
- Enhance accessibility to parking and existing buildings.

1.6.2 BMC Planning Assumptions and Objectives

Like all academic medical centers and health system providers, BMC is responding to dramatic changes in health care delivery. BMC recently completed an in-depth strategic plan that articulated a vision to transform the care delivery model to thrive in the new environment. There are many factors that will contribute to the successful implementation of the model but chief among them is aligning resources in the most efficient and effective manner to deliver quality care. While relocation of all clinical services to the west end of the BUMC Campus is the ultimate goal, consolidation of all inpatient services, emergency/trauma care, radiology, and interventional procedures (surgery and other invasive procedures) on one site is critical to the delivery of care model. BMC has also continued to experience changing trends in patient

volume. This necessitates the need to upgrade its facilities to right-size patient care spaces and to meet modern day clinical care standards.

Table 1-3 Inpatient Admissions and Outpatient Visits at BMC

	2008	2009	2010	2011	2012
Inpatient	29,411	30,250	30,215	29,070	26,132
Outpatient	953,510	882,911	976,532	981,574	1,025,202

To address these clinical trends and achieve the primary goal of providing quality health care to the neediest individuals, BMC objectives include:

- Accommodate changing trends in patient volume;
- Consolidate clinical services;
- Upgrade and expand the Emergency Department and Trauma Center;
- Right size space for current clinical standards;
- Accommodate new technology;
- Upgrade materials handling/receiving/distribution and waste removal facilities;
- Implement an efficient and sustainable energy infrastructure program to ensure reliability and redundancy of services and support future growth;
- Integrate sustainable design principles and operations;
- Facilitate access to the campus and improve campus image;
- Consolidate Medical Administrative functions in proximity to clinical services;
- Locate General Administrative functions on the campus perimeter; and
- Move the core of the clinical campus to the west.

1.6.3 BU Medical Campus Planning Assumptions and Objectives

The BU Medical Campus outlines three areas of concern regarding their current instructional facilities:

1. Quantity – BU Medical Campus currently struggles to meet space needs within their existing buildings as academic programs in medical and research studies and enrollment grow. In addition to the current demand limitations, the American Association of Medical Colleges is calling on medical schools to increase their class size by 30% over the next decade. Additionally, the current method of scheduling instructional space places limitations on the utilization of space and affects the overall quantity and type of space required.
2. Quality – Certain types of academic spaces need to be planned specifically to meet the requirements of the curriculum. These spaces can be more traditional classroom settings or creative solutions driven by instructional technology and strategy. Rooms retrofitted into existing structures are often limited by size, layout, technical infrastructure, and available resources and subsequently do not adequately meet the

needs of the university. Of particular importance is the need to enable increasing levels of student interaction in all instructional spaces.

3. Proximity – It is imperative that new instructional spaces designed to meet growth needs are located in an area considered core to current instructional facilities. Developing instructional space in BU Medical Campus-owned or rented buildings that are not proximate to the current core has a detrimental effect on the operational and didactic aspects of the academic effort. Moving students around for breakout classes for large lectures (as is required for the medical school curriculum) or between classes (as is typical for other curricula) contributes to a loss of instructional time. The issue of proximity also creates issues for ancillary services in supporting rooms for the delivery of instruction. Offering and maintaining support services over a wider geographic area deteriorates the quality of that service. Distance creates limitations in availability of the staff to clean, set up and maintain rooms, provide initial and ongoing audiovisual support, respond to technology/systems troubleshooting requests or other needs and services sought by the instructor in support of their class.

These areas of concern are also relevant for current research facilities needed to support the long term needs of the medical and educational institutions.

In order to support the primary goal of educating future health care professionals, BU Medical Campus objectives include:

- Planning for long-term future growth and transformation;
- Provide student housing consistent with City's desire to reduce demand on off-campus rental housing stock;
- Expand academic programs;
- Foster opportunities for Interprofessional Education;
- Upgrade student services, including increased student gathering, group study and student wellness facilities;
- Consolidate and upgrade research facilities;
- Increase inter-disciplinary opportunities and synergies between research programs; and
- Consolidate administrative support functions.

1.6.4 Campus Adjacencies

The existing BUMC Campus uses are generally zoned with educational functions centrally located, flanked by clinical uses to the east and west. This relationship is primarily a function of the remnants of the pre-merger of the original two campuses. Other major zones include a Support Zone (Power Plant and Parking) and Research (BioSquare) south of Albany Street, and Administration (Crosstown) west of Massachusetts Avenue. See Figure 1-6.

Campus design goals and objectives are specifically associated with enhancing institutional functions, primarily through the establishment of ideal adjacencies between complementary uses. This is particularly important for a campus that delivers medical services, where efficiency is not simply desirable, but may be critical to delivery of patient care in a timely

manner. At the same time, it is also advantageous to create synergies between the delivery of medical services and academic instruction in health sciences.

Boston University Medical Center's master planning objectives of shifting administrative functions away from the inner clinical core location is ideal for inpatient clinical expansion to be situated proximate to other key clinical programs as well as situating academic spaces proximate to the instructional core.

The proposed modifications and IMP projects support and enhance these concepts. The Moakley Cancer Center Addition, New Inpatient Building, Energy Facility, patient transport Bridge, and new Administrative / Clinical Building together will shift the clinical campus core to the west, consolidate clinical services, accommodate changing trends in patient volume, enable more efficient and cost-effective transfer of patients and materials, and upgrade and expand the Emergency Department and Trauma Center.

Figure 1-6 Campus Adjacencies

1.7 Summary of Program Needs

Since the filing and approval of the 2010 IMP, there have been recent changes in health care delivery trends as well as advances in patient care, technology, and health sciences which necessitate specific revisions to program needs. The proposed modifications to the IMP still align with the previous guiding principles and planning assumptions of the Proponents.

1.7.1 Clinical Services

Consolidation of all inpatient, emergency/trauma care, radiology and interventional procedures to the west side of the campus necessitate that new space be obtained. Due to very specific requirements for hospital and clinical functions driven by today's code and clinical space standards, it is impractical to rehabilitate certain buildings. BMC strives to consolidate its clinical programs in proximity to core medical services and operational support functions. This is a particularly important consideration in locating medical facilities to allow for time and continuity of care as well as efficiency for staff and convenience for visitors. The proposed Moakley Cancer Center Addition, New Inpatient Building, and Administration / Clinical Building directly address these needs.

1.7.2 Administrative

A major objective of Boston University Medical Center is to consolidate campus functions while shifting administrative uses away from the clinical and instructional cores. Administrative uses are scattered through the campus creating inefficiencies and occupying space that is ideal for clinical expansion and academic programming. The future Administration / Clinical Building will help consolidate these functions and improve campus adjacencies.

1.7.3 Support Operations and Infrastructure

Boston University Medical Center includes many older structures and has expanded over the years. As BMC's clinical programs have expanded, the infrastructure that supports day-to-day operations for loading and receiving and materials handling and trash removal has remained unchanged. Servicing these buildings and projected future programming requires new and upgraded facilities to support BMC's operations. The proposed new Bridge and proposed new below grade tunnel connecting to the interim materials handling area (in the existing Power Plant) will support these goals by facilitating the transfer of patients and materials, centralizing truck traffic, and reducing vehicular congestion and curb cuts along Albany Street.

1.7.4 Energy Service

The BUMC Campus relies on many utilities that are approaching operating capacity. In order to support the growth of the campus, keep up with advancements in technology, and deliver clinical services 24/7, Boston University Medical Center is faced with the challenge of managing the availability and reliability of energy service which is critical to a major medical center. The goal is to reduce Boston University Medical Center's demand on existing taxed

infrastructure, create redundancy, and to install more energy-efficient equipment that will set the foundation for supporting greener campus growth. The new BMC Energy Facility will address infrastructure and energy service needs for the BUMC Campus as well as the adjacent BioSquare. Upon further review of the selected site and program described in the 2010 IMP, BMC now proposes a smaller Energy Facility and to move the location to the west side of the existing Power Plant to be closer to utility connections thusly increasing overall efficiencies.

1.8 Urban Design Objectives

Section 1.7 provides details regarding the shared planning assumptions, the consolidation of campus functions, and the optimization of operational adjacencies. This section outlines the broader urban design goals that benefit neighbors and visitors, as well as students, patients, faculty, and staff, and describes how all users engage and experience the campus.

The primary urban design objective of Boston University Medical Center 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, sensitive design, careful open space planning, and conscientious site and streetscape enhancements along the campus periphery have supported this objective.

Various improvement projects, implemented under the previous Institutional Master Plan, refined the presence and aesthetic of the BUMC Campus, specifically along Harrison Avenue and Albany Street. (See Figure 1-7 Campus Improvement Projects.)

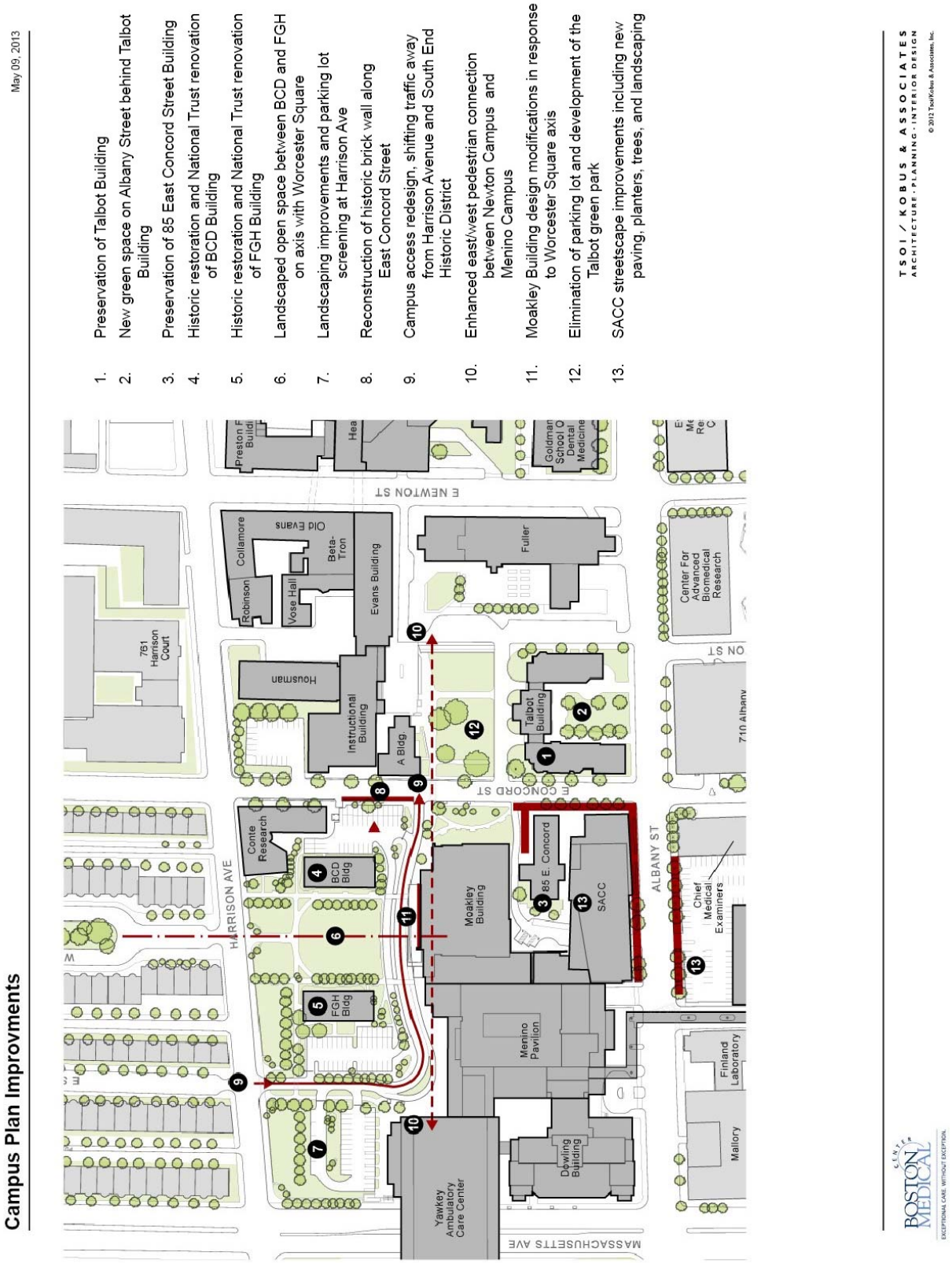
Additional master planning design goals to support future development on the BUMC Campus include:

- Transform the Albany Street campus image.
- Complement the existing context massing, scale, and materials.
- Create a clear and welcoming sense of arrival.
- Enhance open spaces on the campus, both short and long-term.
- Develop pedestrian friendly street edges.
- Enable connectivity between parking and existing buildings.
- Integrate sustainable design principles and operations.
- Plan proactively for future growth and transformation.

These new master plan goals, combined with the previously applied design principles, will enrich the physical image of the BUMC Campus, improve the integration with the surrounding neighborhood, and elevate the perceptions of the Boston University Medical Center by its users, particularly on Albany Street.

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.

Figure 1-7 Campus Plan Improvements



1.8.1 Consistency with the Harrison Albany Corridor Strategic Plan

The Institutional Master Plan aligns with the vision and goals established in the Harrison Albany Corridor Strategic Plan (HASCP) and the IMP has been developed to enhance Boston University Medical Center's public service and economic development role in the community. Under earlier master plans, Boston University Medical Center has accomplished preserving and enhancing open space. The proposed projects under the current master plan will continue this. The design of the proposed buildings will blend with the historic and modern BUMC 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 way finding. 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. To that end, HACSP streetscape guide lines will be explored along with other criteria. Curb cuts on both sides of Albany Street will be reduced to reinforce the pedestrian circulation and improve the experience. Additionally, the existing loading dock and associated traffic will be relocated from the north side of Albany Street to an interim location at the existing Power Plant on the south side thereby diminishing the congestion and conflicting traffic patterns. The design of the New Inpatient Building at the intersection of Massachusetts Avenue and Albany Street will capitalize on the opportunity to improve the pedestrian experience at this pivotal intersection as so appropriately cited by the HACSP.

1.8.2 Existing Urban Fabric

The BUMC Campus is bound by a residential neighborhood to the north along Harrison Avenue, support and research and development uses to the south along Albany Street, and 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 BUMC Campus and links the institution to the City of Boston. Significant pedestrian routes, such as the East Concord Street corridor, weave through the campus.

The existing architectural context is comprised of a variety of scales, styles, and periods. Building heights range from two to 14 stories. Traditional historic buildings, such as the Talbot, BCD, and FGH Buildings, were constructed in the late 1800's. The recently completed Moakley Building and the Shapiro Ambulatory Care Center portray the current, modern campus aesthetic. These diverse buildings represent Boston University Medical Center's sensitivity to historic context through preservation and its commitment to delivering state-of-the-art health care.

See Figure 1-2 BUMC Campus Plan for more information.

1.8.3 Public Realm

1.8.3.1 Campus Development, Past and Present: A Balanced Approach

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, the BUMC Campus utilizes a balanced master planning approach with minimal collateral loss to existing infrastructure through its commitment to historical precedents and open space strategies.

Recent 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 and education. 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 a recent example of careful campus planning. 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.

1.8.3.2 Campus Access and Connectivity

An individual's experience with the BUMC 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, education, and research.

The BUMC 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 Boston University Medical Center. About half of the visitors arriving at the BUMC Campus by car will go directly to the parking garage located on Albany Street.

Currently the arrival experience along Albany Street consists of a ragged edge of buildings of varying styles, ages, and conditions. This is also the primary Trauma Center access route for both East and West campuses. As previously stated, transforming and refining the Albany Street edge is essential to the future development of the BUMC Campus.

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 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 medical campuses and the medical school.

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 the BU Albany Fellows Graduate Student Housing and link future developments and medical and bio-tech clusters to the east and west as envisioned in the Harrison/Albany Study.

See Figure 1-8 Major Vehicular Access and Major Entry Points.

The relocation of the Emergency Department entrance for pedestrians and passenger vehicles will change local circulation patterns. Passenger vehicles headed for the Emergency Department are proposed to use the Shapiro Courtyard. At the new entrance, drivers will be met by a valet who will transfer their vehicle via East Concord Street and across Albany Street to a valet-only parking lot proposed to the east side adjacent to the existing Power Plant.

The relocation of the passenger vehicle pick-up and drop-off along with relocation of the existing loading dock on the north side of Albany Street to an interim location in front of the existing Power Plant to the south side will enable closure of three curb cuts in front of the existing Emergency Department entrance. The resulting one-way circulation scheme will reduce traffic conflicts on the north side of Albany Street and will enlarge space available for ambulances. On the south side of Albany Street, the existing curb cut located between the existing Power Plant and Finland Building will be reduced to one lane. The existing curb cut in front of the Power Plant for truck access will be relocated to better align with existing loading docks. The curb cut consolidation in conjunction with proposed sidewalk improvements similar to those associated with the Shapiro Ambulatory Care Center will foster a more unified, continuous, and pedestrian friendly streetscape.

With the construction of the new Bridge and Energy Facility, the shuttle bus access to the Woods-Mullen Shelter from the driveway between the Power Plant and Finland Building will be eliminated. The shuttle buses will instead use the proposed new one-way entrance and exit driveways on Massachusetts Avenue with right-in/right-out only curb cuts. The proposed new shuttle bus drop-off will be more efficient than the existing condition and will reduce traffic on Albany Street. Currently, the shuttle bus arrives at Woods-Mullen Shelter by traveling north on Massachusetts Avenue and turning east on Albany Street and then south on the driveway in between the existing Finland Building and Power Plant Building.

See Figure 1-9 Proposed Access, Entry and Circulation Changes

On the southern perimeter of the BUMC 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 BUMC connections where it intersects with Massachusetts Avenue.

See Figure 1-10 Neighborhood Connectivity and Open Space Network.

There are several pedestrian pass-through connections on the BUMC Campus. These include access corridors at the Menino Pavilion, Moakley Building, and Talbot Building. The public corridor through the Menino Pavilion links the walk-in Emergency Department entry with the Menino Lobby. There is a limited-access corridor for wheelchair/stretcher patients through the Moakley Building that unites the Moakley/SACC south entry court with the Moakley Lobby. All users (public and institutional) access Talbot Green from Albany Street through the Talbot Building's two underpasses. Security has played an increasing role at institutions in recent years, and the BUMC Campus is no exception. As such, some public access through buildings that would connect Harrison Avenue to Albany Street is limited.

See Figure 1-11 Pedestrian Connectivity.

Additionally, Boston University Medical Center has a very active bicycle program that further promotes movement and connectivity throughout the medical center.

See Transportation Section 4.2.8 for more information. See also Figure 4-11 for BUMC Campus Bicycle Facilities.

1.8.3.3 Campus Open Space

Open spaces play a pivotal role in clarifying way finding and enhancing the user's experience. They furnish visual cues for circulation and effective linkages between city streets and campus pathways. One of the unique characteristics of Boston University Medical Center is the amount and quality of its open spaces, virtually unprecedented on urban hospital campuses.

While examining equivalent medical institutions within the City of Boston, it is evident that the amount of green space on the BUMC Campus is comparable and in some cases much greater than what is being provided elsewhere. Over recent years the completion of Master Plan improvements have 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 the Talbot Building, BioSquare, and Harrison Avenue. The open spaces also provide gathering areas for students, faculty, and staff. In particular, the lawn between the 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 new 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. (See Figure 1-10 Neighborhood Connectivity and Open Space Network).

As per the institutional design goals and objectives, the Boston University Medical Center will continue to complement and animate its open space network through additional streetscape refinements and landscaped areas along the Albany Street corridor.

1.8.3.4 Campus Way finding and Signage Plan

Boston University Medical Center developed a comprehensive signage and way finding plan several years ago. The goals of the BUMC Campus 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. Boston University Medical Center signage efforts were coordinated with its neighbors including representatives of Crosstown, Newmarket Business Association, and the BRA.

The architectural variation and intensive vehicular traffic in the general area of the BUMC Campus can present navigational difficulties for a visitor who is unfamiliar with the medical center. To address this issue, Boston University Medical Center 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 BUMC 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 BUMC 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 BUMC Campus. The maps identify each institution and display information regarding

roadways, transportation routes, landmarks, public transportation, parking, and other public amenities.

The most recent expansion of the signage program was the inclusion of BioSquare Drive. The signage plan allows for future implementation and independent facility updates for each member institution.

The proposed IMP projects and all previously approved projects will be consistent with the BUMC Campus signage plan. See Figure 1-12 BUMC Campus Signage Plan.

Figure 1-8 Major Vehicular Access and Major Entry Points

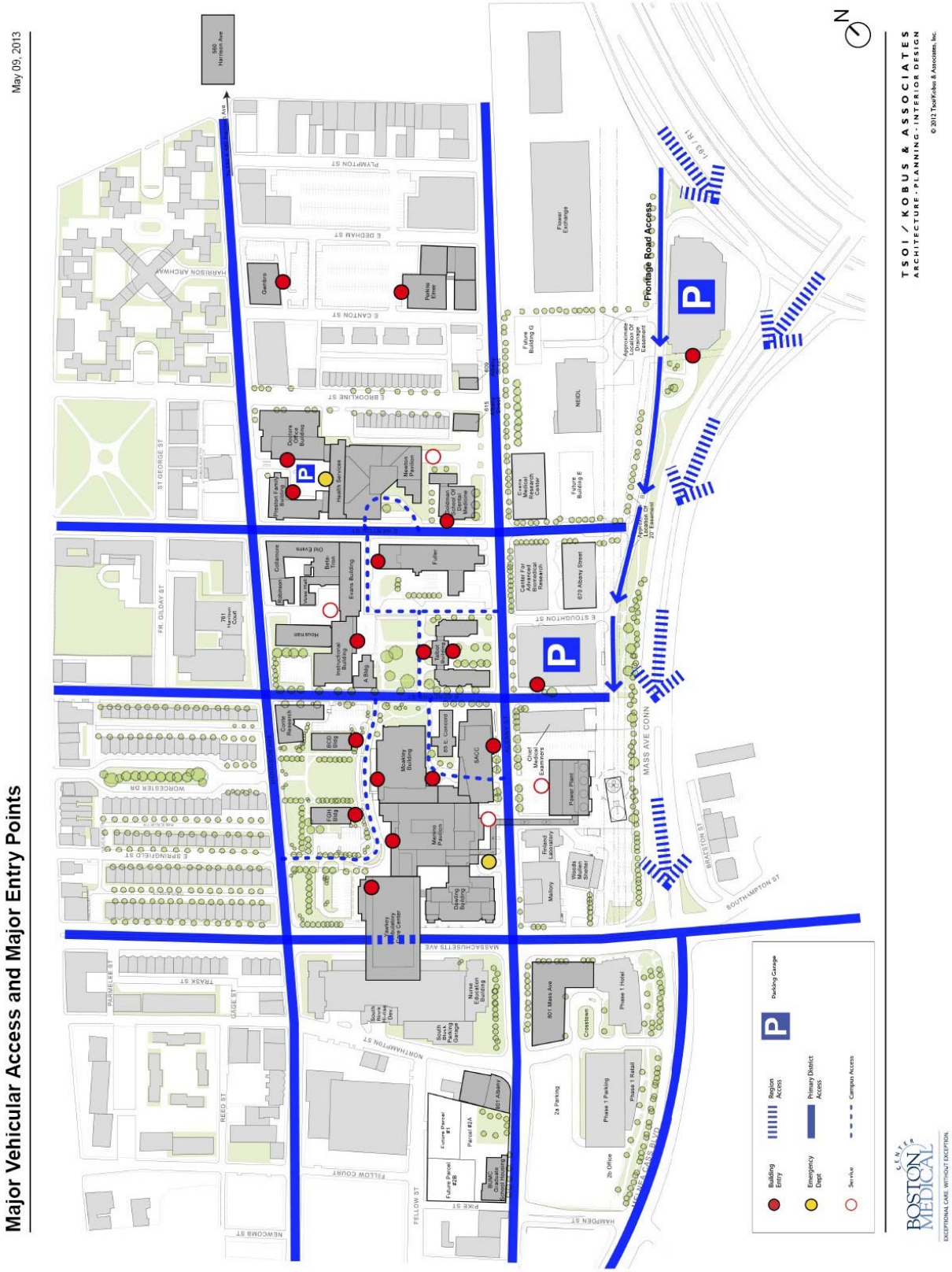


Figure 1-9 Proposed Access, Entry and Circulation Changes

Figure 1-10 Neighborhood Connectivity and Open Space Network

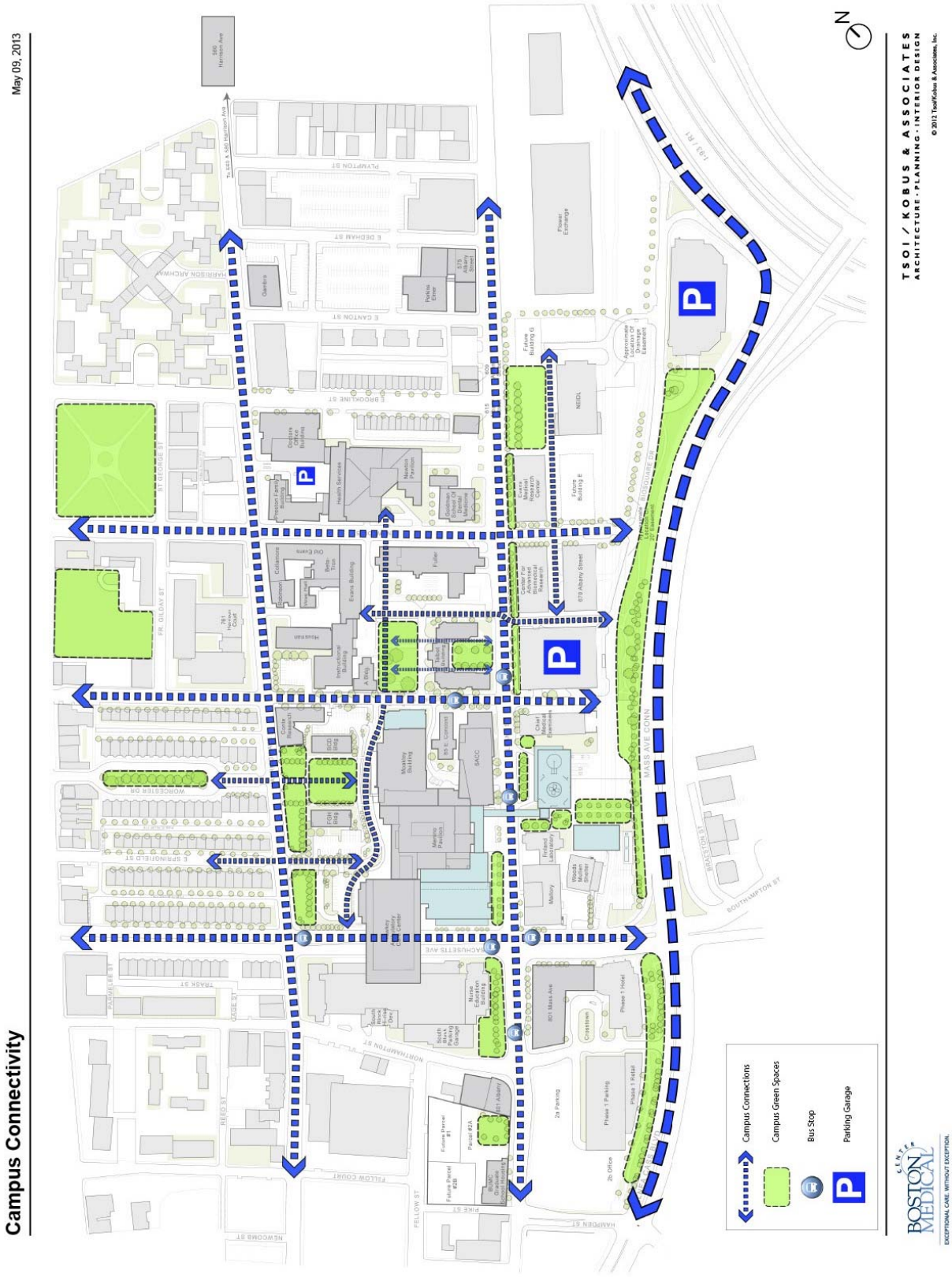


Figure 1-11 Pedestrian Connectivity

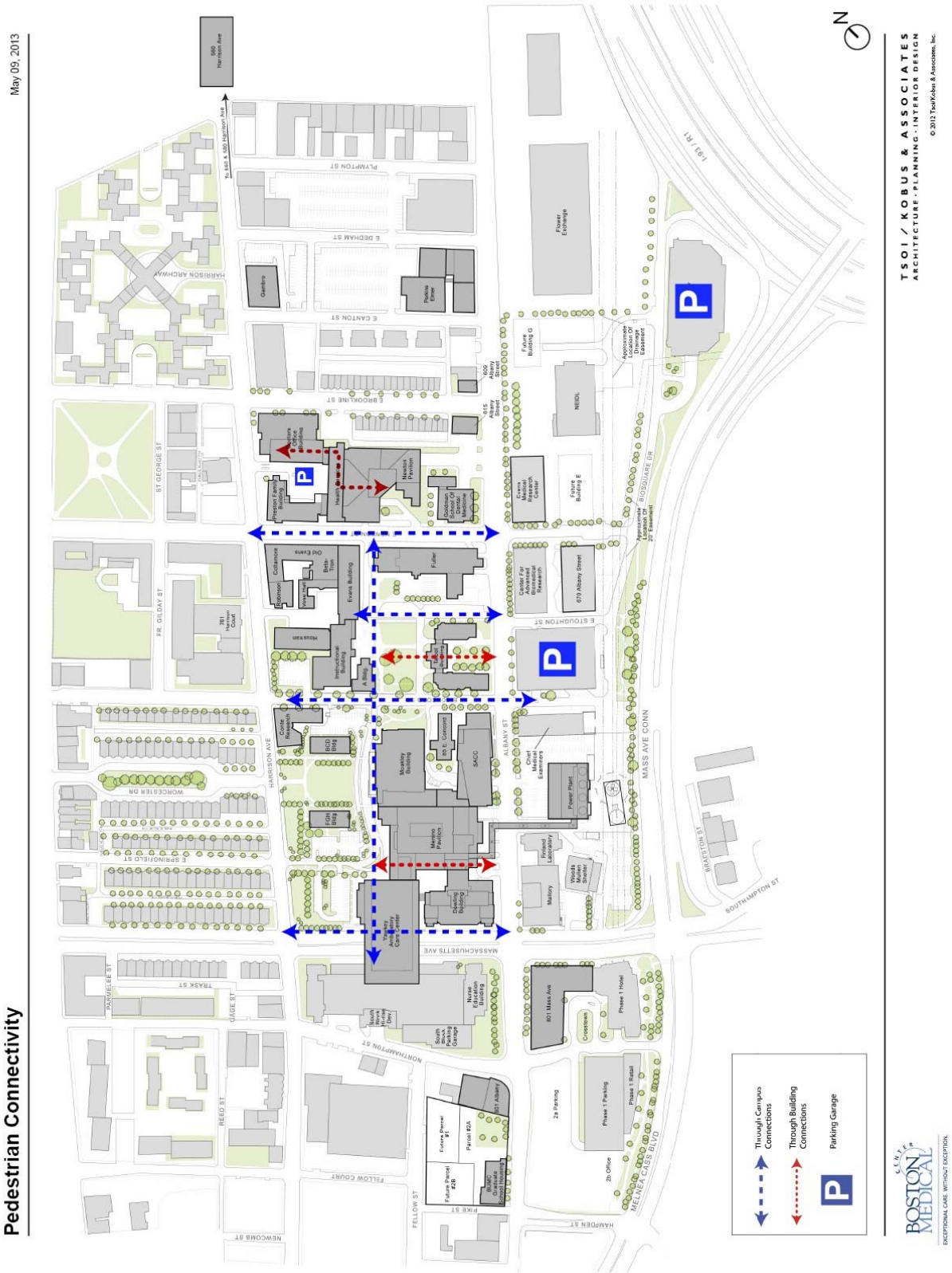
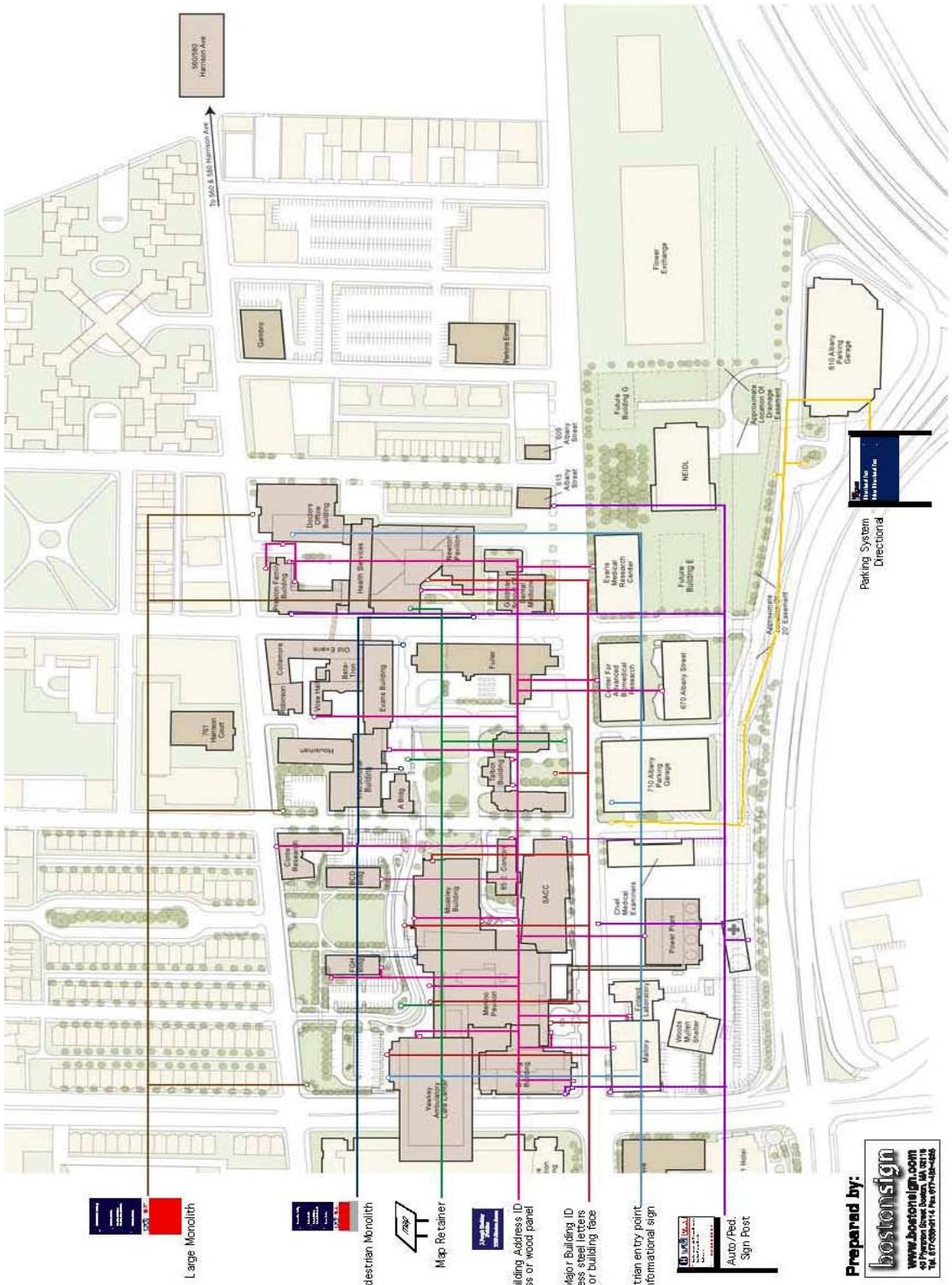


Figure 1-12 BUMC Campus Signage Plan



1.8.4 Massing and Height

Several key factors drive the proposed massing, height, and location of the three master plan projects. The key factors include programmatic needs, optimization of existing real estate, architectural context, and previously established urban planning principles. These elements balance the needs of the institutions while continuing to strengthen and enhance the relationship between the BUMC Campus and the neighborhood.

Each 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 Albany Street Urban Corridor.

See Figures 1-13 to 1-17 Aerial Massing Views.

Figure 1-13 Proposed IMP Projects Aerial Looking North

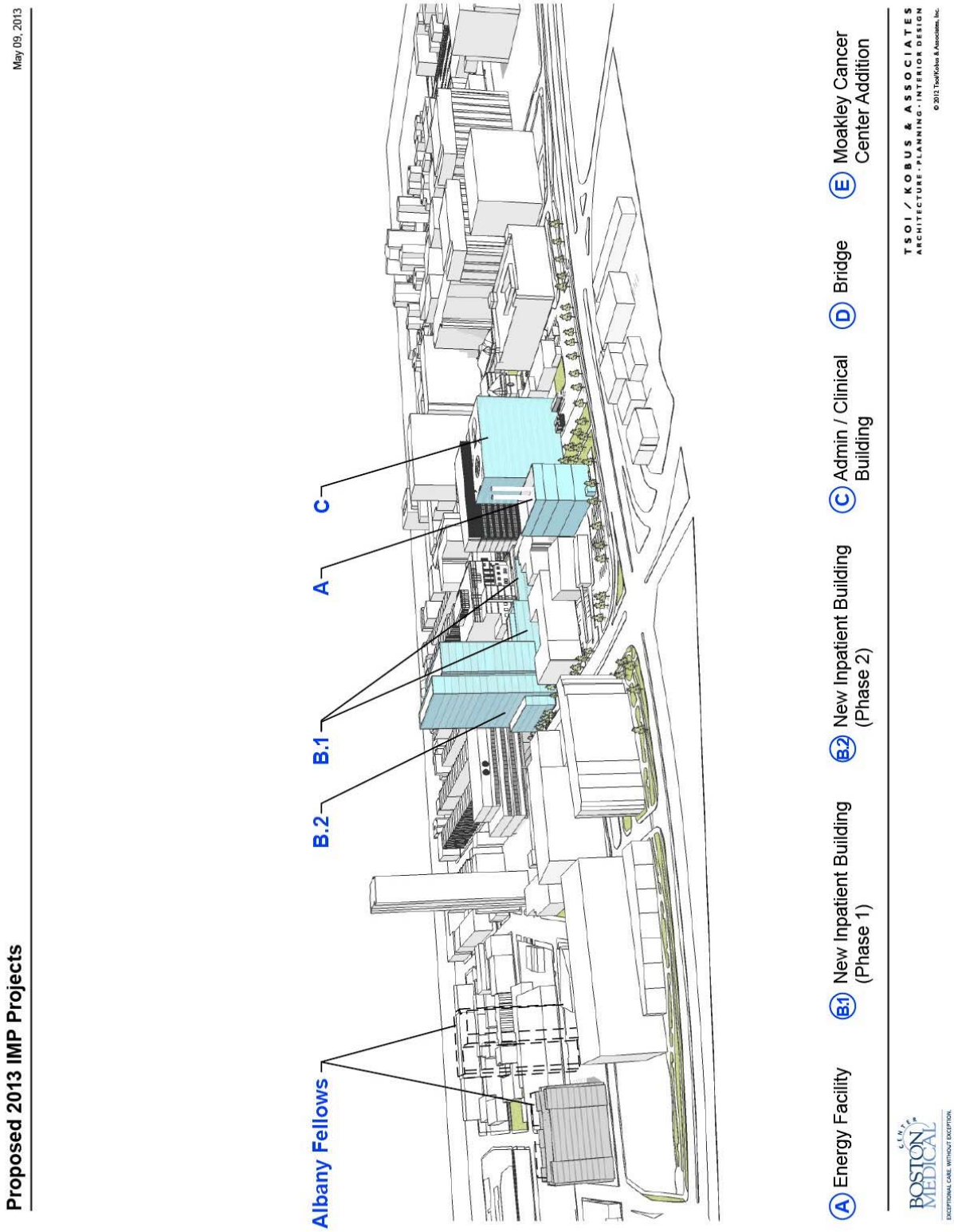


Figure 1-14 Proposed IMP Projects Aerial Looking Northwest

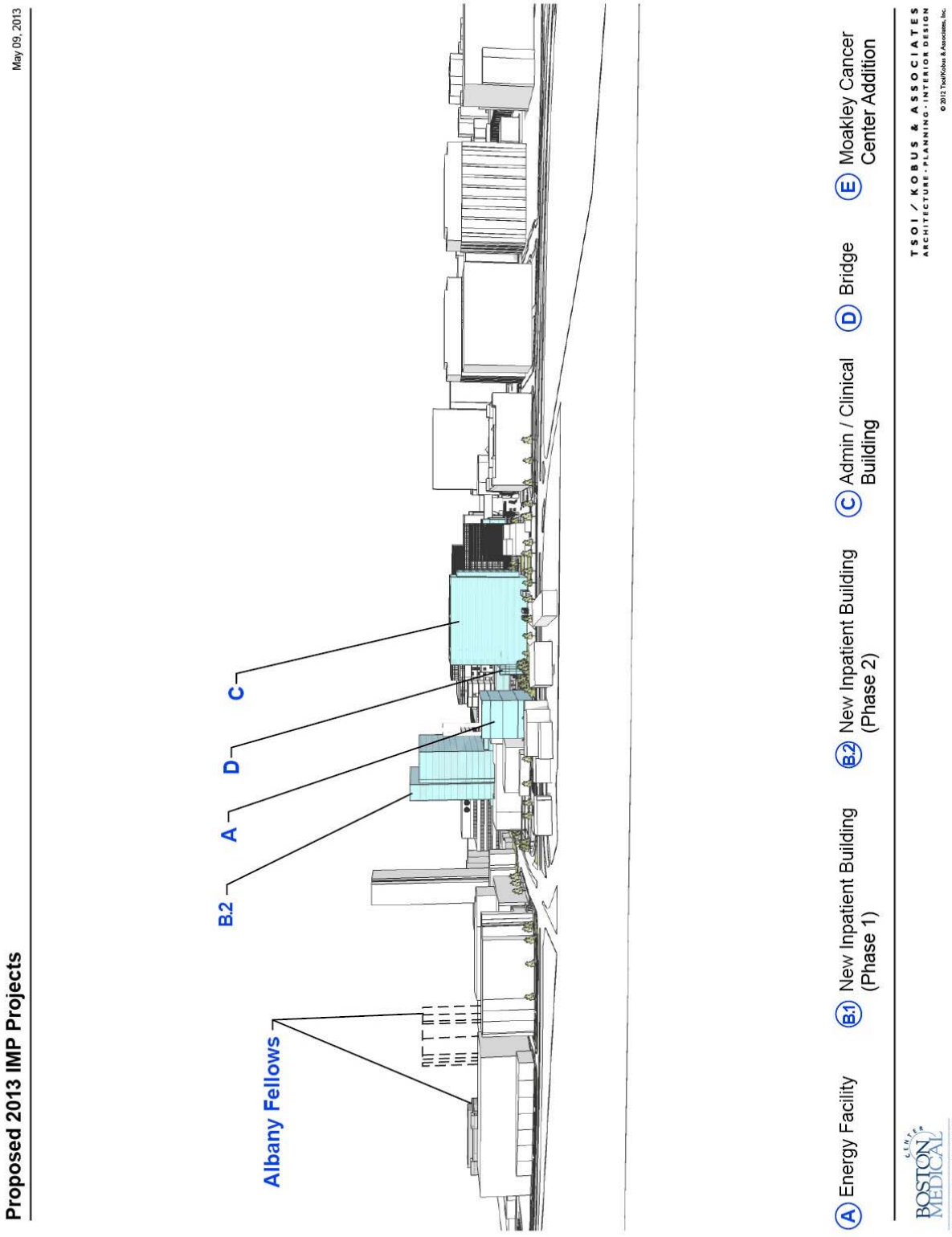


Figure 1-15 Proposed IMP Projects Aerial Looking Southeast

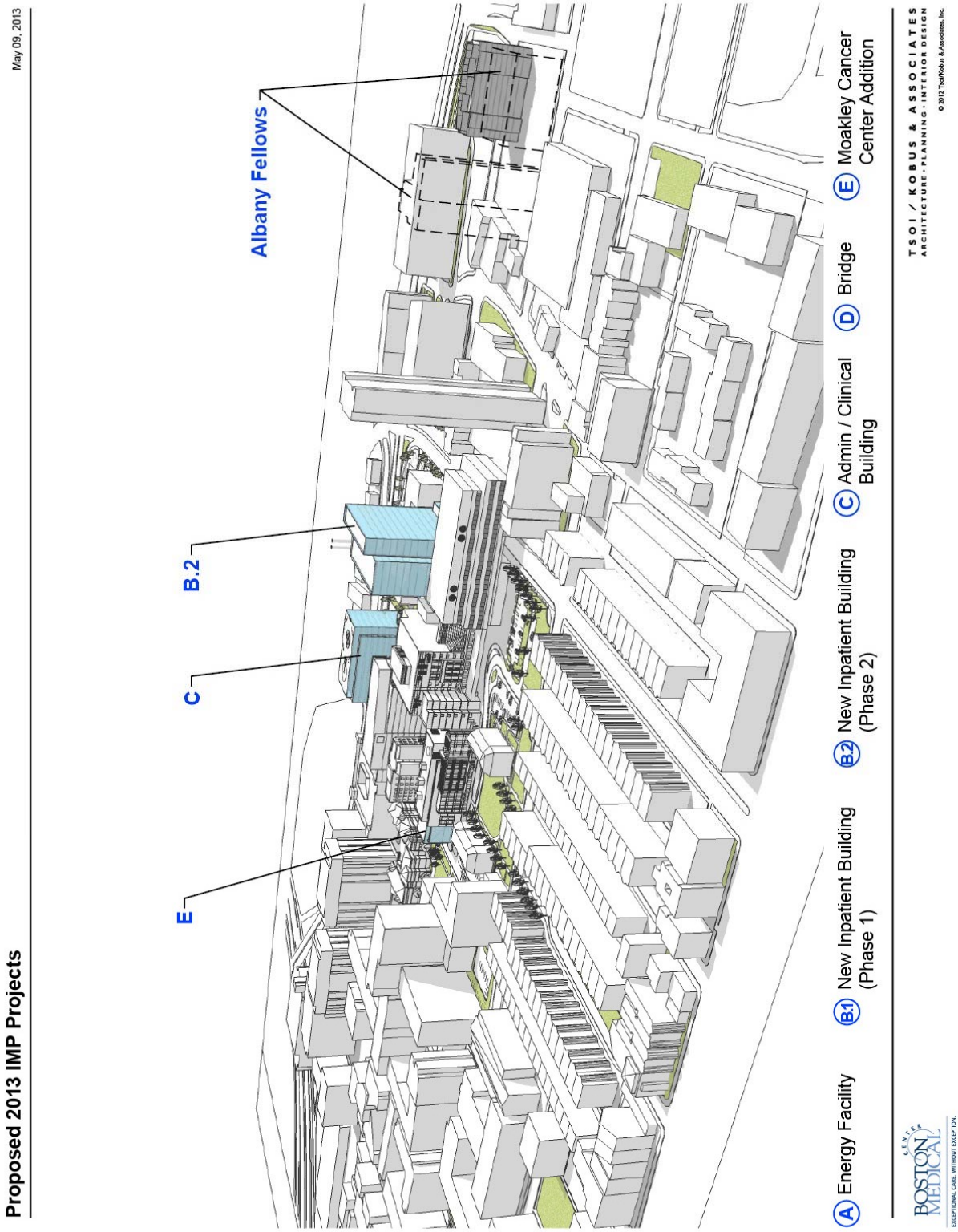


Figure 1-16 Proposed IMP Projects Aerial Looking West

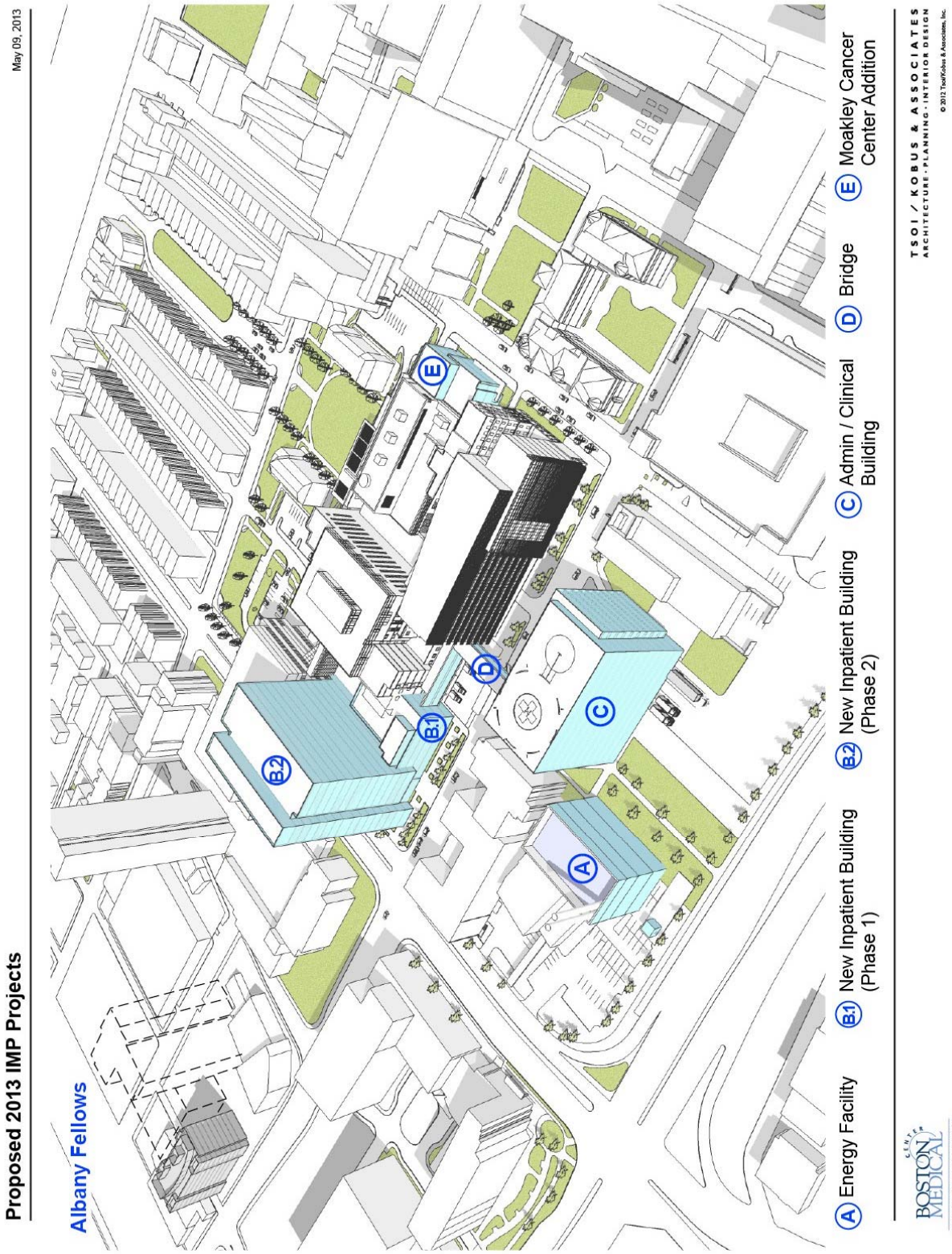
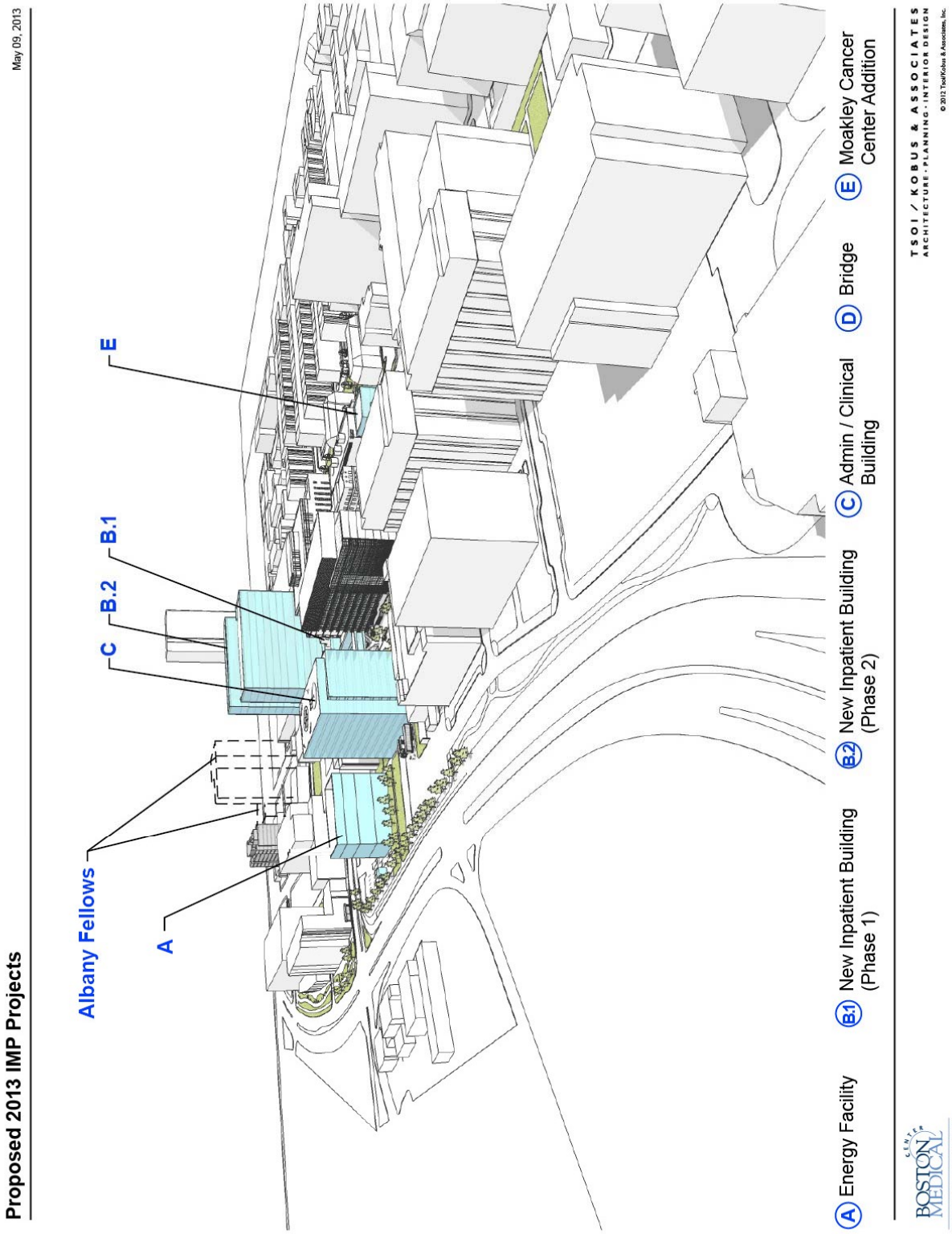


Figure 1-17 Proposed IMP Projects Aerial Looking West Massachusetts Ave Connector



1.9 Public Benefits

Boston University Medical Center provides numerous public benefits to the City of Boston. The IMP projects will directly enhance the Proponents' abilities to administer the services that support their missions within the community.

1.9.1 Boston Medical Center

1.9.1.1 Community Benefits Introduction

As previously noted, BMC's mission is to "consistently provide excellent and accessible health services to all in need of care, regardless of status or ability to pay." Approximately 70 percent of BMC's patients come from underserved populations, including low-income families, elders, people with disabilities, and immigrants. Seventy percent of all patients are from racial and ethnic minority populations, and 30 percent do not speak English as a primary language. To address the health needs of its diverse patient population, BMC provides a wide range of services beyond the traditional medical model. These programs, including but are 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.

BMC values its diverse patient population and is committed to honoring their ethnic, religious and cultural differences. The Interpreter Services program at BMC is the most extensive in New England and one of the largest in the country. In addition to providing person-to-person interpreters on-site in more than 21 languages, 24 hours a day, the program uses the latest advances in technology, such as telephonic and video interpreting. BMC interpreters help break language barriers as well as serve as cultural brokers to patients and staff. In 2012, BMC handled approximately 205,839 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 fore 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 line 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 annual 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 categorizes 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.

Some of the community benefits programs offered at BMC included the following:

Needs Assessment

BMC's assessment of the health care needs of the communities it serves is based on demonstrated need. The Medical Legal Partnership I Boston (MLP) is one of many examples of how demonstrated need informs BMC (BMC) community health improvement activities and services.

In 1993, clinicians within the Department of Pediatrics understood that nutrition and home energy were root causes of poor health and development among their predominantly low-income pediatric patients. In response, MLP initiated the "Energy Clinic" in 2006 to provide targeted advocacy around issues of nutrition and home energy.

Today, MLP is a national leader in medical-legal collaboration to address the root causes of pediatric poor health and development. MLP seeks to improve the health and wellbeing of people in poverty by addressing the non-medical barriers to health faced by low-income individuals. MLP allies lawyers and health professionals and creates access to legal services in the clinical setting to ensure that low-income patients' basic needs—for food, housing, education, health care, and safety/stability—are met. The national MLP network now extends to more than 80 sites across the country, spanning both urban and rural communities.

Promotion of Community Health

<u>Special Support for Children and Families</u>

- Child Life Program (CLP): The CLP helps children and families manage the stresses associated with hospitalization and illness. The Child Life Team is trained to help children and families understand the hospital experience and related feelings. The goals of the CLP are to: help children express their feelings in a safe and supportive environment; help children manage pain effectively; offer children choices that increase feelings of independence, self-esteem and trust; and assist with implementation of coping techniques during stressful situations.
- Children's Health Watch (CHW): CHW is a non-partisan pediatric research center that monitors the impact of economic conditions and public policies on the health and

well-being of very young children. CHW interviews families with young children in five hospitals across the nation, including BMC (4,500 patient interviews in FY11), that serve the poorest families. The database of more than 44,000 children, 80 percent of whom are minorities, is the largest clinical database in the nation on very young children living in poverty. Data are collected on a wide variety of issues, including demographics, food security, public benefits, housing, home energy, and children's health status and developmental risk. We seek to provide policy makers and advocacy groups with the evidence they need to shape policies that prevent child hunger and promote children's health.

- Pediatric Assessment of Communication Clinic (the Autism Clinic): Since 2003, the Autism Clinic has provided evaluations and ongoing care for children of all ages when there is a pediatrician concern about autism spectrum disorder (ASD) and related conditions, or when they have a previous diagnosis of ASD. The primary service provided by the Autism Clinic staff is educational advocacy. The Autism Clinic's Educational Specialist provides direct support services to primarily low-income and/or immigrant families who have limited English proficiency and are most challenged by the complex regulations governing the special education system. As needed, she travels to classrooms to observe young patients with ASD and to help families access the proper special education placement for their children, much faster than these families could manage on their own. Approximately 600 new patients and 1,000 families are served annually.

- Birth Sisters and Perinatal Care: 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 10 two-hour group sessions using a BMC-developed curriculum. 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 support 334 patients.

- Supporting Parents and Resilient Kids Center (SPARK): SPARK is a therapeutic day program for Boston's most vulnerable children, including those living with HIV/AIDS; those born very prematurely; those who have suffered psychological trauma due to abuse/neglect; and those with complex medical and emotional needs. SPARK staff provide medical, educational, nutritional, and mental health services to vulnerable children from birth to age 22. SPARK operates an Early Childhood Day Program, a School-Age After-School Program, a young adult Job Training Program and a Summer Camp Program, serving approximately 100 children annually who live throughout Eastern Massachusetts. SPARK helps children to build positive social

networks, positive self-regard and community belonging. Additionally, the program provides parenting education and support.

- Medical Legal Partnership Boston (MLP│Boston): MLP│Boston seeks to improve the health and wellbeing of people living in poverty by addressing the non-medical barriers to health that low-income individuals so often face. MLP│Boston allies lawyers and health professionals and creates access to legal services in the clinical setting to ensure that low-income patients' basic needs—for food, housing, education, health care, and safety/stability—are met. In FY11, MLP│Boston served 1,000 individuals.

- Margaret M. Shea RN Adult Day Health Program: This program offers families peace of mind and a support system to help them with decisions involving the care of their loved ones. It is a holistic medical intervention program that provides 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. All participants are referred to the program and are screened before entering the program. Services offered by the program include nursing, social services, activities and transportation.

Responding to the Needs of Patients Affected by Violence

- Child Protection Team (CPT): A special services division of the Department of Pediatrics, CPT serves all of BMC's maltreated pediatric patients. The CPT has three major areas of responsibility: 1) supporting BMC providers to ensure that maltreated children treated at BMC are protected; 2) improving the effective identification and response to maltreatment through innovative research and program development at BMC and nationally; and 3) providing training and education to pediatric health and other professionals in the recognition and management of child maltreatment. CPT collaborates with community and state agencies, law enforcement personnel and the judiciary system to ensure the best possible outcome for children and families.

- Child Witness to Violence Project (CWVP): CWVP is a nationally-recognized and award-winning counseling, outreach, and consultation program that focuses on young children under the age of eight who are exposed to domestic or community violence. The CWVP offers a flexible combination of services to children and their families, including: intensive trauma-focused counseling that is developmentally tailored to very young children and their parents; access to legal advocacy; and assistance with linking to other necessary services including health care, child care, housing, and after-school programs. In 2011, the CWVP provided trauma-focused counseling services to 90 children, and brief consultation/advocacy for an additional 200 families. The training/clinical consultation component of the program delivered 100 trainings across Massachusetts and 12 states.

- Domestic Violence Program (DVP): The DVP provides training and education for staff, assistance with hospital policy and protocol development, consultation on a variety of clinical and research initiatives, as well as direct advocacy/support services for survivors of domestic and dating abuse. In 2009, a Safety and Support Advocate position was created to provide a range of advocacy and support services to patients referred from a range of adult and adolescent settings and providers. The DVP served 200 individuals in FY11 by providing services such as crisis intervention/counseling; risk assessment and safety planning; assistance with accessing protective orders, victim compensation; accompaniment to court, legal, medical, housing and other appointments; referral to community-based DV advocacy/rape crisis counseling, medical/mental health services and other support as needed.

- Violence Intervention Advocate Program (VIAP): In April 2006, BMC piloted VIAP to provide specialized services to victims of violence, using two community health workers, Violence Intervention Advocates, to provide individual counseling, triage and referral services for victims of violence brought to the BMC Emergency Department. VIAP staff collaborate with public and private agencies to offer a broad spectrum of concrete services to patients recovering from violent injury. Each VIAP site has hired a peer Violence Intervention Advocate VIA with strong community knowledge. In FY11, VIAP provided services to a total of 415 victims: 178 gunshot victims and 237 stabbing victims. Of these victims, 34 were female. VIAP provided the following direct services and referrals to services to victims and 34 families: crisis intervention and stabilization; housing and transportation; legal; educational; vocational and life skills development; mental health; employment; and health and wellness.

Community Outreach

- Cancer Screenings: BMC offers an annual free cancer screening event to vulnerable, underserved individuals in order to promote the early detection of cancer. Because BMC serves a predominantly minority and low-income population, including many non-English-speaking citizens and immigrants, the delivery of exceptional care requires a keen sensitivity to the challenges for our patient population. The Saturday cancer screenings effectively reach our target population because they create a convenient time for people who work to access screenings, and allow husbands and wives to support each other as they both are screened. A total of 240 people from Boston and surrounding areas attended the 2011 screening event.

- Flu Vaccine Day: BMC began its 2010-2011 influenza vaccination campaign in September of 2010 making influenza vaccine available to all patients in both the inpatient and ambulatory care settings. To date, BMC has administered more than 31,348 doses of vaccine.

A Safety Net for Special At–Risk Populations

- The Metro Boston Jail Diversion Program (JDP): Since 2006, the JDP has worked with 529 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 JDP collaborates with the police and courts to both identify individuals with these risk factors and connect them with appropriate services and treatment as alternatives to arrest and incarceration. The JDP is training 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, 56 JDP participants have successfully completed probation rather than being incarcerated.

- 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; educate and train agencies and professionals who serve these communities; advocate for the promotion of health and human rights in the United States and worldwide; and 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. In FY11, the BCRHHR served more than 500 patients.

- Elders Living at Home Program (ELAHP): In FY11, ELAHP provided housing search and placement to 14 homeless older adults, and housing stabilization services to an additional 60 formerly homeless individuals. None of the vulnerable clients served during the year relapsed into homelessness, although two individuals did require nursing home placement due to significant declines in their cognitive abilities. The goal of ELAHP is to help older adults locate and maintain a permanent residence and allow them to live as independently as possible.

Healthy Nutrition and Exercise

- Food Pantry: The Preventive Food Pantry and Demonstration 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 Food Pantry now provides nutritional food prescriptions to approximately 7,000 people each month. Over the past five years the Pantry has seen an 87% increase in demand for its services. In 2011, the Pantry provided 252,228-worth of food to an estimated 13,902 people. This number is expected to rise by 5% in 2012. Approximately 10,000 pounds of food supplies are required weekly to stock the Pantry shelves at BMC. The Demonstration 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.

- Grow Clinic: As part of BMC's Pediatrics Department, the primary goal of the Grow Clinic is to provide comprehensive multidisciplinary medical, nutritional, social services and dietary assistance 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 poverty, illness and family stress. The effects of FTT include shortened attention spans, emotional problems, delayed cognitive development, lasting growth failure, and frequent and serious illness, which can result in hospitalization. In 2011, the Grow Clinic provided medical treatment, nutritional assessment, home health education, family advocacy, access to a therapeutic food pantry and other services, children's clothes, diapers, books and educational toys to a total of 225 patients/families.

- Adult Weight Management: The Nutrition and Weight Management Center offers several programs, such as weekly support groups for weight management and a cancer survivor's weight management group, for the community aimed at supporting healthy lifestyles and nutrition. More than 500 patients benefited from these services in FY11.

- Nutrition and Fitness for Life Program (NFL): The Department of Pediatrics works to prevent the onset of adult diabetes in young, underserved, and overweight and obese patients through its NFL, which provides clinical and community-based services to children and their families. The NFL model features three primary components: 1) clinical services targeting children with >95 percentile of body mass index; 2) the FANtastic Kids after school program which provides teen-mentored nutrition education and fitness activities for overweight and obese youth who are referred to the program by their physicians; and 3) continuing medical education for clinicians to increase their capacity to treat pediatric overweight patients in the primary care setting. These programs fill a large gap in services to populations most strongly impacted by the pediatric obesity epidemic.

Basic Needs

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

- Social Work Emergency Fund (SWEF): The SWEF provided short-term, immediate assistance to approximately 550 patients who faced crises in FY11 and had nowhere else to turn. The Fund enables BMC to cover the costs of emergency expenses while its social workers help individuals and families find the resources and services they need to stabilize their lives after personal crises. We provide cab vouchers for those unable to access public transportation to get to BMC, and car seats and clothing to young families. SWEF has the flexibility to provide for a range of needs and the judicious use of funds helps in a number of unique situations when, too often, individuals and families have no alternative.

Removing Barriers to Accessing Care

- New England Flight: BMC is a Boston MedFlight (BMF) partner. BMF is a Commission on Accreditation of Medical Transport Services (CAMTS) accredited Critical Care Transport service. Boston MedFlight commits to excellence in critical care transport by providing the highest quality regional critical care transport system. As a non-profit organization, Boston MedFlight transports emergent patients regardless of their ability to pay and is financially supported in part by a consortium of Boston hospitals including BMC. For over 25 years, Boston MedFlight has played an integral role as part of the Massachusetts EMS system and the community hospitals of New England.

- Patient Navigation: The Patient Navigation program is designed for patients with cancer and chronic illnesses, such as diabetes, who need special assistance in navigating the health care system. Patient Navigators are individuals from the communities served by BMC and who have special language skills, training in scheduling, and refined compassion/communication skills. Peer Navigators contact our most vulnerable patients and help them to access the doctor visits and treatment that they need in the most efficient manner possible, arranging transportation for patients, reminding patients about appointments that they helped the patients to schedule, and connecting patients to community resources such as the BMC food pantry.

- Shuttle Buses/Taxis: 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. In FY11, these shuttle buses transported 199,936 patients and their families between BMC and the Boston HealthNet CHCs. There is also a direct taxi and van hospital-to-home service for specific cases.

- Interpreter Services: BMC values its diverse patient population and is committed to honoring their ethnic, religious and cultural differences. The Interpreter Services Department is the most extensive in New England. In addition to providing person-to-person interpreters on-site in more than 30 languages, 24-hours-a day, the department utilizes the latest advances in technology such as telephonic and video interpreting. Interpreter Services goes above and beyond what is mandated by law to provide video interpreting, non-essential document translation (such as appointment reminder letters, bereavement letters), translation and recording of clinic phone menus, and 24/7 on-call face-to-face coverage for our top four languages Our interpreters help to break language barriers as well as serve as cultural brokers to patients and staff. Last year, they assisted in 190,647 interactions with patients and visitors.

Addressing Significant Public Health Problems

- Diabetes: The BMC Diabetes Center provides innovative and up-to-date diabetes education and care to help patients better understand and manage their diabetes. Located in the Endocrinology Clinic, the Diabetes Center provides culturally and literacy-appropriate education about nutrition, menu planning, exercise and medication management to the most chronically ill patients with diabetes. Care providers also train patients to better manage their insulin regimens. A patient navigator on the team assists patients in appointment scheduling and transportation needs, for patients with challenges in retaining their appointments (see patient navigation).

- Smoking Cessation: BMC's Division of Psychiatry offers a medically supervised Smoking Cessation Program. The program is an eight week, one hour per week classroom model with a curriculum that includes pharmacotherapy, nicotine replacement (gum and patches), stress reduction training, cognitive restructuring, social support, and relapse prevention counseling. This clinical resource for BMC patients also serves as a center for training and research in tobacco control available to the entire BMC community.

Improving Quality of Life

- Acupuncture: Acupuncture services at BMC are provided free of charge to more than 600 patients annually who do not have affordable access to complementary alternative medicine (CAM).

- 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 FY11, there were 15 cancer support groups that met regularly and as many as 650 patients who participated in the survivorship programs.

- Integrative Medicine: The mission of the Initiative for Integrative Medicine and Health Disparities within the Department of Family Medicine, which served approximately 250 patients on a rotating basis in FY11, is to substantially impact the quality of life for the urban underserved through providing access to integrative medicine clinical services, research and education. Services provided, primarily free of charge, include yoga classes, integrative cancer care, acupuncture clinics, chi gung class, music therapy, and integrative medicine consults.

Empowering Individuals with Disabilities

- Stepping Forward-Staying Informed Consumer Education Program: *Stepping Forward-Staying Informed* is a two-pronged consumer education program consisting

of an annual one-day research conference tailored to consumers and a bi-monthly evening lecture series. *Stepping Forward-Staying Informed* presents topics that directly relate to living with Spinal Cord Injury (SCI), such as current research findings and emerging effective treatment techniques, in easily understood, lay terminology. Individuals living with SCI and their families seek current information about spinal cord injury research and emerging treatments because it enables them to advocate on their behalf, make informed decisions about care, and share information with other individuals. The *Stepping Forward-Staying Informed* conference has become a relied upon source of information for consumers and healthcare professionals.

Affiliated Health Care System: Boston HealthNet Health Care System

Established in 1995, Boston HealthNet (BHN) is an integrated health care delivery system comprised of BMC, the Boston University School of Medicine, and 15 community health centers (CHCs). 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. 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 17th 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 growth of CHC admissions to BMC; the establishment of an inpatient Rounder System for CHC patients; the collaborative development of quality improvement initiatives, clinical protocols, and standards of practice; increased access to specialty services; a successful public health outreach campaign; and the significant development and coordination of BHN's information technology programs and services.

In 1997, Boston HealthNet established a Community Physician Group Inpatient Rounder System at BMC. The Rounder System brings together physicians from the CHCs and the BMC Department of Family Medicine to care for patients from these centers while they are in the hospital, thereby coordinating and enhancing the quality and continuity of care. Today, 12 CHCs and BMC's Department of Family Medicine participate in the Rounder System. The System was reconfigured in 2008 into three teams, comprised of BMC and CHC attending physicians assisted by three nurse partners and four physician assistants. In 2008 the Rounder System was extended to evenings and seven day coverage. The Average Length of Stay for the Rounder System was 4.39 days, which compares favorably with other national and local indices.

Boston HealthNet CHC partners are active collaborators on a number of projects and programs described in this report, including the Prostate Cancer Screening Initiative, patient navigation research, the FANtastic Kids program to address pediatric overweight, and Medical-Legal Partnership. Additional examples of projects on which BMC and Boston HealthNet have collaborated include:

Information Technology

- Significant strides have been made in the area of information technology across the network. All of Boston HealthNet's primary CHC partners are connected to BMC over high-speed T-1 lines that put BMC's clinical systems at the fingertips of CHC providers and other staff. In 2001, the partnership between BMC and the CHCs, coupled with a substantial grant from an anonymous foundation, supported the implementation of the Centricity electronic medical record (EMR) at eight of the primary partner CHCs. In 2008 implementation was completed at one secondary partner CHC. Additionally, electronic prescribing was implemented at the nine Centricity sites. A Working Group meets monthly to address developmental issues and to evaluate and prioritize future projects.

- A three year, $746,246 HRSA award to Boston HealthNet in FY07 supported the vertical integration of electronic medical records at eight CHCs with that of BMC. This integration took place via implementation of a Clinical Information Exchange (CIE) that now allows CHC providers to view information in both BMC and other CHC systems through the local patient record. The CIE also allows physicians in the CHCs to better track patients receiving care at BMC.

- In 2008, the network was a recipient of a one-year, $543,000 high impact health information technology grant from HRSA that allows staff to implement an electronic referral management system between the 10 BHN primary partner CHCs and specialists in the BMC Department of Medicine. By leveraging the technology of the CIE, the eReferral system also makes it possible for the CHCs to schedule appointments, electronically submit required clinical information to specialists, receive electronic information about referrals, track patients' no-show rates, and receive return specialist reports through the local EMR or by opening a web-based practice portal.

- In 2010, Boston HealthNet received a two-year, $2,986,872 grant from HRSA to help complete the transformation of current Health Information Technology capabilities into a truly integrated, high-performance health information exchange with the capacity to handle all necessary clinical, administrative and financial functions. To this end, project funds are being used to install the Centricity Practice Solution at five CHCs; to implement immunization and diabetes registries for the entire BHN network, including BMC; to fully automate laboratory order entry and results retrieval for 12 of the CHCs; to automate reporting of Uniform Data System measures and HRSA Clinical Performance Measures in all 15 CHCs; and to create a data warehouse for the CHCs.

- In 2011, the Yankee Alliance, Inc. awarded BMC $454,967 for the Balanced Scorecard/Safe Sign-outs project, to begin retroactively on October 1, 2011 and finish September 30, 2012. BMC Balanced Scorecard is a continuation project to move to the next level in developing a computer dashboard system to drill down on patient safety and quality. This project will focus on the provider level metrics development and testing. Safe Sign-Outs is a new systems development project to create a

software system and protocol for resident safe sign-outs to prevent patient adverse events.

- Also in 2011, Boston HealthNet received a two-year HRSA grant to implement a series of Health Information Technology initiatives that integrate databases and electronic alerts in standardized systems in order to improve the quality, effectiveness and efficiency of primary care. The project will implement clinical and financial practice management software that is fully integrated with the electronic health records at five CHCs, reducing the number of customized interfaces and licenses needed and providing crucial business intelligence; create system-wide childhood immunization and diabetes registries; automate reporting of Uniform Data System data, HRSA clinical performance measures and selected practice management metrics; and create a data warehouse for the CHCs. The project will benefit the more than 334,000 Boston HealthNet patients and the clinical impact of the proposed will include significant increases in the number of children fully immunized by age two years and adherence to the standards of the National Committee on Quality Assurance for diabetes care, and a significant decrease in the percent of patients with uncontrolled diabetes (HbA1c > 9).

Increasing Patient Access

- 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. Last year, these shuttle buses transported 199,936 patients and their families between BMC and the Boston HealthNet CHCs.

Advancing Medical Education

- A number of HealthNet CHCs also serve as the primary community-based training sites for Boston University School of Medicine pediatric, family medicine, and general medicine residents.

1.9.1.2 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, 5,244 full-time equivalent employees (FTEs), who work to provide the highest quality, patient-focused care. (See Table 1-4 below.) 39% percent of BMC's employees live within the city of Boston and 16% 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 1-4 BMC Employment (FY13)

BMC Employment FY13

Total BMC Employees*: 6,089

*Includes full and part-time employees including per diems and temporary staff

Full Time Equivalents: 5,244

	Full-time	Part-time	Total
Total Employees	4,642	1,447	6,089
Residents of Boston	1,995	375	2,370
Core Neighborhoods*	813	166	979

*Zip Codes 02219, 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 US Department of Labor.

BMC supports its employees' career and educational goals by providing access to tuition reduction programs at partnering school, 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 courses to BMC employees at a 50 percent tuition reduction.

- Tuition Reimbursement - BMC offers tuition reimbursement to eligible employees. Depending on their status, employees may receive up to $2,500 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 1-5 on the following page shows utilization of these benefits.

Table 1-5 Tuition Reimbursement Utilization

FY 10	Associate	Baccalaureate and above
Nursing Union	2	71
Non-Union	9	35
Total	11	106
FY 11	**Associate**	**Baccalaureate and above**
Nursing Union	0	67
Non Union	4	28
Total	4	95
FY 12	**Associate**	**Baccalaureate and above**
Nursing Union	0	72
Non Union	5	41
Total	5	113

BMC Employees who are represented by 1199SEIU-Service or AFSCME 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 both the service unions 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 1-6 Training and Upgrading Fund Utilization

	Career Advising	Cohort classes *	Associate	Baccalaureate and above
FY 10	33	4	120	75
FY 11	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).

As a leading partner in the community, Boston Medical Center 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.

Boston Medical Center 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.

Boston Medical Center 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.
- STEP Program's mission is to introduce Boston Public School students to a multitude of career opportunities, to help inner city student identify the relevance of continuing their education and to engage Corporate Partners in providing students access to real world work environments. BMC, the only hospital that was invited to participate in the STEP Program, has hosted four student tours per year since 2010 in departments such as Interpreter Services, Respiratory Therapy, Rehabilitation Therapies, Cardiology, Otolaryngology, and Radiation Oncology.
- YMCA Youth Achievers Summer Institute is an innovative summer learning experience for middle school and high school students. Through this unique career exploration program, students are introduced to various careers in the arts, government and health. In July 2010, BMC's Department of Nutrition and Healthy Living staff held a workshop for approximately 20 students on "Nutrition & Fitness for Life Program" and shared information about careers in the Food Services field.

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. 50% 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 over 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 over 33 interns in the past 5 years. BMC has been Training Inc.'s Employer of the Year for 6 consecutive years.

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 professional 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.
- National Association of Health Services Executives (NAHSE) is a non-profit association of Black health care executives that promotes the advancement and development 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.

- New England Regional Black Nurses Association, Inc. 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 Americans, 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.

1.9.1.3 Annual Property Taxes / PILOT - Boston Medical Center

Although much of BMC's property is tax-exempt, BMC contributes annually to the City of Boston's Payment in Lieu of Taxes (PILOT) program.

1.9.1.4 Other Economic Benefits - Boston Medical Center

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 2011, BMC invested $17,419,446 in Community Benefits Programs (as reported to the IRS on Form 990 Schedule H, Part I, Line 7e, column e, *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 $127,000,000 in fiscal year 2012.

The BMC HealthNet Plan, founded in 1997, is the largest MassHealth and Commonwealth Care managed care organization in Massachusetts providing health insurance to 260,000 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.

1.9.2 Boston University Medical Campus

1.9.2.1 Introduction

While renowned for its quality of teaching and research, and for providing education and training imbued in the most current thinking and techniques in the field, the Boston University

Medical Campus prides itself on a legacy of service to the community, particularly service to the most disadvantaged, underserved, and indigent populations.

The Boston University Medical Campus (BU Medical Campus) is composed of the Boston University School of Medicine, the School of Public Health, and the Henry M. Goldman School of Dental Medicine. Utilizing resources provided by BU Medical Campus administration, each school offers a wide array of community programs, resources, and services related to their respective concentrations and specialties. In addition to these University-sponsored community programs, BUMC plays an important role in the economic vitality of both the city and the state, employing nearly 2,800 full-time employees, attracting more than 3,000 students, and making a significant PILOT (payment-in-lieu-of-taxes) contribution to the City of Boston each year.

1.9.2.1.a A Tradition of Community Service

BU Medical Campus' longstanding tradition of community service has led to the development of programs and services that are now fixtures within the community. These programs, which continue to thrive under BU Medical Campus' long-term support and investment, have become dependable sources of care and information for community members. Such programs include:

Smart Smiles in Boston Public Schools

Since 2004, the Boston University Goldman School of Dental Medicine, through its Smart Smiles in Boston Public Schools program, provides dental health education, oral screenings, fluoride varnish applications, and dental sealants to thousands of second grade children in 29 Boston public elementary schools, including: Beethoven, Boston Teachers Union, Clap, Conley, Dever, Edison, English High, Everett, Gardner, Grew, Haley, Henderson, Higginson/Lewis, Holland, Hurley, Kenny, Kilmer, Lyndon, Mason, McKay, Mission Hill, Mozart, Orchard Gardens K-8, Perkins, Roosevelt, Sumner, Trotter, Winthrop and Young Achievers.

As part of Boston University's commitment to Mayor Menino's Step UP initiative, GSDM also offered oral health services to four schools—English High School, Orchard Gardens K-8 School, John Winthrop, and the William Monroe Trotter School. Oral health education was provided to 618 students in these schools, and 195 students received dental screenings, fluoride varnish treatments, and/or dental sealants through this program.

CityLab

In 1992, Boston University School of Medicine (BUSM) pioneered an innovative science education outreach program that has been replicated across the country. CityLab provides Boston Public Schools students and teachers in grades 7-12 with access to state-of-the-art biotechnology laboratory facilities and curricula, which are unavailable in most schools, through the use of its mobile laboratory and on-site laboratories at the School of Medicine.

Framingham Heart Study

Undertaken in 1948, the renowned Framingham Heart Study is the longest-running prospective epidemiological study in history. The study has produced important discoveries related to the major risk factors associated with cardiovascular disease, which is the leading cause of death and serious illness in the United States. The study is run in partnership with the Boston University School of Public Health and the Boston University School of Medicine.

Blackstone Elementary School Annual Field Trip to the Goldman School for Dental Medicine (GSDM)

Third grade children at Blackstone Elementary School make an annual visit to GSDM for a full day of oral health activities, including presentations on oral health and nutrition, a lesson on teeth and gums, and interactive activities in the Simulation Learning Center in which they learn about sealants and dental impressions. One of GSDM's most successful outreach programs, it provides both interactive health education for children and an opportunity for Boston University dental students to inspire a young child to pursue a higher education and possibly a career in dentistry.

Outreach Van Project

Founded in 1997, the Outreach Van Project is a student-run community service staffed by volunteers from Boston University's School of Medicine and School of Public Health to provide health care to the medically underserved and homeless communities. Faculty and students go out one evening per week to East Boston to conduct free health screenings and distribute clothing and other basics necessities to approximately 20 to 30 people weekly during the colder months and 65 to 75 people weekly when the weather is warmer.

Preschool and Kindergarten Dental Health Education

Preschool and/or kindergarten classroom dental health education is conducted each year by GSDM faculty and students, and goodie bags with toothbrush, toothpaste, and stickers are given out at the end of each session. Sites served include:

- Allston Brighton Area Planning Action Council (APAC)
- Ashmont Nursery School, Dorchester, MA
- Roger Wellington Elementary School, Belmont, MA
- St. Agnes School, Arlington, MA
- St. Brendan School, Dorchester, MA
- Temple Emeth Nursery School, Chestnut Hill, MA

1.9.2.1.b New and Enhanced Community Programming

In addition to BU Medical Campus's well-established catalog of community programs and services, BU Medical Campus recently added two new programs to its roster of community benefits: the Boston University Health, Fitness, and Wellness Pilot Program and the BioScience Academy. In response to a community needs assessment conducted by the Boston Centers for Youth & Families (BCYF) and the Boston Public Health Commission and in conjunction with community discussions, Boston University is proud to announce the implementation of the Boston University Health, Fitness, and Wellness Pilot Program, an initiative aimed at combating obesity and promoting a healthy lifestyle for Boston's youth and their families. Additionally, BU Medical Campus was also recently selected by the City of Boston as one of three local partners to implement a biotechnology workforce training program known as the BioScience Academy.

Boston University Health, Fitness, and Wellness Pilot Program

Boston University launched the Boston University Health, Fitness, and Wellness Pilot Program in early 2013. The unique program aims to combat teenage obesity in the City of Boston, and supports Boston Moves for Health, an ambitious initiative launched by Mayor Thomas M. Menino to increase access to free and low-cost physical activities and health living resources.

The Boston University Health, Fitness, and Wellness Pilot Program provides access to quality fitness training, nutrition counseling, and wellness programming to children, youth, and families in at-risk communities. The program's location at the BCYF Blackstone Community Center was chosen for its potential to maximize outreach to at- risk youth and families, as well as for its proximity to additional health resources available at the Boston University Medical Center, the South End Health Center, and other neighboring community-based agencies. Boston University will renovate the space to suit the program's needs and objectives.

The program is directed and guided by experts from the University's College of Health & Rehabilitation Sciences: Sargent College, and the Schools of Medicine, Public Health, and Social Work, and staffed and supervised by members of the University's Department of Physical Education, Recreation & Dance (PERD). Through wellness programming and fitness instruction, University staff strives to provide youths and families with the skills needed to make physical exercise and healthy choices an enduring part of their lifestyles.

The program is open to BCYF Blackstone Community Center members and youth ages 14 and older, and accounts for a 36-hour-per-week commitment from Boston University.

BioScience Academy

Launched in fall 2012, the BioScience Academy is a workforce development program that provides biotechnology training to unemployed and underemployed Boston area residents. Program funding stems from the Metro Boston Skilled Careers in Life Sciences (SCILS) initiative, a four-year $5 million grant that the City of Boston received from the U.S. Department of Labor to grow and maintain the area's life sciences workforce. Boston

University was selected as one of three training partners to implement the biotechnology training program, for which Boston University contributes half of participants' tuition. Students receive professional development training and a Certificate in Applied Biotechnology upon completion of twelve course credits through the School of Medicine and Metropolitan College.

1.9.2.2 Economic Impact

19.2.2.a Employment

In addition to educating future health care professionals focused on community, the schools of the BU Medical Campus extend employment and professional development opportunities to the people of Boston and the surrounding communities, as well.

BU Medical Campus employs approximately 2,047 full-time equivalent employees and 351 part-time employees. Of these, 509 are Boston residents.

Employment at the BU Medical Campus is expected to increase in proportion to moderate increases in student enrollment and the development of research programs.

Table 1-7 BU Medical Campus Employment (FY13)

	BU Medical Campus Employment (2013)		
	Full-time	**Part-time**	**Total**
Total Employees	2,047	351	2,398
Boston Residents	475	34	509

	BU Medical Campus Employment (2013) [Including Temporary Employees]		
	Full-time	**Part-time**	**Total**
Total Employees	2,107	688	2,795
Boston Residents	495	137	632

19.2.2.b PILOT (Payment-in-lieu-of-taxes) Program & Linkage Payments

As a nonprofit educational institution, Boston University is tax exempt; however, motivated by a sense of responsibility as one of Boston's largest employers and landowners, and by its commitment to giving back to the community, in the 1980's Boston University began to make

payments to the City of Boston in lieu of the taxes from which it was exempt. These "PILOT" (payment-in-lieu-of-taxes) funds help the city cover the cost of providing essential services, such as police, fire, and snow removal. These payments account for the University's properties and activities on both the BU Medical Campus and the Charles River Campus.

Boston University was the first educational institution in the City of Boston to make such voluntary contributions, and continues to make substantial PILOT payments.

In FY2012, Boston University contributed $5.3 million in PILOT payments to the City of Boston.

Since FY2006, Boston University has also paid more than $1 million in linkage payments for new developments on the BU Medical Campus.

1.9.2.3 Local Infrastructure Improvements and Beautification Initiatives

In addition to operating 5 free shuttle services within the South End area and between the BU Medical and Charles River Campuses at an approximate cost of $1.75 million a year, the BU Medical Campus also makes significant contributions to local urban beautification efforts. In the early 2000s, the University committed $246,000 to the construction of a "pocket" park on Albany Street, and also installed and maintains planting beds along the median islands stretching from Albany Street to Shawmut Avenue along Massachusetts Avenue.

BU Medical Campus is also a proud participant in Mayor Menino's year-round neighborhood clean-up and community service program, Boston Shines 365, through which volunteers plant flowers, sweet, rake, and pick up trash to keep Boston's neighborhoods clean and beautiful.

1.9.2.4 Scholarships

Community Scholars Program

For full-time working professionals interested in pursuing a Masters in Public Health part-time, the Community Scholars Program encourages experienced health professionals to pursue advanced study for an MPH while continuing their full-time employment. Up to ten half-tuition scholarships are awarded annually to MPH degree candidates depending on the competiveness of the applicant pool. Eligible applicants have at least two years of experience and are currently employed full-time in public health related nonprofit or government agencies.

In FY2011, Boston University awarded nearly $129,000 in scholarship aid for local full-time working professionals pursuing an MPH degree.

Table 1-8 Boston University Scholarship Aid

	Scholarship Aid	
Scholarship Program	**Amount Offered in FY2012**	**Number of Recipients**
SPH Health Care Scholarship	$129,000	14
CityLab Academy	$72,000	15
Roxbury Community College	$20,000	1

CityLab Academy

In FY2011, Boston University contributed $72,360 to the operation of CityLab Academy, a program based on the Boston University Medical Campus. The program is a free, two-semester, college-level program in biotechnology and biomedical science. CityLab Academy prepares students for laboratory jobs in a biotechnology company, medical center, or hospital, and serves as a transition year for students wishing to pursue a bachelor's degree in science while providing the foundation and hands-on experience necessary to join the research workforce. After successful completion of four courses and a two-week internship, students receive a Certificate in Biomedical Laboratory Science and twelve undergraduate college credits from Metropolitan College.

As of September 2012, the CityLab Academy program is currently suspended for four years, as the University concentrates its resources on its BioScience Academy workforce development initiative, which is described in greater detail in the New and Enhanced Community Programming section.

Roxbury Community College

Boston University awards a full-tuition, renewable Roxbury Community College Scholarship for four semesters to selected transfer students from Roxbury Community College. Selected students have been nominated by the Roxbury Community College Scholarship Committee, and must have a minimum grade point average of 3.5 at Roxbury Community College, and transfer at least 60 credits from Roxbury Community College.

In FY2011, Boston University contributed nearly $20,000 in scholarship funding to transfer students from Roxbury Community College.

1.9.2.5 Education Partnerships

CityLab

In 1992, Boston University School of Medicine (BUSM) pioneered an innovative science education outreach program that has been replicated across the country. CityLab is a biotechnology learning laboratory at BUSM serving students and teachers in grades 7–12.

CityLab's mission is to provide access to state-of-the-art biotechnology laboratory facilities and curricula—unavailable to most school systems. Teachers from

Massachusetts and neighboring states bring students to CityLab to solve problems by applying the same techniques and concepts of genetics and molecular biology used in research laboratories today. Each topic is presented in a mystery format.

CityLab facilities include two laboratories for students at BUSM and a MobileLab that brings the laboratory directly to schools. Since 1992, more than 70,000 students have participated in hands-on, discovery-oriented investigations. Two thousand teachers have attended workshops at CityLab or aboard the MobileLab, while CityLab curriculum supplements have been adopted for use by museums, schools, and enrichment programs nationwide.

CityLab maintains its continued support of teachers and students in the Boston Public Schools by providing access to laboratory-based learning experiences in biotechnology, molecular biology, and clinical sciences. Through the use of its mobile laboratory and on-site laboratories at the School of Medicine, CityLab plans to continue its many class visits to the Boston Public Schools each year.

SummerLab

In 2013, Boston University plans to award 6 full-scholarships to students from the South End, Roxbury, Dorchester, and South Boston for SummerLab, a one-week program open to students in grade 10 through freshman year of college. Students gain hands on lab experience with biotechnology, acting as a members of a research team and using state-of-the-art equipment to perform experiments of their own design. At SummerLab, scholarship recipients will learn about biotechnology techniques associated with recombinant DNA, protein purification, cell lysis, and gel electrophoresis.

1.9.2.6 Community Partnerships and Community Relations

In support of one of Boston University Medical Campus' top priorities, to serve the local community, the University's office of Government & Community Relations established a full-time Community Relations division on the BU Medical Campus. Community Relations is tasked with planning, implementing, and overseeing community relations activities between BUMC and neighboring residents, business owners, and neighborhood associations. In addition to serving as the primary point of contact for any inquiries lodged by community stakeholders, the Community Relations team maintains a strong community presence through regular attendance and participation at local business and community meetings and events.

Community Relations on the BU Medical Campus strives to ensure that the University is fully aware of and responsive to the needs of its neighbors. Members of the Community Relations team serve as active members of various community organizations and provide annual contributions to many local community groups and organizations in the South End and neighboring Roxbury, Dorchester, and South Boston. Since 2003, Community Relations staff has proudly participated in well over 500 community meetings and events at local organizations. Additional information regarding Community Relations outreach efforts can be

found at http://www.bu.edu/community, and a comprehensive list of the community organizations with which Community Relations on the BU Medical Campus is involved is provided below. It should be noted that this list is solely representative of BU Medical Campus Community Relations' outreach efforts, and does not account for community relations activities on the Charles River Campus.

The BU Medical Campus' Community Relations office, a division of the University's office of Government & Community Affairs, is a member and/or active participant in the following community and trade organizations:

- A Better City
- Associated Industries of Massachusetts
- Association of Independent Colleges and Universities in Massachusetts (AICUM)
- Blackstone/Franklin Square Neighborhood Association
- Boston Police Department
- DREAM Program
- Dudley Corridor Safety Task Force
- Dudley Vision Advisory Task Force
- Egleston Square Community Task Force
- Greater Boston Chamber of Commerce
- Greater Boston Convention & Visitors Bureau
- Massachusetts Association of Nonprofit Schools and Colleges (MANS&C)
- Massachusetts Biotechnology Council (MassBio)
- Massachusetts High Technology Council
- Morgan Memorial / Goodwill Industries
- Newmarket Business Association
- Private Industry Council
- Roxbury Community Alliance for Health
- Roxbury Strategic Master Plan Oversight Committee
- South End / Lower Roxbury Safety Task Force

- Worcester Square Neighborhood Association
- Washington Gateway Main Streets

The BU Medical Campus' Community Relations office, a division of the University's office of Government & Community Affairs, also provides financial contributions to the following organizations in support of their community development activities and programs:

- 826 Boston
- Action for Boston Community Development
- Boston City Lights
- Boys & Girls Clubs of Dorchester
- Boys & Girls Club of Roxbury
- Discover Roxbury
- Dorchester House
- Dorchester YMCA
- Grant Manor Housing Development
- Huntington Avenue YMCA
- Inquilinos Boricuas en Accion
- Jamaica Plain YMCA
- Mandela Residents Cooperative Association
- Nature's Classroom, Summer Camp (Boston)
- Orchard Gardens Housing Development
- Roxbury YMCA
- South End Community Builders
- St. Stephens
- Teen Challenge (Roxbury)
- Teen Empowerment
- Twelfth Baptist Church
- Urban League of Eastern Massachusetts

- Vietaid
- West End House Boys & Girls Club
- Whittier Street Housing Development
- Yawkey Club of Roxbury, Boys & Girls Clubs of Boston
- Youthbuild
- Youth Options Unlimited

1.9.2.6.a Boston University Community Grants Program

In late 2011, responding to drastic budget cuts undertaken by community organizations across the city, Boston University's Government & Community Affairs office implemented a community grants program. The $2,500 community grants are awarded to programs and services that benefit residents of Boston University's host community, with special consideration for programs and services that benefit local youth. Funding is intended to supplement the existing budgets of established organizations and agencies.

In 2012, Boston University doubled its commitment to the communities of Roxbury and South End, awarding not one but two $2,500 grants in support of the extraordinary efforts undertaken by local community organizations working to make a difference in the lives of the young people of Boston.

Community Grant - 2011:

The Boys & Girls Clubs of Boston Yawkey Club of Roxbury received $2,500 in support of their Young Leaders summer program, a seven-week program offering 13- and 14- year-olds a realistic work environment experience in a summer camp setting, the opportunity to be a role model for young children, and the chance to acquire new skills and develop leadership abilities. The Young Leaders program encourages students to experience personal growth and develop meaningful relationships with peers and caring adults through travel and exploring the New England region.

Community Grants - 2012:

Boston City Lights, located in the South End, is a free performing arts and training program designed to develop the artistic abilities of inner city kids. Committed volunteers and past students teach dance, singing, acting, video production, set design and sound engineering. Boston City Lights received a $2,500 in support of the organization's on-going efforts to use the arts to empower youth.

Mandela Resident Cooperative Association (MCRA) received a $2,500 grant in support of its 2013 Annual Get Connected Youth Fair. The Annual Get Connected Youth Fair allows local community agencies to connect and provide information to youth, ages 14-24, on a

variety of different topics, including educational opportunities, job skills readiness training and employment openings.

1.9.2.6.b Community Programs & Services Provided by Boston University Schools & Colleges

BU Medical Campus offers a wide array of community programs, resources, and services related to their respective concentrations and specialties. These programs are part of the Boston University Medical Campus' long-standing commitment to community service, public health, and social advocacy through student service-learning and faculty service. Select community programs are summarized below. Comprehensive descriptions of all community programs offered through the Medical Campus can be found in Appendix C, BU Medical Campus Community Outreach Initiatives.

Boston University School of Medicine offers medical students a unique service-learning experience through community based medicine and social advocacy programs. The programs include:

Outreach Van Project - Founded in 1997 by School of Medicine and School of Public Health students, students under the supervision of a licensed physician provide food, clothing, and reliable, consistent medical care to the underserved, predominately Hispanic community of East Boston where 25 percent of children live below the poverty line. The Outreach Van Project is currently the only outreach agency supporting the underserved community in East Boston.

Project MED HEALTH (Helping Educate Adolescents to Live Tomorrow Health) – School of Medicine students lead interactive, technology based educational workshops for Boston Public School children on key health issues such as nutrition, fitness, safety, puberty, and sex education.

Codman Square Fiscal Health Survey & Intervention – A partnership of School of Medicine students and leaders of Codman Square community based organizations working together to explore the links between community economics, community health, effective listening, effective advocacy, and racism.

The Henry M. Goldman School of Dental Medicine has an unwavering commitment to improving oral health and quality of life in communities through strategic partnering, health education and promotion, and implementation of public health initiatives. Goldman School of Dental Medicine programs serve as national models for training dental students and non-dental health professionals to provide oral health services for disadvantaged populations. The Goldman School of Dental Medicine's work includes:

City-wide Dental Health Programs – These city-wide dental health programs operate in public schools in Boston, Chelsea, Framingham, and Lawrence. The programs provide oral screenings, sealant placement, fluoride applications, and oral health education. Similar services are provided at Early Head Start, Head Start, and other preschool programs in the greater Boston metropolitan area.

Chelsea School Dental Center – Since opening in April of 2003, the Chelsea School Dental Center (CSDC), which is managed by GSDM and located in the Williams Middle School, has provided preventive and restorative services for thousands of children. The CSDC gives care to Chelsea public school students regardless of their grade level or ability to pay for services. Many of the patients, who range in age from preschoolers to high school seniors, have never been to the dentist and would have no other source of dental care if it were not for the CSDC. Five bilingual dentists devote time to treating patients in the clinic.

Health Promotion for the Underserved - Over 50 other oral health promotion programs for underserved populations with programs targeted to serve the homeless, financially disadvantaged, uninsured and underinsured, elders, survivors of torture, refugees, and individuals with HIV.

The Boston University School of Public Health has a long standing, service-oriented philosophy evidenced by the combination research and academics with a practicum requirement involving work experience in a public health environment. Through longstanding collaborations with the Massachusetts Department of Public Health, the Boston Public Health Commission, and the Veterans Affairs Administration, and international alliances with the Red Cross, the Peace Corps, and foreign governments, School of Public Health students, faculty, and alumni draw on their own diverse backgrounds to carry out the School's mission in a variety of settings. Some examples of programming include:

Refugee and Immigrant Health Program

Since 1996, the Refugee and Immigrant Health Program, a joint project of Boston Medical Center, the Department of Medicine at Boston University's School of Medicine, Global Lawyers and Physicians, and the Department of Health Law, Bioethics & Human Rights at Boston University's School of Public Health, has actively cared for the medical, psychological, legal, and social needs of more than 500 clients each year. Clients hail from 57 countries and live in and around Boston. It is a multidisciplinary center that provides services for refugees and survivors of torture and related trauma. The program provides primary health care, mental health services, referrals for medical specialties, neuro-psychiatric evaluation, dental evaluations of persons in detention, physical therapy, referral and consultation for legal services, social services, English classes, creative therapies, and vocational rehabilitation. The program also offers a clothing bank, access to the BMC Food Pantry, and ethnic community support groups.

Public Health Education Week

During Public Health Education Week, School of Public Health (SPH) students, with support from faculty and staff, conduct high school education programs in Boston public schools. SPH students speak with high school students about the relevance of public health in their everyday lives, health promotion, disease prevention, and health protection.

1.10 Project Benefits

The proposed BMC projects will:

Elevate Quality of Care

- Consolidation and modernization of clinical care areas within the campus core allows for improved patient care and operational efficiency.
- Provide right-sized patient care space to accommodate emergency single expanded emergency department, located in the Menino Pavilion, and clinical programs therefore improving timing and quality of patient care.
- Relocate the Emergency Department Entrance and drop-off to the rear of the Moakley Cancer Care Center and relocate the loading dock to the south side of Albany Street. This will allow separation of service areas from patient care areas and reduction in vehicular and truck traffic on Albany Street.
- Improves patient transport from the helipad and directly connects to the Emergency Department on the north side of Albany Street to provide more efficient patient care.

Improve the Pedestrian Environment

- Create a defined pedestrian experience along East Concord Street by engaging the east face of the building with the sidewalk.
- Provide sidewalk and landscape improvements along the perimeter of the building to enhance the pedestrian experience.
- Relocate the MBTA bus stop on East Concord Street from the street edge closer to the building to provide users as well as traversing pedestrians with protection from the elements.
- Eliminate three of the existing curb cuts on the north side of Albany Street and consolidate the remaining curb cuts to eliminate vehicular and pedestrian conflicts and enhance the overall pedestrian experience.
- Facilitate the demolition of the existing yellow utility tube which will continue to the transformation of the Albany Street image.
- Allow for closure of one of the two existing lanes underneath the existing yellow utility tube minimizing and reducing the width of the curb cut and contributing to an improved pedestrian experience.

Improve Access to and through Boston University Medical Center

- Create a more optimal intersection configuration at Shapiro Drive and East Concord Street to provide visual clarity for vehicular traffic turning right onto East Concord Street.
- Provide improved circulation and vital connections to adjacent campus buildings improving operational efficiency.
- Better define the north edge of Albany Street and improve the image of Albany Street and the BUMC Campus as its major arrival point.

Advance Sustainable Design, Green Building and Technology Goals

- Shrink Boston University Medical Center's carbon footprint through lesser greenhouse gas emissions and lower its impact on the local environment.
- Decrease Boston University Medical Center's impact on the locally taxed energy infrastructure by generating 75% of its electricity and 95% of its steam.
- Producing steam and electricity through cogeneration will decrease Boston University Medical Center's energy costs.

Job Creation

- Create approximately 250 construction jobs.

Provide Linkage Funds

- Contribution to the housing and jobs linkage fund.

1.11 Linkage

Upon approval of the Boston University Medical Center IMP in 2000, Boston University Medical Center entered into a Development Impact Project ("DIP") Agreement with the BRA for its institutional projects which exceeded the threshold requirements of Article 80B of the Code. With the adoption of the IMP renewal for a new 10-year term commencing in 2010, Boston University Medical Center and the BRA entered into a new DIP Agreement which will govern all new projects which exceed the thresholds set forth in Article 80B of the Code.

1.12 Areas of Interest for Future Campus Expansion

As the proponents look into the future and as trends continue to change for patient care and academic needs, they will continue to evaluate opportunities for future expansion. The proponents recognize the following sites, if available, as ideal locations for future expansion due to proximity to the existing BUMC Campus:

- Solomon Carter Fuller Building
- Chief Medical Examiner's Office Building
- Finland Building
- Flower Exchange
- Jacobson Floral
- Immaculate Conception Church and the attached Link Building
- Northampton Square Complex – Medical Office Building and storefronts

1.13 Institutional Master Plan Background / History

Overview

The original Boston University Medical Center Institutional Master Plan was approved by the Boston Redevelopment Authority on May 18, 2000 and the Boston Zoning Commission on

June 28, 2000, effective July 13, 2000. From 2001 through early 2010, the Proponents filed multiple IMP Amendments, Notices of Project Change, Project Notification Forms, and Notices of Exemption. In March 2010, the Proponents submitted their Institutional Master Plan Renewal Form. The IMP Renewal was approved by the BRA on June 22, 2010. Three new construction projects were included in the 2010 IMP: a 48,000 square foot Energy Facility located to the east of the existing Power Plant, a 160,000 square foot Administration/Clinical Building located on the surface parking lot on the north side of the Power Plant (along Albany Street), and a 405,000 square foot New Inpatient Building located on the current Dowling Building site. See Appendix A for the complete IMP Background and History.

Section 2

2.0 SUMMARY & PROJECT DESCRIPTION

2.1 Proposed Project Summary

Boston Medical Center recognizes the immediate need to address the space and physical constraints of its existing campus, consolidate clinical services to the West Campus, and accommodate the growth in clinical services through four proposed projects. The projects will allow campus development supportive of the institution's mission and will ensure BMC continues to be an industry leader and provider of quality patient care.

BMC is initiating Large Project Review for the following four projects:

- Moakley Cancer Center Addition
- New Inpatient Building Phase 1
- Energy Facility
- New Patient Transport Bridge

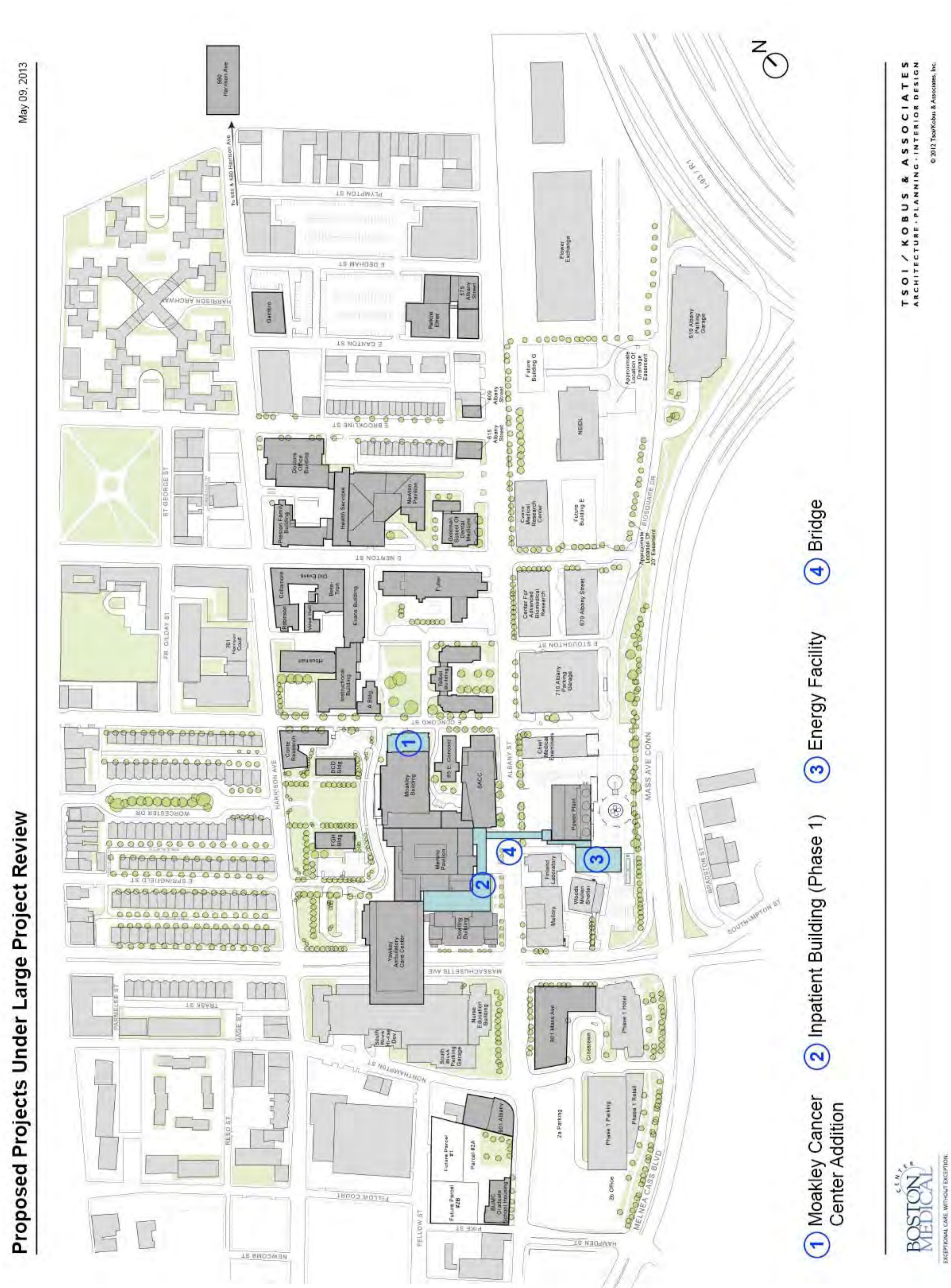
The proposed projects will accomplish the following objectives:

- Consolidate clinical functions in proximity to core medical services;
- Meet current patient care standards and improve patient experience;
- Enhance day-to-day operations to support clinical programs;
- Improve departmental adjacencies and patient flow through "right-size" design of clinical buildings and care spaces;
- Improve operational efficiency;
- Upgrade and expand the Emergency Department and Trauma Center;
- Create clear way finding pathways and internal connections through the West Campus;
- Improve patient access by relocating the Emergency Department Drop-off and Entrance to the rear of the Moakley Cancer Center, accessed via Shapiro Drive;
- Centralize loading to the south side of Albany Street away from the Hospital Entrance separating service areas for patient care area;
- Reduce existing curb cuts along Albany Street;
- Minimize potential vehicle conflicts with pedestrians and foster a more user-friendly experience;
- Expand Ambulance drop off area; and
- Replacement of the "yellow utility tube" with a patient transport, material and utility bridge.

The proposed projects under Large Project Review are summarized below.

See Figure 2-1 Proposed IMP Projects Under Large Project Review.

Figure 2-1 Proposed IMP Projects Under Large Project Review



2.1.1 Moakley Cancer Center Addition

BMC is proposing the construction of an approximately 27,800 square foot outpatient addition at the site east of the existing Moakley Cancer Center building along East Concord Street. The new Moakley Cancer Center Addition will facilitate both inpatient and outpatient program consolidation within the campus core. Completing the Moakley Cancer Center Addition first will allow BMC to begin operational reorganization necessary for other IMP projects to commence.

The Moakley Cancer Center Addition will provide adequate space for departments being displaced by the proposed expansion of the Emergency Department and the Trauma Center as well as the Centralized Surgical Department within the existing Menino Pavilion and Moakley Cancer Center. The displaced departments include Endoscopy and Digestive Disorders. The building will also accommodate increased volume in outpatient care.

The Project will be a 3-story building above grade and approximately 27,800 square feet with a typical floor-plate of approximately 7,000 square feet. The Moakley Cancer Center Addition is proposed in this central location to take advantage of proximity to current outpatient services and utilize existing campus and building infrastructure. Alignment of the new addition with the surrounding context will further define and promote existing campus pedestrian connections, which are essential to maintain and strengthen the urban fabric.

See Figures 2-2 to 2-12 for Floorplans, Sections and Elevations.

Figure 2-2 Moakley Cancer Center Addition Project Location and Campus Plan

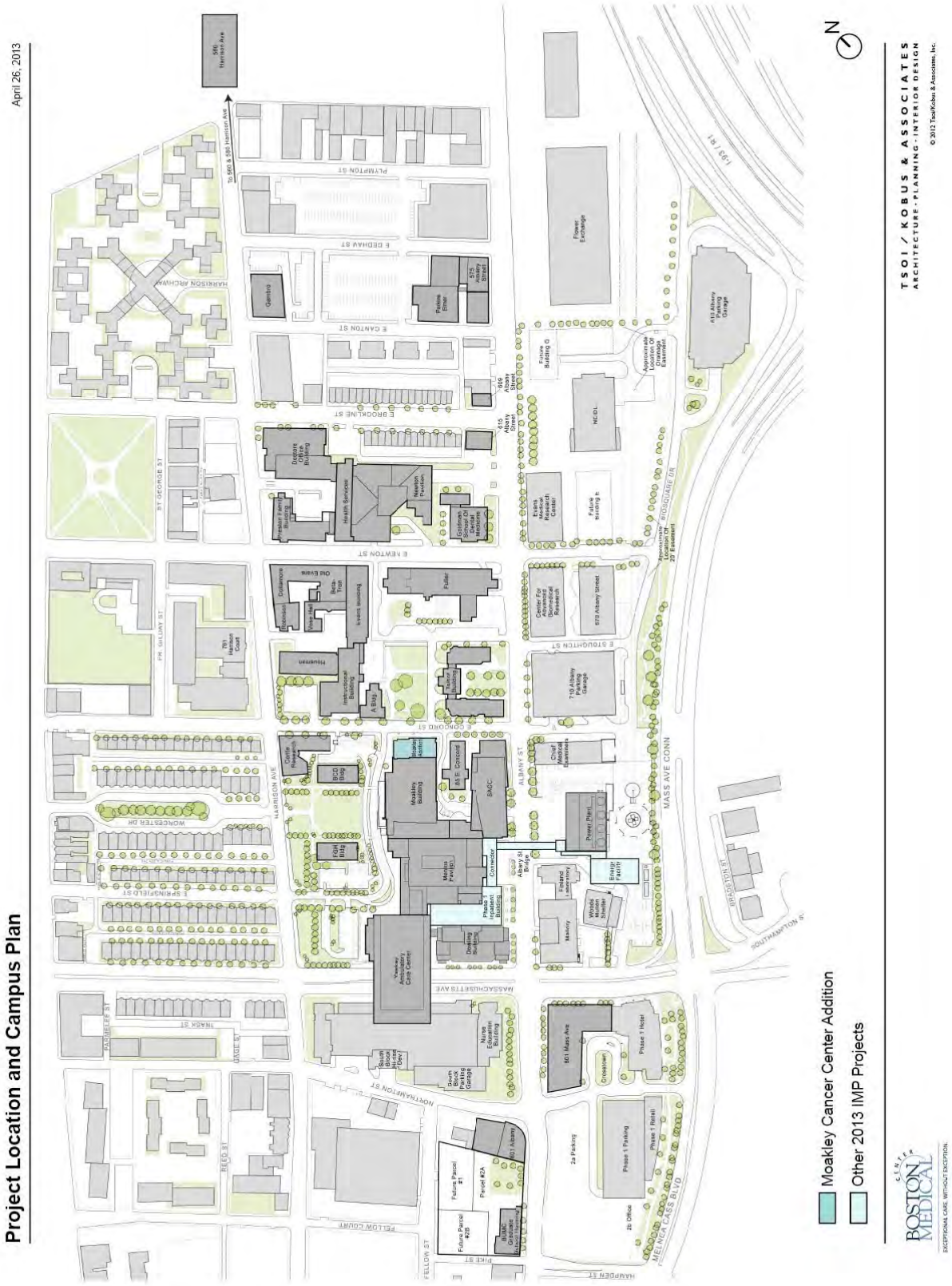


Figure 2-3 Moakley Cancer Center Addition Site Plan

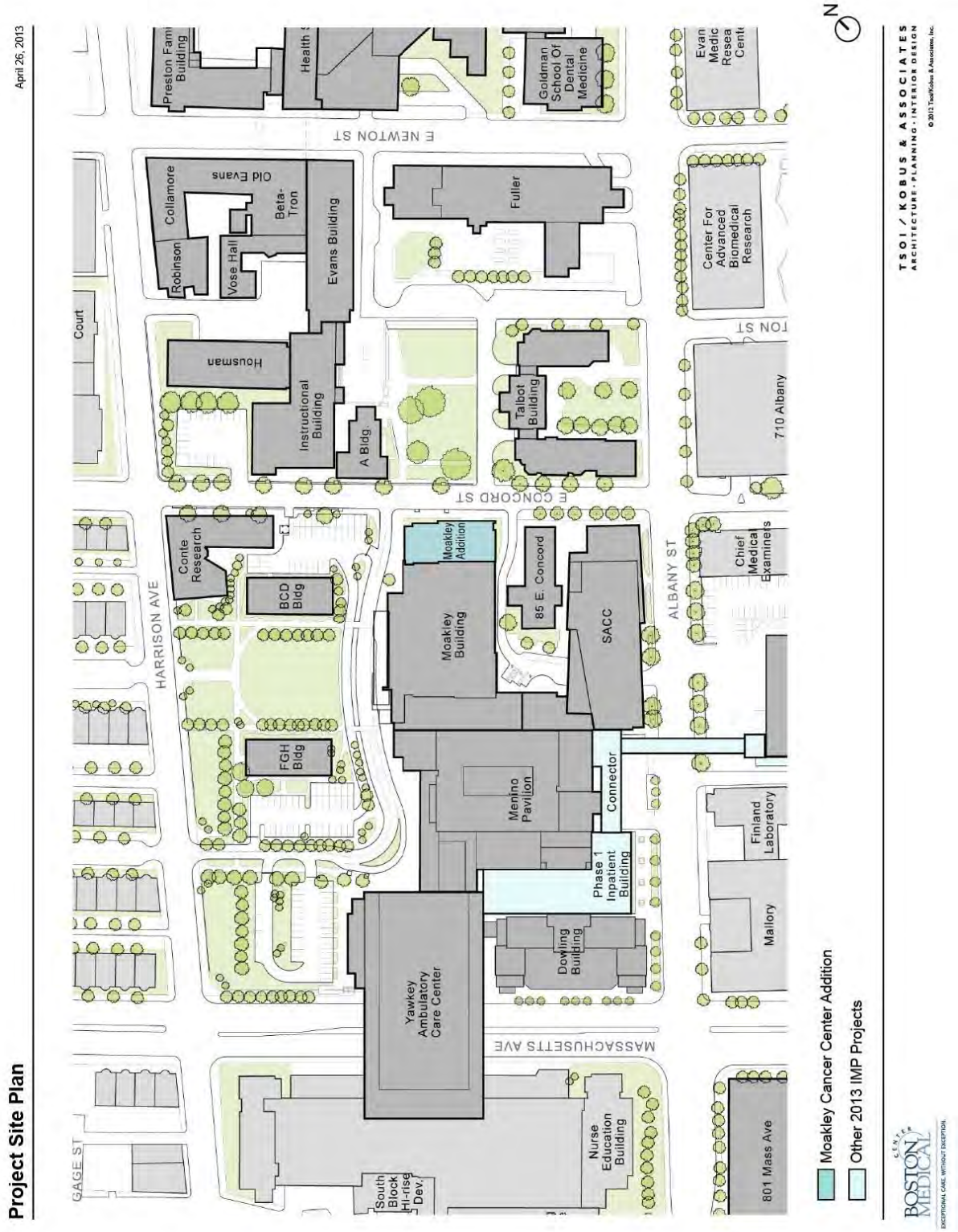


Figure 2-4 Moakley Cancer Center Addition Basement Level Floorplan

Figure 2-5 Moakley Cancer Center Addition First Level Floorplan

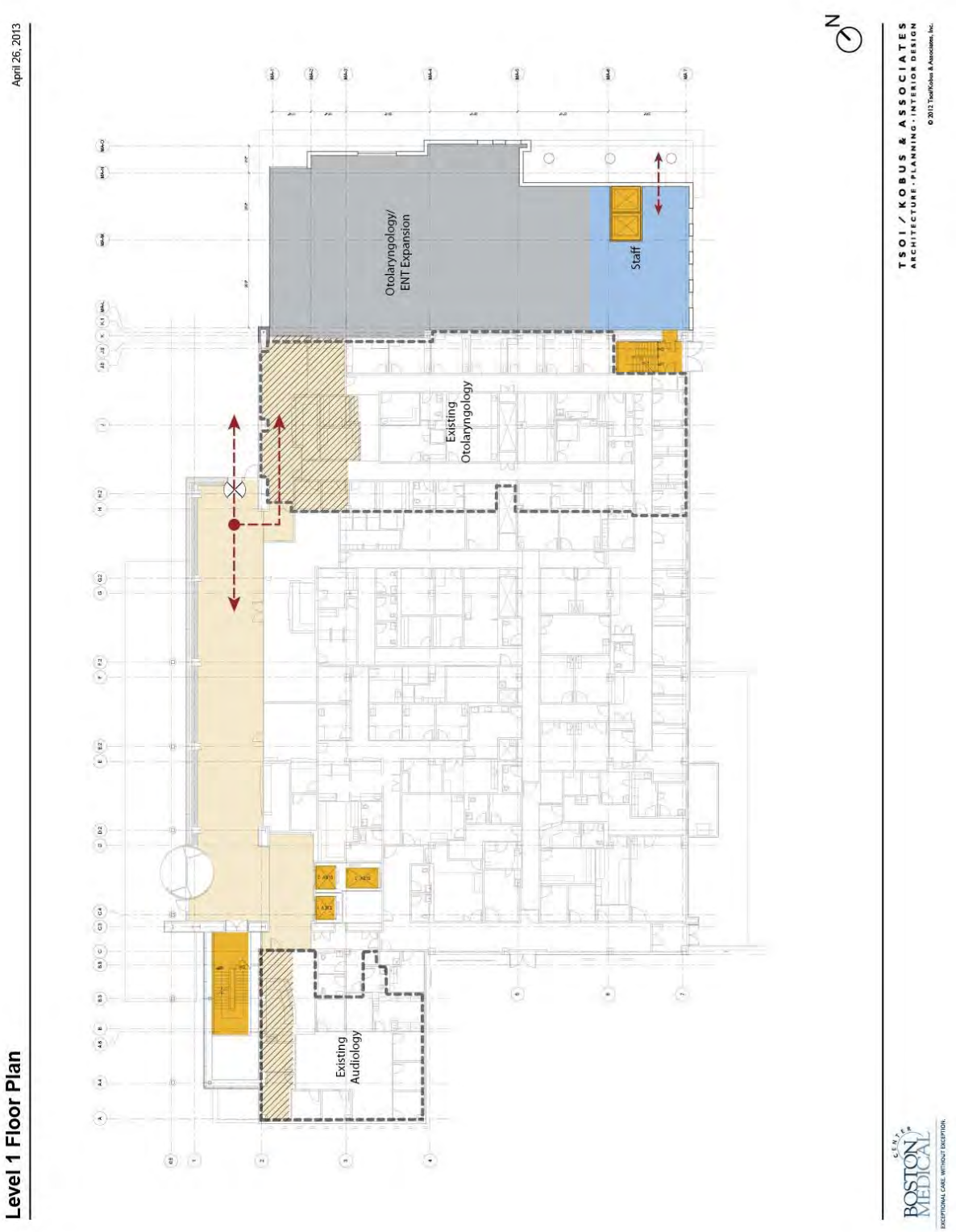


Figure 2-6 Moakley Cancer Center Addition Second Level Floorplan

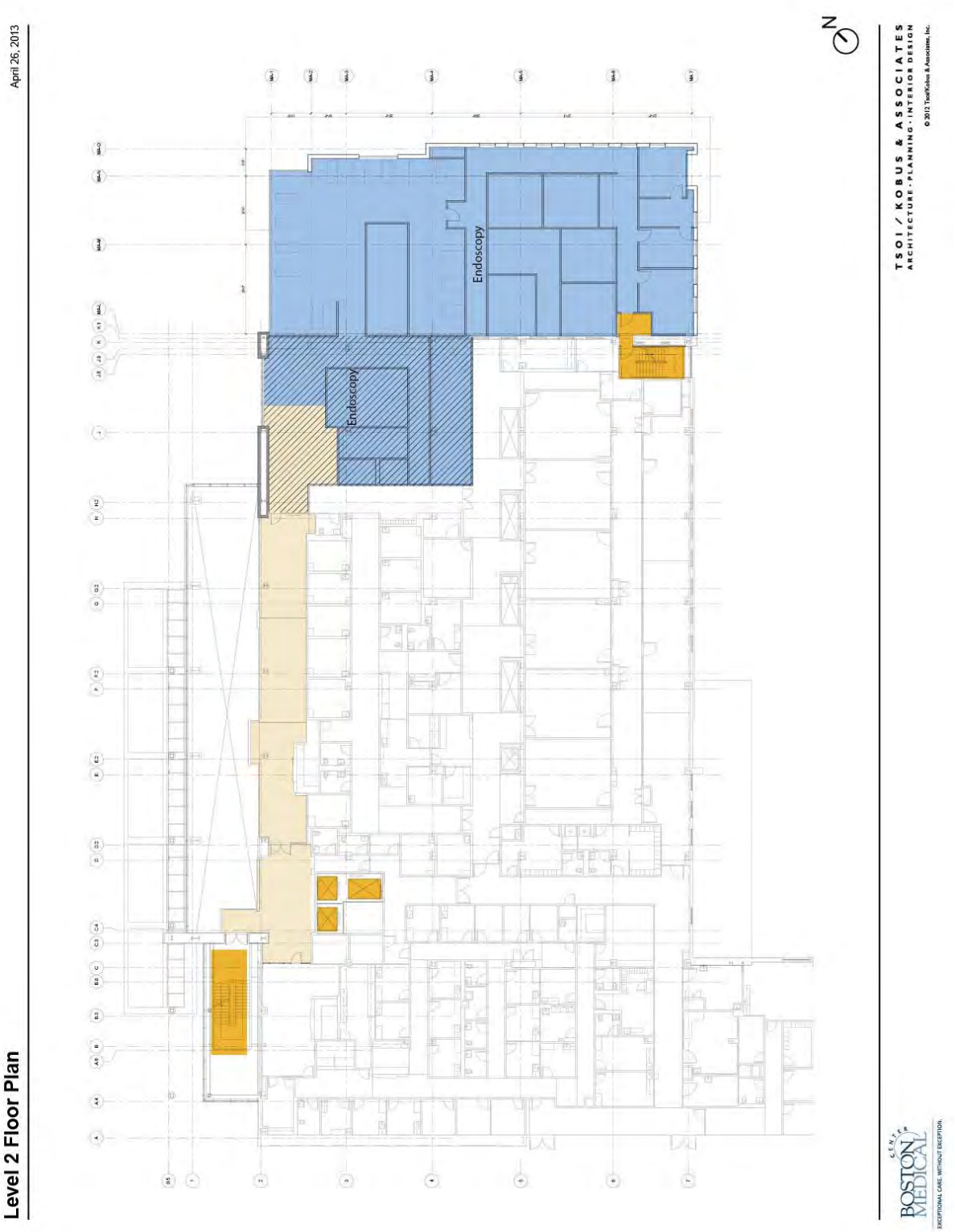


Figure 2-7 Moakley Cancer Center Addition Third Level Floorplan

Figure 2-8 Moakley Cancer Center Building Section Looking West

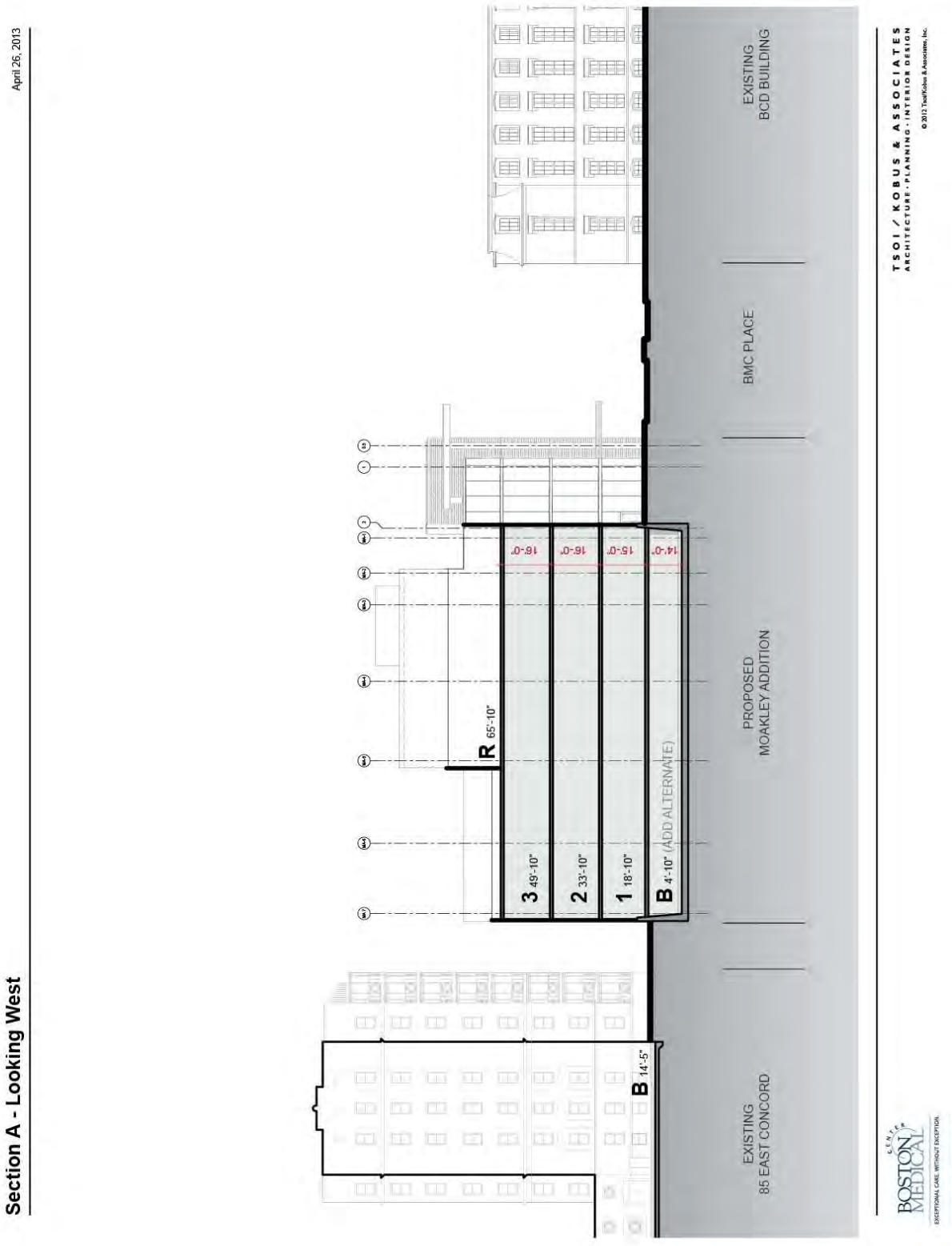


Figure 2-9 Moakley Cancer Center Addition Building Section Looking South

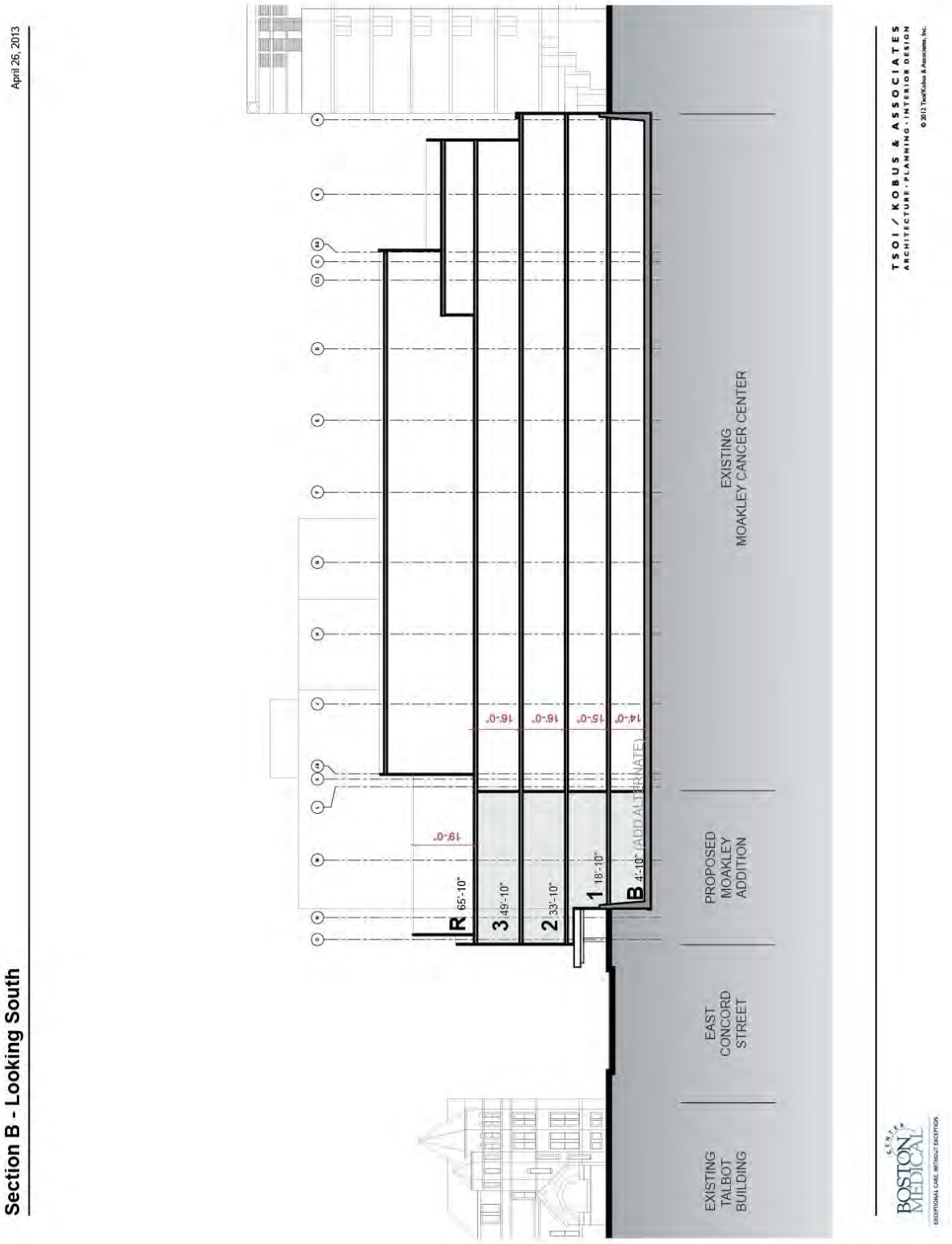


Figure 2-10 Moakley Cancer Center Addition North Elevation

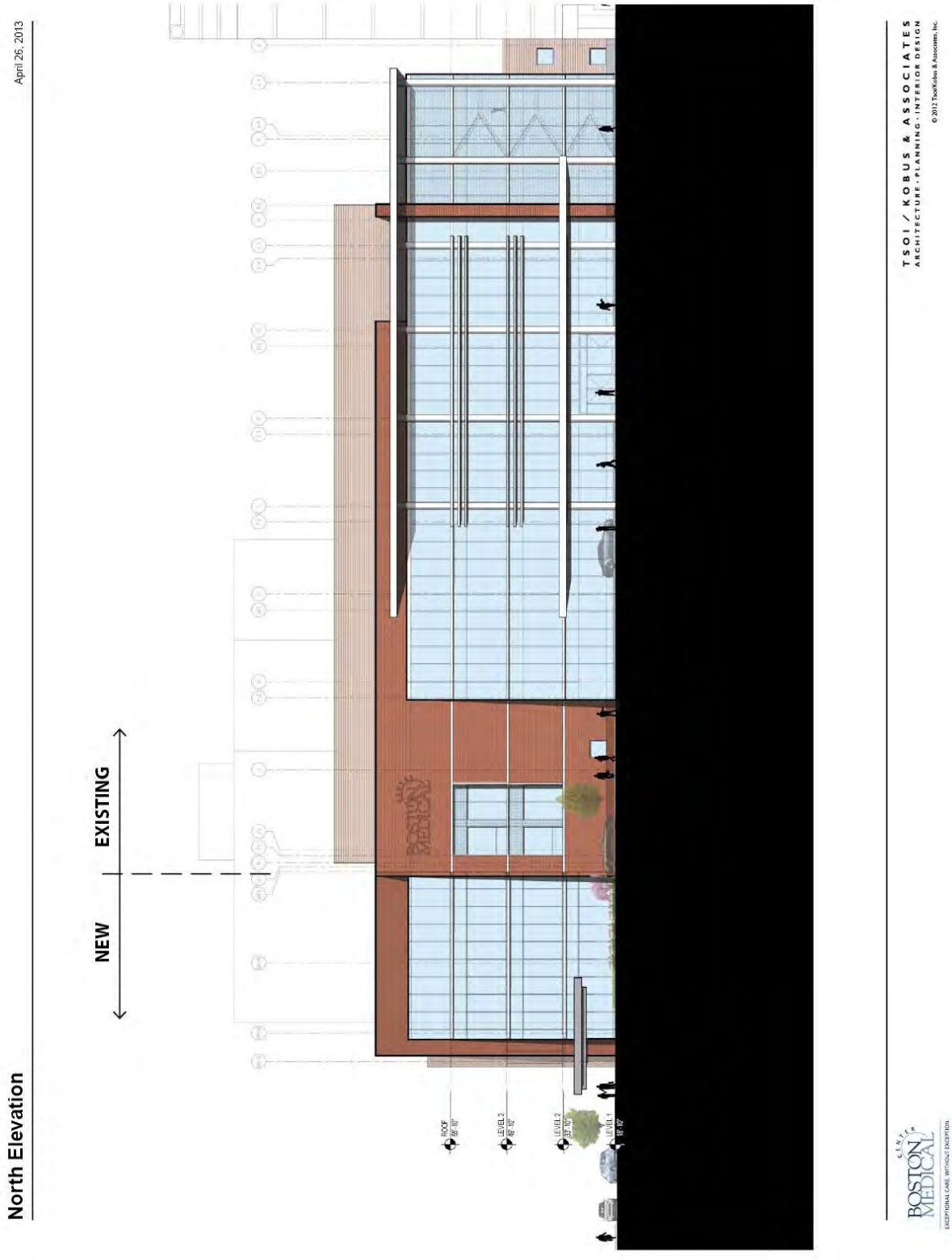
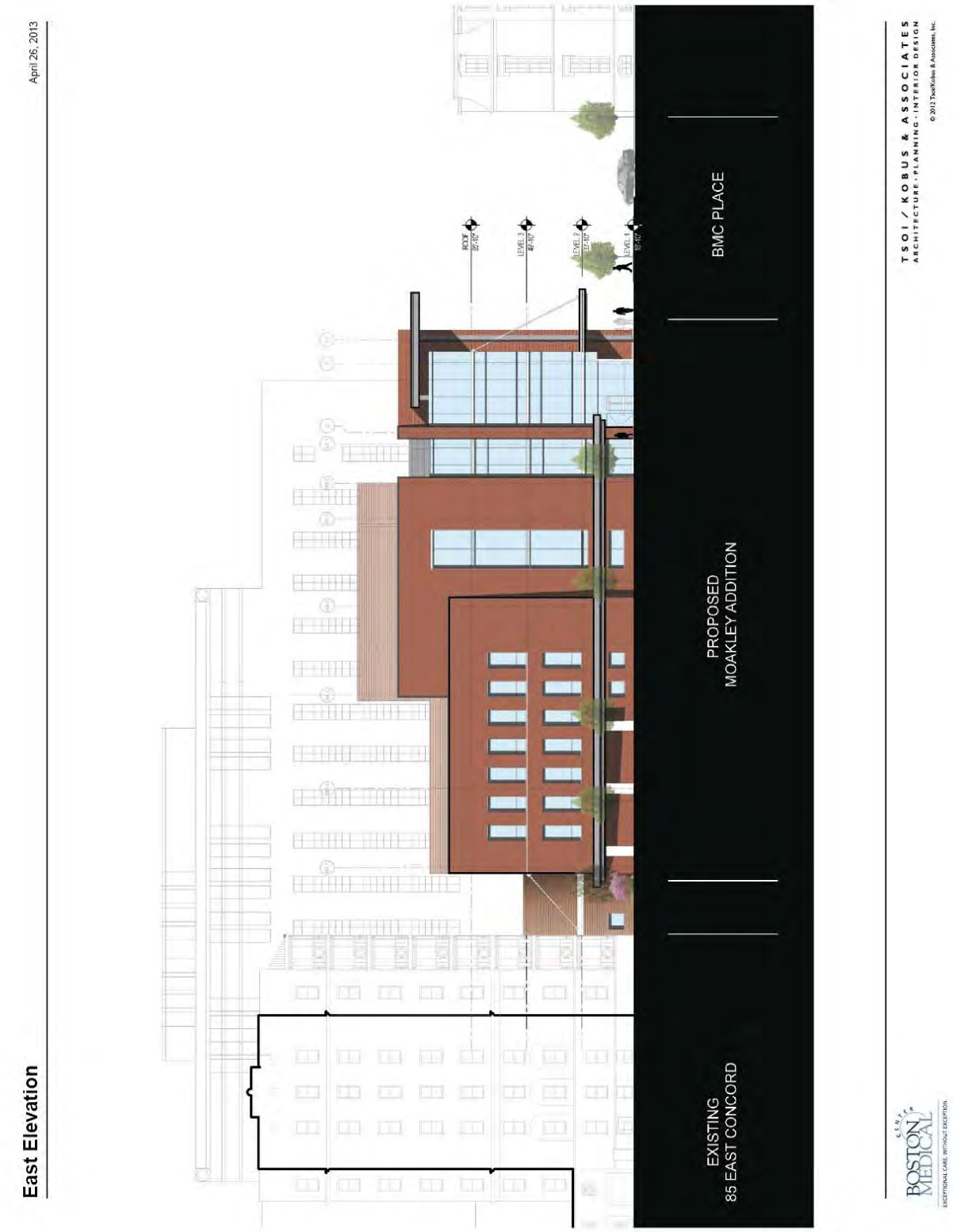


Figure 2-11 Moakley Cancer Center Addition South Elevation

Figure 2-12 Moakley Cancer Center Addition East Elevation



2.1.2 New Inpatient Building Phase 1

BMC is proposing to construct the first phase of the New Inpatient Building. Upon relocation of the displaced departments to the Moakley Cancer Center Addition, the expansion of the Emergency Department and Trauma Center and consolidation of other critical care departments can be completed with the New Inpatient Building.

In July 2010, Boston Medical Center consolidated its two emergency departments, merging service of the Newton Pavilion Emergency Department into the Menino Pavilion Emergency Department. The unified departments enhance patient care by combining all required resources in one location. However, the existing configuration of clinical spaces in the Menino Pavilion is inadequate due to the increase in Emergency Department volumes and for the scope of the services provided (trauma, adult acute, pediatric acute, psychiatric, and urgent care). In addition, the consolidation of the Radiology Department requires significant expansion of that service. The first phase of the New Inpatient Building will allow the reconfiguration of the first floor to accommodate both an expanded Radiology Department and Emergency Department and Trauma Center. The proposed building will also accommodate the consolidation of all interventional procedure space on the second floor and facilitate the consolidation of all inpatient beds on upper floors.

The New Inpatient Building Phase 1 will be located on the site of the eastern portion of the present Dowling Building. This will necessitate the demolition of the existing 19,000 square foot, 3-story portion of the Dowling Building along Albany Street (east section of the building located between the Dowling Tower and the Menino Pavilion) which is currently used for administrative and support functions. The New Inpatient Building Phase 1 will be 4-stories above grade at approximately 78,800 square feet with a typical floorplate of approximately 16,700 square feet on levels one and two and approximately 9,350 square feet on levels three and four. The building's southern face is set back from Albany Street to allow further sidewalk improvements intended to promote a user-friendly experience. The facade engages this streetscape providing a clear and continuous edge further defining the pedestrian path.

The Emergency Department drop-off and entrance will be relocated to the rear of the Moakley Cancer Center, accessed via Shapiro Drive. This action will further remove vehicular traffic from the north side of Albany Street, minimizing potential conflicts with pedestrians and fostering a more user-friendly experience.

Phase 1 will also provide increased support and circulation space and vital connections to adjacent campus buildings via a connector wing. The connector wing will span over the existing ambulance bays to the south of the Menino Pavilion. The first level will extend from Level 2 of the New Inpatient Building Phase 1 and will align with Level 2 of the existing Menino Pavilion while the second level will align with Level 3 of the Menino Pavilion and Level 3 of the Shapiro Ambulatory Care Center.

See Figures 2-13 to 2-23 for Floorplans, Sections and Elevations.

Figure 2-13 New Inpatient Building Phase 1 Location and Campus Plan

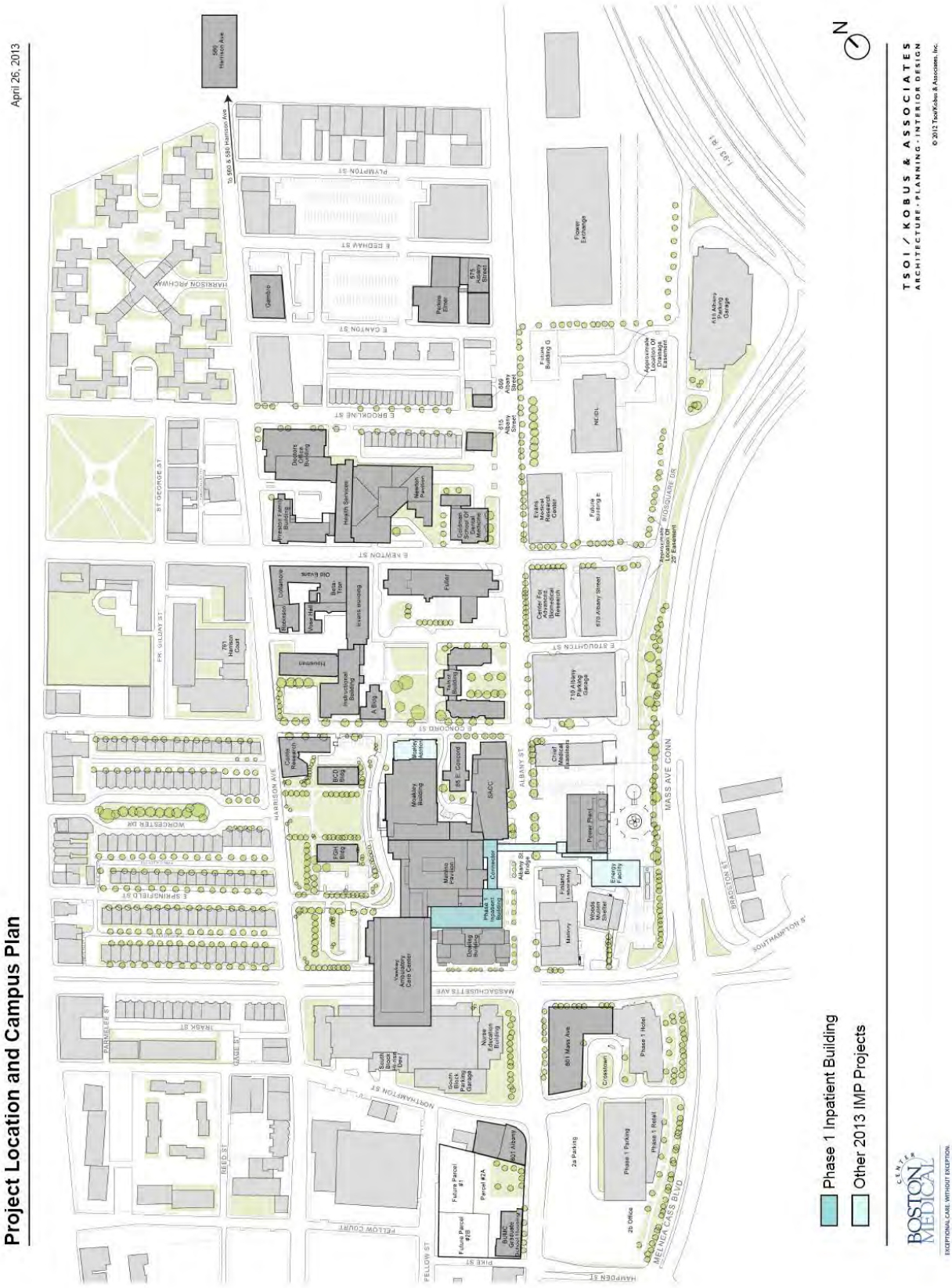


Figure 2-14 New Inpatient Building Phase 1 Site Plan

Figure 2-15 New Inpatient Building Phase 1 Basement Level Floorplan

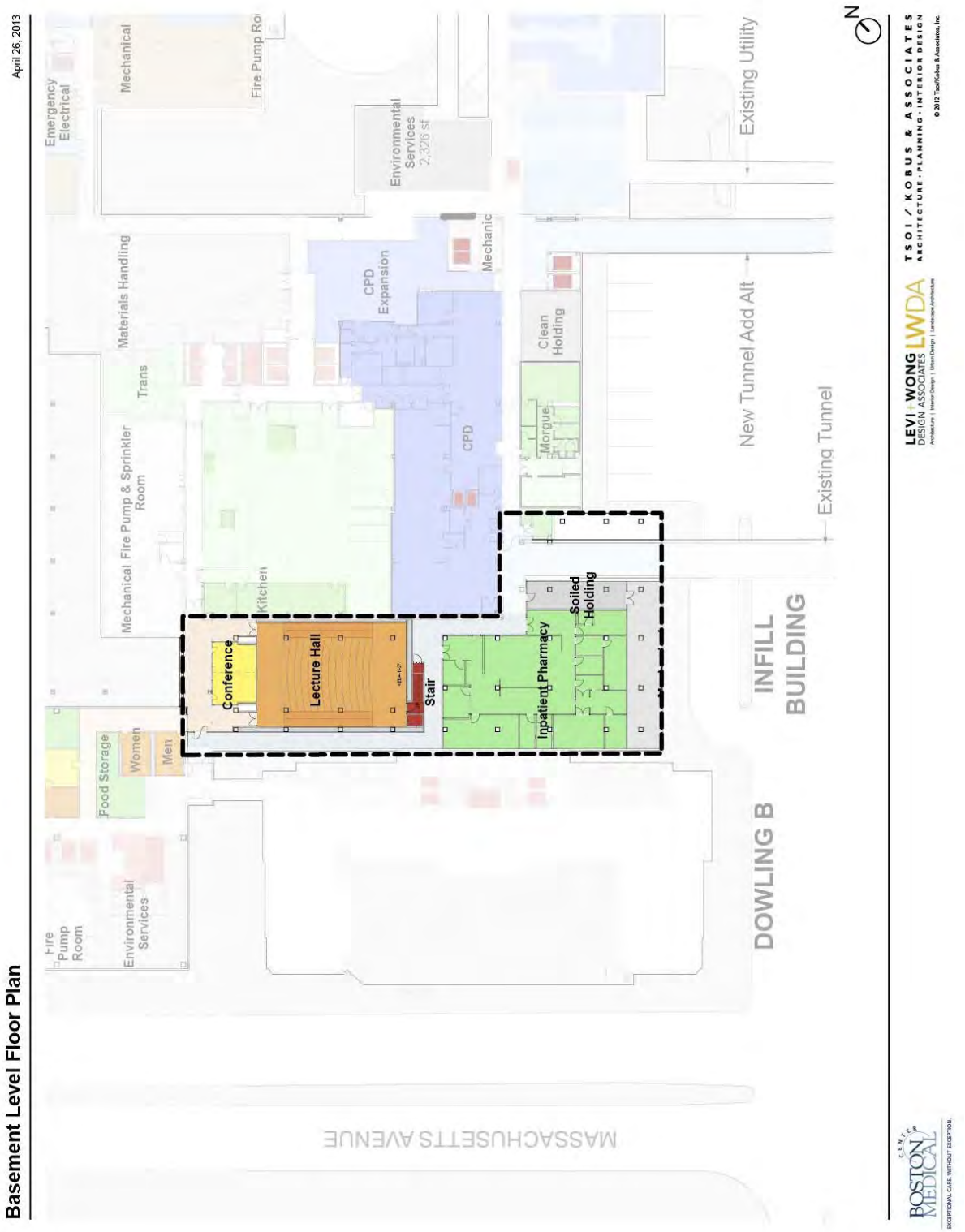


Figure 2-16 New Inpatient Building Phase 1 First Level Floorplan

Figure 2-17 New Inpatient Building Phase 1 Second Level Floorplan

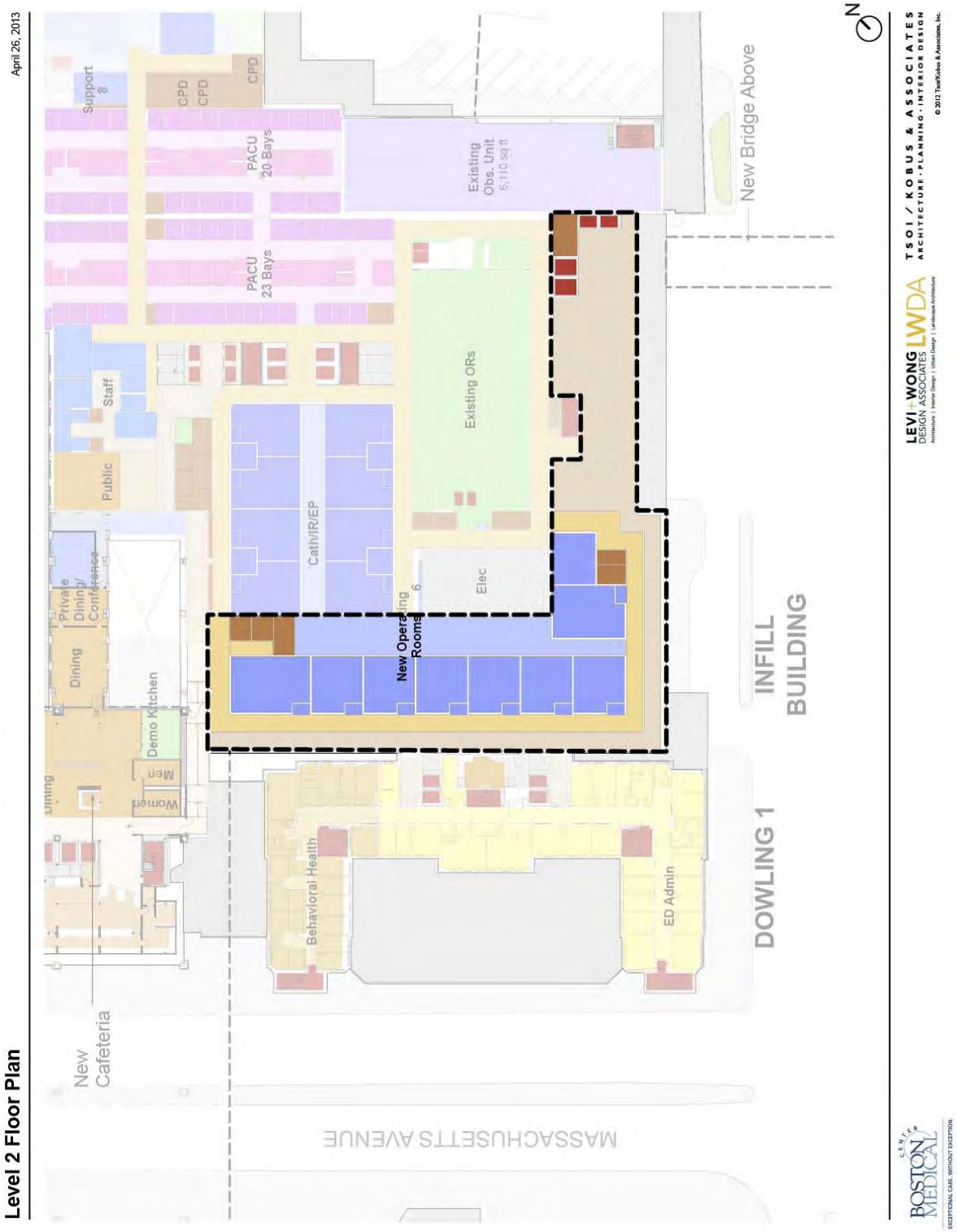


Figure 2-18 New Inpatient Building Phase 1 Third Level Floorplan

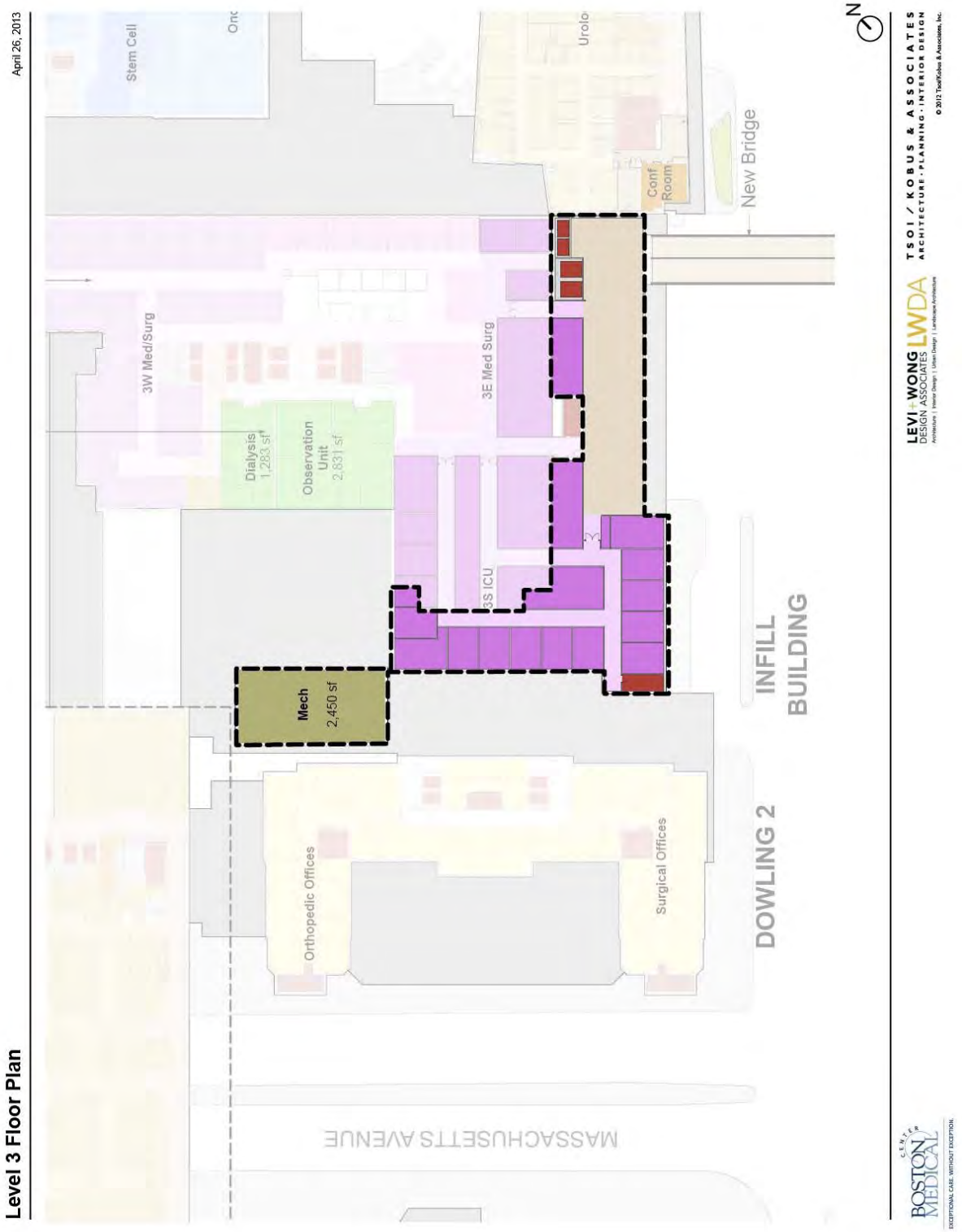


Figure 2-19 New Inpatient Building Phase 1 Fourth Level Floorplan

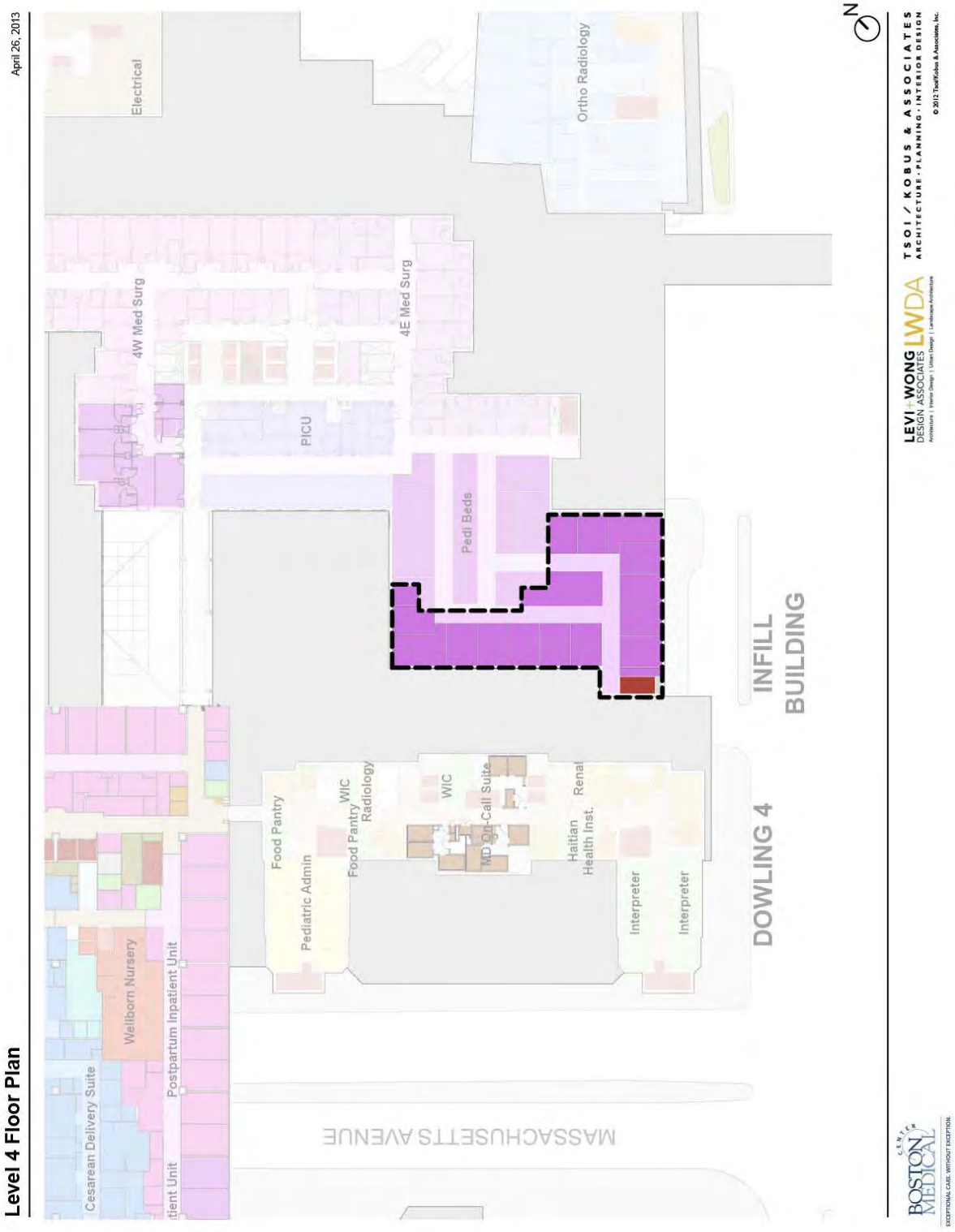


Figure 2-20 New Inpatient Building Phase 1 Fifth Level Floorplan

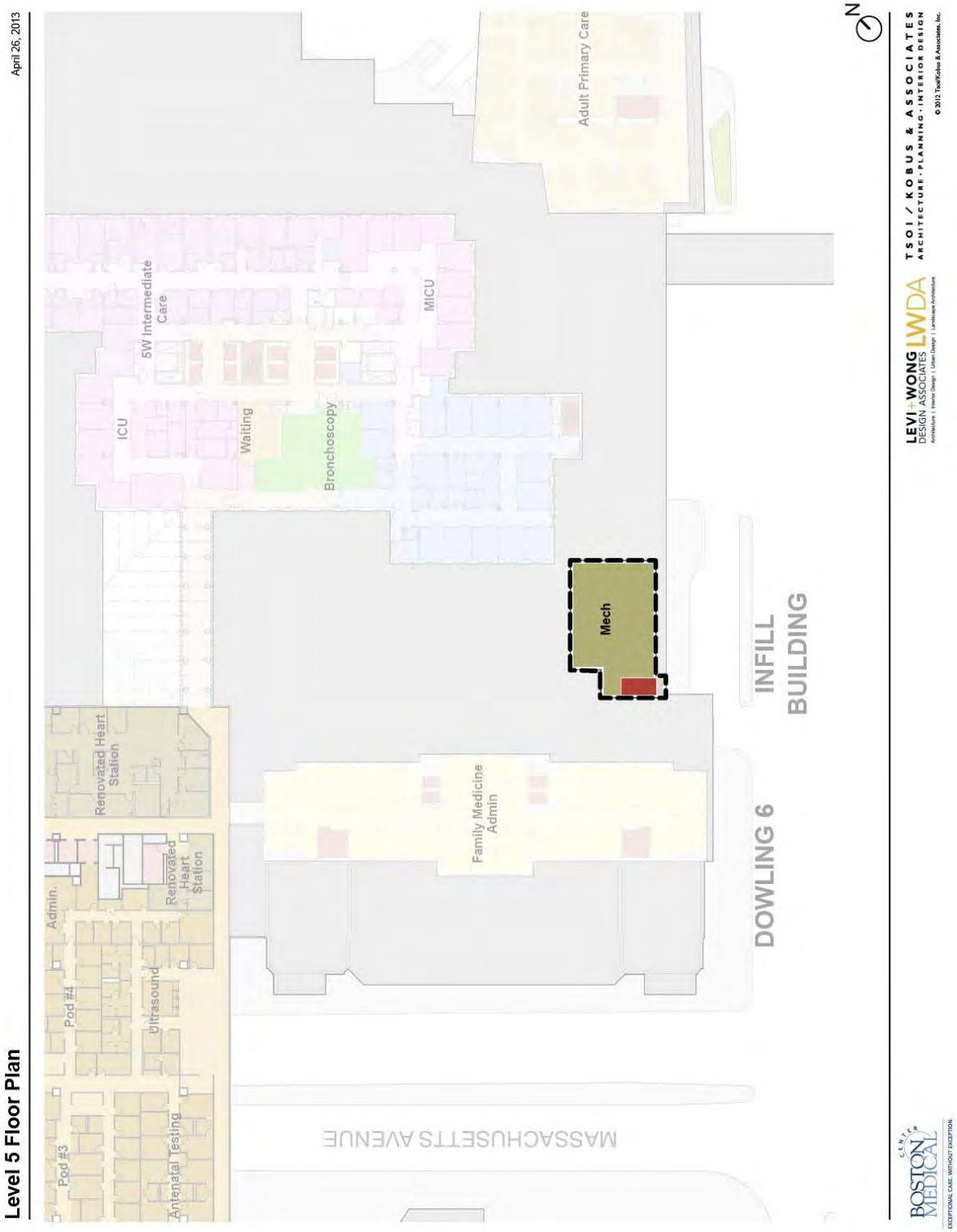


Figure 2-21 New Inpatient Building Phase 1 Section Looking North

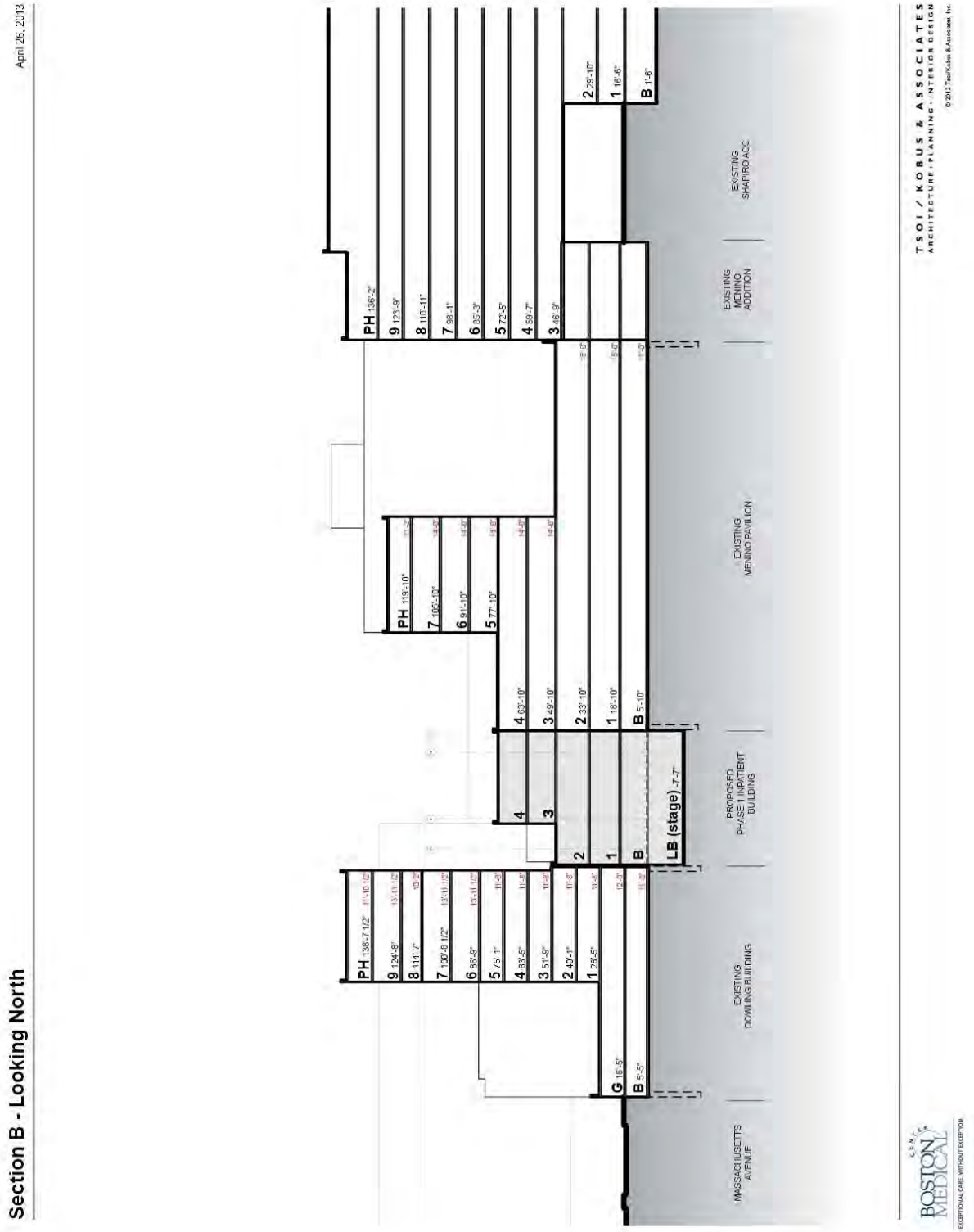


Figure 2-22 New Inpatient Building Phase 1 Section Looking West

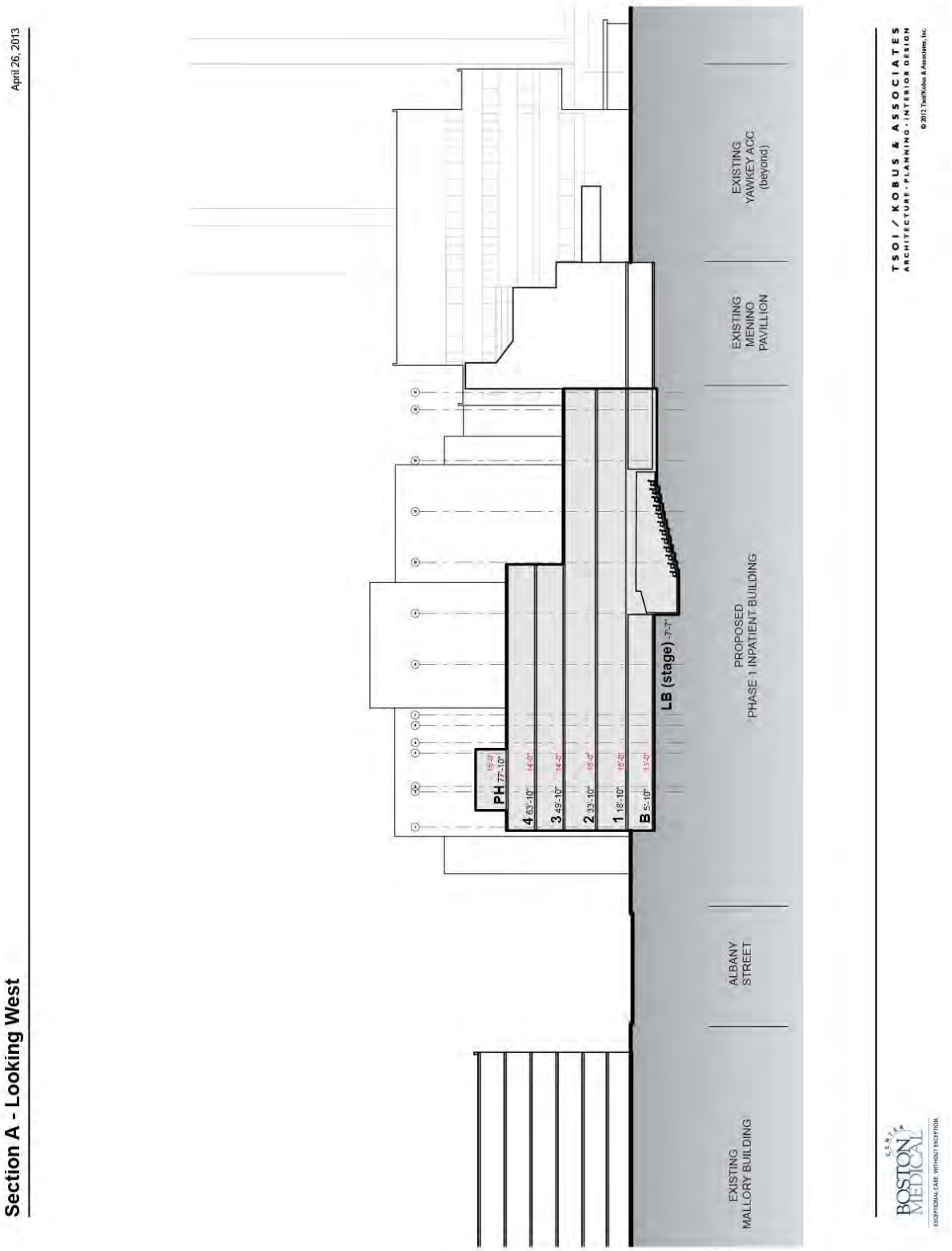
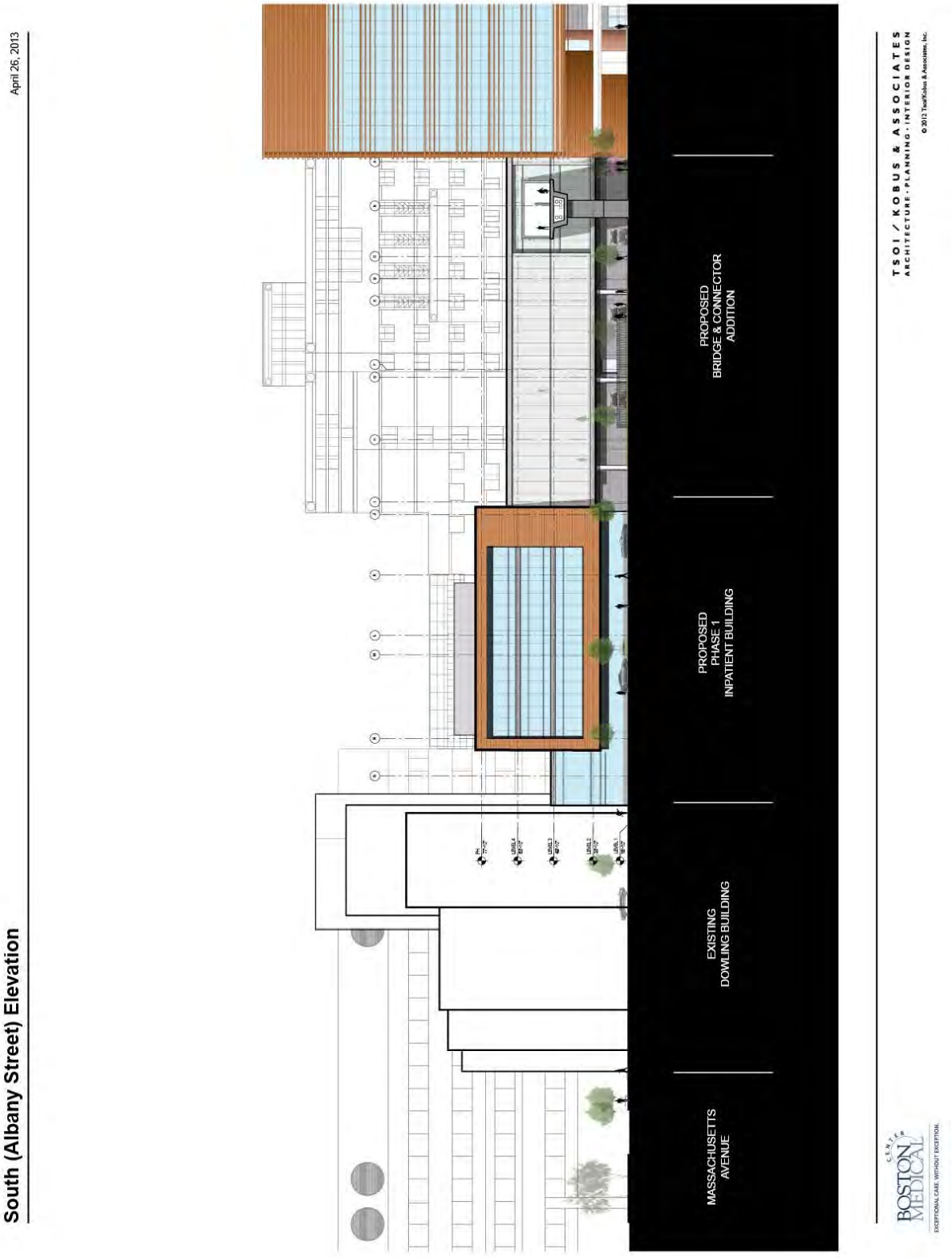


Figure 2-23 New Inpatient Building Phase 1 South Elevation



2.1.3 BMC Energy Facility

The BUMC Campus relies on utilities and energy infrastructure facilities that are approaching their operating limits. Boston University Medical Center infrastructure systems are largely dependent on purchased utilities with significant utilization of electrical power and steam. Currently Boston University Medical Center uses a steam distribution system that is at capacity and an electrical distribution system that is not designed to support future growth. The BUMC Campus relies to a lesser degree on natural gas and oil. Those fuel sources are primarily for back-up systems within patient care and research buildings and spaces.

BMC currently utilizes electrical power through two power distribution centers on the BUMC Campus. These stations (at the Power Plant and the Evans Building) are both over 30 years old and are using out of date technology that is not supported by replacement parts without customization or reliance on refurbished equipment. One of these stations is operating within five percent of its rated capacity. The other is presently operating at 65 percent of its capacity, but services an area of significant anticipated growth. Given the age of these stations and projected energy demand, upgrades and modernization of electrical infrastructure will be required in the very near future.

With increased reliance on technology and ever increasing minimum standards, requirements for powering and cooling patient care and research space on the BUMC Campus creates new demands that continues to outpace the ability to reduce the amount of utilities used in total.

BMC now faces the challenge of managing the availability and reliability of energy service that is critical to a major medical center. In order to support the campus growth, keep up with advancements in health care technology, and deliver clinical services 24/7, BMC requires a new energy facility to address these issues. The goals of the proposed Energy Facility project are to reduce demand on existing taxed infrastructure, create energy and system redundancy, increase system efficiency, and reduce overall environmental impact.

The following are the primary objectives of the BMC Energy Facility:

- Reliability - The Energy Facility will add redundancy to the BUMC Campus existing energy supply and ensure a reliable power system – an especially important concept in operating a major medical center. Currently, electricity is provided to the BUMC Campus by NSTAR and Veolia supplies the steam. The BUMC Campus will stay connected to these existing utility suppliers in the event that back-up energy is needed (e.g. during peak periods, scheduled equipment maintenance, or unexpected shutdowns).

- Efficiency - The Energy Facility will be located close to where BMC needs the power – a concept known as distributed generation. Placing a facility close to where the power is used is much more efficient and reliable than sending power farther away. This is based on the premise that with shorter distances for power to travel, there are fewer points for system failures. Further, the efficiency of the proposed system is approximately 72% as compared to a conventional single cycle power plant capable of operating at 33%.

- Reduced Environmental Impact - With the Energy Facility, BMC will be able to make electricity and steam from the same process – a process known as “combined heat and power” (CHP) or also referred to as “cogeneration”. In this process, a combustion gas turbine is fueled by natural gas to generate electricity. Waste heat from the combustion turbine is then sent to a Heat Recovery Steam Generator to produce usable steam. BMC uses steam to heat buildings and for medical equipment sterilization. Combining electric and thermal energy generation into a single integrated process reduces fuel consumption and the impact on the carbon footprint dramatically.

With the Energy Facility, BMC plans to make approximately 75% of its own electricity and nearly 100% of its own steam.

The Energy Facility will be approximately 38,500 square feet with a typical floorplate of approximately 10,000 square feet. At street level, the building will be accessed from the north and south sides for purposes of limited and scheduled equipment maintenance. The Energy Facility will be bordered to the north, east and west by existing buildings.

The Energy Facility, with a similar program, was approved in 2010 IMP for a site on Albany Street to the east of the existing Power Plant. By relocating the project to the west, BMC can utilize the new Bridge as a conduit for power distribution to the main campus from the Energy Facility and create a less encumbered site for future development of the proposed Administration / Clinical Building upon demolition of the existing Power Plant.

See Figures 2-24 to 2-34 for Floorplans, Sections and Elevations.

Figure 2-24 BMC Energy Facility Project Location and Campus Plan

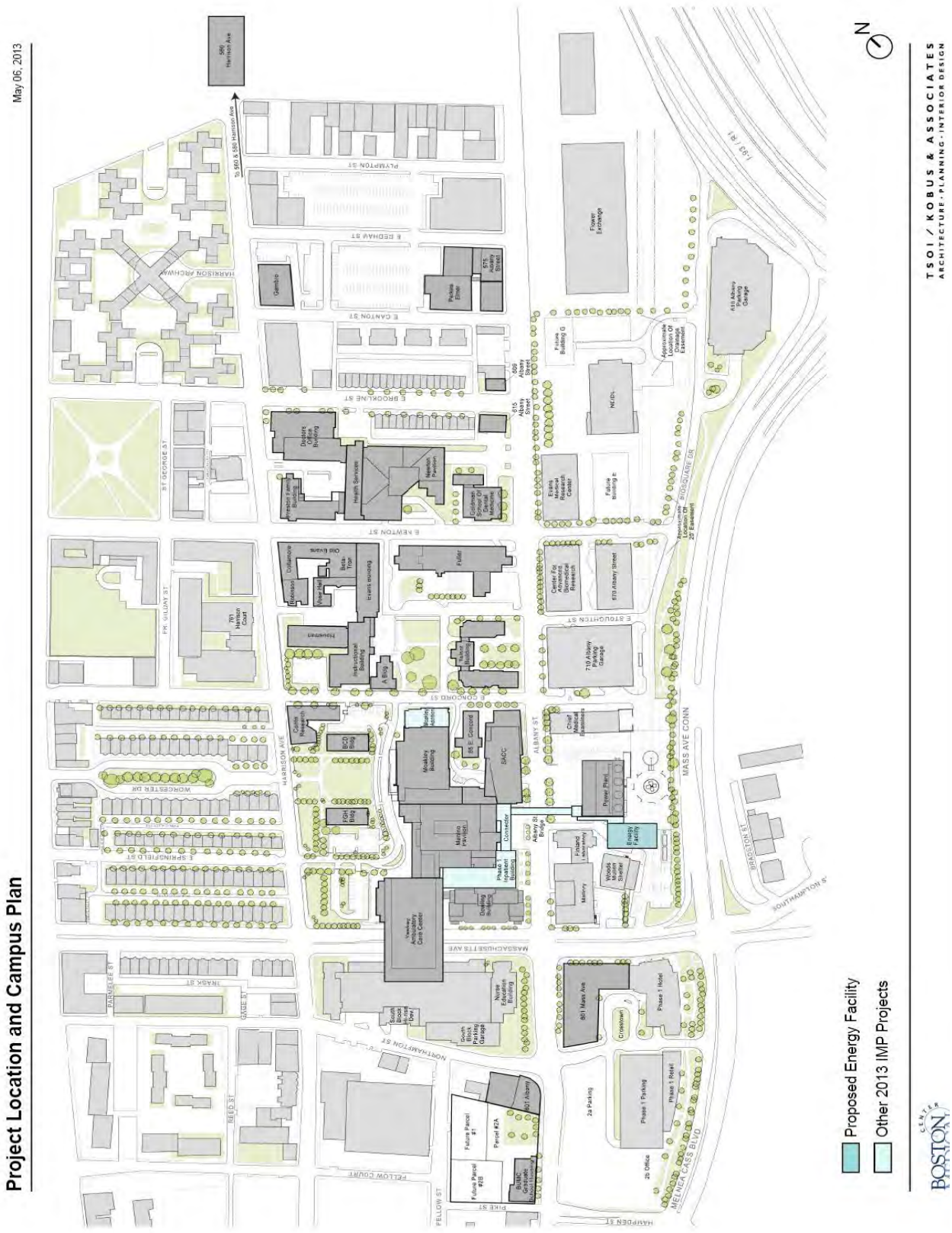


Figure 2-25 BMC Energy Facility Site Plan

Figure 2-26 BMC Energy Facility Basement Level Floorplan

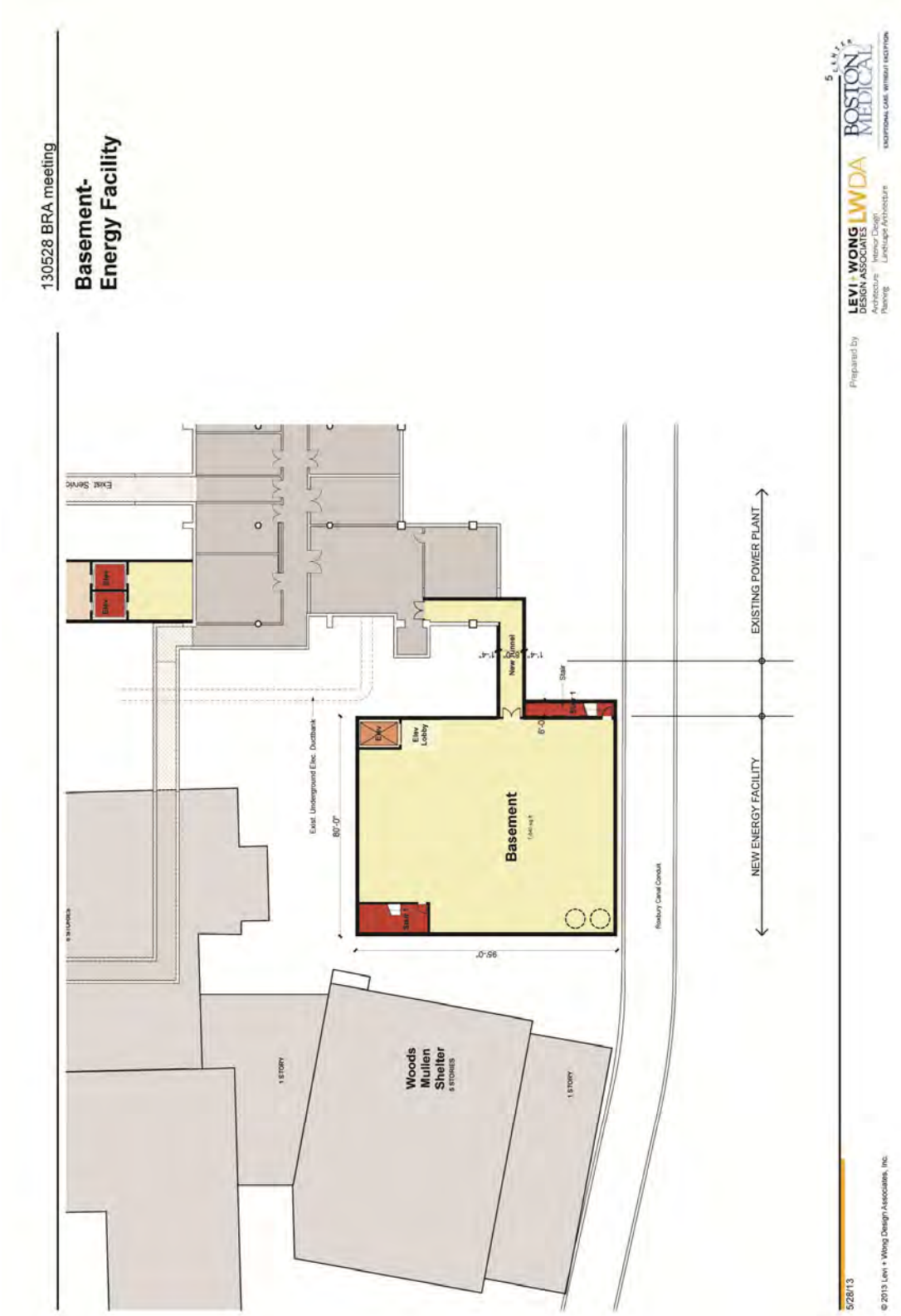


Figure 2-27 BMC Energy Facility First Level Floorplan

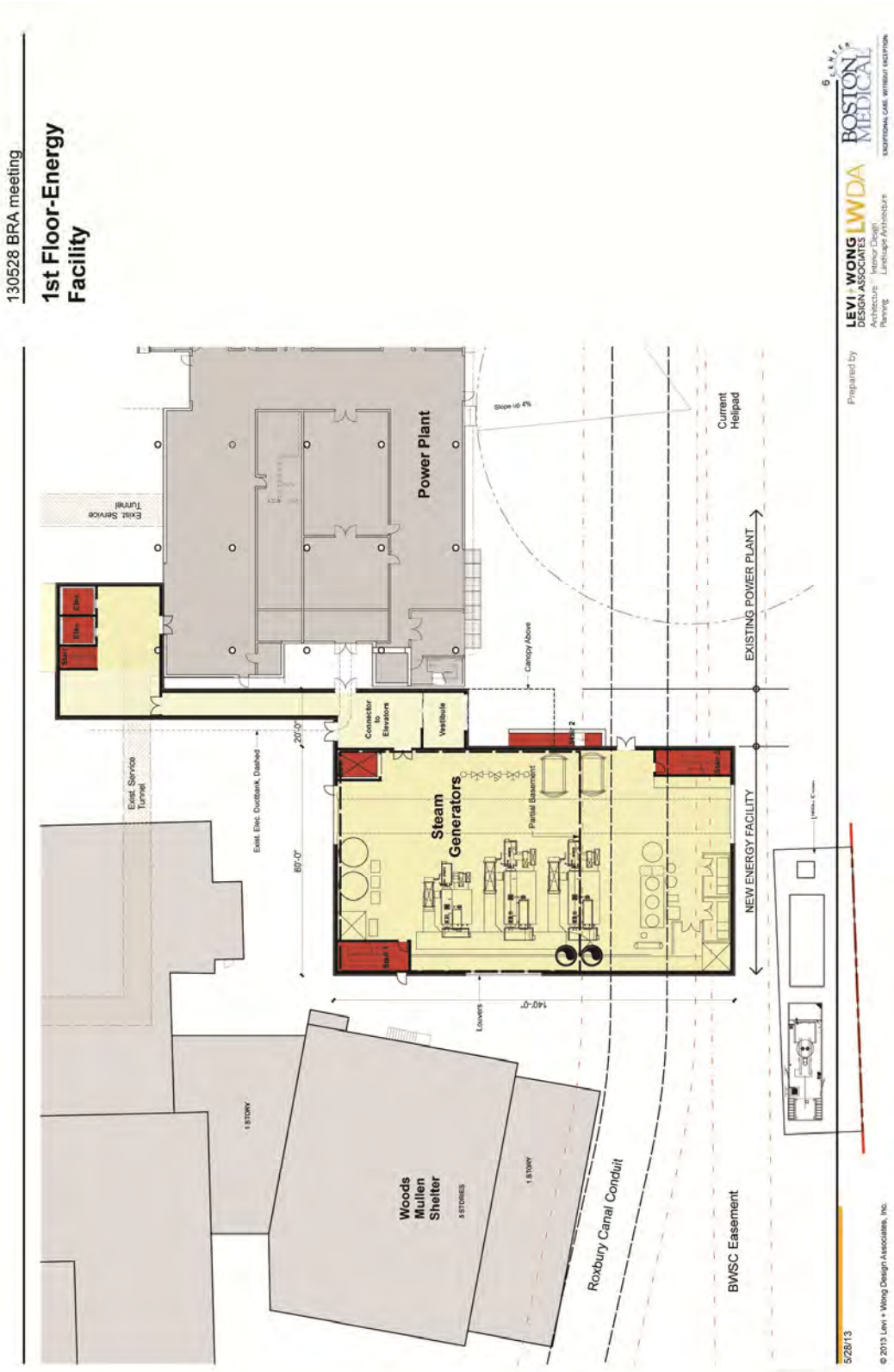


Figure 2-28 BMC Energy Facility Second Level Floorplan

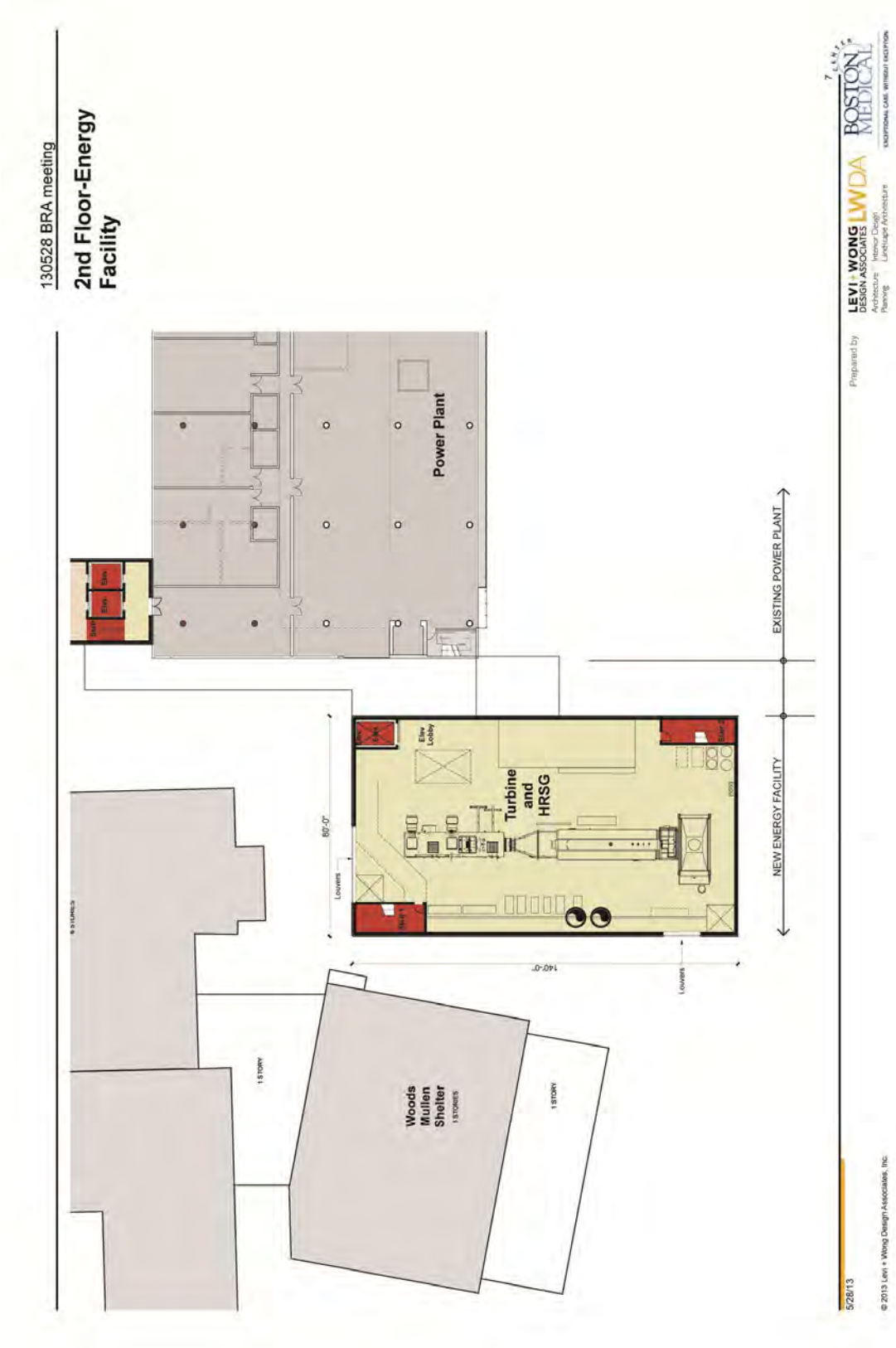


Figure 2-29 BMC Energy Facility Third Level Floorplan

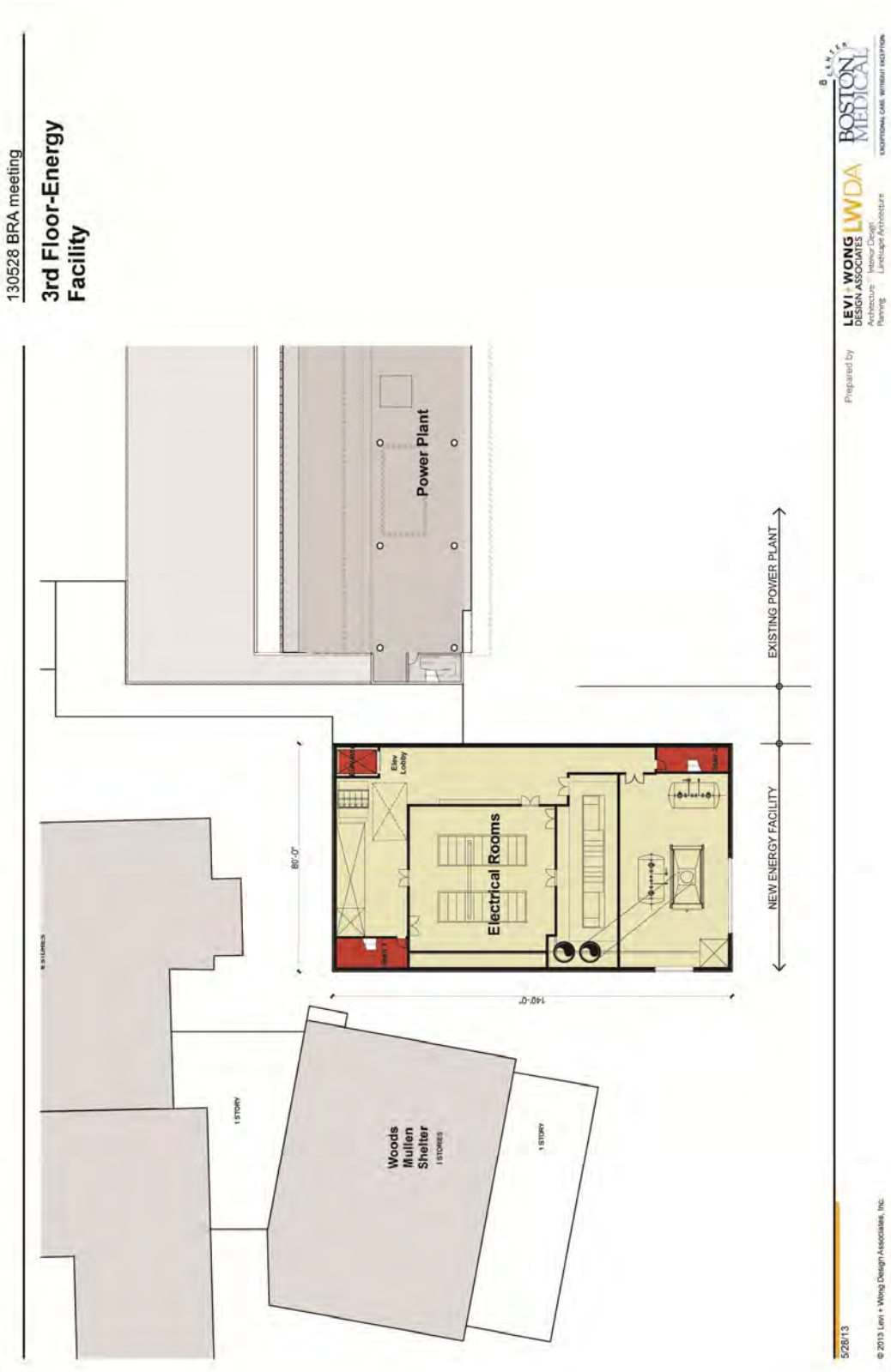


Figure 2-30 BMC Energy Facility Roof Plan

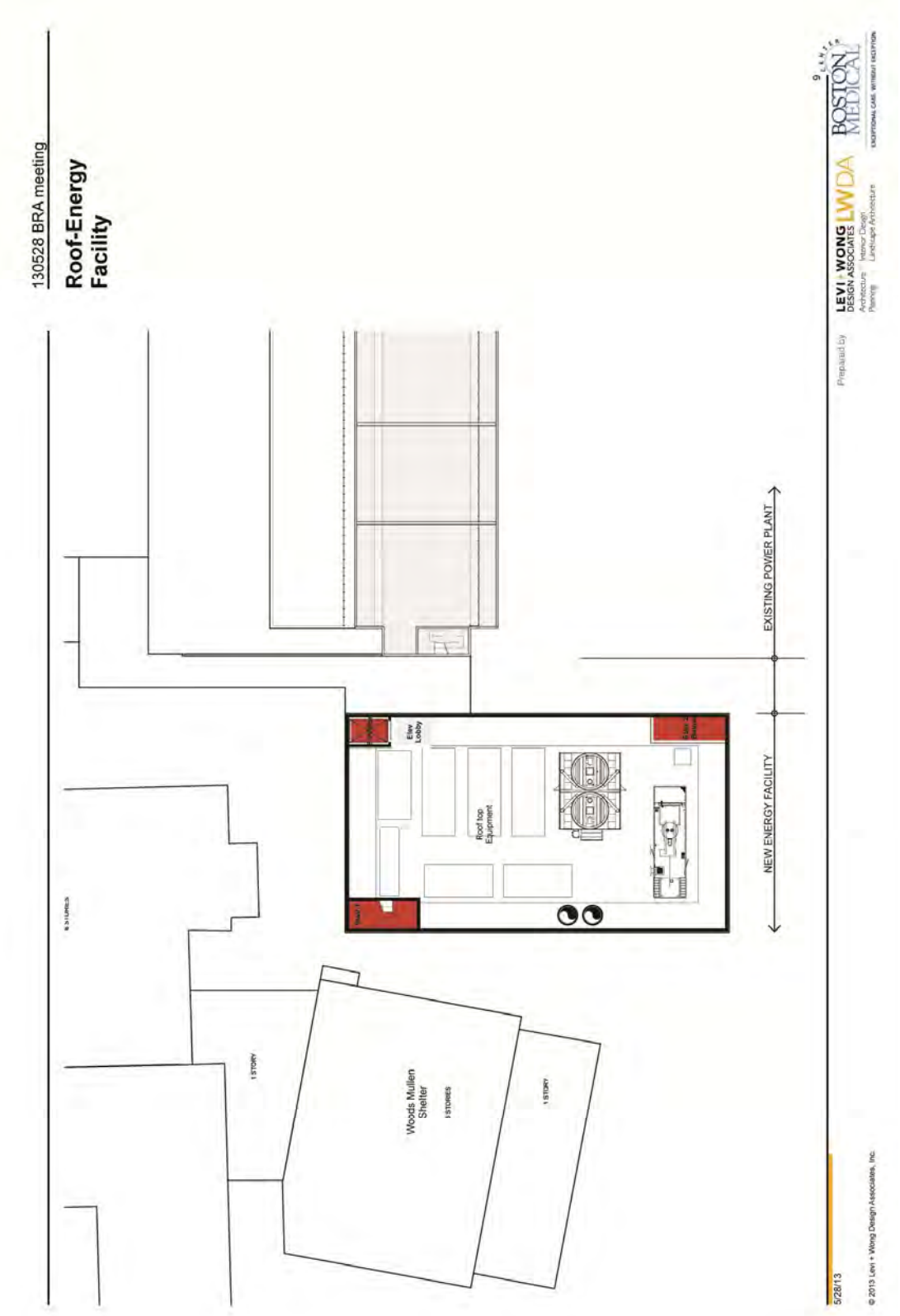


Figure 2-31 BMC Energy Facility South Elevation

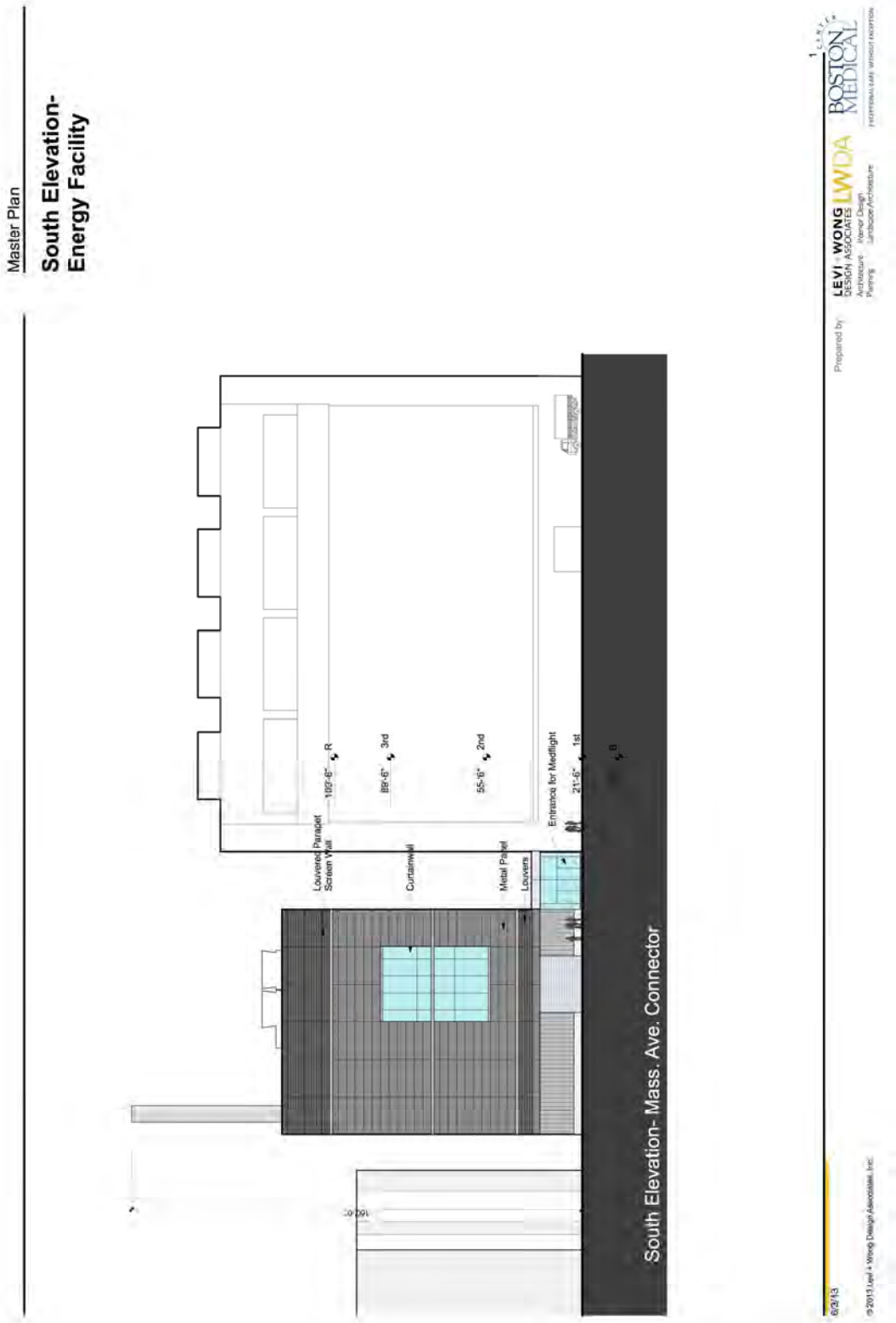


Figure 2-32 BMC Energy Facility East Elevation

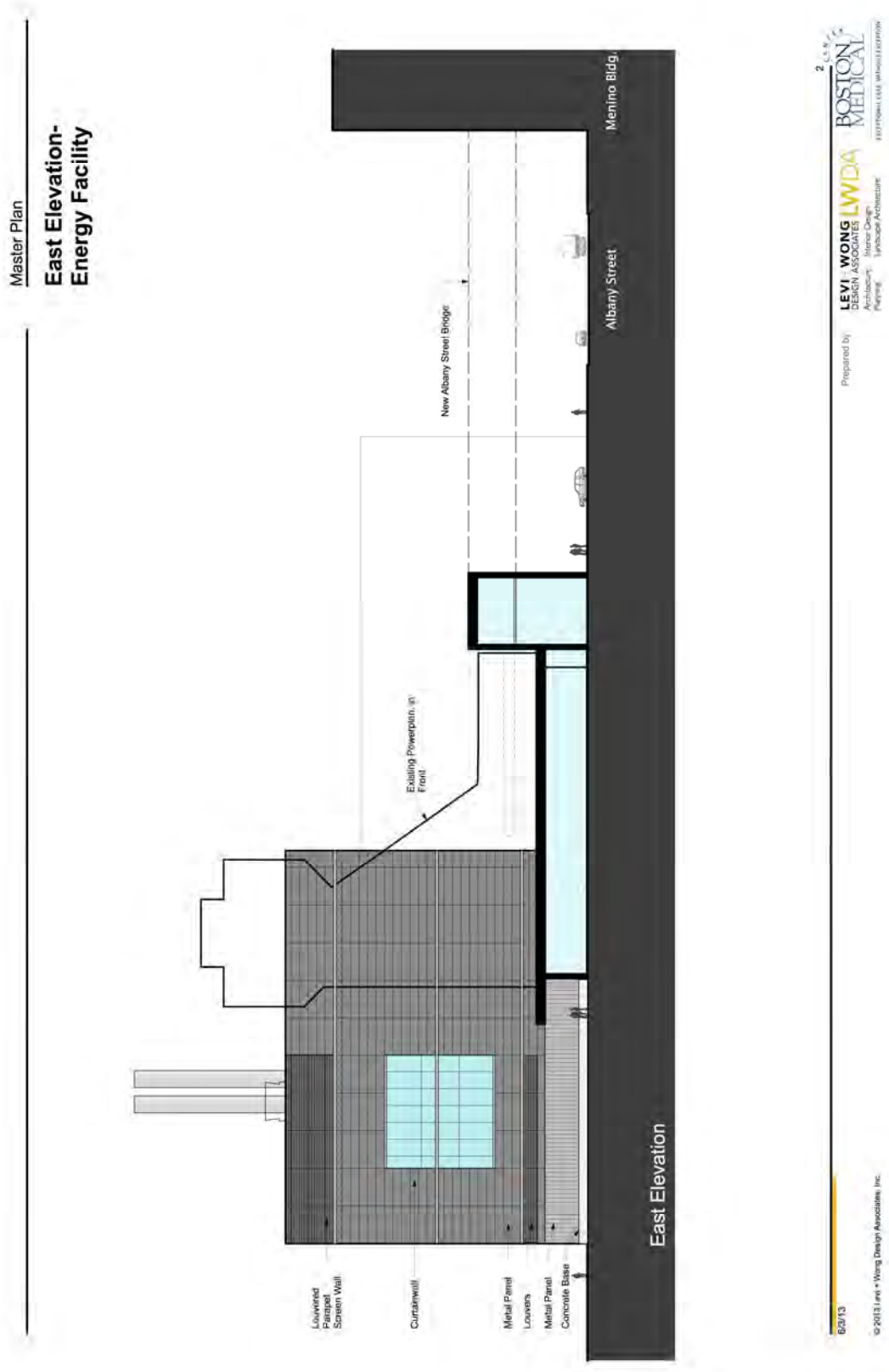


Figure 2-33 BMC Energy Facility North Elevation

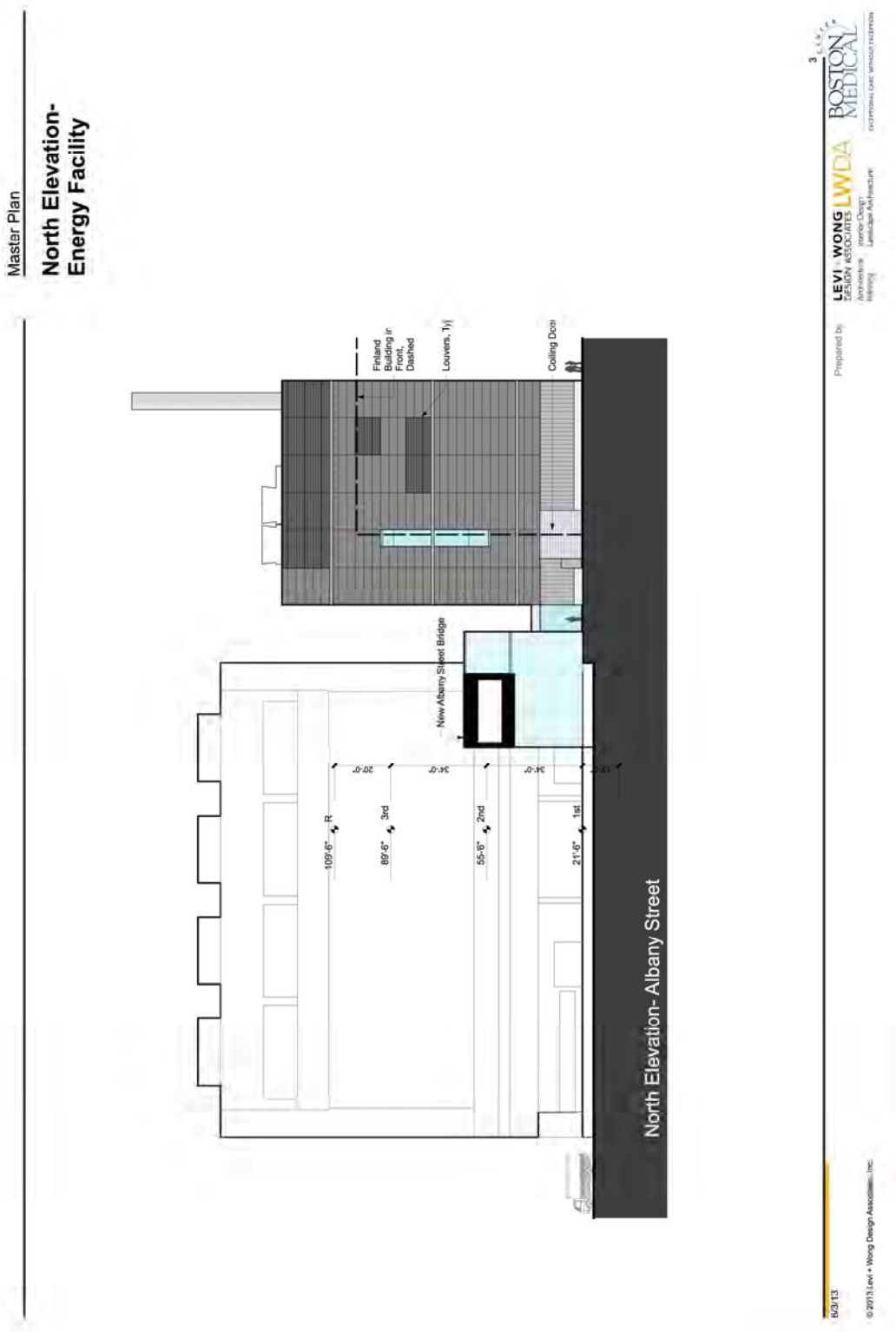
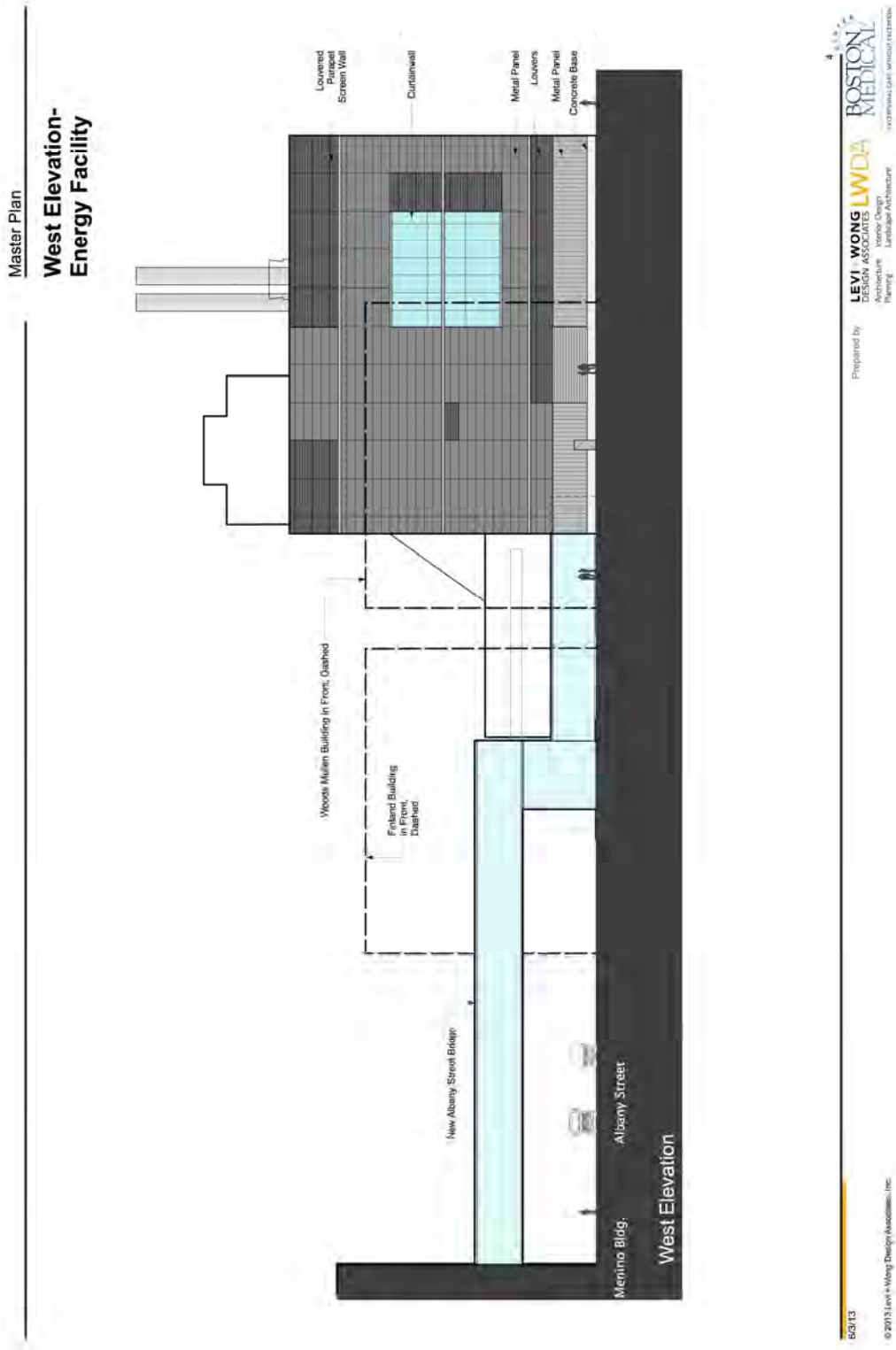


Figure 2-34 BMC Energy Facility West Elevation



2.1.4 New Patient Transport Bridge

The new Bridge will improve patient transport and material handling operations. The new Bridge will be a 1-story material, utility, and patient transport Bridge at approximately 7,100 square feet, including a 1 story corridor to provide access for the Med Flight patients from the helipad to the new Bridge. The new Bridge will require the demolition of the existing yellow tube currently used for utility services.

The new Bridge is proposed to cross Albany Street in approximately the same location as the existing yellow utility tube. The 1 story corridor will be constructed at grade located adjacent to the existing Power Plant. Med Flight patients will be transported through the 1-story corridor to the new elevator tower in the Bridge and through the Bridge spanning across Albany Street connecting to the New Inpatient Building Phase 1.

By connecting the north and south sides of Albany Street, the project will provide direct patient transport from the existing Helipad to the expanded Emergency Department and Trauma Center, providing better patient care through increased operational efficiency, and reducing health care costs by eliminating ambulance transport. The new Bridge is also intended to transport clean materials from the newly relocated loading docks on the south side of Albany Street at the existing Power Plant, as well as house necessary utility connections from the existing Power Plant and Energy Facility to the main campus.

See Figures 2-35 to 2-43 for Floorplans, Sections and Elevations.

Figure 2-35 New Patient Transport Bridge Project Location and Campus Plan

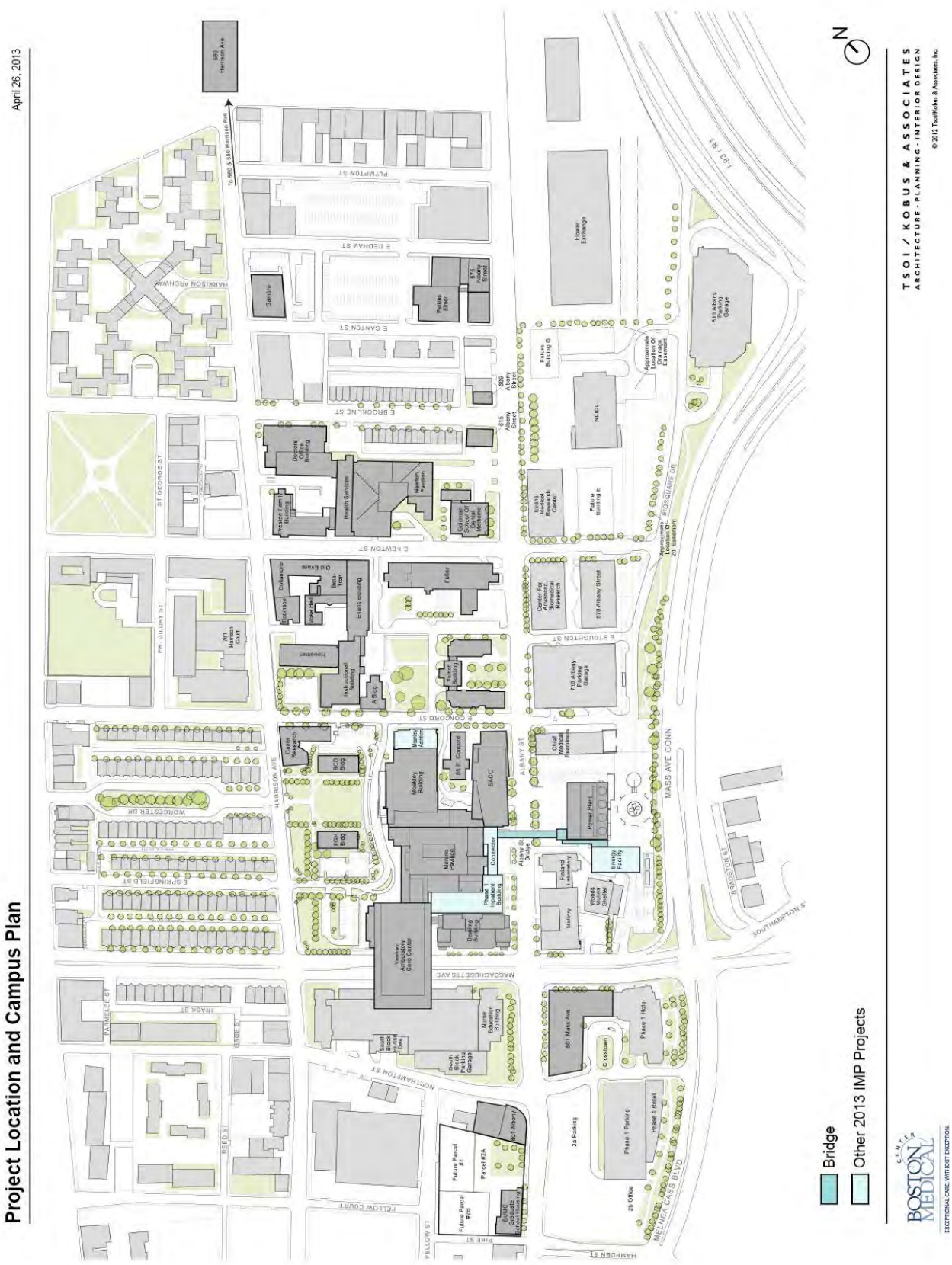


Figure 2-36 New Patient Transport Bridge Site Plan

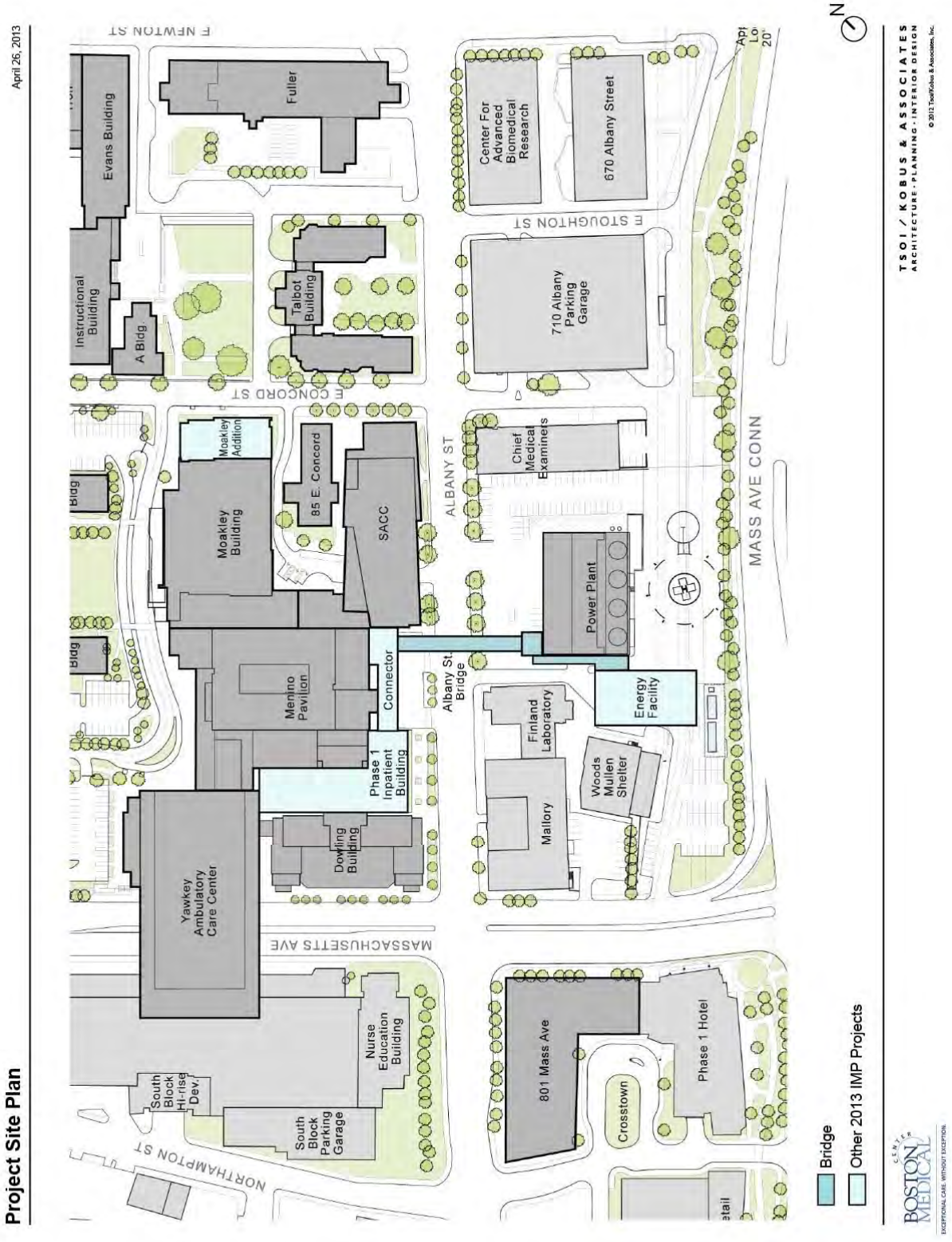


Figure 2-37 New Patient Transport Bridge First Level Floorplan

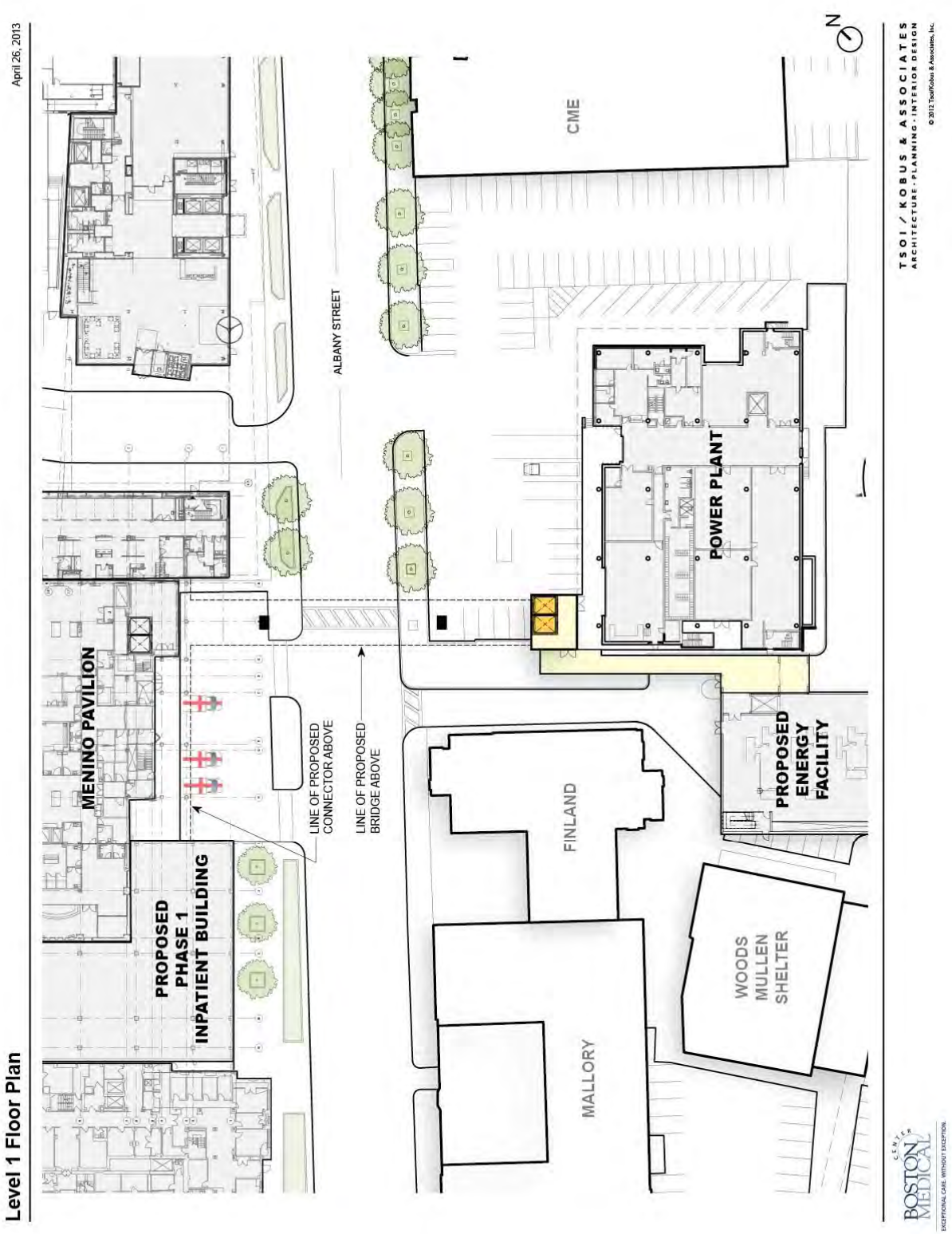


Figure 2-38 New Patient Transport Bridge Second Level Floorplan

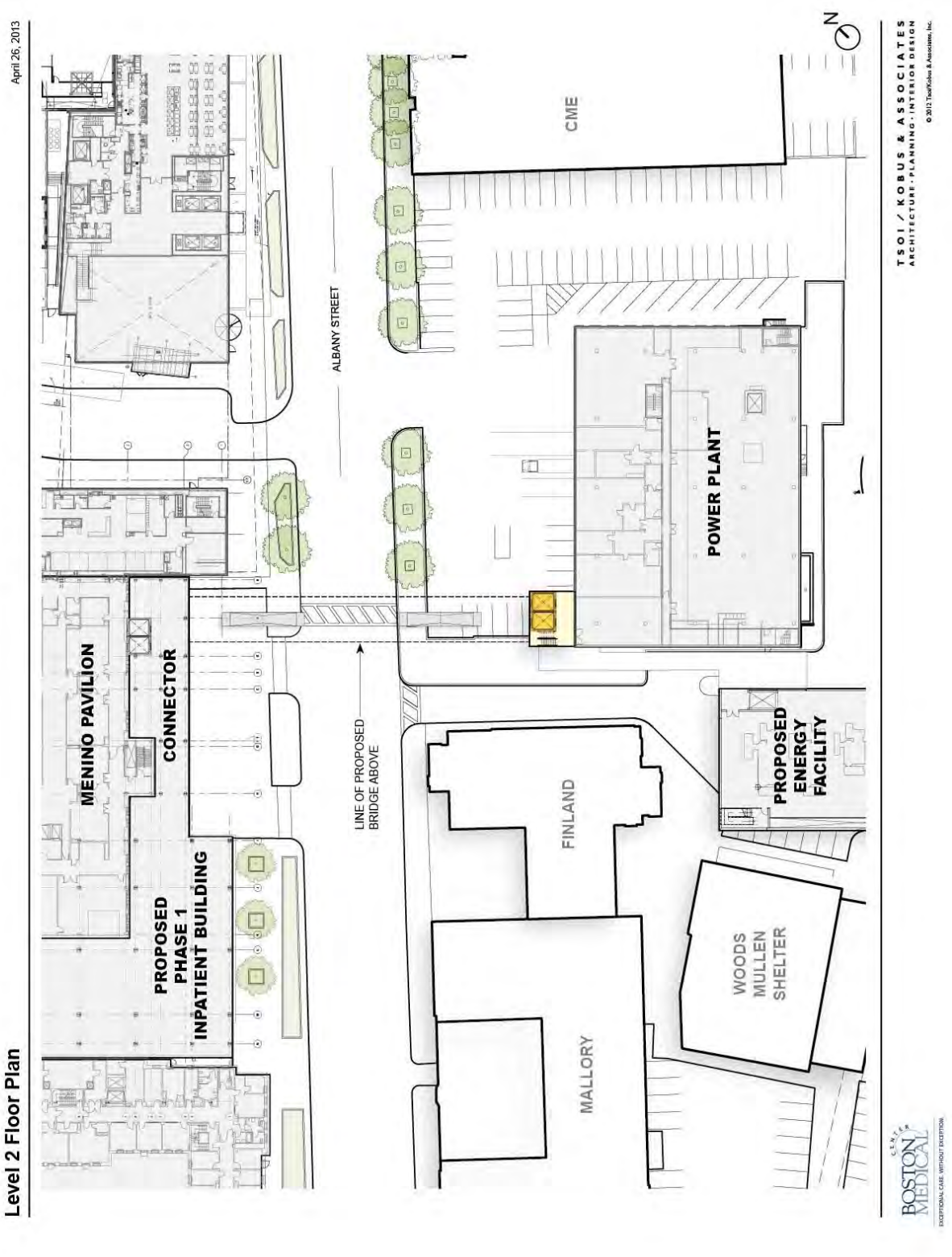


Figure 2-39 New Patient Transport Bridge Third Level Floorplan

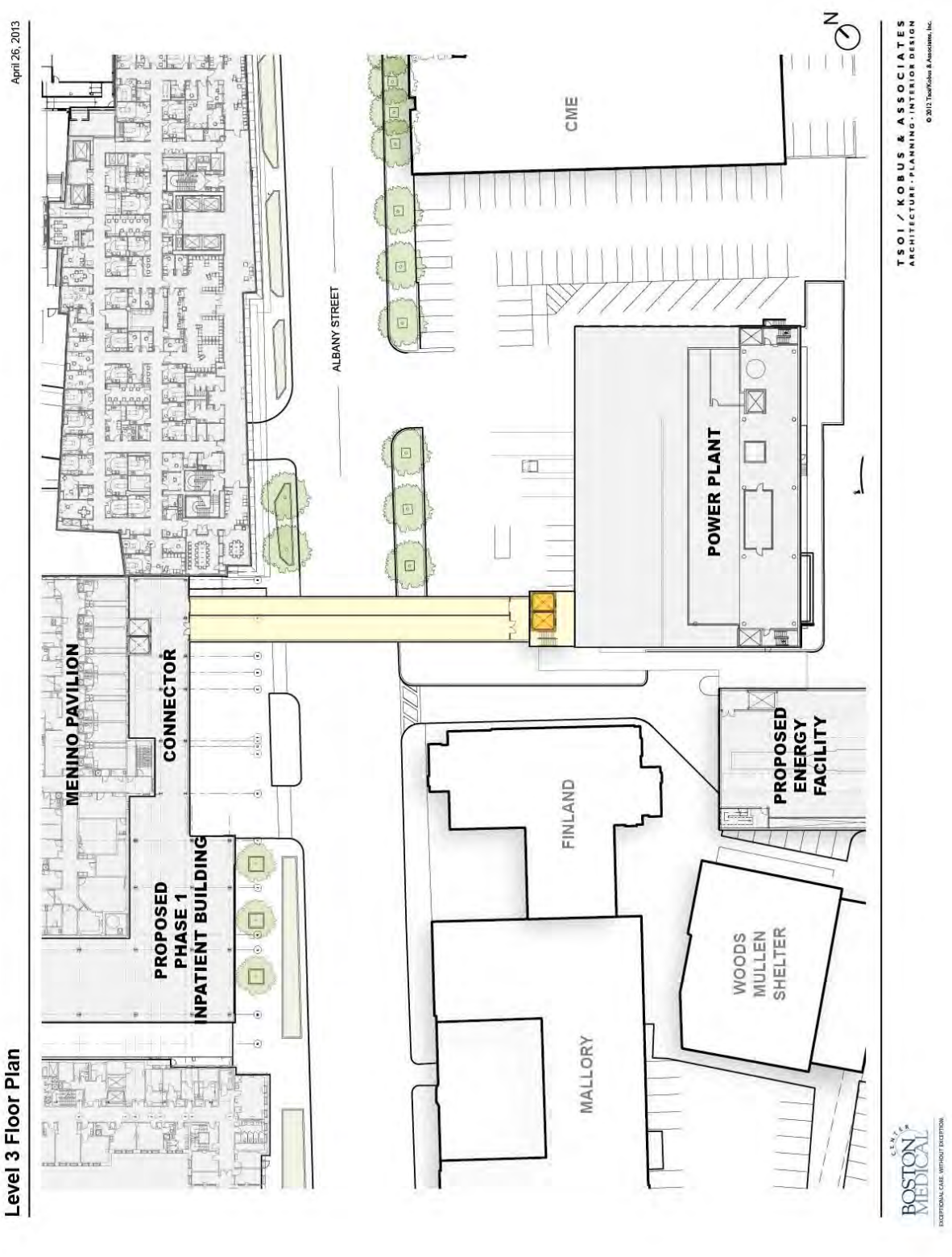


Figure 2-40 New Patient Transport Bridge Section Looking North

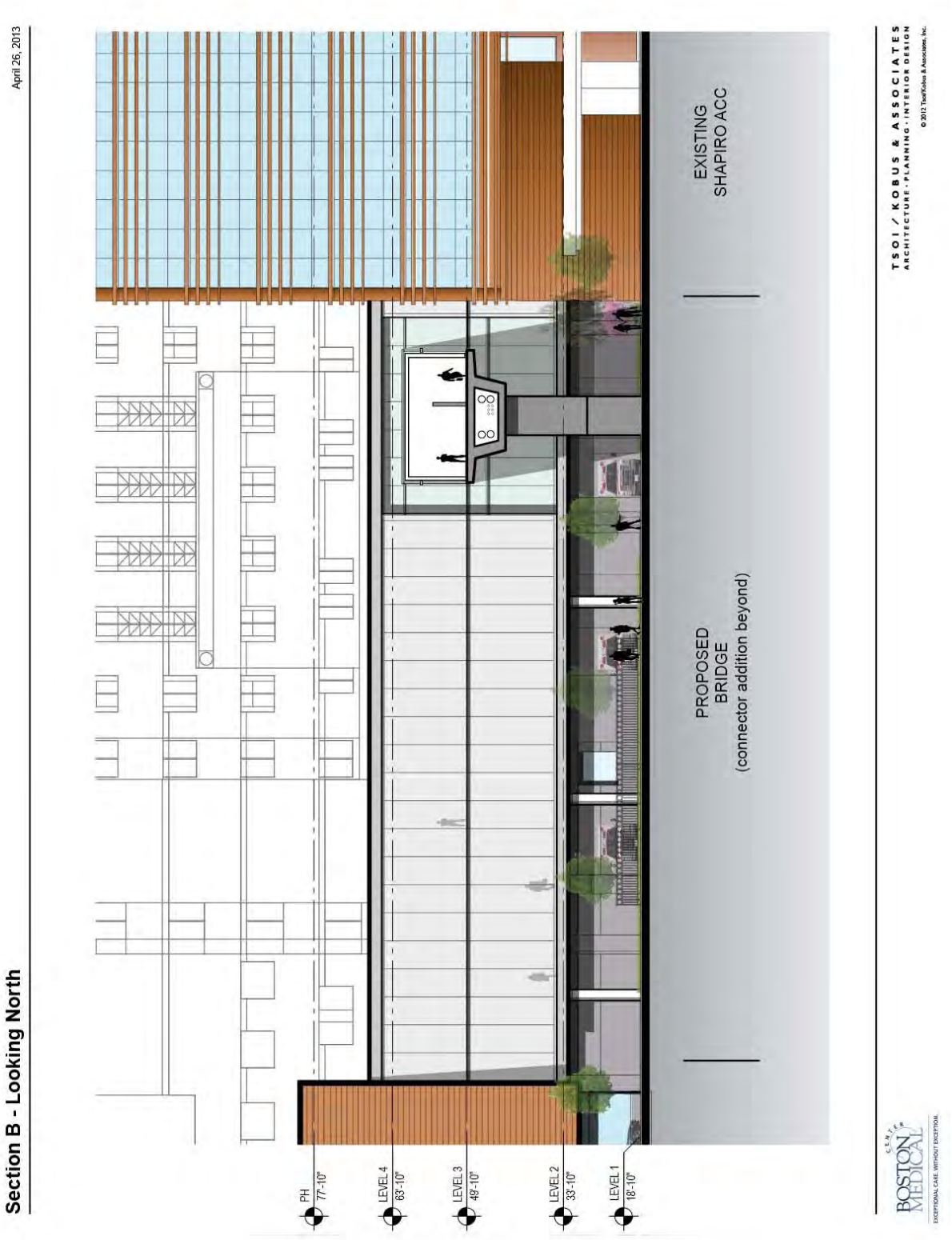


Figure 2-41 New Patient Transport Bridge Section Looking East

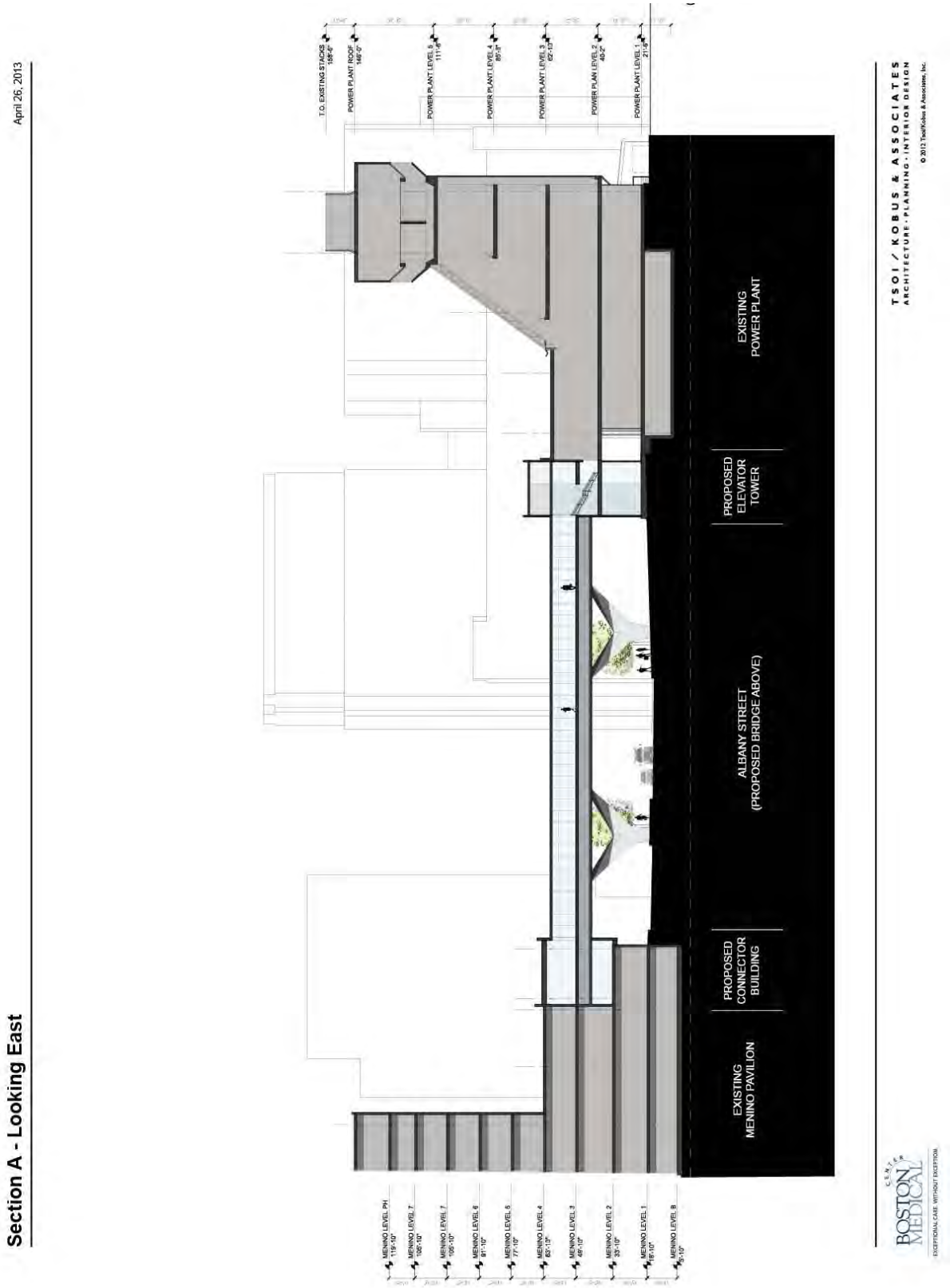


Figure 2-42 New Patient Transport Bridge East Elevation

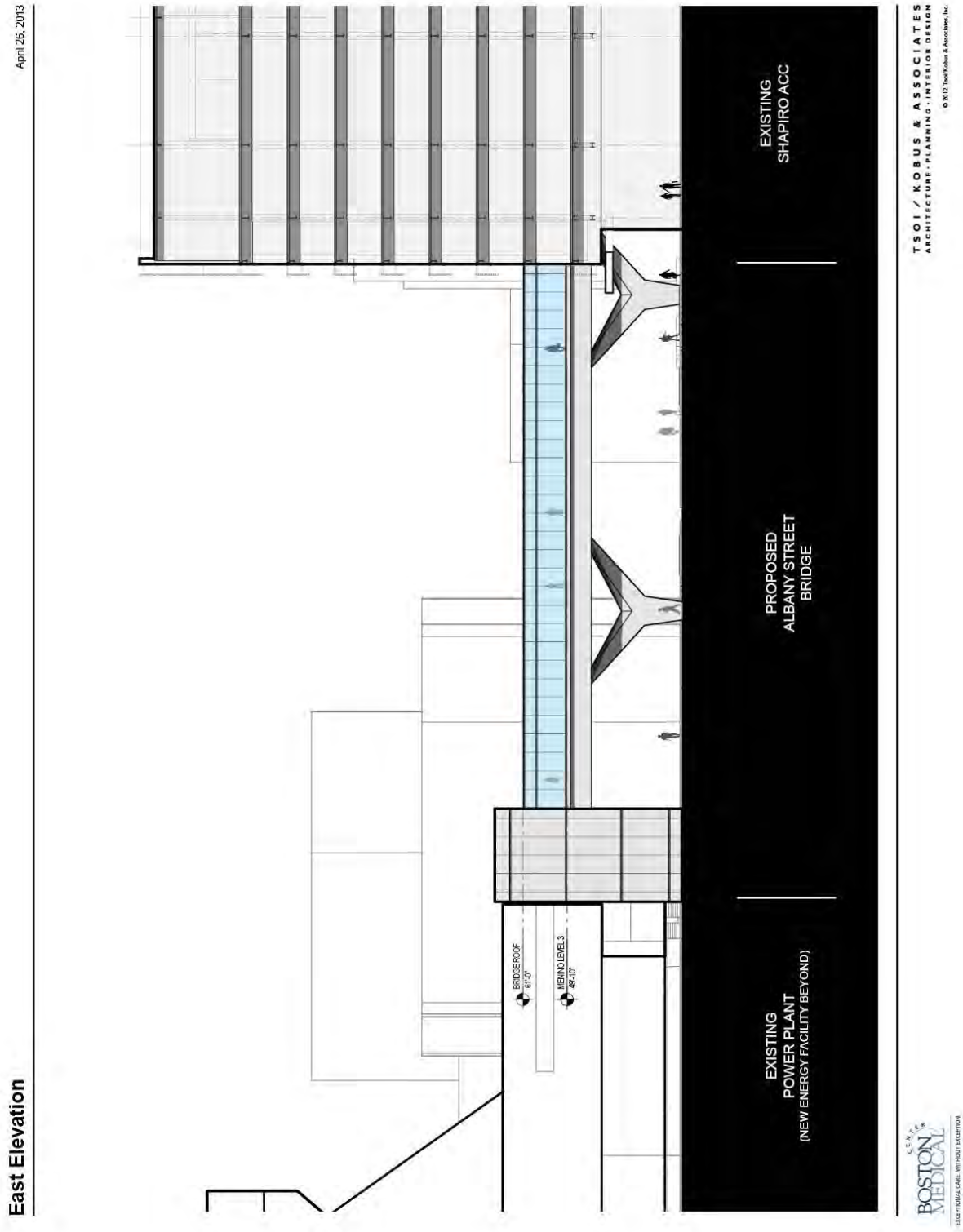
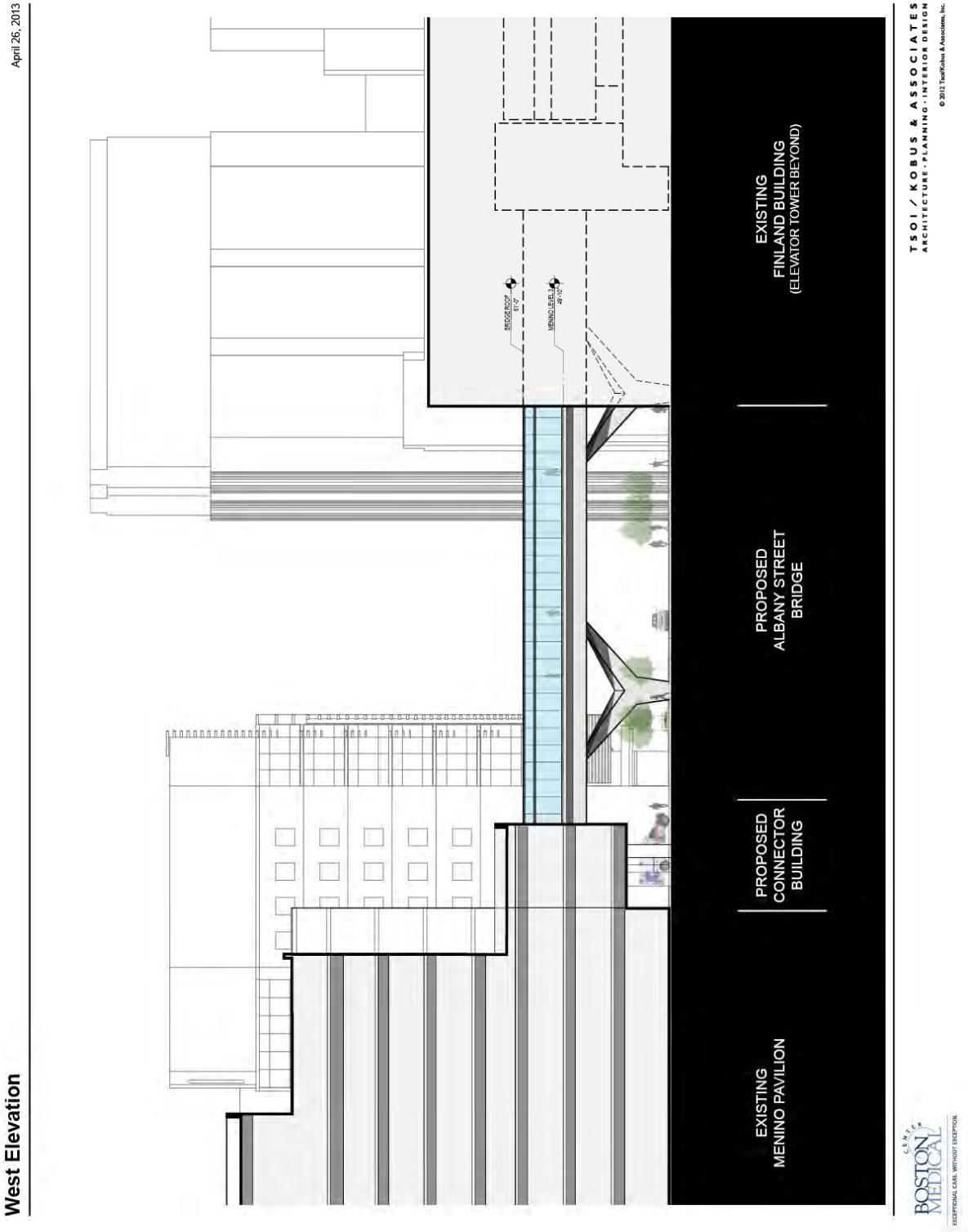


Figure 2-43 New Patient Transport Bridge West Elevation



2.1.5 Campus Reconfiguration and Relocation Projects

Boston Medical Center will be undertaking departmental reconfigurations as part of the campus realignment and consolidation to provide better departmental adjacencies and patient flow, operational efficiencies and an improved patient experience. Improvements include reconfiguration of the existing Emergency Department and Radiology Department including a new walk-in patient entrance and expanded drop-off area, renovation of existing inpatient surgery, relocation of existing cafeteria, and relocation of the Maternity Department as well as other enabling projects.

See Figures 2-44 through 2-50 for Reconfiguration and Relocation Projects.

2.1.6 Campus and Building Maintenance Projects

Boston University Medical Center will continue to pursue various campus and building maintenance activities throughout the term of the IMP. These include: replacing aging infrastructure throughout the campus; upgrading and replacing finishes in all facilities; ongoing general operational improvements; maintaining plant materials in the constructed planters in the median strips on Massachusetts Avenue completed as part of the Massachusetts Avenue Reconstruction Project; and improvements to the Albany Street sidewalk to enhance the pedestrian experience along the street and to assist patients and visitors in wayfinding.

During the term of the IMP, Boston University Medical Center will also continue to maintain the various open spaces that are located throughout the campus, including the new 12,000 square foot park constructed in conjunction with the Albany Fellows Graduate Student Residence located at 815 Albany Street.

Figure 2-44 Reconfiguration and Relocation Projects Basement Level Floorplan

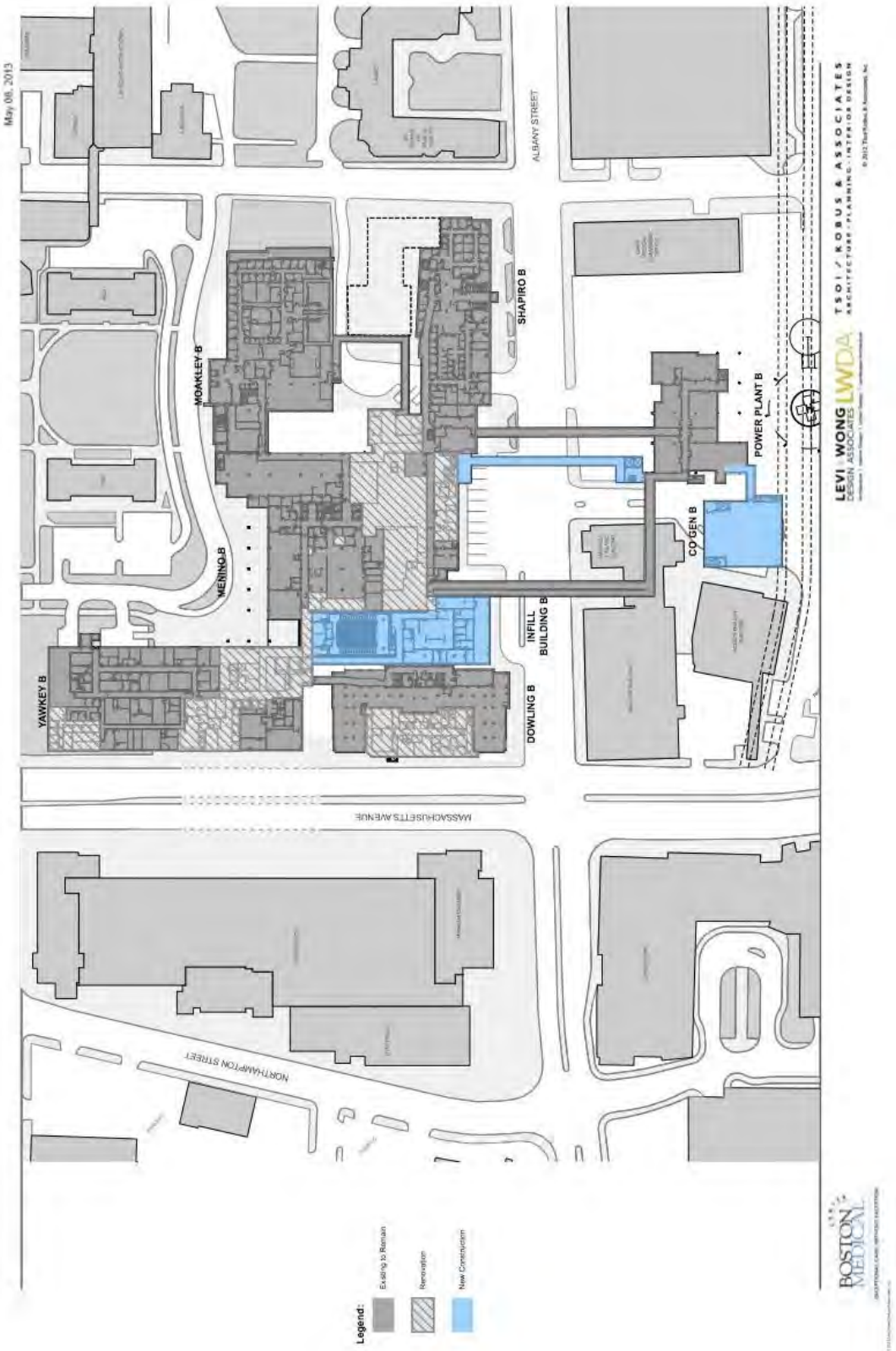


Figure 2-45 Reconfiguration and Relocation Projects First Level Floorplan

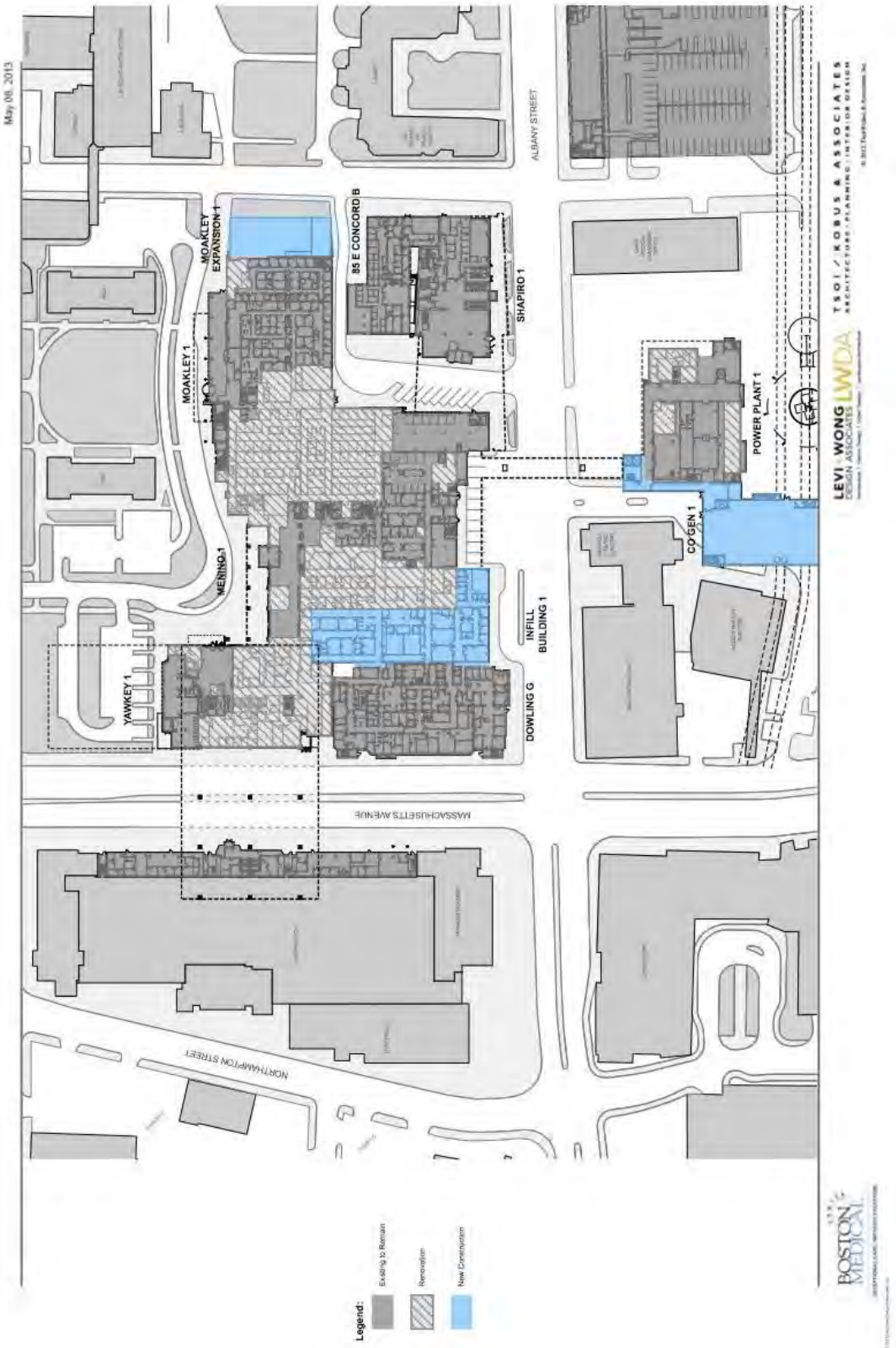


Figure 2-46 Reconfiguration and Relocation Projects Second Level Floorplan

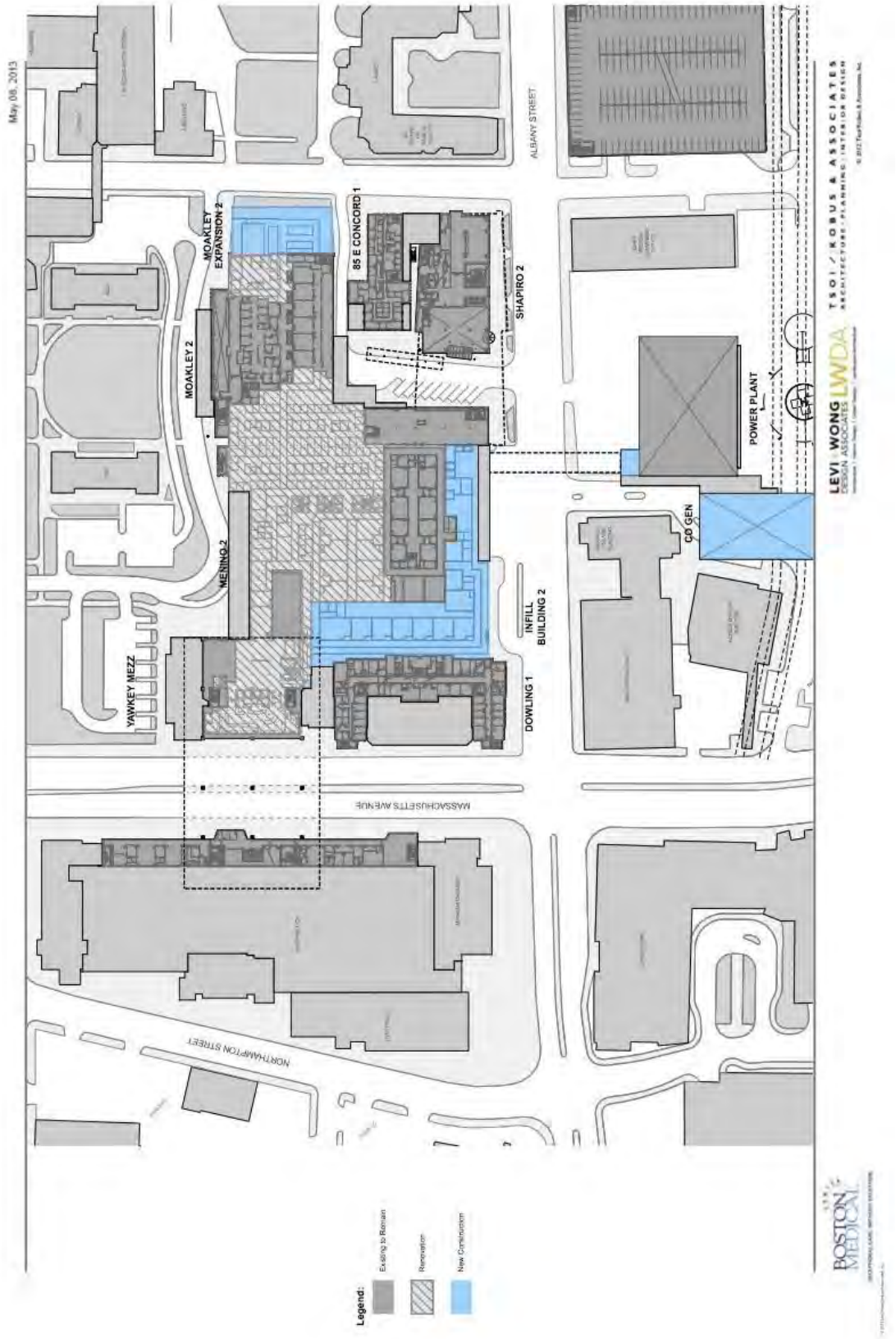


Figure 2-47 Reconfiguration and Relocation Projects Third Level Floorplan

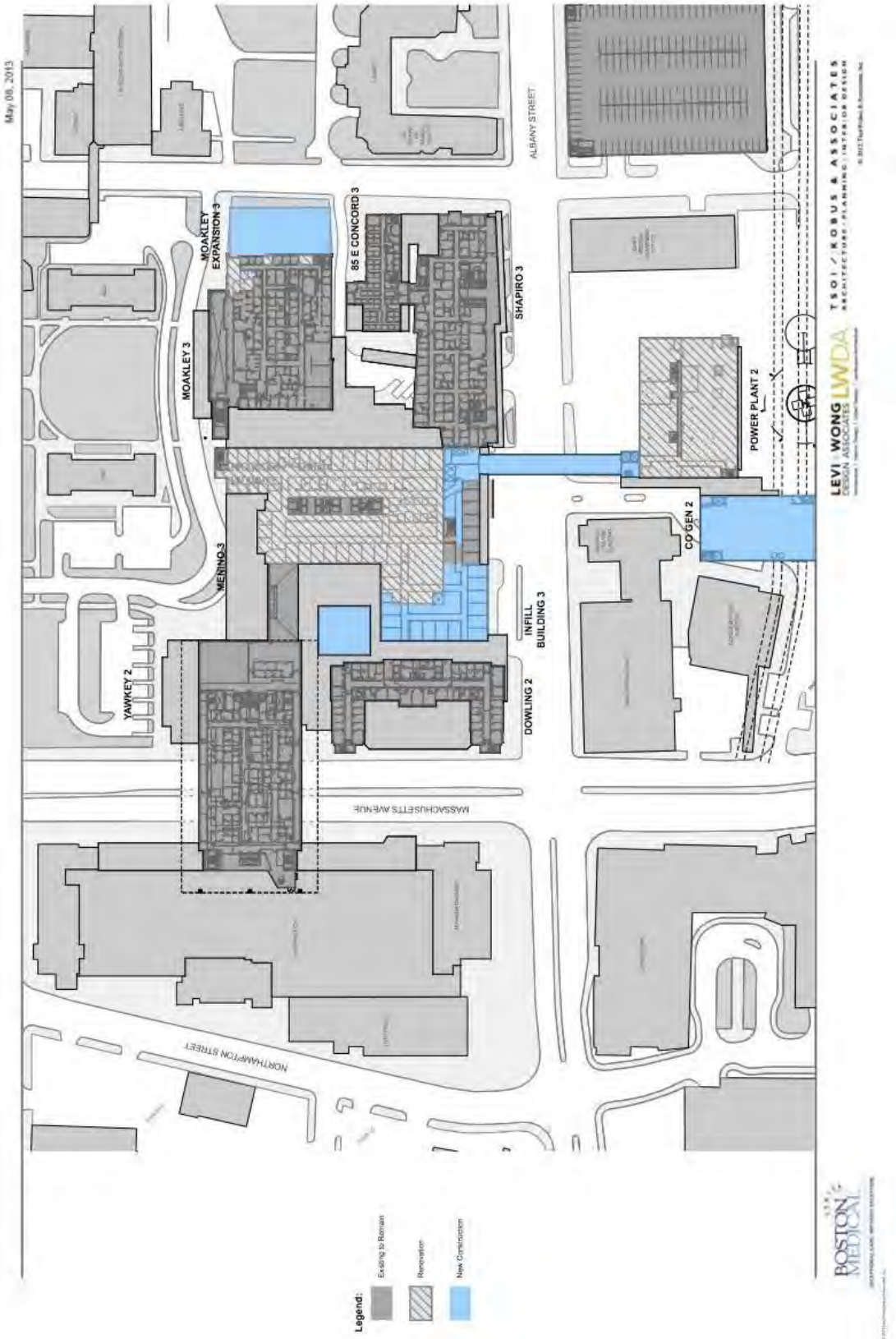


Figure 2-48 Reconfiguration and Relocation Projects Fourth Level Floorplan

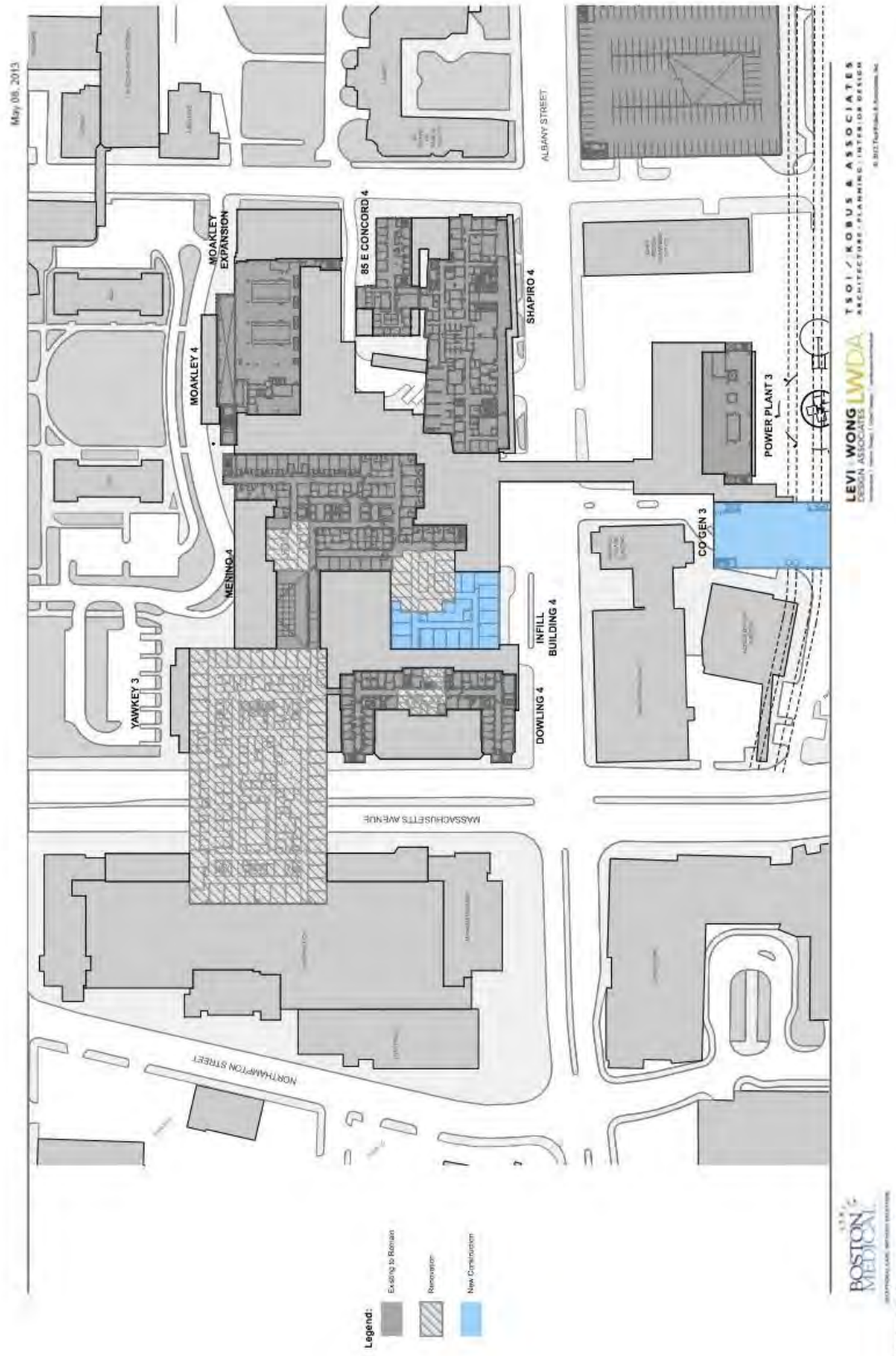


Figure 2-49 Reconfiguration and Relocation Projects Fifth Level Floorplan

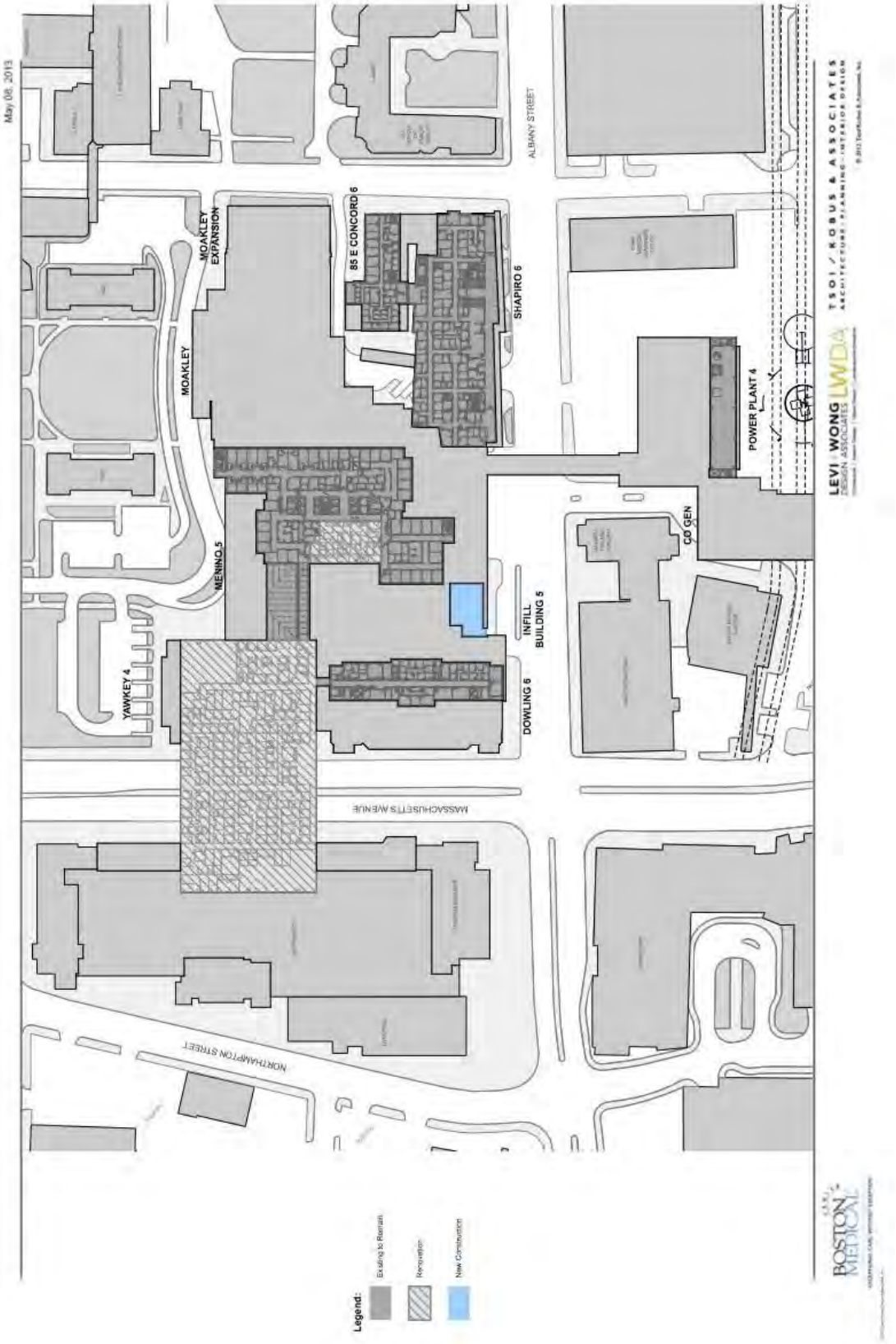
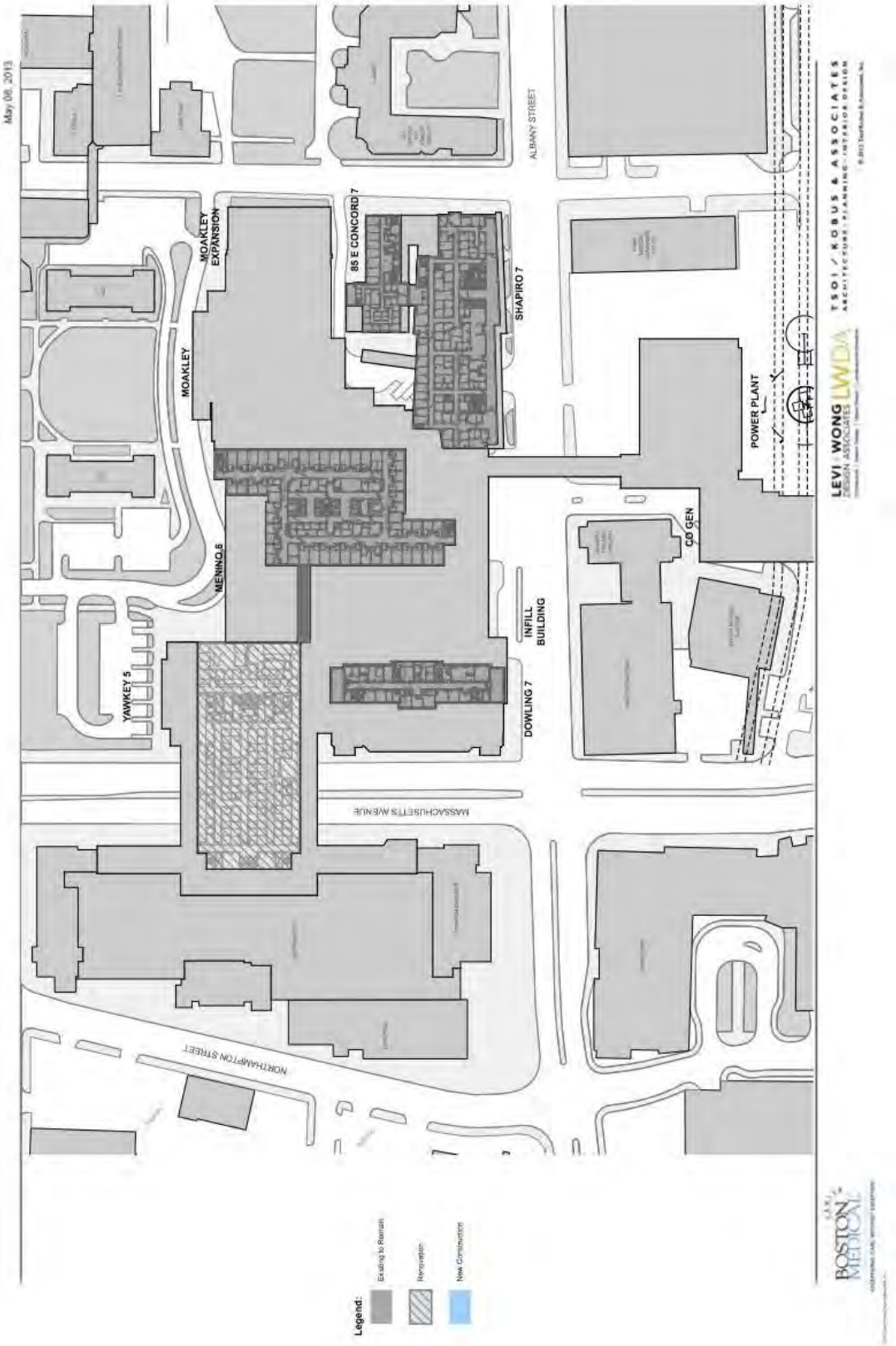


Figure 2-50 Reconfiguration and Relocation Projects Sixth Level Floorplan



2.1.7 Support Operations and Infrastructure

The existing loading dock at the Menino Pavilion is undersized for the current and future needs of the Boston University Medical Center's West Campus. The current loading dock location creates a problematic situation forcing trucks to back up off Albany Street and overhang the pedestrian sidewalk while parked.

In the first five years of the IMP, an interim loading dock and materials handling area will be created to alleviate conflicting vehicular and pedestrian circulation caused by the current configuration. The interim loading dock will be located on the north face of the existing Power Plant on Albany Street, utilizing the existing dock and contiguous storage spaces. The current curb cut along Albany Street will be slightly modified to allow trucks to maneuver on site and access the interim docks at the north face of the existing Power Plant. This relocation will immediately alleviate the current truck access condition by transferring all movement from Albany Street to the parking lot in front of the existing Power Plant.

Materials will be processed within the existing Power Plant with space created to manage clean and soiled materials. Clean materials will be transported to the Central Processing Department in the basement of the Menino Pavilion using the new elevator tower and through the new Bridge. Due to the relocation of the loading dock, a new below grade tunnel is proposed beneath Albany Street to transport soiled materials from the Menino Pavilion to the Power Plant. This new tunnel will replace the current function provided at the existing loading dock that will be relocated to the interim location at the existing Power Plant. The new tunnel will be used for transporting soiled materials, including medical waste and trash, while clean materials will be transported through the new Bridge providing for improved safety in material handling operations.

The interim relocation of the loading dock and materials handling provides a solution that is consistent with Boston University Medical Center's broader urban design goal for continued transformation of the Albany Street image. This action promotes the separation of service vehicles and pedestrians by removing truck circulation from the north side of Albany Street. This solution provides for the consolidation and elimination of three existing curb cuts along the north side of Albany Street. On the south side of Albany Street, the existing curb cut located between the existing Power Plant and Finland Building will be reduced to one lane. The existing curb cut in front of the Power Plant for truck access will be relocated to better align with existing loading docks.

The curb cut consolidation in conjunction with proposed sidewalk improvements similar to those associated with the Shapiro Ambulatory Care Center will foster a more unified, continuous, and pedestrian friendly streetscape.

2.2 Project Site

The proposed projects will be located within the West Campus. See Figure 2-51 Project Sites Locus Plan below. (See also Figure 1-6 Campus Adjacencies Plan and Figure 2-1 IMP Projects Under Large Project Review for additional reference.)

2.2.1 Moakley Cancer Center Addition

The Proposed Moakley Cancer Center Addition will be located directly east of the existing Moakley Cancer Center and has frontage along East Concord Street. The north face is located along the Moakley and Menino drop-off drive and is aligned with the northern edge of the existing Moakley Cancer Center building. The south face is also aligned with the existing building and has frontage along Shapiro Drive. The east face abuts East Concord Street further defining the existing pedestrian travel path while creating a distinct bookend to the green behind the Talbot building.

2.2.2 New Inpatient Building Phase 1

The New Inpatient Building Phase 1 is located on the north side of Albany Street and is proposed to replace the 3-story section of the existing Dowling Building and the current Emergency Department drop-off adjacent to the Menino Pavilion. The first phase of the New Inpatient Building is an infill project bordered directly on the north, east, and west sides by the Yawkey Ambulatory Care Center, Menino Pavilion, and the Dowling Tower, the remaining portion of the Dowling building, respectfully. The connector wing will span above the existing ambulance bays to the south of the Menino Pavilion. The first level will align with the existing Menino Pavilion Level 2 while the second level will align with Menino Pavilion Level 3 and Shapiro Ambulatory Care Center Level 3. The south edge of the project site engages the pedestrian streetscape along Albany Street.

2.2.3 BMC Energy Facility

The proposed Energy Facility site is located adjacent to the existing Power Plant at 750 Albany Street on the BUMC Campus and north of the Massachusetts Avenue Connector. The other immediately abutting properties include the Finland Building located just to the north which accommodates offices of the Boston Public Health Commission, and the Woods-Mullen Shelter to the west which is a homeless shelter.

The site is currently occupied by BMC's oxygen farm and is also used as an access way to a paved parking area at the corner of Massachusetts Avenue and the Massachusetts Avenue Connector. A portion of the project may be located on land currently owned by University Associates Limited Partnership. The Energy Facility will require the existing Med Flight helipad to be shifted to the east. The site also extends to the south toward the Massachusetts Avenue Connector and spans the Roxbury Canal. The general area is urban in nature.

2.2.4 New Patient Transport Bridge

The new Bridge will be located within the Boston University Medical Center West Campus. The project site is located both on the north and south sides of Albany Street with the Bridge proposed to cross south to north over Albany Street in the approximate location of the existing yellow utility tube.

Figure 2-51 IMP Project Sites Locus Plan

Boston University Medical Campus (BUMC) Boston, MA

Epsilon

Figure 1
Project Sites

2.3 Building Program and Approximate Project Dimensions

2.3.1 Moakley Cancer Center Addition

The proposed Moakley Cancer Center Addition is comprised of departments displaced by the proposed expansion of the Emergency Department and the Trauma Center as well as the Centralized Surgical Department. The addition will house the displaced departments including Endoscopy and Digestive Disorders. It will also provide for increased volume in outpatient services. Minor renovations will be made to the existing Moakley Cancer Center to allow circulation within the building. The Moakley Cancer Center Addition will be approximately 27,800 square feet and approximately 66 feet in height from grade to the top of the roof screen.

2.3.2 New Inpatient Building Phase 1

The proposed first phase of the New Inpatient Building will provide expanded space for the Emergency Department, Trauma Center, Centralized Radiology Department, Surgical Department and Inpatient beds. The project along with renovations within the existing Menino Pavilion will allow for the consolidation of clinical functions to the West Campus. The connector wing will also provide increased support and circulation space and vital connections to adjacent campus buildings aligning with the existing Menino Pavilion Level 2, Menino Pavilion Level 3 and Shapiro Ambulatory Care Center Level 3.

The New Impatient Building Phase 1 will be approximately 78,800 square feet and approximately 74 feet in height from grade to the top of the roof screen.

2.3.3 BMC Energy Facility

The proposed Energy Facility is comprised of spaces designated for primary mechanical equipment which includes three (3) dual fuel steam boilers, a combustion turbine generator (CTG) with a matched heat recovery steam generator (HRSG). The CTG will have a heat recovery steam generator to comprise one complete power island. The power island will be provided with auxiliary systems and ancillary equipment necessary for production of steam and electricity through cogeneration.

The Energy Facility will also include associated electrical switchgear and a transformer vault, emergency electrical rooms as well as auxiliary equipment/systems and associated distribution infrastructure. Auxiliary equipment/systems include natural gas compressors, life safety/emergency generators, cooling towers, air handling units, condensate and feed water tanks/pumps, treated water system, control system, natural gas, chemical treatment, ammonia, fuel equipment/piping, and plant air systems. Other programmed spaces include a Control Operator room.

A utility farm will be required for additional equipment including a generator, gas compressor for turbine and control isolation transformer. This farm will be located to the south of the Energy Facility along the Massachusetts Avenue Connector and will be screened by a low, concrete wall. Landscaping will be provided to screen it further from the Massachusetts Avenue Connector vehicular approach.

The Energy Facility will be approximately 38,500 square feet and approximately 100 feet in height from grade to the top of the roof screen. Emissions stacks will be approximately 160 feet in height from grade.

2.3.4 New Patient Transport Bridge

The new Bridge will be comprised of spaces for patient transport, clean material handling, and utility connections. The new Bridge will also consist of 1-story corridor located at grade adjacent to the existing Power Plant to provide access for the Med Flight patients from the helipad connecting to a new elevator and stair tower in the Bridge. The new Bridge will be approximately 7,100 s.f. and approximately 43 feet in height from grade. The elevator overrun will be approximately 50 feet in height from grade. (The Bridge mass begins 27 feet from grade and will be 16 feet in height.) The 1 story corridor will be approximately 16 feet in height from grade.

Table 2-1 below provides a detailed list of program components for each project.

Table 2-1 Proposed Project Square Footage Table

MOAKLEY CANCER CENTER ADDITION	Square Feet	Program and Comments
Level 0 (basement)	6,600	Add Alternate - Shell Space
Level 1	6,600	Otolaryngology, ENT Expansion
Level 2	7,300	Endoscopy
Level 3	7,300	Digestive Disorders
Total Moakley Cancer Center Addition	**27,800**	
NEW INPATIENT PHASE 1	**Square Feet**	**Program and Comments**
New Inpatient Building Phase 1		
Level 0 (basement)	13,700	250 seat Amphitheater
Level 1	16,700	Radiology, Emergency Department
Level 2	23,500	Surgical Support, Circulation, Connector
Level 3	13,400	Inpatient beds, Connector
Level 4	9,400	Inpatient beds
Level 5	2,100	Mechanical
	78,800	

Table 2-1 Proposed Project Square Footage Table (continued)

BMC ENERGY FACILITY	Square Feet	Program and Comments
Level 0 (basement)	8,250	Fire Protection Equipment, Entering/Incoming Utility Services
Level 1	10,750	Three Boilers, Water Treatment and Chemical Treatment Equipment, Fuel Oil Equipment, Condensate Surge Tanks, Blowdown Heat Recovery
Level 2	9,750	One Combustion Turbine Generator and Heat Recovery System Generator, Turbine/HRSG Auxiliary Equipment, Control Room, Plant Air Compressors
Level 3	9,750	Electrical Switch Gear, Transformer Vault, Emergency Power Room
Roof	0	Air Handling Equipment, Three Gas Compressors, Cooling Tower, Boiler Stack, HRSG Stack
Total BMC Energy Facility	**38,500**	
NEW PATIENT TRANSPORT BRIDGE	**Square Feet**	**Program and Comments**
Level 1 (at grade)	2,100	Med Flight Corridor
Level 3	5,000	Patient and Material Transport
Total New Patient Transport Bridge	**7,100**	

2.4 Anticipated Permits, Reviews, and Approvals

Table 2-2 on the following page catalogs the permits, reviews, and approvals anticipated throughout the process for the proposed IMP Projects. Those specifically related to the Energy Facility include Department of Environmental Protection, Division of Air Quality Control, Environmental Results Program, and the Department of Public Safety, Storage Tank Permit.

Table 2-2 Anticipated Permits, Reviews and Approvals

Agency Name	Permit / Review / Approval
Federal	
Federal Aviation Authority	Construction Permit for Temporary Airspace Obstruction
State	
Executive Office of Environmental Affairs, Massachusetts Environmental Policy Act	Secretary's Certificate
Department of Public Health	Determination of Need Plan Review Approval
Massachusetts Historical Commission	State Register Review
Department of Environmental Protection, Division of Air Quality Control	Non-Major Comprehensive Air Plan Approval Environmental Results Program Certification
Department of Environmental Protection, Division of Water Pollution Control	Groundwater Discharge Permit Clean Water Act - Pre-treatment Standards Sewer Extension/Connection Compliance Certification
Massachusetts Water Resources Authority	Sewer Use Discharge Permit Individual Discharge/Sewer Permit
Department of Public Safety	Storage Tank Permit
State Fire Marshall	Flammable Storage License
Massachusetts Health and Educational Facilities Authority	Project Financing, if required
Local	
Boston Redevelopment Authority	Article 80 Large Project Review
Boston Landmarks/South End Landmark District Commission	Application for Certificate of Appropriateness Article 85 Demolition Delay, if required
Boston Civic Design Commission	Design Review
Boston Groundwater Trust	Groundwater Trust Certification
Boston Transportation Department	Construction Management Plan
Boston Air Pollution Control Commission	Air Quality Control Permit
Boston Water and Sewer Commission	Construction Dewatering Permit Sewer Use Discharge Permit Stormwater Management Plan Groundwater Trust Certification Site Plan Approval
Boston Inspectional Services Department	Building and Occupancy Permits
Boston Public Improvement Department	Street and Sidewalk Occupancy Permits Specific Repair Plan / Discontinuance
Boston Public Works Department	Street Opening Permit Curb Cut Permit
Boston Fire Department	Plan Review
Joint Committee on Licenses	Flammable Storage License

2.5 Zoning

The proposed Project is located within the Boston University Medical Center Institutional Master Plan area and shown on Map 1p of the south End Neighborhood District which was adopted by MAP Amendment No. 273 by the Boston Zoning Commission on June 28, 2000, subsequent to the approval by the BRA on May 18, 2000 of the BUMC IMP. In accordance with the provisions of the Boston Zoning Code and Article 64, the South End Neighborhood District Zoning, projects within the district are subject to the provisions of the approved Institutional Master Plan. The Boston University Medical Center IMP was approved by the BRA on May 18, 2000 and the Zoning Commission on June 28, 2000 and approved by the Mayor on July 13, 2000. In accordance with provisions of Section 80D-8, Renewal of Institutional Master Plan, The Boston University Medical Center IMP Renewal was approved by the BRA on June 22, 2010 and Zoning Commission on August 4, 2010 and approved by the Mayor on August 5, 2010. In accordance with provisions in Section 80D-2, institutional projects are required to be consistent with the approved Institutional Master Plan. Upon the approval of this proposed 2013 IMP Amendment by the BRA and the Zoning Commission, the projects named herein will be deemed to be consistent with the provisions of the Boston Zoning Code.

2.6 Public Review Process

The Boston Redevelopment Authority (BRA) has established a Task Force representing the area community to participate in the public review of the Project as part of the Boston University Medical Campus IMP. By filing this IMPNF/PNF, BMC formally initiates the IMP Amendment review process under Article 80D and Large Project Review Process under Article 80B with the Boston Redevelopment Authority.

The Proponent has engaged in meetings with the BRA, the Worcester Square Neighborhood Association and the South End Landmarks District Commission staff. The Proponent will also meet with the Task Force throughout the process and will continue an open and inclusive public process with all necessary public agencies and interested parties. Table 2-3 below provides a list of meetings that have been held to date.

Table 2-3 Community, Public, City Agency Meetings

Date	Group	Location
2/19/13	Boston Redevelopment Authority	City Hall, 9th Floor
3/18/13	Boston Redevelopment Authority	City Hall, 9th Floor
5/28/13	Worcester Square Neighborhood Association	Newton Pavilion
5/30/13	Boston Redevelopment Authority	City Hall, 9th Floor
6/6/13	South End Landmarks District Commission Staff	City Hall, 8th Floor

Section 3

3.0 ASSESSMENT OF DEVELOPMENT REVIEW COMPONENTS

3.1 Urban Design

3.1.1 Introduction and Urban Design Principles

The primary urban design objective of Boston University Medical Center 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, sensitive design, careful open space planning, and conscientious site and streetscape enhancements along the campus periphery have supported this objective. Various improvement projects, implemented under the previous master plan, refined the presence and aesthetic of the BUMC Campus, specifically along Harrison Avenue.

The Proposed Projects are designed within the context of important urban planning principles. These principals include:

- Transform the Albany Street campus image;
- Complement the existing context massing, scale, and materials;
- Create a clear and welcoming sense of arrival;
- Enhance open spaces on the campus, both short and long-term;
- Develop pedestrian friendly street edges;
- Enable connectivity between parking and existing buildings;
- Integrate sustainable design principles and operations; and
- Plan proactively for future growth and transformation.

The master plan goals, combined with the previously applied design principles, will enrich the physical image of the BUMC Campus, improve the integration with the surrounding neighborhood, and elevate the perceptions of the Boston University Medical Center by its users, particularly on Albany Street.

3.1.2 Urban Design – Moakley Cancer Center Addition

Moakley Cancer Center Addition - Existing Context and Project Location

The Proposed Moakley Cancer Center Addition will be located on the West Campus along East Concord Street within the center of the BUMC Campus.

Currently East Concord Street plays an important role within the BUMC Campus by providing a link to the boundary residential neighborhoods located to the north, while fostering one of the campuses most important north/south pedestrian and vehicular connections. The Street is composed of academic buildings varying in scale and style, a large open green space along its east side, and the 710 Parking Garage located at the

corner of Albany Street. Additionally there is a MBTA bus stop located along East Concord Street adjacent to the project site.

The project site is located on the open space directly east of the existing Moakley Cancer Center and has frontage along East Concord Street. The north face is located along the Moakley and Menino Drop-off drive and is aligned with the northern edge of the existing Moakley Cancer Center building. The south face is also aligned with the existing building and has frontage along Shapiro Drive. The east face abuts East Concord Street further defining the existing pedestrian travel path while creating a distinct bookend to the green behind the Talbot building.

Moakley Cancer Center Addition - Massing and Height

The height and massing are dictated by both programmatic need and existing contextual cues. The project height and massing will be consistent with, and relate to, the existing Moakley Cancer Center building. The building will be 3-stories at approximately 50 feet above grade, aligning with the current height of the Moakley Cancer Center. There will be roof screen to define a sense of hierarchy consistent with the existing Moakley Cancer Center building. The overall height of building with the new roof screen will be approximately 66 feet in height from grade. This is approximately 15 feet lower than the adjacent existing penthouse. Contemporary design of hierarchy and planer expression will be extended from the existing Moakley Cancer Center building to further integrate the architecture with the surrounding context.

The north and south facades of the addition are aligned with the existing Moakley Cancer Center building, helping to strengthen the east-west pedestrian corridor connecting The Moakley Cancer Center with the Boston University Medical School Campus. The east face of the addition engages the sidewalk along East Concord Street further defining the pedestrian experience along the street edge. The building will also create shelter for the relocated MBTA bus stop and for traversing pedestrians along East Concord Street by providing an architecturally integrated canopy.

Moakley Cancer Center Addition - Material Image

Currently the existing Moakley Cancer Center successfully integrates itself within the neighboring historic context through the meaningful use of a simplified material palette. Brick, metal and glass curtain wall are applied in a way that resemble the typical architecture of the South End while simultaneously creating its own contemporary image. The new Moakley Cancer Center Addition will look to extend the currently successful approach of the existing building.

The exterior treatment will be predominantly comprised of red brick and glass curtain wall systems. Small scale punched openings are proposed along the east and south facades relating to the smaller scale and historic presence along East Concord Street. A large-scale vertical window opening along East Concord Street will provide a visual bookend to the horizontal expression created by the smaller punched windows. The north facade will be

composed of glass curtain wall relating to the existing Moakley Cancer Center north elevation.

Moakley Cancer Center Addition - Vehicle Access and Circulation

Patient and vehicular access for the Moakley Cancer Center Addition will be via the existing Moakley Cancer Center entrances located along the drop-off to the north of the building.

Construction of the Moakley Cancer Center Addition will necessitate a slight reconfiguration of the existing Shapiro Drive where it intersects with East Concord Street. The portion of Shapiro Drive located between the Moakley Cancer Center Addition and 85 East Concord will be relocated approximately 20 feet south of its existing location. This creates a more optimal intersection configuration and provides appropriate visual clarity for vehicular traffic turning right onto East Concord Street. Sidewalk and landscape improvements along this reconfigured portion of Shapiro Drive will be consistent with the existing conditions and materials.

Moakley Cancer Center Addition - Site Improvements

The existing MBTA bus stop along East Concord Street will be relocated from the street edge closer to the building footprint to provide users with added protection from the elements. Sidewalk and landscaping improvements will take place along the perimeter of the building defining the new MBTA bus stop location and enhancing the pedestrian experience.

Figure 3-1 Moakley Cancer Center Addition Aerial View Looking South

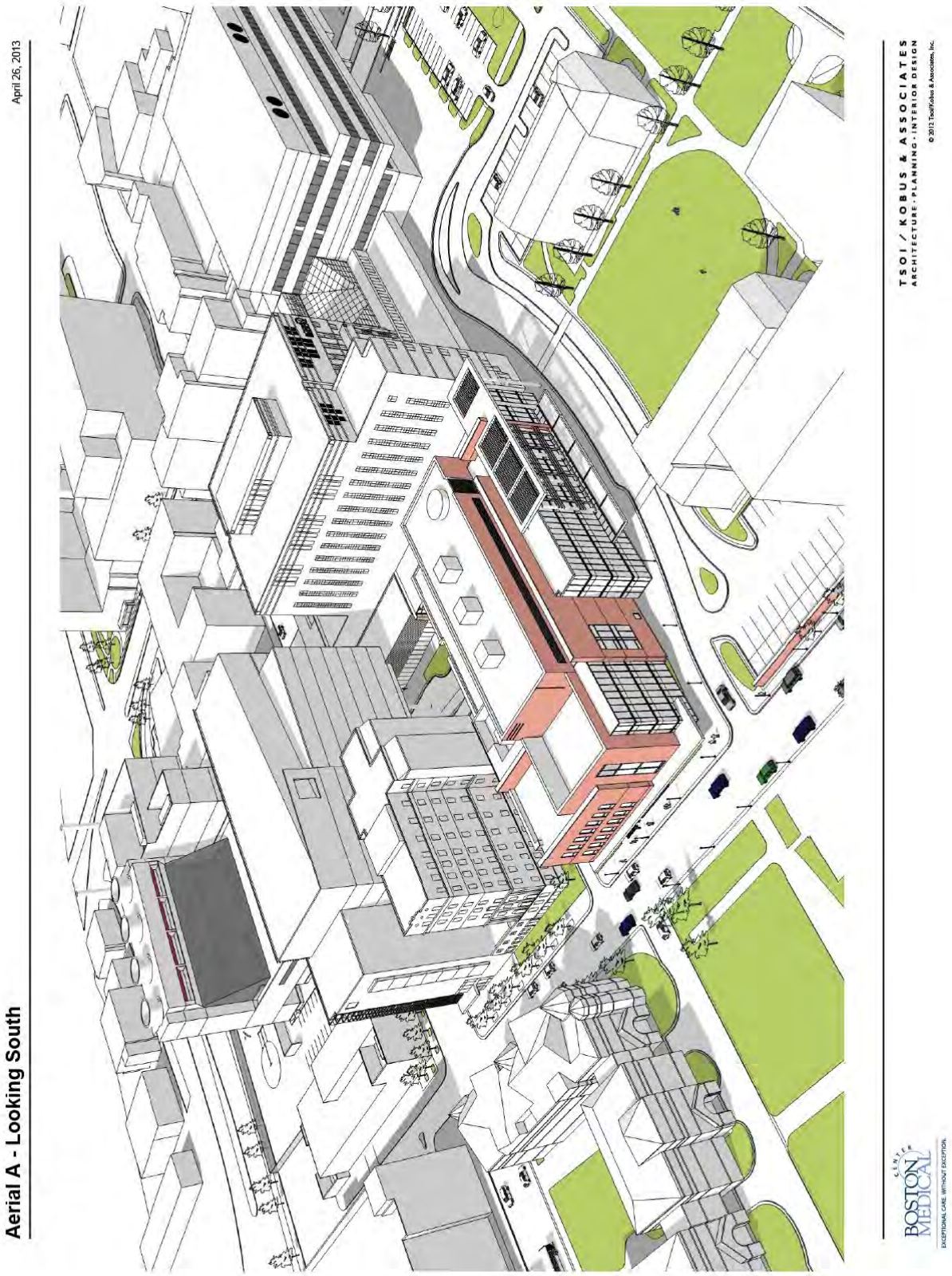


Figure 3-2 Moakley Cancer Center Addition Aerial View Looking West

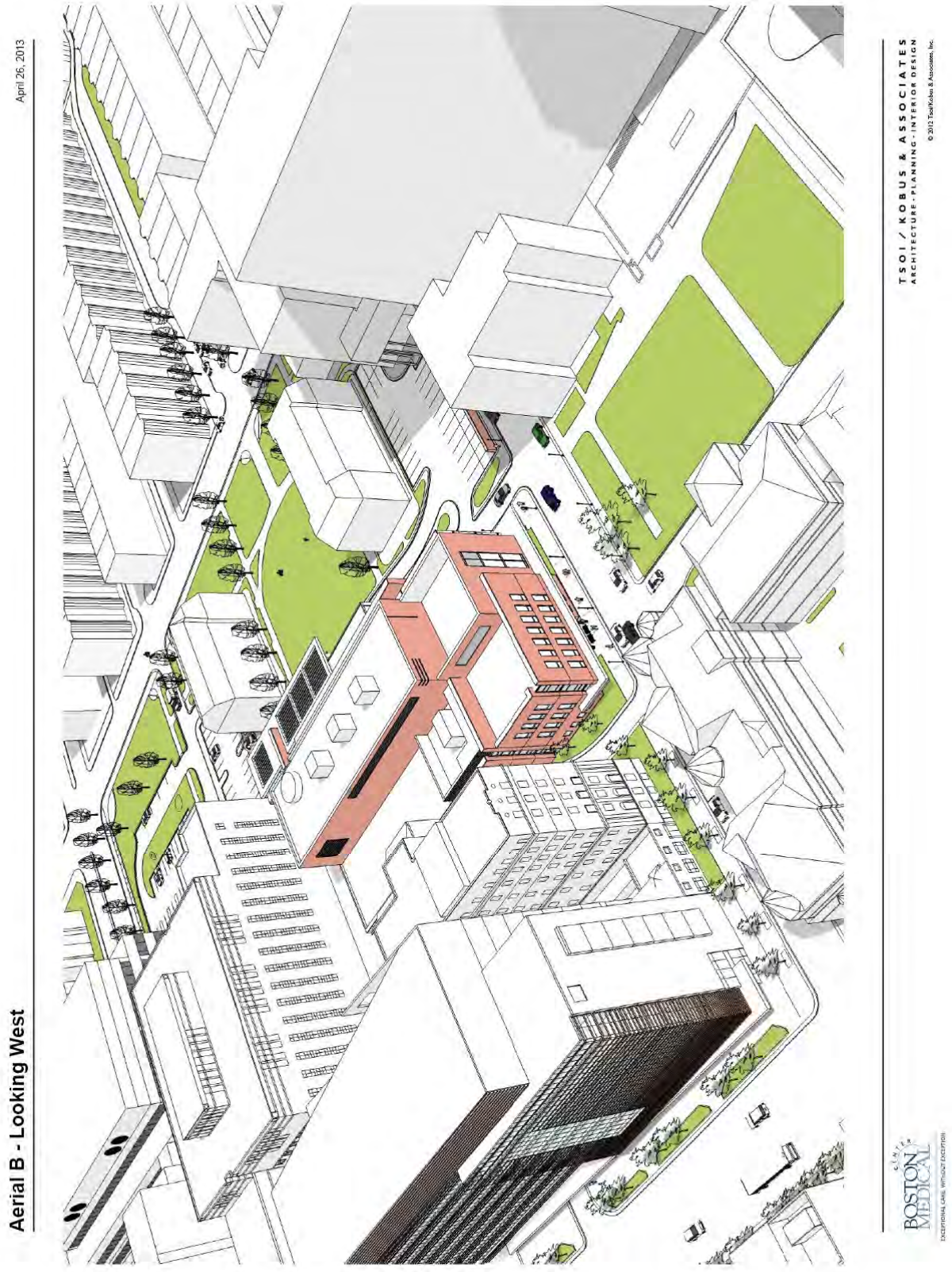


Figure 3-3 Moakley Cancer Center Addition Context Photos

Figure 3-4 Moakley Cancer Center Addition Context Photos (continued)

3.1.3 Urban Design – New Inpatient Building Phase 1

New Inpatient Building Phase 1 - Existing Context and Project Location

The proposed New Inpatient Building Phase 1 will be located on the West Campus along Albany Street..

The New Inpatient Building Phase 1 site is located on the north side of Albany Street and is proposed to replace the 3-story section of the existing Dowling Building and the current Emergency Department drop-off adjacent to the Menino Pavilion. Phase 1 of the New Inpatient Building is a 4-story infill project bordered directly on the north, east, and west sides by the Yawkey Ambulatory Care Center, Menino Pavilion, and remaining Dowling building respectfully. The 2-story connector wing will be located on the south edge of the Menino Pavilion over the existing Emergency Department entrance, ambulance parking, and loading area. The southern edge of the project site will engage the pedestrian streetscape and better define the building edge.

The current Albany Street edge is composed of varying building setbacks, scales and styles. As a major arrival point on the BUMC Campus the streetscape lacks a vital sense of clarity and organization. The New Inpatient Building Phase 1 project will begin to better define the north edge of Albany Street and align with Boston University Medical Center's strategic urban design goals stated previously to enhance the Albany Street image.

New Inpatient Building Phase 1 - Massing and Height

The project height and massing are primarily dictated by the available site area and necessary space requirements of the program and will have a simple rectilinear form. The New Inpatient Building Phase 1 will be approximately 74 feet in height from grade including the small penthouse and will align with the Level 4 roof of the Menino Pavilion. The small penthouse will be located to the south in order to minimize visual obstruction of existing bedrooms within Menino. The connector wing will span over the existing ambulance parking area with physical links will to Menino Pavilion Levels 2 and 3. The mass of the connector wing will be a simple rectangular form along the southern face of the Menino Pavilion.

The north, east, and west facades of the New Inpatient Building Phase 1 will abut the existing Yawkey Ambulatory Care Center, Dowling Building, and Menino Pavilion. The project height and massing are consistent with the smaller scale context along Albany Street, such as the Finland and Mallory Buildings; and will provide a physical transition to the larger scale Phase 2 of the New Inpatient Building in the future.

New Inpatient Building Phase 1 - Material Image

The exterior design of the New Inpatient Building Phase 1 along with the new Bridge will reflect Boston University Medical Center's desire to transform the Albany Street Campus image by visually strengthening connections to existing campus context and providing continuity along the street edge. The exterior treatment of the New Inpatient Building Phase 1 will be predominantly composed of a glass curtain wall system and a proposed phenolic resin panel system conveying a contemporary aesthetic consistent with the modern design direction of the campus. The south façade along the street edge will sponsor a large "picture" window, providing needed light to functions within and visual connections back to the Albany streetscape. The connector wing will continue the curtainwall system with fritted glass intended to obscure the primarily utilitarian functions within.

New Inpatient Building Phase 1 - Vehicle Access and Circulation

Normal staff and non-emergency patient access for the New Inpatient Building Phase 1 will be via the existing Menino Pavilion entrances located along the drop-off to the north of the building. Service access will be provided thru the connector wing via the new Bridge.

Construction of the New Inpatient Building Phase 1 will necessitate the relocation of the Emergency Department entrance and drop-off to the rear of the Moakley Cancer Center, where emergency patient and vehicular access will be provided via Shapiro Drive. The current loading truck dock will be relocated to the south side of Albany Street along the north face of the existing Power Plant.

New Inpatient Building Phase 1 - Site Improvements

A considerable setback from Albany Street has been maintained to provide adequate space for continued urban landscaping and sidewalk improvements to enhance the pedestrian experience along the Albany Street Corridor. A simplified ambulance parking area will be created with reduction in existing curb cuts along the north side of Albany Street. Three existing curb cuts will be closed and removal of the existing curb between the existing loading dock and existing ambulance parking areas. Urban landscape improvements will include new planters, trees, and pavers, consistent with the recent enhancements as part of the Shapiro Ambulatory Care Center to further integrate and enhance the Albany Street experience.

Figure 3-5 New Inpatient Building Phase 1 Aerial View Looking Northwest

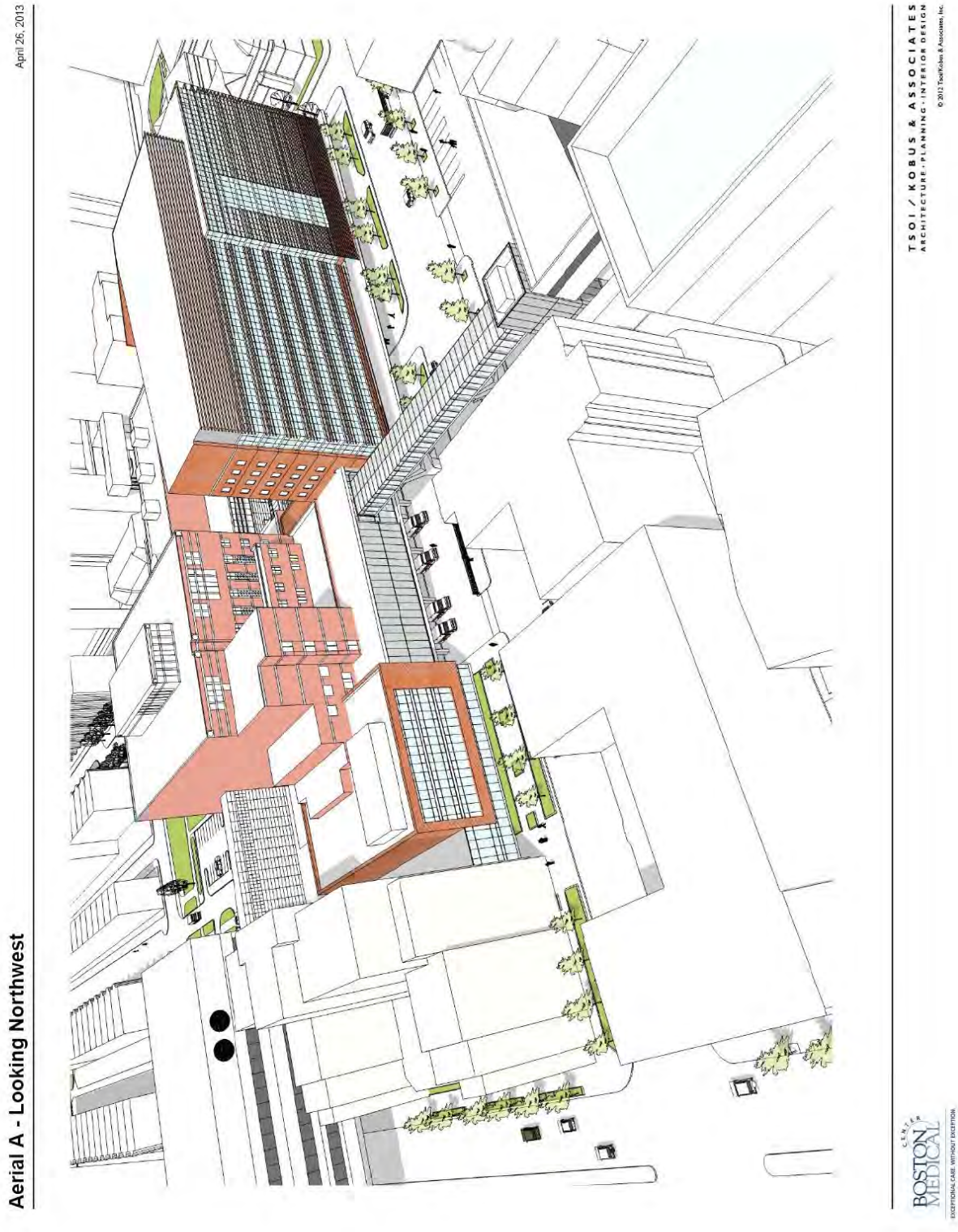


Figure 3-6 New Inpatient Building Phase 1 Aerial View Looking Southwest

Figure 3-7 New Inpatient Building Phase 1 Context Photos

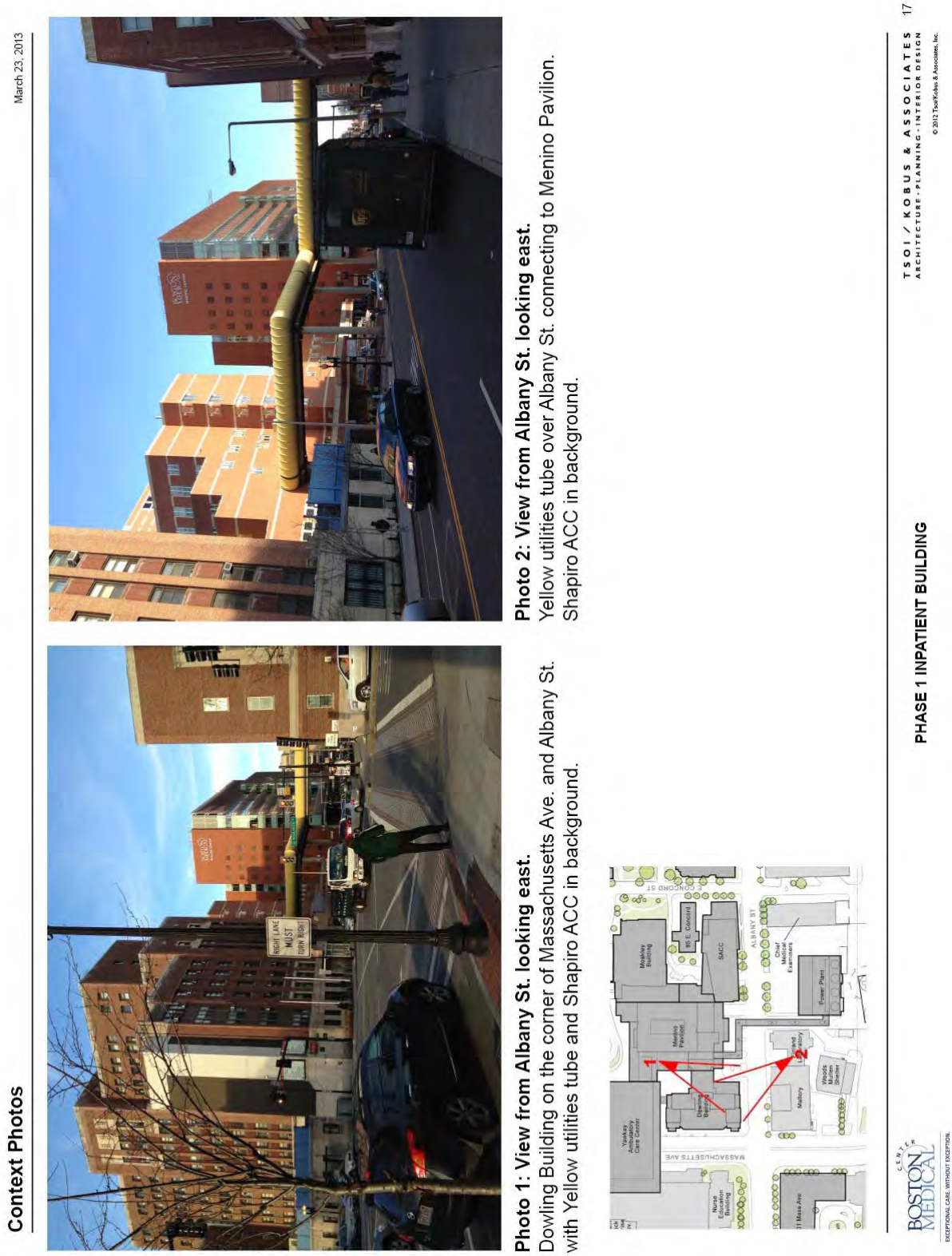


Figure 3-8 New Inpatient Building Phase 1 Context Photos (continued)

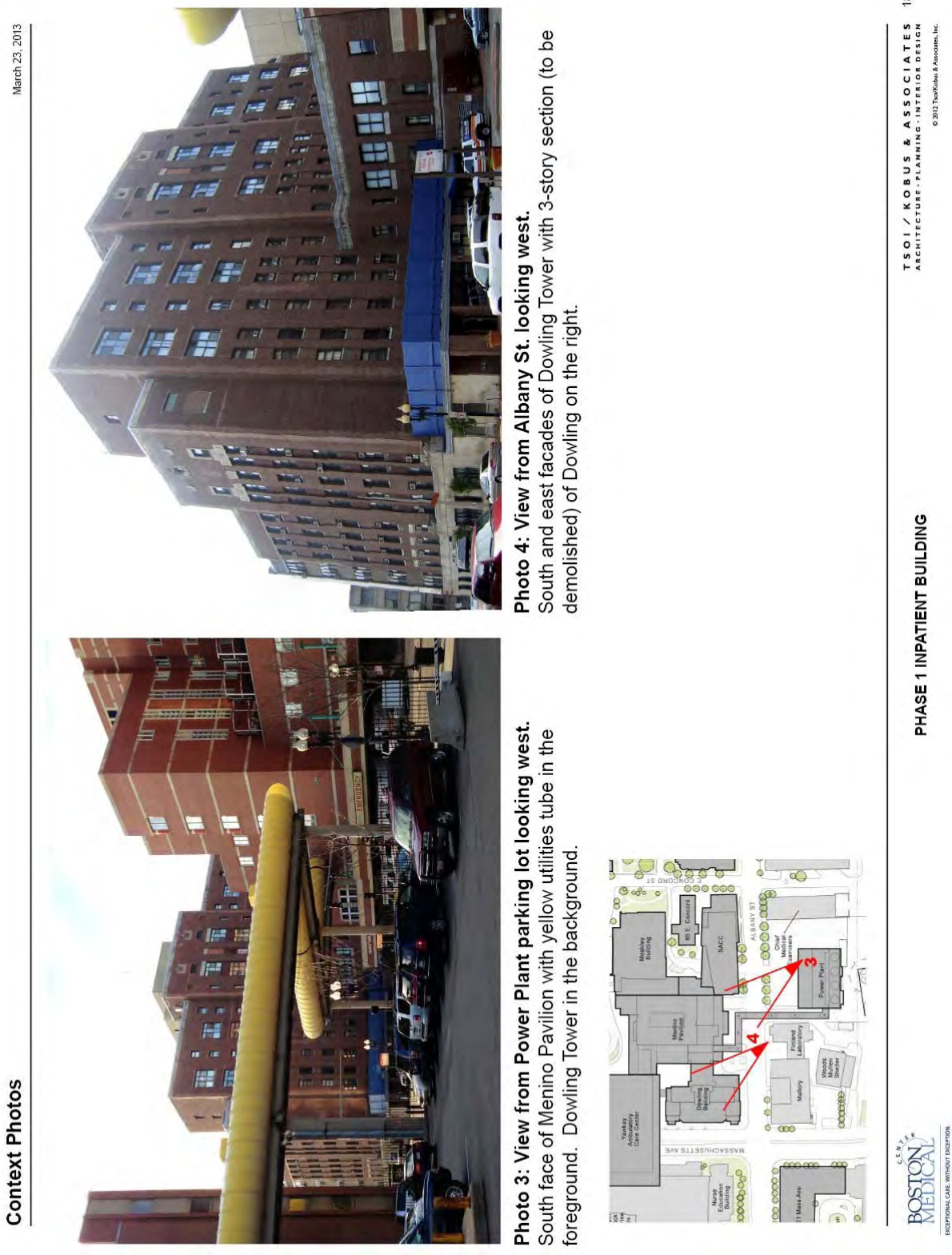


Figure 3-9 New Inpatient Building Phase 1 Context Photos (continued)

3.1.4 Urban Design – BMC Energy Facility

Energy Facility – Existing Context and Project Location

The proposed location of the Energy Facility to the west of the existing Power Plant and behind the Finland Building will help meet the urban design objectives as outlined in the IMP Amendment. It will allow for a less encumbered building site along Albany Street so the future development can continue to bring order to that urban corridor. As future phases of the IMP are developed, the desired balance of density and open space enhancements, and further definition of Albany Street will be realized.

The Energy Facility will also reinforce the contemporary architectural vocabulary that is shaping the NewMarket Square area as experienced from the Massachusetts Avenue Connector. The site to the west of the existing Power Plant will make the Energy Facility more prominent from that connector allowing it to be visually linked to the Hampton Suites and the Boston University Medical Center buildings that are contributing to the character of NewMarket.

The Energy Facility will connect to the new 1-story corridor (constructed in conjunction with the new patient transport Bridge) to the west of the existing Power Plant. The new building site will be set back further from Albany Street allowing the north side of the site to be developed as open space in conjunction with the construction of the future Administration / Clinical Building. This configuration of buildings will continue to capitalize on the unique open space characteristics of the BUMC Campus and will provide relief for pedestrians and staff. The south side of the site fronts the Massachusetts Avenue Connector, a major vehicular approach.

Energy Facility - Height and Massing

The height and massing are primarily dictated by dimensional clearances required for the large pieces of equipment to be housed within the building envelope. The height of the building will be approximately 100 feet from grade to the top of the roof screen and will be shorter than the existing Power Plant in overall height. The north face will be set back approximately 60 feet in front of the north face of the existing Power Plant. The existing staff parking along Albany Street will be maintained until the proposed Administration / Clinical Building and open space is developed. The south side is bound by setbacks associated with the Roxbury Canal.

Two 6’-0” diameter exhaust stacks will be approximately 160 feet above grade. They will be located adjacent to the taller portion of the existing Power Plant to reduce the perceived height. The height (to the top of the roof) of the Energy Facility will be approximately 30’-0” shorter than the height (to the top of the roof) of the existing Power Plant.

The project’s height and massing are consistent and compatible with the institutional scale and density of the existing BioSquare development to the east and Crosstown/NewMarket development to the west. The massing of the Energy Facility also establishes a relationship with the scale and massing of the existing Power Plant, the Shapiro Ambulatory Care Center

across Albany Street and the proposed New Inpatient Building that will bring continuity to the North side of Albany.

Energy Facility - Material and Image

Simple massing and a minimal material palette are proposed for the Energy Facility. The building will be almost exclusively mechanical equipment with minimal occupied space. As a result, the building façade will utilize dark grey solid and louvered metal panels. This exterior cladding system will be complemented by metal screening around the rooftop mechanical equipment that will complement the "industrial" architecture of the existing Power Plant. The building's simple form celebrates its utilitarian function while softening the visual impact to the BUMC and BioSquare campuses. The contemporary façade will also complement the evolving architectural style of structures in the NewMarket area.

The Energy Facility's presence will be predominantly visible from the Massachusetts Avenue Connector. Visual glazed portals will be viewed from the South, East and West elevations.

Energy Facility - Vehicular Access and Circulation

Normal staff access and small material deliveries for the Energy Facility will be via existing Power Plant entrances and loading docks located along the Albany Street. Limited service access will occur on the north and south side of the Energy Facility for routine maintenance and to accommodate deliveries of equipment and materials to support ongoing operations.

Energy Facility - Site Improvements

Sidewalk and urban landscaping improvements along the project frontage at Albany Street will occur as part of the proposed new Bridge. Urban landscape improvements will include new planters, trees, and pavers, consistent with the recent enhancements as part of the Shapiro Ambulatory Care Center to further integrate and enhance the Albany Street experience. It is anticipated that this zone will remain oriented to service vehicles in the near term with pedestrian improvements focusing on the sidewalks along Albany Street.

One of the existing two lanes underneath the existing yellow utility tube will be closed (with the construction of the new Bridge) minimizing and reducing the width of this curb cut in half. The vehicle ramp to the existing staff parking lot of the Power Plant will be relocated to better align with the loading docks for the proposed interim loading relocation. The building setback will allow for the extension of an open space system with the development of the future Administration / Clinical Building. Access to the existing staff parking lot next to the Woods-Mullen Shelter will be re-located to Massachusetts Avenue.

Figure 3-10 Energy Facility Aerial View Looking East

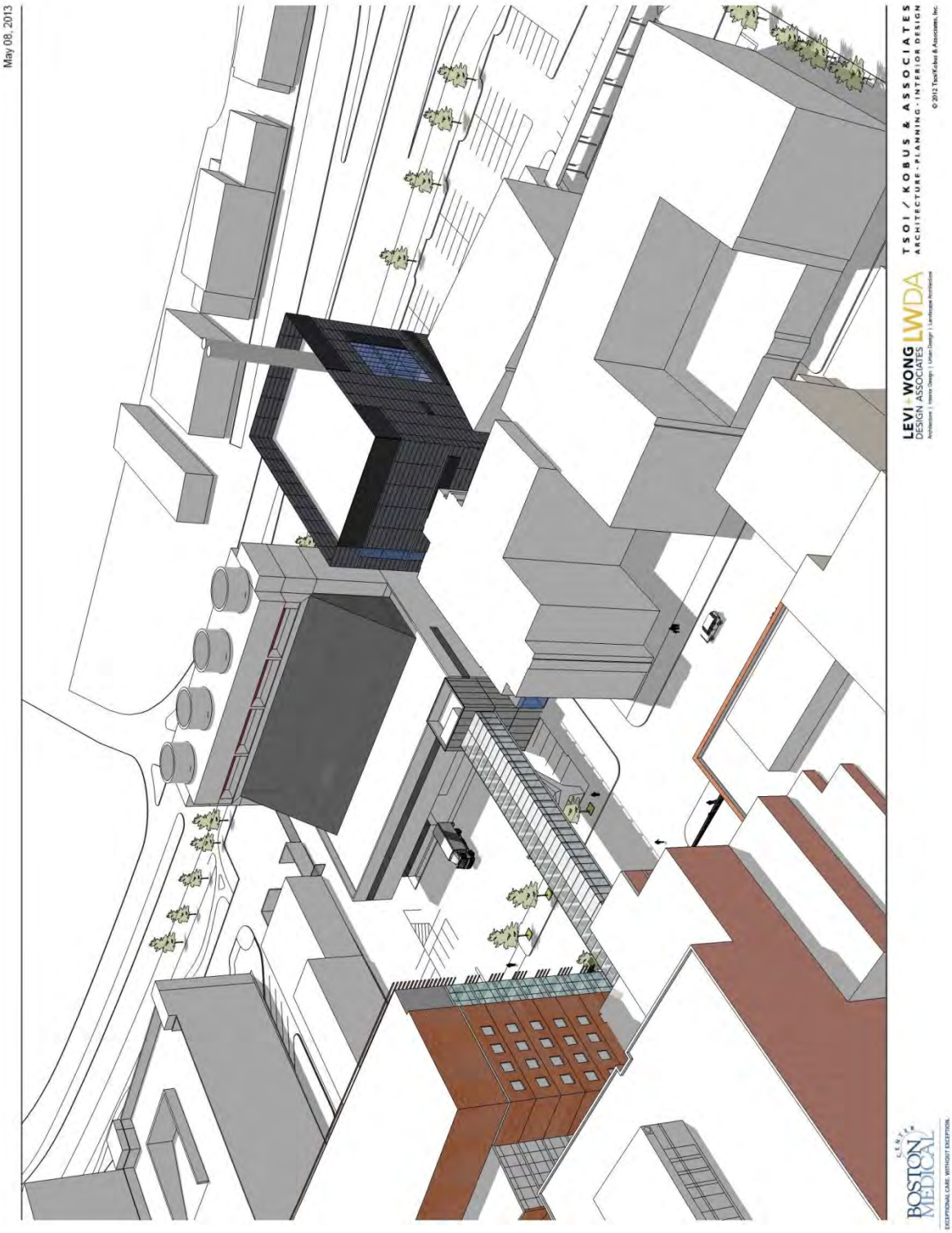


Figure 3-11 Energy Facility Aerial View Looking West

Figure 3-12 Energy Facility Context Photos

Figure 3-13 Energy Facility Context Photos (continued)

3.1.5 Urban Design – New Patient Transport Bridge

New Patient Transport Bridge - Existing Context and Project Location

The proposed new Bridge will be located within the Boston University Medical Center West Campus spanning over Albany Street.

Currently Albany Street is composed of varying building setbacks, scales and styles. As a major arrival point on the BUMC Campus the streetscape lacks a vital sense of clarity and organization. This project in conjunction with the proposed New Inpatient Building Phase 1 will begin to better define the north edge of Albany Street and align with Boston University Medical Center's strategic urban design goals stated previously.

The project site is located both on the south and north sides of Albany Street. The project is proposed to cross south to north over Albany Street in the approximate location of the existing yellow utility tube connecting to the New Inpatient Building Phase 1 over the existing Emergency Department Entrance, Ambulance parking, and loading area.

New Patient Transport Bridge - Massing and Height

The project is consistent with the surrounding contextual scale and desired contemporary aesthetic of the institution. A simplified form and a minimal material palette provide the visual clarity and consistency currently absent from the Albany Street Corridor.

The new Bridge is a simple rectilinear mass spanning from the existing Power Plant on the south of Albany Street to New Inpatient Building Phase 1. It rests on two structural supports located on either side of the street edge and has a clear height of approximately 27 feet above Albany Street. The new Bridge is approximately 16 feet tall (approximately 43 feet in height from grade) and has a roofline consistent with the connector wing of the New Inpatient Building Phase 1 and the Menino Pavilion. The new elevator and stair tower in the new Bridge will rise above the roof of the new Bridge to accommodate the elevator overrun. The overall building height including the elevator overrun will be approximately 50 feet in height from grade. A 1-story corridor approximately 16 feet in height will be located at grade to the west of the existing Power Plant providing access from the helipad for Med Flight patients to the new Bridge and to the Emergency Department.

New Patient Transport Bridge - Material Image

Simple massing and a minimal material palate are proposed for the project in order to reduce its visual impact on the Albany Street Corridor. Glass curtainwall and metal panel wall will be featured on the Bridge conveying a clean, light, modern image. The bridge structure is supported at two points on either side of Albany Street and will be clad in metal panel. The position and simple form of the supports help to define a new gateway along the Albany Street Corridor. The 1 story corridor at grade will feature a consistent material palate of metal panel and glazing. At night, the Bridge is proposed to be strategically lit creating a luminous beacon providing a new way-finding device in the center of the Albany Street Corridor.

New Patient Transport Bridge - Vehicle Access and Circulation

The Bridge will facilitate new Med Flight patient transport by providing access from the existing helipad located on the south side of Albany Street to the Emergency Department within the Menino Pavilion. This new transport will provide more efficient patient care while reducing operational costs associated with current ambulance patient movement.

Construction of the Bridge will also necessitate the relocation of the Emergency Department entrance and drop-off to the rear of the Moakley Cancer Center, where emergency patient and vehicular access will be provided via Shapiro Drive.

The existing loading truck dock along the south face of the Menino Pavilion will be relocated to the south side of Albany Street along the north face of the existing Power Plant. Materials will be provided to the hospital functions north of Albany Street via the new Bridge, where they will be transported to the Menino Pavilion and then distributed accordingly.

New Patient Transport Bridge - Site Improvements

Streetscape alterations will occur with the new Bridge and New Inpatient Building Phase 1 along Albany Street in order to create a simplified ambulance parking area and reduce the number of curb cuts along the north side of Albany Street. Alterations include the closing of three existing curb cuts and the removal of the curb between the existing loading dock and existing ambulance parking areas. One of the two lanes underneath the existing yellow utility tube will be closed minimizing and reducing the width of the curb cut in half. New Sidewalk and urban landscaping improvements are proposed along the street edge to further integrate and enhance the Albany Street experience.

Figure 3-15 New Patient Transport Bridge Aerial View Looking Northwest

Figure 3 -16 New Patient Transport Bridge Aerial View Looking Southwest

Figure 3 -17 New Patient Transport Bridge Context Photos

Figure 3-18 New Patient Transport Bridge Context Photos (continued)

3.2 Sustainable Design

The Proposed Projects include a number of environmentally protective technologies and practices incorporated into the planning, design and operations.

All of the proposed IMP projects will meet the requirements of Article 37 of the Code. The Proponent has evaluated the projects under the U.S. Green Council's Leadership in Energy and Environmental Design (LEED) system and the projects are anticipated to receive ratings of up to "Silver" LEED-NC [New Construction]. See Appendix F for LEED Checklists for each of the proposed projects demonstrating anticipated compliance with these standards.

3.3 Environmental Protection

3.3.1 Wind

The Moakley Cancer Center Addition will be a similar height to the Moakley Building. Given the Addition's location, it is anticipated that it will be shielded from the predominant winds by other buildings in the surrounding area, and therefore is anticipated to have minimal impact on pedestrian level winds.

The New Inpatient Building Phase 1 is located in an area where a building currently exists and a driveway, and will be significantly shorter than the buildings immediately adjacent to it. The buildings will also be set back from the sidewalk and trees will buffer the edge of the building from the sidewalk. It is anticipated that the New Inpatient Building Phase 1 will have minimal impact on pedestrian level winds.

The Energy Facility is designed to be of similar height and massing to buildings in the vicinity of the project Site. Based on the height of the project and its similar massing to surrounding buildings, the Project is not expected to cause significant material impacts to upper level or pedestrian level winds.

3.3.2 Daylight

The project sites are located within a dense urban environment surrounded by building of similar height and massing as the proposed projects. Due to the existing configuration of the project sites, minimal impacts to daylight obstruction are anticipated.

3.3.3 Shadow

The proposed project sites are located in a dense urban area on the BUMC Campus. The new Moakley Cancer Center Addition will be surrounded by and adjacent to structures of similar height and massing, any shadow impact will not create significant new shadow coverage on public ways or open space in the area when compared to existing conditions during the time periods studied.

The proposed New Inpatient Building Phase 1 location is along the north side of Albany Street. Based upon the shadow study, the New Inpatient Building Phase 1 will not create

any new shadows on public ways or green spaces. Net new shadows created will be primarily cast back on the roof of the new Phase 1 Inpatient Building.

The proposed Energy Facility will be surrounded by and adjacent to structures of similar height and massing, any shadow impact will be comparable to the neighboring buildings. It is anticipated that the Energy Facility will not create significant new shadow coverage on public ways or open spaces in the area when compared to existing conditions during the time periods studied.

The scale and location of the new Bridge creates a small net new shadow impact that falls primarily on itself. As the Bridge will be replacing the existing "Yellow Tube" that currently spans Albany Street, there will be a minimal shadow impact on the adjacent streetscape compared to the existing condition.

See Appendix B for Shadow Study diagrams – Moakley Cancer Center Addition
See Appendix C for Shadow Study diagrams – New Inpatient Building Phase 1
See Appendix D for Shadow Study diagrams – BMC Energy Facility
See Appendix E for Shadow Study diagrams – New Patient Transport Bridge

3.3.4 Solar Glare

The exterior materials for the proposed projects have not been determined. Building exteriors are expected to be constructed of a mixture of modern and traditional building materials. At this time, reflective glass is not anticipated for any of the projects. The proposed projects will be designed so as not to present an adverse safety impact on project area traffic as a result of solar glare.

3.3.5 Air Quality

Transportation Impacts: Impacts on air quality from transportation typically occur at intersections with long delays. It is anticipated that the increases in traffic due to the proposed Projects (mostly the New Inpatient Building Phase 1 and Moakley Cancer Center Addition) will not lead to an exceedance of the National Ambient Air Quality Standards (NAAQS).

Boston University Medical Center currently implements an aggressive vehicle trip reduction program which will be implemented for its proposed Projects as applicable.

Stationary Sources: It is anticipated that the air quality impacts from the new mechanical equipment necessary for the New Inpatient Building Phase 1 will not significantly impact air quality in the surrounding area. New equipment subject to Massachusetts Department of Environmental Protection (MassDEP) regulations will comply with such regulations.

It is anticipated that the air quality impacts from the minimal new mechanical equipment necessary for the Moakley Cancer Center addition will not significantly impact air quality in the surrounding area.

The Energy Facility will allow BMC to generate approximately 75% of its own electricity and nearly 100% of its own steam. Cogeneration is a highly efficient method to produce steam and power, resulting in one of the lowest fossil fuel emissions and greenhouse gases. The cogeneration facility will consist of one Taurus 70 gas turbine, one duct burner to provide supplemental steam to the BMC distribution system, and three gas fired boilers for cogeneration duct burner backup. The gas turbine and duct burners will be fueled by natural gas under normal operating conditions. In the event of an emergency, the gas turbines and duct burners will be fueled by the existing fuel oil storage tank in order to support continuous operation.

The Energy Facility will be a minor source of air emissions and will need to file an Environmental Results Program form for a Non-Emergency Turbine and a Non Major Comprehensive Air Plans Approval application for its equipment. The turbine and duct burner will be designed with Selective Catalytic Reduction (Oxides of Nitrogen (NOx) controls) and Oxidation Catalysts (Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) controls) to meet Massachusetts Department of Environmental Protection's (MassDEP) requirements for Best Available Control Technology. The cogeneration facility will also demonstrate compliance with the National Ambient Air Quality Standards. Therefore, the Project will have minimal impacts to air quality.

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

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

3.3.6 Noise

The primary operational noise caused by the proposed projects will be the result of mechanical equipment. The project sites are located proximate to I-93 and the Massachusetts Avenue Connector which are the sources for much of the ambient noise in the area. In addition, the ambient noise levels around the project sites are elevated due to

the urban nature of the area. Design of the projects will consider operational noise and will include noise attenuation mitigation as needed to ensure compliance with City of Boston Noise Ordinance and MassDEP noise regulations.

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

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

3.3.7 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). The map shows that the Projects' sites are located outside of the 500-year flood plain. The project sites do not contain any wetlands.

3.3.8 Geotechnical / Groundwater

The proposed Moakley Cancer Center Addition and New Inpatient Building Phase 1 will involve some subsurface excavation for a below grade basement. The Draft Project Impact Report (DPIR) will include information on anticipated subsurface conditions across the proposed sites. The sites are located in the Groundwater Conservation Overlay District.

Measures will be implemented in order to minimize the potential for impact to the groundwater conditions.

3.3.9 Construction Waste and Disposal

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.

3.3.10 Solid Waste Generation and Recycling

The 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 Boston University Medical Center's active campus recycling program. Staging areas with recycling bins will accommodate the recyclable material from the projects.

3.3.11 Rodent Control

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 Project, 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.

3.3.12 Wildlife Habitat

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

3.4 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. The CMP will define truck routes which will help minimize the impact of trucks on local streets. The

construction contractor will be required to comply with the details and conditions of the approved CMP.

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

3.4.1 Construction Schedule and Coordination

Construction of the Moakley Cancer Center Addition is estimated to last approximately 18 months. Initial site work is expected to begin during the 4th Quarter of 2013.

Construction of the New Inpatient Building Phase 1 is estimated to last approximately 18 months. Initial site work is expected to begin during the 4th Quarter of 2013.

Construction of the Energy Facility is estimated to last approximately 24 months. Initial site work is expected to begin during the 1st Quarter of 2015.

Construction of the New Patient Transport Bridge is estimated to last approximately 11 months. Initial site work is expected to begin during the 2nd Quarter of 2016.

Typical construction hours will be 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 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.

3.4.2 Construction Staging and Public Safety

Primary staging will be on-site. For each project the proposed construction staging plan will be designed to isolate the construction while providing safe access for pedestrians and vehicles during normal day-to-day 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 have not been finalized, the Proponent and its construction management consultants will work to ensure that staging areas will be

located to minimize impacts to pedestrian and vehicular flow. Secure fencing and barricades will be used 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.

3.4.3 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. The Proponent will make reasonable good-faith efforts to have at least 50 percent of the total employee work hours are for Boston residents, at least 25 percent of total employee work hours are for minorities and at least 10 percent of the total employee work hours are for women. The Proponent will enter into a construction jobs agreement with the City of Boston.

To reduce vehicle trips to and from the construction site, minimal construction worker parking will be available at the site and all workers will be strongly encouraged to use public transportation and ridesharing options. The Proponent and contractor will work aggressively to ensure that construction workers are well informed of the public transportation options serving the area. Five bus routes currently service the area, and the Project site is proximate to the Silver Line. Space on-site will be made available for workers' supplies and tools so they do not have to be brought to the site each day.

3.4.4 Construction Truck Routes and Deliveries

The construction team will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. The construction team will provide subcontractors and vendors with Construction Vehicle & Delivery Truck Route Brochures in advance of construction activity. “No Idling” signs will be included at the loading, delivery, pick-up and drop-off areas.

Truck traffic will vary throughout the construction period depending on the activity. Construction truck routes to and from the Project site for contractor personnel, supplies, materials, and removal of excavations will be coordinated by the Proponent with the BTD and established in the CMP. These routes will be mandated as a part of subcontractors’ contracts for the Project. Traffic logistics and routing are planned to minimize community impacts.

3.4.5 Construction Noise

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

Mitigation measures are expected to include:

- Instituting a proactive program to ensure compliance with the City of Boston noise limitation policy;
- Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously running equipment, such as air compressors and welding generators;
- Replacing specific construction operations and techniques with less noisy methods where feasible;
- Selecting the quietest alternative items of equipment where feasible;
- Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;
- Turning off idling equipment; and
- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

3.4.6 Construction Air Quality

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

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Minimizing spoils on the construction site;
- Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Minimizing storage of debris on the site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.

3.4.7 Construction Waste

The Proponents will reuse or recycle construction materials to the extent feasible. Construction procedures will allow for the segregation, reuse, and recycling of materials. Materials that cannot be reused or recycled will be transported in covered trucks by a contract hauler to a licensed facility, per the MassDEP regulations for Solid Waste Facilities, 310 CMR 16.00.

3.4.8 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 the MWRA, BWSC, Boston Public Works Department, the Dig Safe program, and the governing utility company requirements. All necessary permits will be obtained before the commencement of the specific utility installation. Specific methods for constructing 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.

3.5 Historic and Archaeological Resources

Boston University Medical Center is located within the South End Harrison/Albany Protection Area (Protection Area), and encompasses the “Boston City Hospital” Area, both of which are included in the Inventory of Historic and Archaeological Assets of the Commonwealth. The Protection Area was established to protect views of the adjacent South End Landmark District, to ensure that new development or major alterations adjacent to the District are architecturally compatible in massing, setback, and height, and to protect light and air circulation within the District. Building demolitions, the height and setback of new construction, and changes to topography and landscaping within the Protection Area are subject to review by the South End Landmark District Commission (SELDC).

There are no known archaeological resources listed in the State and National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth within the Project site. The Project sites consist of a previously developed urban site; therefore, it is unlikely that the proposed Project will affect previously unidentified archaeological resources.

3.6 Infrastructure

This section evaluates the infrastructure systems that will support BMC’s proposed projects. Based on initial investigations, the existing infrastructure systems in the area appear to be able to accommodate the incremental increase in demand associated with the proposed projects.

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.

3.6.1 Regulatory Framework

This section, in addition to a description of existing and future infrastructure connections, discusses 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 permit process, as required.
- New steam and power conduits between campus buildings, within city streets, will require permitting with the City of Boston Public Improvements Commission (PIC).

3.6.2 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.

3.6.2.1 Demand/Use

Wastewater generation from each of the projects has been calculated as described below.

Moakley Cancer Center Addition

The Moakley Addition will provide additional and improved space for existing uses within the building. The proposed addition does not represent an expansion of the building's uses by increasing patient capacity, doctors or staff. Accordingly, no increase in wastewater generation from the existing Moakley building is anticipated as a result of this project.

New Inpatient Building Phase 1

The New Inpatient Building Phase 1 will include in-patient rooms, radiology and surgery areas as well as an amphitheater and circulation space for vital connector to campus buildings. The estimated wastewater generation from the New Inpatient Building Phase 1 has been calculated in gallons per day (gpd) as the sum of these uses based on rates established by the Massachusetts Department of Environmental Protection Title V 310 CMR 15.203 System Sewage Flow Design Criteria and summarized in the table below.

Table 3-1 Estimate Wastewater Generation

Use	Number	Units	Rate	Averaged Daily Sewage Flow (gpd)
Floor B: Amphitheater	250	seats	3 gpd/seat	750
Floor 1: Radiology	16,678	sf	75 gpd/1,000 sf	1,250
Floor 2: Surgery	16,678	sf	75 gpd/1,000 sf	1,250
Floors 3 & 4: In-patient	28	Beds	200 gpd/bed	5,600
			Totals	**8,850**

Average daily flow is calculated from the project to be approximately 8,850 gpd. Based on a peaking factor of 3.0, peak daily flows from the project are estimated to be approximately 26,550 gpd.

Energy Facility

The Energy Facility will generate wastewater from cooling tower blow down and other sanitary wastewater from within the proposed building. Other wastewater generation associated with this project includes condensate from steam distribution which does not return to the facility. A preliminary estimate of wastewater generation from the new Energy Facility is approximately 50,000 gpd.

New Patient Transport Bridge

The new Bridge consists of patient transport and service corridors to connect hospital buildings. There is no wastewater generation associated with this use.

3.6.2.2 Proposed Connections

The sewer services for the proposed projects will tie into existing nearby existing sewer mains.

The New Inpatient Building Phase 1, and Moakley Cancer Center Addition will connect to BWSC sewer mains in Albany and East Concord Street, respectively. These addition projects may utilize existing service connections from their respective buildings or construct new connections as appropriate based on final project design. Proposed sewer service configurations and design notes are summarized in the table below.

Table 3-2 Proposed Sewer Service Configurations

Project	Sewer Connection	Design Notes
New Inpatient Building Phase 1	66"x68" Sewer in Albany Street	Connection to existing buildings or new service connection to Albany Street to be determined during design.
Moakley Cancer Center Addition	27" Sewer in East Concord Street	Project will likely combine with wastewater from existing Moakley Building since the existing service connection passes through addition area.
Energy Facility	66"x68" Sewer in Albany Street	Connection to Albany Street sewer similar to the existing Power Plant connection
New Patient Transport Bridge	None	No sewer service anticipated. Incidental wastewater will likely be routed to systems in adjacent buildings.

3.6.3 Domestic Water and Fire Protection

3.6.3.1 Existing Water Supply System

The BUMC Campus is located in the South End service area of the BWSC public water supply service areas. Albany and East Concord Streets are served by 12-inch high and low pressure lines. Hydrant test data provided by the BWSC expressed in gallons per minute (gpm) is presented in the table below.

Table 3-3 Hydrant Test Data

Date	Location	Static Pressure (psi)	Residual Pressure (psi)	Total Flow (gpm)	Flow at 20 psi (gpm)
3/21/05	12" Low Albany Street	68	62	3,182	1,083
9/26/00	12" High Albany Street	96	88	4,388	1,479

The results of the hydrant flow tests indicate the actual amount of water (flow) available and the actual pressure (residual) flow provided. These flow metrics are analyzed to establish the quantity of water that will be delivered at 20 psi as a common evaluation point.

The data provided is the most recent test data obtained from the BWSC. Additional testing of specific hydrants in close proximity to the proposed projects will likely be performed during subsequent project phases to support design of fire protection systems.

3.6.3.2 Demand/Use

Based on the wastewater calculations provided in Section 3.6.2.1, water use for the New Inpatient Building Phase 1 is estimated to be approximately 8,850 gpd. The Moakley Cancer Center Addition provides additional and improved space for existing building uses and is not expected to result in an increase in water use above existing conditions. There is no water use associated with the New Patient Transport Bridge project.

Domestic water demand for the Energy Facility will be variable based on the rate of steam production and outdoor air conditions. It is estimated that the proposed project will require an average of approximately 220,000 gpd with a peak demand of 750 gallons per minute.

3.6.3.3 Proposed Connections

Proposed domestic and fire service connections for each of the projects are summarized in the table below.

Table 3-4 Proposed Domestic and Fire Service Connections

Project	Water/Fire Connection	Design Notes
New Inpatient Building Phase 1	12" High and Low Services in Albany Street	Connection to existing buildings or new service connection to Albany Street to be determined during design.
Moakley Cancer Center Addition	12" High and Low Services in East Concord Street	Connection to existing building water systems and/or new tap into existing Moakley service connection from East Concord Street to be determined during design.
Energy Facility	12" High and Low Services in Albany Street and 18" Low Service in Mass Avenue	Redundant service required with fire and domestic connections in both Albany Street and Mass Avenue.
New Patient Transport Bridge	None	No water service anticipated.

3.6.4 Stormwater Management

3.6.4.1 Existing Conditions

The BUMC Campus is serviced by several BWSC drain lines. The proposed project sites are currently occupied by buildings, paved surfaces or landscaped areas. Runoff from these areas flows to nearby BWSC storm drain systems which discharge to the Roxbury Canal Conduit.

3.6.4.2 Proposed Conditions

Stormwater from the project sites will be routed to follow existing drainage patterns to the nearby BWSC drain lines and the Roxbury Canal Conduit. Since the BUMC Campus is located in the Groundwater Conservation Overlay District (GCOD), each of the projects will be required to infiltrate one inch of runoff per square foot of new building footprint.

The proposed projects will be designed mitigate potential increases in peak flows, pollutants, or sediments to existing drainage infrastructure. In conjunction with the BWSC site plan review and the General Service Application, the proponent will submit a stormwater management plan. Compliance with the standards for the final site design will be reviewed as part of the BWSC site plan review process.

A summary of stormwater management controls for each project site is provided in the table below.

Table 3-5 Stormwater Management Controls

Project	Approximate Footprint (sf)	Infiltration Requirement (ft^3)	Design Notes
New Inpatient Building Phase 1	16,800	1,400	Project site occupied primarily by existing building. Project may result in a minimal increase in impervious surfaces.
Moakley Cancer Center Addition	6,200	516	Project site occupied by grass area. Increase in impervious surface will require stormwater management to mitigate potential increases in peak runoff.
Energy Facility	12,500	1,042	Project site is currently occupied by paved surfaces.
New Patient Bridge	7,000	583	Project will be located above Albany Street and adjacent sidewalks. No resulting change in surface runoff patterns is anticipated.

3.6.5 Anticipated Energy Needs

3.6.5.1 Natural Gas Service

Natural gas for the Proposed Project will be provided by National Grid from their existing gas mains within Albany Street. The specific gas service needs for each project will be determined and coordinated with the utility company during final design.

3.6.5.2 Electrical Service

Boston University Medical Center purchases electricity from NSTAR Electric in bulk and redistributes from the existing Power Plant Building to other BUMC Campus buildings. This practice will be continued for the New Inpatient Building Phase 1 or other projects until the new Energy Facility is constructed. The new Energy Facility will be equipped with a nominal 7.5 MW gas-fired turbine module and serve as the primary electric service power source for the BUMC Campus.

3.6.5.3 Steam

Steam is currently provided by Veolia Energy and distributed to the BUMC Campus from the existing Power Plant building.

The new Energy Facility will be a Combined Heat and Power (CHP) generating facility. The project is anticipated to generate approximately 300,000 lbs/hour of high pressure steam which will be distributed throughout the BUMC Campus through existing and new infrastructure. The proposed steam generation will be sufficient to supply Boston University Medical Center's needs and will negate the need for importing steam from off-site sources.

3.6.5.4 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 the proposed project.

Section 4

4.0 TRANSPORTATION

4.1 Introduction

This section provides a summary of the 2013 Boston University Medical Center (BUMC) IMP Amendment/Large Project Review and the BUMC Campus from a transportation perspective, and provides an overview of the area's existing transportation infrastructure including:

- a brief discussion of the transportation characteristics of the BUMC campus and the Project;
- the existing transportation infrastructure surrounding the site, including descriptions of public transportation, area roadways, parking and patient valet operations, loading activities, and bicycle storage;
- an evaluation of future No-Build conditions and Build conditions with the Project in place, including future parking and bicycle storage, loading activities, and trip generation; and
- a discussion of anticipated transportation-related construction management actions and transportation demand management (TDM) measures that are expected to be employed in connection with the Project.

4.1.1 Project Description

4.1.1.1 Existing Campus Description

Boston University Medical Center is located in the South End neighborhood of Boston. See **Figure 4-1**. Regional vehicular access to the BUMC Campus via the north and south is provided directly via the Massachusetts Avenue Connector. At Massachusetts Avenue, the Connector joins Melnea Cass Boulevard, which provides a direct connection to the Longwood Medical and Academic Area. Local vehicular access is primarily form Harrison Avenue, Massachusetts Avenue and Albany Street. East Concord Street and East Newton Street provide connections from the primary campus parking facilities, the 710 Albany Street and 610 Albany garages, to other facilities within the campus. A campus plan is provided in **Figure 4-2.**

4.1.1.2 IMP Projects

As noted above, the purpose of the BUMC IMP Amendment is to obtain approval for modifications to projects previously approved in the BUMC 2010 IMP and the addition of new projects necessary for critical campus realignment and growth, to reduce the impact of ambulance and material deliveries on Albany Street and to eliminate the yellow utility tube across Albany Street.

BUMC IMP Amendment/Large Project Review Boston, Massachusetts

Figure 4-1
Locus Map

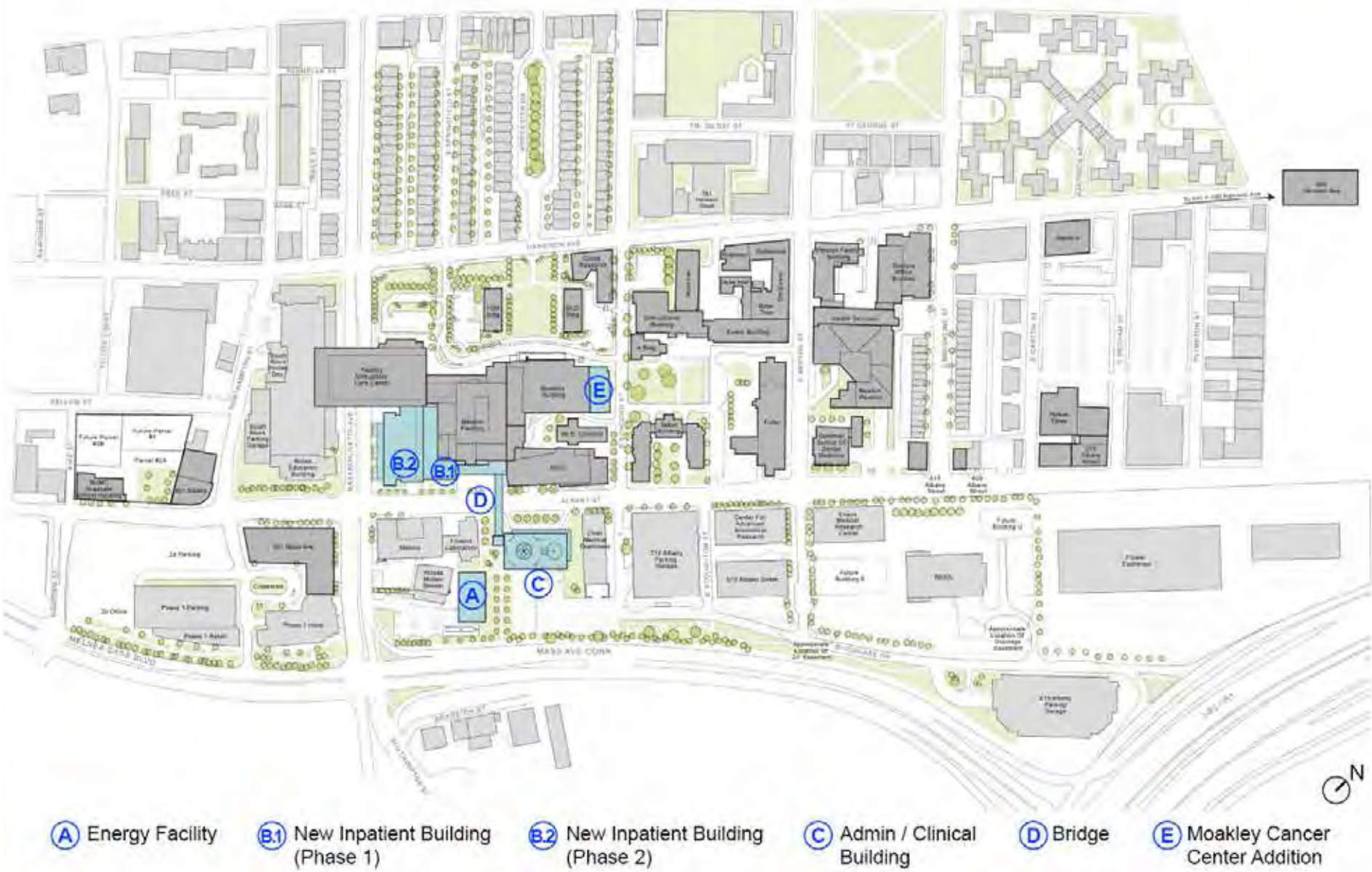


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Figure 4-2
Campus Site Plan

By 2019, the original time frame for the IMP, Boston Medical Center may:

- construct a 27,800 square foot addition to the Moakley Cancer Center on existing open space located to the east of the Moakley Cancer Center along East Concord Street;
- relocate the Emergency Room entrance for pedestrians and passenger vehicles to the northwest corner of the Shapiro Building courtyard;
- construct the proposed 38,500 sf Energy Facility previously located on the existing surface parking lot to the east of the existing Power Plant to a new location west of the existing Power Plant;
- demolish the existing yellow utility tube across Albany Street and replace it with a 7,100 sf new bridge for patient transport and materials handling including a connector corridor at grade providing covered access for Med Flighht patients from the helipad to the new bridge;
- make minor modifications to the previously approved New Inpatient Building footprint and massing, and construct Phase 1 of the New Inpatient Building totaling 78,800 square feet including a connector wing providing vital connections to adjacent campus buildings;
- change the status of the Perkin Elmer site from leased to ownership, incorporating the entire site, amounting to 92,937 additional square feet of administrative office space beyond the 36,524 sf of space that was leased by BUMC in 2010; and
- create an interim central location for materials handling at the existing Power Plant on Albany Street.

In later phases of the IMP, Boston Medical Center may:

- construct Phase 2 of the New Inpatient Building - approximately 323,000 square feet;
- construct the New Administrative/Clinical Building – approximately 219,000 square feet; and
- demolish the existing 64,064 sf Power Plant.

BMC is also submitting this Large Project Review filing under Article 80 with the following components:

- Moakley Cancer Center Addition (new construction only): 27,800 sf
- New Inpatient Building Phase 1: 78,800 sf
- New Patient Transport Bridge: 7,100 sf
- Energy Facility: 38,500 sf

TOTAL 152,200 sf

4.1.2. Study Area

As shown in **Figure 4-3**, the study area has been expanded from that of the 2010 IMP to include parking lot entrances and driveways that will be affected by internal circulation changes anticipated in association with IMP projects, as discussed under Build conditions below. The study area includes the following intersections and site driveways:

- Massachusetts Avenue/Albany Street;
- East Concord Street/Albany Street;
- East Newton Street/Albany Street;
- Massachusetts Avenue/Harrison Avenue;
- East Concord Street/Harrison Avenue;
- East Newton Street/Harrison Avenue;
- BMC entrance on Harrison Avenue and exit on East Concord Street;
- Shapiro Building Courtyard entrance on Albany Street and exit on East Concord Street;
- Power Plant entrance;
- Boston Public Health entrance; and
- Shelter entrances on Albany Street and Mass. Avenue (3 locations).

4.2 Existing Conditions

4.2.1 Roadway Network

The study area includes the following roadways, which are categorized according to the Massachusetts Department of Transportation Office of Transportation Planning functional classifications:

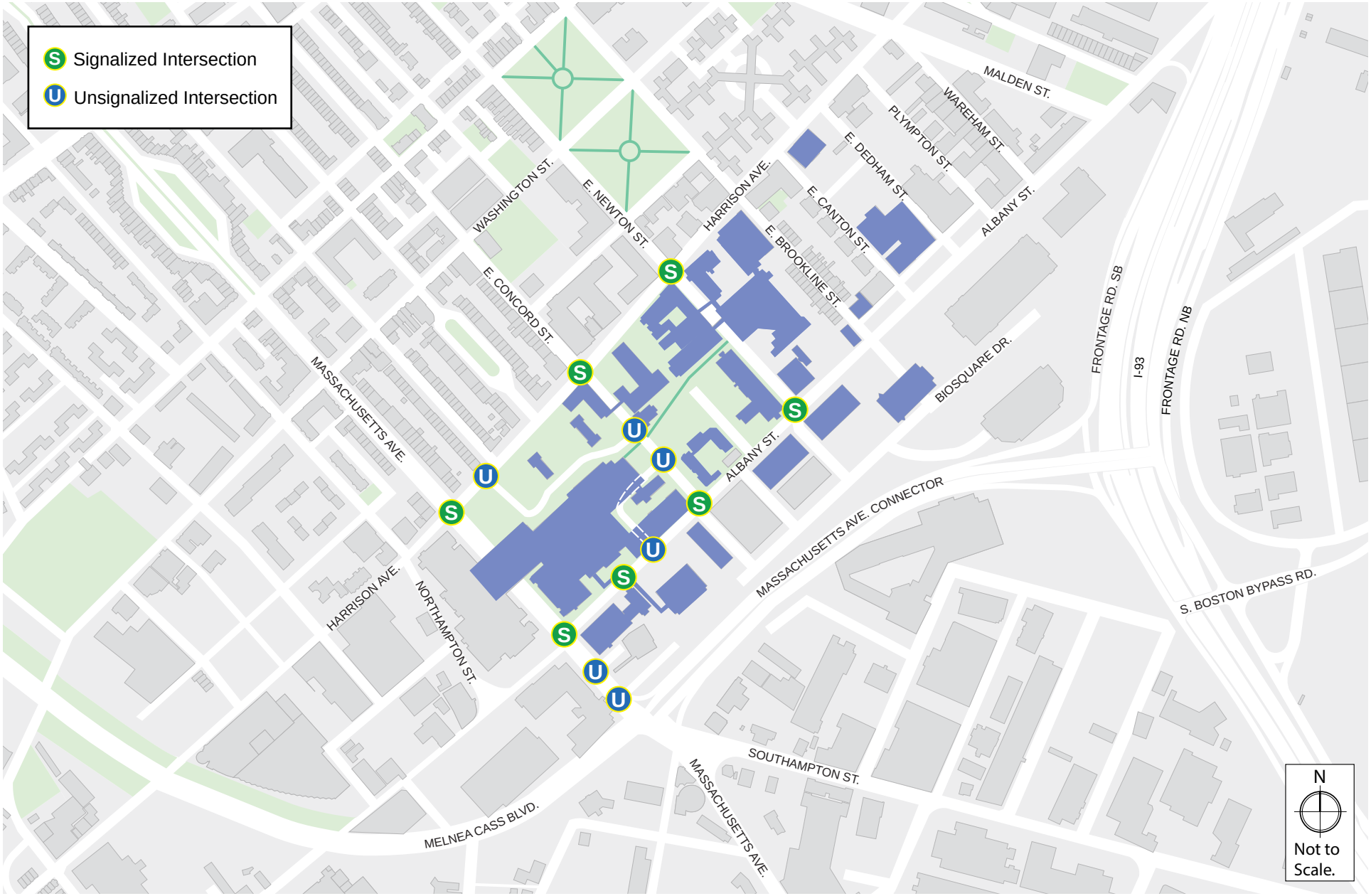

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Figure 4-3
Study Area Intersections

Massachusetts Avenue is an urban principal arterial, running north–south from Cambridge and the northwestern part of the Boston metropolitan area to Columbia Road to the southeast. Massachusetts Avenue carries about 40,000 vehicles total in both directions on an average weekday. 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 west of Harrison Avenue. Bus stops are located regularly on both sides of Massachusetts Avenue serving several MBTA routes and the Boston University Medical Center shuttle routes within the campus. Sidewalks on each side range in width from 7 to 23 feet. Near the site, the mix of land uses includes medical, retail, office, and residential.

In early 2013, the City of Boston is nearing the end of construction on a $14.5 million improvement program for Massachusetts Avenue from 150 feet south of Albany Street to 100 feet north of St. Botolph Street. The project includes repaving the roadway and fully modernizing all traffic signal equipment and interconnecting it with the City's traffic management center via a new fiber optic connection. Left turn bays have been installed at certain intersections to reduce congestion and improve traffic safety. New curbing, sidewalks, street lighting and trash receptacles are being installed and landscaping enhanced with trees and shrubbery. A critical element of the plan, as discussed below, is bike accommodations in the corridor.

As signal timing improvements have not been finalized by the City, analyses below are based on the existing signal timings.

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. Albany Street provides one travel lane in each direction near the site with no median. Approximately 11,500 vehicles use Albany Street east of Massachusetts Avenue daily, according to March 2013 ATR data, reduced from about 16,000 vehicles per day counted in 2008. Parking is allowed on both sides of the street, with various uses from metered to special use vehicles only (e.g., EMS vehicles) to no restrictions. The BUMC Campus is located on the north side of the street and the BioSquare site on the south side. Sidewalks on each side range in width from 8 to 35 feet. Land uses along Albany Street include a mix of research, educational, city services, medical uses, and in and outpatient medical uses. Field observations showed that due to congestion in the BUMC Campus driveways, some cars drop off or pick up patients in the through lanes on Albany Street.

East Concord Street is a local street running one-way south. Parking is prohibited on both sides of the street. Two bus shelters—one near Harrison Avenue and one near Albany Street—serve several MBTA routes and the Boston University Medical Center shuttle routes within the campus. Sidewalks on each side range in width from 8 to 24 feet. BUMC Campus buildings are located along both sides of the street.

East Newton Street is an urban minor arterial running one-way north, with parking on both sides of the street. Bus stops are located along East Newton Street with a bus shelter on

Atrium Plaza on the north side of the street between Harrison Avenue and Albany Street. Sidewalks on each side range in width from 8 to 30 feet. BUMC Campus buildings are located along both sides of the street.

Harrison Avenue is an urban minor arterial 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 BUMC 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 on each side range in width from 9 to 11 feet. Harrison Avenue is a boundary between the BUMC Campus on its south side and the primarily residential areas along the north side.

East Springfield Street is a local street running one-way south from Washington Street to Harrison Avenue where it turns into Boston Medical Center Place. There is 8 foot designated residential parking on both sides of the road. Sidewalks on each side range in width from 8 to 9 feet. Residential buildings are located along both sides of the street.

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 sides of the road and sidewalks ranging in width from 7 to 8 feet. Boston Medical Center Place provides access to the BUMC Campus with a bus stop located on the southeast corner of Harrison Avenue and Boston Medical Center Place. BUMC Campus buildings and green space are located along both sides of the street.

Boston Health Commission Driveway is a gated 17.5-foot wide exit only driveway. This driveway accesses a parking lot for the Boston Health Commission with the entrance located on Public Health Building Street off Albany Street.

Woods-Mullen Service Driveway is a 27-foot wide service driveway. It services the Woods-Mullen Shelter and functions as two lanes, one in each direction.

Public Health Building Roadway is a two lane, one in each direction, driveway separated by a median, which contains the structural support for the overhead utility tube. Each roadway is 16-feet wide. There is no parking permitted or sidewalks on either side of the driveway.

Power Plant Driveway is a gated 30-foot wide entrance and exit driveway. This driveway gives access to the surface lot for the Power Plant Building and the Chief Medical Examiner's Office. The signage specifies that permit/authorized parking only and No Trespassing. There are no parking permitted or sidewalks on either side of the driveway.

Shapiro Driveway is a 20-foot wide entrance only driveway 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 and mentions that parking is available at the 710 Albany Garage. There is no parking on either side of the

driveway; sidewalks range in width from a narrow point of about 12′ at the building entrance to about 35 feet at the rear of the building. The Shapiro Ambulatory Care Center is located on the east and the Menino Pavilion along the west of the driveway.

4.2.2 Intersection Conditions

The following intersections are included in the study area:

4.2.2.1 Signalized Intersections

Massachusetts Avenue/Albany Street is a four-approach signalized intersection. The eastbound approach on Albany Street provides an 11-foot shared left-turn/through lane, a 12-foot exclusive through lane, and a 12-foot exclusive right-turn lane. The westbound approach on Albany Street provides an 11-foot left-turn-only lane, a 12-foot through lane, and a 12-foot shared through/right-turn lane. The northbound Massachusetts Avenue approach provides two 12-foot through lanes and one 11-foot right-turn-only lane. The southbound Massachusetts Avenue approach provides one 10-foot left-turn-only lane, one 11-foot through lane, and one 11-foot shared through/right-turn lane. Crosswalks, wheelchair ramps, pedestrian pushbuttons and indications are provided on all approaches.

Public Health Driveway/Albany Street is a four-approach signalized intersection. The eastbound Albany Street approach provides one 12-foot shared left-turn/through lane and one 15-foot shared through/right-turn lane. The westbound Albany Street approach provides one 11-foot shared left-turn/through lane and one 10-foot shared through/right-turn lane. The northbound and southbound approaches are both driveways. The northbound approach is approximately a 31-foot driveway to the Public Health building with one 16-foot accepting lane and one 15-foot left-turn/through/right turn lane. These two lanes are separated by a raised median which accommodates the structural support for the overhead utility tube. The southbound approach is a 28-foot driveway for ambulances only to enter the emergency room. Crosswalks and wheelchair ramps are provided for the northbound, southbound, and westbound approaches with pedestrian pushbuttons and indications on the northbound and westbound approaches only.

East Concord Street/Albany Street is a four-approach signalized intersection. The eastbound Albany Street approach provides one 12-foot through lane and one 12-foot exclusive right-turn lane. The westbound Albany Street approach provides one 11-foot shared left-turn/through lane and one 11-foot exclusive through lane. East Concord Street is one-way southbound and operates with one exclusive left-turn lane and one through/right-turn lane. Wheelchair ramps and crosswalks are provided for all approaches. Pedestrian pushbuttons and indicators are provided across the eastbound, westbound, and southbound approaches. An exclusive pedestrian phase is provided.

East Newton Street/Albany Street is a four-approach signalized intersection. At this intersection, the eastbound approach on Albany Street provides one 10-foot left-turn-only lane and 12-foot one through lane. The westbound Albany Street approach provides one 11-foot through lane and one 16-foot exclusive right-turn lane. East Newton Street, which runs one-way northbound, provides one 12-foot exclusive left-turn lane and one 13-foot

through/right-turn lane. Crosswalks, wheelchair ramps, pedestrian pushbuttons and indications are provided on all approaches. Both pedestrian phases are concurrent with vehicular movements and exclusive.

East Newton Street/Harrison Avenue is a four-approach signalized intersection**.** The eastbound approach on Harrison Avenue provides one 12-foot shared left-turn/through lane. The westbound Harrison Avenue approach provides one 12-foot through/right-turn lane. East Newton Street is one-way in the northbound direction, with one 16-foot shared left-turn/through/right-turn lane. Crosswalks, wheelchair ramps, pedestrian pushbuttons and indications are provided on all approaches.

East Concord Street/Harrison Avenue is a four-approach signalized intersection. The eastbound approach on Harrison Avenue provides one 12-foot through/right-turn lane. The westbound Harrison Avenue approach provides one 12-foot left-turn/through lane. East Concord Street is one-way in the southbound direction with one 16-foot left-turn/through/right-turn lane. Crosswalks, wheelchair ramps, pedestrian pushbuttons and indications are provided on all approaches.

Massachusetts Avenue/Harrison Avenue is a four-approach signalized intersection. The eastbound approach on Harrison Avenue provides one 20-foot left-turn/through/right-turn lane that functions as one 10-foot left-turn/through lane and one 10-foot through/right-turn lane. Both the northbound and southbound Massachusetts Avenue approaches provide three travel lanes; a 10-foot exclusive left-turn lane, a 12-foot exclusive through lane, and an 18-foot shared through/right-turn lane. Crosswalks, wheelchair ramps, pedestrian pushbuttons and indications are provided on all approaches.

4.2.2.2 Unsignalized Intersections

Shapiro Entrance Driveway/Power Plant Driveway is a four-approach unsignalized intersection. The northbound Power Plant stop-controlled approach provides a 15-foot accepting and a 15-foot exiting lane. Both lanes are gated and are accessed via a permit only. The southbound Shapiro Entrance approach provides a 20-foot accepting lane for drop-off and pick-up of patients only. The eastbound and westbound Albany Street approaches both have two 11-foot through lanes with 5-foot bicycle lanes on both sides of the roadway. There is metered parking on the south side of Albany Street but it ends at the Power Plant driveway. There are no crosswalks at this intersection but field observations showed that multiple pedestrians cross this roadway. Field observations also showed that cars used the outside through lane and bicycle lane in both directions as pick-up and drop-off of patients.

Shapiro Exit Driveway/East Concord Street is an unsignalized T intersection. East Concord Street is one-way free control southbound with metered parking on both sides of the 18-foot through lane. The eastbound Shapiro Exit approach is a stop controlled one-way exiting driveway that measures 12-feet wide and tapers to 18-feet. There are no crosswalks at this intersection, although field observations showed that multiple pedestrians cross at this location.

Boston Medical Center Place /East Concord Street is an unsignalized T intersection. The westbound Boston Medical Center Place driveway is a stop controlled one-way out driveway that measures 17-feet wide. The southbound East Concord Street approach is a one-way street that provides one 18-foot through lane with free control and metered parking on both sides of the roadway. A 12.5-foot wide raised crosswalk is provided on the south side of the intersection crossing East Concord Street and an 8-foot wide crosswalk is provided across Boston Medical Center Place.

East Springfield Street/Boston Medical Center Place/Harrison Avenue is a four-approach unsignalized intersection. The eastbound Harrison Avenue approach provides a 20-foot left-turn/through/right-turn lane. The westbound Harrison Avenue approach provides one 13-foot left-turn/through/right-turn lane with metered parking. East Springfield Street is a one-way in the southbound direction; one 18-foot left-turn/through/right-turn lane is provided. A crosswalk is provided on the north and east side of the intersection crossing Harrison Avenue, 7-foot and 11-foot respectively. Wheelchair ramps are provided on all approaches.

Woods-Mullen Service Driveway/Massachusetts Avenue is an unsignalized two approach intersection. The eastbound Woods-Mullen approach provides a 27-foot wide unstriped driveway, which operates as a right-in/right-out. The northbound Massachusetts Avenue approach has two 10-foot through lanes, a 5-foot bicycle lane and an 11-foot through lane that turns into a right-turn lane after the Woods-Mullen Service Driveway.

Boston Health Commission Exit Driveway/Massachusetts Avenue is an unsignalized two approach intersection. The eastbound Boston Health Commission approach provides a gated 17.5-foot wide driveway, which operates as an exit only. The northbound Massachusetts Avenue approach has two 10-foot through lanes, a 5-foot bicycle lane and an 11-foot through lane that turns into a right-turn lane after the Woods-Mullen Service Driveway.

4.2.3 Traffic Volumes

Howard/Stein-Hudson Associates (HSH) collected a 48-hour Automatic Traffic Recorder (ATR) count on Albany Street as well as morning (7:30–9:30 a.m.) and afternoon (3:30–5:30 p.m.) manual turning movement count data at the study area intersections in March, 2013. Based on these data, HSH determined the morning and evening peak one-hour traffic volumes for analysis are 7:45–8:45 a.m. and 3:30–4:30 p.m. See **Figure 4-4** and **Figure 4-5.**

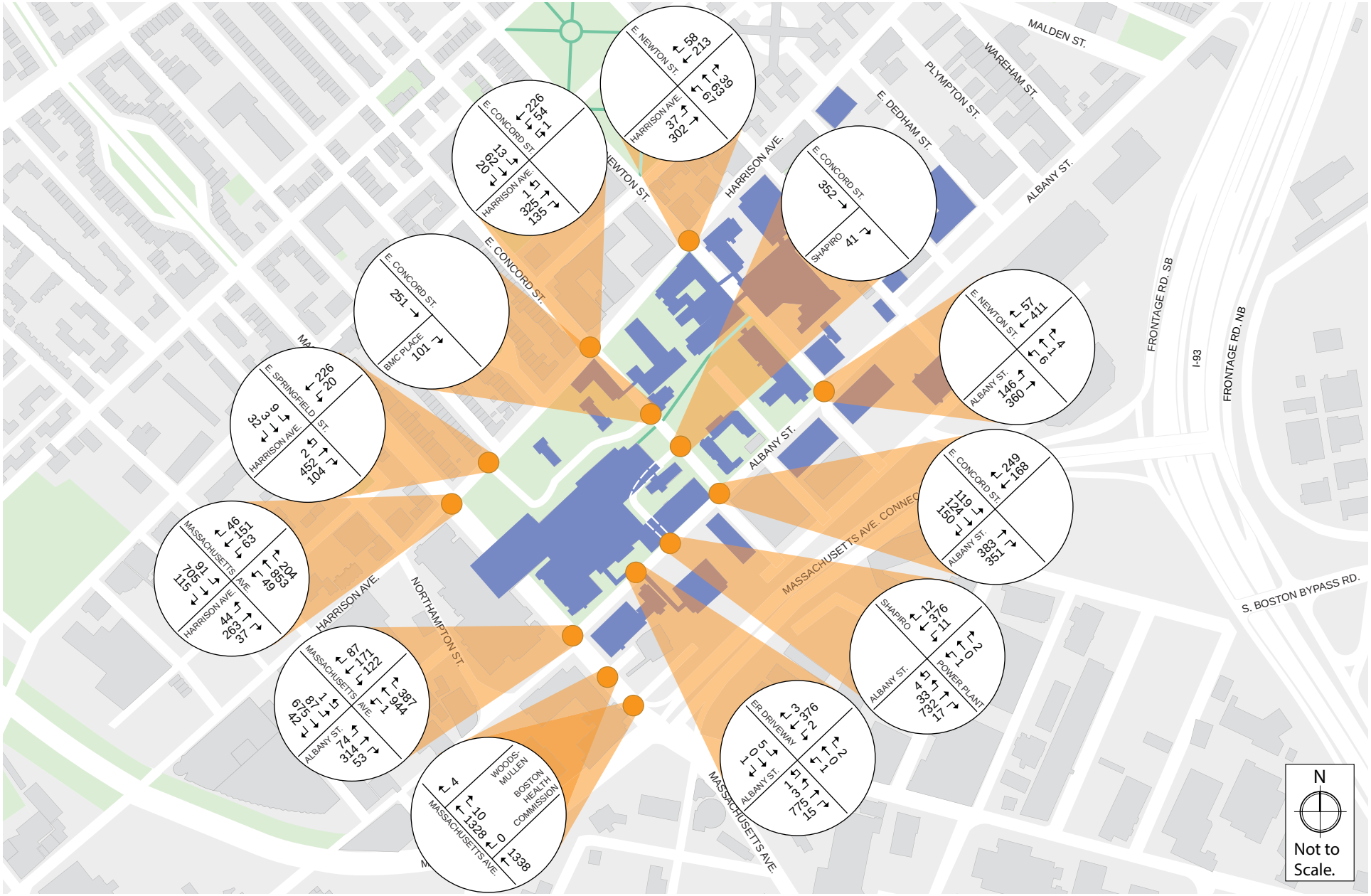

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Figure 4-4
Existing Conditions (2013) Traffic Volumes,
a.m. Peak Hour

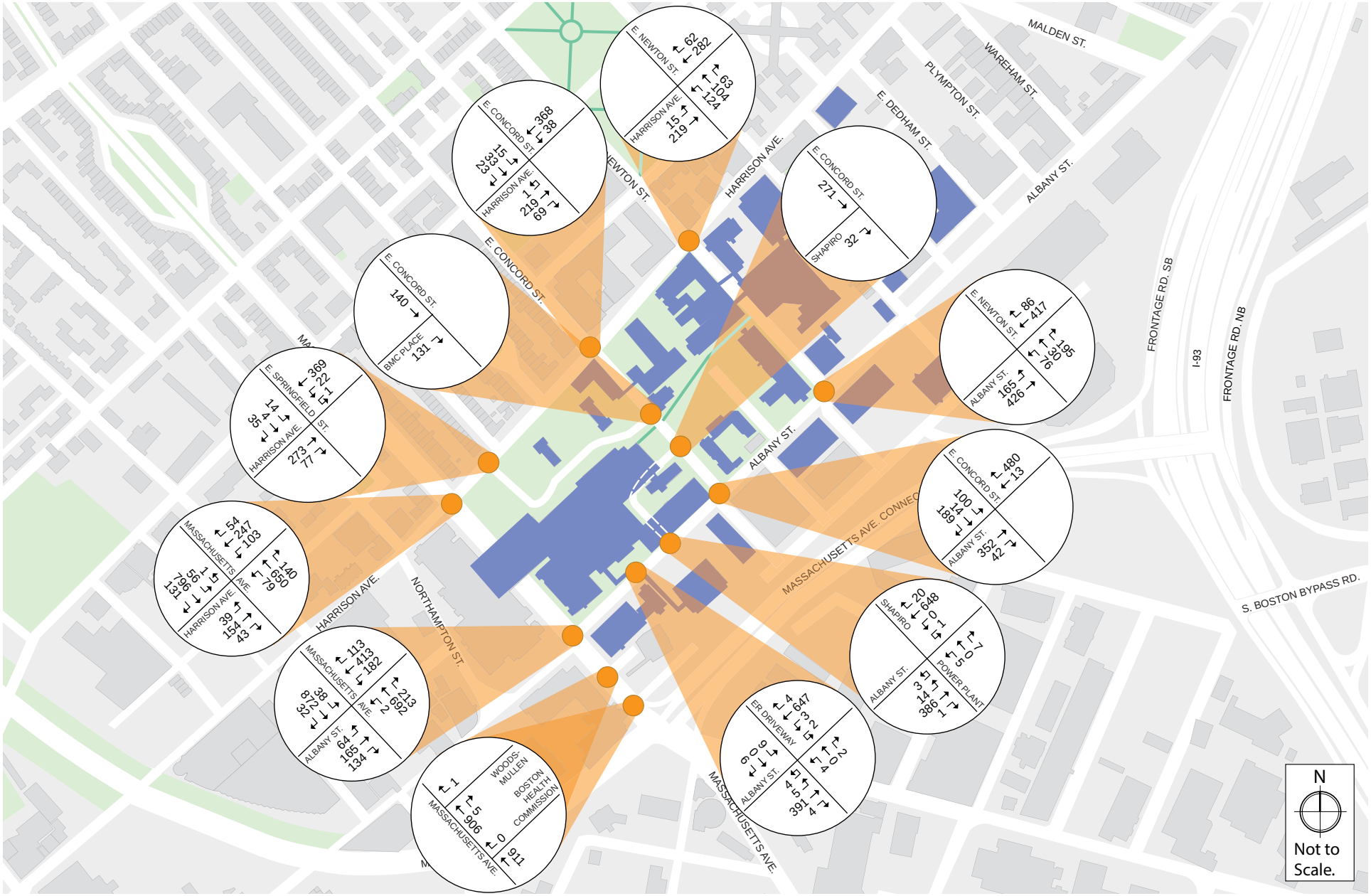

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Figure 4-5
Existing Conditions (2013) Traffic Volumes,
p.m. Peak Hour

4.2.4 Traffic Operations

Traffic operations are determined through an analysis of intersection Level of Service (LOS). LOS and delay at the intersections were analyzed using the Synchro software developed by Trafficware. Synchro 6 was used to evaluate the effects that closely spaced intersections may have on one another. Synchro is based on the traffic operational analysis methodology of the Transportation Research Board's *2000 Highway Capacity Manual* (HCM); LOS and delay (in seconds) are determined based on intersection geometry and available traffic data for each intersection. Signal timings and phasing used in this analysis were provided by BTD. **Table 4-1,** derived from the HCM, provides LOS criteria for signalized and unsignalized intersections. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (unacceptable), with significant traffic delay. LOS D is generally considered acceptable in an urban environment.

Table 4-1: Level of Service (LOS) Criteria (HCM Excerpt)

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

The ***v/c ratio*** is a measure of congestion at an intersection approach. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity.

The ***95th percentile queue length***, measured in feet, represents the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line during 5% of all signal cycles. The 95th percentile queue will not be seen during each cycle. The queue would be this long only 5% of the time and would typically not occur during off-peak hours.

Field observations were performed by Howard/Stein-Hudson Associates, Inc. (HSH) to establish intersection geometry (i.e., number of turning lanes, lane length, and lane width). Signal timing and phasing used in this analysis were obtained from BTD and through field observations conducted by HSH.

To evaluate existing intersection operations, the study team calibrated the level of service analysis based on field observations of actual queues and delays on March 18, 2013. Uncalibrated, the analysis can show exaggerated queues and delays. **Table 4-2** and **Table 4-3** summarize the existing morning and evening intersection LOS, delay, v/c ratio, and 95th percentile queue length analysis results for the Project. Detailed Synchro reports are provided in **Appendix B**.

Table 4-2: Existing Conditions (2013) LOS Summary, a.m. Peak Hour (7:45-8:45 a.m.)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Massachusetts Avenue/Albany Street	**C**	**32.0**		
Albany EB left/thru | thru	D	43.8	0.67	211
Albany EB right	D	35.2	0.24	68
Albany WB left	F	>80.0	0.82	#205
Albany WB thru | thru/right	B	12.2	0.28	92
Mass Ave NB thru | thru	D	35.5	0.75	453
Mass Ave NB right	C	20.8	0.49	293
Mass Ave SB left	E	67.3	0.61	129
Mass Ave SB thru | thru/right	B	18.0	0.43	228
Albany Street/Public Health Driveway	**A**	**9.6**		
Albany EB left/thru /right	B	12.0	0.57	598
Albany WB left/thru | thru/right	A	4.6	0.17	6691
Public Health NB left/thru/right	D	38.7	0.06	319
ER Driveway SB	N/A	-	-	-
Albany Street/East Concord Street	**C**	**21.0**		
Albany EB thru	C	25.8	0.54	352
Albany EB right	B	11.2	0.54	175
Albany WB left/thru | thru	A	7.1	0.43	43
E. Concord SB left	E	63.4	0.65	149
E. Concord SB thru	D	54.9	0.54	157
E. Concord SB right	B	13.6	0.60	25
Albany Street/East Newton Street	**B**	**16.1**		
Albany EB left	B	19.0	0.47	106
Albany EB thru	A	9.6	0.32	214
Albany WB thru | thru/right	B	18.4	0.31	233
E. Newton NB left	D	47.8	0.13	11
E. Newton NB thru/right	C	23.6	0.17	22
Harrison Avenue/East Newton Street	**B**	**19.4**		
Harrison EB left/thru	A	7.5	0.34	88
Harrison WB thru/right	B	10.0	0.28	165
E. Newton NB left/thru/right	D	51.0	0.80	124
Harrison Avenue/East Concord Street	**B**	**11.0**		
Harrison EB thru/right	A	6.2	0.40	230
Harrison WB left/thru	A	3.7	0.35	m66
E. Concord SB left/thru/right	D	45.7	0.62	94
Massachusetts Avenue/Harrison Avenue	**C**	**31.8**		
Harrison EB left/thru/right	E	60.6	0.92	#408
Harrison WB left/thru/right	E	70.1	0.94	#339
Mass Ave NB left	A	9.6	0.21	26
Mass Ave NB thru | thru/right	C	25.2	0.79	390
Mass Ave SB left	B	11.3	0.33	45
Mass Ave SB thru | thru/right	B	17.1	0.52	254

Intersection	LOS	Delay	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway				
Albany EB left/thru | thru/right	A	1.1	0.24	6
Albany WB left/thru | thru/right	A	0.5	0.14	2
Power Plant NB left/thru/right	D	29.7	0.08	6
East Concord Street/Shapiro Exit Driveway				
Shapiro EB right	B	11.6	0.10	8
E. Concord SB thru	A	0.0	0.24	0
East Concord Street/Boston Medical Center Place				
Boston Medical EB right	C	16.5	0.29	30
E. Concord SB thru	A	0.0	0.17	0
Harrison Avenue/East Springfield Street				
Harrison EB thru/right	A	0	0.36	0
Harrison WB left/thru	A	1.4	0.04	3
E. Springfield SB left/thru/right	C	17.6	0.21	19
Massachusetts Avenue/Woods-Mullen Service Driveway				
Woods-Mullen WB right	C	17.0	0.03	2
Mass Ave NB thru | thru | thru/right	A	0.0	0.34	0
Massachusetts Avenue/Boston Health Commission Exit Driveway				
Boston Health Commission WB right	-	-	-	-
Mass Ave NB thru | thru | thru	A	0.0	0.28	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicates LOS below D.

Table 4-3: Existing Conditions (2013) LOS Summary, p.m. Peak Hour (3:30-4:30 p.m.)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Massachusetts Avenue/Albany Street	**C**	**30.7**		
Albany EB left/thru | thru	D	40.0	0.50	122
Albany EB right	D	41.9	0.49	154
Albany WB left	E	66.2	0.72	205
Albany WB thru | thru/right	A	7.8	0.38	56
Mass Ave NB thru | thru	D	37.6	0.63	358
Mass Ave NB right	B	15.8	0.28	151
Mass Ave SB left	E	55.6	0.29	67
Mass Ave SB thru | thru/right	C	27.8	0.63	408
Albany Street/Public Health Driveway	**A**			
Albany EB left/thru /right	A	9.2	0.36	230
Albany WB left/thru | thru/right	A	1.5	0.30	m10
Public Health NB left/thru/right	D	38.2	0.06	25
ER Driveway SB	N/A	-	-	-
Albany Street/East Concord Street	**C**	**25.3**		
Albany EB thru	B	17.2	0.48	264
Albany EB right	B	12.3	0.10	42
Albany WB left/thru | thru	A	9.9	0.36	50
E. Concord SB left	D	41.9	0.37	121
E. Concord SB thru	C	35.0	0.06	23
E. Concord SB right	E	70.0	0.84	231
Albany Street/East Newton Street	**C**	**30.8**		
Albany EB left	C	34.7	0.54	187
Albany EB thru	C	23.8	0.40	374
Albany WB thru | thru/right	C	30.6	0.46	#312
E. Newton NB left	D	44.8	0.34	86
E. Newton NB thru/right	C	34.8	0.85	33
Harrison Avenue/East Newton Street	**C**	**24.7**		
Harrison EB left/thru	A	9.1	0.30	103
Harrison WB thru/right	B	12.0	0.38	249
E. Newton NB left/thru/right	D	53.0	0.88	197
Harrison Avenue/East Concord Street	**A**	**8.2**		
Harrison EB thru/right	A	4.4	0.27	127
Harrison WB left/thru	A	3.8	0.34	m109
E. Concord SB left/thru/right	D	39.5	0.52	72
Massachusetts Avenue/Harrison Avenue	**D**	**38.9**		
Harrison EB left/thru/right	D	35.0	0.63	232
Harrison WB left/thru/right	F	>80.0	>1.00	#548
Mass Ave NB left	B	12.5	0.36	41
Mass Ave NB thru | thru/right	B	18.6	0.55	239
Mass Ave SB left	A	10.0	0.21	32
Mass Ave SB thru | thru/right	B	19.6	0.62	310

Intersection	LOS	Delay	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway				
Albany EB left/thru | thru/right	A	0.8	0.13	3
Albany WB left/thru | thru/right	A	0.1	0.23	0
Power Plant NB left/thru/right	C	19.0	0.07	6
East Concord Street/Shapiro Exit Driveway				
Shapiro EB right	B	10.8	0.08	6
E. Concord SB thru	A	0.0	0.19	0
East Concord Street/Boston Medical Center Place				
Boston Medical EB right	B	14.8	0.33	36
E. Concord SB thru	A	0.0	0.09	0
Harrison Avenue/East Springfield Street				
Harrison EB thru/right	A	0.0	0.24	0
Harrison WB left/thru	A	0.9	0.03	2
E. Springfield SB left/thru/right	C	15.6	0.20	18
Massachusetts Avenue/Woods-Mullen Service Driveway				
Woods-Mullen WB right	C	20.5	0.02	1
Mass Ave NB thru | thru | thru/right	A	0.0	0.25	0
Massachusetts Avenue/Boston Health Commission Exit Driveway				
Boston Health Commission WB right				
Mass Ave NB thru | thru | thru	A	0.0	0.21	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicates LOS below D.

With existing volumes and existing geometry, during the a.m. and p.m. peak hours, typically LOS D or better is considered acceptable in an urban environment such as this Project. During the peak periods, all of the signalized and unsignalized intersections operate at an overall LOS D or better. The following descriptions explain specifically which approaches operate at LOS E or worse.

- Albany Street/Massachusetts Avenue operations are actually improved from conditions documented in the 2010 IMP, probably due to the Massachusetts Avenue improvement project. At that time, the intersection operated at LOS F both morning and evening. Although the overall intersection operates today at a much improved LOS C both morning and evening, the westbound Albany Street approach at Massachusetts Avenue operates at a LOS F in the a.m. peak and a LOS E in the p.m. peak. The approach of Massachusetts Avenue southbound left operates at a LOS E in the a.m. peak and the p.m. peak. This is due to the new signal phasing which limits SB left turns to one protected phase. Currently Massachusetts Avenue

traffic signals are still being optimized at the end of the improvement contract, although no completion time has been determined.

- Overall LOS at Massachusetts Avenue/Harrison Avenue has improved from LOS D in 2009 to C in the a.m. peak hour and from LOS E in 2009 to D in the p.m. peak hour. However, the Harrison Avenue eastbound and westbound left/thru/right approaches continue operate at LOS E during the a.m. peak hour. The approach of Harrison Avenue westbound left/thru/right operates at a LOS F during the p.m. peak hour. This is due to the high number of vehicles traveling northbound and southbound on Massachusetts Avenue taking away green time from the Harrison Avenue eastbound and westbound phase. Currently, as noted above, Massachusetts Avenue traffic signals are being optimized, although no completion time has been determined.

- At Albany Street, the East Concord southbound left operates at a LOS E during the a.m. peak and the approach of East Concord southbound right operates at a LOS E during the p.m. approach, unchanged from 2009 existing conditions. Overall, LOS at this location has improved from LOS D to C in the a.m. peak and from LOS E to D in the p.m. peak.

4.2.5 Parking

This section documents the existing on-street and off-street parking facilities in the study area. The parking inventory comprises off-street parking on the BUMC campus, distinguished between spaces for Boston University Medical Center employees and Boston University Medical Center visitors and patients.

4.2.5.1 Existing Off-Street Parking

Figure 4-6 illustrates the locations of the existing off-street Boston University Medical Center owned and leased parking garages and surface lots. Currently, Boston University Medical Center owns three (3) parking garages and four (4) surface parking lots and leases parking in two (2) parking garages and one (1) surface parking lot.

In March 2013, HSH studied supply and midday (11:00 a.m. to 1:00 p.m.) occupancy of all parking facilities on the campus. Capacities and occupancies were verified by Boston University Medical Center's Office of Parking Transportation Services. The study determined an overall occupancy rate of 85%. Approximately 500 spaces were available mid-day, according to the data. Capacity and occupancy of each facility are shown in **Table 4-4.**

As shown, Boston University Medical Center operates 3,422 spaces today, of which almost all – 92% -- are owned, and only 8% leased off-site. Of the total, 2,940 spaces are found in garages, and 482 in lots. Over the years, BUMC has transitioned its parking lots into garages as buildings have replaced the surface parking. The parking facilities serve a total of 3,643,516 square feet of space, including 520,000 square feet of occupied BioSquare space.

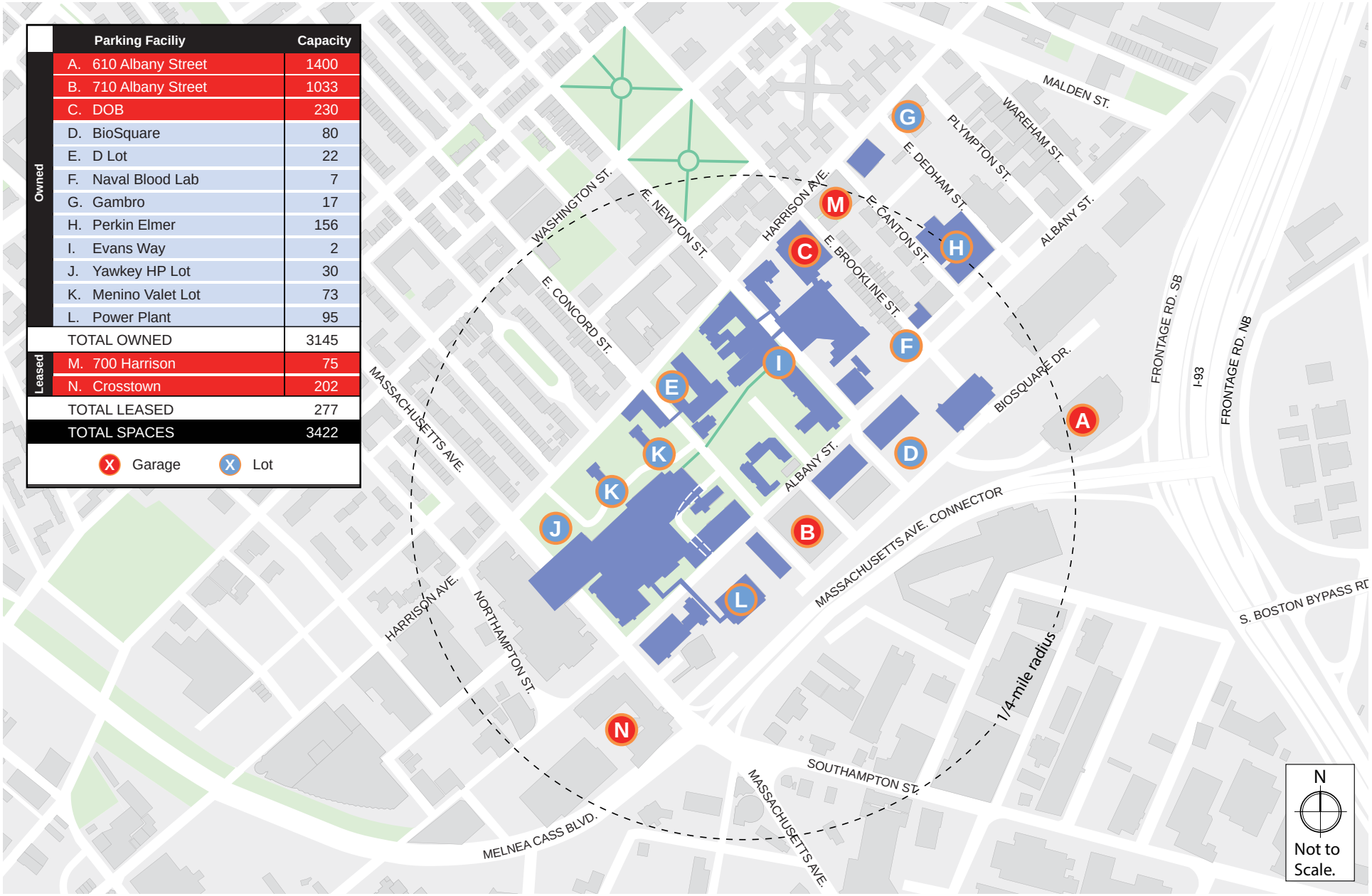

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Figure 4-6
Off-Street Parking

The on-campus parking ratio is 0.94 spaces per 1,000 square feet, in line with suggested BTD ratios of 0.75 to 1.0 spaces per 1,000 square feet.

Of the owned, on-campus spaces, approximately 941 are currently public spaces, available for patients and visitors of the campus. The Doctors' Office Building and the 710 Albany Garage are open to the public on a market rate, hourly basis, although around 325 staff permits are issued for spaces in those garages as well. The 610 Albany Garage is for medical center employees who pay market rate for spaces on a monthly basis.

Table 4-4 Campus Parking Supply and Occupancy

Map Key	Facility	Lot/ Garage	Own/ Lease	Existing Spaces	Midday Occupancy	%Occupied	User
	Owned Parking						
A	610 Albany	G	O	1,400	1,329	95%	Staff
B	710 Albany (including 14 reserved spaces outside garage)	G	O	1,033	859	83%	Primarily patients.
C	DOB	G	O	230	157	68%	Patients. Staff after 5:30 p.m.
D	BioSquare Lot E	L	O	80	36	45%	Staff
E	D Lot	L	O	22	10	45%	Staff
F	Naval Blood Lab	L	O	7	6	86%	Staff
G	Gambro	L	O	17	7	41%	Staff
H	Perkin Elmer	L	O	156	119	76%	Staff
I	Evans Way	L	O	2	2	100%	BUMC Provost, BU Senior Faculty
J	Yawkey HP Lot	L	O	30	25	83%	HP
K	Menino Valet Lot	L	O	73	54	74%	Patient/Valet
L	Power Plant	L	O	95	83	87%	Staff
	Leased Parking						
M	700 Harrison	G	L	75	51	68%	Staff
N	Crosstown	G	L	202	184	91%	Staff
	Summary			**Existing Spaces**	**Occupied Spaces**	**Occupancy**	
	Total Owned			3,145	2,687	**85%**	
	Total Off-site Leased			277	235	**85%**	
	Total Parking			**3,422**	**2,922**	**85%**	

Source: BUMC 3-13

Boston University Medical Center issues 2,916 staff permits for the 3,422 total spaces. The largest staff garage at 610 Albany Street accommodates 2028 employee permits within its 1,400 space capacity, due to part-time schedules, shift workers, etc. which allow each space to serve more than one employee over the course of the day. Other garages accommodate fewer employee permits, freeing up spaces for patients and visitors. At the 710 Albany Garage, for example, only 297 permits are issued for the 1,019 total spaces, allowing for patient parking.

A midday (11:00 a.m. to 1:00 p.m.) occupancy check of off-street on Wednesday, March 6, 2013 indicated that overall occupancy of all facilities was 85% -- with a surplus of only 500 spaces. As shown in the table above, however, several facilities did have available spaces, primarily those geared toward patient/visitor parking. As a matter of policy, patients and visitors have priority in this hospital setting.

4.2.5.2 Existing On-street Parking

Figure 4-7 illustrates the City of Boston on-street parking supply in the study area along with regulations within the campus.

As shown, parking in the quarter-mile surrounding the project site can be thought of in three large segments. The segment between Harrison Avenue and Washington Street is composed primarily of South End resident parking. The segment between Harrison Avenue and Albany Street consists primarily of metered and unrestricted parking. East Brookline Street and East Canton Street are signed for South End Resident Parking. There are several areas within this zone that cannot be used for parking for a variety of reasons including MBTA bus stops, loading zones and construction. The third segment, south of Albany Street is dominated by Melnea Cass Boulevard and the Massachusetts Avenue Connector. Parking is not permitted on either of these major roads.

4.2.6 Public Transportation

This section highlights the transportation routes, schedules, and capacity of public transportation within the medical center.

4.2.6.1 MBTA Bus Service

As shown in **Table 4-5** and **Figure 4-8,** seven Massachusetts Bay Transportation Authority (MBTA) bus route and the Silver Line Bus Rapid Transit currently provide public transit service to the site and the medical area as a whole. The bus and bus rapid transit routes connect the BUMC Campus area with Cambridge, Longwood Medical and Academic Area (LMA), South Boston, Back Bay/South End, Lower Roxbury, and Downtown, as well as with MBTA subway stations, including the Red Line (Broadway, Andrew, and JFK/UMass) and the Orange Line (Massachusetts Avenue, Back Bay, and Ruggles). Major bus stops with shelters on the BUMC Campus are located on East Newton Street and East Concord Street between Harrison Avenue and Albany Street. Buses also stop along Albany Street, Harrison Avenue, and Massachusetts Avenue.

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Figure 4-7
On-Street Parking

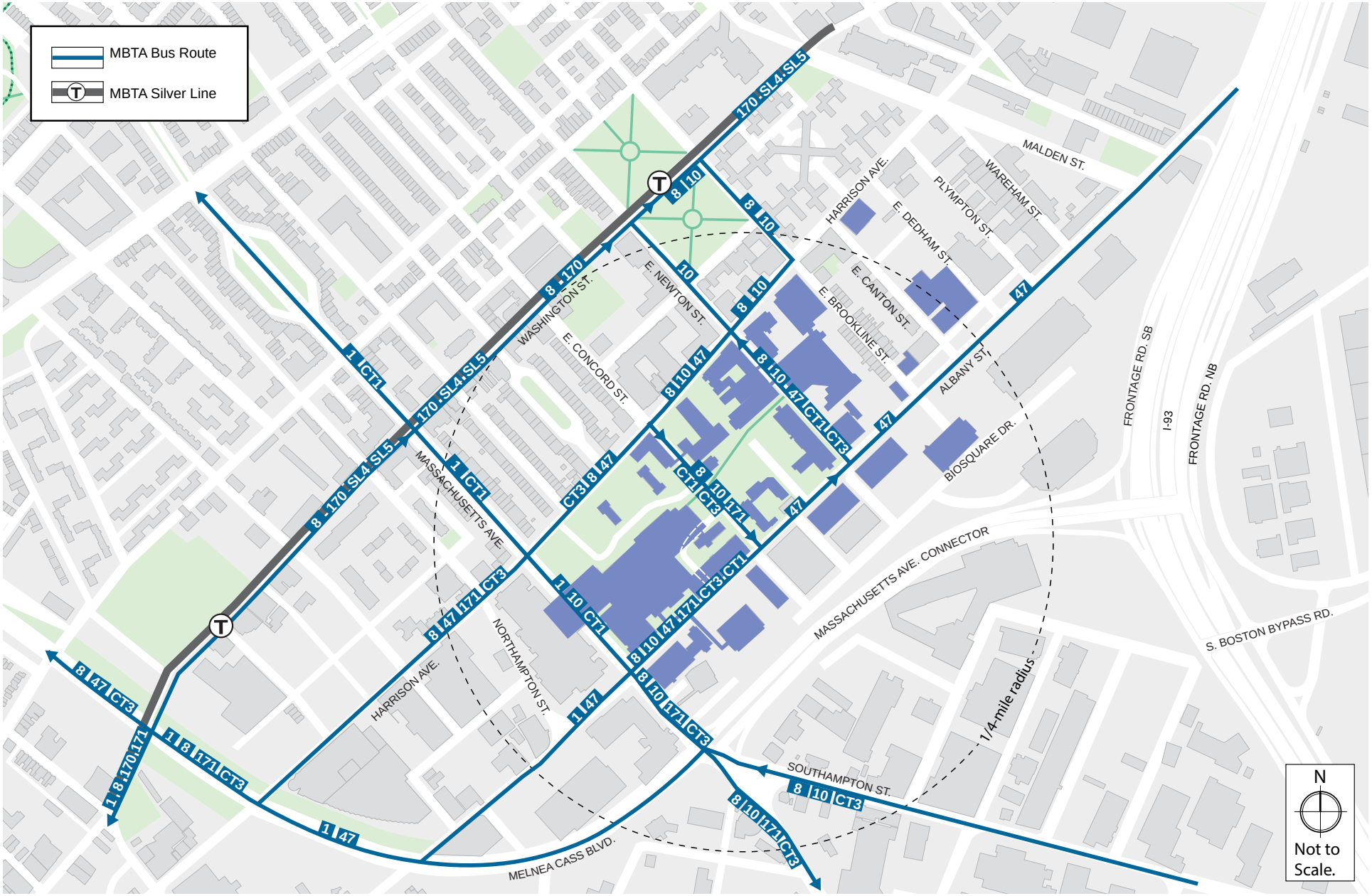

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Figure 4-8
Public Transportation in the Study Area

Table 4-5 Existing MBTA Bus Service in the Study Area

Bus Route	Origin–Destination	Rush-hour Frequency (min)
CT #1	Central Square (Cambridge)–BUMC	20
CT #3	Beth Israel Hospital–Andrew Station	20
1	Harvard–Dudley Square	8-11
8	UMass–Kenmore	15–20
10	City Point–Copley Square	20
47	Central Square–Broadway	8-10
170 (PM)	Central Sq., Waltham – Dudley Square	60
171 (AM)	Dudley Station - Logan Airport via Andrew Station	30

Sources: www.mbta.com

4.2.6.2 MBTA Silver Line

In July 2002, Boston's first Bus Rapid Transit service, the "Silver Line", opened along Washington Street between Dudley Square and Downtown Crossing. In the fall of 2009, the route was extended and now runs between Dudley Square, Downtown Crossing, and South Station. A transit priority lane is provided in each direction between Melnea Cass Boulevard and the Massachusetts Turnpike along Washington Street (the lane is shared with general traffic turning right). The Silver Line replaces the existing Route #49 bus, which previously operated on Washington Street, and operates at 8-10minute headways during peak periods. The Silver Line stop closest to the campus is on Washington Street at East Newton Street, approximately a five-minute (one-quarter mile) walk, or two blocks from the intersection of Albany Street and East Newton Street.

4.2.6.3 MBTA Commuter Rail Service

The closest existing commuter rail station to the medical area is found at South Station. However, the MBTA is in the process of upgrading the Fairmount commuter rail line, which runs from Readville in Hyde Park into South Station, with a new stop under construction at NewMarket Square. According to the MBTA website, the proposed NewMarket Station will be located just north of the Massachusetts Avenue Bridge and directly adjacent to the South Bay Shopping Center. The actual site location is between the bridges at Southampton Street and Massachusetts Avenue. Given its proximity to jobs within NewMarket Square as well as Boston University Medical Center the NewMarket Station has a unique characteristic of being considered a destination station.

The station will consist of approximately 800-foot long high-level platforms in order to facilitate direct platform-to-coach boarding. The platforms will include detectable warning strips, new canopies, passenger shelters, benches/windscreens, wayfinding signage, graphic panels, and a train approach warning system, variable message signs, and high non-glare lighting. The station will also be equipped with closed circuit television (CCTV) video surveillance cameras, police emergency call box systems, and public telephones. There are no available parcels of land in the immediate area so parking and a drop-off/pickup area are not incorporated into the design. Constructing new concrete ramps and sloped walkways will provide full access to both the inbound and outbound platforms for all passengers.

The construction work commenced in January 2011 and is expected to be completed by Summer, 2013. The opening of this station will enhance public transportation options for the Boston University Medical Center community, particularly from neighborhoods to the south.

4.2.6.4 TranSComm Shuttle Services

Founded in 1991 as one of the first organizations of its kind in Boston, Boston University Medical Center's Transportation Management Association (TMA) is called Transportation Solutions for Commuters, Inc. (TranSComm). TranSComm's members include the Boston University Medical Campus (the BU Schools of Medicine, Public Health, Graduate Medical Science and Dental Medicine), Boston Medical Center, BioSquare, and Boston Health Care for the Homeless Program.

TranSComm works to bring more frequent and accessible public transportation to the Medical Center community and provides information on transportation services in the area (see www.transcomm.org). Additional information on TranSComm programs is found in Section 4.6.

With its dedicated bus and shuttle program Boston University Medical Center through TranSComm can significantly reduce the number of inter campus vehicle trips. The radial routes can reduce the number of vehicle trips made by patients.

TranSComm operates the following 15- to 30-passenger shuttles:

- VA Shuttle for employees and students travels from Boston Veterans Administration Medical Center (VA) in Jamaica Plain to the BUMC Campus several times per day on the hour, from 10:00 a.m. to 5:00 p.m., leaving the BUMC Campus.

- Evening Shuttle travels on request from a central stop at 710 Albany Street on the BUMC Campus to MBTA subway stations at Andrew, Broadway, Ruggles, Back Bay and Copley stations, nearby South End neighborhood locations, and Boston University Medical Center parking lots and garages from 5:15 p.m. to 12:15 a.m.

- Inner Campus Shuttle, primarily for patients, travels on a continuous loop between institutions from 9:00 a.m. to 5:00 p.m. Arrival and departure times vary according to the number and disposition of patients taking the shuttle. Specific pick-up times can be scheduled by phone.

- Healthnet Shuttle, a free service primarily for patients, travels from Boston neighborhoods to Boston Medical Center (for patients only). Centers served include the Mattapan Community Health Center, Harvard Street Neighborhood Health Center, Greater Roslindale Medical & Dental Center, Whittier Street Health Center, Roxbury Comprehensive Health Center, South End Community Health Center, Codman Square Health Center, East Boston Neighborhood Health Center and Uphams Corner Health Center.

- Charles River Campus Shuttle travels from the BU Charles River Campus hourly from 7:00 a.m. to 9:30 p.m. and hourly at 10:00 and 11:00. This schedule is modified during the summer months.

- TranSComm allows South End residents to use its shuttle services at no cost. This includes the all-day campus shuttle stopping at St. Helena House, a facility for elderly and disadvantaged South End residents.

4.2.7 Pedestrian Conditions

The medical campus, with its treatment and academic functions, generates a significant number of pedestrian trips throughout the study area, including trips along and across many of the study area roadways. Generally speaking, the sidewalks on Albany Street are in good condition and are of adequate width. Most sidewalks are 8–10 feet wide.

Pedestrian conditions within the medical center are acceptable along the most heavily traveled roadways; Massachusetts Avenue, Harrison Avenue, Albany Street, and the mid-block East Concord Street crossing that connects the Moakley Building to the educational programs of the medical center. Four study area intersections have exclusive pedestrian phases: East Concord Street/Albany Street, East Newton Street/Albany Street, East Concord Street/Harrison Avenue, and East Newton Street/Harrison Avenue. During the exclusive pedestrian phase, all vehicular traffic is stopped to allow pedestrians to cross.

Pedestrian pathways are shown in **Figure 4-9**. A.m. and p.m. peak hour pedestrian volumes are shown **in Figure 4-10.**

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Figure 4-9
Pedestrian Pathways

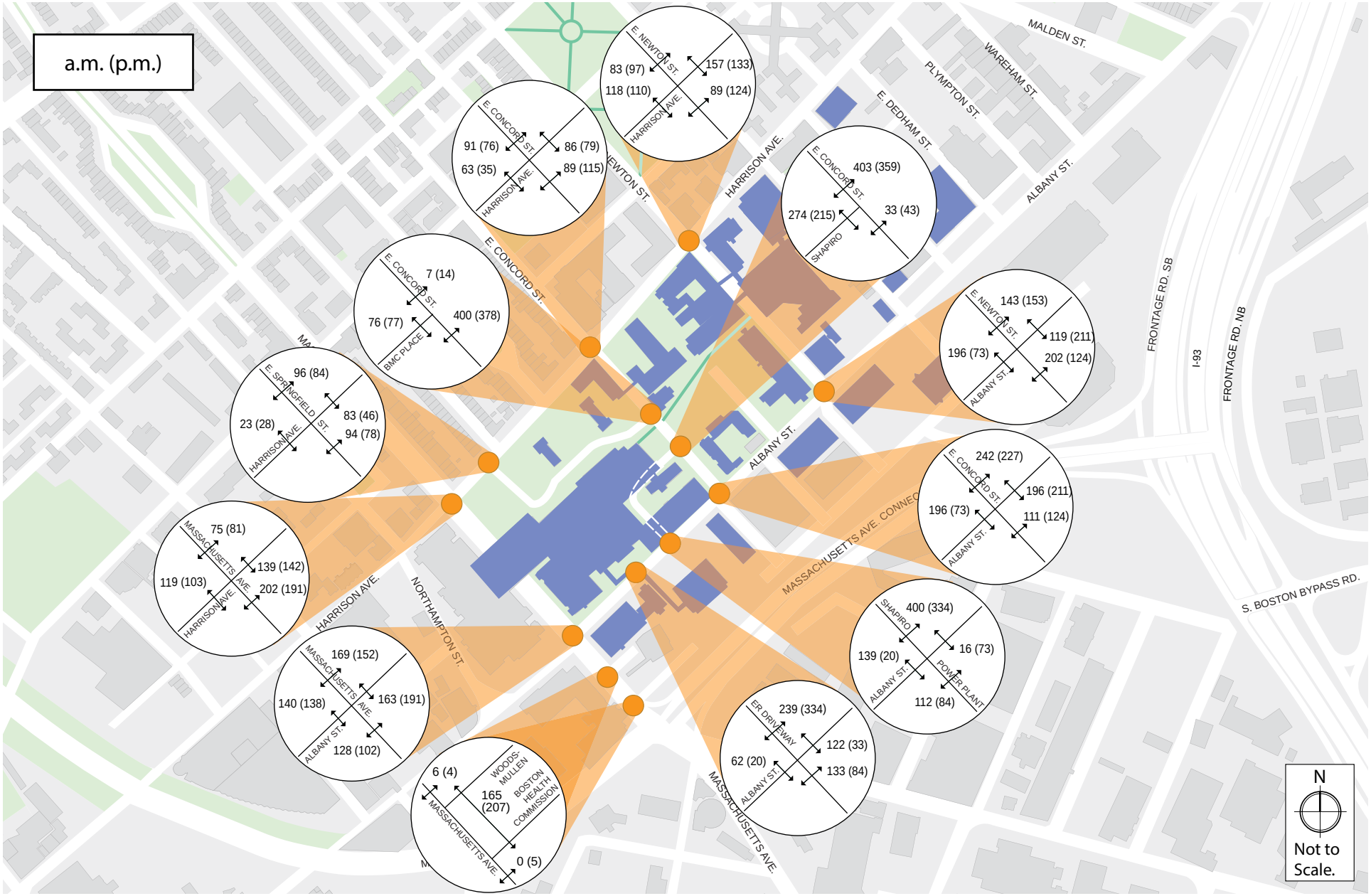

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Figure 4-10
Existing Conditions (2013) Pedestrian Volumes, a.m. and p.m. Peak Hours

4.2.8 Bicycle and Scooter Facilities

Albany Street, Massachusetts Avenue, Harrison Avenue, and East Newton Street are generally considered on-street bicycle routes in this area. In recent months, the City of Boston has created marked bike lanes and marked shared-travel bike lanes (where space does not allow an exclusive bike lane) between parked cars and the outside travel lanes on Massachusetts Avenue between Albany Street and St. Botolph Street as part of a major improvement project, extending lanes already in place from Huntington Avenue across the Harvard Bridge into Cambridge. The Southwest Corridor bike path can be reached via Massachusetts Avenue or Melnea Cass Boulevard. According to a 2002 survey of Boston University Medical Center employees conducted by TranSComm, about 1% of employees rode bicycles to work at Boston University Medical Center (most of the cyclists are likely students). TranSComm continues to encourage cycling as a healthy, inexpensive, and environmentally positive alternative to driving alone and provides many amenities and programs, including:

- Installing three secure, weather protected bike cages. The first one, installed in March, 2006, is located on East Newton Street between the Newton Pavilion and the School of Dental Medicine and houses approxinmately132 bicycles. The second one, installed in October 2006, is located at the Menino Pavilion. It was expanded in 2012 from 87 to 138 spaces. Both cages are well utilized. As a result, a third bike cage with room for 70 bicycles was added early in 2013 in the 710 Albany garages, bringing the total spaces in bike cages up to 340 spaces. In 2012 there were 376 registered bike cage cyclists.

- Providing a bicycle lock loan program for cyclists;

- Providing showers for cyclists in the basement of the School of Medicine building;

- Providing umbrellas for walkers and cyclists if it rains;

- Organizing free bike safety and mechanical check-ups, twice per year: TranSComm works with local bike shops to bring this popular event to the Medical Center to encourage cyclists to bike to work/school.

- Registering bikes on-line: For students and Boston University Medical Center employees, bike registration continues to be offered on-line.

- Installing new racks and repairing existing bike racks located throughout the campus.

- Boston University Medical Center will work with Boston's Director of Bike Programs to identify ways to improve bicycle use.

- Motorcycles may park at the BUMC Campus garages at regular parking rates.

- Six gas-powered scooter parking spaces are provided for employees in the 610 Albany Garage. All gas powered scooters must have a $20 annual Boson University Medical Center sticker issued by TranSComm.

- Electric scooters must park in the bike cages located at the Menino and East Newton Pavilions for a $20 annual fee. The scooters must park along the sides of the bike cages so that they do not take up additional bike parking spaces or obstruct movement of other bicycles/scooters.

Hubway, a bicycle sharing system in Metro Boston launched in July 2011, now has more than 100 stations with 1,000 bicycles available throughout Boston, Brookline, Cambridge, and Somerville. Hubway bicycles are available during the spring, summer, and fall seasons (the system is shut down in the winter). Near the Project site, there are four Hubway stations:

- at the Boston Medical Center FGH Building at 820 Harrison Avenue;

- at the corner of Washington Street and Rutland Street;

- at the corner of Washington Street and Lenox Street; and

- at the corner of Washington Street and Waltham Street.

Each Hubway station accommodates between 15 and 20 bicycle docks. All four stations are within a half-mile of the BUMC Campus.

4.2.9 Car Sharing Availability

Car sharing, predominantly provided by Zipcar in the Boston area, supplies easy short-term access to vehicular transportation for those who do not own cars. Vehicles are rented on an hourly or daily basis with all vehicle costs (gas, maintenance, insurance, and parking) included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location. Approximately twenty-six Zipcars are located at six locations within one-quarter mile of the Project site. Also, Hertz On-Demand car sharing options are available on the Northeastern Campus, which is located outside of the one-quarter mile radius. In 2012 there were 521 students and 146 employees enrolled in the Zipcar program – 667 total members.

Bicycle, Scooter, and Zipcar facilities on campus are shown in **Figure 4-11.** **Figure 4-12** shows a.m. and p.m. peak hour bicycle volumes.

4.2.10 Loading and Service

Boston University Medical Campus is served by two primary loading docks, serving the west and east sides of the campus. A weekly schedule of deliveries at each location was provided by BMC. Truck activity at each location is summarized in **Table 4-6.** Only one delivery per day at each loading dock is made by a 53' truck, at either 9:00 or 10:00 a.m.

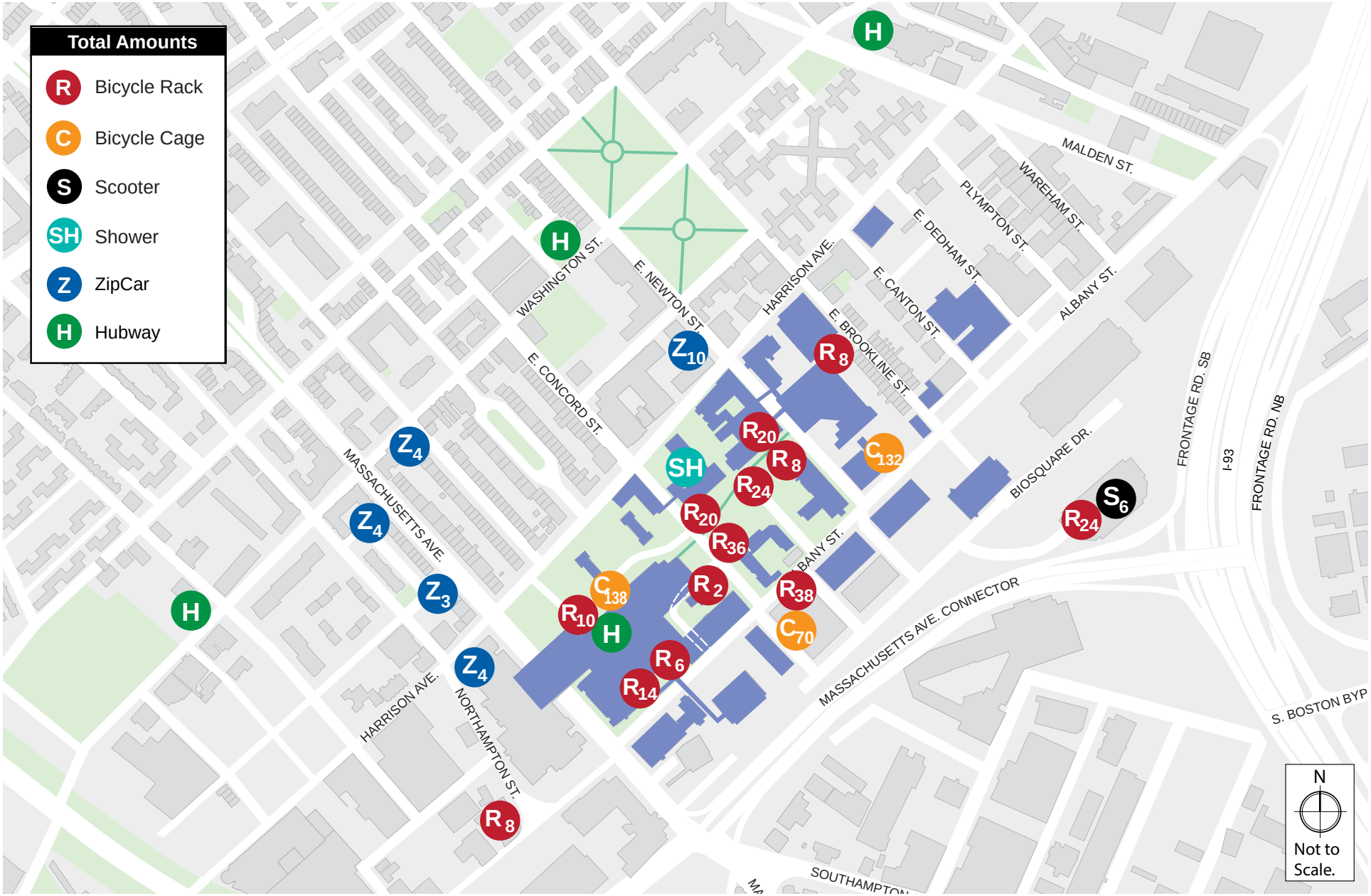

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Figure 4-11
Bicycle, Scooter, and ZipCar Locations

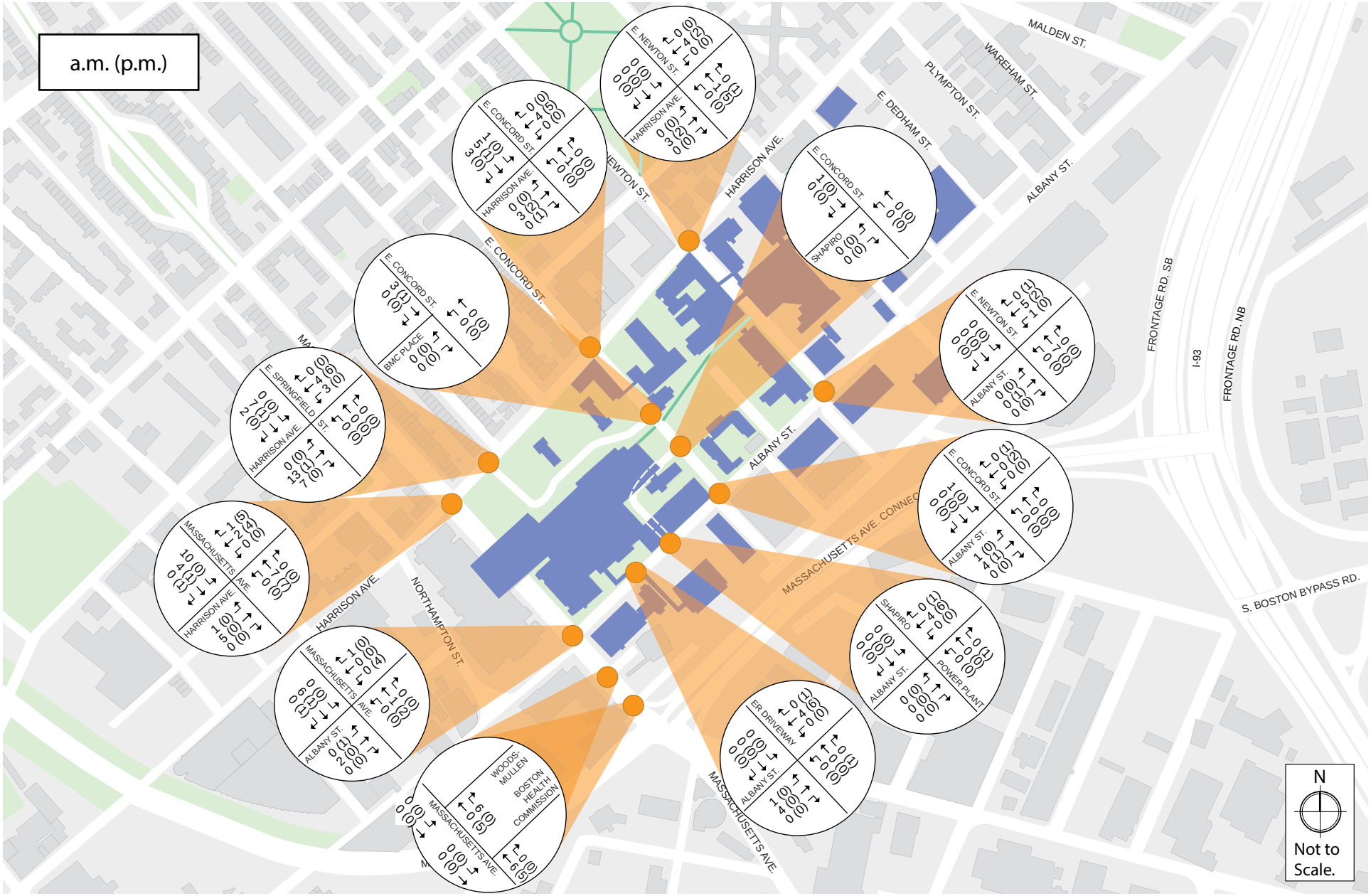

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Figure 4-12
Existing Conditions (2013) Bicycle Volumes, a.m. and p.m. Peak Hours

Table 4-6 Existing (2013) Average Weekday Truck Activity: Menino and Newton Loading Docks

	Menino Dock	Newton Dock	Total
Vehicle Type	**Vehicles Observed**	**Vehicles Observed**	
Car/Van/Pick-up	9	5	14
27′ Truck	17	7	24
48′ Truck	4	5	9
53′ Truck (Tractor Trailer)	1	1	2
Total	**31**	**18**	**49**

A graph showing weekday activity at each loading dock by hour is provided in **Figure 4-13.** As shown, the peak hour for deliveries at Newton is 8:00 to 9:00 AM, when six vehicles enter. At Menino, the peak hours occur at 5:00-6:00 AM, 6:00-7:00 AM and 10:00-11:00 AM, when four vehicles enter.

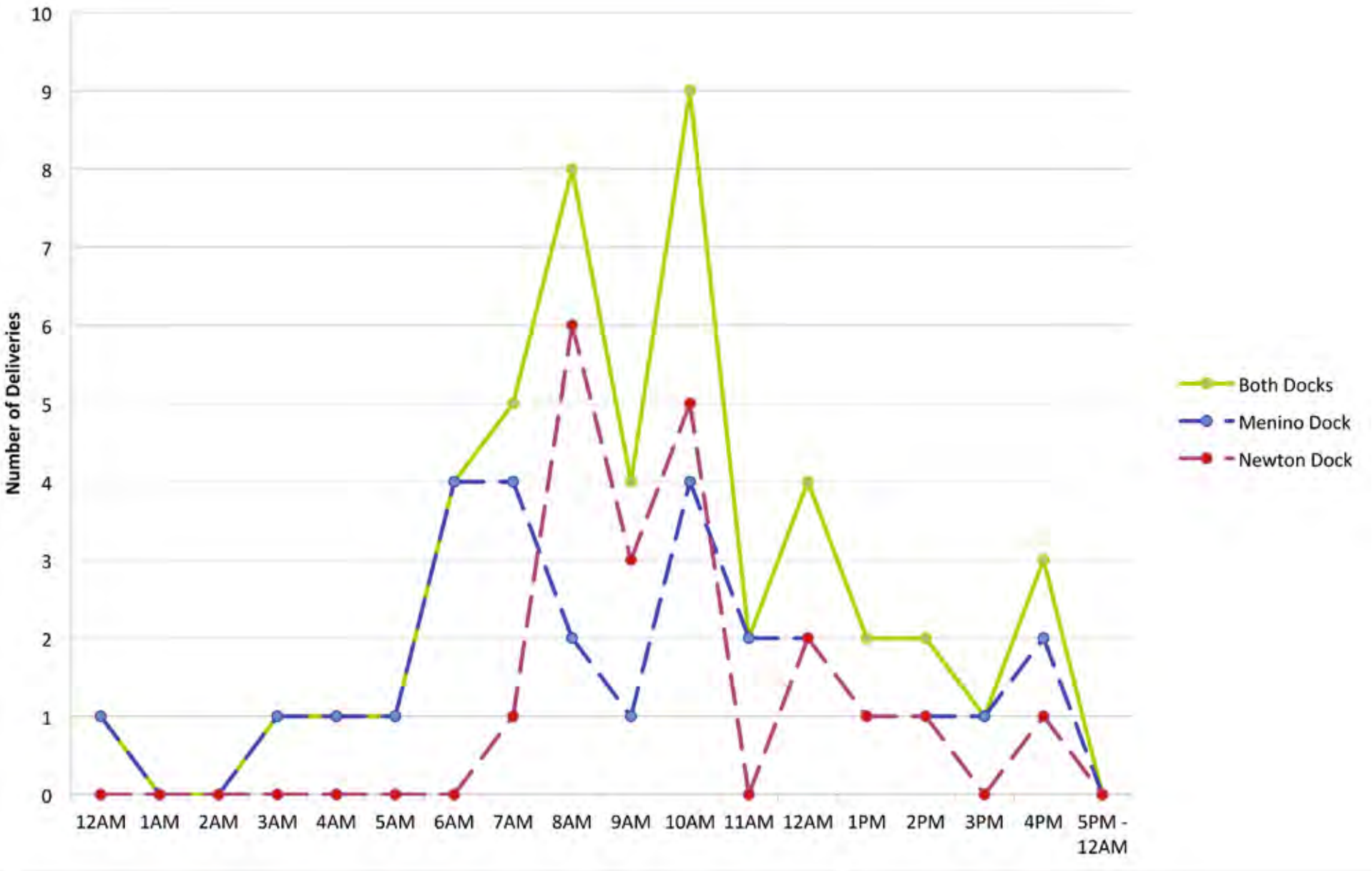
4.2.10.1 Menino Loading Dock

The main campus loading dock at 751 Albany Street (Menino dock) has three dedicated bays, with occasional loading for small vehicles occurring in front of the trash compactors. Trucks access the loading dock from Albany Street; larger trucks must back in from the street. This facility serves the BMC West Campus – the Menino Pavilion, the Yawkey Ambulatory Care Center, the Dowling Building, and the Moakley Building. Its operating hours are 12:00 a.m. to 5:00 p.m., Monday through Friday, although there are three deliveries at 12:00 a.m., 9:00 a.m. and 11:00 a.m. on Saturday and Sunday. The Menino dock accommodates vehicles ranging from a small van to a 53′ truck. The docks carry approximately 31 vehicles on an average weekday day; the typical duration at the dock is 36 minutes, according to a nine-hour survey conducted on September 27, 2012.

The peak hour for deliveries is 10:00 a.m. on Wednesdays and Fridays, when 4 vehicles arrive at the loading dock.

4.2.10.2 Newton Loading Dock

The Newton Pavilion loading dock, serving 88 E. Newton Street, is located on Albany Street midblock between East Newton and East Brookline Streets, with three dedicated bays. This facility serves the east side of the campus, including the Newton Pavilion, the Evans Building and the Doctors Office Building. This loading dock is open from 7:00 a.m. to 5:00 PM Monday through Friday, although there are two deliveries per day at 10:00 a.m. and 4:00 p.m. on Saturday and Sunday. Again, most of the deliveries are made by smaller vehicles. This dock accommodates 18 vehicles per average weekday. The peak hour for deliveries is Wednesdays and Fridays at 10:00 a.m., when 5 vehicles arrive at the loading dock.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8AM
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10AM
11AM
12AM
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2PM
3PM
4PM
5PM - 12AM
Both Docks
Menino Dock
Newton Dock

4.3 Evaluation of Long-term Impacts

Long-term transportation impacts were estimated for 2019, to reflect the initial term of the Institutional Master Plan.

4.3.1 No-Build Scenario 2019

The no-build scenario models traffic operations for a horizon year without considering any IMP project traffic estimates. No-Build traffic volumes were developed by applying a general traffic growth factor, along with specific study area traffic added to the street network by individual projects.

4.3.1.1 Background Growth Factor

A background growth factor of 1% per year is assumed for the project, consistent with BTD approved rates for current development projects in the area. All existing traffic volumes are increased by 1% per year for a period of 6 years. Given the fact that trips from projects nearby are specifically included in the network, this is extremely conservative.

4.3.1.2 Projects Included in the No-Build Scenario

To provide a conservative analysis, the no-build scenario also adds traffic contributions from specific projects approved and/or under construction. These projects are shown in **Figure 4-14.** Traffic volumes from the following projects were specifically traced through the study area traffic network:

- BioSquare Building E – The proposed project includes 160,000 square feet of research and development space. Although its traffic has been added to the No-Build network, it is not anticipated that this project will be built within the 10-year term of the IMP.
- BioSquare Building G – The proposed project includes 215,000 square feet of research and development space (approved, not constructed). Although its traffic has been added to the No-Build network, it is not anticipated that this project will be built within the 10-year term of the IMP.
- NEIDL Building – The proposed project includes 250 additional employees (built, not fully occupied).
- 275 Albany Street – The proposed project includes the redevelopment of the former Teradyne parking lot into a hotel consisting of 325 hotel rooms and 220 apartments. Most of the vehicle trips will be accessing the regional roadways north of East Berkeley Street.

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Figure 4-14
Area Projects

- 35 Northampton Street – The proposed project includes the rehabilitation of the existing 29-story, 165,000 square feet residential building. The existing office space within the building will be converted to 11 handicap accessible residential units, for a total of 245 affordable units.

- Ink Block (300 Harrison Avenue) – The proposed project includes 471 units, 85,000 square feet of retail, including a supermarket and 411 parking spaces.

In addition, traffic added from the projects below was considered to be reflected in the area-wide growth factor of 1% per year:

- Albany Fellows Phase 2 - to encompass approximately 358,500 square feet of above-grade building space and up to 322 parking spaces. Potential uses for these future facilities may include: housing ground level retail, office, backstreets, research & development, and academic space.

- 5-10 St. George Street - The proposed project includes 33 residential units and approximately 22 underground parking spaces. Traffic from this project was included in the overall growth factor.

- 199 West Brookline Street – The proposed project includes an adaptive reuse and rehabilitation of the existing Concord Baptist Church, which will include approximately nine residential units and 21 below grade parking spaces. Traffic from this project was included in the overall growth factor.

- Alexandra Hotel Rehab - The proposed project includes renovating the existing building to accommodate the Church of Scientology's new 45,000 square foot headquarters including ground floor retail. Traffic from this project was included in the overall growth factor.

In addition, the following infrastructure improvements were taken into account in developing the No-Build network:

Southbound Frontage Road Connection. The BioSquare Phase II project permitting included a connection from BioSquare Drive to the Frontage Road Southbound, which was approved, and also included a long-term goal of a connection to the Massachusetts Avenue Connector from East Concord Street.

Currently, BioSquare Drive has been constructed just short of its intersection of Frontage Road Southbound and the right-turn in/right-turn out intersection is anticipated to be completed prior to the completion of IMP projects. Although traffic generally operates at an acceptable level without either connection, the Frontage Road connection is expected to relocate traffic from Albany Street to BioSquare Drive and improve the roadway capacity and traffic operations within Boston University Medical Center. For this project, we have estimated that 17% of employee vehicle trips are expected to access the site from the Frontage Road Southbound Connection, as well as 29% of employee exiting vehicle trips.

MBTA Urban Ring. As noted in prior filings, Boston University Medical Center is located within the corridor of the MBTA's planned "Urban Ring" or circumferential transit project. At the present time, bus routes CT1 and CT3 serve as circumferential routes through the campus. Boston University Medical Center has worked with the MBTA over the years on long-term plans for the Urban Ring. At present, the locally preferred alternative for the Urban Ring Phase 2 is outlined in the November 2008 *Revised Draft Environmental Impact Report/Draft Environmental Impact Statement* (DEIR/DEIS) and expanded upon in a June, 2009 *Notice of Project Change* (NPC). This option calls for Bus Rapid Transit in both mixed traffic and exclusive lanes travelling through the BUMC Campus on Albany Street between Broadway Station and a new Crosstown Station. A new BU Medical Center Station would also be provided between E. Newton Street and E. Concord Street. In January 2010, the Massachusetts Department of Transportation notified the Executive Office of Environmental Affairs that it was suspending further environmental review of the Urban Ring Phase 2 project. Thus, no changes to MBTA transit services were assumed to be implemented by 2019.

MBTA Indigo Line. The MBTA is improving the Fairmount Branch of the commuter rail that runs from South Station to Readville in Hyde Park, calling it the "Indigo Line." BUMC and TranSComm have been advocating with the MBTA to build a new station at NewMarket Square, which will increase transit options to BMC for a densely populated area in Boston. Construction of Phase 1 of the "Indigo Line" is under construction now. This will rebuild Uphams Corner and Morton St stations so they are ADA compliant, with high level platforms, and better shelter from the elements. Phase 2 will construct new stations along the route at NewMarket, Five Corners, Talbot Ave, and Blue Hill Ave. The MBTA estimates that service to the new NewMarket Station will begin in Summer, 2013. No increased transit mode share was estimated as a result of this new service in the interest of a conservative analysis.

City of Boston Melnea Cass Boulevard Improvement Project. The Boston Transportation Department is working with the Roxbury community to redesign Melnea Cass Boulevard with the goal of making it a neighborhood friendly corridor. The scope includes the development of roadway and streetscape designs that create a pedestrian friendly environment, ensure efficient traffic flow, accommodate transit vehicles and bicycles and promote economic development. The redesign plans will include dedicated bus lanes that can accommodate existing transit and future BRT service. As a final design has not yet been adopted, traffic analyses reflect current geometry and signal timing.

The design is progressing in collaboration with Roxbury and other surrounding communities and with all relevant City and state agencies, neighborhood groups and corridor abutters. The BTD, as lead agency on the project, aims to incorporate the city's new "Complete Streets" strategy as well as the goals of the Roxbury Strategic Master Plan (RSMP) and the state-devised Urban Ring project. The Complete Streets approach focuses on the needs of pedestrians, bicyclists and transit users as well as drivers, and on environmentally sustainable design.

4.3.1.3 No-Build Traffic Impacts 2019

No-Build traffic volumes were calculated by factoring the existing volumes up by a .05 percent annual growth rate over 10 years and totaling the project-added trips for each development described above. The No-Build street networks, shown in **Figure 4-15** and **Figure 4-16**, include the Frontage Road Southbound connection to BioSquare Drive east of Albany Street, which has been approved by the City. Morning peak hour overall intersection traffic operations under No-Build conditions are shown in **Table 4-7.**

Evening peak hour overall intersection traffic operations under No-Build conditions are shown in **Table 4-8.**

Under No-Build Conditions, most signalized intersections continue to operate at the same overall level of service in both the morning and afternoon peak hours as the Existing Conditions. The intersections and approaches that decreased to an LOS E or worse are listed below:

- At Massachusetts Avenue/Albany Street, the LOS for Massachusetts Avenue southbound left turn decreased from LOS E to LOS F during the a.m. peak hour. However, the overall LOS, while reduced from LOS C to LOS D, is still within the acceptable range.

- At Albany Street/East Concord, LOS for the East Concord Street southbound through movement decreased from LOS D to LOS E during the a.m. peak hour, although overall LOS remains at C.

- At Albany Street/East Newton Street, the LOS for East Newton Street northbound decreased from LOS C to LOS E during the a.m. peak hour, although overall LOS remains at LOS D.

- At Albany Street/Shapiro Entrance Driveway/Power Plant Driveway, the Power Plant approach decreased from LOS D to LOS E during the a.m. peak hour. This decrease is due mainly to the increased volume on Albany Street making it difficult to make an unsignalized left turn out of the driveway.

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Figure 4-15
No-Build Conditions (2019) Traffic Volumes,
a.m. Peak Hours

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Figure 4-16
No-Build Conditions (2019) Traffic Volumes,
p.m. Peak Hours

Table 4-7: No-Build Conditions (2019) LOS Summary, a.m. Peak Hour (7:45 – 8:45 a.m.)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Massachusetts Avenue/Albany Street	**D**	**31.8**		
Albany EB left/thru | thru	D	46.8	0.69	232
Albany EB right	C	34.6	0.21	73
Albany WB left	F	>80.0	0.91	#257
Albany WB thru | thru/right	C	23.6	0.27	113
Mass Ave NB thru | thru	D	37.4	0.80	491
Mass Ave NB right	C	27.6	0.66	446
Mass Ave SB left	F	>80.0	0.84	#227
Mass Ave SB thru | thru/right	B	18.9	0.48	266
Albany Street/Public Health Driveway	**B**	**17.3**		
Albany EB left/thru /right	C	22.5	0.75	#1127
Albany WB left/thru | thru/right	A	4.9	0.18	103
Public Health NB left/thru/right	D	38.0	0.03	11
ER Driveway SB	N/A	-	-	-
Albany Street/East Concord Street	**C**	**23.3**		
Albany EB thru	C	27.4	0.52	382
Albany EB right	B	16.7	0.67	335
Albany WB left/thru | thru	B	11.0	0.56	97
E. Concord SB left	E	62.8	0.66	160
E. Concord SB thru	E	57.6	0.63	191
E. Concord SB right	B	12.4	0.53	62
Albany Street/East Newton Street	**B**	**18.0**		
Albany EB left	C	21.1	0.48	m126
Albany EB thru	B	10.2	0.35	250
Albany WB thru | thru/right	B	19.8	0.36	287
E. Newton NB left	D	49.9	0.21	58
E. Newton NB thru/right	C	32.0	0.22	37
Harrison Avenue/East Newton Street	**B**	**18.0**		
Harrison EB left/thru	A	6.90	0.34	81
Harrison WB thru/right	A	9.20	0.29	163
E. Newton NB left/thru/right	D	5.19	0.78	165
Harrison Avenue/East Concord Street	**A**	**9.20**		
Harrison EB thru/right	A	6.00	0.44	265
Harrison WB left/thru	A	3.40	0.35	m66
E. Concord SB left/thru/right	D	42.7	0.54	100
Massachusetts Avenue/Harrison Avenue	**C**	**31.6**		
Harrison EB left/thru/right	E	60.5	0.92	#407
Harrison WB left/thru/right	E	66.2	0.92	#330
Mass Ave NB left	A	9.60	0.20	29
Mass Ave NB thru | thru/right	C	27.3	0.83	430
Mass Ave SB left	B	13.4	0.41	58
Mass Ave SB thru | thru/right	B	17.6	0.57	300

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Unsignalized Intersections				
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway				
Albany EB left/thru | thru/right	A	0.7	0.31	4
Albany WB left/thru | thru/right	A	0.4	0.15	2
Power Plant NB left/thru/right	E	437.6	0.03	2
East Concord Street/Shapiro Exit Driveway				
Shapiro EB right	B	11.6	0.18	6
E. Concord SB thru	A	0.0	0.26	0
East Concord Street/Boston Medical Center Place				
Boston Medical EB right	C	16.5	0.26	26
E. Concord SB thru	A	0.0	0.19	0
Harrison Avenue/East Springfield Street				
Harrison EB thru/right	A	0.0	0.39	0
Harrison WB left/thru	A	1.1	0.03	2
E. Springfield SB left/thru/right	C	16.4	0.14	12
Massachusetts Avenue/Woods-Mullen Service Driveway				
Woods-Mullen WB right	C	18.2	0.02	1
Mass Ave NB thru | thru | thru/right	A	0.0	0.39	0
Massachusetts Avenue/Boston Health Commission Exit Driveway				
Boston Health Commission WB right	-	-	-	-
Mass Ave NB thru | thru | thru	A	0.0	0.32	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicated decreased LOS from existing conditions.

Table 4-8: No-Build Conditions (2019) LOS Summary, p.m. Peak Hour (3:30 – 4:30 p.m.)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Massachusetts Avenue/Albany Street	**C**	**33.6**		
Albany EB left/thru | thru	D	39.5	0.47	130
Albany EB right	D	41.4	0.47	162
Albany WB left	E	79.5	0.85	#363
Albany WB thru | thru/right	A	9.6	0.43	57
Mass Ave NB thru | thru	D	40.6	0.69	382
Mass Ave NB right	B	16.2	0.31	170
Mass Ave SB left	E	56.8	0.33	78
Mass Ave SB thru | thru/right	C	30.7	0.69	448
Albany Street/Public Health Driveway	**A**	**5.4**		
Albany EB left/thru /right	A	9.4	0.40	273
Albany WB left/thru | thru/right	A	3.1	0.40	59
Public Health NB left/thru/right	D	40.0	0.03	16
ER Driveway SB	N/A	-	-	-
Albany Street/East Concord Street	**C**	**24.6**		
Albany EB thru	B	17.6	0.51	290
Albany EB right	B	12.0	0.12	69
Albany WB left/thru | thru	B	14.1	0.51	m146
E. Concord SB left	D	42.4	0.37	127
E. Concord SB thru	C	35.0	0.06	33
E. Concord SB right	E	68.6	0.82	245
Albany Street/East Newton Street	**D**	**45.2**		
Albany EB left	D	46.2	0.61	205
Albany EB thru	C	34.6	0.58	432
Albany WB thru | thru/right	D	47.0	0.70	#358
E. Newton NB left	D	38.1	0.51	244
E. Newton NB thru/right	E	60.8	0.95	#379
Harrison Avenue/East Newton Street	**C**	**26.9**		
Harrison EB left/thru	A	9.30	0.26	94
Harrison WB thru/right	B	13.1	0.40	256
E. Newton NB left/thru/right	D	52.9	0.90	#325
Harrison Avenue/East Concord Street	**A**	**6.90**		
Harrison EB thru/right	A	3.90	0.26	121
Harrison WB left/thru	A	4.10	0.37	m128
E. Concord SB left/thru/right	D	35.9	0.43	74
Massachusetts Avenue/Harrison Avenue	**D**	**40.6**		
Harrison EB left/thru/right	C	34.5	0.61	259
Harrison WB left/thru/right	F	>80.0	>1.00	#579
Mass Ave NB left	B	12.6	0.36	44
Mass Ave NB thru | thru/right	C	20.0	0.62	282
Mass Ave SB left	B	10.3	0.23	34
Mass Ave SB thru | thru/right	C	20.2	0.65	332

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Unsignalized Intersections				
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway				
Albany EB left/thru | thru/right	A	0.7	0.14	3
Albany WB left/thru | thru/right	A	0.0	0.28	0
Power Plant NB left/thru/right	C	22.1	0.06	5
East Concord Street/Shapiro Exit Driveway				
Shapiro EB right	B	11.0	0.05	4
E. Concord SB thru	A	0.0	0.19	0
East Concord Street/Boston Medical Center Place				
Boston Medical EB right	B	14.2	0.27	37
E. Concord SB thru	A	0.0	0.10	0
Harrison Avenue/East Springfield Street				
Harrison EB thru/right	A	0.0	0.24	0
Harrison WB left/thru	A	0.7	0.03	2
E. Springfield SB left/thru/right	C	15.4	0.15	13
Massachusetts Avenue/Woods-Mullen Service Driveway				
Woods-Mullen WB right	C	20.4	0.00	1
Mass Ave NB thru | thru | thru/right	A	0.0	0.25	0
Massachusetts Avenue/Boston Health Commission Exit Driveway				
Boston Health Commission WB right	-	-	-	-
Mass Ave NB thru | thru | thru	A	0.0	0.21	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicated decreased LOS from existing conditions.

4.3.2 Build Conditions

4.3.2.1 Projects Analyzed

As previously described, the Build Scenario transportation analysis estimates the cumulative impacts of the proposed Institutional Master Plan projects. A summary of projects for which traffic analysis has been conducted by category of space for this IMP is found in **Table 4-9.**

Table 4-9. BUMC Projects for 2013 IMP

Project	SF	Analyze as:
Moakley Cancer Center Addition	27,280	ITE 610 Hospital
New Inpatient Building Phase 1	67,888	ITE 610 Hospital
New Inpatient Building Phase 2	322,600	ITE 610 Hospital
Total Hospital	**417,768**	
Admin/Clinical building	219,600	
Admin	175,680	ITE 715 Single Tenant Office
Clinical	43,920	ITE 720 Medical-Dental Office
Perkin Elmer (added space)	92,937	ITE 715 Single Tenant Office
Total Office/Medical Office	**312,537**	
TOTAL SPACE	**730,305**	
Patient Transport Bridge	7,100	
New Inpatient Building Phase 1 Connector Wing	10,800	
Energy Facility	38,500	
Power Plant demolition	(64,064)	
TOTAL: Additional Projects with No Impacts	**(7,664)**	

4.3.2.2 Additional IMP Projects

The following projects will be undertaken to improve traffic operations along Albany Street and to create a significantly improved pedestrian environment for patients, employees and visitors to Boston University Medical Center. Traffic impacts for the following projects were not specifically analyzed as they will not have any noticeable impact on area traffic operations.

- ***New Patient Transport Bridge.*** It is of note that the new Bridge and will have a positive effect on area traffic operations and the pedestrian environment. Creation of this new connector will eliminate the need for ambulance trips to transfer patients across Albany Street between the helipad and the hospital emergency room. The curb cut that currently exists under the yellow utility tube will be reduced in half, minimizing vehicle conflicts on Albany Street. Shuttle buses from the Woods Mullen Shelter that now use the driveway will be relocated to new one-way entrance and exit driveways on Massachusetts Avenue and use right-in/right-out only curb cuts. These shuttles typically run early in the morning and later in the evening, with no peak period impacts.

- ***Energy Facility/Power Plant Demolition.*** The Energy Facility and Power Plant demolition similarly will have no traffic impacts, as these buildings are predominantly mechanical space, with very few employees involved.

- ***Relocation of Emergency Department Entrance.*** The relocation of the Emergency Department entrance for pedestrians and passenger vehicles will not affect traffic

volumes but will change local circulation patterns. Passenger vehicles headed for the Emergency Department will now be directed to the Shapiro Courtyard instead of the wide curb openings along Albany Street. At the new entrance, drivers will be met by a valet who will transfer their vehicle via East Concord Street and across Albany Street to a valet-only parking lot to be created in adjacent to the Power Plant.

The relocation of the passenger vehicle pick-up and drop-off along with modifications to campus loading will enable closure of three curb cuts in front of the current Emergency Department entrance. The resulting one-way circulation scheme will reduce traffic conflicts on the north side of Albany Street and will enlarge the space available for ambulances.

- ***Interim Facility for Consolidation of Loading Operations.*** One of the primary goals of the BUMC IMP is to begin the effort to relocate all campus loading from its current locations on the north side of Albany Street— locations that negatively impact traffic operations and affect pedestrians. Boston Medical Center will create consolidated materials management facilities in proximity to the existing Power Plant. The new facilities will utilize the proposed Bridge to efficiently distribute materials for the entire campus. As planning for the facilities continues, Phase 1 of the IMP will provide an interim loading dock at the Power Plant to realize the traffic benefits of the final materials management configuration. The interim loading dock will be a significant improvement because it will allow trucks to enter from Albany Street and maneuver to and from the loading dock on campus property. Currently trucks sometimes queue and often have to back into the loading dock from Albany Street

4.3.2.3 Mode Use

Separate mode shares were developed for patients and employees. This approach provides a more accurate representation because of the extremely low auto use by Boston University Medical Center employees and students. Sources for the mode share assumptions are discussed below.

Patient Trips

Boston Transportation Department (BTD) mode split data for the Medical Area (BTD Area 15) The "All Purposes" category was used to capture the travel patterns of patients. Daily mode shares, shown in **Table 4-10,** vary during peak hours.

Table 4-10 BTD Area 15 Daily Mode Shares

Mode	Percentage
Auto	56%
Public Transportation	17%
Walk/Bike/Other	27%
Total	**100%**

Employee/Student Trips

Boston University Medical Center employee and student mode shares, derived from 2012 Rideshare Survey data of its employees and students are shown below in **Table 4-11**. The survey is conducted to determine travel patterns at Boston University Medical Center, as required by the Massachusetts Department of Environmental Protection. As the table indicates, existing employees and students have a significantly lower auto use than reflected by the BTD mode share rates—only approximately 28%. Overall employee vehicle occupancy, taking into account the 5% of commuters on campus who rideshare, is 1.2.

Table 4-11. Boston University Medical Center Employee Daily Mode Shares

Mode	Percentage
Auto	28%
Public Transportation	52%
Walk/Bike/Other	20%
Total	**100%**

The survey results reflect the strong transportation demand management program and low auto use in effect at Boston University Medical Center.

4.3.2.4 Trip Generation

It is important to note that although standard methodology for trip generation estimates has been employed for the IMP, a significant amount of the construction will be to right-size and update outdated building space for existing programs. Therefore, some of the building area to be constructed will not generate additional traffic and the actual transportation impact may be less.

Land Use Codes

The Institute of Transportation Engineers (ITE) *Trip Generation 9th Edition* (2012) was used as the basis for trip generation estimation. The following ITE land use codes were used:

ITE Land Use Code 610 - Hospital. A hospital is any institution where medical or surgical care and overnight accommodations are provided to non-ambulatory and ambulatory patients. This code was applied to the Moakley and Menino additions.

ITE Land Use Code 715 – Single Tenant Office Building. A single tenant office building generally contains offices, meeting rooms and space for file storage and data processing of a single business or company and possibly other service functions including a restaurant or cafeteria. This code was applied to the administrative space in the Administrative/Clinical Building.

ITE Land Use Code 720 - Medical Office Building. A medical-dental office building is a facility that provides diagnoses and outpatient care on a routine basis, but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility. This code was applied to the clinical space in the Administrative/Clinical Building.

Using the ITE *Trip Generation* 7th edition and applying the mode share, **Table 4-12** summarizes the total projected trip generation estimates for the IMP projects within the 2019 time frame.

Table 4-12 IMP Project Trip Generation Summary

	Vehicle Trips	Transit Trips	Bike/Walk Trips
Daily			
Total	**4,482**	**4,992**	**3,749**
In	2,241	2,496	1,875
Out	2,241	2,496	1,875
a.m. Peak Hour			
Total	**409**	**634**	**330**
In	298	500	243
Out	111	134	87
p.m. Peak Hour			
Total	**431**	**550**	**354**
In	133	86	107
Out	298	463	246

4.3.2.5 Trip Distribution

Trip distribution describes the different roadways used for trips originating or destined to Boston University Medical Center. The roadways that vehicles are assigned to are based on BTD trip origin/destination information for this district and from Boston University Medical Center employee data.

With the exception of employee trips associated with space in the Perkin Elmer building, employee trips were assigned to the 610 Albany garage, and all patient/visitor trips were assigned to the 710 Albany garage. Trip distribution for employee and patient/visitor vehicle trips entering and leaving the campus is shown in **Figure 4-17** and **Figure 4-18**

4.3.2.6 Build Conditions Traffic Operations

Build conditions turning movement counts are illustrated in **Figures 4-19** and **4-20**. Intersection levels of service for the a.m. and p.m. peak hours are summarized in **Tables 4-13** and **4-14,** below.

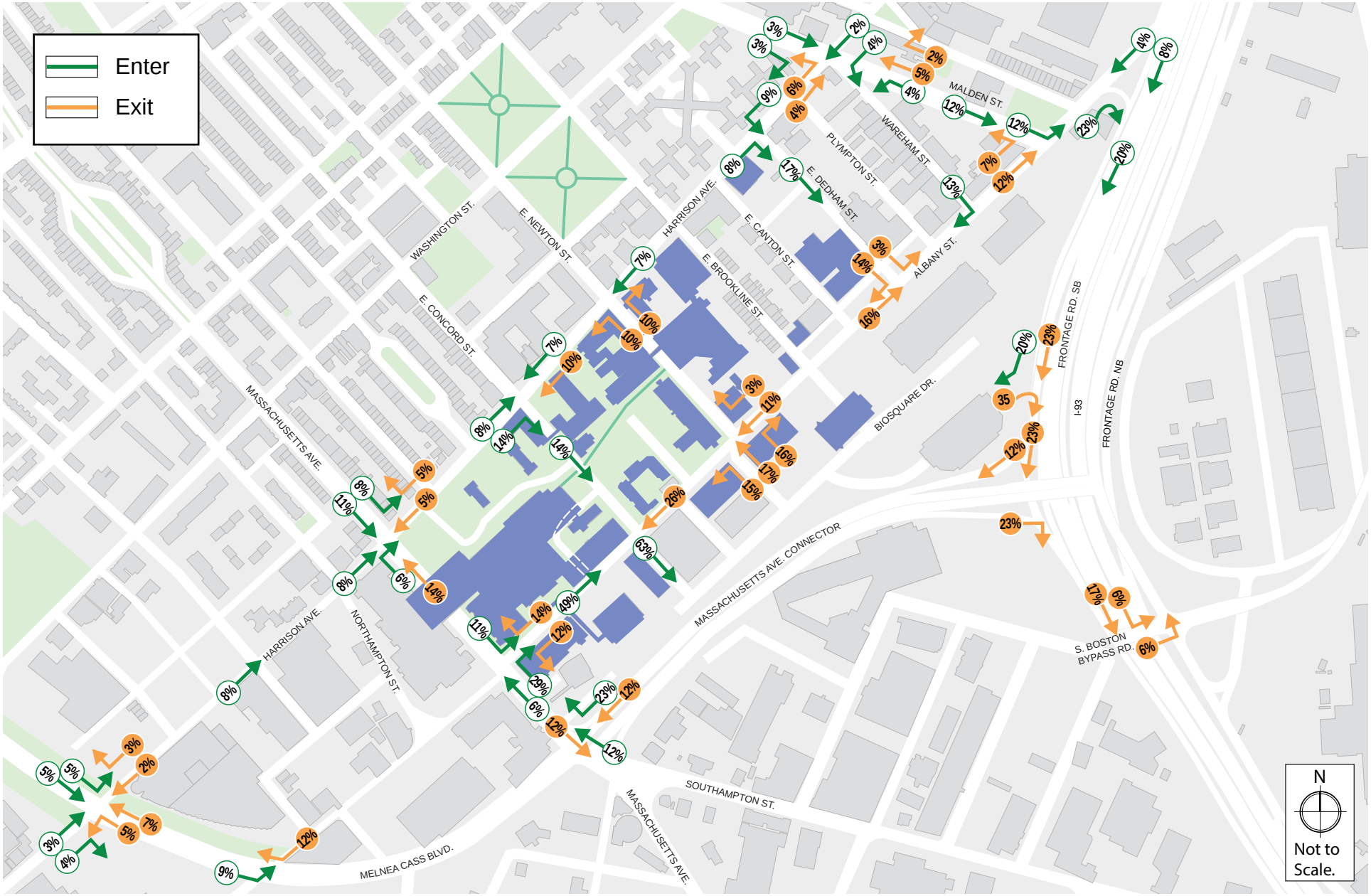

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Figure 4-17
Trip Distribution (Employees)

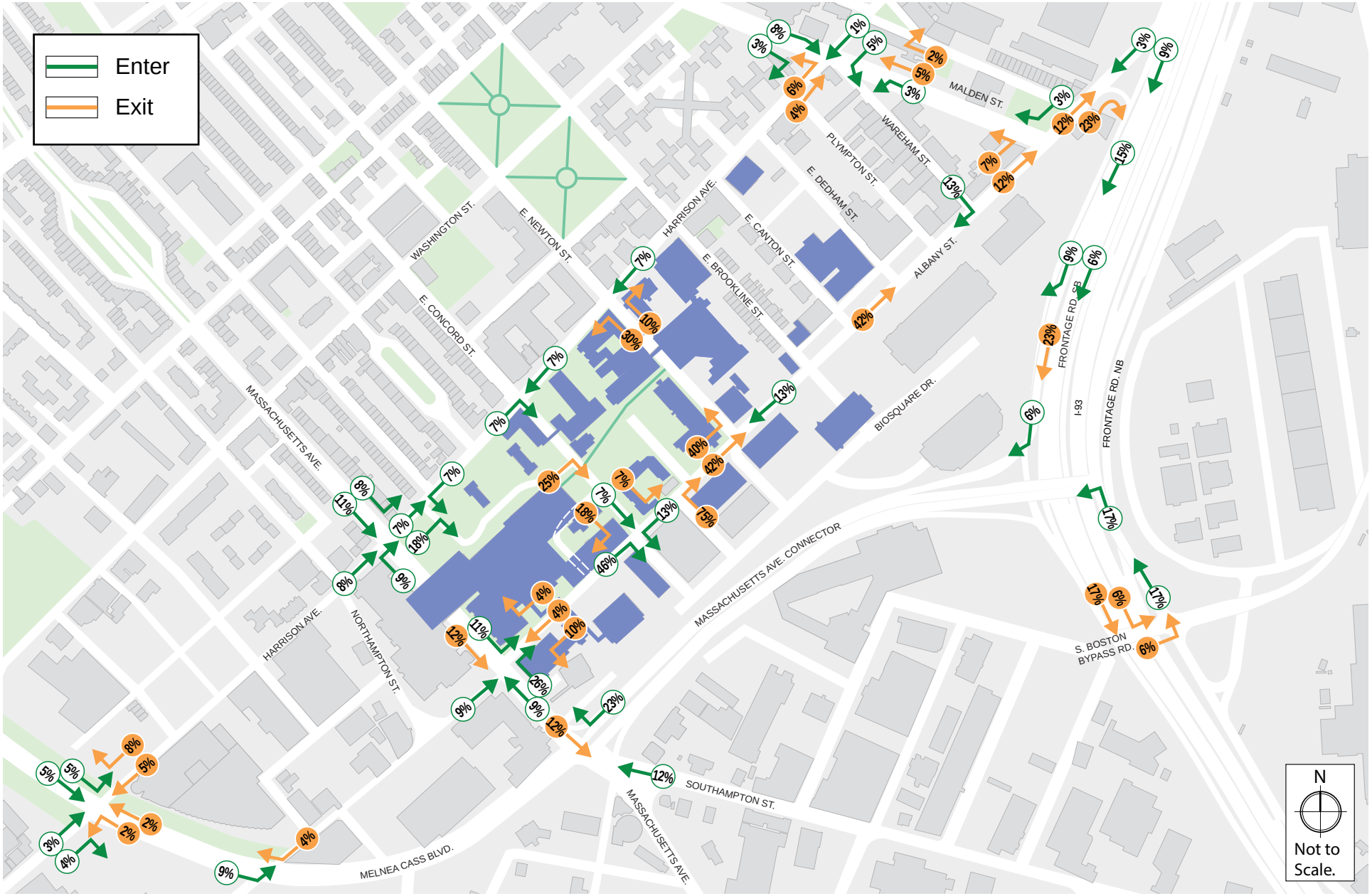

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Figure 4-18
Trip Distribution (Patients)

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Figure 4-19
Build Conditions (2019) Traffic Volumes,
a.m. Peak Hours

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Figure 4-20
Build Conditions (2019) Traffic Volumes, p.m. Peak Hours

Table 4-13: Build Conditions (2019) LOS Summary, a.m. Peak Hour (7:45-8:45 p.m.)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Massachusetts Avenue/Albany Street	**D**	**49.0**		
Albany EB left/thru | thru	D	51.2	0.72	247
Albany EB right	C	34.6	0.21	73
Albany WB left	F	>80.0	0.98	#283
Albany WB thru | thru/right	C	23.7	0.28	117
Mass Ave NB thru | thru	D	38.5	0.82	506
Mass Ave NB right	D	48.9	0.78	578
Mass Ave SB left	F	>80.0	>1.00	#298
Mass Ave SB thru | thru/right	B	19.0	0.49	267
Albany Street/Public Health Driveway	**C**	**29.9**		
Albany EB left/thru /right	D	39.7	0.86	#1387
Albany WB left/thru | thru/right	A	4.90	0.19	109
Public Health NB left/thru/right	D	38.0	0.03	11
ER Driveway SB	N/A	-	-	-
Albany Street/East Concord Street	**C**	**27.1**		
Albany EB thru	C	28.9	0.53	388
Albany EB right	C	26.9	0.83	#576
Albany WB left/thru | thru	B	12.6	0.88dl	100
E. Concord SB left	E	58.0	0.62	163
E. Concord SB thru	E	59.9	0.71	229
E. Concord SB right	B	11.5	0.53	62
Albany Street/East Newton Street	**B**	**19.8**		
Albany EB left	C	25.2	0.55	156
Albany EB thru	B	11.0	0.37	292
Albany WB thru | thru/right	C	20.7	0.38	296
E. Newton NB left	D	50.7	0.26	68
E. Newton NB thru/right	C	34.2	0.33	51
Harrison Avenue/East Newton Street	**C**	**20.1**		
Harrison EB left/thru	A	8.20	0.35	90
Harrison WB thru/right	B	10.6	0.30	179
E. Newton NB left/thru/right	D	51.5	0.81	187
Harrison Avenue/East Concord Street	**A**	**9.60**		
Harrison EB thru/right	A	6.70	0.50	318
Harrison WB left/thru	A	4.60	0.43	m85
E. Concord SB left/thru/right	D	42.7	0.54	100
Massachusetts Avenue/Harrison Avenue	**C**	**33.8**		
Harrison EB left/thru/right	E	62.9	0.94	#449
Harrison WB left/thru/right	E	70.5	0.95	#365
Mass Ave NB left	A	9.80	0.21	29
Mass Ave NB thru | thru/right	C	28.9	0.86	#451
Mass Ave SB left	C	20.7	0.56	#94
Mass Ave SB thru | thru/right	B	18.7	0.61	315

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Unsignalized Intersections				
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway				
Albany EB left/thru | thru/right	A	0.90	0.36	4
Albany WB left/thru | thru/right	A	0.50	0.15	2
Power Plant NB left/thru/right	E	42.5	0.04	3
East Concord Street/Shapiro Exit Driveway				
Shapiro EB right	B	12.2	0.08	7
E. Concord SB thru	A	0.00	0.29	0
East Concord Street/Boston Medical Center Place				
Boston Medical EB right	C	18.0	0.31	33
E. Concord SB thru	A	0.00	0.21	0
Harrison Avenue/East Springfield Street				
Harrison EB thru/right	A	0.00	0.43	0
Harrison WB left/thru	A	1.40	0.04	3
E. Springfield SB left/thru/right	C	19.2	0.17	15
Massachusetts Avenue/Woods-Mullen Service Driveway				
Woods-Mullen WB right	C	19.1	0.02	1
Mass Ave NB thru | thru | thru/right	A	0.00	0.41	0
Massachusetts Avenue/Boston Health Commission Exit Driveway				
Boston Health Commission WB right	-	-	-	-
Mass Ave NB thru | thru | thru	A	0.00	0.35	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicated decreased LOS from No-Build conditions.

Table 4-14: Build Conditions (2019) LOS Summary, p.m. Peak Hour (3:30-4:30 p.m.)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Massachusetts Avenue/Albany Street	**D**	**35.7**		
Albany EB left/thru | thru	D	40.0	0.49	137
Albany EB right	D	41.3	0.47	162
Albany WB left	F	>80.0	0.89	#437
Albany WB thru | thru/right	A	8.70	0.45	54
Mass Ave NB thru | thru	D	42.7	0.74	388
Mass Ave NB right	B	16.7	0.35	197
Mass Ave SB left	E	60.4	0.43	97
Mass Ave SB thru | thru/right	C	32.0	0.72	448
Albany Street/Public Health Driveway	**A**	**6.30**		
Albany EB left/thru /right	A	9.90	0.44	92
Albany WB left/thru | thru/right	A	4.00	0.43	93
Public Health NB left/thru/right	D	40.0	0.03	10
ER Driveway SB	N/A	-	-	-
Albany Street/East Concord Street	**C**	**25.4**		
Albany EB thru	B	18.1	0.52	304
Albany EB right	B	13.5	0.24	122
Albany WB left/thru | thru	B	15.4	0.61	m154
E. Concord SB left	D	42.0	0.38	134
E. Concord SB thru	D	35.2	0.09	47
E. Concord SB right	E	30.6	0.85	#286
Albany Street/East Newton Street	**D**	**54.3**		
Albany EB left	E	64.3	0.83	#278
Albany EB thru	C	34.8	0.70	400
Albany WB thru | thru/right	E	56.4	0.85	#396
E. Newton NB left	C	34.6	0.49	270
E. Newton NB thru/right	F	>80.0	>1.00	#518
Harrison Avenue/East Newton Street	**C**	**32.7**		
Harrison EB left/thru	A	9.5	0.28	89
Harrison WB thru/right	B	14.8	0.44	263
E. Newton NB left/thru/right	E	60.9	0.96	#444
Harrison Avenue/East Concord Street	**B**	**11.9**		
Harrison EB thru/right	A	5.30	0.30	145
Harrison WB left/thru	A	6.80	0.40	m162
E. Concord SB left/thru/right	D	47.1	0.63	125
Massachusetts Avenue/Harrison Avenue	**D**	**46.1**		
Harrison EB left/thru/right	D	35.9	0.65	#243
Harrison WB left/thru/right	F	>80.0	>1.00	#619
Mass Ave NB left	B	14.9	0.46	54
Mass Ave NB thru | thru/right	C	20.6	0.65	297
Mass Ave SB left	B	11.0	0.27	38
Mass Ave SB thru | thru/right	C	21.8	0.68	340

Intersection	LOS	Delay	V/C Ratio	95% Queue Length
Unsignalized Intersections				
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway				
Albany EB left/thru | thru/right	A	0.60	0.16	3
Albany WB left/thru | thru/right	A	0.00	0.31	0
Power Plant NB left/thru/right	D	25.1	0.07	5
East Concord Street/Shapiro Exit Driveway				
Shapiro EB right	B	10.9	0.05	4
E. Concord SB thru	A	0.00	0.21	0
East Concord Street/Boston Medical Center Place				
Boston Medical EB right	C	15.0	0.32	34
E. Concord SB thru	A	0.00	0.11	0
Harrison Avenue/East Springfield Street				
Harrison EB thru/right	A	0.00	0.25	0
Harrison WB left/thru	A	0.90	0.03	2
E. Springfield SB left/thru/right	C	18.3	0.18	17
Massachusetts Avenue/Woods-Mullen Service Driveway				
Woods-Mullen WB right	C	20.9	0.00	0
Mass Ave NB thru | thru | thru/right	A	0.00	0.26	0
Massachusetts Avenue/Boston Health Commission Exit Driveway				
Boston Health Commission WB right	-	-	-	-
Mass Ave NB thru | thru | thru	A	0.00	0.22	0

# = 95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after 2 cycles.
m = Volume for the 95th percentile queue is metered by the upstream signal.
N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicated decreased LOS from No-Build conditions.

Under Build Conditions, all new and relocated driveways affected by the various curb cut closures and relocations will operate at acceptable Levels of Service.

Most of the signalized intersections will continue to operate at the same overall level of service in both the morning and afternoon peak hours as the Existing and No-Build Conditions. Three intersection approaches show reductions in LOS, including:

- At Albany Street/Massachusetts Avenue, the Albany Street left turns went from LOS E to LOS F, with a slight increase in delay, although the overall intersection continues to operate at LOS D.

- At Albany Street/East Newton Street, the LOS for Albany Street eastbound left turns and the Albany Street westbound approach decreased from LOS D to LOS E during the p.m. peak hour, and the East Newton northbound through/right approach decreased from LOS E to LOS F, although overall operations remained at LOS D.

- At Harrison Avenue/East Newton Street, the E. Newton northbound approach decreased from LOS D to LOS E, although overall operations remained at LOS C.

A summary of traffic operations under Existing, No-Build and 2019 IMP Build conditions is included in **Tables 4-15** and **4-16**, below.

Table 4-15: LOS Comparison Table, a.m. Peak Hour (7:45-8:45 a.m.)

Intersection	Existing	No-Build	Build
Signalized Intersections			
Massachusetts Avenue/Albany Street	**C**	**D**	**D**
Albany EB left/thru | thru	D	D	D
Albany EB right	D	C	C
Albany WB left	F	F	F
Albany WB thru | thru/right	B	C	C
Mass Ave NB thru | thru	D	D	D
Mass Ave NB right	C	C	D
Mass Ave SB left	E	F	F
Mass Ave SB thru | thru/right	B	B	B
Albany Street/Public Health Driveway	**A**	**B**	**C**
Albany EB left/thru /right	B	C	D
Albany WB left/thru | thru/right	A	A	A
Public Health NB left/thru/right	D	D	D
ER Driveway SB	N/A	N/A	N/A
Albany Street/East Concord Street	**C**	**C**	**C**
Albany EB thru	C	C	C
Albany EB right	B	B	C
Albany WB left/thru | thru	A	B	B
E. Concord SB left	E	E	E
E. Concord SB thru	D	E	E
E. Concord SB right	B	B	B
Albany Street/East Newton Street	**B**	**B**	**B**
Albany EB left	B	C	C
Albany EB thru	A	B	B
Albany WB thru | thru/right	B	B	C
E. Newton NB left	D	D	D
E. Newton NB thru/right	C	C	C
Harrison Avenue/East Newton Street	**B**	**B**	**C**
Harrison EB left/thru	A	A	A
Harrison WB thru/right	B	A	B
E. Newton NB left/thru/right	D	D	D
Harrison Avenue/East Concord Street	**B**	**A**	**A**
Harrison EB thru/right	A	A	A
Harrison WB left/thru	A	A	A
E. Concord SB left/thru/right	D	D	D
Massachusetts Avenue/Harrison Avenue	**C**	**C**	**C**
Harrison EB left/thru/right	E	E	E
Harrison WB left/thru/right	E	E	E
Mass Ave NB left	A	A	A
Mass Ave NB thru | thru/right	C	C	C
Mass Ave SB left	B	B	C
Mass Ave SB thru | thru/right	B	B	B

Intersection	Existing	No-Build	Build
Unsignalized Intersections			
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway			
Albany EB left/thru | thru/right	A	A	A
Albany WB left/thru | thru/right	A	A	A
Power Plant NB left/thru/right	D	E	E
East Concord Street/Shapiro Exit Driveway			
Shapiro EB right	B	B	B
E. Concord SB thru	A	A	A
East Concord Street/Boston Medical Center Place			
Boston Medical EB right	C	C	C
E. Concord SB thru	A	A	A
Harrison Avenue/East Springfield Street			
Harrison EB thru/right	A	A	A
Harrison WB left/thru	A	A	A
E. Springfield SB left/thru/right	C	C	C
Massachusetts Avenue/Woods-Mullen Service Driveway			
Woods-Mullen WB right	C	C	C
Mass Ave NB thru | thru | thru/right	A	A	A
Massachusetts Avenue/Boston Health Commission Exit Driveway			
Boston Health Commission WB right	-	-	-
Mass Ave NB thru | thru | thru	A	A	A

N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicates decreased LOS from prior condition.

Table 4-16: LOS Comparison Table, p.m. Peak Hour (3:30 p.m. – 4:30 p.m.)

Intersection	Existing	No-Build	Build
Signalized Intersections			
Massachusetts Avenue/Albany Street	**C**	**C**	**D**
Albany EB left/thru | thru	D	D	D
Albany EB right	D	D	D
Albany WB left	E	E	F
Albany WB thru | thru/right	A	A	A
Mass Ave NB thru | thru	D	D	D
Mass Ave NB right	B	B	B
Mass Ave SB left	E	E	E
Mass Ave SB thru | thru/right	C	C	C
Albany Street/Public Health Driveway	**A**	**A**	**A**
Albany EB left/thru /right	A	A	A
Albany WB left/thru | thru/right	A	A	A
Public Health NB left/thru/right	D	D	D
ER Driveway SB	N/A	N/A	N/A
Albany Street/East Concord Street	**C**	**C**	**C**
Albany EB thru	B	B	B
Albany EB right	B	B	B
Albany WB left/thru | thru	A	B	B
E. Concord SB left	D	D	D
E. Concord SB thru	C	C	D
E. Concord SB right	E	E	E
Albany Street/East Newton Street	**C**	**D**	**D**
Albany EB left	C	D	E
Albany EB thru	C	C	C
Albany WB thru | thru/right	C	D	E
E. Newton NB left	D	D	C
E. Newton NB thru/right	C	E	F
Harrison Avenue/East Newton Street	**C**	**C**	**C**
Harrison EB left/thru	A	A	A
Harrison WB thru/right	B	B	B
E. Newton NB left/thru/right	D	D	E
Harrison Avenue/East Concord Street	**A**	**A**	**B**
Harrison EB thru/right	A	A	A
Harrison WB left/thru	A	A	A
E. Concord SB left/thru/right	D	D	D
Massachusetts Avenue/Harrison Avenue	**D**	**D**	**D**
Harrison EB left/thru/right	D	C	D
Harrison WB left/thru/right	F	F	F
Mass Ave NB left	B	B	B
Mass Ave NB thru | thru/right	B	C	C
Mass Ave SB left	A	B	B
Mass Ave SB thru | thru/right	B	C	C

Intersection	Existing	No-Build	Build
Unsignalized Intersections			
Albany Street/Shapiro Entrance Driveway/Power Plant Driveway			
Albany EB left/thru | thru/right	A	A	A
Albany WB left/thru | thru/right	A	A	A
Power Plant NB left/thru/right	C	C	D
East Concord Street/Shapiro Exit Driveway			
Shapiro EB right	B	B	B
E. Concord SB thru	A	A	A
East Concord Street/Boston Medical Center Place			
Boston Medical EB right	B	B	C
E. Concord SB thru	A	A	A
Harrison Avenue/East Springfield Street			
Harrison EB thru/right	A	A	A
Harrison WB left/thru	A	A	A
E. Springfield SB left/thru/right	C	C	C
Massachusetts Avenue/Woods-Mullen Service Driveway			
Woods-Mullen WB right	C	C	C
Mass Ave NB thru | thru | thru/right	A	A	A
Massachusetts Avenue/Boston Health Commission Exit Driveway			
Boston Health Commission WB right		-	-
Mass Ave NB thru | thru | thru	A	A	A

N/A = The ER Driveway SB does not operate with the signal timing. The ambulances exiting the driveway have their emergency lights on therefore stopping all conflicting traffic. There is no signal head facing the SB traffic.
Grey shading indicates decreased LOS from prior condition.

As shown, all overall intersection LOS remains at acceptable levels under Build conditions, with minimal changes from No-Build conditions.

4.3.2.7 Build Conditions Parking Supply and Demand

The IMP projects will result in a net addition of 730,305 square feet to the campus. At the current on-campus parking ratio of 0.86 parking spaces per 1,000 sf, this new space would result in a potential added demand for 628 total employee and patient/visitor parking spaces. The Moakley Cancer Center Addition and the Phase 1 New Inpatient Building will add 95,168 square feet in the short-term, with an added potential demand of 82 spaces.

At current peak occupancy, there are 500 available owned and leased off-street spaces available for Boston University Medical Center parking, sufficient to meet added short-term demand. At present, no new on-campus parking is anticipated to be added. As a result, the overall on-campus ratio in the short-term will decline to 0.84 spaces per 1,000 square feet, within the BTD recommended range. In the long-term at full-build, if no new parking is built on-campus, the on-campus ratio will decline to 0.72 spaces per 1,000 square feet, slightly below BTD's minimum recommended ratio of 0.75 spaces per 1,000 square feet for this area.

Over the years, the parking ratio for Boston University Medical Center and BioSquare has steadily decreased as development has increased. At the same time, BUMC has employed active parking management to monitor space use and preserve patient/visitor parking availability, as well as a hierarchy of employee parking fees that makes the most convenient spaces the most expensive. The combination of the constrained supply and increased fees, along with transit service improvements and active demand management, has allowed the medical area to accommodate growth while limiting project-generated traffic increases.

The existing 710 and 610 Albany garages will continue to operate as the major parking facilities for the campus, supplemented by off-site leased parking spaces as needed. Valet parking will continue to be provided in the Menino Valet lots; valet parking for the relocated passenger vehicle emergency room entrance in the Shapiro Courtyard will be provided in the reconfigured L lot in front of the power plant.

As the IMP period unfolds, Boston University Medical Center will continue to actively manage both its on-campus owned spaces and its off-campus leased supply in order to meet new demand, while continually working to encourage the use of alternate modes such as transit, walking and bicycling. In the short-term, about 500 existing spaces are vacant at peak occupancy today. In the longer term, the total parking demand for up to 628 spaces will be met through a combination of on-campus spaces and leased off-site facilities. As each project is advanced, Boston University Medical Center will continue its parking management strategies, and, if needed, evaluate off-site employee parking options to preserve the most convenient spaces for patients and visitors on the campus.

4.3.2.8 Build Conditions Transit, Pedestrian and Bicycle Impacts

The IMP projects will generate about 2,580 patient, visitor and employee transit riders entering and leaving the campus over the course of a day and almost 2,000 people who come and go by walking or cycling. Added transit riders, cyclists and pedestrians will use existing pathways along Melnea Cass Boulevard and the Southwest Corridor Park as well as improved sidewalks and pathways through the campus. In the long-term, the South Bay Harbor Trail will provide a new shared-use path along the outer perimeter of the BioSquare site. New transit service by the MBTA in the area and the improvements planned along Melnea Cass Boulevard will continue to improve transit access to Boston University Medical Center.

4.3.2.9 Build Conditions Loading and Service

As noted above, the current loading facility for the West Campus is located close to the Emergency Department and Trauma Center entrance at the Menino Pavilion and is not large enough to allow trucks to maneuver off-street (trucks currently have to back in from Albany Street). This disrupts Albany Street vehicular and pedestrian traffic. The Newton Pavilion loading facility involves a wide curb cut along Albany Street as well. The IMP includes consolidation of these loading areas into a single loading dock to be located in front of the existing Power Plant on the opposite site of Albany Street. This will have the benefit of shortening existing curb cuts and moving truck activity further away from the

hospital buildings and the residential neighborhood. It also will have the benefit of allowing direct truck access from the Southbound Frontage Road via BioSquare Drive. Accommodated by the proposed new Bridge, materials will be transferred across the street from the loading facility to the campus. These improvements will improve existing loading operations and provide the capacity to support future growth.

Until the Administrative / Clinical Building is constructed, Boston Medical Center is proposing an interim relocation of the consolidated Menino and Newton Pavilion loading docks to a site in front of the existing Power Plant, as discussed above. The new location will enable trucks to be accommodated without the need to back up into Albany Street, improving safety for pedestrians and traffic and removing vehicular conflicts. It will also enable expansion of the ambulance area behind the Menino Building, reducing the need for ambulances to wait on-street or maneuver within the lot.

4.3.2.10 Removal of Ambulance Trips

When the new Bridge is constructed, patients arriving at the helipad will no longer need to be transported by ambulance across Albany Street to the Emergency Department. They will instead travel through the new bridge and move directly across to the new connector at the Menino Pavilion and into the hospital. Closure of the one of the two lanes allowing reduction in this existing curb cut by half under the yellow utility tube will reduce vehicle conflicts on Albany Street and improve the pedestrian experience on the south side of the street.

4.4 Transportation Demand Management

Boston University Medical Center has consistently worked to reduce the number of drive-alone trips to the medical area, both through efforts of the individual institutions and through TranSComm, the area's very active Transportation Management Association. TranSComm, founded in 1991, is in its 20th year of operation on the campus. TranSComm, BMC and BUMC have won several awards in recent years – the 2012 Mayor's Silver Award for Bike Friendly Business, a Silver Aware from the prestigious National League of American Cyclists and the "Pinnacle Award" for excellence in commuter options. They participate in several member sustainability committees including BMC's Green Committee, BUMC's Sustainability Committee and Boston University's Sustainability Committee (Charles River Campus).

As indicated in Section 4.3.2.3, existing employees and students at Boston University Medical Center have a significantly lower auto use than the BTD mode share rates, at only 28%. This rate reflects the strong transportation demand management program in effect. Through TranSComm, Boston University Medical Center will continue to encourage and assist its employees, students, 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 35% transit subsidy through payroll deduction to full-time employees who do not have parking permits.

- BU students can enroll in the MBTA's semester pass program through TranSComm and save 11%.
- Full-time BU 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 TranSComm Web site.
- A transit rider "read and ride" library is provided for commuters in the TranSComm office lobby.
- TranSComm works with the MBTA and BTD to improve bus service, wayfinding, and pedestrian safety around the campus.
- Boston University Medical Center provides 6 free shuttle services:
  - Inner Campus Shuttle for patients and visitors;
  - All-Day Medical Campus Shuttle for employees (which can also be used by neighbors in the South End)s;
  - VA/Medical Center Shuttle (patients, medical staff);
  - Evening Shuttle (to T stations and neighborhood for staff and students);
  - Boston University Shuttle (the BUS), ten minute weekday service and fifteen minute weekend service for students, staff and faculty; and
  - 610 Albany Shuttle to the employee parking garage.
- Since June 2007, preferential parking is provided for Carpool/Hybrid program participants on the first level of the 610 Albany Garage.
- TranSComm is developing a new Guaranteed Ride Home program for carpoolers in 2013, ensuring that carpoolers will have a ride home in case of emergency.
- TranSComm participates in NuRide, a free website 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 and are rewarded with discounts to stores, restaurants, entertainment, etc. NuRide also serves as the state's rideshare database for finding carpool partners.
- Gas-powered scooter parking for six scooters is provided in the 610 Albany Garage. Electric-powered scooters can park in the bike cages.

- TranSComm offers sheltered and secured bicycle parking at several locations, participation on the Annual Bike to Work/School week, a free Cyclists' Luncheon and a free Bike Safety Checkup.

- Boston University Medical Center provides an on-site car-sharing service and two dedicated parking spaces for shared-use vehicles.

- TranSComm installed two electric vehicle (EV) charging stations on the ground floor of the 710 Albany Garage in Spring 2012, one 120-volt and one 240-volt station. The stations are open to the public in return for paying the appropriate parking fee. TranSComm was one of 22 organizations to receive an EV grant offered by the Green Communities Division. The BMC/BUMC community can charge vehicles with free electricity until February 2014. In 2013, TranSComm has received funding to upgrade its one 120-volt station to 240-volts and to add two 240-volt stations so that there will be a total of four 240-volt stations in the garage. There are currently eight regular users, and the stations are also used by patients and visitors.

- TranSComm 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 BUMC to the neighboring MBTA stations.

- Boston University Medical Center, through TranSComm, publishes a periodic transportation newsletter and holds events to encourage its employees and students to use the alternative commuter transportation system. TranSComm also contributes a column in the Masscommuter newsletter once a year.

4.5 Summary of IMP Transportation Impacts

The impetus for the IMP projects is to right-size clinical and support services to support new trends in health care delivery. The proposed Moakley Cancer Center Addition, the New Inpatient Building and the Administration/Clinical Building will allow for consolidation of departments, improvement of operational adjacencies, and improvement of the patient care environment by modernizing current uses in outdated facilities on campus. Although there is new program space created, a portion of it will replace current uses on the campus and is not expected to generate additional trips. Furthermore, there are no transportation related impacts associated with the Energy Facility and New Patient Transport Bridge projects.

4.5.1 Summary of Findings

The IMP Amendment analyzes impacts to the original 2019 horizon year from the 2010 IMP. For a more accurate understanding of how the IMP projects will impact traffic, it is important to note that the largest traffic generator – the New Inpatient Building – will not be completed until near the expiration of the IMP. IMP traffic and parking analyses currently show that there exist approximately 500 spaces within the current supply of owned and leased parking spaces to accommodate the parking demand for additional development over the second half of the IMP. Additionally, the traffic analysis shows there is no significant degradation in intersection operations.

Within the 10-year time frame of the IMP, growth not associated with the medical area combined with IMP developments on the BUMC Campus and the BioSquare campus will impact operations only at a few intersections. However, of the intersections studied in the Build condition, all will have overall peak hour operations at acceptable levels (above LOS D), with only a few approaches operating below that level. Although the IMP developments will place further demands on existing parking resources, the campus parking ratio will still be generally in line with BTD ratios at 0.72 spaces per 1,000 s.f. Boston University Medical Center will continue to implement parking management strategies that have proven to be effective as evidenced by steadily decreasing auto use. Boston University Medical Center's goal is to ensure that BUMC Campus parking needs do not encroach on the available supply of on-street parking in the neighborhood.

Recognizing the potential of these impacts, Boston University Medical Center proposes to review each project in detail as the programs are more clearly defined and as they move into design review through the Article 80 Large Project Review process. This process will also allow new traffic data to be collected and recalibrated to existing conditions and new projects so that traffic impacts can be accurately assessed and planned.

4.5.2 Proposed Mitigation and Long Term Sustainability

Boston University Medical Center realizes the effect of the IMP development to its campus roadways and knows it is necessary to manage transportation demand while improving the transportation network in order to maintain good access for its employees and patients, and maintain access to its high level of care.

When addressing the transportation impacts in the study area for projects associated with the IMP, our recommended approach is to evaluate the project impacts and the transportation networks as individual projects advance. As each project is permitted and implemented, Boston University Medical Center will identify and mitigate individual project impacts while considering the overall transportation operations in the study area.

Because the IMP horizon year is distant and development needs and goals of the Medical Center change depending on public need, this project based mitigation approach will ensure that the measures used to offset impacts are administered efficiently and at the most effective locations.

To accomplish this, Boston University Medical Center, through the Article 80 Large Project Review process, will present detailed building programs, design options, and measures to mitigate impacts as the programs for each project are advanced through planning and design. It is believed that this approach will be an effective collaboration of design development and City and Community review that will allow for the most efficient project mitigation measures.

Boston University Medical Center has identified transportation improvement goals for the master plan time frame and will continue to advance important mitigation commitments made previously in the form of policies and management actions. **Table 4-17** lists transportation mitigation elements that Boston University Medical Center is proposing to pursue in order to ensure that future development can be sustained at the BUMC Campus with minimal impact to the neighborhood.

Table 4-17 Proposed Transportation Improvement and Mitigation Plan

	IMPROVEMENT ELEMENT	DESCRIPTION	PURPOSE/BENEFIT
Traffic Management Plan / Local Street Network Improvements			
1	Relocation of West Campus Central Loading Dock	Consolidation and interim relocation of the Menino Pavilion and Newton Pavilion loading docks on the north side of Albany Street to the south side of Albany Street in front of the existing Power Plant.	Access will occur from BioSquare Drive removing trucks from Albany Street. This will improve roadway operations and pedestrian movement along Albany Street.
2	Relocation of Emergency Department walk-in and passenger vehicle (non-ambulance) pick-up and drop-off	Relocation from the rear of the Menino Pavilion to the northwest corner of the Shapiro Building courtyard.	Allows more room for ambulances at Dowling Building and facilitates valet parking for emergency department drop-off and pick-up.
3	Reduction in Curb cuts	Goal to reduce number of curb cuts in front of the Emergency Department and Trauma Center entrance along Albany Street upon development of the New Inpatient Building.	Improve pedestrian experience along edge of Albany Street. Improve vehicular access and safety reduces confusion and traffic back-ups into the roadway.
4	Sidewalk and Streetscape Improvements	Additional improvements along Albany Street including installing new sidewalk paving, street trees, lighting, signage, etc. as each new development project is advanced.	Establish a unified streetscape to assist patients and visitors in wayfinding. This will improve pedestrian safety and movement and create better connectivity to future developments across Massachusetts Avenue.
5	Regional Highway Access	Implement the Southbound Frontage Road connection, continue to support additional access and connectivity from the BUMC Campus to the regional highway system.	Allows access for vehicles from the regional roadway network to access at BioSquare Drive removing traffic from Albany Street and the local street network.
6	Improved Access to Bus Stops	Continue to work with the MBTA to provide improved bus shelters and pedestrian connections to the MBTA bus stops within the Medical Center	Will encourage shift in employee and student mode share from auto to transit use.
Parking Management Plan			
1	Employee Parking Pricing	Continue to evaluate and charge market rates for employee parking.	Encourages transit use and will reduce parking demand.
2	Off-site Employee Parking Options	Continue to evaluate off-site locations for employee parking as needed.	Encourages transit use and removes employee vehicles from medical area roadways.

Transportation Demand Management Plan

1	Maintain active role in TransComm	Continue to encourage and assist BUMC Campus employees, students, patients and visitors as well as other area institutions and businesses to use many of the demand management programs offered.	Will encourage shift in employee and student mode share from auto to alternative modes such as transit, bicycle, and walk.
2	Employee Transit Subsidy	35% transit pass subsidy to employees .	Will encourage shift in employee mode share from auto to transit.
4	Bicycle Parking	Continue to install bicycle racks and cages throughout the campus where feasible. Will install short-term bicycle racks for new projects where feasible.	Will encourage shift in employee and student mode share from auto to bicycle.
5	Zip-Car	Coordinate with Zip-Car representatives to continue discounted membership for BU Medical Campus, BMC and its affiliates. Maintain 1 vehicle as a hybrid vehicle.	Will encourage shift in employee and student mode share from auto to transit and improve air quality.

City Planning Initiatives / Community Benefits

1	Community Parking Benefit	Provide reduced rate evening public parking, and free evening public parking during snow emergencies.	Will continue to offer this benefit to resident neighbors and the local community.
2	Support Transit Service Improvements	Through TranSComm, continue to work with the MBTA to promote transit service improvements such as the Urban Ring project, and the Indigo Commuter Rail Line.	Will improve access for employees and student to transit service at the Medical Center and encourage shift in auto use to transit.
3	South Bay Harbor Trail	Continue campus planning to accommodate connections to the City's South Bay Harbor Trail project.	Will encourage walking and bicycling as an alternative mode of transportation for the surrounding community with connections to other city neighborhoods along the Boston Harbor.

Sustainability

1	Bicycle User Group	Through TranSComm, a network of cyclists work together to improve biking on the campus.	Will encourage employee, student as well as patient and visitor shift in auto use to bicycle. Helps promote bicycling as an important health benefit.
2	Carpool and Hybrid Program	Offer designated and priority parking for carpool and hybrid cars.	Will encourages employees to not drive alone and relieves traffic congestion and improves air quality.
3	Walking Initiative	Continue to promote walking programs in coordination with WalkBoston	Will encourage employee, student, patient and visitor shift from auto use to transit and walking. Encourage walking as an important health benefit.
4	Electric Car Charging Stations	Two implemented, two to be added	Encourages use of alternative modes by employees, patients and visitors

Section 5

5.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

5.1 Introduction

As IMP projects move forward, the Proponents will initiate consultation with other governmental agencies as required.

5.1.1 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.

5.1.2 Massachusetts Environmental Policy Act

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

5.1.3 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, Boston University Medical Center 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 BUMC 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"). Boston University Medical Center 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.

5.1.4 Boston Civic Design Commission

The Proponent will meet the Boston Civic Design Commission (BCDC) to review the proposed Institutional Master Plan Amendment and the IMP Large Project Review documentation. The IMP Amendment and IMP Large Project Review documentation will be submitted to the BCDC by the BRA in accordance with the provisions of Article 28 of the Boston Zoning Code.

5.1.5 Boston Groundwater Trust

The proposed IMP projects are located within the Groundwater Conservation Overlay District ("GCOD"). Boston University Medical Center will incorporate systems into the proposed IMP projects that meet the groundwater conservation standards set forth in Article 32 of the Boston Zoning Code. Boston University Medical Center 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 BRA and the Boston Groundwater Trust prior to the issuance of a Certificate of Consistency. Accordingly, Boston University Medical Center comply with the requirements of Article 32 and so will not be required to obtain a conditional use permit from the Board of Appeal for its proposed IMP projects.

5.1.6 Other Permits and Approvals

Anticipated permits and approvals for the proposed IMP projects are identified in Section 2.4 Table 2-2.

Appendix A

APPENDIX A BOSTON UNIVERSITY MEDICAL CENTER INSTITUTIONAL MASTER PLAN BACKGROUND / HISTORY

A.1 2000 Boston University Medical Center IMP Overview

The original Boston University Medical Center Institutional Master Plan was approved by the Boston Redevelopment Authority on May 18, 2000 and the Boston Zoning Commission on June 28, 2000, effective July 13, 2000. Boston University Medical Center is comprised of Boston Medical Center ("BMC") and Boston University Medical Campus ("BU Medical Campus") which includes three of Boston University's health science schools – the School of Medicine, Goldman School of Dental Medicine; and the School of Public Health.

Only one new construction project, the Medical Services Center, was contemplated as part of the 2000 BUMC IMP. The Medical Services Center included a five-story, 92,010 square foot outpatient care center to be located northeast of the Menino Pavilion and related circulation, parking and landscaping improvements. The circulation system included a two-way interior road connecting to both Harrison Avenue and Albany Street. The then existing 176 parking spaces on the site were reconfigured to accommodate 111 spaces. A new 32,000 square foot landscaped courtyard was proposed off Harrison Avenue and East Concord Street between building BCD and FGH. The project also included the demolition of the Thorndike, Administration and Sears Buildings, and the renovation of Buildings BCD and FGH. While the building demolition activities occurred and buildings BCD and FGH have been preserved, the Medical Services Center building was never constructed. However, the 2003 Second Amendment, as described below, substituted the Medical Services Center with the Moakley Medical Services Building.

The Boston University Medical Center Institutional Master Plan Renewal was approved by the Boston Redevelopment Authority on June 22, 2010 and the Boston Zoning Commission on August 4, 2010. Boston University Medical Center is comprised of Boston Medical Center ("BMC") and Boston University Medical Campus ("BU Medical Campus") which includes three of Boston University's health science schools – the School of Medicine, Goldman School of Dental Medicine; and the School of Public Health.

Three new construction projects were contemplated as part of the 2010 BUMC IMP.

- Energy Facility - Construct an approximately 48,000 s.f. building on the existing surface parking lot located to the east of the Power Plant to improve energy efficiencies, ensure reliability, and support greener campus growth.

- Administration/Clinical Building – Construct an approximately 160,000 s.f. building on the surface parking lot located on the north side of the Power Plant

along Albany Street to consolidate administrative functions and improve campus adjacencies. This building will also accommodate space for outpatient offices and operational support space.

- New Inpatient Building - Construct an approximately 405,000 s.f. building on the Dowling Building site to support the increased inpatient volume and the growth in Emergency Service and Trauma volume. This project will necessitate the demolition of the Dowling Building.

A discussion of IMP Amendments, Notices of Project Change, and Notices of Exemption follows, while Table A-1 summarizes the history of the BUMC Campus IMP to date.

A.1.1 Boston University Medical Center IMP Amendments

On May 14, 2001, Boston University Medical Center proposed its first amendment to the IMP; the rehabilitation of the Surgical Building, an administrative building, located at 85 East Concord Street. This building is an existing eight-story, 66,952 square foot building including an adjoining one-story entry building. BMC proposed to rehabilitate the building for office uses and replace the entry building with a new one-story lobby. The amendment was approved by the BRA on July 17, 2001 and the renovation was completed in September 2003.

On July 31, 2003, Boston University Medical Center submitted a Notice of Project Change ("NPC") to the BRA. The NPC considered: the replacement of the approved Medical Services Center in the 2000 IMP with the proposed Moakley Building as an Institutional project; modifications and additions to the existing Ambulatory Care Center; and, inclusion of circulation and parking changes associated with the Moakley Building. The 133,217 square foot Moakley Building at 830 Harrison Avenue has a program of consolidated cancer related care, a patient-centered ambulatory surgery center, a center for digestive disorders, and a new otolaryngology clinic. The NPC also represented a biannual update to the Boston University Medical Center IMP. The NPC was approved by the BRA on October 7, 2003 and the building was completed in the Fall of 2006.

On December 1, 2004, Boston University Medical Center submitted its second IMP amendment for several minor modifications, which considered the reuse of basement, office and administrative space in BCD, FGH and 761 Harrison Avenue, and to remove from the Boston University Medical Center IMP list of buildings, the Mallory building which is no longer leased to BMC. The second amendment to the IMP was approved by the BRA on January 26, 2006.

On April 30, 2007, a third IMP Amendment was filed for the new, approximately 245,000 s.f. Shapiro Ambulatory Care Center ("SACC") at 725 Albany Street. When completed, the new facility will allow for the relocation of the DOB clinical services to appropriately-sized new space consistent with Department of Public Health requirements and BMC

clinical standards. This solution also allows BMC to further its goal to consolidate clinical departments by shifting some outpatient services from Dowling, Yawkey and other locations on campus to the proposed SACC. The SACC's design does not result in significant new outpatient space on campus, rather it will create more efficient use of outpatient space resulting in higher throughput of patients. The third amendment was approved by the BRA in December 2007.

On June 8, 2009, Boston University Medical Center submitted an Institutional Master Plan Notification Form for the Renewal and Amendment of the Boston University Medical Center IMP ("IMPNF for Renewal and Amendment"), which IMPNF for Renewal and Amendment described the minor expansion of the Menino Pavilion by the construction of a single-story slab-on-grade addition of approximately 845 square feet on the southwest end of the Menino Pavilion (the "ED Project"). Notice of receipt by the Authority of the IMPNF for Renewal and Amendment was published in the ***Boston Herald*** on June 9, 2009 initiating a comment period that ended on July 9, 2009. On July 16, 2009, the Authority approved the IMPNF for Renewal and Amendment for a two year renewal of the Boston University Medical Center IMP and the ED Project.

On August 14, 2009, Boston University filed an IMPNF for Amendment of the IMP in connection with the incorporation in the IMP of the Albany Fellows Site, which is an approximately 1.7 acre site lying between Albany Street and Fellows Street, and the construction on a portion of the Albany Fellows Site of a proposed project known as the Graduate Student Housing Project for Boston University Medical School. The Albany Fellows Site consists of three parcels: Parcel 1, which fronts on Fellows Street and contains approximately 15,324 square feet of land area; Parcel 2A, which fronts on Albany Street and contains approximately 38,920 square feet of land area; and Parcel 2B, which is bounded by Parcel 2A, former Pike Street, Fellows Street and Parcel 1 and contains approximately 20,766 square feet of land area. Notice of receipt by the Authority of the Amendment IMPNF was published in the ***Boston Herald*** on August 14, 2009 initiating a comment period that ended on September 25, 2009. On January 12, 2010, the Authority approved the IMP Amendment for inclusion of the Albany Fellows Site and Graduate Student Housing Project, and on February 10, 2010, the Zoning Commission approved the same.

Boston University has completed the Graduate Student Housing Project as a nine story building of approximately 84,033 square feet including a 12,000 square foot landscaped open space on a portion of Parcel 2A. The building provides 104 two bedroom units to house up to 208 graduate students of the Boston University Medical Campus and also contains approximately 5,000 square feet of ground floor retail space. It is anticipated that future development on Parcels 1 and 2B of the Albany Fellows Site will be consistent with the development density previously approved by the BRA for a prior development. Under this assumption, total development on Parcel 1 and Parcel 2B (including the remainder of Parcel 2A, not used for the open space and the Graduate

Student Housing Project) will be limited to approximately 358,500 square feet of above-grade building space and up to 322 parking spaces. Potential uses for these future facilities may include: housing (either student housing or housing for faculty and staff of the Boston University or Boston Medical Center), ground level retail, office, backstreets, research & development, and academic space. As currently envisioned, the density of development of these two remaining building sites, Parcels 1 and 2B, is expected to be evenly distributed, with the Parcel 2B site having a range of between 110,000 and 190,000 square feet of program (exclusive of parking), and the Parcel 1 site (with the remainder of Parcel 2A area) having a range of between 80,000 and 170,000 square feet of program (exclusive of parking). This would result in two buildings of moderate height (i.e. in a range from 9 to 14 stories).

For purposes of ensuring that the recently approved (January 2010) Albany Fellows Site and the Graduate Student Housing Project are included in the renewal IMP, the 2010 BUMC IMP incorporates the site and project in this filing.

A.1.2 Notices of Exemption

On October 2, 2006, Boston University Medical Center submitted an Institutional Master Plan Notification Form to the BRA proposing an addition of approximately 10,000 square feet to the Newton Pavilion inpatient care building located on East Newton Street. The existing Newton Pavilion is eight floors and has an elevator penthouse. The Newton Pavilion was originally built in 1986, at which time all inpatient care floors below the eighth floor were built with three pods per floor. The existing eighth floor has two pods. The IMPNF proposed filling in the last pod of the eighth floor in order to provide approximately 12 beds of additional care. On November 7, 2006, the BRA issued a Notice of Exemption for the Newton Pavilion eighth floor addition exempting it from Article 80 Institutional Master Plan Review because it was not affecting a gross floor area of more than 20,000 square feet and was not a phase of another Institutional project.

On February 23, 2007, BMC submitted a Request for a Notice of Exemption to the BRA proposing an addition of approximately 17,500 square feet to the Menino Pavilion located on Albany Street. BMC determined that the need for a third MRI and 11 additional Emergency Department beds to ease overcrowding of existing patient flows could not be accommodated within existing space and therefore requested approval for the addition to the Menino Pavilion. On April 5, 2007, the BRA issued a Notice of Exemption for the Menino Pavilion addition exempting it from Article 80 Institutional Master Plan Review because it was not affecting a gross floor area of more than 20,000 square feet and was not a phase of another Institutional project.

Table A-1 Summary of Boston University Medical Center IMP and Amendments

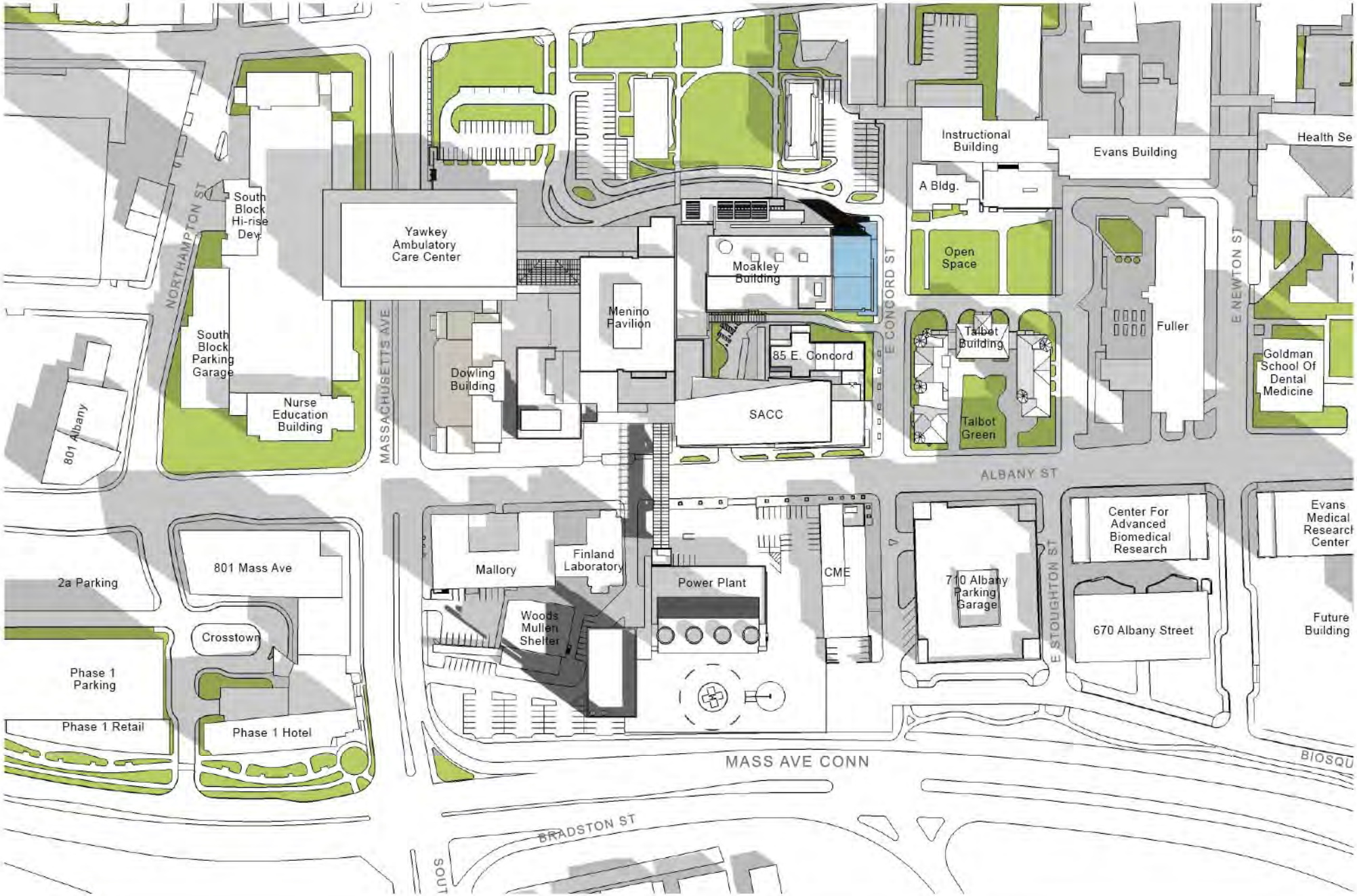
Date	Action	Subject
May 18 2000	IMP BRA Board Approval	Original Boston University Medical Center IMP and including proposed five-story, 92,010 s.f. Medical Services Center (outpatient care) and related circulation, parking and landscaping.
July 14 2001	IMP Amendment BRA Board Approval	Rehabilitation of the Surgical Building for administration uses. Involved an existing eight-story, 66,952 square foot building including an adjoining one-story entry building. Amendment included replacement of the adjoining building with one-story lobby.
October 7 2003	NPC BRA Board Approval	Replacement of the Medical Services Center with the Moakley Building (133,217 s.f. – cancer care, ambulatory care, digestive disorder center, and otolaryngology clinic), modifications to existing Ambulatory Care Center and circulation/parking changes associated with Moakley.
January 26 2006	IMP Amendment BRA Board Approval	Minor modifications including reuse of basement, office and administrative space in BCD, FGH and 761 Harrison Avenue, and removed from the BUMC Campus IMP list of buildings, the Mallory building which is no longer leased to BMC.
November 2006	Notice of Exemption Granted	Expansion of the Newton Pavilion to create 10,000 s.f. with 12 new inpatient beds
April 5 2007	Notice of Exemption Granted	Addition of 17,500 s.f. to the Menino Pavilion for MRI and ER beds.
December 2007	IMP Amendment BRA Board Approval	Demolition of existing building and construction of the new 245,000 s.f. Shapiro Ambulatory Care Center at 725 Albany Street. The SACC will create more efficient use of existing outpatient space shifted from other campus locations.

July 16 2009	IMP Renewal and Amendment BRA Board Approval	Renewal of the 2000 Boston University Medical Center IMP for a 2 year term and minor expansion of the Menino Pavilion by construction of a single story slab on grade addition of 845 s.f. to the ED.
January 12 2010	IMP Amendment BRA Board Approval	Amendment to IMP to include the approximately 1.7 acre site lying between Albany Street and Fellows Street (the "Albany Fellows Site") in the Boston University Medical Center IMP and the construction on a portion of the Albany Fellows Site of a proposed project known as the Graduate Student Housing Project for Boston University Medical School consisting of a nine story building of approximately 84,033 square feet with approximately 12,000 square feet of on-site landscaped open space, which building will provide 104 two bedroom units to house up to 208 graduate students of the Boston University Medical Campus and will also contain approximately 5,000 square feet of ground floor retail space.
June 22 2010	IMP Renewal BRA Board Approval	Renewal of the 2010 IMP to include 3 proposed IMP Projects. The construction of a 48,000 square foot Energy Facility, the construction of a 160,000 square foot Administration/Clinical Building and demolition of an existing building and the construction of a 405,000 square foot new Inpatient Facility. Removal of leased space at the Finland and Kakas Building. Inclusion of leased space at the Crosstown Site, clarification of the Ownership of the Gambro Building and a change in use for the Doctors Office Building from Outpatient to Administration.

Appendix B

Shadow Study - March 21 9am

April 26, 2013



BOSTON MEDICAL CENTER
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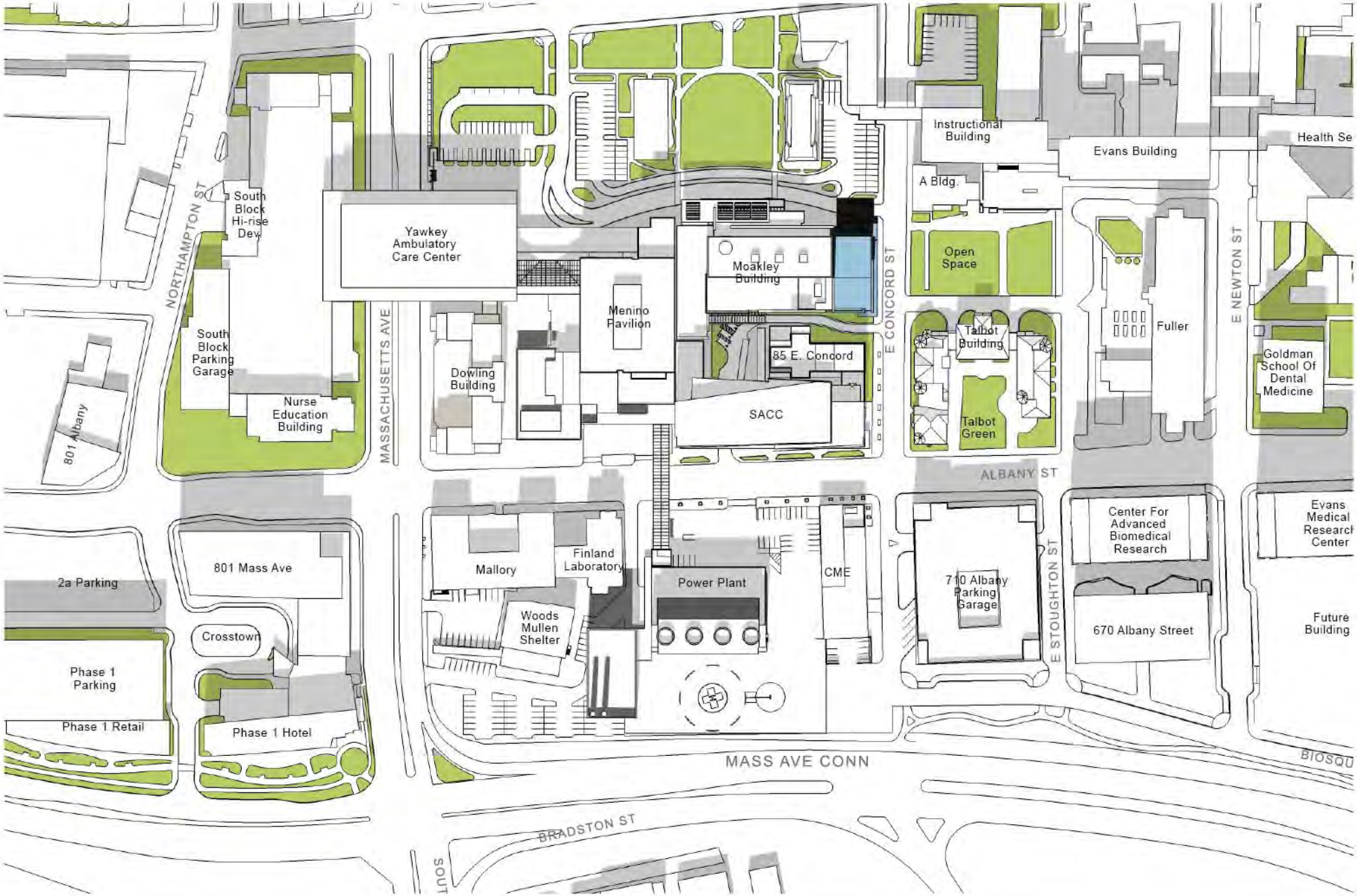
Shadow Study - March 21 12pm

April 26, 2013



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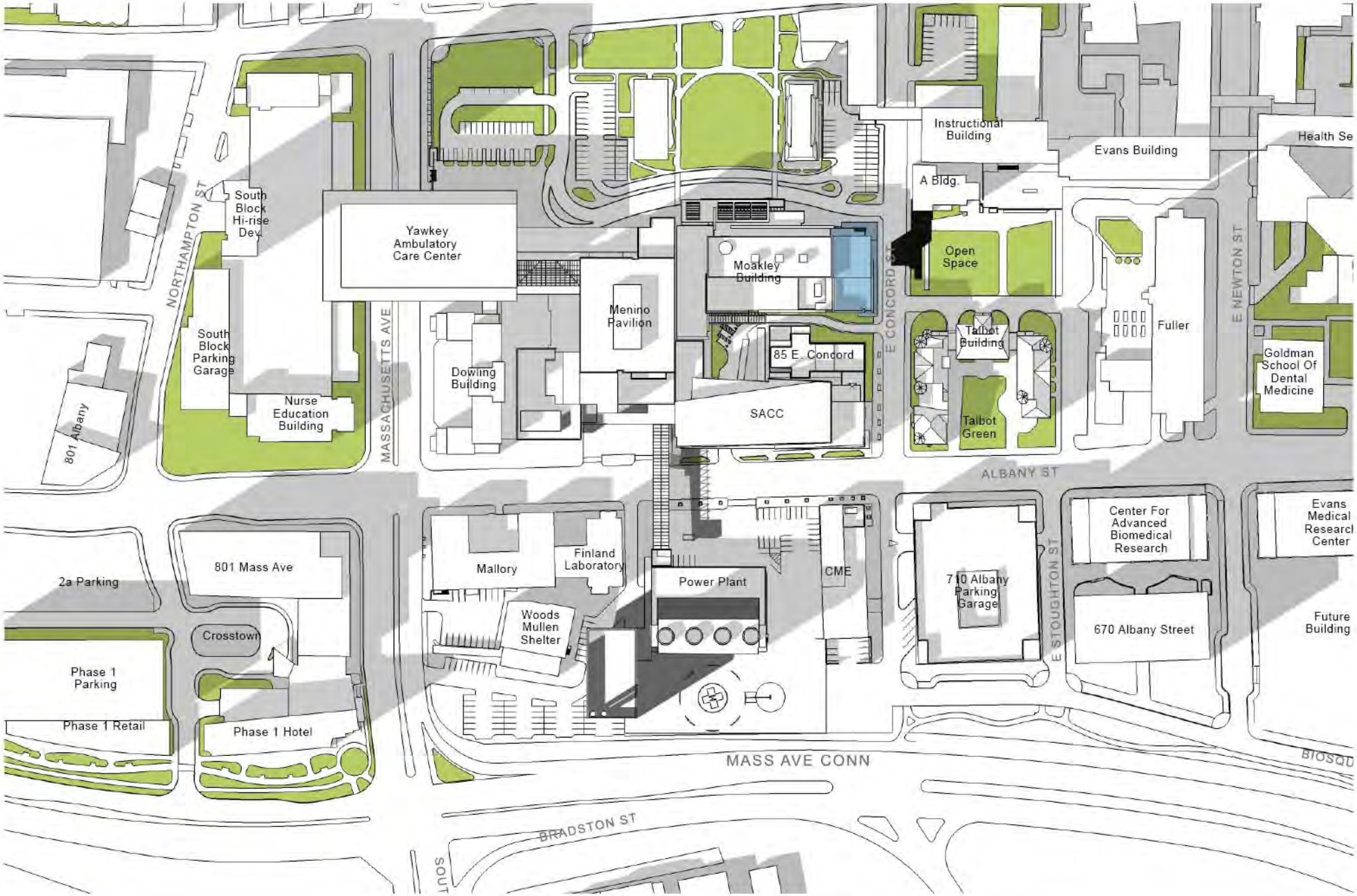

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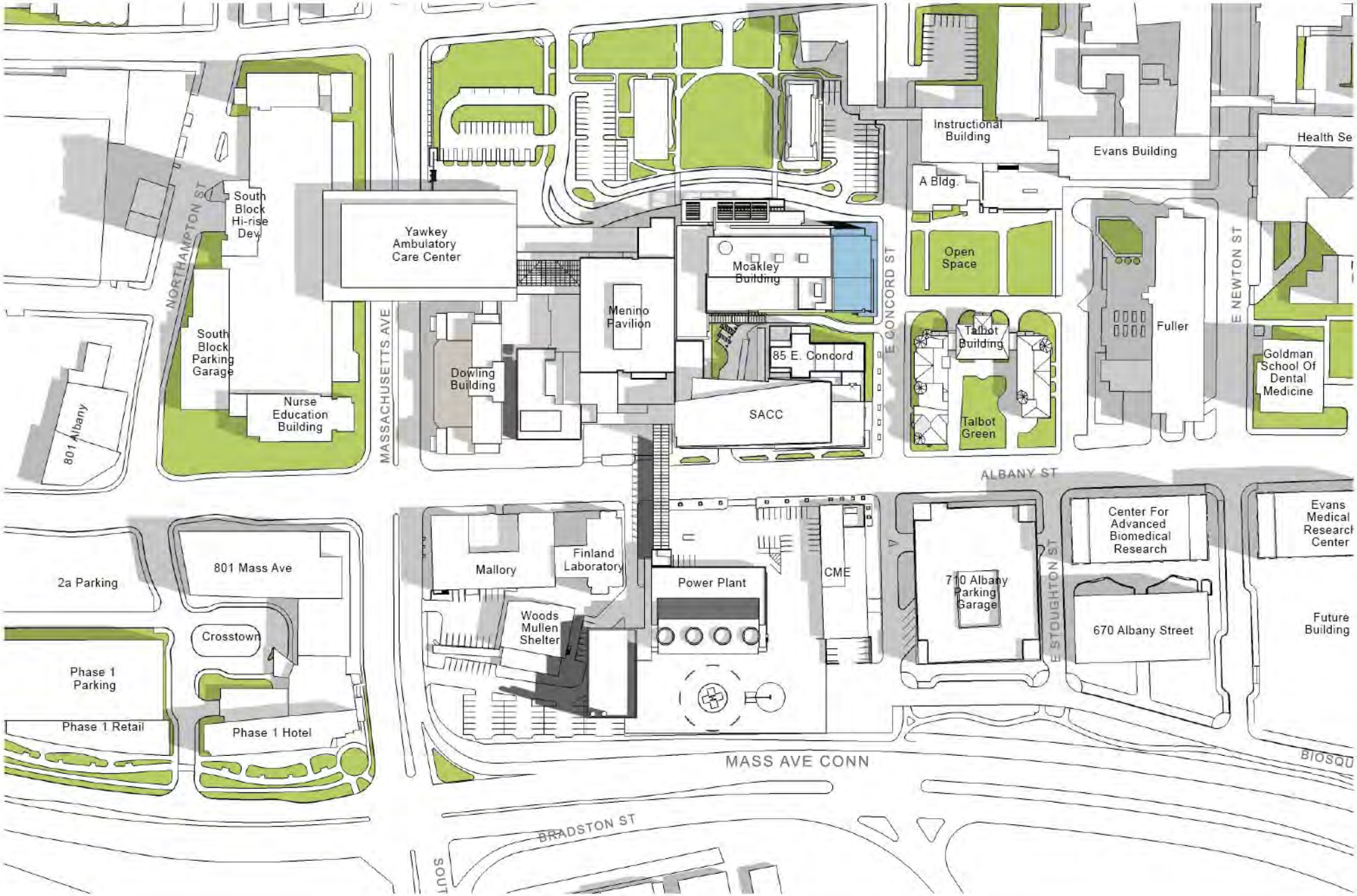

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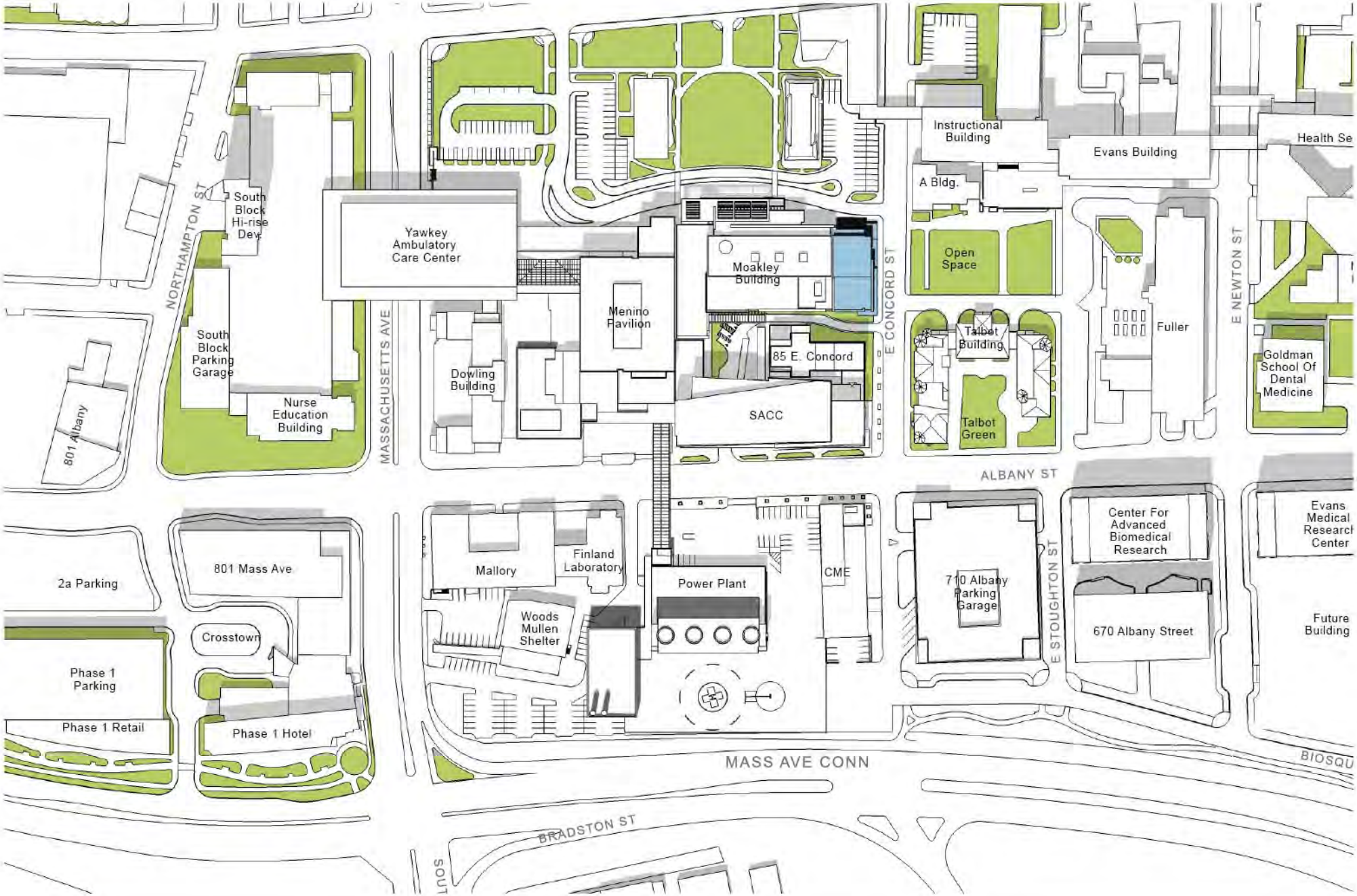

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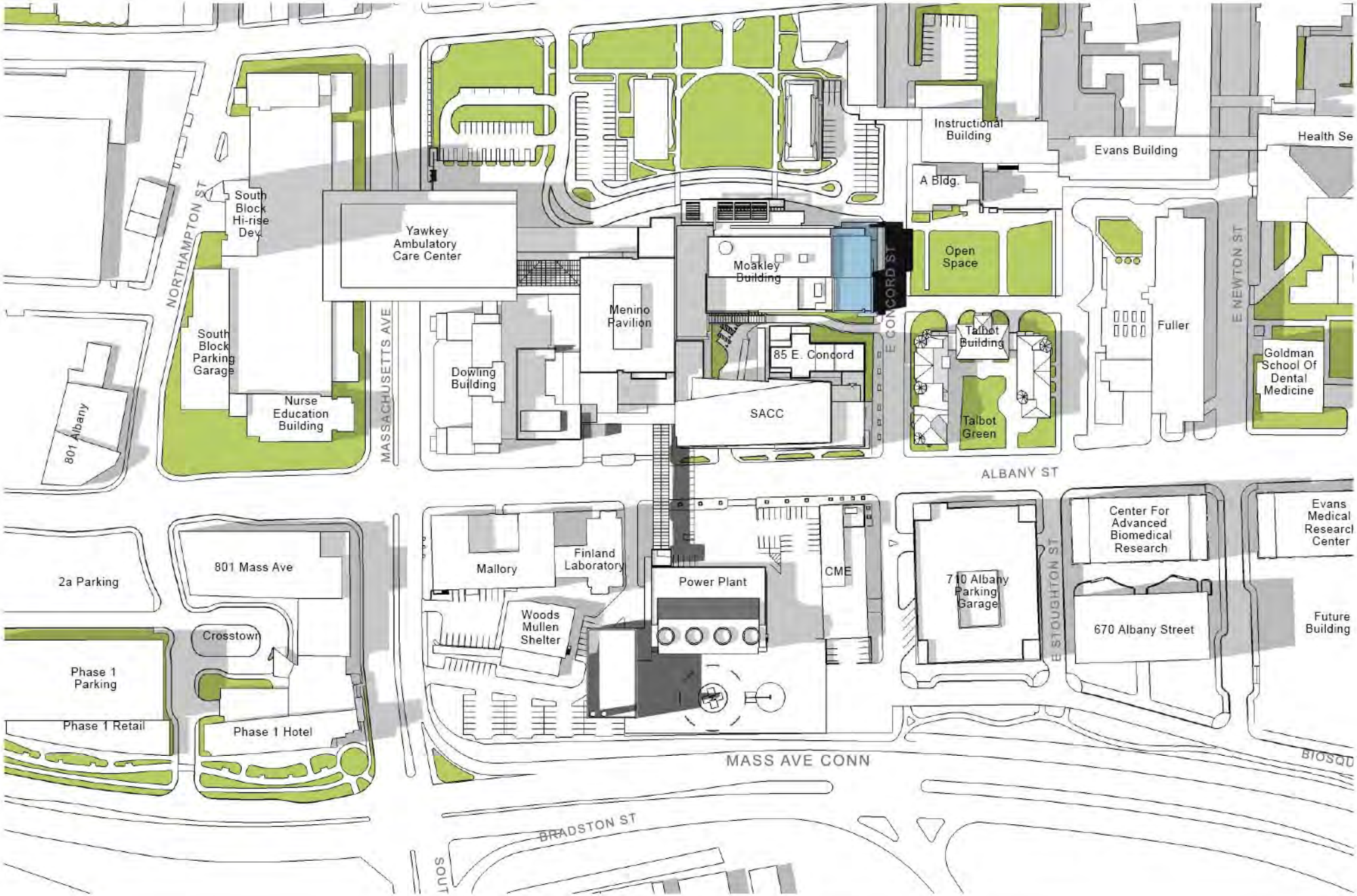

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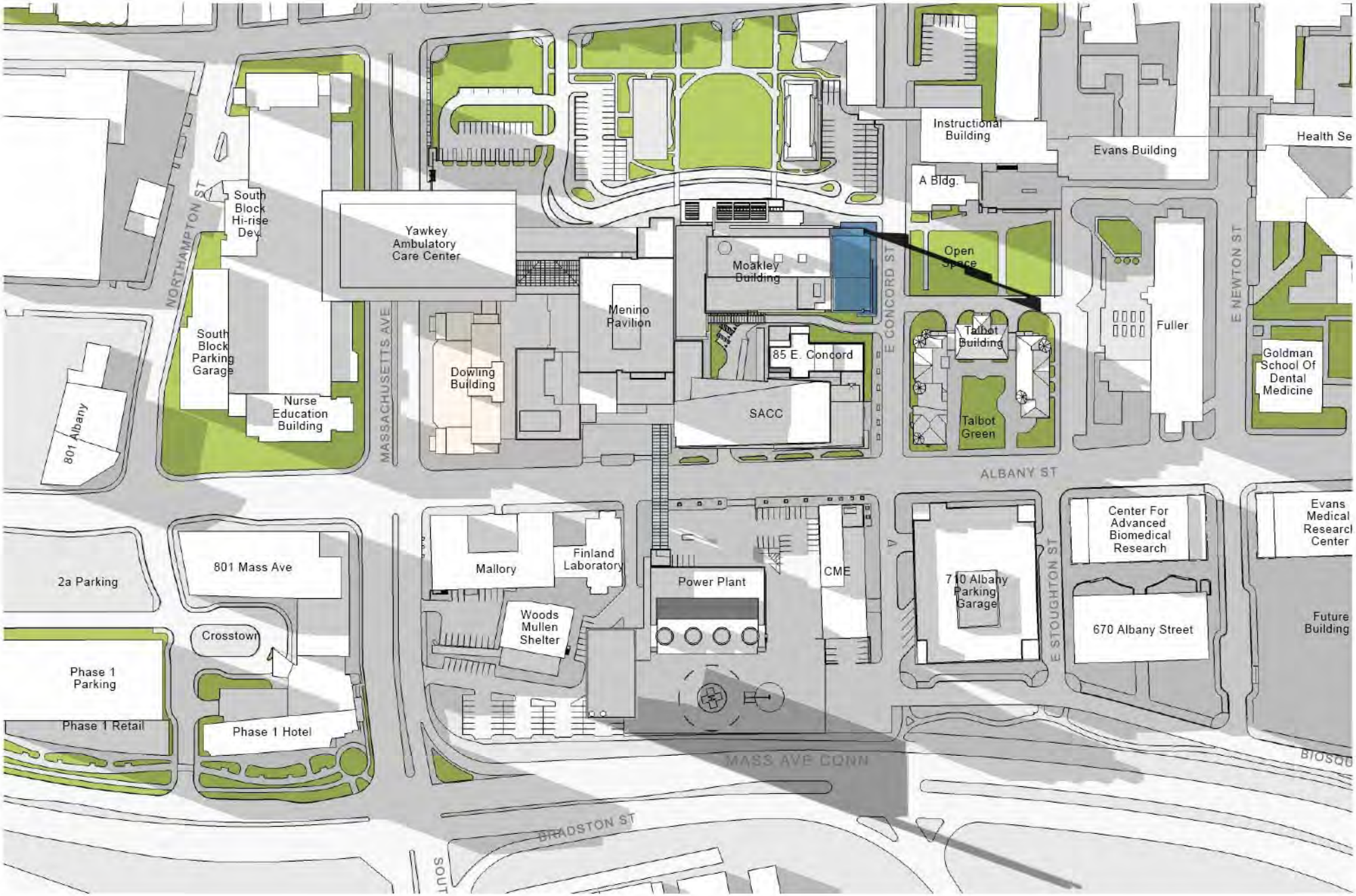

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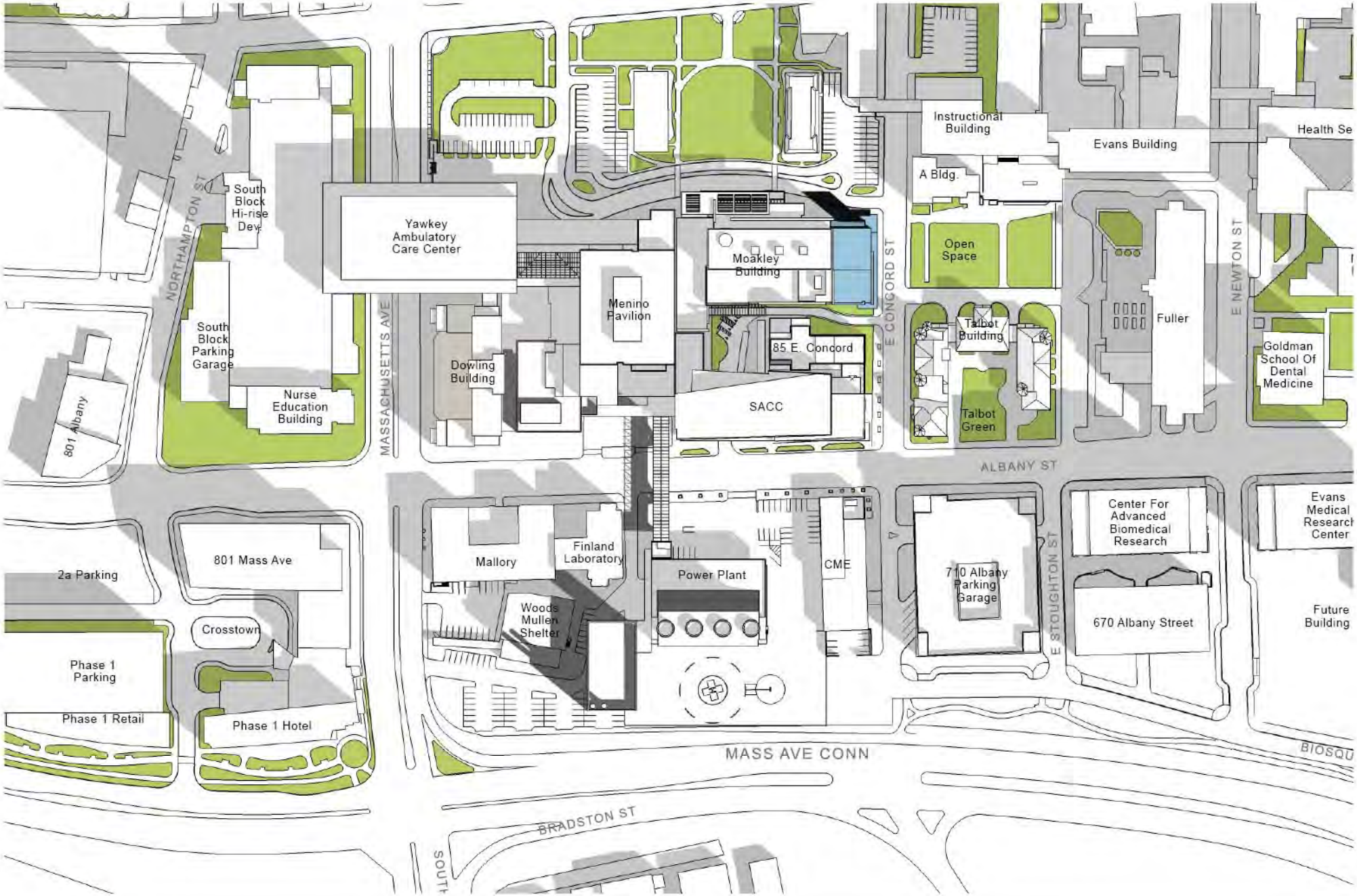
April 26, 2013



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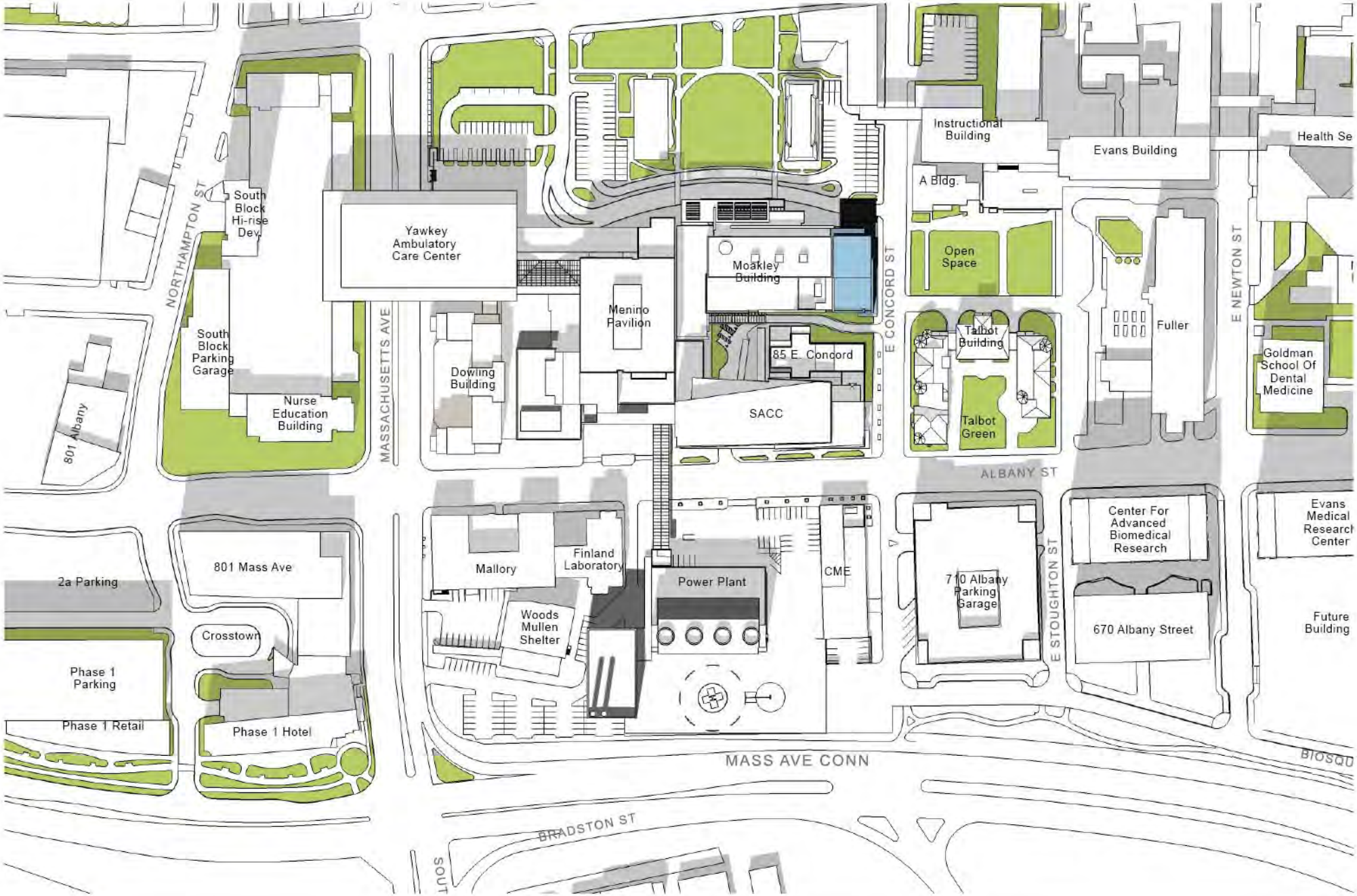

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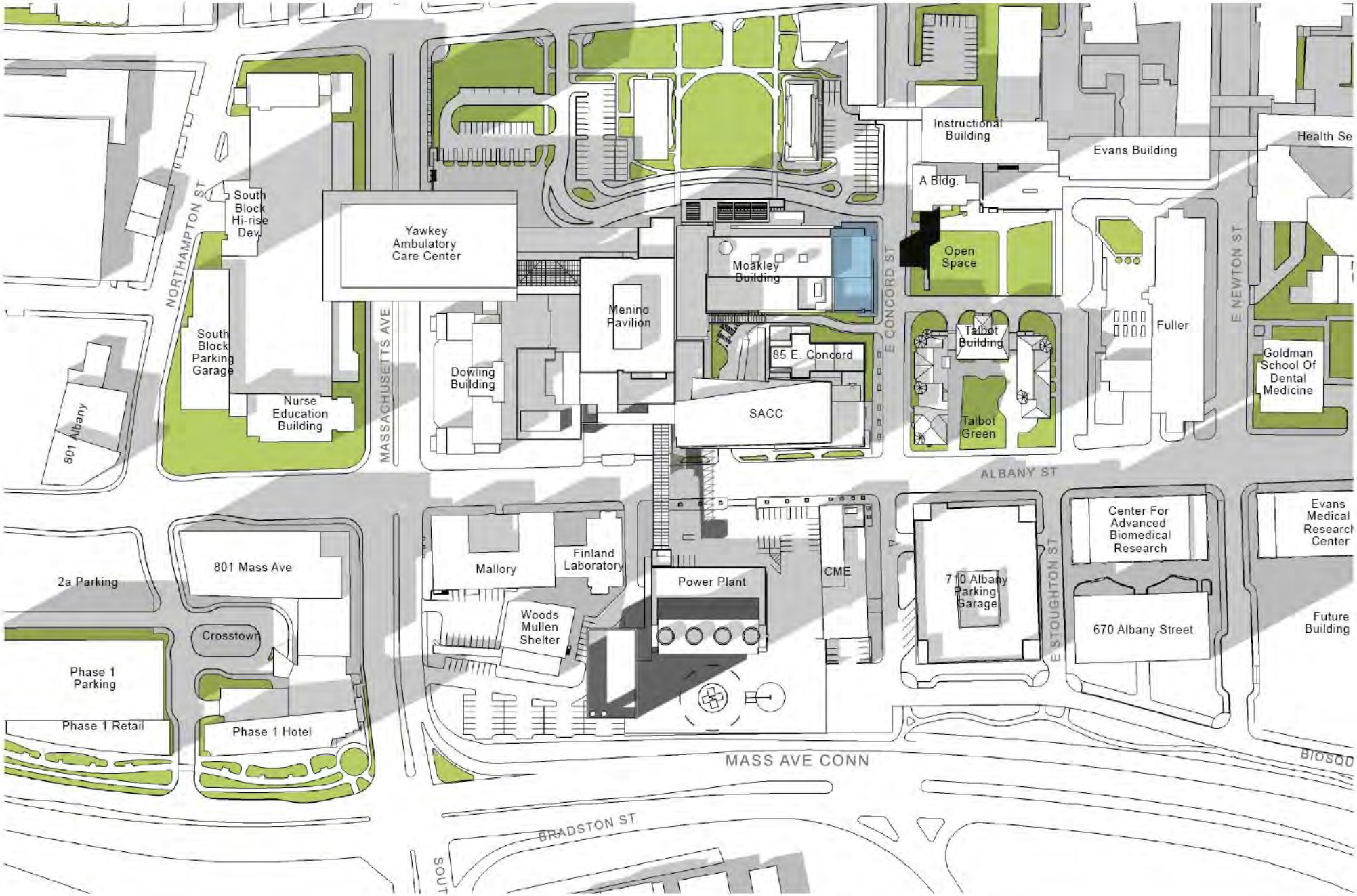
Shadow Study - September 21 3pm

April 26, 2013



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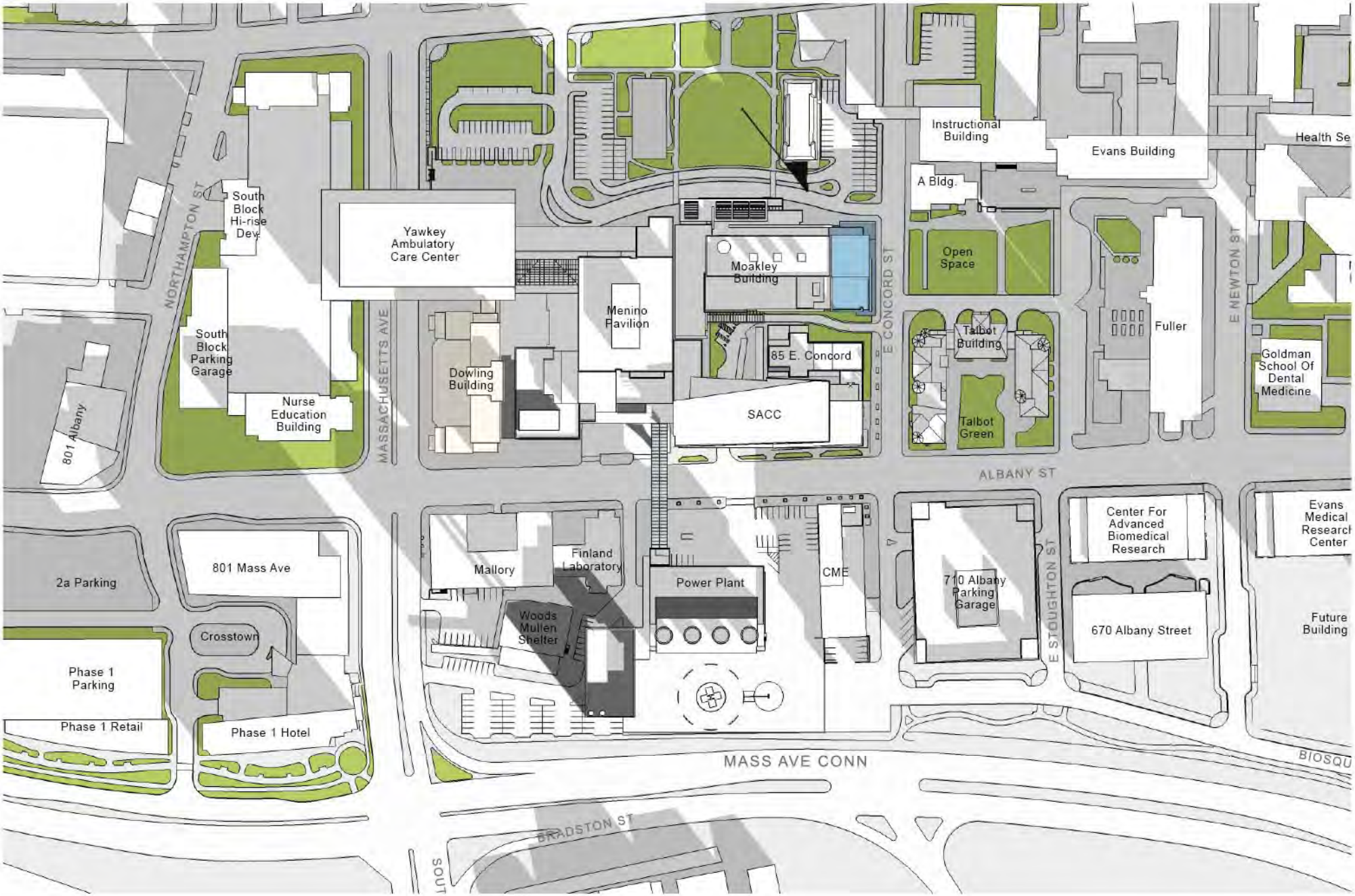

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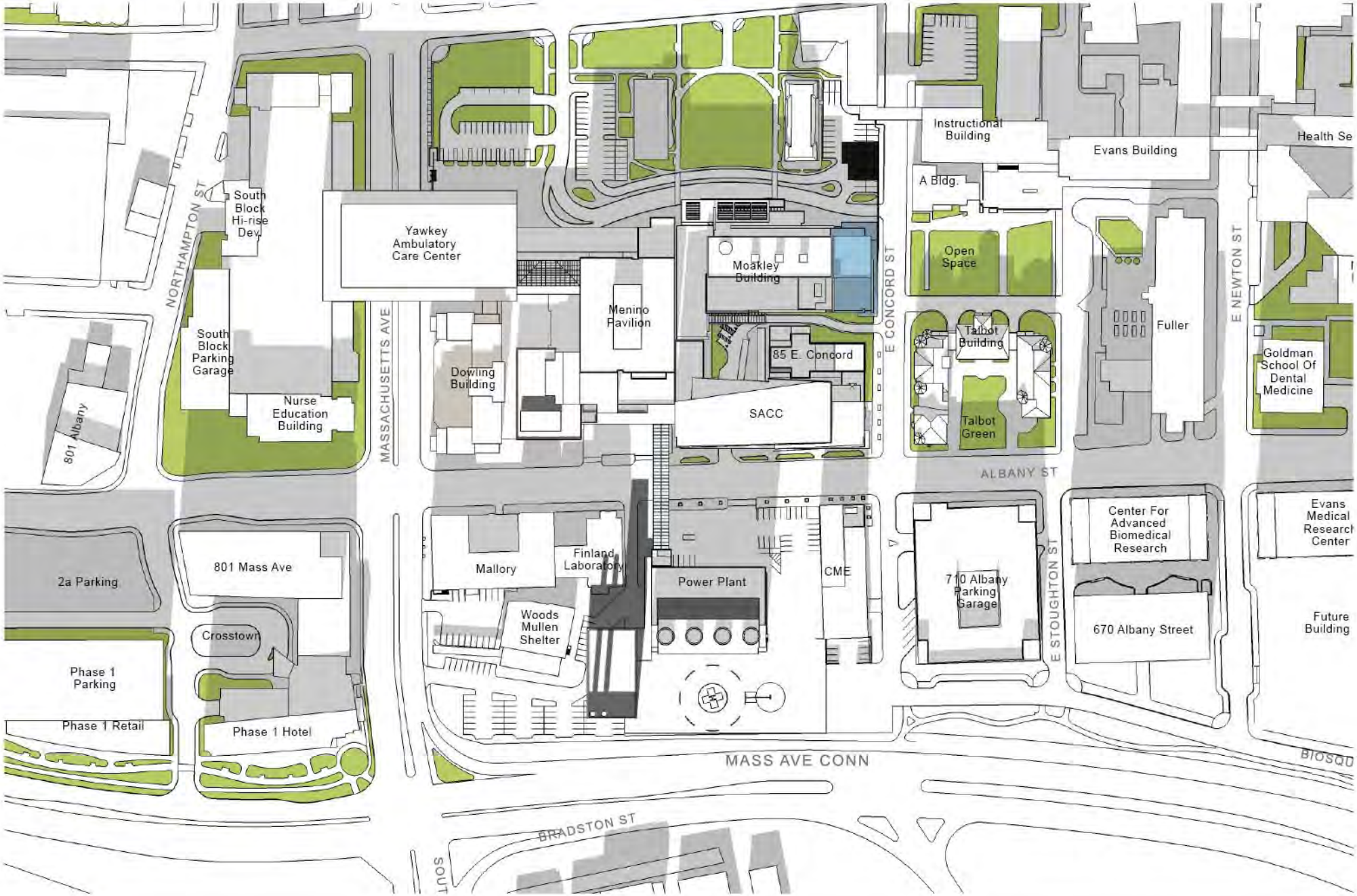
April 26, 2013



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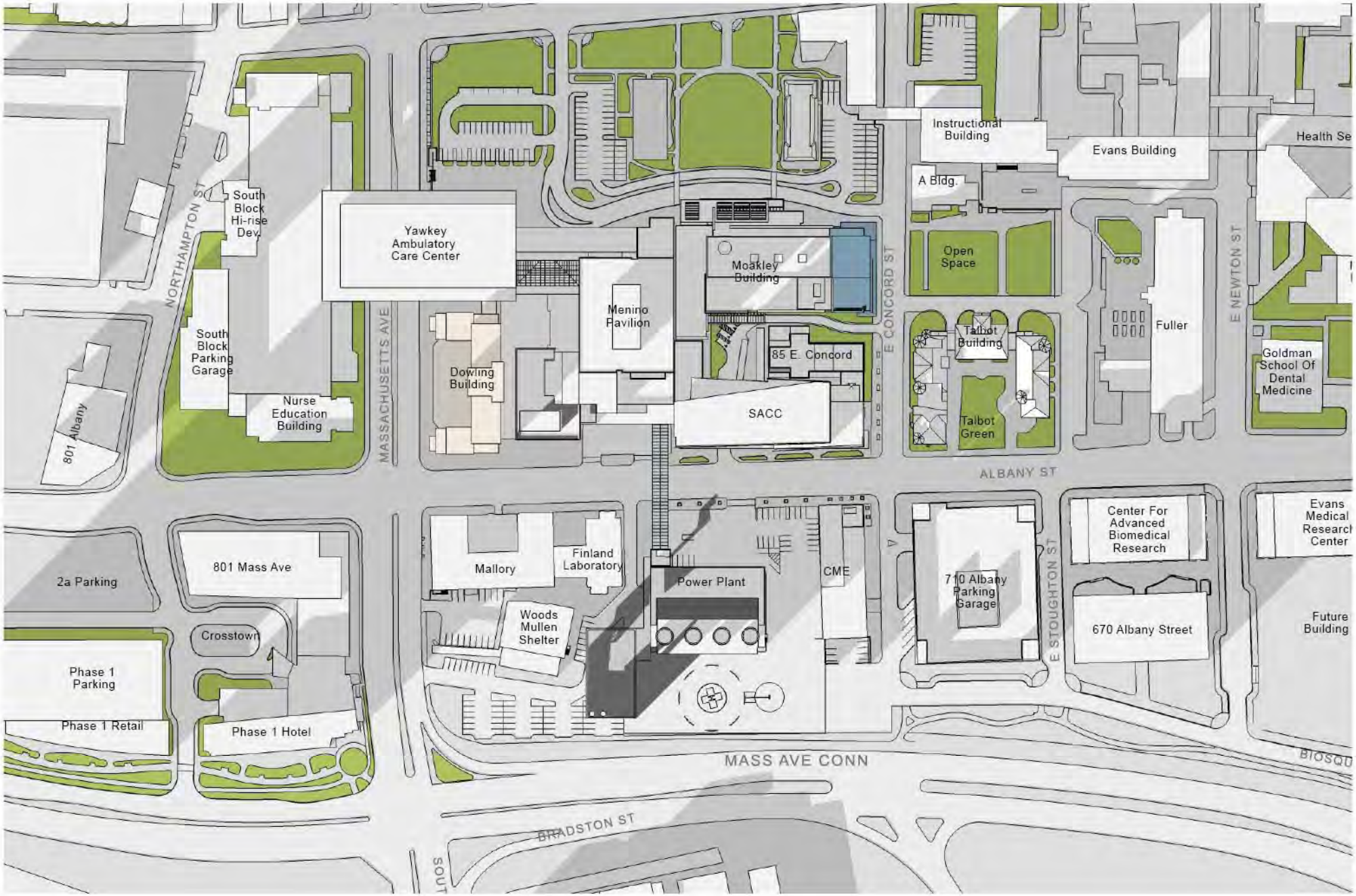
Shadow Study - December 21 3pm

April 26, 2013



BOSTON MEDICAL CENTER
EXCEPTIONAL CARE. WITHOUT EXCEPTION.

TSOI / KOBUS & ASSOCIATES
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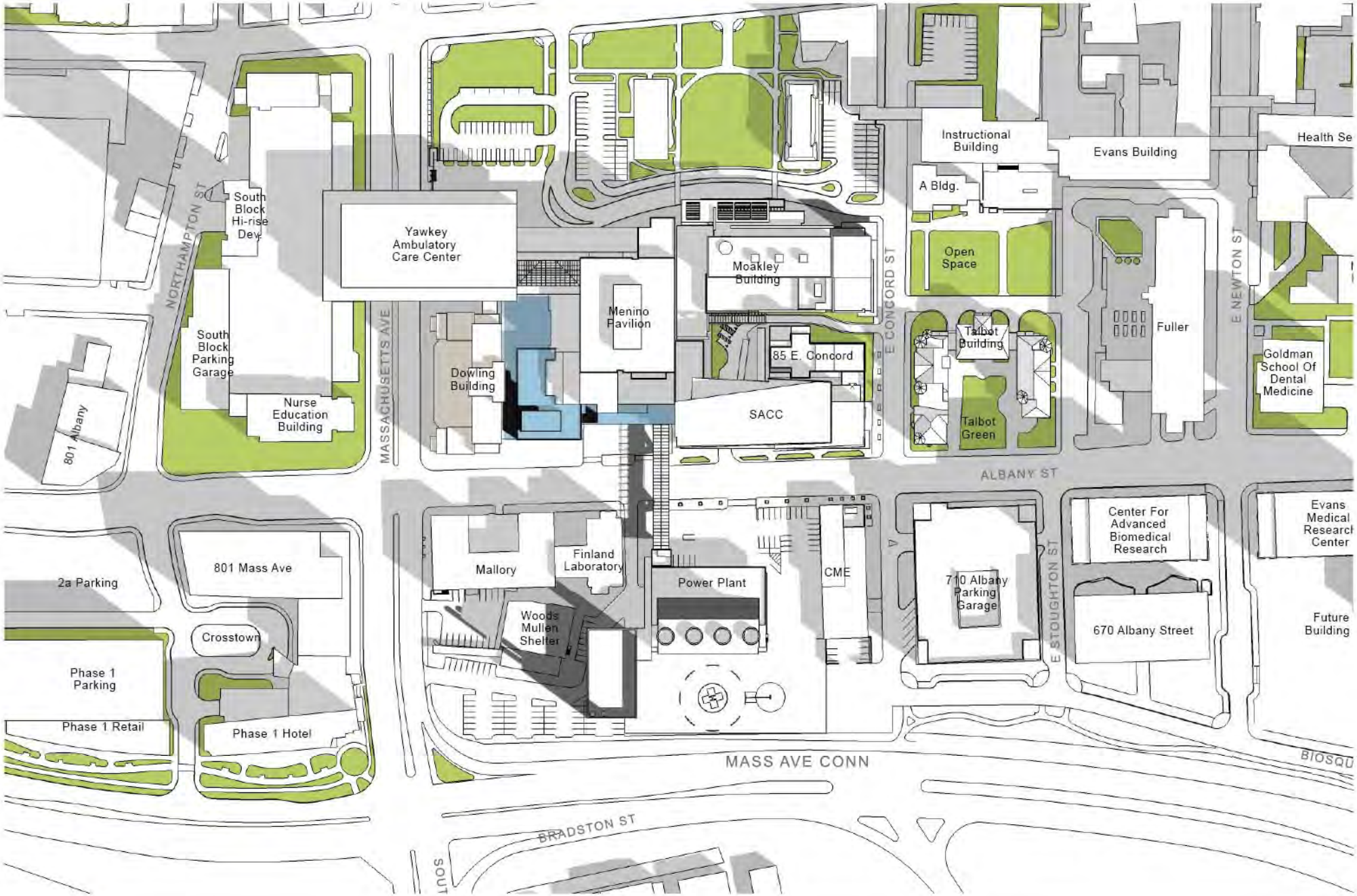
Appendix C

Shadow Study - March 21 9am

April 26, 2013



BOSTON MEDICAL CENTER
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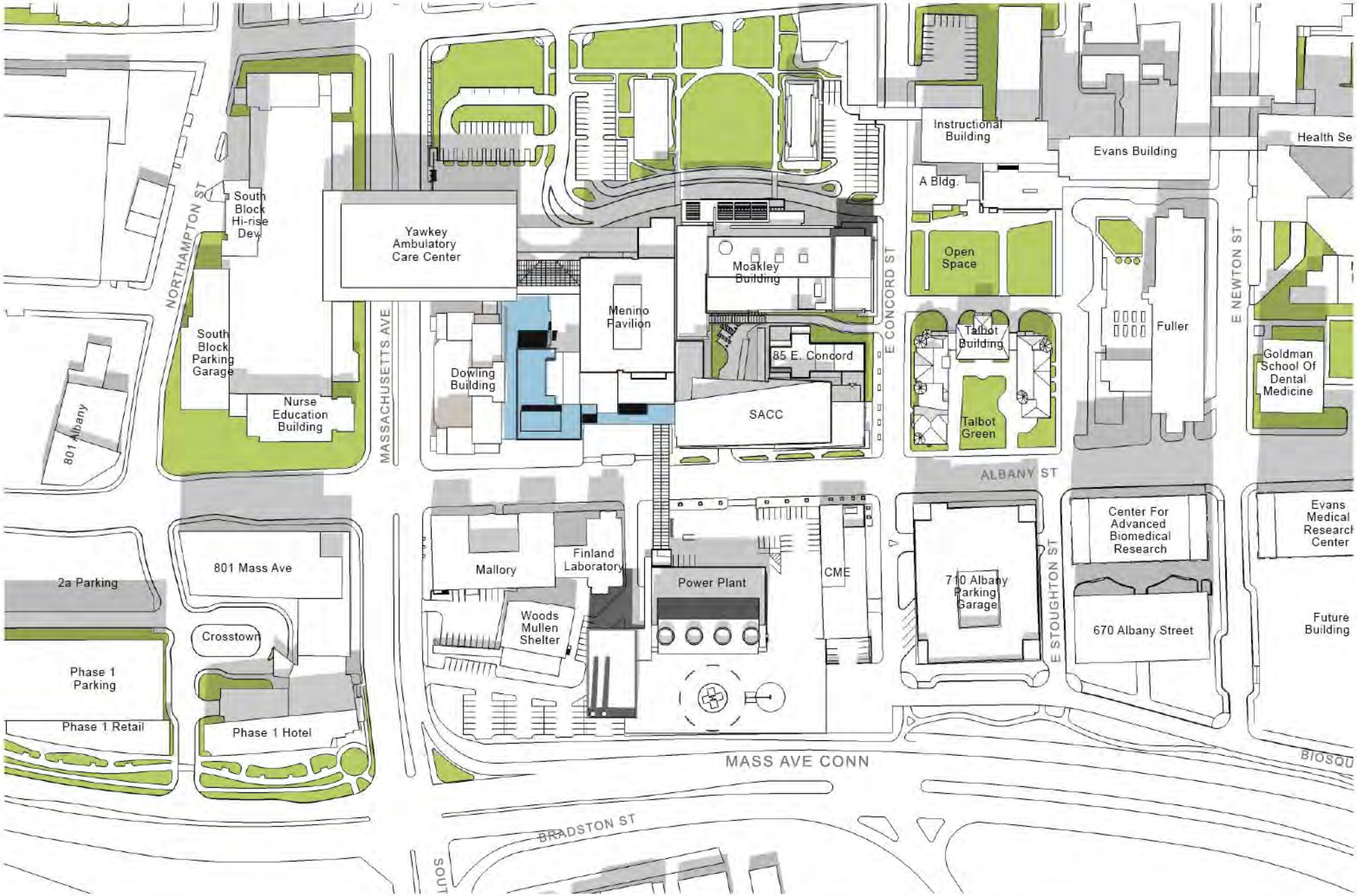
Shadow Study - March 21 12pm

April 26, 2013



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Shadow Study - March 21 3pm

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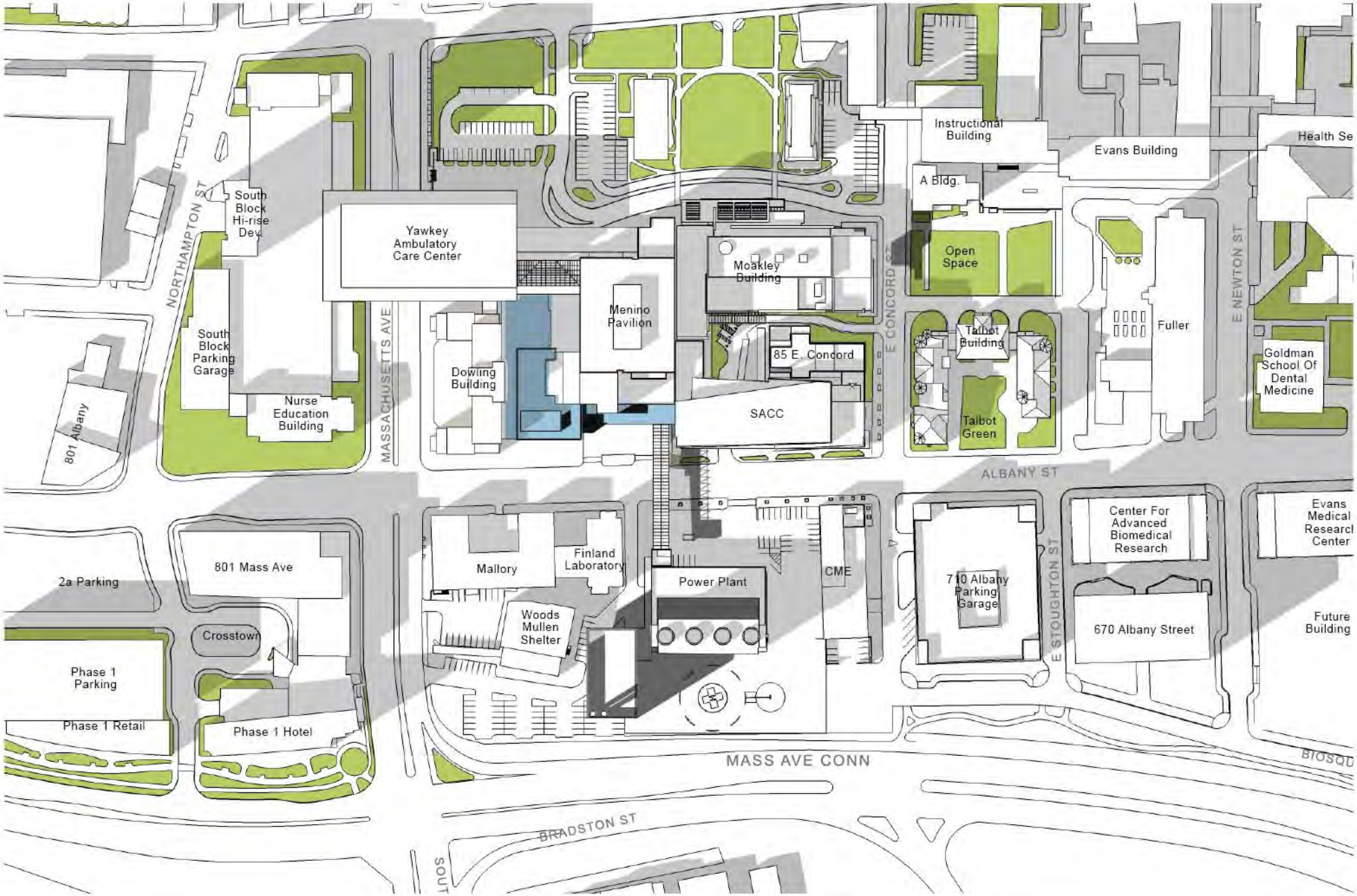

BOSTON MEDICAL CENTER
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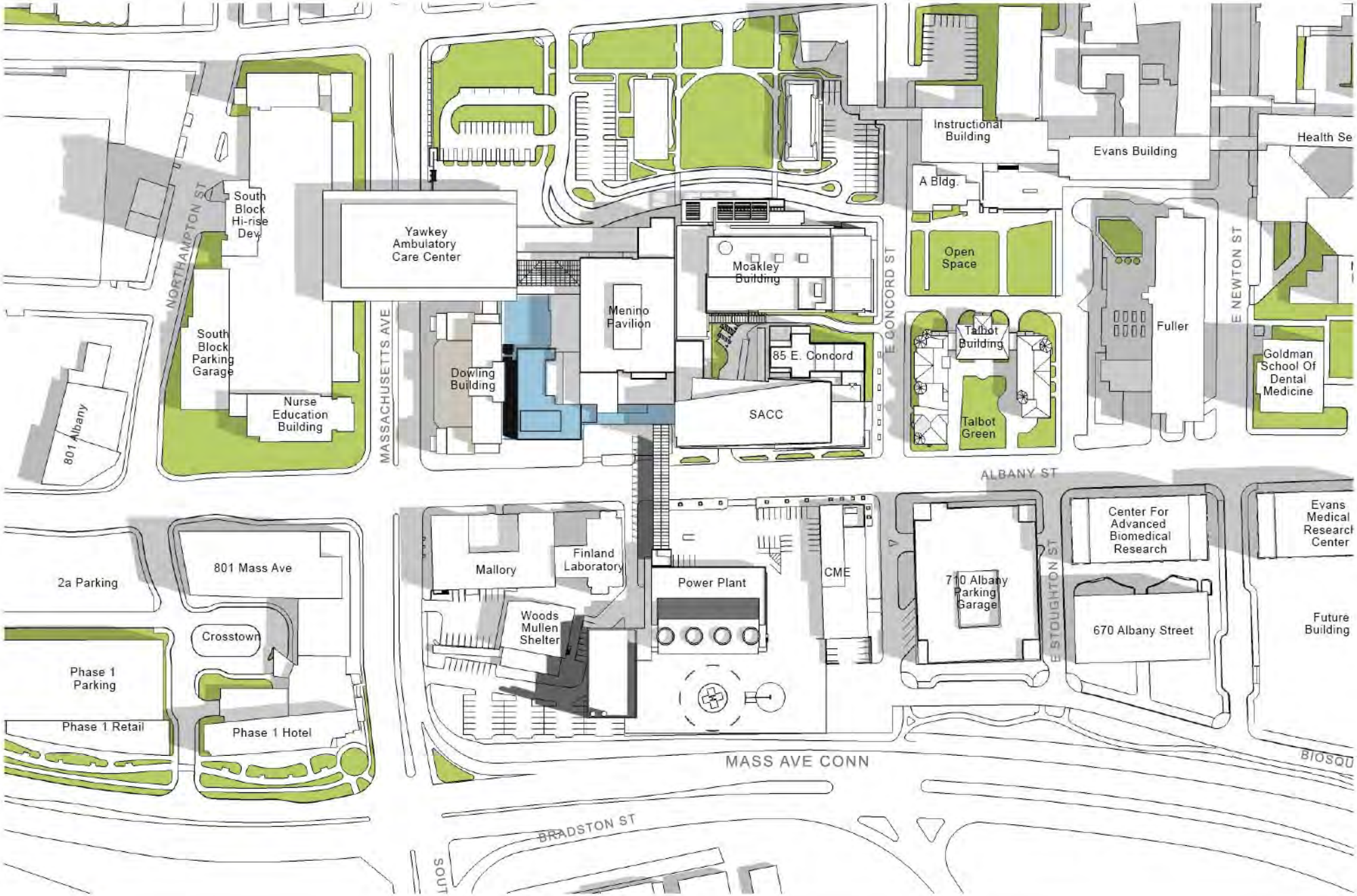
Shadow Study - June 21 9am

April 26, 2013



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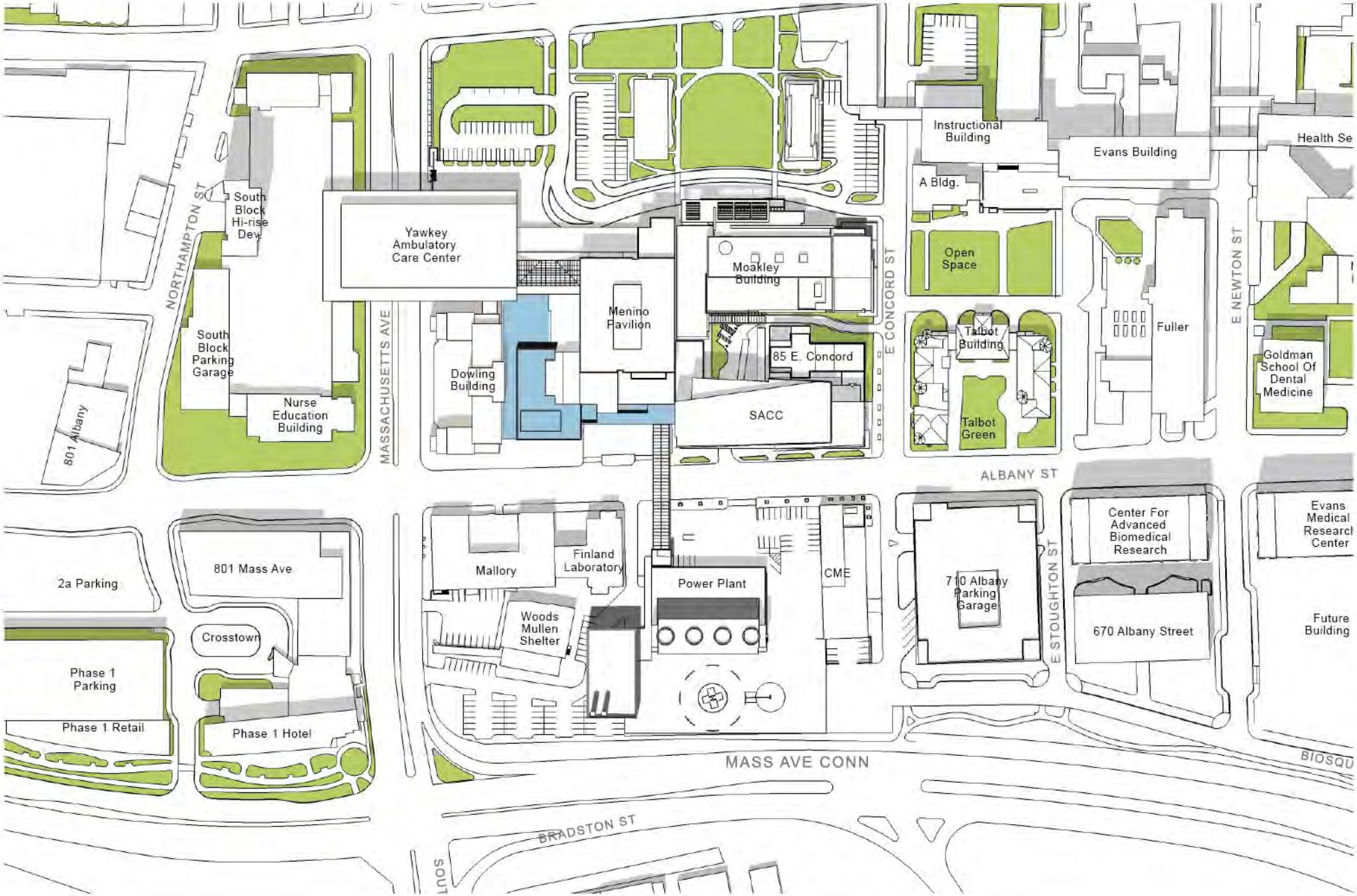

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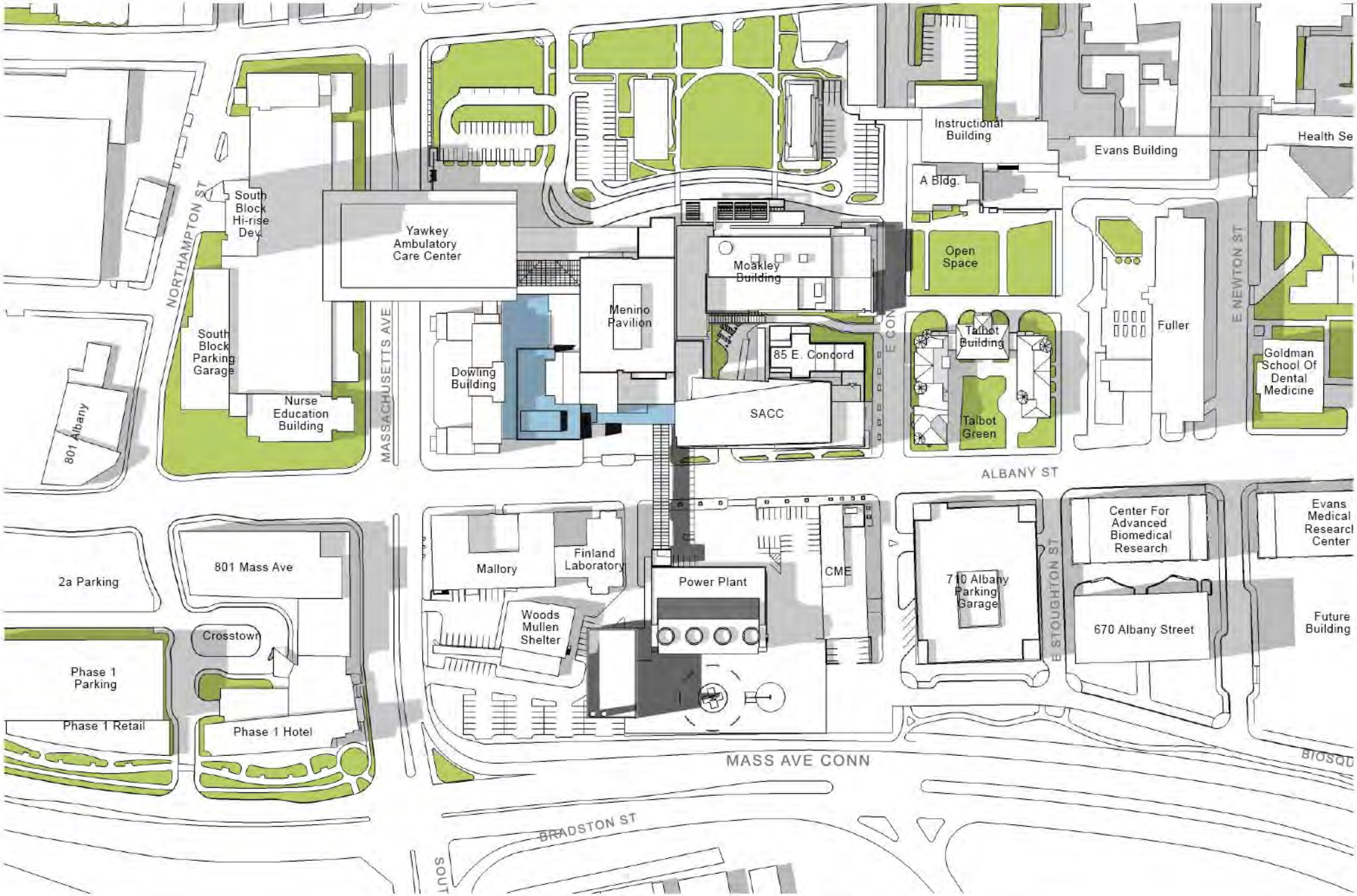

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Shadow Study - June 21 6pm

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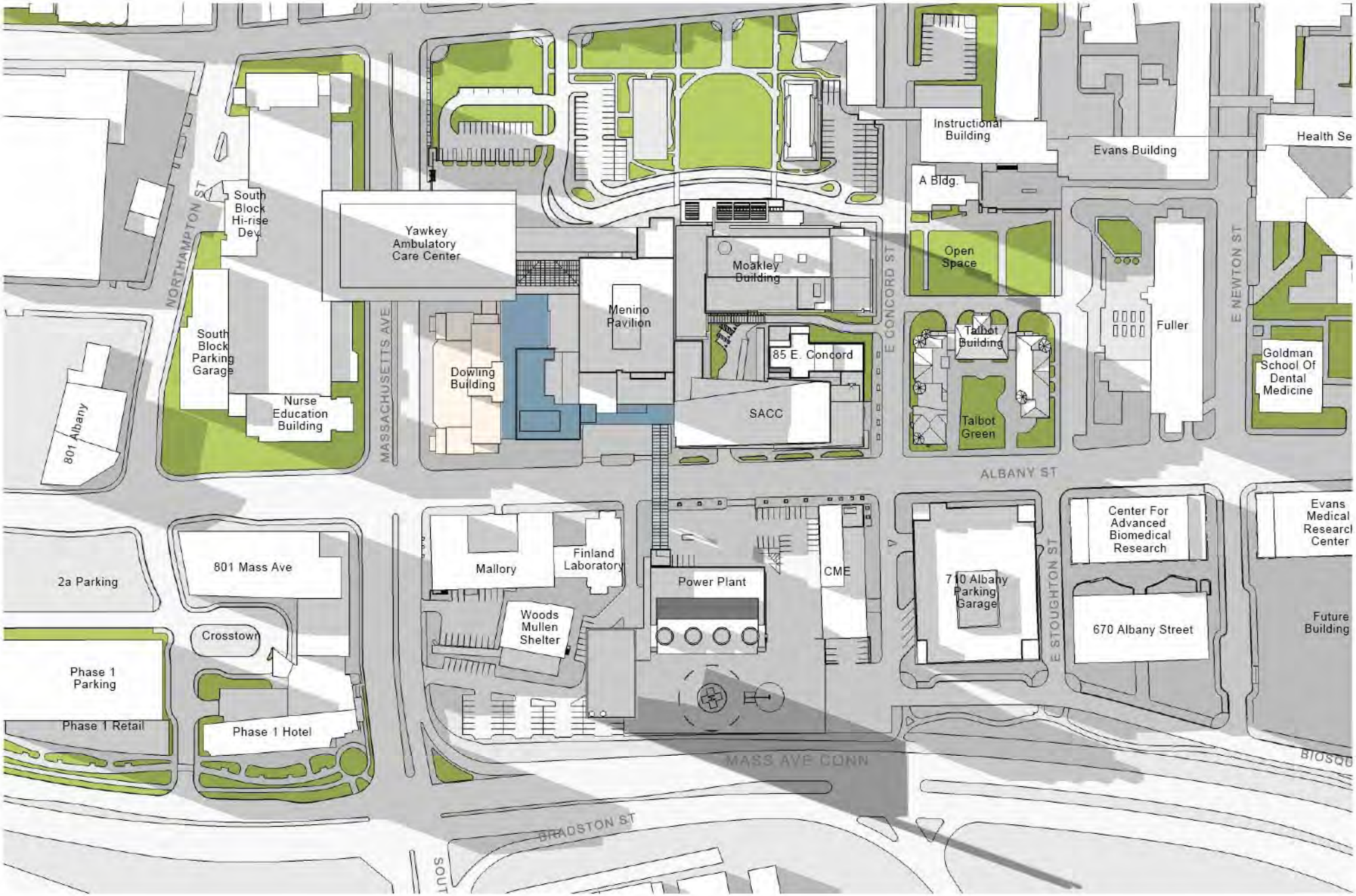

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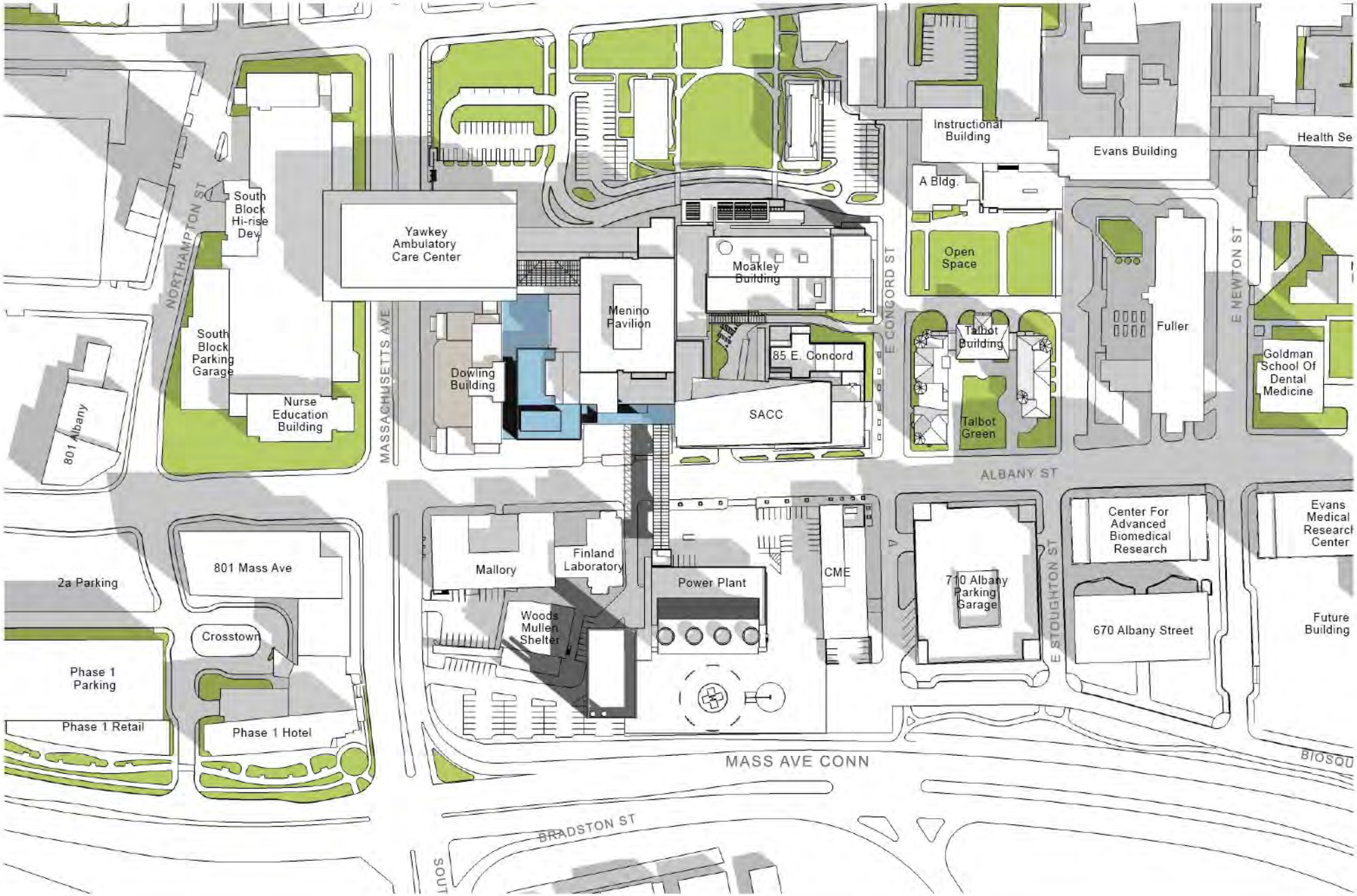

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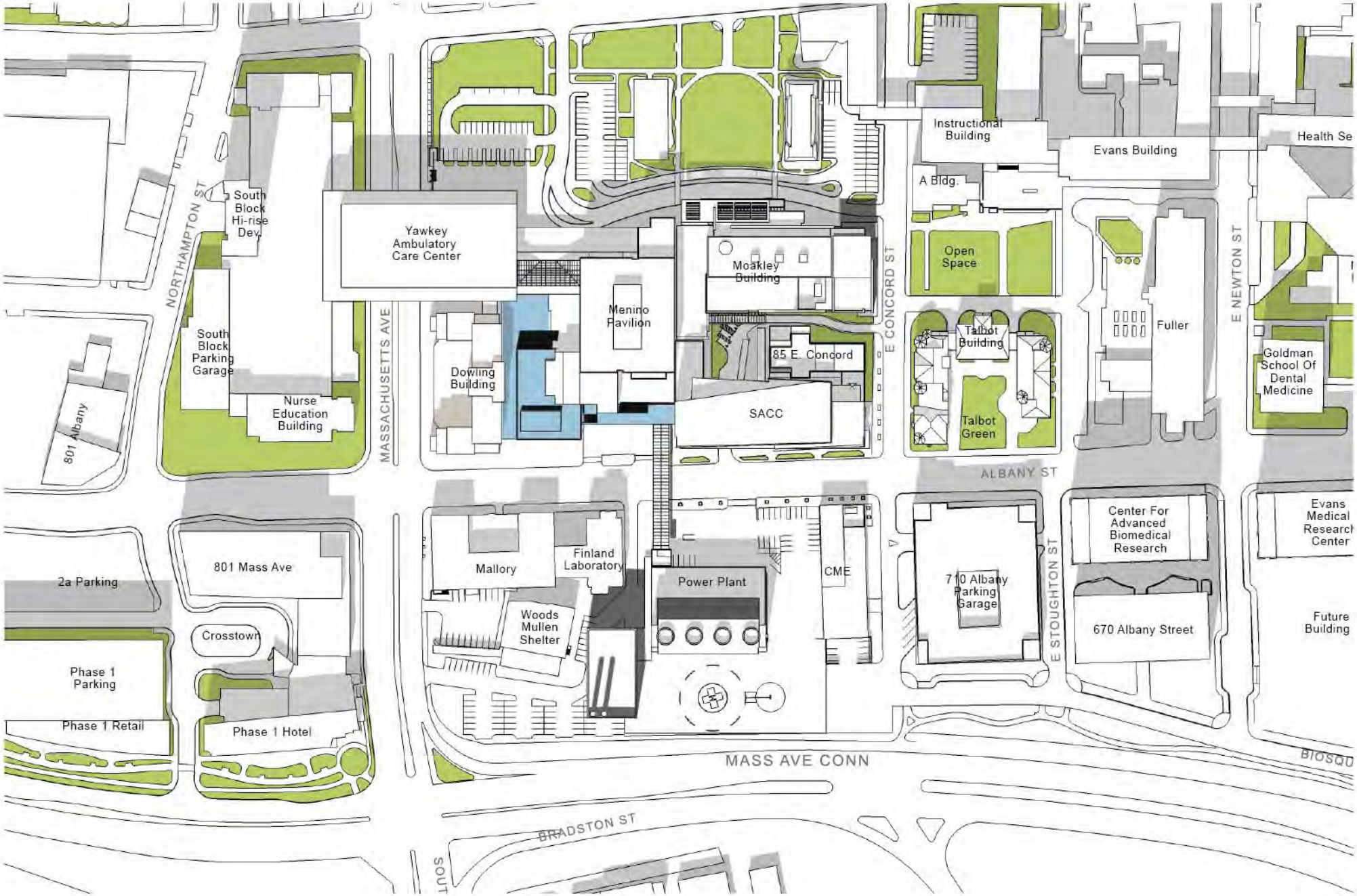

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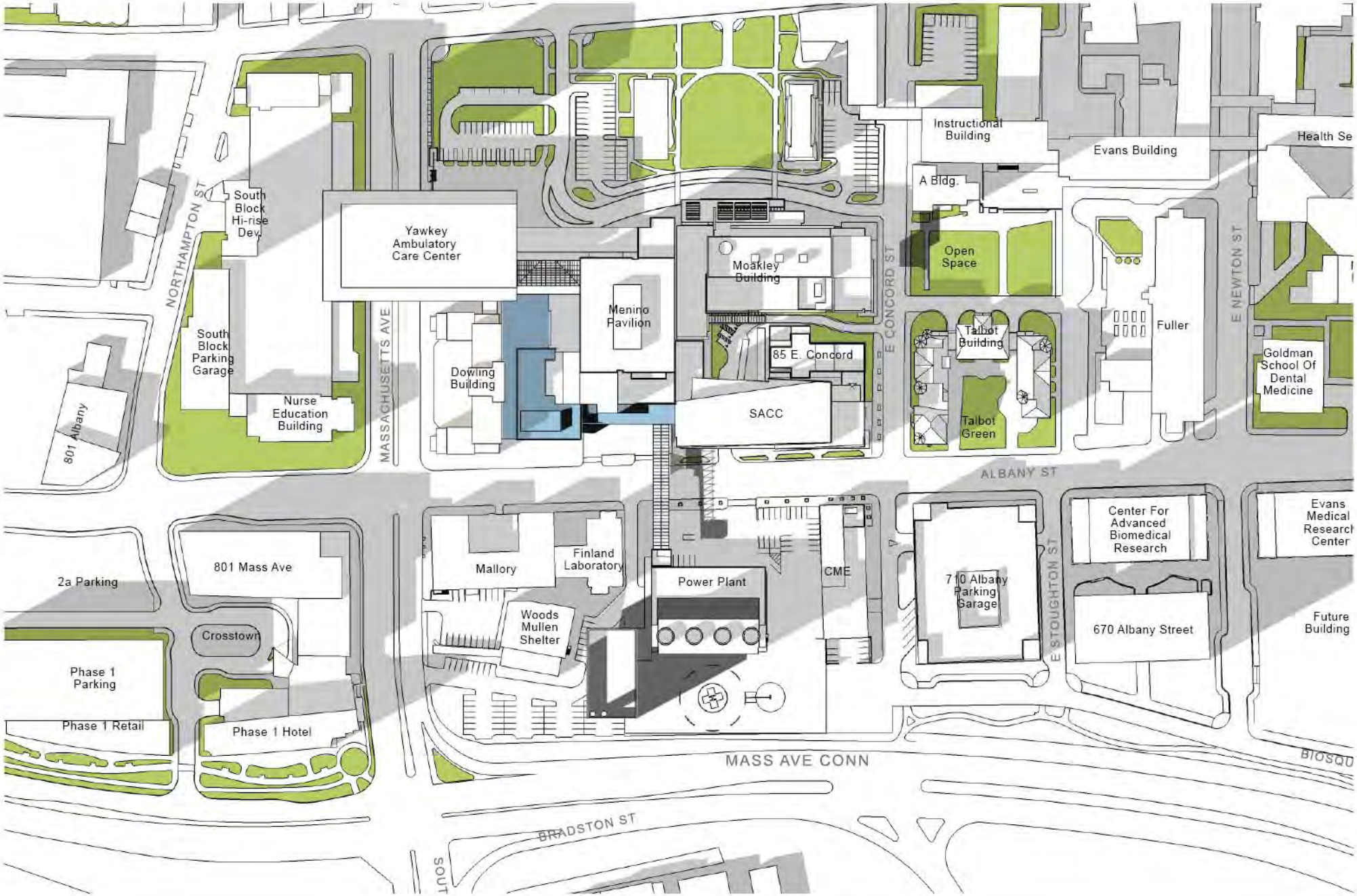

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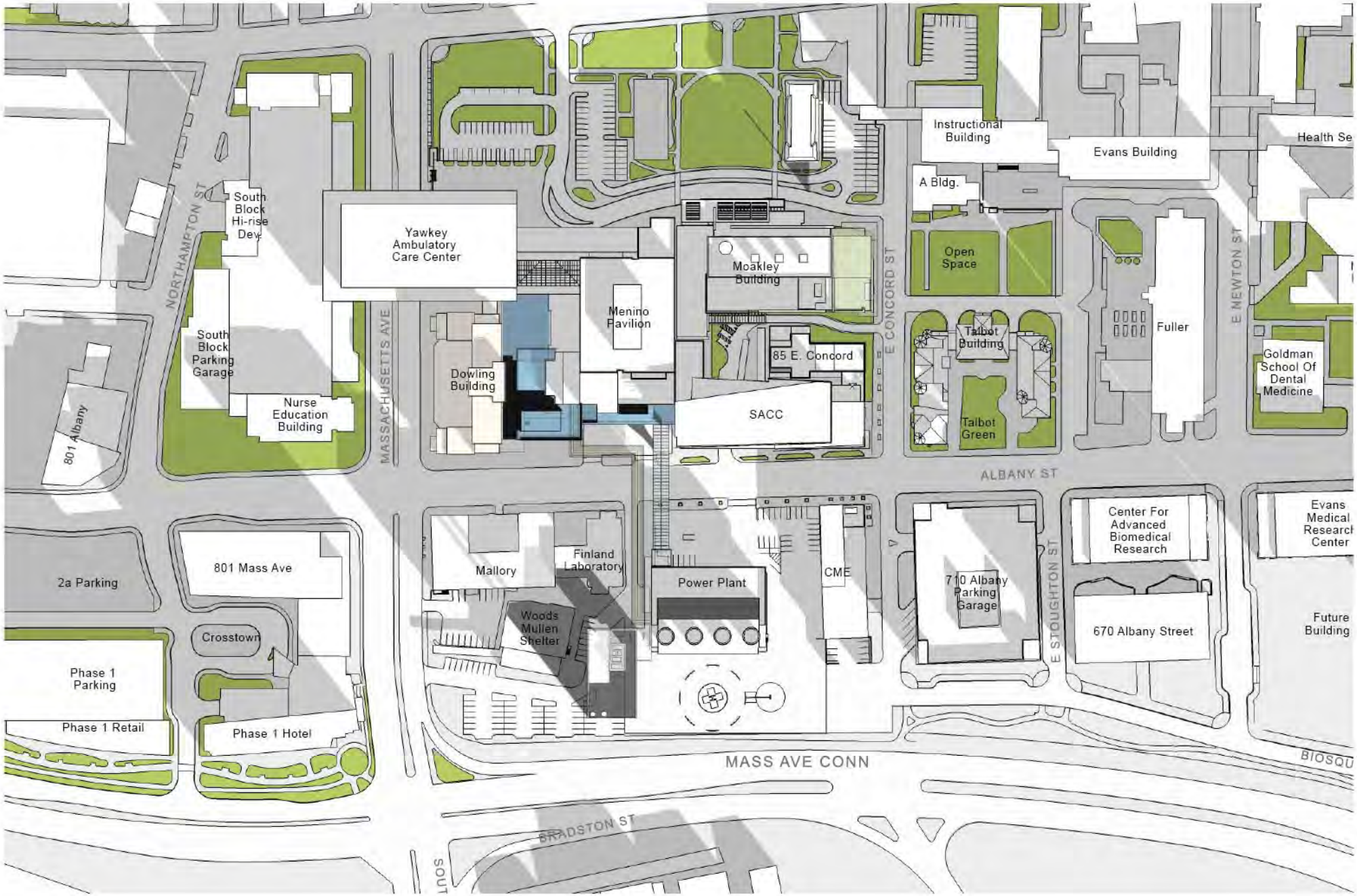

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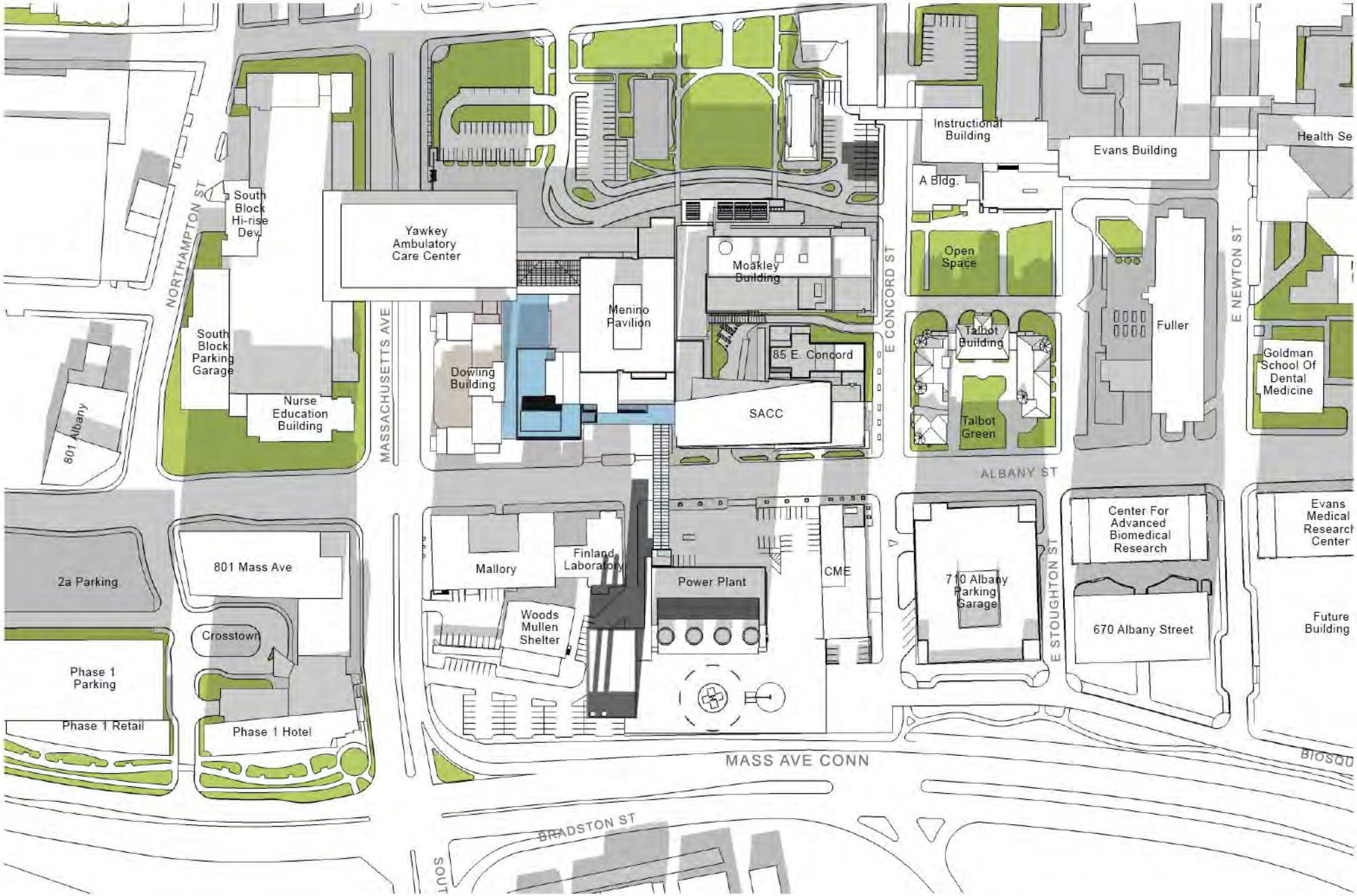

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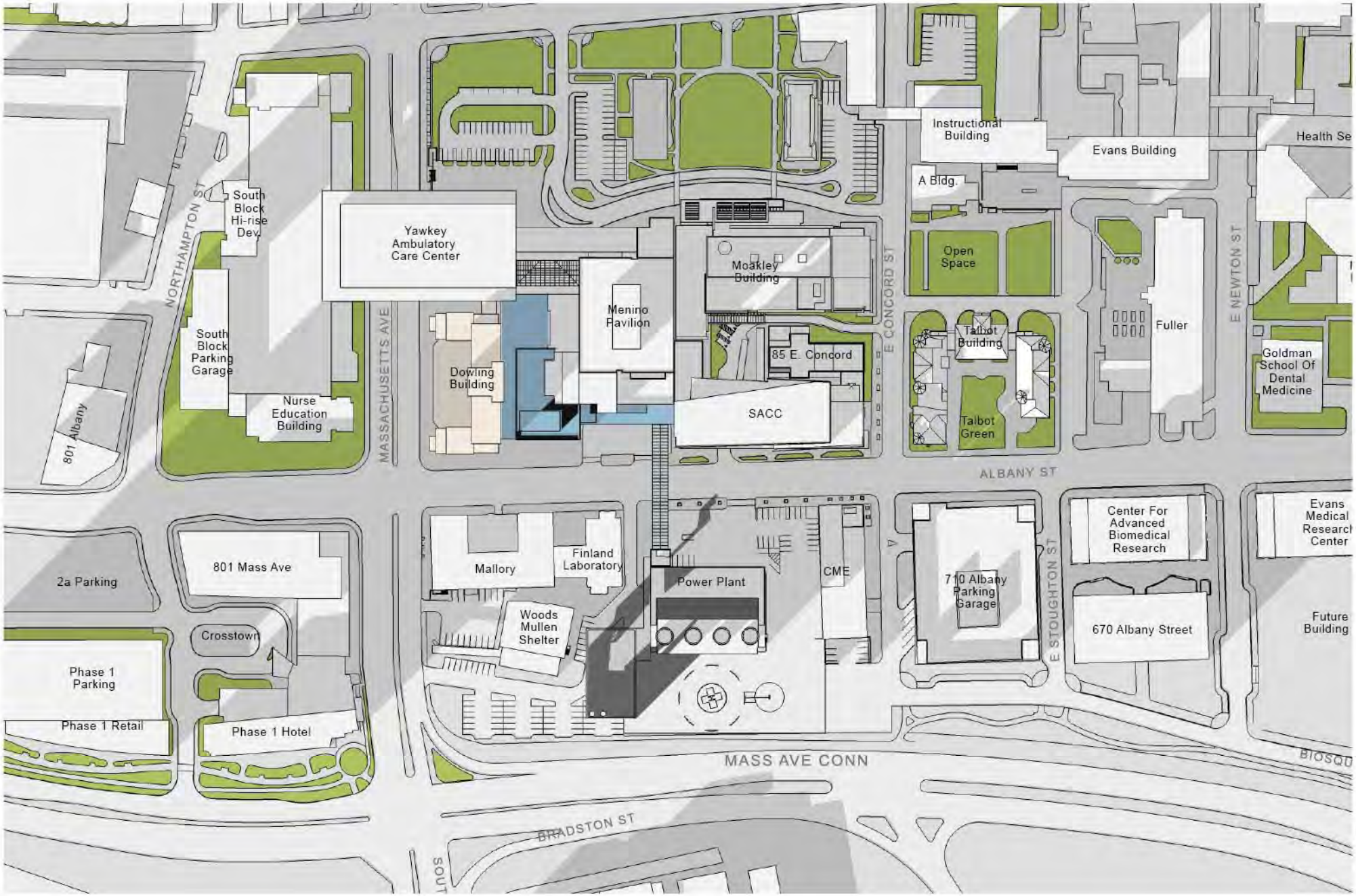

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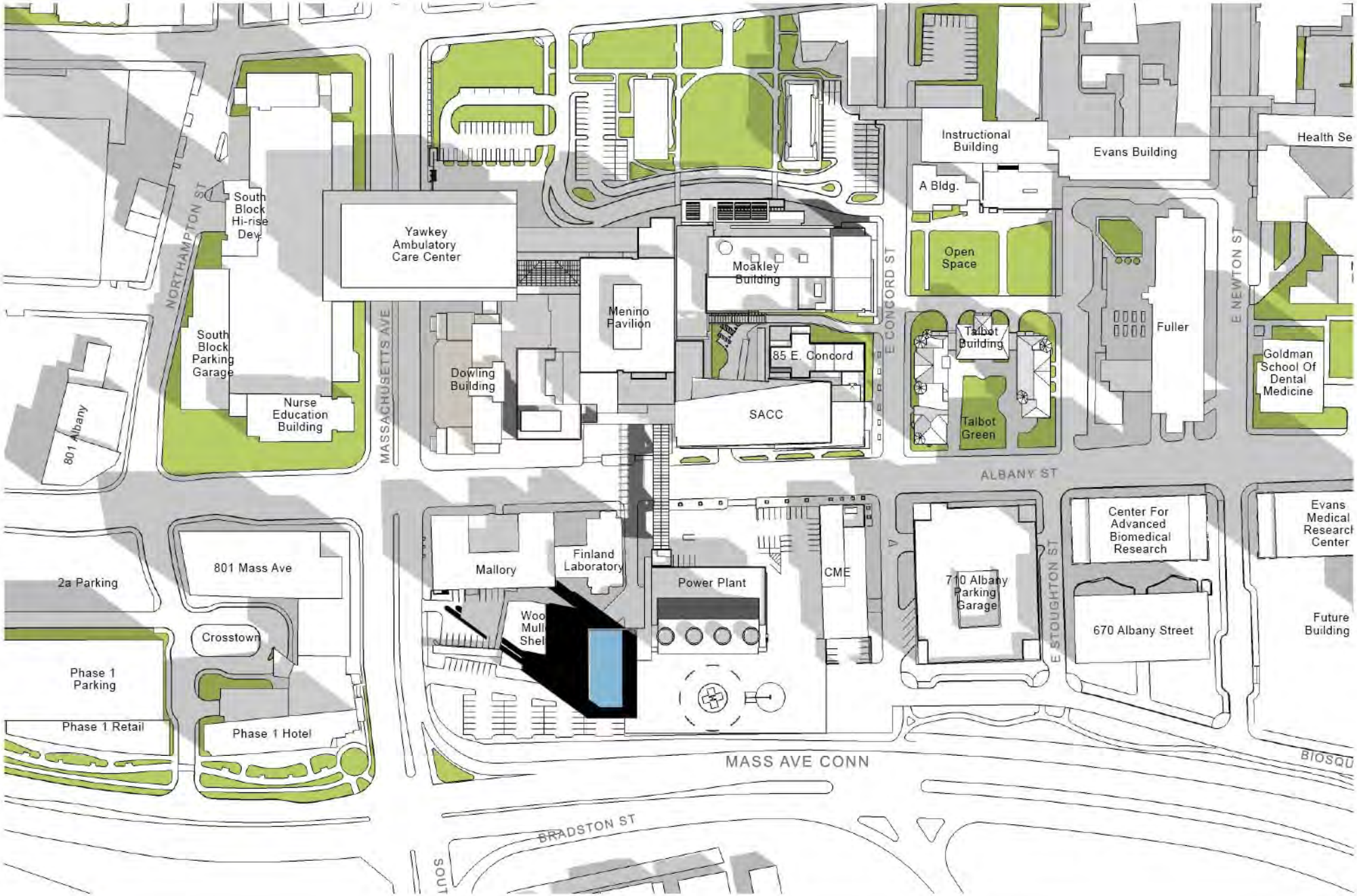
Appendix D

Shadow Study - March 21 9am

May 06, 2013



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Shadow Study - March 21 12pm

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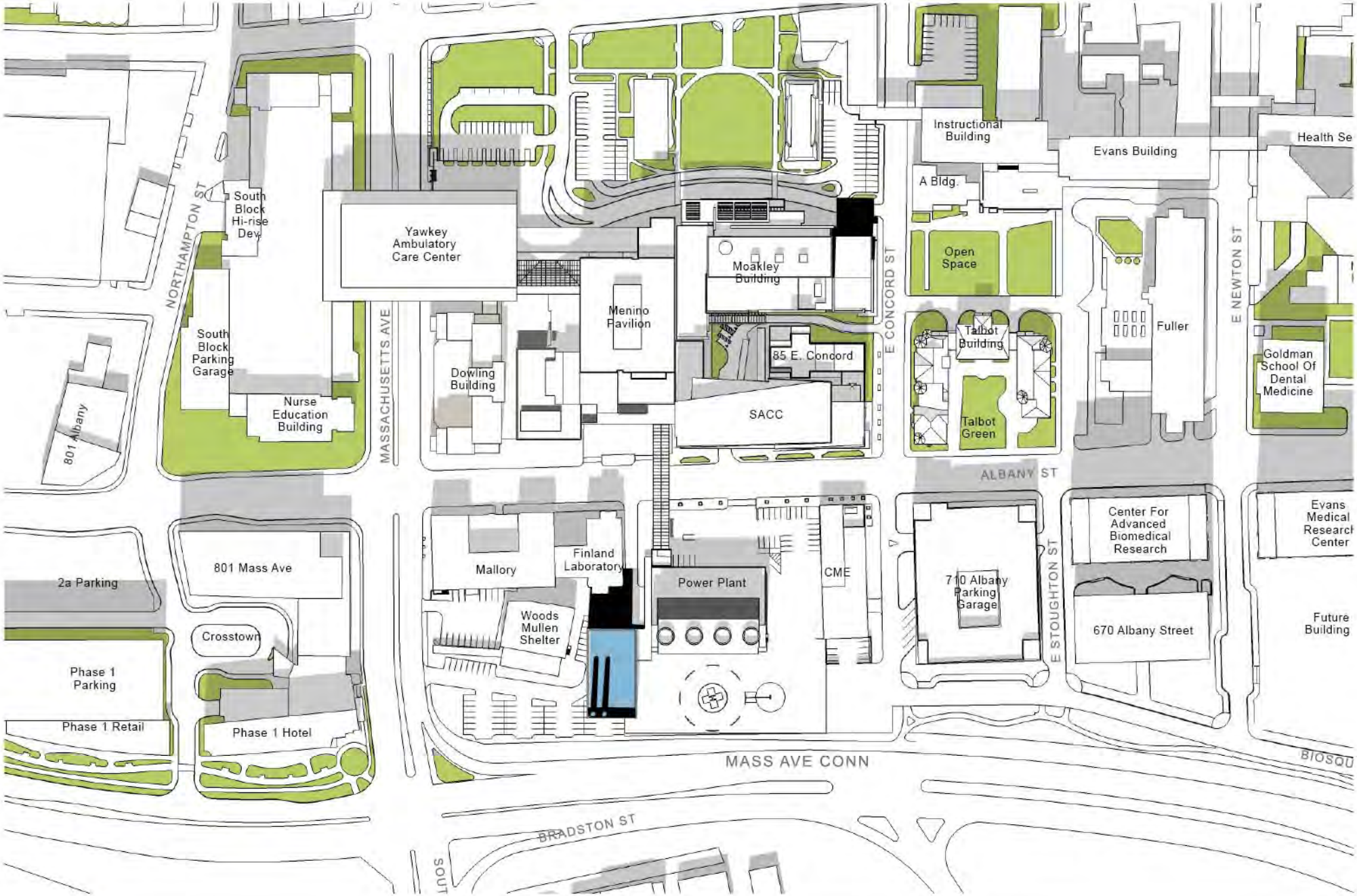

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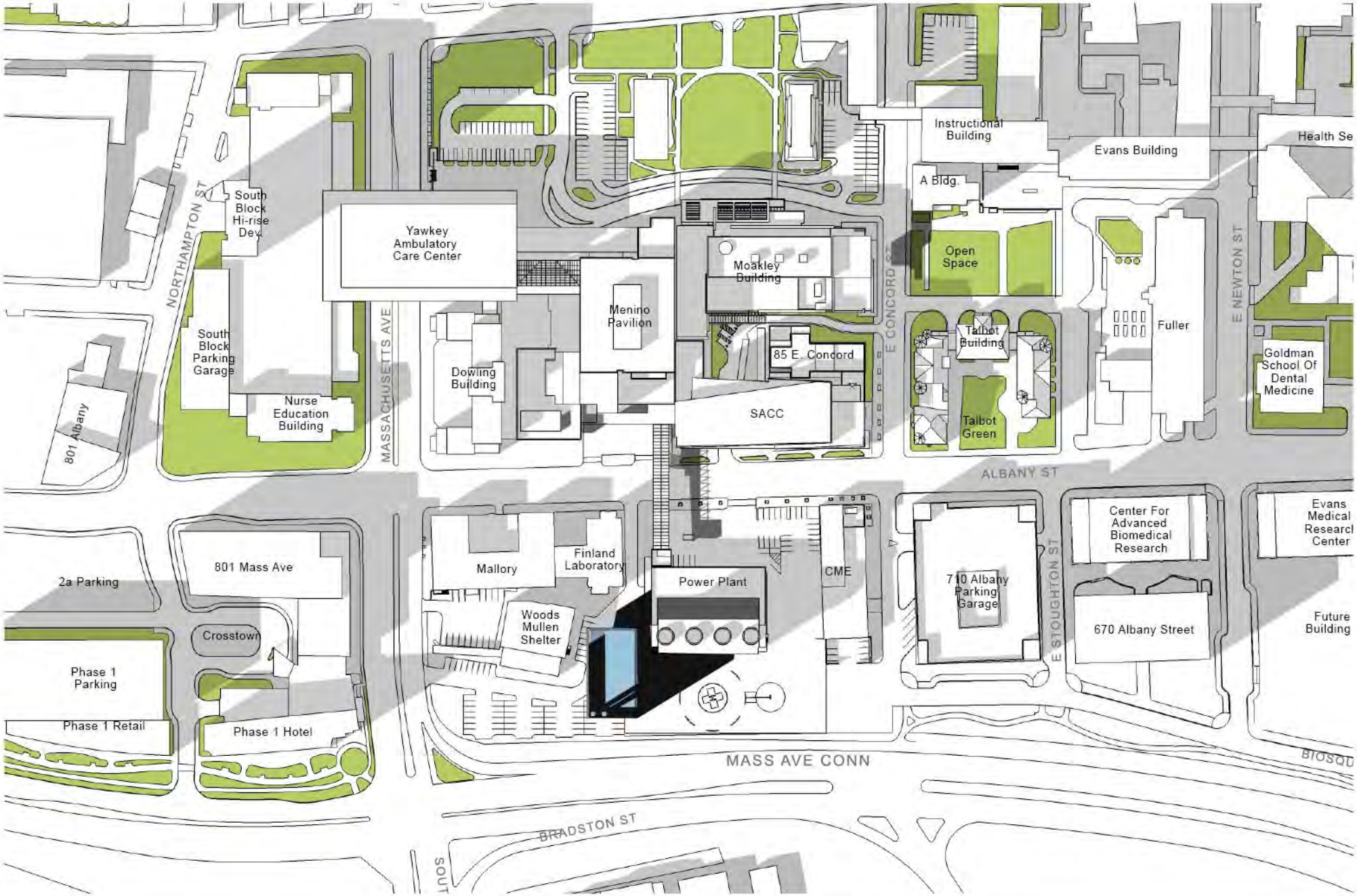

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Shadow Study - June 21 9am

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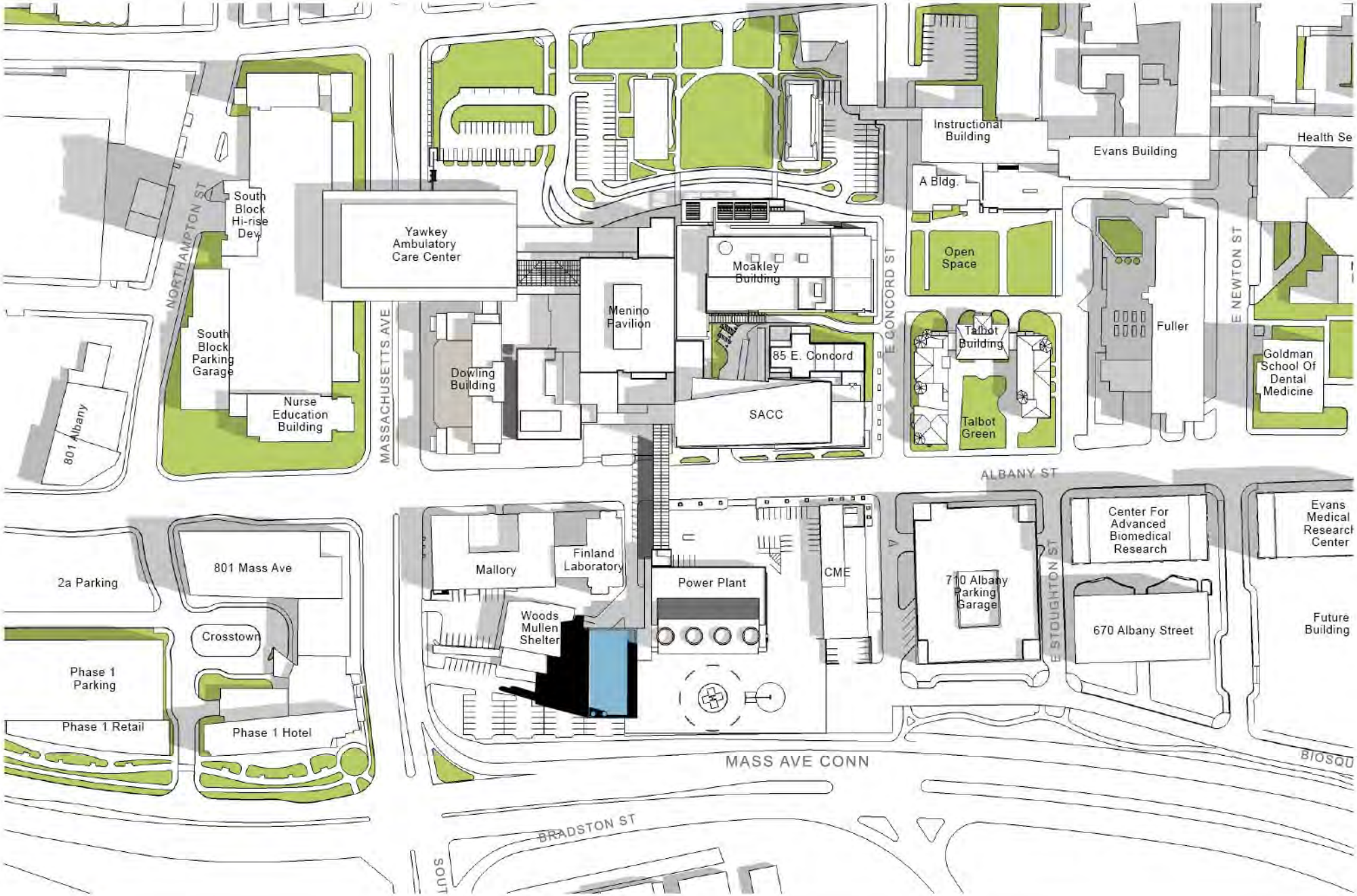

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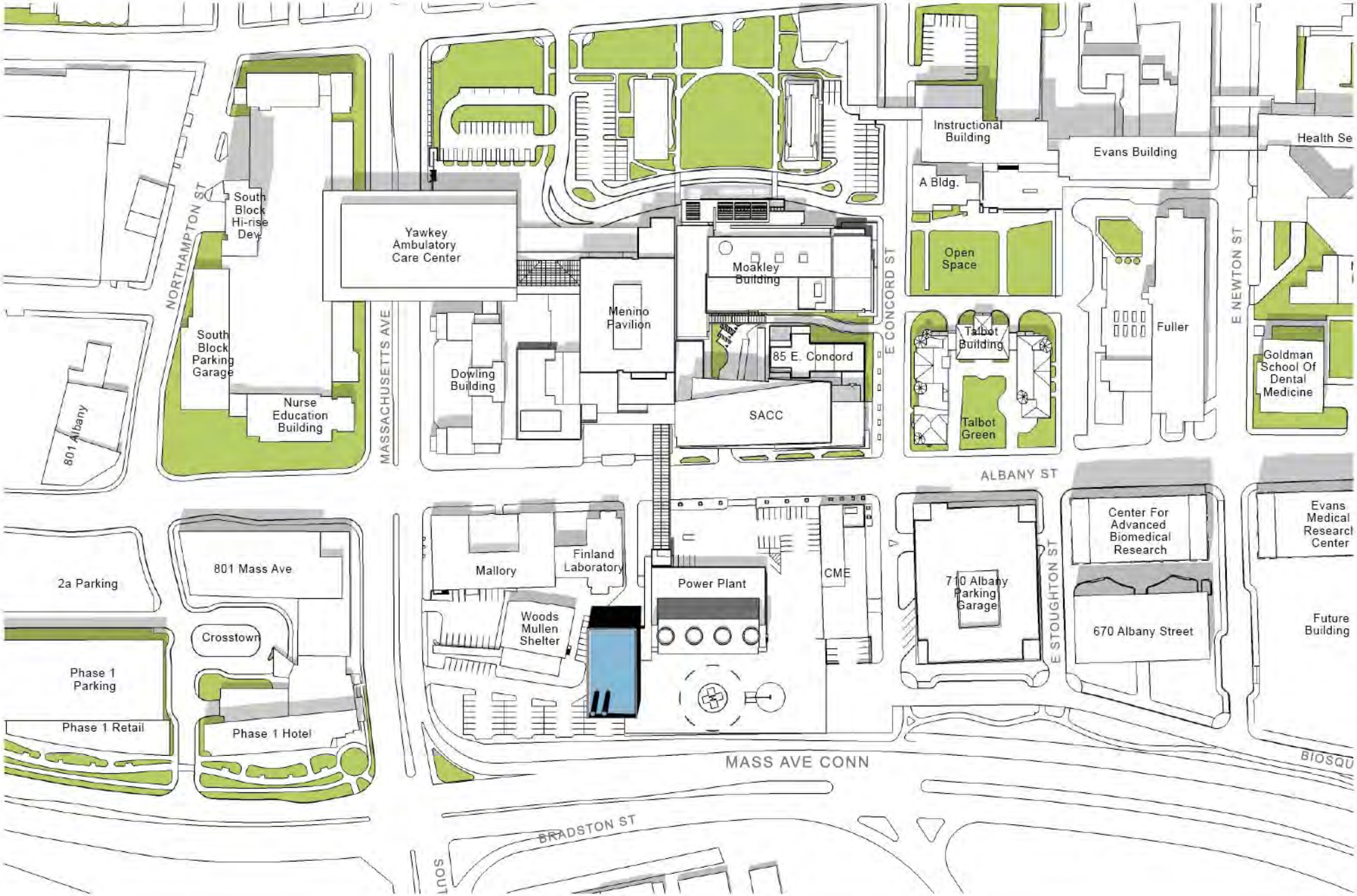

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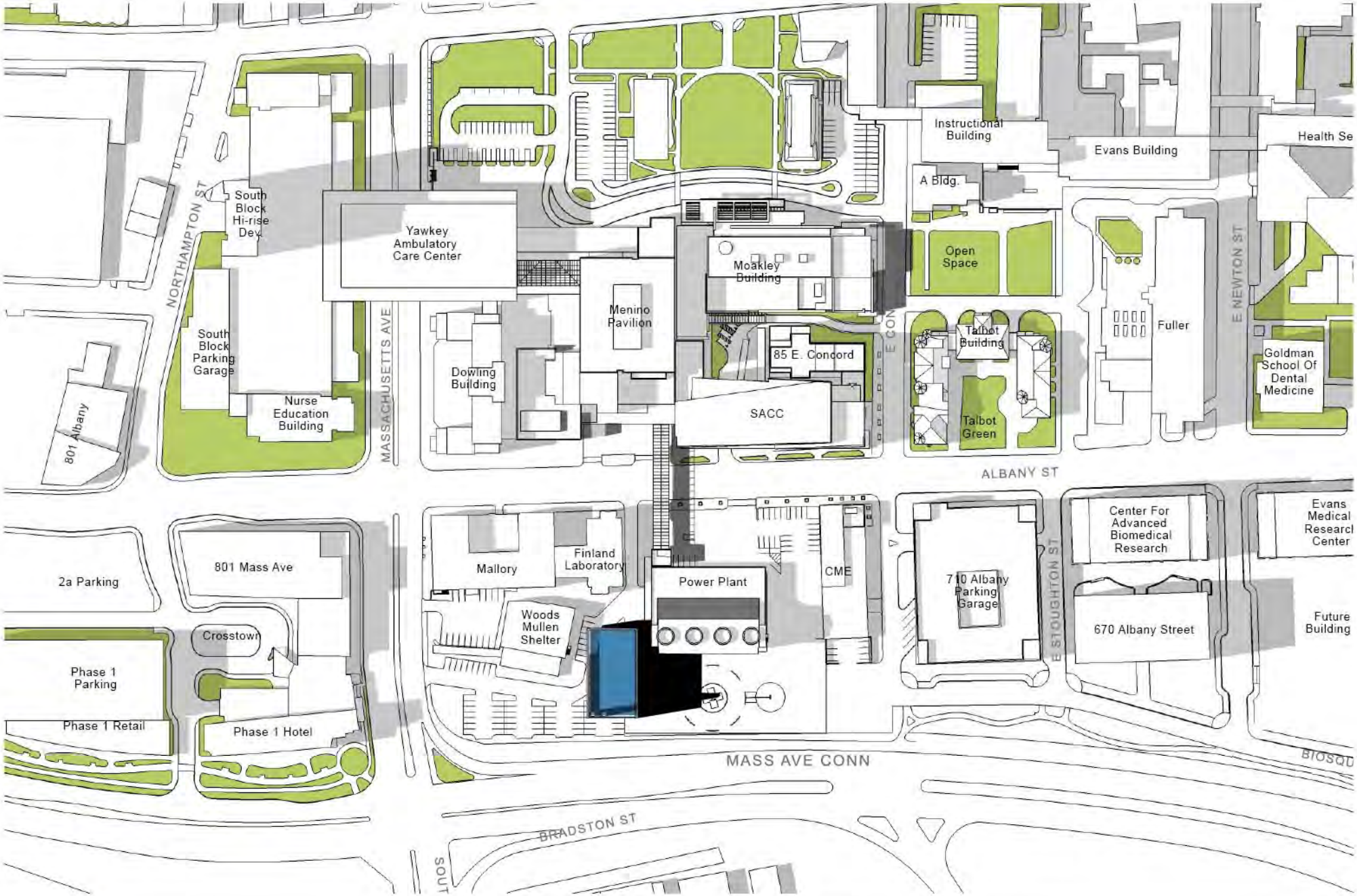

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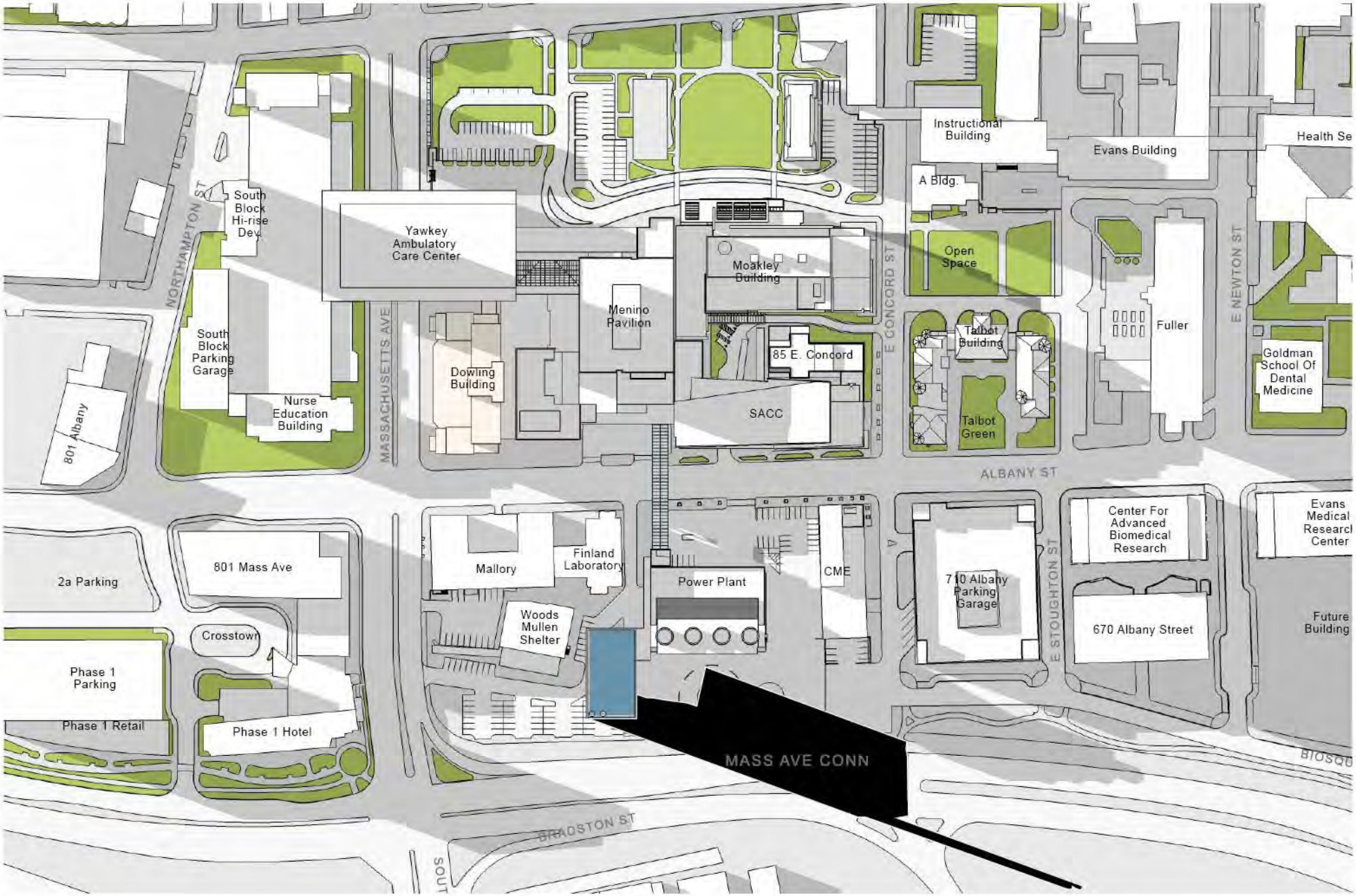
Shadow Study - June 21 6pm

May 06, 2013



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Shadow Study - September 21 9am

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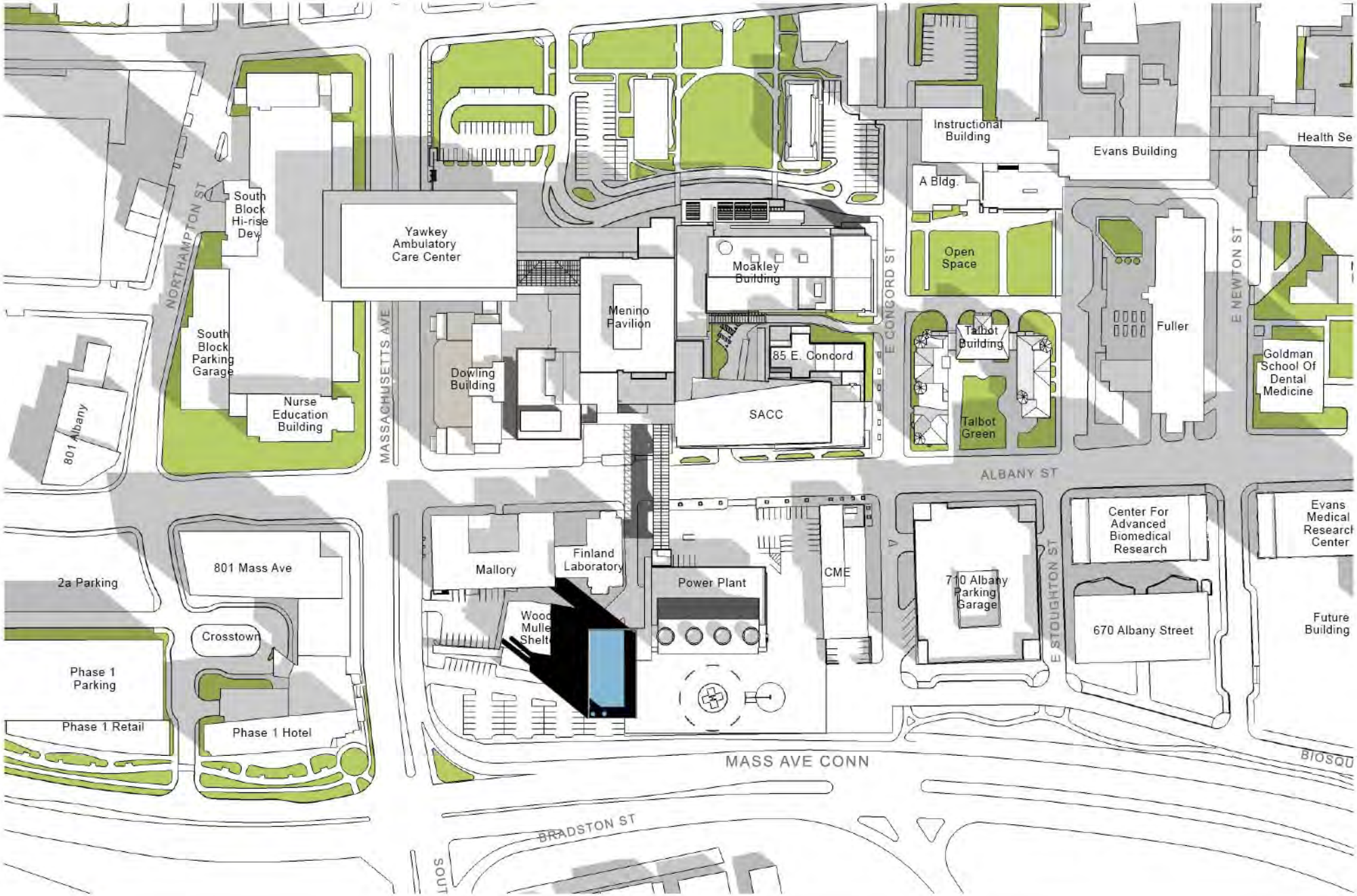

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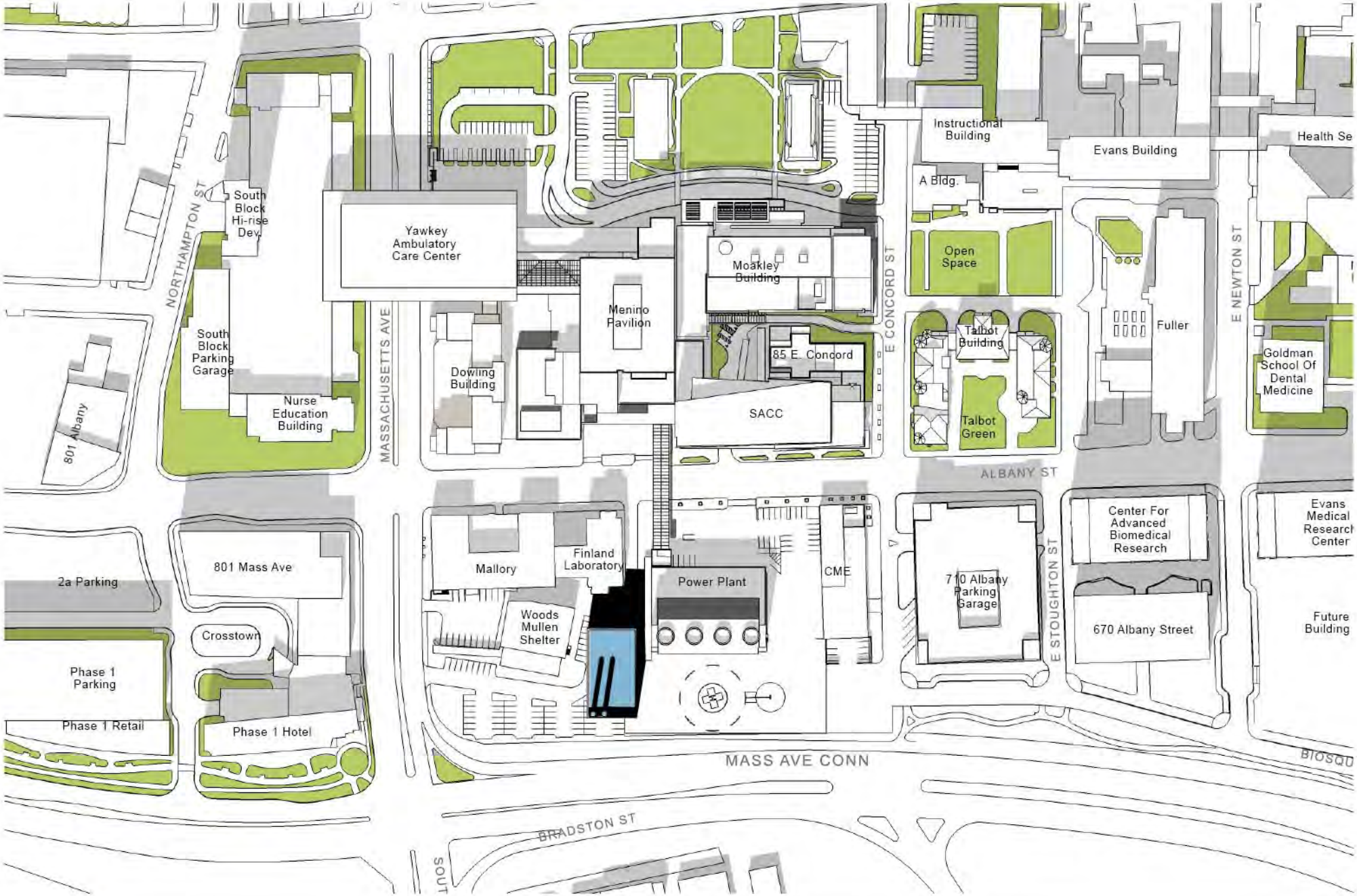

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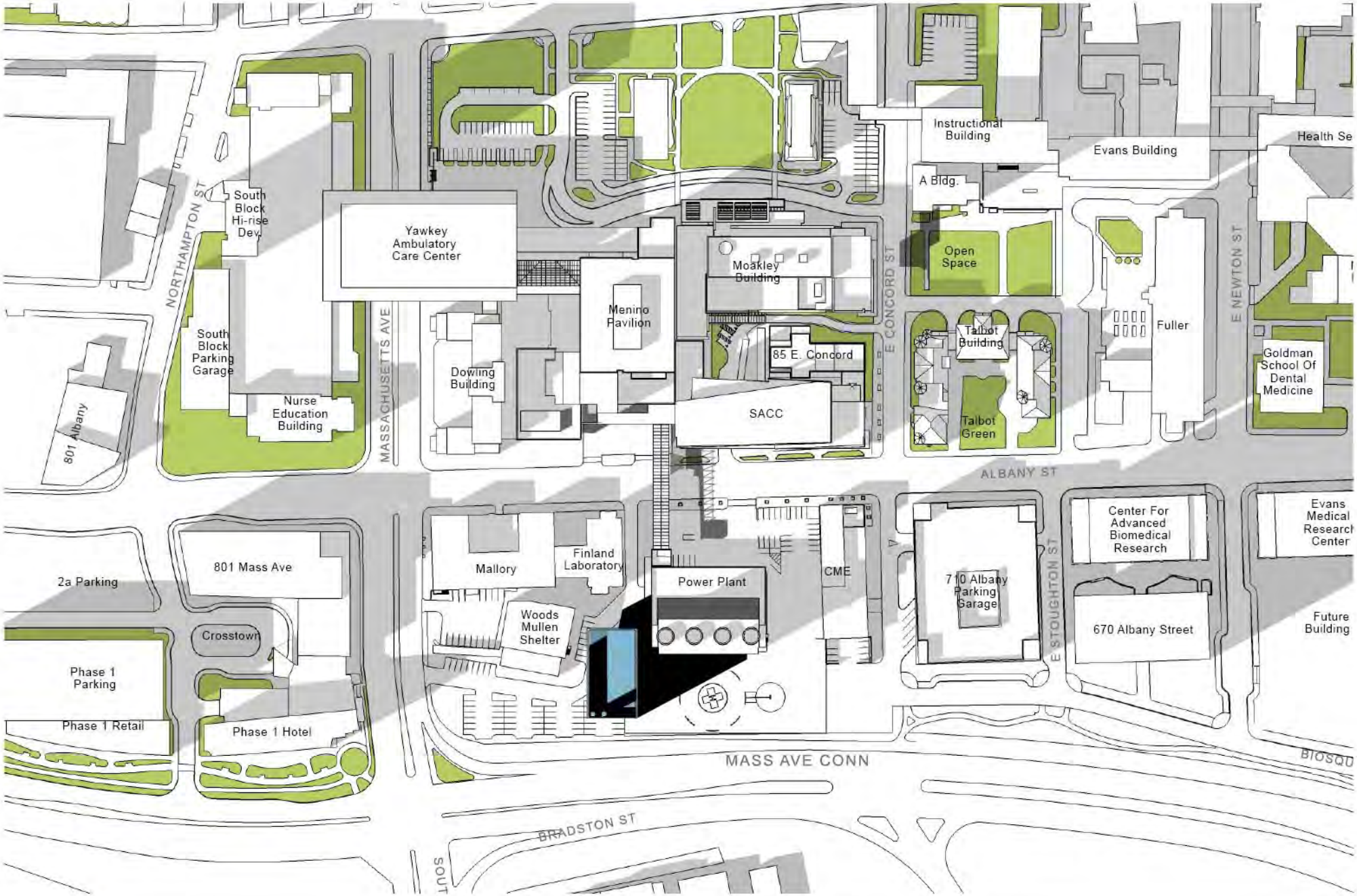

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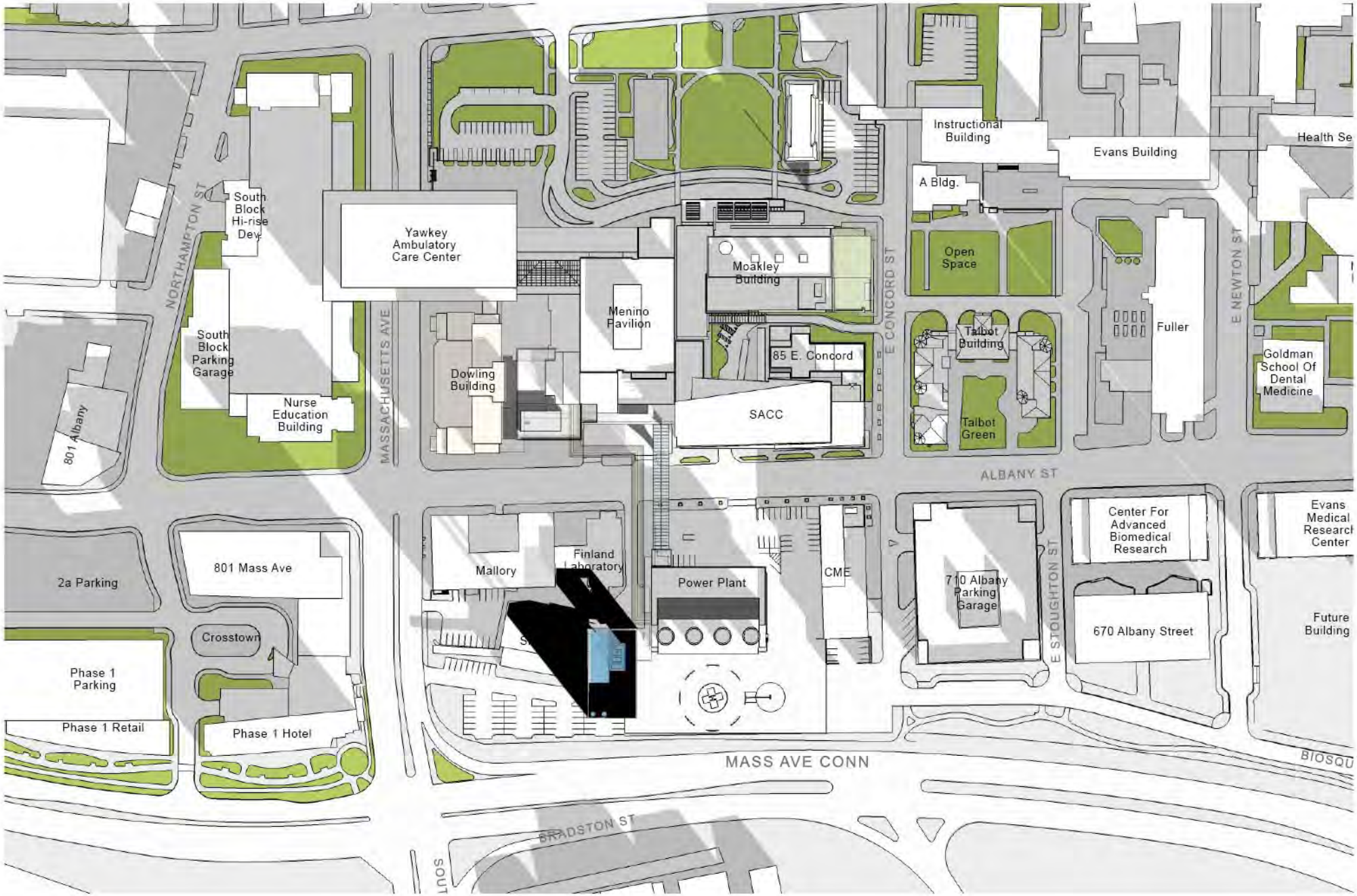

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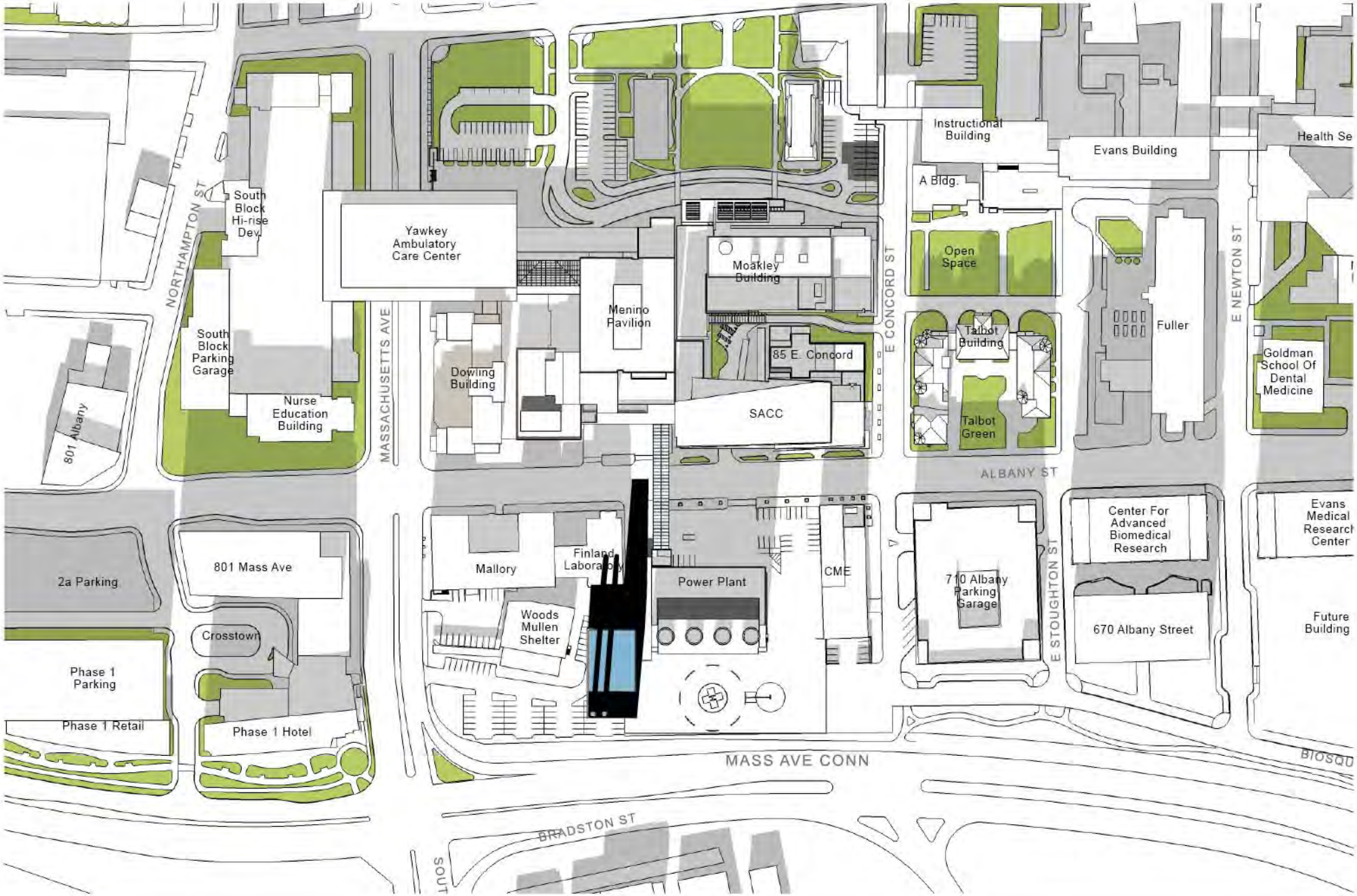

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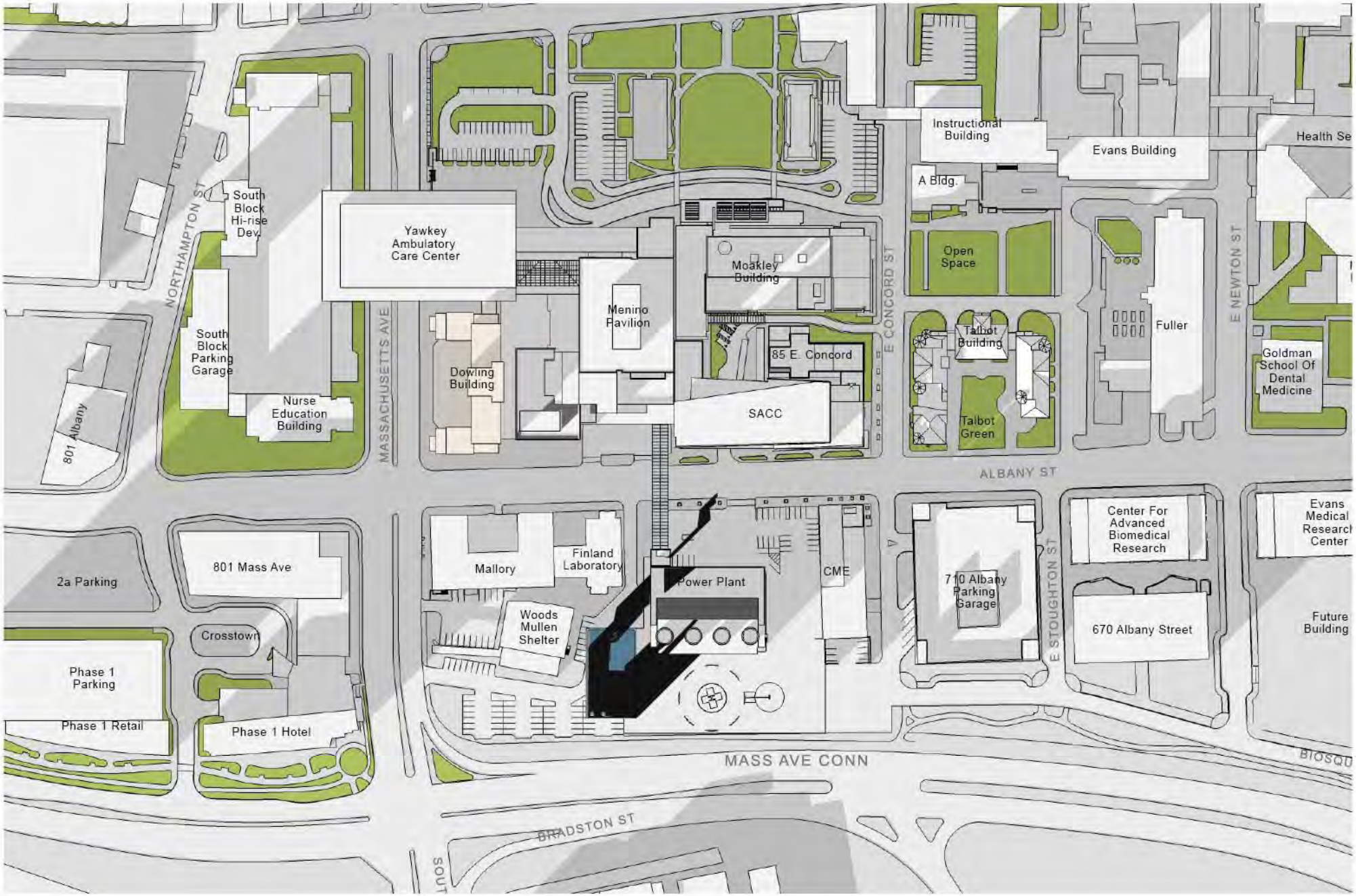

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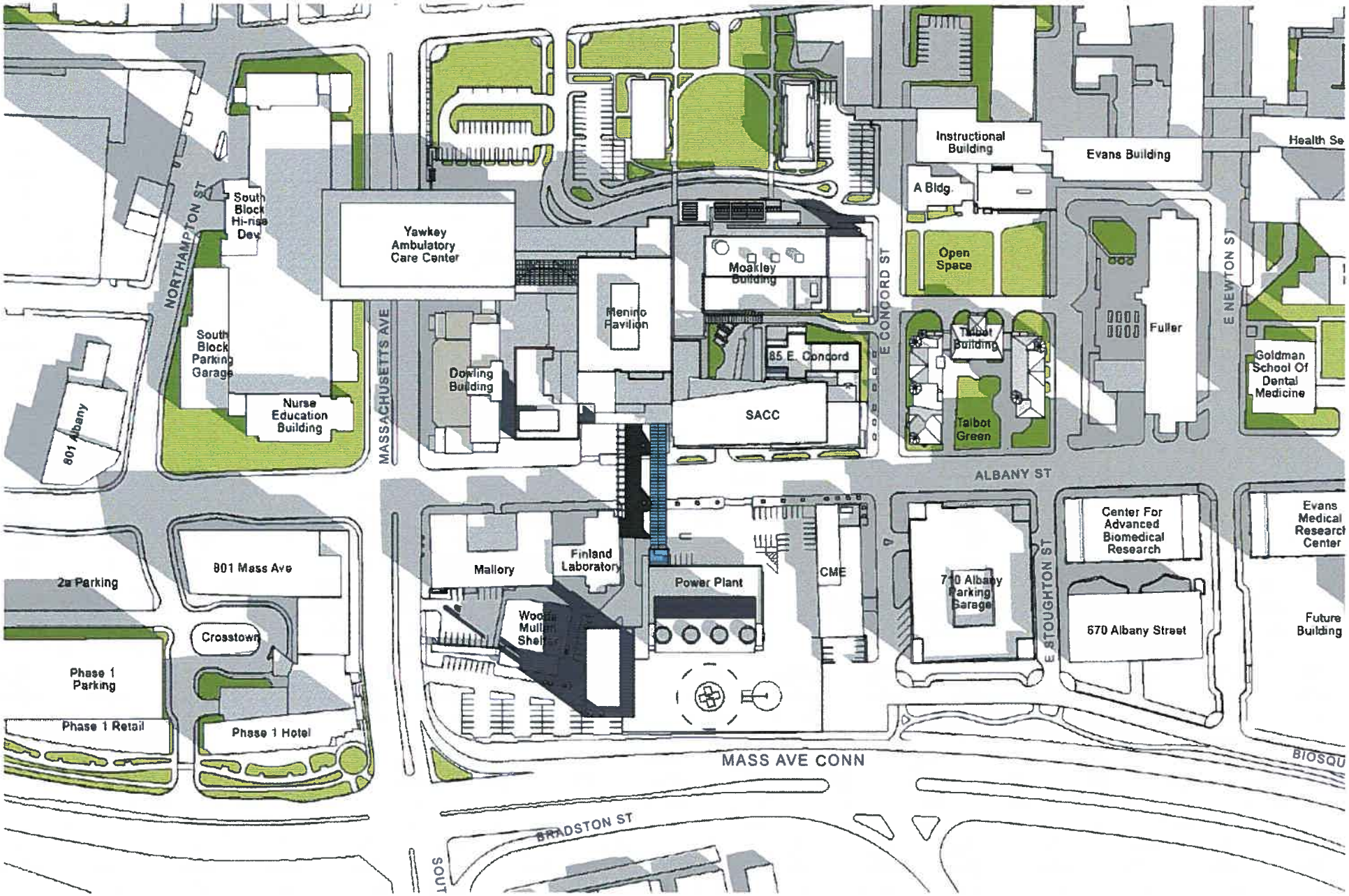
Appendix E

Shadow Study - March 21 9am

April 26, 2013



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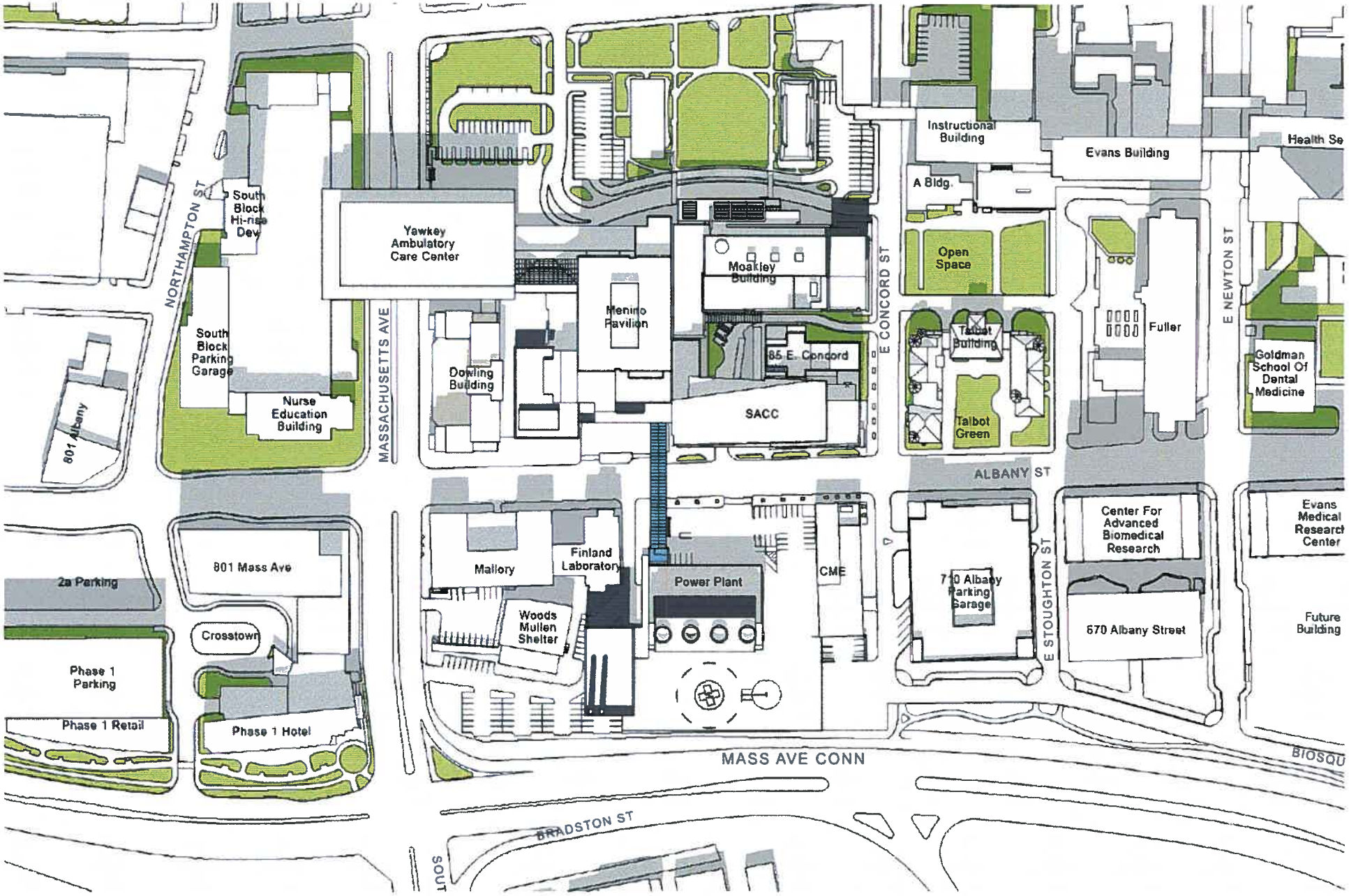

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Shadow Study - March 21 3pm

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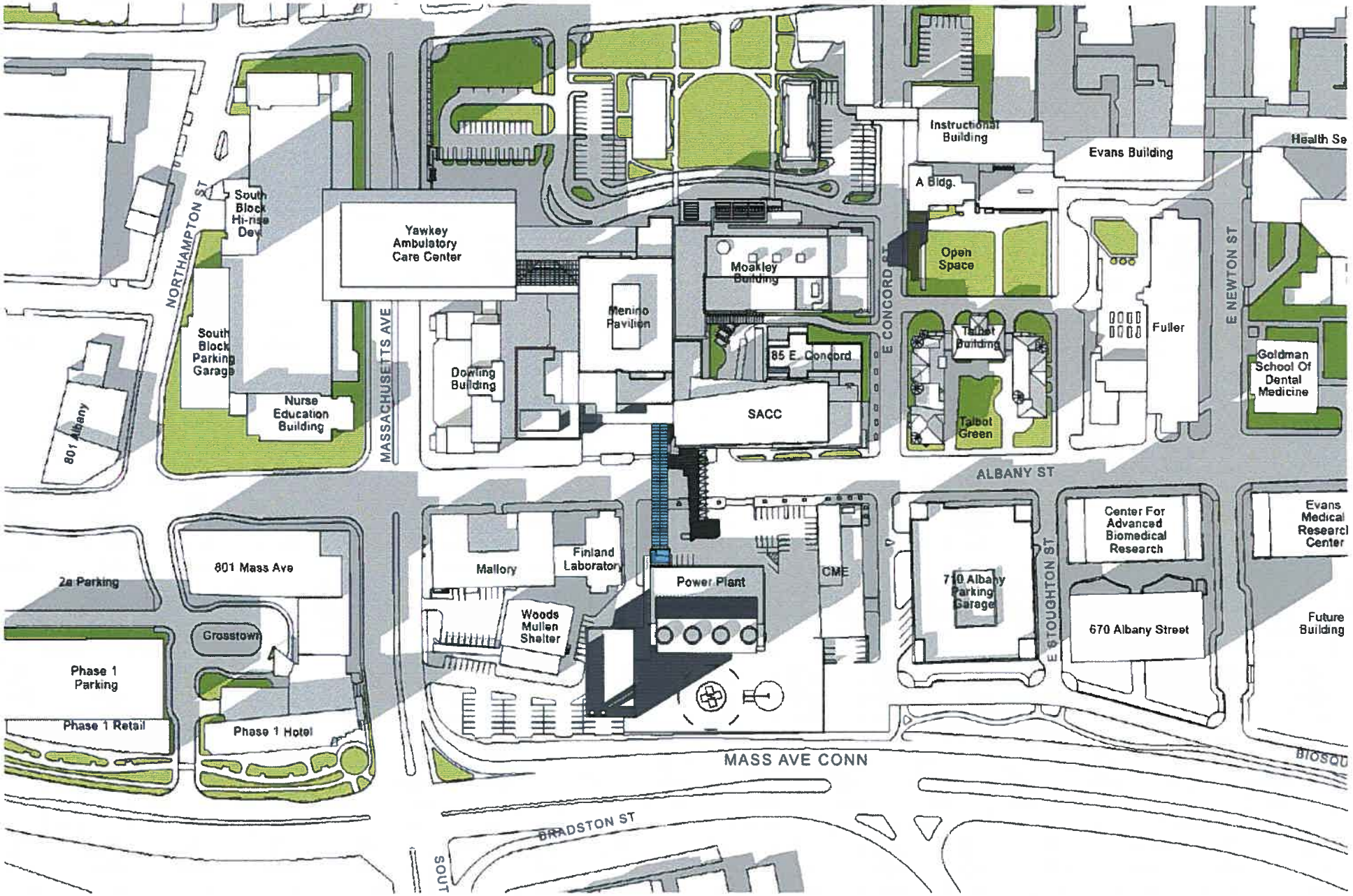

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Shadow Study - June 21 9am

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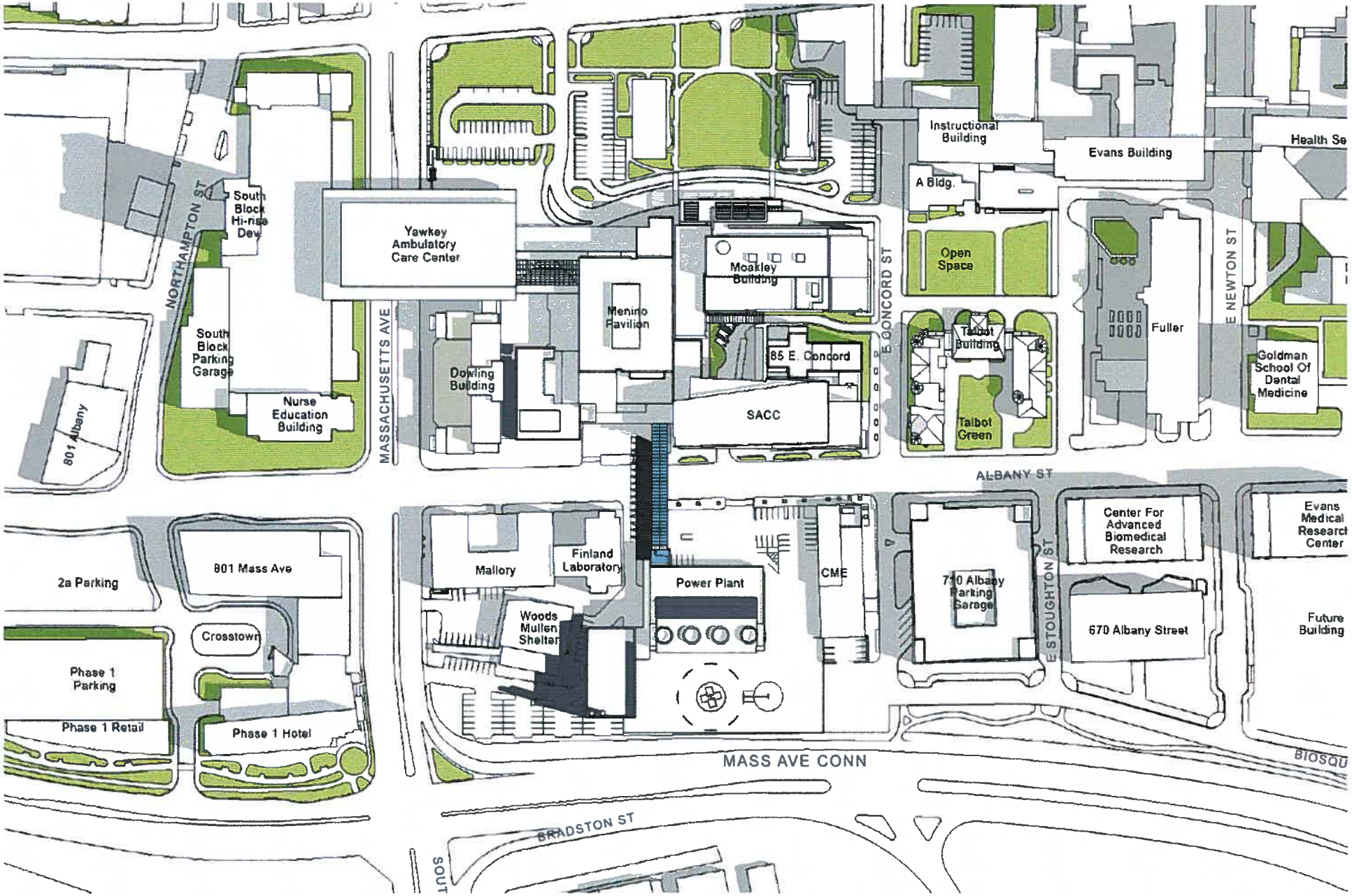

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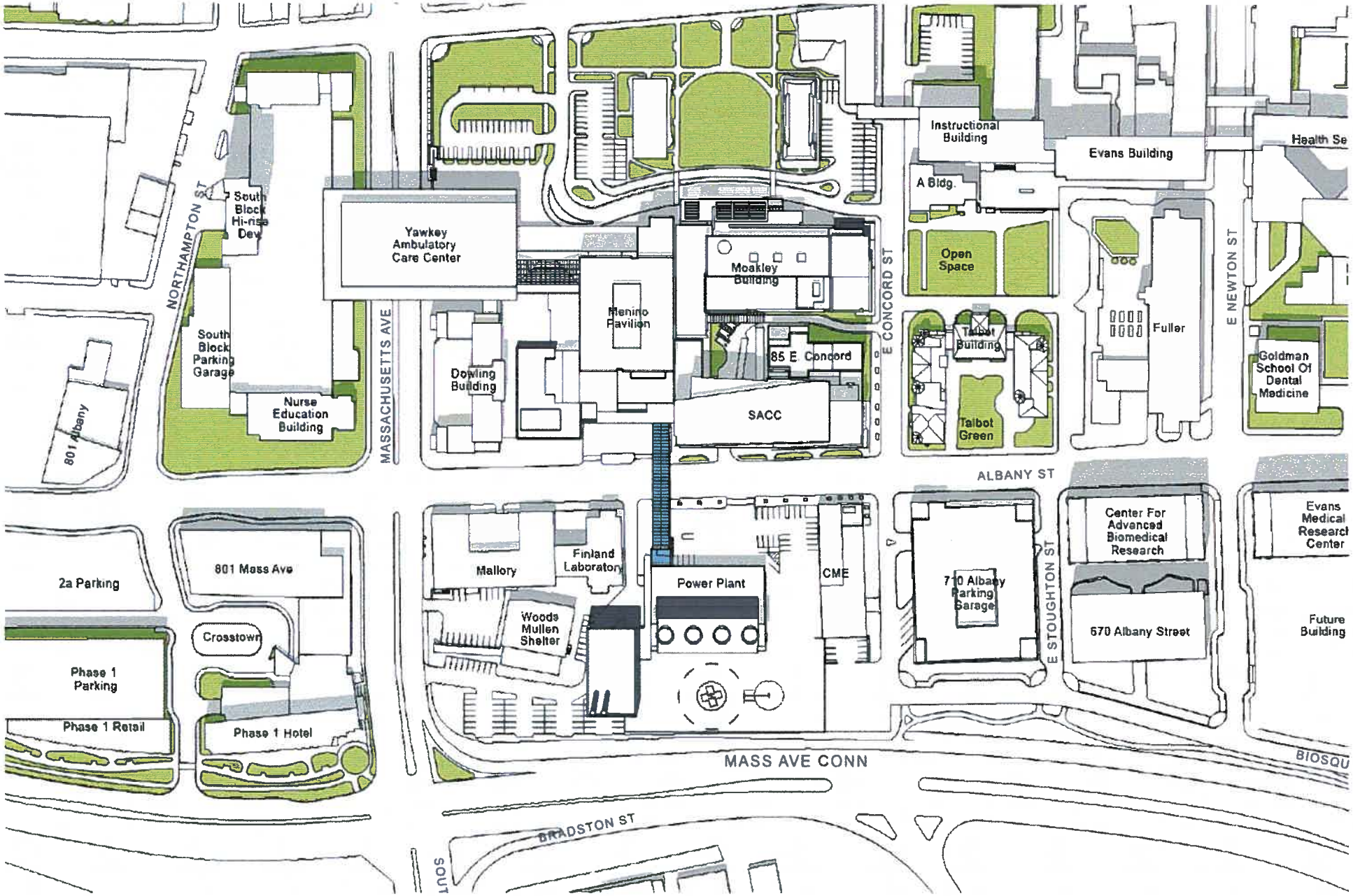

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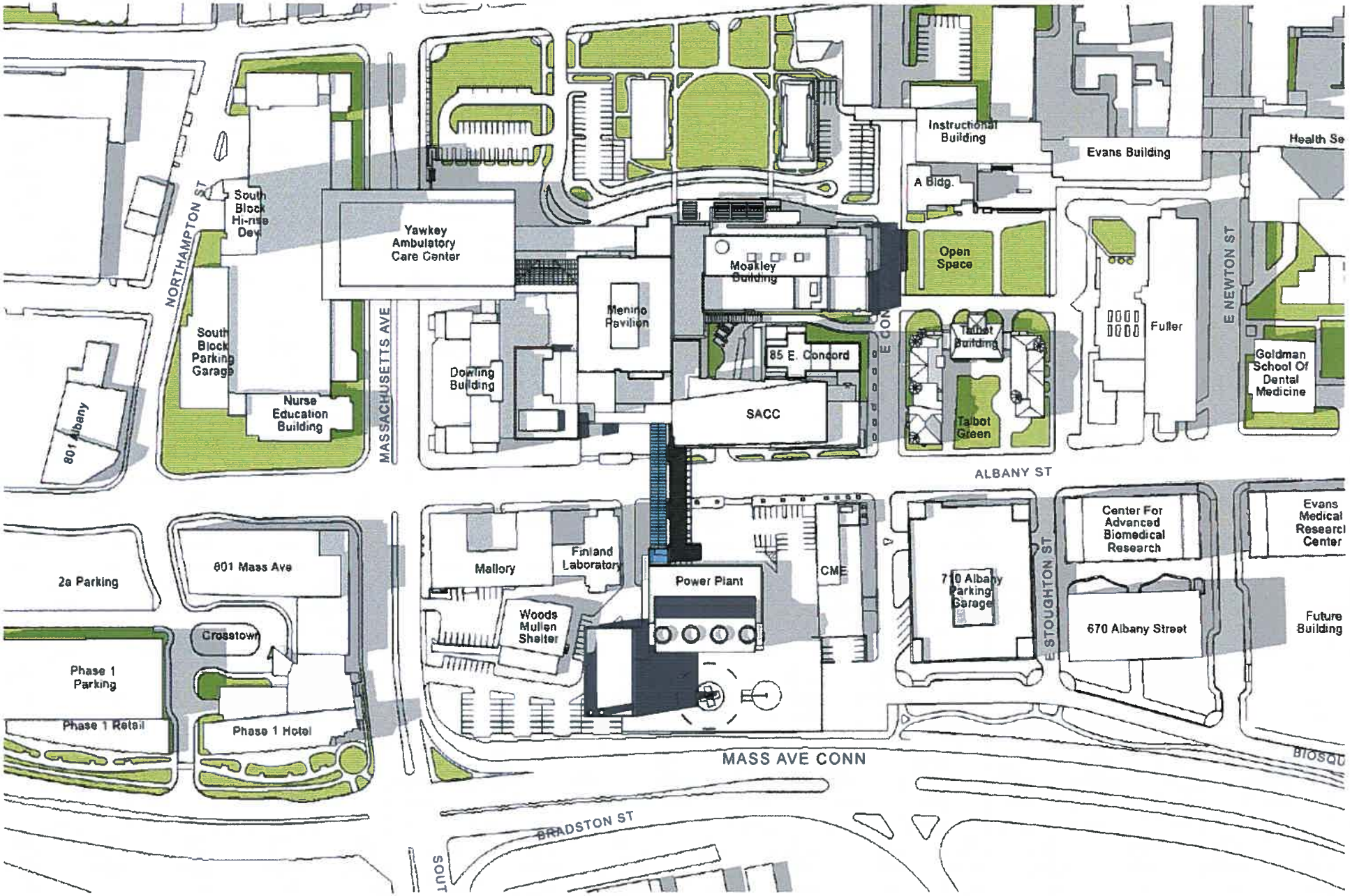

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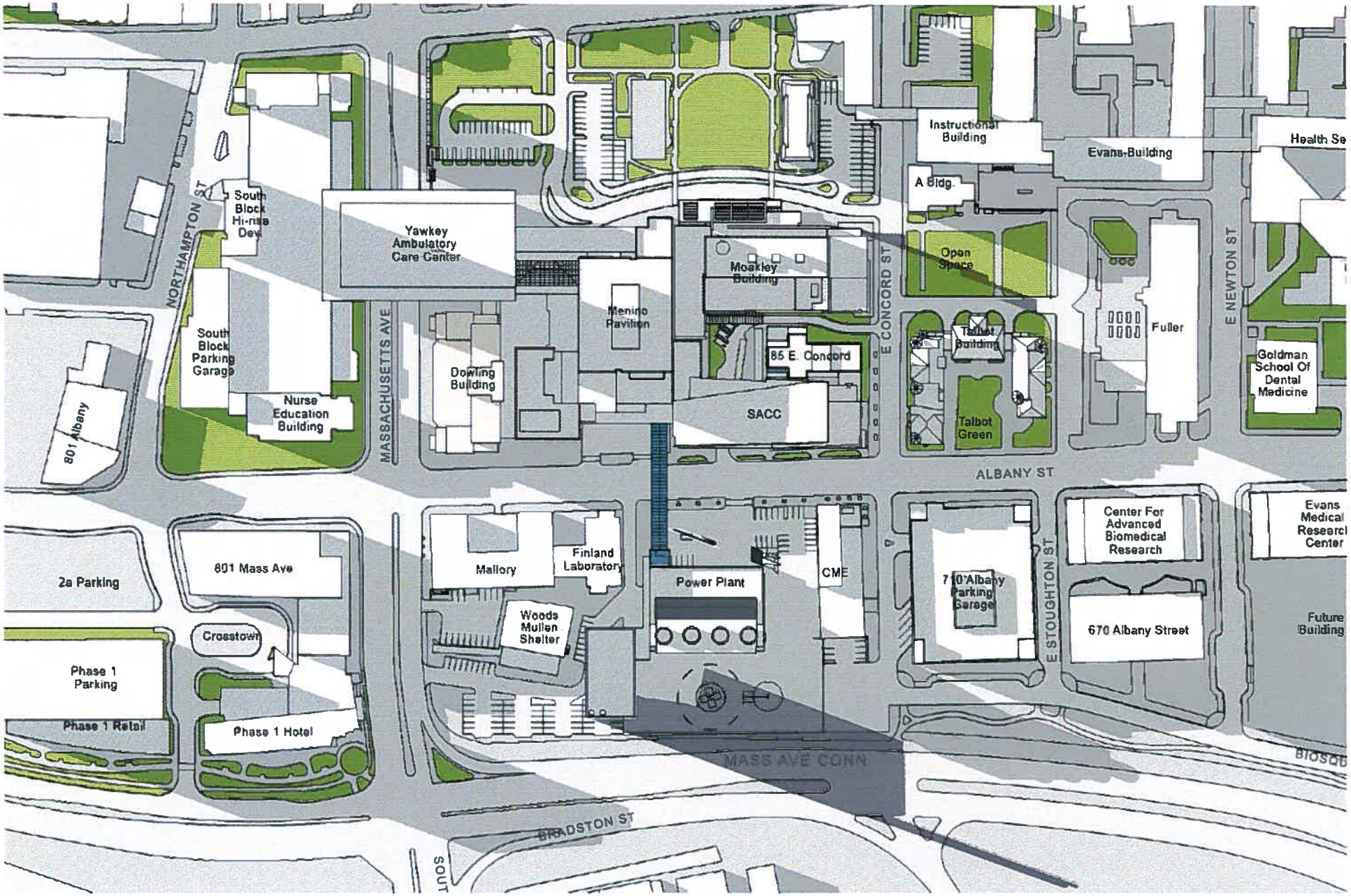

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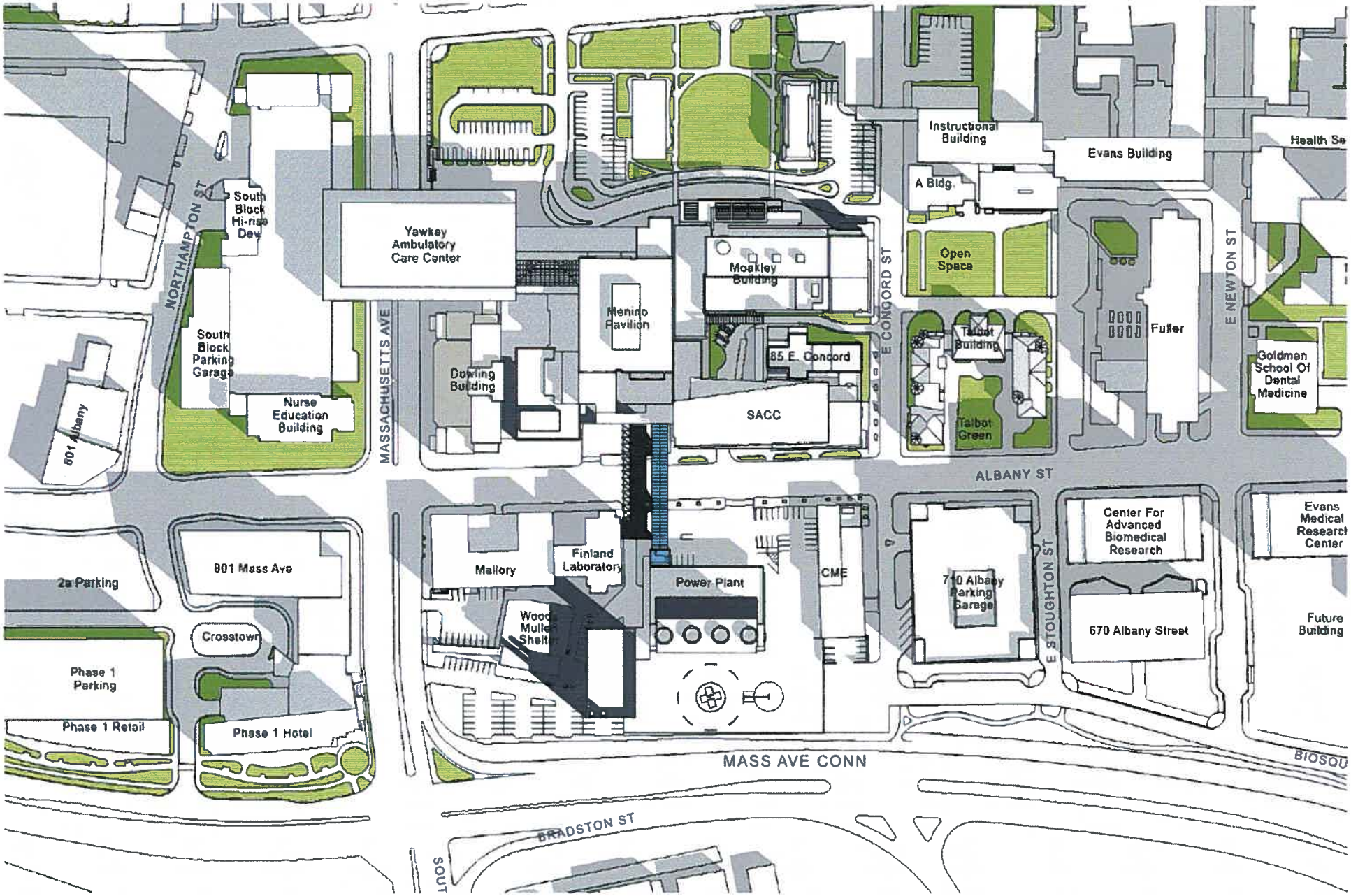

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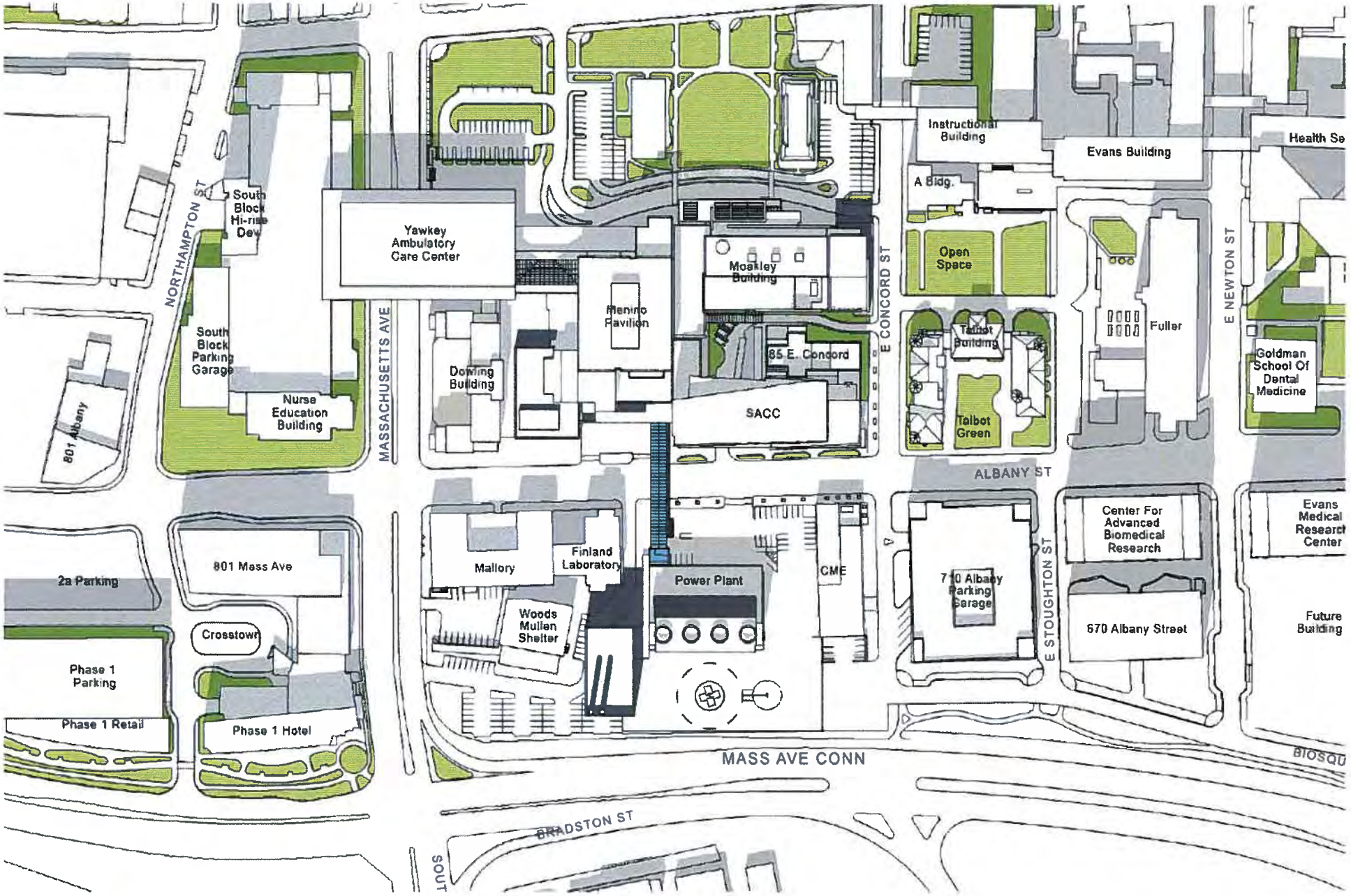

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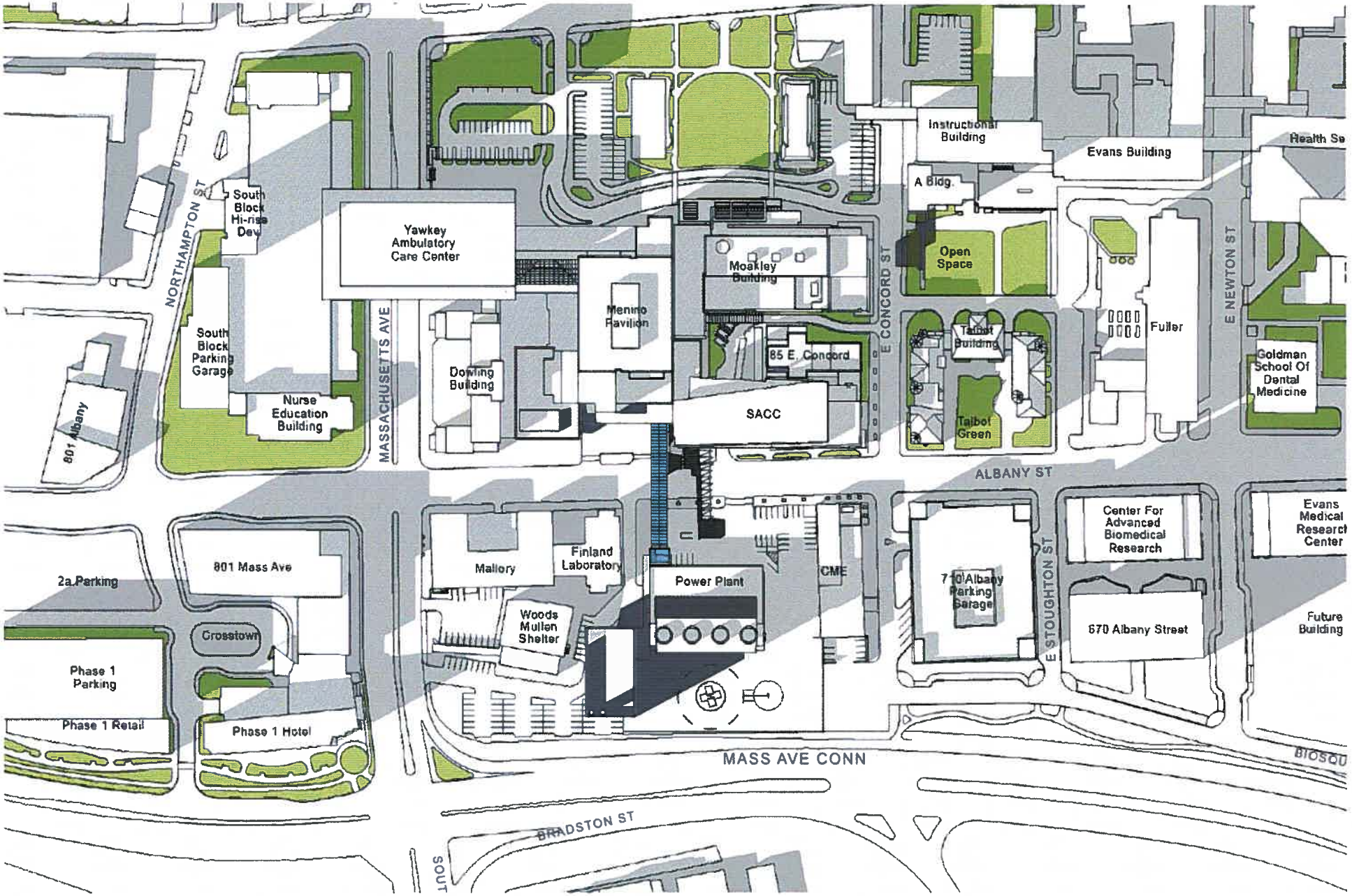

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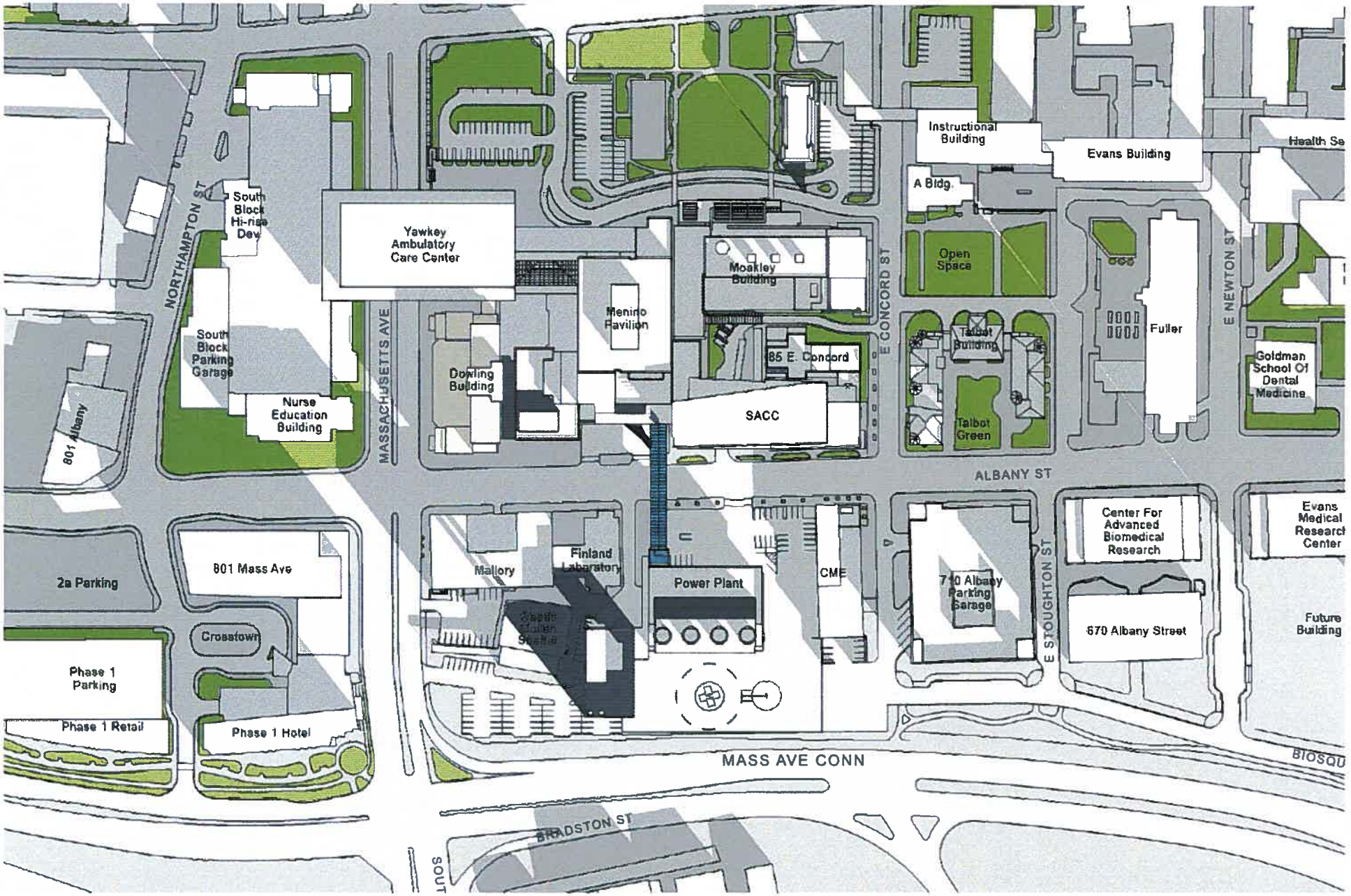

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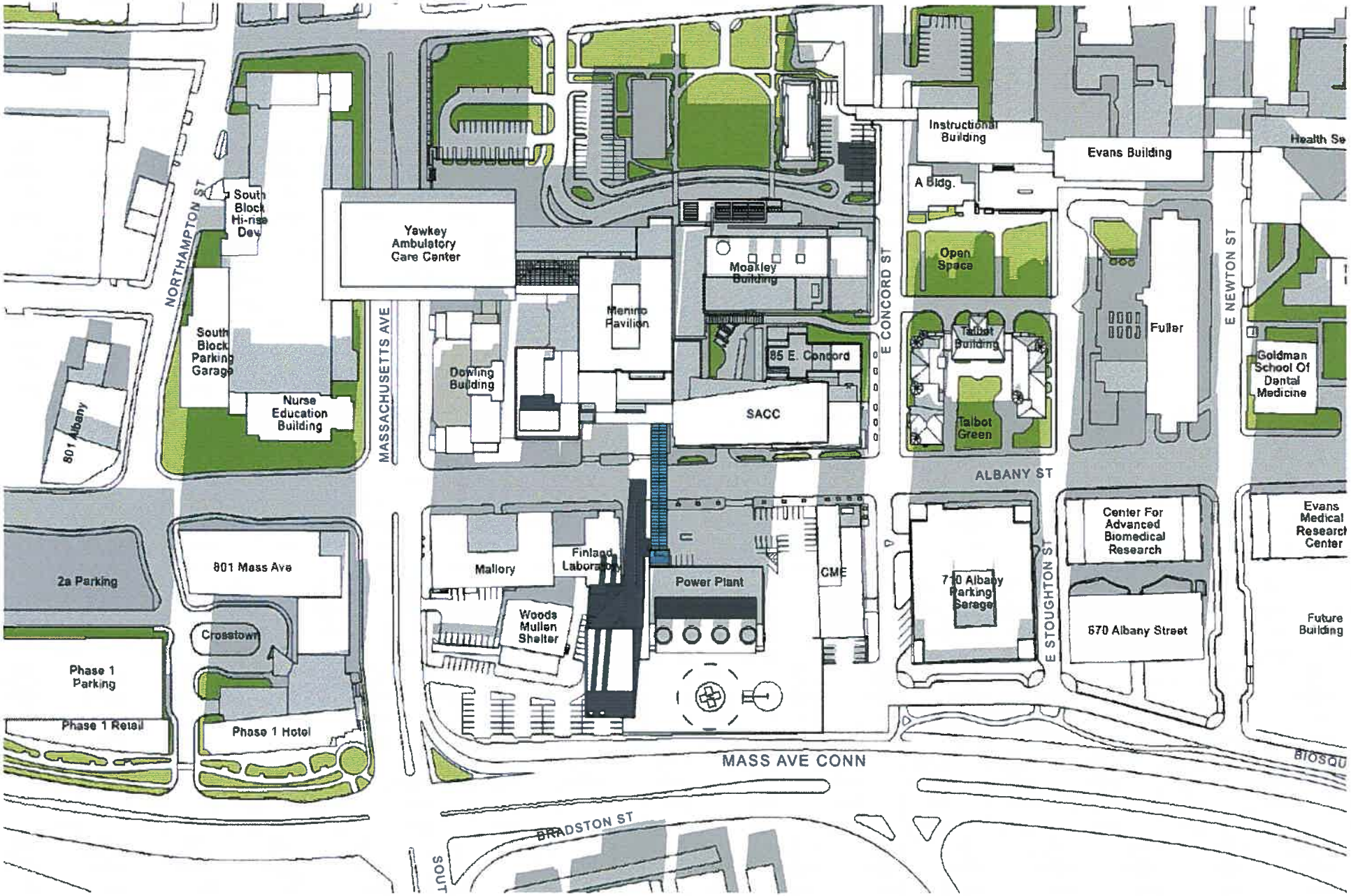

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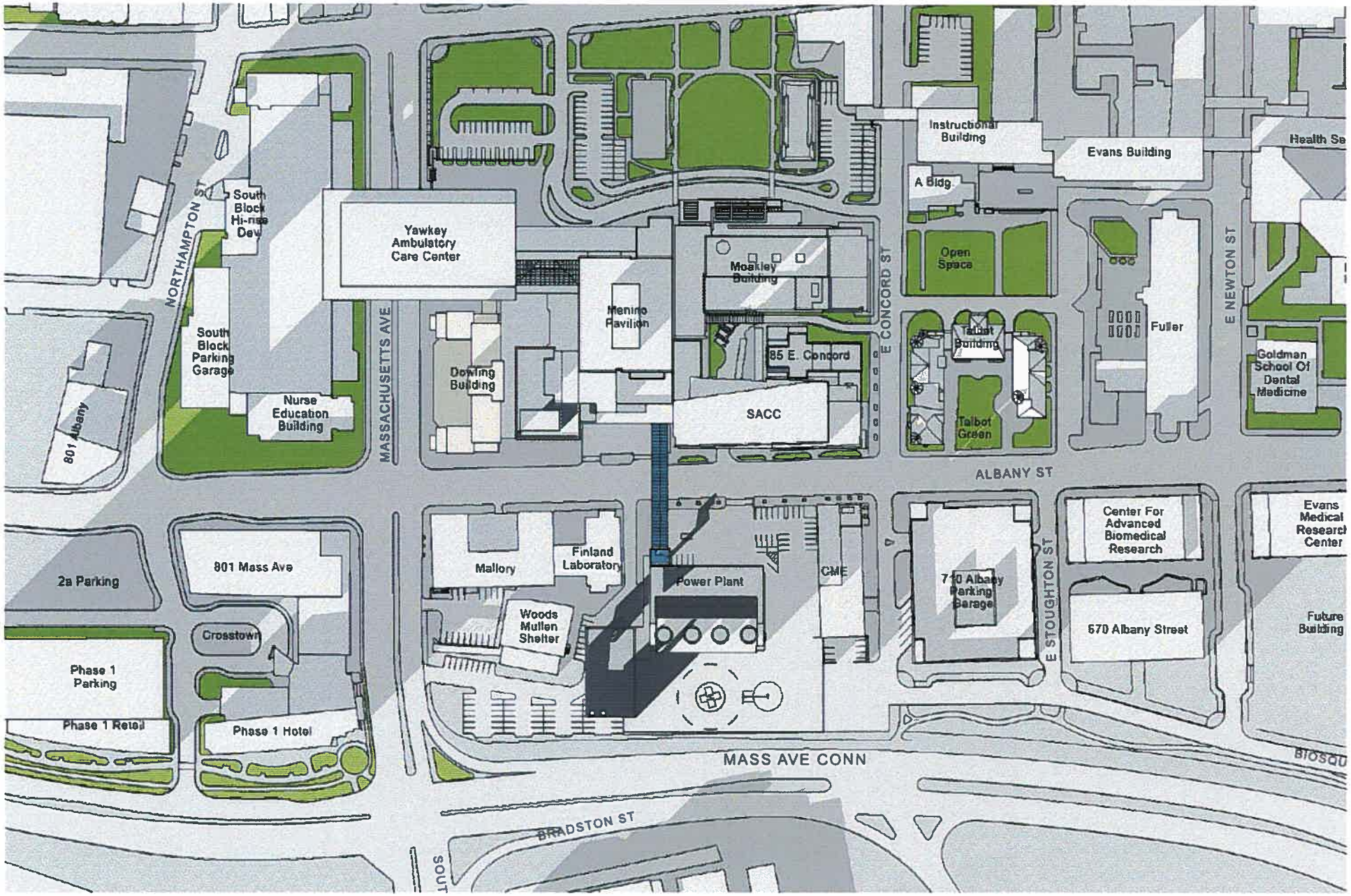

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Appendix F

LEED 2009 for New Construction and Major Renovation
Project Scorecard

Project Name: Moakley Cancer Center Addition
Project Address: Albany Street, Boston, MA 02118

Yes	?	No			
21	1	4	**SUSTAINABLE SITES**		**26 Points**
Y			Prereq 1	Construction Activity Pollution Prevention	Required
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation - Public Transportation Access	6
1			Credit 4.2	Alternative Transportation - Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation - Parking Capacity	2
		1	Credit 5.1	Site Development - Protect or Restore Habitat	1
		1	Credit 5.2	Site Development - Maximize Open Space	1
1			Credit 6.1	Stormwater Design - Quantity Control	1
	1		Credit 6.2	Stormwater Design - Quality Control	1
1			Credit 7.1	Heat Island Effect - Nonroof	1
1			Credit 7.2	Heat Island Effect - Roof	1
		1	Credit 8	Light Pollution Reduction	1

Yes	?	No			
4	4	2	**WATER EFFICIENCY**		**10 Points**
					4
Y			Prereq 1	Water Use Reduction	Required
2	2		Credit 1	Water Efficient Landscaping	2 to 4
			2	Reduce by 50%	2
			4	No Potable Water Use or Irrigation	4
		2	Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4
			2	Reduce by 30%	2
			3	Reduce by 35%	3
			4	Reduce by 40%	4

9	8	18	**ENERGY & ATMOSPHERE**		**35 Points**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	Required
Y			Prereq 2	Minimum Energy Performance	Required
Y			Prereq 3	Fundamental Refrigerant Management	Required
5	5	9	Credit 1	Optimize Energy Performance	1 to 19
			1	Improve by 12% for New Buildings or 8% for Existing Building Renovations	1
			2	Improve by 14% for New Buildings or 10% for Existing Building Renovations	2
			3	Improve by 16% for New Buildings or 12% for Existing Building Renovations	3
			4	Improve by 18% for New Buildings or 14% for Existing Building Renovations	4
			5	Improve by 20% for New Buildings or 16% for Existing Building Renovations	5
				Improve by 22% for New Buildings or 18% for Existing Building Renovations	6
				Improve by 24% for New Buildings or 20% for Existing Building Renovations	7
				Improve by 26% for New Buildings or 22% for Existing Building Renovations	8
				Improve by 28% for New Buildings or 24% for Existing Building Renovations	9
				Improve by 30% for New Buildings or 26% for Existing Building Renovations	10
				Improve by 32% for New Buildings or 28% for Existing Building Renovations	11
				Improve by 34% for New Buildings or 30% for Existing Building Renovations	12
				Improve by 36% for New Buildings or 32% for Existing Building Renovations	13
				Improve by 38% for New Buildings or 34% for Existing Building Renovations	14
				Improve by 40% for New Buildings or 36% for Existing Building Renovations	15
				Improve by 42% for New Buildings or 38% for Existing Building Renovations	16
				Improve by 44% for New Buildings or 40% for Existing Building Renovations	17
				Improve by 46% for New Buildings or 42% for Existing Building Renovations	18
				Improve by 48%+ for New Buildings or 44%+ for Existing Building Renovations	19
		7	Credit 2	On-Site Renewable Energy	1 to 7

LEED 2009 for New Construction and Major Renovation
Project Scorecard

Project Name: Moakley Cancer Center Addition
Project Address: Albany Street, Boston, MA 02118

Yes	?	No				
				1% Renewable Energy	1
				3% Renewable Energy	2
				5% Renewable Energy	3
				7% Renewable Energy	4
				9% Renewable Energy	5
				11% Renewable Energy	6
				13% Renewable Energy	7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

Yes	?	No		
5	2	7	MATERIALS & RESOURCES	14 Points

Y			Prereq 1	Storage and Collection of Recyclables	Required
		3	Credit 1.1	Building Reuse - Maintain Existing Walls, Floors and Roof	1 to 3
				Reuse 55%	1
				Reuse 75%	2
				Reuse 95%	3
		1	Credit 1.2	Building Reuse - Maintain Interior Nonstructural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
			1	50% Recycled or Salvaged	1
			2	75% Recycled or Salvaged	2
		2	Credit 3	Materials Reuse	1 to 2
				Reuse 5%	1
				Reuse 10%	2
1	1		Credit 4	Recycled Content	1 to 2
			1	10% of Content	1
			2	20% of Content	2
1	1		Credit 5	Regional Materials	1 to 2
			1	10% of Materials	1
			2	20% of Materials	2
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

Yes	?	No		
11		4	INDOOR ENVIRONMENTAL QUALITY	15 Points

Y		Prereq 1	Minimum Indoor Air Quality Performance	Required
Y		Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
1		Credit 1	Outdoor Air Delivery Monitoring	1
	1	Credit 2	Increased Ventilation	1
1		Credit 3.1	Construction Indoor Air Quality Management Plan - During Construction	1
1		Credit 3.2	Construction Indoor Air Quality Management Plan - Before Occupancy	1
1		Credit 4.1	Low-Emitting Materials - Adhesives and Sealants	1
1		Credit 4.2	Low-Emitting Materials - Paints and Coatings	1
1		Credit 4.3	Low-Emitting Materials - Flooring Systems	1
1		Credit 4.4	Low-Emitting Materials - Composite Wood and Agrifiber Products	1
1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1		Credit 6.1	Controllability of Systems - Lighting	1
	1	Credit 6.2	Controllability of Systems - Thermal Comfort	1
1		Credit 7.1	Thermal Comfort - Design	1
1		Credit 7.2	Thermal Comfort - Verification	1
	1	Credit 8.1	Daylight and Views - Daylight	1
	1	Credit 8.2	Daylight and Views - Views	1

Yes	?	No		
1	5		INNOVATION IN DESIGN	6 Points

LEED 2009 for New Construction and Major Renovation
Project Scorecard

Project Name: Moakley Cancer Center Addition
Project Address: Albany Street, Boston, MA 02118

Yes	?	No				
	5		Credit 1	Innovation in Design		1 to 5
			1	Article 37 - Modern Grid		1
			1	Article 37 - Groundwater Recharge		1
			1	Article 37 Modern Mobility		1
			1	Exemplary performane or LEED Pilot Credit		1
			1	Exemplary performane or LEED Pilot Credit		1
1			Credit 2	LEED® Accredited Professional		1
Yes	?	No				
3		1	REGIONAL PRIORITY			4 Points
3		1	Credit 1	Regional Priority		1 to 4
				SSc3		1
			1	SSc6.1		1
			1	SSc7.1		1
			1	SSc7.2		1
Yes	?	No				
54	20	36	PROJECT TOTALS (Certification Estimates)			110 Points

Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

LEED 2009 for New Construction and Major Renovation
Project Scorecard

Project Name: New Inpatient Building Phase 1 + New Patient Transport Bridge
Project Address: Albany Street Boston, MA 02118

Yes	?	No			
22	2	2	SUSTAINABLE SITES		26 Points
Y			Prereq 1	Construction Activity Pollution Prevention	Required
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
	1		Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation - Public Transportation Access	6
1			Credit 4.2	Alternative Transportation - Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation - Parking Capacity	2
		1	Credit 5.1	Site Development - Protect or Restore Habitat	1
		1	Credit 5.2	Site Development - Maximize Open Space	1
1			Credit 6.1	Stormwater Design - Quantity Control	1
	1		Credit 6.2	Stormwater Design - Quality Control	1
1			Credit 7.1	Heat Island Effect - Nonroof	1
1			Credit 7.2	Heat Island Effect - Roof	1
1			Credit 8	Light Pollution Reduction	1

Yes	?	No			
4	4	2	WATER EFFICIENCY		10 Points
					4
Y			Prereq 1	Water Use Reduction	Required
2	2		Credit 1	Water Efficient Landscaping	2 to 4
			2	Reduce by 50%	2
			4	No Potable Water Use or Irrigation	4
		2	Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4
			2	Reduce by 30%	2
			3	Reduce by 35%	3
			4	Reduce by 40%	4

9	10	16	ENERGY & ATMOSPHERE		35 Points
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	Required
Y			Prereq 2	Minimum Energy Performance	Required
Y			Prereq 3	Fundamental Refrigerant Management	Required
5	5	9	Credit 1	Optimize Energy Performance	1 to 19
			1	Improve by 12% for New Buildings or 8% for Existing Building Renovations	1
			2	Improve by 14% for New Buildings or 10% for Existing Building Renovations	2
			3	Improve by 16% for New Buildings or 12% for Existing Building Renovations	3
			4	Improve by 18% for New Buildings or 14% for Existing Building Renovations	4
			5	Improve by 20% for New Buildings or 16% for Existing Building Renovations	5
				Improve by 22% for New Buildings or 18% for Existing Building Renovations	6
				Improve by 24% for New Buildings or 20% for Existing Building Renovations	7
				Improve by 26% for New Buildings or 22% for Existing Building Renovations	8
				Improve by 28% for New Buildings or 24% for Existing Building Renovations	9
				Improve by 30% for New Buildings or 26% for Existing Building Renovations	10
				Improve by 32% for New Buildings or 28% for Existing Building Renovations	11
				Improve by 34% for New Buildings or 30% for Existing Building Renovations	12
				Improve by 36% for New Buildings or 32% for Existing Building Renovations	13
				Improve by 38% for New Buildings or 34% for Existing Building Renovations	14
				Improve by 40% for New Buildings or 36% for Existing Building Renovations	15
				Improve by 42% for New Buildings or 38% for Existing Building Renovations	16
				Improve by 44% for New Buildings or 40% for Existing Building Renovations	17
				Improve by 46% for New Buildings or 42% for Existing Building Renovations	18
				Improve by 48%+ for New Buildings or 44%+ for Existing Building Renovations	19
		7	Credit 2	On-Site Renewable Energy	1 to 7

LEED 2009 for New Construction and Major Renovation
Project Scorecard

Project Name: New Inpatient Building Phase 1 + New Patient Transport Bridge
Project Address: Albany Street Boston, MA 02118

Yes	?	No			
				1% Renewable Energy	1
				3% Renewable Energy	2
				5% Renewable Energy	3
				7% Renewable Energy	4
				9% Renewable Energy	5
				11% Renewable Energy	6
				13% Renewable Energy	7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2

Yes	?	No		
5	2	7	MATERIALS & RESOURCES	14 Points

Y			Prereq 1	Storage and Collection of Recyclables	Required
		3	Credit 1.1	Building Reuse - Maintain Existing Walls, Floors and Roof	1 to 3
				Reuse 55%	1
				Reuse 75%	2
				Reuse 95%	3
		1	Credit 1.2	Building Reuse - Maintain Interior Nonstructural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
			1	50% Recycled or Salvaged	1
			2	75% Recycled or Salvaged	2
		2	Credit 3	Materials Reuse	1 to 2
				Reuse 5%	1
				Reuse 10%	2
1	1		Credit 4	Recycled Content	1 to 2
			1	10% of Content	1
			2	20% of Content	2
1	1		Credit 5	Regional Materials	1 to 2
			1	10% of Materials	1
			2	20% of Materials	2
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

Yes	?	No		
11		4	INDOOR ENVIRONMENTAL QUALITY	15 Points

Y		Prereq 1	Minimum Indoor Air Quality Performance	Required
Y		Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
1		Credit 1	Outdoor Air Delivery Monitoring	1
	1	Credit 2	Increased Ventilation	1
1		Credit 3.1	Construction Indoor Air Quality Management Plan - During Construction	1
1		Credit 3.2	Construction Indoor Air Quality Management Plan - Before Occupancy	1
1		Credit 4.1	Low-Emitting Materials - Adhesives and Sealants	1
1		Credit 4.2	Low-Emitting Materials - Paints and Coatings	1
1		Credit 4.3	Low-Emitting Materials - Flooring Systems	1
1		Credit 4.4	Low-Emitting Materials - Composite Wood and Agrifiber Products	1
1		Credit 5	Indoor Chemical and Pollutant Source Control	1
1		Credit 6.1	Controllability of Systems - Lighting	1
	1	Credit 6.2	Controllability of Systems - Thermal Comfort	1
1		Credit 7.1	Thermal Comfort - Design	1
1		Credit 7.2	Thermal Comfort - Verification	1
	1	Credit 8.1	Daylight and Views - Daylight	1
	1	Credit 8.2	Daylight and Views - Views	1

Yes	?	No		
4	2		INNOVATION IN DESIGN	6 Points

LEED 2009 for New Construction and Major Renovation
Project Scorecard

Project Name: New Inpatient Building Phase 1 + New Patient Transport Bridge
Project Address: Albany Street Boston, MA 02118

Yes	?	No			
3	2		Credit 1	Innovation in Design	1 to 5
			1	Article 37 - Modern Grid	1
			1	Article 37 - Groundwater Recharge	1
			1	Article 37 - Modern Mobility	1
			1	Exemplary performance of LEED Pilot Credit	1
			1	Exemplary performance of LEED Pilot Credit	1
1			Credit 2	LEED® Accredited Professional	1
Yes	?	No			
3	1		REGIONAL PRIORITY		4 Points
3	1		Credit 1	Regional Priority	1 to 4
				SSc3	1
			1	SSc6.1	1
			1	SSc7.1	1
			1	SSc7.2	1
Yes	?	No			
58	21	31	PROJECT TOTALS (Certification Estimates)		110 Points

Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

LEED 2009 for New Construction and Major Renovation

Project Checklist

BMC - New Energy Facility

17-Feb

Sustainable Sites — Possible Points: 26

Y	N	?			
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
	1		Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
	3		Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
	1		Credit 5.1	Site Development—Protect or Restore Habitat	1
	1		Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
		1	Credit 6.2	Stormwater Design—Quality Control	1
	1		Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
1			Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y			Prereq 1	Water Use Reduction—20% Reduction	
	4		Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
	2	2	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	0
Y			Prereq 3	Fundamental Refrigerant Management	
	17	2	Credit 1	Optimize Energy Performance	1 to 19
	7		Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y			Prereq 1	Storage and Collection of Recyclables	**0**
	3		Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
	1		Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
	2		Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	N	?			
2			Credit 4	Recycled Content	1 to 2
	1	1	Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

Y			Prereq 1	Minimum Indoor Air Quality Performance	**0**
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	**0**
1			Credit 1	Outdoor Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
1			Credit 8.1	Daylight and Views—Daylight	1
1			Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

1			Credit 1.1	Innovation in Design: Article 37 "Modern Grid" CHP System	1
1			Credit 1.2	Innovation in Design: Article 37 "Modern Mobility" TDM Plan	1
1			Credit 1.3	Innovation in Design: Green Cleaning Plan	1
1			Credit 1.4	Innovation in Design: Green Building Education plan	1
	1		Credit 1.5	Innovation in Design: Article 37 "Groundwater Recharge"	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

1			Credit 1.1	Regional Priority: SSc6.1: Stormwater Design-Quantity Control	1
1			Credit 1.2	Regional Priority: SSc7.2: Heat Island Effect-Roof	1
	1		Credit 1.3	Regional Priority: Specific Credit	1
	1		Credit 1.4	Regional Priority: Specific Credit	1

Total — Possible Points: 110

45	56	9

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

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