Institutional Master Plan Notification Form / Project Notification Form

Submitted pursuant to Article 80 of the Boston Zoning Code

Boston Children's Hospital

Submitted to:
Boston Redevelopment Authority
One City Hall Square
Boston, Massachusetts 02201

Submitted by:
Boston Children's Hospital
300 Longwood Avenue
Boston, Massachusetts 02115

Prepared by:
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, Massachusetts 01754

In Association with:

Bard, Rao + Athanas Consulting Engineers, LLC
Elkus Manfredi Architects
Goulston & Storrs
Haley & Aldrich, Inc.
McNamara/Salvia, Inc.
Redgate Real Estate Advisors, LLC
Shepley Bulfinch Richardson & Abbott
Turner Construction
Vanasse Hangen Brustlin

October 12, 2012

Epsilon ASSOCIATES INC.

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BOSTON CHILDREN'S HOSPITAL

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Chapter 1.0

Introduction/Overview

1.0 INTRODUCTION/OVERVIEW

1.1 Introduction

The Children's Hospital Corporation and its affiliated entities[1] known collectively as Boston Children's Hospital (Children's or BCH or the Hospital) is the nation's premier pediatric medical center with a commitment to being a worldwide leader in the advancement of children's health. Boston Children's Hospital ranks first in more specialties than any other children's hospital in the nation according to the 2011-12 edition of Best Children's Hospitals by U.S. News & World Report. Children's has been ranked first in Heart and Heart Surgery, Neurology and Neurosurgery, Cancer, Orthopedics, Urology, and Kidney Disorders. Children's is also the only hospital to rank in the top three in all 10 specialties included in the ranking. Since the magazine began ranking hospitals over 20 years ago, Children's has continuously been ranked as one of the top pediatric hospitals in the country.

Founded in 1869 as a 20-bed hospital for children, Children's has grown significantly and has a legacy of firsts that have improved the practice of pediatric care across the world. Children's is a 395-bed[2] comprehensive center for pediatric and adolescent health care guided by the values of excellence, sensitivity, leadership, and community. These core attributes run throughout the Hospital's four interwoven missions: providing the best clinical care to children, researching new cures for diseases, training the next generation of pediatric caregivers, and improving the health and well being of children with a special emphasis on making Boston a better place for families to live, work, and play.

Boston Children's Hospital is located in Boston (with satellite facilities in Waltham, Lexington, Weymouth and Peabody), with most of the campus located in the Longwood Medical and Academic Area (LMA). Figure 1-1 shows Children's campus.

Children's continuing growth in patient volume and employment, as well as a focus on high-level tertiary and quaternary care, have exacerbated constraints that already exist on Children's campus, including the need for single-bed rooms, administration and support space, space for families, parking, a consistent and regular supply of electricity and heat, and improved circulation throughout its campus. In order for Boston Children's Hospital to continue delivering the award winning care, research and teaching on which it has built its reputation and address its growth in patients and employees, it is imperative that Children's increases its clinical care space on campus, as well as increases its office and administrative space both on and off campus.

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[1] Affiliated entities include The Children's Medical Center Corporation, Fenmore Realty Corporation, Longwood Research Institute, Inc., 333 Limited Partnership, CHB Properties, Inc. and Longwood Corporation.

[2] 384 beds are located in Boston and 11 beds are located at Children's facility in Waltham, Massachusetts.

Boston Children's Hospital

Epsilon Associates Inc.

Figure 1-1

Boston Children's Hospital IMP Campus

In addition to the existing physical constraints, the financial side of health care continues to be a challenge for the Hospital and its patients. Boston Children's Hospital continues to make a concerted effort to provide exceptional care to its growing patient population and provide the most up-to-date medical technologies and methods, while managing costs. Like its partners in state and federal government, Children's strongly believes that reducing unnecessary use of services throughout its system will have the highest impact in cost reduction. Therefore, Children's is working collaboratively with its primary care partners to develop care protocols, patient education materials, and accessible subspecialty consultative guidance (i.e., in advance of making a referral) to better manage patient care and reduce unnecessary referrals. Boston Children's Hospital continues to actively pursue redesigns of its systems of operations consistent with its objectives of improving quality care while reducing costs, and its mission of driving innovation in pediatric care delivery.

To help address these objectives and constraints, Children's proposes in this Institutional Master Plan Notification Form/Project Notification Form (IMPNF/PNF) three Projects.

1. The new Children's Clinical Building (CCB) with approximately 445,000[3] square feet (sf) will include clinical and medical support spaces on the Core Campus as well as expanded and new green and gathering spaces. The Children's Clinical Building will be connected to the existing buildings on the Core Campus on its lower outpatient, support and surgical levels. In addition, the Children's Clinical Building will connect an upper clinical floor (floor 9) with Main South over the Farley/Bader Pavilion.

   The consideration of several Combined Heat and Power (CHP) options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to consider and evaluate these and other options and alternatives as its planning evolves.

2. The Patient and Family Parking Garage Addition will add a new level of parking containing 86 new spaces (76 net new spaces due to the elimination of 10 spaces in connection with the Children's Clinical Building) to the existing garage, and will include circulation modifications aimed at improving garage ingress and egress for patients and their families.

[3] All references to "sf" for Boston buildings have been calculated in accordance with the definition of "Floor Area, Gross" under Article 2A of the Boston Zoning Code.

3. An office building at 819 Beacon Street will include approximately 211,170 sf of office space, ground floor retail space and approximately 526 parking spaces within a new garage (including 249 replacement spaces and 277 net new spaces of which 158 spaces will support the office space within 819 Beacon Street and of which 119 spaces will be available to support the needs of Children's employees working in the LMA). The 819 Beacon Street Project is located in the Audubon Circle neighborhood.

Figures 1-2 and 1-3 show the locations of the proposed Projects.

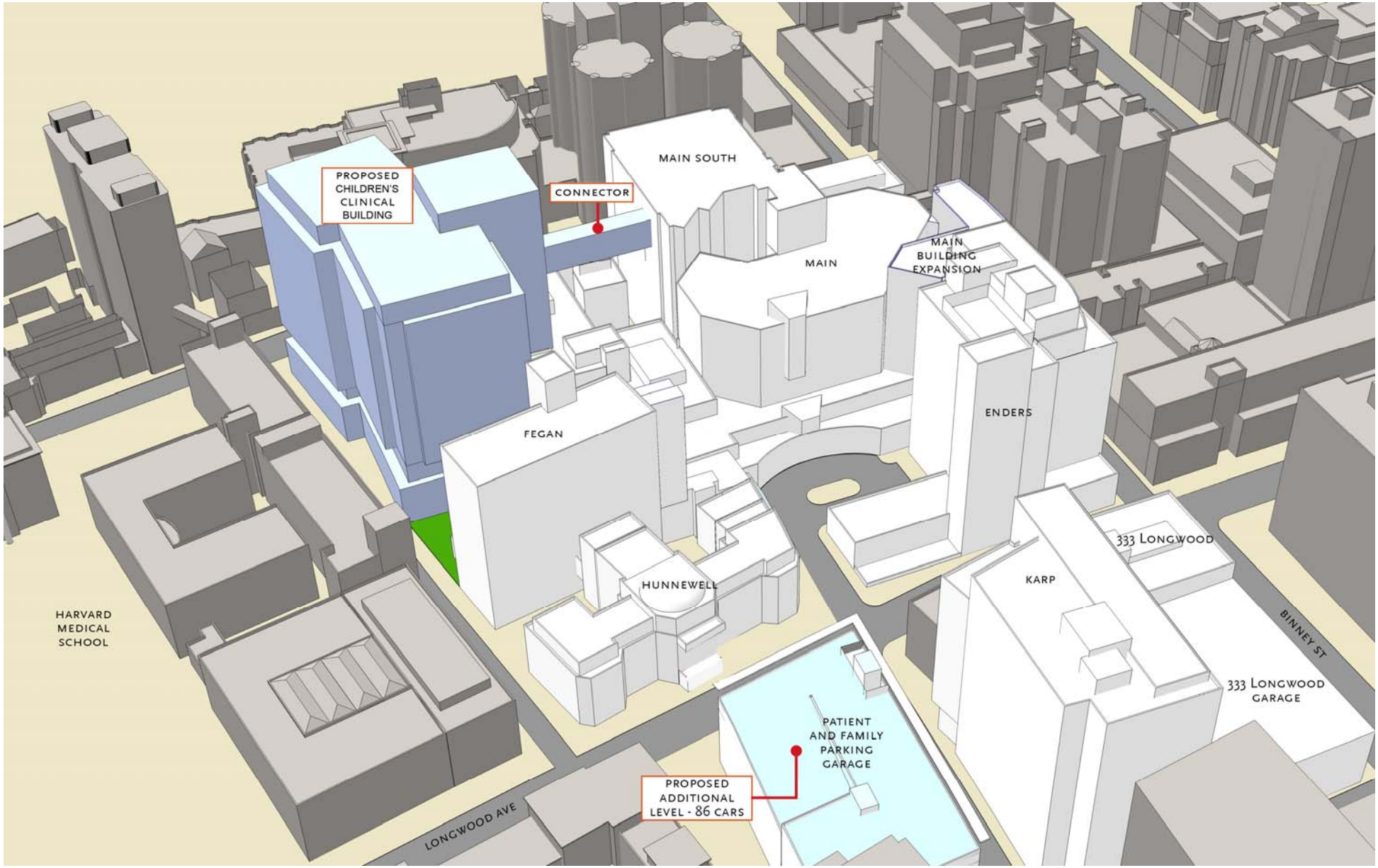
Children's also continues to undertake on-going campus improvement and maintenance projects including the Main Lobby renovation (see Section 1.2.3.3) and general operational improvements to circulation across Children's campus. Since the Core Campus is bisected by Longwood Avenue, Children's has identified and is assessing potential opportunities to improve at grade traffic and pedestrian circulation at the Longwood Avenue/Blackfan Circle intersection. Children's also continues to explore expansion of an LMA-wide elevated pedestrian pathway network across Longwood Avenue in the interests of safety and to allow for valet operations at the Patient and Family Parking Garage.

Children's is pleased to submit this IMPNF/PNF to initiate Article 80D Institutional Master Plan Review to amend the Institutional Master Plan (IMP), Article 80B Large Project Review for the proposed CCB and 819 Beacon Street Projects and Article 80E Small Project Review for the proposed Patient and Family Parking Garage Addition.

1.2 General Information

1.2.1 Previous Institutional Master Plan Review

On January 30, 2007, Children's submitted an IMPNF/PNF to the Boston Redevelopment Authority (BRA) initiating Institutional Master Plan Review and Large Project Review under Article 80D and Article 80B, respectively. The IMPNF/PNF proposed two projects: the Main Building Inpatient Expansion (later referred to as the Main Building Vertical Addition) and a Patient Care Center. The Main Building Vertical Addition proposed the addition of approximately 76,100 net new sf of additional upper level floors, lobby and lower level expansion space to the existing Main Building, and the demolition of an approximately 7,000 sf building at 57 Binney Street. The proposed 15-story Patient Care Center contemplated inpatient beds, clinical spaces and family support space, as well as parking for patients and families on the site of the existing Enders Building. The IMPNF/PNF also proposed incorporating in the 2008 IMP the provisions of the Development Plan for PDA No. 29, as amended, and the Development Plan for PDA No. 61, as amended (Phase 2 only), which areas are part of the Children's Core Campus.



Boston Children's Hospital

Figure 1-2

Locations of Proposed Projects – Core Campus

Boston Children's Hospital

Figure 1-3

Location of Proposed Projects – 819 Beacon Street

The BRA issued an Institutional Master Plan Scoping Determination and a Large Project Review Scoping Determination for the IMPNF/PNF on April 17, 2007. By letter dated December 6, 2007, Children's filed a Notice of Project Change (NPC) for the Main Building Vertical Addition and Patient Care Center, requesting that only the Main Building Vertical Addition be considered for approval and that the Patient Care Center no longer be considered. Subsequently, the BRA issued a Modified IMP Scoping Determination and a Modified Large Project Review Scoping Determination on December 26, 2007.

On January 31, 2008, Children's submitted an IMP and a Draft Project Impact Report (PIR) for the Main Building Vertical Addition. The proposed Main Building Vertical Addition included the demolition of the 7,000 sf 57 Binney Street building and the addition of two stories comprising 60,375 sf for a total of 53,375 net new square feet and 39 "net new" beds, which was reduced in size from the Main Building Vertical Addition initially proposed in the IMPNF/PNF. The BRA Board approved the Children's IMP and Main Building Vertical Addition in April 2008. The Boston Zoning Commission approved the 2008 IMP on May 28, 2008, and Map Amendment No. 491 creating the "I" District was approved by the Boston Zoning Commission on May 28, 2008 and executed by the Mayor on May 29, 2008.

Upon subsequent internal review by Children's, construction constraints associated with the approved Main Building Vertical Addition caused major concerns about cost efficiency and the ability to meet the demand for patient care during the construction process. Consequently, after much discussion, Children's concluded that implementation of the Main Building Vertical Addition was not feasible. However, due to the need for space that would have been provided by the Main Building Vertical Addition, on April 29, 2009 Children's submitted an IMPNF/NPC for the Main Building Expansion on Binney Street to replace the approved Main Building Vertical Addition. Instead of an addition built on top of the Main Building, the Main Building Expansion on Binney Street initially proposed an approximately 112,000 sf addition on the western side of the Main Building at 57 Binney Street. On June 16, 2009, the BRA issued a Scoping Determination regarding the IMPNF/NPC. Subsequently, on November 17, 2009, Children's submitted to the BRA a proposed IMP Amendment (for approximately 73,000 sf of net new floor area in the Main Building Expansion on Binney Street), a draft map amendment expanding the "I" District to include a portion of Binney Street and the building at 333 Longwood Avenue, and a Supplemental Materials document providing additional information about the project and responding to public agency and community comments. At a February 16, 2010 hearing, the BRA Board approved the IMP Amendment and authorized the BRA Director to petition the Boston Zoning Commission for approval of the map amendment. On March 24, 2010, the Boston Zoning Commission approved the 2009 IMP Amendment and Map Amendment No. 581. Map Amendment No. 581 was executed by the Mayor on March 30, 2010.

1.2.2 Status of 2008 IMP/2009 IMP Amendment Projects

1.2.2.1 2009 Main Building Expansion on Binney Street

Upon completion, the 10-story Main Building Expansion project will include approximately 82,750 sf, or 75,750 net new square feet as a result of the demolition of the 7,000 sf 57 Binney Street building. Four of the floors are devoted to inpatient beds and one floor each will be dedicated to emergency, radiology, surgical service expansions, and pharmacy/neuro radiology. There is no net increase in beds as existing double-bed rooms will be changed to single-bed rooms. At this time, excavation and utility relocation is completed, structural steel has been erected, and installation of the curtainwall is completed. Occupancy is expected in the third quarter of 2013.

1.2.2.2 Campus Improvement Projects

Children's has continued to pursue facility and campus upgrades as described in Section 4.2.2 of the 2008 IMP. Campus upgrades planned for the term of the IMP included the Fegan Elevator project which is currently under construction and scheduled for completion during the summer of 2013. This new addition of 5,871 sf to the Fegan Building will provide three new elevator shafts to improve movement of patients, visitors, and staff around the Hospital, in particular between the front entrance and ambulatory care clinics throughout Fegan.

1.2.3 Evolution of 2008 IMP and 2009 IMP Amendment Projects into Proposed 2012 IMP Amendment Projects

1.2.3.1 Patient Care Center/Children's Clinical Building

The 2008 IMP envisioned the Patient Care Center, located at Binney Street and Longwood Avenue, as a clinical building with inpatient beds, family support spaces and parking on the site of the existing John Enders Laboratory building. The Patient Care Center was envisioned to include 12 to 14 stories of additional inpatient beds to increase the quantity of acute care beds, solve the "double bedded room" problems, enhance patient satisfaction, and reduce the risk of error and infection. The Children's Clinical Building proposed in this IMPNF/PNF will take the place of the Patient Care Center. Please see Section 2.1.2 for more information about the Children's Clinical Building.

1.2.3.2 819 Beacon Street

Children's has been considering options for the development of 819 Beacon Street since 2004. Although 819 Beacon Street was described in the 2008 IMP as an integral part of the future campus vision for Children's Hospital, the 2008 IMP did not include 819 Beacon Street in the IMP Area, but rather stated that development of 819 Beacon Street would be proposed as an amendment to the IMP.

819 Beacon Street is ideally suited for Children's continued decanting of its non-clinical administrative space from its Core Campus so that space within the Core Campus can be increasingly devoted to patient care and to research requiring "bench to bedside" proximity. Presently, the site is a licensed, 249-space surface parking lot which serves Children's employees working in the LMA and provides public parking for Fenway Park events on weekdays after 6:00 p.m. and on weekends. The total square footage of the site, including a permanent easement (acquired from the MBTA to square the site), equals approximately 1.6 acres. At earlier points in time, the site had been considered for construction of an approximately 110,000 sf office building with a 940-car parking garage. In order to accommodate several transit-related infrastructure projects both currently under construction and proposed by various City and State agencies, including, without limitation, the proposed future alignments of MassDOT's Urban Ring, the BRA's multi-use pedestrian path and the redesigning and reconstructing of Maitland Street to provide access to the new Yawkey Way Commuter Station, Children's has revised its development plans even though it is not certain that these transit-related public infrastructure projects will ever be constructed. Please see Section 2.1.5 for more information about the 819 Beacon Street Project and the manner in which the Hospital's current proposal for 819 Beacon Street has been revised to accommodate such existing and proposed public-transit projects.

1.2.3.3 Ongoing Upgrades to Existing Facilities

As part of the 2008 Main Building Vertical Addition, Children's had planned to undertake a series of lobby improvements. With the decision to eliminate the 2008 Main Building Vertical Addition and to substitute the Main Building Expansion at Binney Street, Children's plans for the Main Lobby improvements were deferred. Children's is currently proceeding with the planned renovation of its Main Lobby and as part of on-going campus improvements and maintenance projects, Children's plans to implement operational improvements to circulation across its campus. Since the Core Campus is bisected by Longwood Avenue, Children's has identified and is assessing potential opportunities to improve at grade traffic and pedestrian circulation at the Longwood Avenue/Blackfan Circle intersection. Children's also continues to explore expansion of an LMA-wide elevated pedestrian pathway network across Longwood Avenue in the interests of safety and to allow for valet operation at the Patient and Family Garage.

Please see Section 2.3 for more information about the on-going campus improvements.

1.3 Project Team

Proposed Projects: 2012 IMP Amendment including:
Children's Clinical Building
Patient and Family Parking Garage Addition
819 Beacon Street

Address/Location:	300 Longwood Avenue 819 Beacon Street
Proponent:	Boston Children's Hospital 300 Longwood Avenue Boston, MA 02115 (617) 355-6000 Charles Weinstein, Esq., Vice President Real Estate, Planning and Development Paula Quan, Executive Director of Capital Planning and Design, Facilities Management
Development Consultant:	Redgate Real Estate Advisors, LLC 100 Franklin Street, 9th Floor Boston, MA 02110 (617) 904-7013 Lisa Serafin
Architects:	Shepley Bulfinch 2 Seaport Lane Boston, MA 02210 (617) 423-1700 Uma Ramanathan Cathleen Lange Andre Kamili Elkus Manfredi Architects 300 A Street Boston, MA 02210 (617) 426-1300 Sam Norod Alvin Hung
Environmental Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Cindy Schlessinger Geoff Starsiak

Legal Counsel:	Goulston & Storrs 400 Atlantic Avenue Boston, MA 02110-3333 (617) 482-1776 Marilyn Sticklor, Esq. Darren Baird, Esq. Kevin J. Renna, Esq.
Transportation Consultants/Civil Engineers:	VHB/Vanasse Hangen Brustlin 99 High Street Boston, MA 02110 (617) 728-7777 Sean Manning, PE, PTOE Ellen Donohoe Howard Moshier
MEP Engineer:	Bard, Rao + Athanas Consulting Engineers, LLC 311 Arsenal Street Watertown, MA 02472 (617) 254-0016 Stephen Carroll
Geotechnical Consultant:	Haley & Aldrich, Inc. 465 Medford Street, Suite 2200 Boston, MA 02129 (617) 886-7400 Mark Haley
Structural Engineer:	McNamara/Salvia, Inc. 160 Federal Street, 5th Floor Boston, MA 02110 (617) 737-0040 Joe Salvia
Construction Manager:	Turner Construction 2 Seaport Lane, Suite 200 Boston, MA 02210 (617) 247-6400 Michael Gallivan Bob McGee

1.4 Description of Boston Children's Hospital

1.4.1 Mission

As described previously, Children's vision is to advance pediatric care worldwide. The Hospital's four interwoven missions are: providing the best clinical care to children, researching new cures for diseases, training the next generation of pediatric caregivers, and improving the health and well being of children with a special emphasis on making Boston a better place for families to live, work, and play.

The 2008 IMP identified Children's mission relative to patient care, teaching and research. These focus areas are summarized below:

- **Patient Care** – Boston Children's Hospital offers a complete range of health care services for children from birth through 21 years of age. In addition, when medical circumstances require long-term follow-up care, the Hospital often treats adult patients as well. The Hospital's clinical staff represents more than 30 pediatric specialty services and 228 specialized clinical programs. Children's is the largest provider of health care to the children of Massachusetts. Children's provided approximately $45.6 million in free care and unreimbursed Medicaid in 2010.

  Increasingly, the focus of the Core Campus is on high-level tertiary and quaternary care. Over the past decade, Children's has made a strategic decision to develop and expand the Children's Hospital Network in collaboration with leading community hospitals for those patients whose needs may not be as complex. This network provides convenient access to pediatric medical care and the expertise of Children's specialists in fourteen locations throughout eastern Massachusetts. The strategy was developed to both provide high quality care to patients where they live and to make more space available at the Core Campus to treat patients with specialized care requirements.

- **Teaching** - Home to the largest, most comprehensive pediatric medical and surgical training program in the United States, Boston Children's Hospital attracts about 475 residents (research/clinical) and Fellows from around the world each year. Children's also supervises 200 – 250 medical students in clinical pediatric rotations every year. The Hospital has worked to integrate advocacy education and to encourage local community outreach among its medical residents.

- **Research** – Boston Children's Hospital is also home to the world's largest pediatric research enterprise based at a pediatric hospital. Within the John F. Enders Pediatric Research Laboratories (named for the 1954 Nobel Prize recipient who cultured the polio and measles viruses at Children's) and Karp Family Research Laboratories, as well as six floors of basic research in the Center for Life Sciences Boston (CLSB), are 1,100 principal investigators, research fellows, post-doctoral students, medical

students and laboratory technicians searching for answers to some of the most perplexing childhood, as well as adult, illnesses and diseases. The Hospital's lease at CLSB includes approximately 167,181 sf devoted to neuroscience, genetics, otolaryngology, genomics, endocrine, immunology and obesity programs.

- **Community** – Boston Children's Hospital is dedicated to enhancing the health and well-being of children and families in the local neighborhoods through robust community benefits programs and partnerships.

  Boston Children's Hospital is the leading provider of health care to low-income and uninsured children in Massachusetts. For thousands of patients and families in this region, there literally is often nowhere else to turn for the kind of care Children's provides. The Hospital is committed to treating all pediatric patients from Massachusetts regardless of their ability to pay.

  Children's is the safety net provider for the children of Boston. More than half of all Boston children hospitalized come to Children's; nearly one-third of the Hospital's outpatients come from Boston and immediately neighboring towns. Beyond the provision of care, a major institutional priority for Children's is ensuring that care is available to patients regardless of their ability to pay and ensuring that needed care is accessible.

1.4.2 Values

Children's is guided by the following values:

- **Excellence:** Children's is committed to achieving and maintaining a standard of excellence in the provision of patient care and all related services; in its support services and systems; in the quality of work in research laboratories; and in education programs. Children's consistently strives to make the patient experience, in particular, a model of quality care through advanced treatment, compassionate support, and full family participation and communication.

- **Sensitivity:** Children's believes that sensitivity means a compassionate awareness of the stress experienced by families of ill and injured children with an understanding of the impact it can have upon the emotions and behavior of the child and families. Children's strives both to anticipate and respond to issues arising from complex personal and family situations, and provide the support that can contribute to the best possible outcome for the child and family. Children's also believes that sensitivity means a recognition of and respect for the diverse backgrounds of both the patients and families Children's serves and the employees throughout the Hospital.

- **Leadership:** As an academic medical center devoted to the practice of pediatrics, Children's fosters an environment of innovation and discovery, with individual and team contributions to advancing pediatrics in all areas of Children's mission: patient care, research, teaching and community service.

The proposed 2012 IMP Amendment and its proposed Projects, including new clinical space and office space, increased parking, and improved circulation will afford the Hospital the space it needs to further its mission of providing the best clinical care, research, training and improving the health and well being of children.

1.4.3 Research Milestones

Children's has been a leader in child health for more than 130 years. Section 1.2 of the 2008 IMP and Section 1.4.2 of the 2009 IMPNF/PNF outlined Children's historic milestones in patient care and research. With more than $225 million of annual funding and more than 800,000 sf of state-of-the-art laboratory space, Children's is the world's largest and most active research enterprise based at a pediatric hospital. Recent research milestones include:

- **New potential treatments for Duchenne muscular dystrophy.** A study in zebrafish found that a number of existing drugs may help restore muscle in this devastating disease. The results have led to a partnership with Pfizer to develop the most promising compounds as treatments.

- **Gene therapy for "bubble boy" disease.** Children's is leading a trial in X-linked Severe Combined Immunodeficiency (SCID-X1), and gene-therapy trials for several other diseases are in the pipeline.

- **New diagnostics for autism.** Children's developed and now offers a new genetic test for children thought to have autism. Called chromosomal microarray, it detects more abnormalities than other genetic tests that have long been the standard of care. Another research team is developing electroencephalograms (EEGs) as an inexpensive way to identify a child's risk for autism as early as six months of age based on differences in brain wave patterns.

- **Taming milk allergies.** Children's has piloted a successful treatment to desensitize milk-allergic patients by increasing their exposure to milk in tandem with the allergy drug Zolair.

- **A long-acting anesthetic from algae successfully blocks pain.** Children's has teamed with a Chilean team to test a surgical anesthetic that blocks pain for as long as 2-4 days, avoiding the need to use opioid analgesics, which cause side effects and delay recovery.

- **School obesity-prevention curriculum can reduce medical costs.** Epidemiologists at Children's, teaming with a health economist at the Centers for Disease Control and Prevention (CDC), show that a school curriculum teaching about nutrition and healthy eating results in a net savings to the health care system for obesity and eating disorders. A study in 10 Massachusetts schools found a projected $14,000 in savings for the 254 girls receiving the curriculum.

- **Quick test identifies vision loss in children as young as 2.** Children's ophthalmologists have developed and are field-testing a simple, seconds-long test with a handheld scanning device that may enable pediatricians to identify "lazy eye" during the preschool years when it is most treatable.

- **A personalized approach to childhood brain tumors.** Medulloblastomas are the most common malignant brain tumors of childhood, with an overall mortality of 40 to 50 percent. They are hard to treat because they vary so much from child to child. In the largest genomic study of human medulloblastomas to date, Children's researchers have identified six subtypes with distinct molecular "fingerprints" that are starting to guide individualized treatment in the clinic.

- **Cured sickle cell disease in mice by turning up production of the fetal form of hemoglobin.** Researchers at Children's have found that turning off a single gene called BCL11A can correct sickle cell disease in mice. This gene may be the key to treating other anemias and blood disorders as well, such as beta thalassemia.

- **New approach corrects diabetes in mice, without insulin.** Diabetes can result from either a deficiency of insulin (type 1 or insulin-dependent diabetes) or decreased sensitivity to insulin (type 2 diabetes). Researchers at Children's have discovered a mechanism for normalizing blood sugar that does not involve insulin and could offer a new therapeutic approach to both kinds of diabetes.

- **Development of nanotechnology approaches to heart attack and heart failure.** Children's and MIT are collaborating to use nanotechnology to engineer better cardiac patches and nanoparticles that could possibly help strengthen weakened heart tissue after a heart attack.

- **Fine-tuning the flu vaccine for broader, longer-lasting protection.** New research from Children's suggests that immune systems might be able to be trained to look past the flu virus's annual attempts to render vaccines from previous years obsolete, by designing vaccines that mimic features of the influenza virus's entry point into human cells.

- **Explanation of why flu exacerbates asthma, suggesting a new way to protect asthmatic children when they get flu and other viral infections.** When children with asthma get the flu, they often land in the hospital gasping for air. Researchers at Children's have found a previously unknown biological pathway explaining why influenza induces asthma attacks.

- **Two new partnerships with Pfizer.** This year, Children's has entered into two research partnerships with Pfizer. In June, 2011, Pfizer invited Children's and six other Boston-area academic medical centers to join its Centers for Therapeutic Innovation program, which aims to facilitate and support joint drug discovery and development—from the conception of an idea through early clinical trials. In October, Children's and Pfizer announced the signing of a novel collaborative agreement for the development of therapies for Duchenne muscular dystrophy. Both partnerships bring the respective strengths of academia and industry together in a framework that could hold promise for accelerating therapeutic development in a number of disease areas.

- **Standardized Clinical Assessment and Management Plan (SCAMPs) – bringing the cost of care down through data.** The cost of health care needs to come down. That is why pediatric cardiologists at Children's came up with SCAMPs—algorithms that guide physicians in managing each patient's care and exploring clinical questions. These questions, and all plausible patient outcomes, are identified in advance and built into the SCAMP, allowing data collection to be focused around them, supported by nimble, dedicated software. SCAMPs are now being adopted throughout the Hospital.

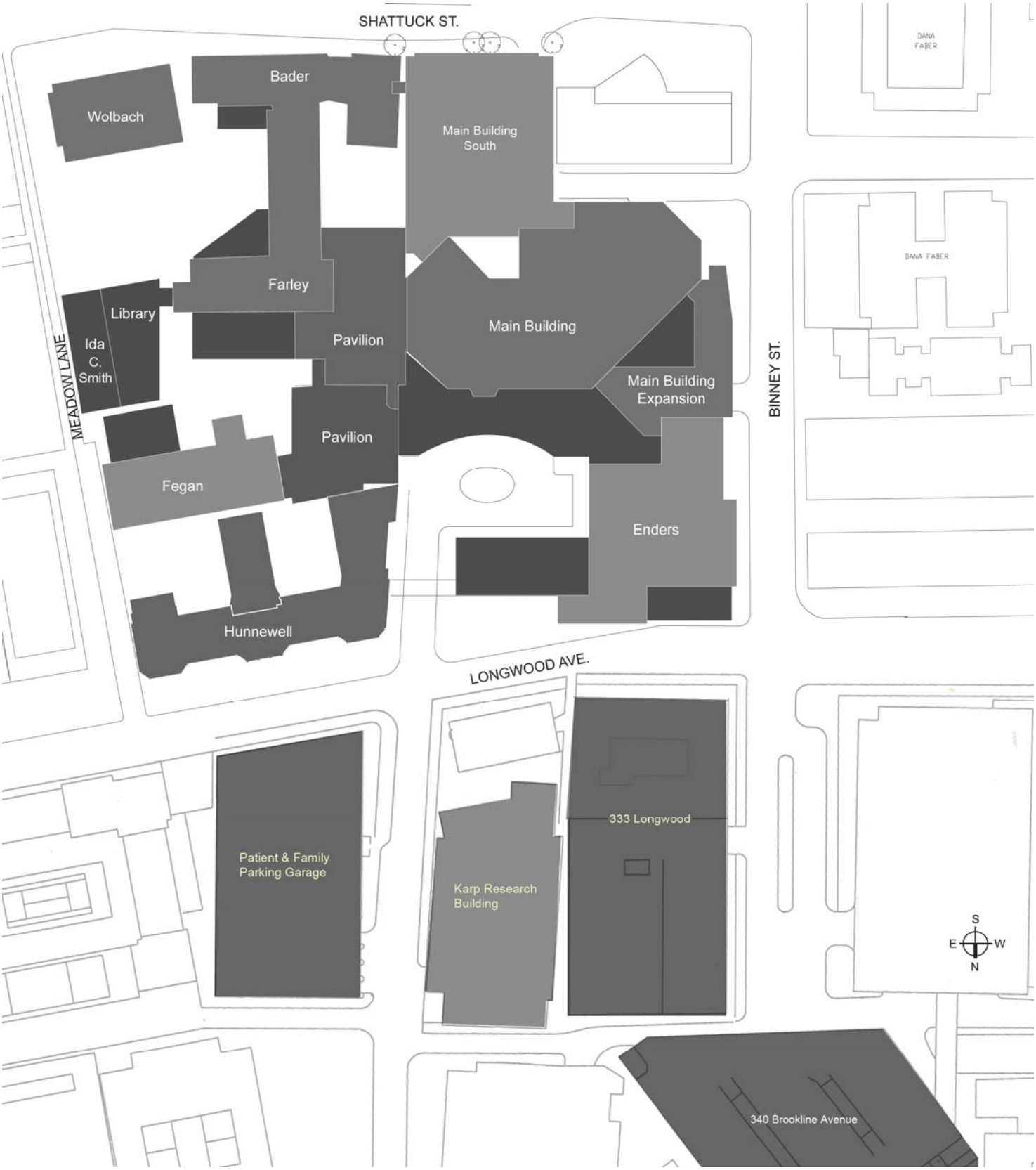
1.4.4 Existing Campus and Facilties

The Hospital's campus in Boston is comprised of three main properties:

- **Core Campus:** The Core Campus, totaling approximately 509,351 sf[4] or 11.7 acres (excluding the approximately 14,777 sf portion of Blackfan Circle that is currently open to public use and not included within the "Lot Area"), includes areas to the south and north of Longwood Avenue, as well as the site of the 340 Brookline Avenue Garage (the future site of the approved Longwood Research Institute project, which has not yet been constructed). Figure 1-4 shows the Core Campus.

- **Autumn Street:** The approximately 0.9-acre Autumn Street parcel is bound by Autumn Street, Longwood Avenue, and The Riverway, and includes two buildings: One and 21 Autumn Street.

[4] The area of the Core Campus does not include Longwood Avenue.



Boston Children's Hospital

Shepley Bulfinch

Figure 1-4

Boston Children's Hospital Core Campus

Table 1-1 Existing Facilities

Hospital-owned Facilities in LMA	Year Built	Principal Uses	Floors Above / Below Grade	Height in Feet*	Zoning SF
Core Campus, South of Longwood Avenue**					
Bader	1930	Hospital Use: Inpatient and Ambulatory, Offices, Diagnostics / Treatment	7 / 1	80	74,146
Enders	1971	Research, Public Assembly	13 / 2	227	146,311
Enders Expansion	1990	Research, Public Assembly	13 / 2	227	141,384
Farley	1956	Hospital Use: Ambulatory, Offices, Diagnostics & Treatment	9 / 2	97	130,837
Fegan	1966/67	Hospital Use: Ambulatory, Offices, Support Space	11 /2	162	106,545
Hunnewell	1914	Hospital Use: Ambulatory, Offices	5	65	98,044
Ida C. Smith	1924	Hospital Use: Offices	1	25	3,438
Library	1994	Hospital Use: Library	1	25	5,518
Main	1988	Hospital Use: Inpatient, Offices, Diagnostics & Treatment	10 / 2	138	281,606
Main South	2005	Hospital Use: Inpatient, Offices, Diagnostics & Treatment	11 / 2	186	190,800
Pavilion	1974/79	Hospital Use: Inpatient, Offices, Diagnostics & Treatment	6/2	48	54,281
Wolbach	1914	Hospital Use: Offices (plus 10 parking spaces)	3	54	28,405
57 Binney Street	2013*	Hospital Use: Inpatient, Offices, Diagnostic and Treatment	10/2	138	82,750
Subtotal					**1,344,065**
Core Campus, North of Longwood Avenue					
Karp Family Research Building, Blackfan St., including portion of bridge to Blackfan Research Center	2003	Research, Public Assembly, Parking (300 spaces)	12 / 5	206	269,822
Patient & Family Garage, Longwood Ave.	1995	Parking (643 spaces)	8 / 1	68	215,854
Longwood Research Institute***	2012	Research, Public Assembly, Parking (330 spaces)	18 / 5	298	440,000
333 Longwood Avenue	1986	Hospital Use: Inpatient, Offices, Diagnostics & Treatment, parking (490 spaces)	6	72	243,504
Subtotal					**1,169,180**

Table 1-1 Existing Facilities (Continued)

Hospital-owned Facilities in LMA	Year Built	Principal Uses	Floors Above / Below Grade	Height in Feet*	Zoning SF
Autumn Street					
1 Autumn Street	1977/2003	Hospital Use: Offices	6 / 1	60	80,106
21 Autumn Street	1929/2001	Hospital Use: Offices	6	53	29,233
Subtotal					**109,339**
TOTAL					**2,622,584**

* Heights not surveyed. Most heights were taken from the MASCO SketchUp Model of the LMA, September 2007

** All addresses are 300 Longwood Avenue unless otherwise noted.

*** The Longwood Research Institute parcel was purchased in 2006, commencement of construction has not been determined. Prior to construction of the LRI, the existing 340 Brookline Avenue Garage (formerly the BIDMC East Campus Parking Garage), which contains 117,850 square feet of Gross Floor Area and 454 parking spaces, will remain. BCH has received approval from the BRA to maintain up to 330 parking spaces in the 340 Brookline Avenue Garage until commencement of construction of the LRI project (which is the amount of below grade parking that would be built in connection with that project). BCH has elected to lease these 330 parking spaces to BIDMC, and concurrently, BIDMC has leased 198 parking spaces that it controls in the nearby Center for Life Sciences – Boston to BCH.

- **819 Beacon Street:** The 819 Beacon Street site, including both fee and easement rights, equals approximately 1.6 acres. It is bound by Beacon, Maitland and Munson streets, a parcel known as 16 Miner Street and land owned by the MBTA. This property was previously referenced in the 2008 IMP but not included in the previous map amendments creating the IMP Area. As part of the 2012 IMP Amendment, a map amendment is proposed to include the 819 Beacon Street Site in the IMP Area.

Buildings owned by Children's in Boston are presented in Table 1-1 along with their principal uses, year built, number of floors, and building area.

1.4.4.1 Children's Campuses and Buildings Outside Boston

Outside Boston, Children's owns or ground leases the following properties:

- a ground lease with an option to purchase property in Brookline, One and Five Brookline Place, totaling approximately 110,000 sf;
- Two and Four Brookline Place, Brookline which is approved for development as medical office, administrative office, retail uses and parking totaling approximately 252,000 sf under a development agreement and a long-term ground lease;
- an existing building with approximately 10,616 sf in Brookline at 241 Kent Street used for extended stay family housing for parents of inpatients;
- a campus in Waltham with approximately 400,000 sf of building area;
- a facility in Lexington in a joint venture with Beth Israel Deaconess Medical Center with approximately 25,000 sf; and
- a 25-acre campus in Peabody with 350,370 sf of space, with the majority of the space leased to commercial and industrial tenants. In 2011 Children's opened its Peabody Campus consisting of 46,769 sf of outpatient clinical space with a future expansion of 33,468 sf planned for a later date.

1.4.4.2 Leased Spaces

As indicated in Table 1-2 below, Children's leases space as a tenant in Boston for offices and ambulatory care, as well as approximately 25,000 sf of space for the Martha Eliot Health Center (MEHC) in Jamaica Plain.

Additional space is leased outside of Boston, also shown in Table 1-2. Since the approval of the 2009 IMP Amendment, Children's has terminated its lease at one leased facility in Peabody, as the location and size did not meet the Hospital's strategic objectives. All other leases will be maintained and extended, as they serve the Hospital's mission in providing direct patient care or operational support.

In addition to space leased by Children's, space for Children's physicians is made available at other medical centers in the Greater Boston area, including at Beverly Hospital, MetroWest Medical Center in Framingham and St. Luke's Hospital in New Bedford. However, Children's is not a tenant at these medical centers.

Table 1-2 Leased Space

Leased Space	Uses	Square Feet	Lease Expiration
Boston			
Longwood Galleria	Hospital Uses: Offices	9,018	2012 - 2015
1295 Boylston Street	Hospital Uses: Offices	99,021	various 2028
20 Overland Street	Hospital Uses: Offices	7,156	2014
Martha Eliot Health Center	Hospital Uses: Ambulatory, Offices	25,345	2016
120 Brookline Avenue	Administrative Office	19,750	2012
132 Brookline Avenue	Administrative Office	7,000	2012 2013
Center for Life Sciences Boston	Hospital Uses: Research	150,215	2023
	Hospital Uses: Research (Immune Disease Institute Sublease)	16,966	2023
Simmons College	Offices	11,407	2015
Landmark Center, 401 Park Drive	Offices	111,385	2019
Subtotal		**457,263**	
Outside Boston			
128 First Avenue, Needham	Administrative Office	7,291	2022
Norwood Hospital, Norwood	Clinical uses	1,873	Tenant at will
Good Samaritan Hospital, Brockton	Clinical uses	1,678	Tenant at will
Stetson, Weymouth	Clinical Uses	22,622	2021
20 Hope Avenue, Waltham	Administrative Office	2,195	2016
Subtotal		**35,659**	
Total Leased Space		**492,922**	

1.4.5 Area Context

Section 2.4 of the 2008 IMP described the urban context of the Children's Core Campus and Autumn Street location, addressing land use, density, building heights, open space, view corridors, and pedestrian and vehicular circulation. Since the approval of the 2008 IMP, the only change to the surroundings has been the construction of Dana-Farber Cancer Institute's 14-story Yawkey Center for Cancer Care and the approval of the Massachusetts Mental Health Center (MMHC) Redevelopment, including the construction of the

Binney Street Building being used in the short term by the Department of Mental Health (DMH) until the DMH designated space within the approved Brigham and Women's Building on the MMHC site is available. Construction of the Brigham Green Enhancement and Parking Project has also been initiated.

The 819 Beacon Street site is located adjacent to commercial buildings, entertainment venues and Fenway Park to the east, and the Audubon Circle neighborhood to the west. North of the site is the Massachusetts Turnpike and the site of the Proposed Air Rights Parcel 7 development which is a mixed-use development with residential, commercial and retail space as well as parking. South of the site are large commercial and residential buildings.

1.5 Trends and Needs

1.5.1 Recent and Anticipated Future Trends

1.5.1.1 Patients

At its facilities in Boston and throughout the region, Children's currently serves over 550,000 children on an outpatient basis, a number that is rising at a level of nearly 17,000 visits a year, as more and more children are seen in a lower cost outpatient basis. More than 25,000 children are seen as inpatients and observation cases annually. In addition, the Hospital's emergency department serves over 55,000 patients each year. Approximately 17 percent of these children are admitted as inpatients. Approximately 41 percent of Children's patients seen in the emergency department are residents of Boston.

Increasingly, the expectation is that Children's will serve as the hub of tertiary and quaternary care, with less serious illnesses and injuries staying in the community for treatment, and the more complex conditions coming to Boston for care. Outpatient care at non-LMA facilities has increased from 16.3 percent of all outpatient care in 2005 to 29 percent in 2011. This increase in outpatient care outside of the LMA and the patient growth reinforces the focus of the Core Campus on high-level tertiary and quaternary care which requires significant space for high tech equipment and appropriate spaces for patients and families. However, the Hospital is currently at capacity for inpatient activity, averaging 82 percent average daily occupancy, which is essentially full. The desired design occupancy of a hospital is 80 percent; this occupancy percentage allows for flexibility to accommodate the ups and downs of patient arrival.

1.5.1.2 Employees

As of 2011, approximately 17,525 people work at Children's and at its facilities throughout greater Boston, which includes more than 8,025 "associated personnel" who work, study, or volunteer at Children's.

Children's has 9,500 employees paid directly from the Hospital, of whom approximately 30% reside in Boston.

Children's has experienced significant employment growth over the past several years. Employment has grown by approximately seven percent over the past four years. This growth is attributable to several factors, including but not limited to the success in securing grant funds, new research and clinical facilities, increased research activity, higher acuity patients and resultant need for higher staff-to-patient ratios, and increased regulatory requirements.

1.5.1.3 Facilities

Since its inception, Children's has continuously adjusted with the changes in healthcare requiring updates to its facilities in order to meet the medical needs of the community. Many of the facility issues facing Children's today have existed since the Hospital first opened. Although the Hospital's previous expansions have created much needed new clinical and research space in the past few years, the campus continues to experience limitations such as insufficient bed capacity, constrained space for families and restricted patient and family parking facilities. Children's needs to address the emerging trends of pediatric care, including:

- Providing necessary space related to pediatric care such as larger rooms and support space to accommodate the patient and one or more parents or relatives, as well as more space in waiting rooms and exam rooms, as well as updating facilities and equipment, such as chairs and patient lifts, to accommodate bariatric patients.

- Providing space for higher acuity inpatient patients who generally require more procedures, longer hospital stays, and more testing and imaging. These patients also often require higher staff-to-patient ratios and more space within patient rooms for advanced medical equipment as well as for visitors, since children with higher acuity levels generally have more family staying with them and more visitors.

- Moving towards single and critical-care capable rooms which allow hospitals to provide the highest quality care, respond quickly to external factors and provide sufficient space to host state-of-the-art medical technology. Research has demonstrated that single-bed rooms lower hospital-induced infections, reduce medical errors associated with room transfers, reduce noise, improve patient confidentiality, facilitate social support by families, and improve staff communication with patients.

- Providing space and infrastructure to allow for new image-guided procedures and minimally invasive surgeries which require larger procedure rooms, more support space, and more electrical power and cooling capacity for this advanced equipment.

- Adjusting the patient care model through the organization of Centers of Excellence. For example, Children's and its Cardiovascular Program (CVP) are preparing to embark on a new approach to managing care and resources that will support its continued growth regionally, nationally and internationally, and the world class care that has earned the CVP the #1 ranking from U.S. News and World Report. The CVP at Children's will serve as a pilot for creating a novel organization within the Hospital. By moving accountability closer to the point of care delivery, the CVP intends to create a patient-centered care model that accelerates innovations in care delivery and reduces costs, while increasing efficiency. Children's is looking for other opportunities to replicate this model in the future.

In addition, Children's needs to address the limitations of its existing facilities, as well as the upgrade from older facilities that do not meet the needs of the existing and future patients and employees.

Children's parking facilities also continue to be a challenge. Higher patient and visitor demand related to increased patient volumes and higher acuity patients has created a demand for parking on the Core Campus. Valet service at the Main Entrance is heavily used, especially when patients and families cannot find parking in the Patient and Family Parking Garage. Children's also aggressively manages its parking supply, especially in the Patient and Family Parking Garage, to make sure that only persons going to Children's use the garage facilities.

1.5.2 Meeting Current and Future Needs

Children's has a number of facility needs to address the trends described above. The proposed Projects (described further in Chapter 2) will meet many of these needs, as described below.

Children's Clinical Building

Children's seeks to improve the patient and family experience, while also improving its ability to provide the best quality care to its patients. Specific needs include:

- **Improved Rooms** – Even with the opening of Main South in June 2005 and the associated shifts of inpatient services in the Main Building and the construction of the Main Building Expansion, Children's still has a need for additional single-bed patient rooms to be converted from two-bed rooms into single-bed rooms. As mentioned above, single-bed rooms have a significant beneficial impact on infection control. In addition, some existing rooms require updating and/or increased size to address Americans with Disabilities Act (ADA) requirements.

- **Sufficient Space For Families** – While Children's currently provides a wide array of support spaces for families—the Children's library, Center for Families, laundry, dormitory space for ICU patient families, Chapel—the Hospital recognizes that with patient acuity levels rising now and in the future, there will be a need to provide even more quiet and contemplative spaces that allow seriously ill patients and their families a respite from the rigors of intensive or extended medical treatment, including indoor and outdoor spaces that may be used during all seasons of the year.

- **Neonatal Intensive Care Unit (NICU)** – The existing NICU was opened in 1988 and is in need of an update to accommodate new state-of-the-art equipment. The current layout of the NICU is predominantly an open bay configuration that limits patient and family privacy. A new NICU with private rooms will provide a more private space for families, more space for state-of-the-art equipment, and better lighting and sound attenuation for the patient population. Children's is eager to update its NICU and incorporate the many advances resulting from research done on NICU environments into a new state-of-the-art NICU.

The proposed Children's Clinical Building will meet or alleviate the needs described above, including new single-bed patient rooms to allow for existing two-bed rooms to be converted to single-bed rooms, new and expanded surgery support, green and gathering spaces (such as roof gardens, indoor and outdoor gardens, play space, as well as contemplative quiet spaces) for patients and families, and additional space to implement Centers of Excellence. The construction of the Children's Clinical Building will also help to provide space on the Core Campus for a new NICU.

The Children's Clinical Building will be integrated into existing buildings on the Core Campus through a connection on its lower clinical and support levels, providing convenient access and circulation for patients, families and employees. In addition, the Children's Clinical Building will connect an upper clinical floor (floor 9) with Main South over the Farley Bader Pavilion.

Combined Heat and Power Facility

It is crucial for the care of patients and ongoing operation of the Hospital to have a consistent and regular supply of electricity and heat. A combined heat and power facility would allow Children's to decrease its dependence on other facilities for its electricity and heat needs and is consistent with efforts to reduce greenhouse gas emissions. A CHP option could present a very economical and environmentally responsible solution.

In view of concerns about the costs and consequences of fossil-fuel consumption, Children's is considering and evaluating several cogeneration options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's

Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to consider and evaluate these and other options and alternatives as its planning evolves. Please see Section 2.1.3 for additional detail.

Parking - Patient and Family Parking Garage Addition and 819 Beacon Street

As described above, parking for families and patients continues to be a challenge. Children's offers its patients, visitors, physicians, and employees a multitude of options for parking. Children's currently controls approximately 3,452 off-street parking spaces either by ownership or through leases from other institutions or organizations. Of the 3,452 spaces, 1,047 spaces are available for public use by Children's patients and visitors and are located on the Core Campus, and 2,405 parking spaces are subscribed to staff and physicians. Children's on-campus parking ratio is approximately 0.97 spaces per 1,000 gross square feet of floor area for its facilities in the LMA.

The Family and Patient Garage consistently fills to capacity on weekdays, and Children's takes proactive measures to screen vehicles entering the garage to ensure they are affiliated with the Hospital. Vehicles which cannot find parking at the Patient and Family Garage often rely on valet services at the Main Entrance which, in turn, creates a congested situation at the Main Entrance and more vehicle traffic. Employee parking in the LMA and the limited parking options outside of the LMA also have an impact on the availability of parking for patients and families.

Only 896 of the employee parking spaces (or about 40 percent) are located on or in close proximity to the Core Campus within the LMA. BCH must continually evaluate its parking supply to ensure that an adequate amount of parking spaces is made available for its growing patient demands. The most common solution to maintaining an adequate patient parking supply is to relocate employee parking outside of the LMA, as it is very difficult to secure new parking opportunities within the LMA for employees. The Hospital's extensive employee transportation demand management program includes a number of strategies aimed at addressing the constrained parking situation, including measures to reduce single-occupancy vehicle trips to the campus with aggressive public transportation subsidies, moving employees to off-campus, remote parking locations that are serviced by shuttles, walking and bicycling initiatives through participation in MASCO's Commuteworks, and other initiatives and incentives. However, even with these measures in place, there is a current deficit of parking spaces to support future BCH patient, visitor and staff demands. In addition, the Hospital will lose a net of 282 parking spaces in and near the LMA when leases expire.

The proposed new level of parking on the Patient and Family Parking Garage and changes to the parking garage exit will improve vehicular circulation within the garage, and provide additional parking supply near the campus for BCH patients. The proposed 86 additional parking spaces in the Patient and Family Garage (76 net new spaces due to the elimination of 10 spaces in connection with the Children's Clinical Building) will provide for much needed patient and visitor parking.

Additional parking spaces at 819 Beacon Street will provide 158 spaces for employees working in that facility and will increase by 119 spaces the number of spaces available to employees working in the LMA, thus further contributing to BCH's goal of relocating employee parking outside of the LMA, allowing for more spaces in the LMA to be used by patients. Children's will continue to target BCH employees who come from the north or Storrow Drive for parking at this facility since they are already traveling in the area. These employees will then be shuttled to the LMA so that there will be an overall reduction in traffic in the LMA.

819 Beacon Street

As Children's clinical needs have grown in recent years, there has been a resulting pressure to limit or reduce the administrative space that has historically been located at the Core Campus. To date, Children's has managed its growth through a strategy of relocating non-core administrative functions to locations off of its Core Campus, primarily in leased space.

Three factors are currently converging to make the accommodation of administrative functions an even more pressing issue for the Hospital. First, the proposed Children's Clinical Building will result in the displacement of approximately 50,000 sf of administrative space currently located at the Core Campus. Second, a number of Children's leases for administrative space in third-party facilities will expire over the next few years. Finally, Children's natural rate of growth in recent years has resulted in an additional administrative space requirement of approximately 15,000 square feet annually.

While Children's will likely always require leased space to meet its administrative needs, owned space will enable Children's to manage its administrative space in a rational way by providing the flexibility to make investments in the property, co-locate related functions, develop appropriate space layouts and operate the space consistent with institutional practices.

An important factor in the location of administrative space is its functional relationship to the Core Campus. Although some functions, such as human resources, back office, marketing and other functions that do not need to be near patients and clinicians, do not require a proximate physical relationship to the Core Campus, others, such as clinical research space, have a closer relationship to the day to day operations, and employees need to be available for meetings and other functions that occur at the Core Campus. Through its office space management policies in recent years, the Hospital has been able to decant the functions for which proximity to the Core Campus is less important, leaving at the Core Campus those activities that have a direct relationship to Core Campus functions. Therefore, as the Hospital seeks to further decant, the location of the new administrative space is particularly important as it must facilitate the continued relationship between the administrative and clinical functions.

The 819 Beacon Street building will enable Children's LMA medical facilities to meet increasing clinical needs and to implement Centers for Excellence on its Core Campus by allowing expansion and decanting of some of the Hospital's existing administrative services to 819 Beacon Street. In order to satisfy the administrative office needs in the interim, BCH has recently leased the remaining 16,000 sf of space not currently occupied by BCH at 1295 Boylston Street and approximately 111,000 sf of space at Landmark Center.

Circulation

Children's plans to implement operational improvements to circulation across its campus. Since the Core Campus is bisected by Longwood Avenue, improving the safety and comfort of its unique patient and family population crossing Longwood Avenue to access the Main Lobby from the Patient and Family Garage is of critical importance. Children's has identified and is assessing potential opportunities to improve at grade traffic and pedestrian circulation at the Longwood Avenue/Blackfan Circle intersection through strategies of traffic calming, signalization and crosswalk, lane and ramp design. Children's also continues to explore expansion of an LMA-wide elevated pedestrian pathway network across Longwood Avenue in the interests of safety and to allow for valet operations at the Patient and Family parking Garage.

1.6 Public Benefits

Boston Children's Hospital's community mission is to enhance the health and well-being of the children and families it serves and to affect systemic change to achieve health improvements for children in Boston and beyond. This section provides a summary of some of the Public Benefits provided by Boston Children's Hospital. A more detailed description of these efforts can be found in the Office of Child Advocacy's Annual Report, spotlight in Appendix A or on the Hospital's website at childrenshospital.org/community.

The neighborhoods of Boston benefit most from Children's deep commitment to community health. The Hospital invested nearly $22 million in FY11 to support Boston children and families, of which:

- **Safety Net.** More than $16.7 million ensured the "safety net" for access to care for Boston children, including free care, unreimbursed costs for children insured by Medicaid, and services that are not readily available elsewhere, such as primary care, dental, and mental health services.
- **Community Service.** Another $4.7 million was allocated to programs that address the most pressing health needs of Boston children and families. Children's focuses its resources and investments in programs that will improve child health in Boston and achieve broader systemic change in the areas of asthma, mental health, obesity and child development.

Investment in Boston Children and Families FY11	
	FY11 actual
Safety Net	$16.7 M
Community Service	$4.7 M

In addition to direct expenditures by Children's in support of Boston children and families, Children's recognizes that strong partnerships with City agencies and initiatives are critical to addressing health and also non-health issues that have an impact on community health. Thus, the Hospital makes supplementary direct cash contributions or grants to support key City of Boston agencies and initiatives which help to make Boston a healthier place for children and families, in addition to making cash contributions to the City Assessor annually as general revenue. In FY11, Children's made cash contributions to support both the City's general fund as well as those city agencies and initiatives in which the Hospital has developed deep, lasting partnerships.

Everything Children's does in fulfilling its community mission is based on how it can best utilize its expertise, resources and partnerships to address the most critical health issues families face today. Its mission revolves around keeping Boston children healthy through wellness and prevention efforts, ensuring that children have access to needed health care services and partnering with others to address non-health issues such as violence, workforce development and education. In all these endeavors, Children's seeks out input from its key partners to ensure that the Hospital's priorities are aligned with those of the City of Boston, the Boston Public Health Commission, the Boston Public Schools and other city agencies.

1.6.1 Safety Net

Children's is the leading provider of health care to low-income and uninsured children in Massachusetts, and is the safety net provider for Boston's children. More than half of all Boston children hospitalized come to Children's, and nearly one-third of Children's outpatients come from Boston and neighboring towns. The Hospital's safety net is both financial and programmatic, ensuring that care is available to patients regardless of their ability to pay and that needed care is accessible.

- It is financial in that the Hospital provides free care, subsidizes care for Medicaid patients, and incurs bad debt for patient families who cannot or do not pay for the care they receive.

- It is programmatic in that the Hospital offers vital, subsidized services that either are unavailable elsewhere or are available in very limited capacity and support to important components of the City's health care delivery system. Children's is

affiliated with 11 Boston community health centers including its own Martha Eliot Health Center, which in total provided primary care and support to an estimated 33,000 Boston children and their families (See Section 1.6.3 on Community Health Centers).

1.6.2 Community Service

1.6.2.1 Supporting Programs to Address Core Health Issues and Achieve Systemic Change

Children's needs assessment process both identifies community health priorities and informs the Hospital to help prioritize and determine the best ways to utilize its resources and partnerships to bring about change. Children's also works to ensure that the Hospital's community health priorities are in alignment with its key partners, the City of Boston and the Boston Public Health Commission (BPHC).

A handful of core health issues remain at the top of the list of both local health needs and areas where there is the greatest community need including asthma, obesity, mental health and child development. These are also areas in which Children's has significant clinical expertise, strong partnerships and the resources to make an impact.

Children's has developed a strategy to improve child health outcomes by investing Hospital financial and human resources in a portfolio of programs addressing these core issues. Following are descriptions of the programs.

Asthma

Since 2005, the **Community Asthma Initiative** (CAI) has helped to improve the health and lives of 800 Boston children with asthma. Through a comprehensive and community-oriented program, CAI provides case-management and home visits, offers education to caregivers and providers, distributes asthma control supplies, connects families to resources, as well as increases access through advocacy. As the data shows, CAI has improved health outcomes for children and proven to be cost-effective. As a result, CAI has evolved into a model that has the potential to reach every child with asthma in Massachusetts. CAI and the Asthma Regional Council developed a business case for its approach to pediatric asthma management. This "Business Case" was instrumental in convincing legislators of the benefits of such an approach and to provide funding for a MassHealth demonstration project that will provide case management to children with asthma. As a result of CAI's success using a nurse case management model, the Boston Public Health Commission invited CAI to participate in the Boston Home Visiting Collaborative to provide guidance in developing standards for home visiting programs. Finally, CAI has received funding to provide technical assistance to Alabama to replicate the CAI model in that state.

In FY11, CAI was able to show that the program reduced the percentage of patients who have had any asthma-related emergency department visits by 81% and any emergency department visits by 62%. In addition, the program was able to show a 41% decrease in the percentage of children who have had any missed school days and a 46% decrease in the percentage of parents/caregivers who have had any missed work days.

Mental Health

Children's Hospital Neighborhood Partnerships (CHNP) is the community mental health program in the Department of Psychiatry at Boston Children's Hospital. Established in 2002, CHNP places Children's clinicians in 15 Boston area schools and five community health centers to provide a comprehensive array of mental health services to children and adolescents where they live and learn. CHNP's goals are to: 1) increase access to mental health services for children in underserved communities, 2) promote children's social-emotional development, 3) build the sustainable mental health capacity of partner schools and community health centers, and 4) achieve high satisfaction with services provided among all key stakeholders. CHNP has proven successful in helping schools develop their capacity to address the mental health needs of students. It has also evolved into a model that can help schools across the city and state build the internal capacity to proactively address behavioral health issues. CHNP was instrumental in including school-based mental health services in the Children's Mental Health Omnibus law which led to the Safe and Support Schools Act legislation now under consideration. CHNP was asked to serve as the main partner for the Boston Public Schools in the development of a district wide behavioral health model that will pilot many of the bill's elements and will serve as a model for school districts across the country.

CHNP has shown that the program can effectively decrease wait times for crisis (immediate intervention by the school-based CHNP team versus approximately 90 minutes of wait time for outside clinicians) and routine clinical services (10 days compared with 42 days in outpatient setting). Nearly 1,800 students in partner schools were provided with prevention and early intervention services. Over 290 teachers participated in professional development workshops, and 756 families participated in parent workshops and community events.

Obesity

Every year, over 900 Boston children are referred by health care center providers to participate in **Fitness in the City Program** (FIC), Children's community-based approach to address obesity. FIC supports 11 Boston community health centers, including Martha Eliot Health Center, to provide their pediatric patients with case-management support as well as nutrition education and physical activity programs. FIC has demonstrated that it is an effective model to help children reduce or maintain their Body Mass Index and make the behavioral changes needed to maintain a healthier weight. The program also shows potential for building community capacity using a public health approach to achieve

systemic change. FIC also believes that its approach will become an important part of pediatric medical homes as the model is an effective way to deliver coordinated, patient centered and culturally competent services to address obesity.

The majority of children (57%) participating in FIC have been able to decrease their Body Mass Index after one year in the program. Children participating in the program also report spending less time watching TV on weekends and decreasing their soda/juice intake after 12 weeks in the program.

Child Development

The Advocating Success for Kids Program (ASK) provides access to needed services for families with children experiencing school-functioning problems and learning delays. ASK focuses on providing services to diverse, urban populations in community-based pediatric practices—Children's Hospital Primary Care Clinic (CHPCC) and three Boston community health centers (CHCs). Not only does ASK provide developmental evaluation and patient advocacy services to families; it does so in a timely way, through a one-stop-shopping model that empowers parents to advocate on behalf of their children within the school system. Finally, ASK provides an important opportunity to train psychology and developmental medicine fellows about providing community-based, culturally competent care.

Last year, 356 children were served by the ASK Program, which has been able to ensure that 87% of referred patients completed their scheduled appointments at community health centers.

1.6.2.2 Addressing Social Determinants of Health

"The influence of place on health is related to other major influences on health and life expectancy such as income and education."[5]

Recognizing the link between social issues and health issues, Children's collaborates with community partners to respond to three of the most pressing social determinants of health facing Boston residents: education level, income, and violence.

Education and Schools

Children's recognizes that access to a safe and supportive educational environment is vital to a child's academic success and to ensuring future economic mobility and opportunity. Children's partners closely with the Boston Public Schools to support and strengthen the system, as a whole as well as to work directly in school settings to reach students and help families overcome barriers that may prevent their children from functioning well in school.

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[5] Williams, David R. and Marks, James. ***Community Development Efforts Offer A Major Opportunity To Advance Americans' Health.*** HealthAffairs. http://content.healthaffairs.org/content/30/11/2052.full#aff-1#aff-1

Children's supports programs such as Thrive in 5, Smart from the Start and Countdown to Kindergarten. In addition, the Hospital provides direct services through initiatives such as the Children's Hospital Neighborhood Partnerships Program and the Advocacy Success for Kids Program. (See Appendix A for more detail.)

Workforce Development

Children's recognizes that one of the most significant ways to address poverty in the local neighborhoods is to provide employment and career development opportunities to local Boston residents. This approach has the double advantage of ensuring a diverse and culturally competent workforce. The Hospital addresses workforce development through a network of strong community partnerships, spanning across a continuum of activities. Partners include Sociedad Latina, the Fenway Community Development Corporation and Jewish Vocational Services.

Violence and Violence Prevention

Exposure to violence, both directly and indirectly, has a profound impact on the physical and emotional health of those affected—the effects of which can negatively influence other aspects of their lives, including work and school. Children's plays a key role in helping Boston children and families cope with the impact of violence in their lives and working with communities to help prevent it, including the Jamaica Plain Violence Intervention and Prevention Collaborative (JPVIP), a partnership with 15 local organizations including the Hospital's own Martha Eliot Health Center in Jamaica Plain. Additionally, the JPVIP model will be replicated by the Boston Public Health Commission, with Children's support, at two additional community health centers. (See Appendix A for more detail.)

1.6.3 Supporting the City's Infrastructure

Children's is also committed to, and directs resources to build capacity within the existing infrastructure of care for Boston children and families. This means partnering with and supporting two key community groups—the Boston Public Health Commission (BPHC) and Boston community health centers.

Boston Public Health Commission

Children's has been a longtime partner with the BPHC, working together on pressing health issues and supporting efforts to help children, adolescents and young adults, including:

- A Children's-initiated, first-of-its-kind study to assess the needs of young children in Boston; the study will include phone interviews, a review of public health data on children's issues and literature review of program best practices;

- Participation in the BPHC's Tobacco-Free Hospital Initiative and Sugar-sweetened Beverage Learning Network, in addition to the formation of an internal Health Hospital Workgroup to analyze and make recommendations for Hospital policies promoting a health environment for patients, families, and staff; and

- Provision of financial support and expertise to the BPHC to support the City's NeighborCare initiative, an effort encouraging Boston residents to receive primary care at community health centers.

Community Health Centers

Community health centers are key partners in Children's efforts to 1) build community capacity to deliver high quality pediatric care and services; 2) address critical health needs for children, youth and families; 3) improve quality initiatives within community health centers to track areas such as asthma care, immunization rates, obesity and child development; and 4) improve access and coordination of care through advocacy efforts.

Children's provides financial and programmatic support to 11 Boston community health centers: Bowdoin Street, Brookside, Dimock, Joseph Smith, Roxbury Comprehensive, South Cove, South End, Southern Jamaica Plain, Upham's Corner, Whittier Street and the Hospital's own Martha Eliot.

These health centers provide primary care and support, including medical, dental, and mental health services, to an estimated 33,000 Boston children and their families, particularly the uninsured and underinsured.

Children's support enables these health centers to augment current services or provide new services that are in great demand, yet not always readily available. The health centers are able to reach hundreds of children per year with case management support, nutrition and fitness education, psychiatric and developmental consultation and other services.

1.6.4 Contributing to the Vibrancy of Boston

Children's feels an important obligation to help improve the City of Boston and is active in a number of local and state civic organizations, including: Boston Alliance for Community Health; Greater Boston Chamber of Commerce; Massachusetts Taxpayers Foundation; Mass Inc.; and A Better City.

1.6.5 Voluntary Cash Payments to the City of Boston

In addition to the monetary value of Safety Net and Community Services rendered by Children's as discussed above, Boston Children's Hospital makes cash payments to the City consisting of both cash payments to support specific City programs, as discussed above, and cash payments to the assessing department for the City's general fund.

Children's has made annual voluntary cash payments to the City of Boston assessing department for the City's general fund since 1994.

1.6.6 Employment

As of 2011, approximately 17,525 people work at Children's and at its facilities throughout greater Boston, which includes more than 8,025 "associated personnel" who work, study, or volunteer at Children's.

Children's has 9,500 employees who are paid directly from the Hospital, of which approximately 30% reside in Boston.

The construction of the proposed Projects will contribute directly to the local economy by creating approximately 2,200 construction jobs for the Children's Clinical Building and 130 construction jobs for 819 Beacon Street. For each applicable Project, a Boston Residents Construction Plan will be submitted in accordance with the Boston Jobs Policy. The plan will provide that Children's will make reasonable good-faith efforts to have at least 50 percent of the total construction worker hours be by Boston residents, at least 25 percent of the total construction worker hours be by minorities, and at least 10 percent of the total construction worker hours be by women.

1.6.7 Linkage

Boston Children's Hospital will make a housing linkage contribution to the Neighborhood Housing Trust and jobs linkage contribution to the Neighborhood Jobs Trust as applicable for development greater than the 100,000 sf exemption under Article 80.

1.7 Public Participation

Boston Children's Hospital is committed to an open and inclusive public process, and as the IMP process progresses, Children's will continue to seek input from community representatives, neighbors and stakeholders, as well as public and elected officials.

Children's will meet with community representatives from the following organizations: Audubon Circle Neighborhood Association, Community Alliance of Mission Hill, Fenway Civic Association, Fenway Community Development Corporation, MASCO, Mission Hill Neighborhood Housing Services, Roxbury Tenants of Harvard, and Sociedad Latina. Children's will also present at an upcoming LMA Forum.

In addition, BCH has met with or will meet with City of Boston agencies and departments, including the Assessor's Department, Boston Civic Design Commission, Boston Public Health Commission, Boston Redevelopment Authority, Boston Transportation Department, Mayor's Office of Neighborhood Services, and the Office of Jobs and Community Services.

Children's has also met with or will meet with local City and State elected officials, including City Councilor Michael Ross, State Representative Gloria Fox, State Representative Michael Moran, State Representative Jeffrey Sanchez, State Senator Sonia Chang-Diaz and State Senator William Brownsberger.

Chapter 2.0

Proposed IMP Projects

2.0 PROPOSED IMP PROJECTS

2.1 Project Descriptions

2.1.1 Introduction

As discussed in Chapter 1, Children's proposed 2012 IMP Amendment includes three Projects to help meet its needs for more clinical and support space, the consideration of more consistent and reliable electricity and heat, as well as parking. Children's also continues to undertake on-going campus improvement and maintenance projects including the Main Lobby renovation and general operational improvements to circulation across Children's campus.

The three Projects are detailed in Table 2-1, shown in Figure 2-1 and explained in detail below. The Projects do not include the campus improvement projects which are independent undertakings below the thresholds for review under Article 80B, Article 80E and Article 80D.

Table 2-1 Proposed Projects

Project Element	Approximate Dimension
Children's Clinical Building	
Gross Floor Area (as determined by the Boston Zoning Code)	445,000 sf
Floors (below/above grade)	Occupiable or partially occupiable floors—3 floors below grade/10 floors above grade Mechanical floors—2 floors below grade/2 floors above grade
Height to top of highest occupiable floor as measured from grade (as determined by the Boston Zoning Code)	161 feet[1]
Uses: Clinical use Medical support/office	 354,700 sf 87,800sf
Demolition (three buildings, portions of two others)	41,689 sf
Net New Building Area	403,311 sf

[1] Height is 145 feet from grade to the top of the highest clinical use, 161 feet from grade to the top of the highest occupiable story (only a 6,000 sf sanctuary is above the highest clinical use) and 175 feet from grade to the top of the mechanical floors (which are more than 1/3 of the roof area).

Table 2-1 Proposed Projects (Continued)

Project Element	Approximate Dimension
Patient and Family Parking Garage Addition	
Gross Floor Area (as determined by the Boston Zoning Code)	29,370 (including 86 above-grade parking spaces)
Height to top of the highest point of the roof beams of a flat roof as measured from grade (as determined by the Boston Zoning Code, inclusive of above-grade parking spaces)	79′-8″[2]
Parking	86 new spaces on one new level (76 net new spaces due to the elimination of 10 spaces in connection with the Children's Clinical Building)
819 Beacon Street	
Project Site	69,892[3]
Gross Floor Area (as determined by the Boston Zoning Code, inclusive of above-grade parking spaces)	424,130 sf (including 526 above-grade parking spaces)
Floors (above grade)	10 stories
Height to top of highest occupiable floor as measured from grade (as determined by the Boston Zoning Code)	142 feet[4]
Uses Office Retail Parking	 202,430 sf 8,740 sf 212,960 sf (including above-grade parking spaces)
Parking	277 net new spaces included within 526 space parking garage on six levels

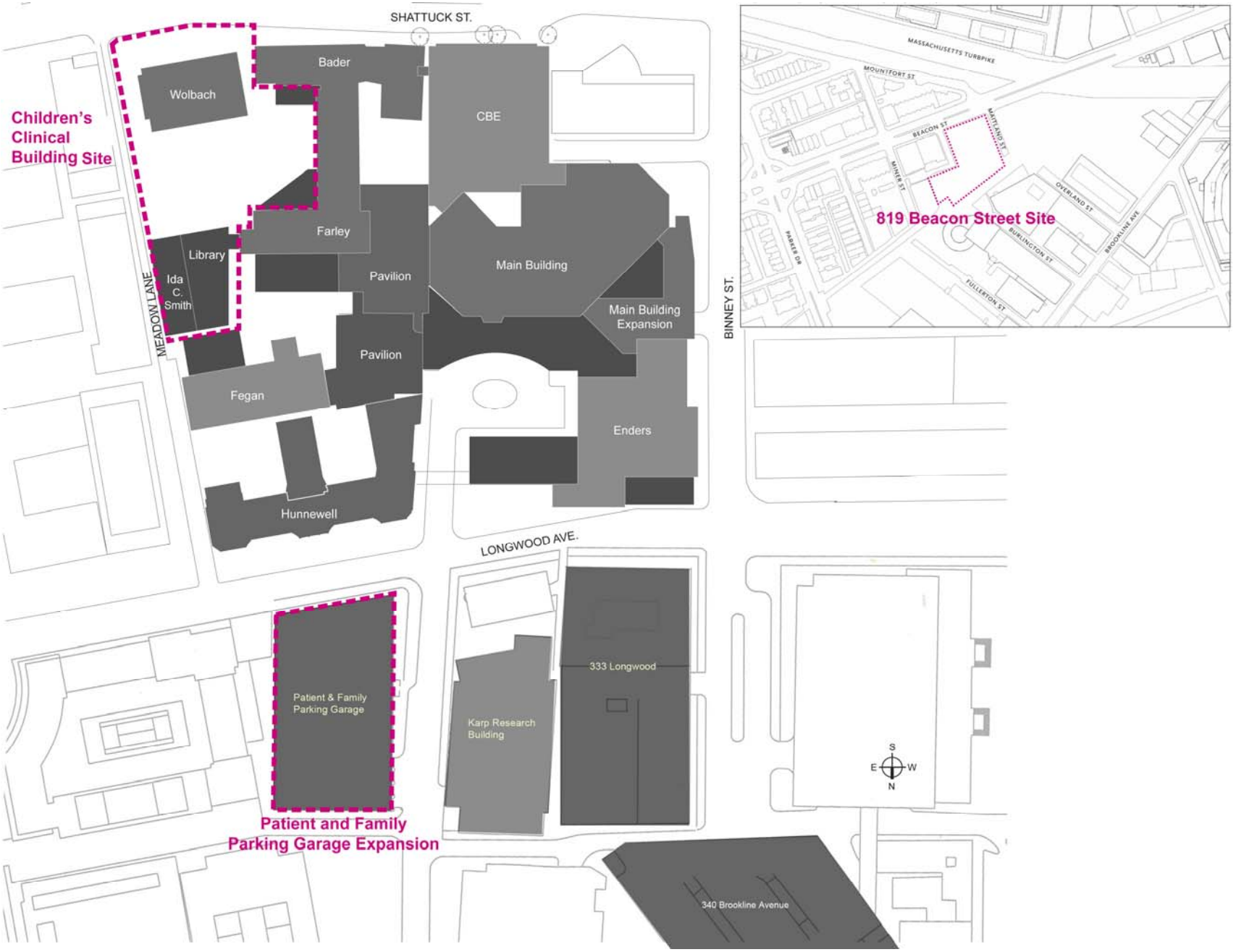
2.1.2 Children's Clinical Building

Due to higher patient acuity, the demand for single-bed patient rooms, the need for critical care capable beds, and improved technology, Children's needs to replace semi-private inpatient beds and expand surgery, clinic, and medical support spaces. To fulfill these needs, Children's proposes the new Children's Clinical Building on a portion of its Core Campus (see Figure 2-2). The Children's Clinical Building provides additional space to convert all the remaining semi-private patient rooms to private rooms; to help provide space on the Core Campus for a new Neonatal Intensive Care Unit facility; to right size clinical support space; to expand patient-family amenities; and to improve circulation and access. In order to create an integrated campus experience for patients and staff, the Children's

[2] Height is 99′-6″ feet to the top of the mechanical penthouse (which is less than 1/3 of the roof area).

[3] This number assumes the discontinuance of Maitland Street containing 4,727 feet.

[4] Height is 142 feet from grade to the top of the highest occupiable story and 158 feet from grade to the top of the mechanical floor (which is less than 1/3 of the roof area).



Boston Children's Hospital

Figure 2-1

Projects' Sites

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Figure 2-2

Children's Clinical Building Site

Clinical Building will be connected to existing buildings on the Core Campus on its lower outpatient, support and surgical levels. In addition, the Children's Clinical Building will connect an upper inpatient floor (floor 9) with Main South over the Farley/Bader Pavilion. (see Figures 2-3 and 2-4).

The Children's Clinical Building will expand Children's Core Campus with approximately 445,000 sf of space (approximately 403,311 sf of net new space) to be located on the site currently occupied by portions of Bader East and Farley, the Prouty Garden, the Wolbach Building, the Library and the Ida C. Smith building (see Figure 2-5).

The Children's Clinical Building will provide Children's with the opportunity to, among other things, re-prioritize the use of green and gathering spaces for patients and family members by replacing current green space in the Prouty Garden with more visible and accessible green and gathering spaces that are available during all seasons. The program and amenities on each green space will be carefully planned to interact with a diverse population of patients and families. In addition, with the increasing higher acuity patient population, the proposed green and gathering spaces will be designed to accommodate the patient population by providing protected areas that are connected visually to the outdoor open spaces.

Specifically, construction of the Children's Clinical Building will include approximately 22,250 sf of new and expanded green and gathering spaces around, and as a part of, the building. At grade gardens, interior gardens, and roof terrace gardens will provide all-season, easily accessible green and gathering spaces for patients, families and staff (see Figure 2-6). The green and gathering spaces associated with the Children's Clinical Building include the following spaces:

- Berenberg Garden Expansion: The existing garden space will be expanded from approximately 1,250 sf to 2,500 sf. It will serve both as a place of respite and as a way-finding element, connecting the Children's Clinical Building with the remainder of the Core Campus.

- Bader Garden: A new indoor/outdoor space will be created between the Children's Clinical Building and existing Bader Building.

- Fegan Terrace Expansion: The existing playground space will be expanded from approximately 3,000 sf to 9,200 sf. Currently, the space is not clearly visible. The planned expansion will link the playground with the Core Campus, including the Children's Clinical Building, making it more accessible to patients and families.

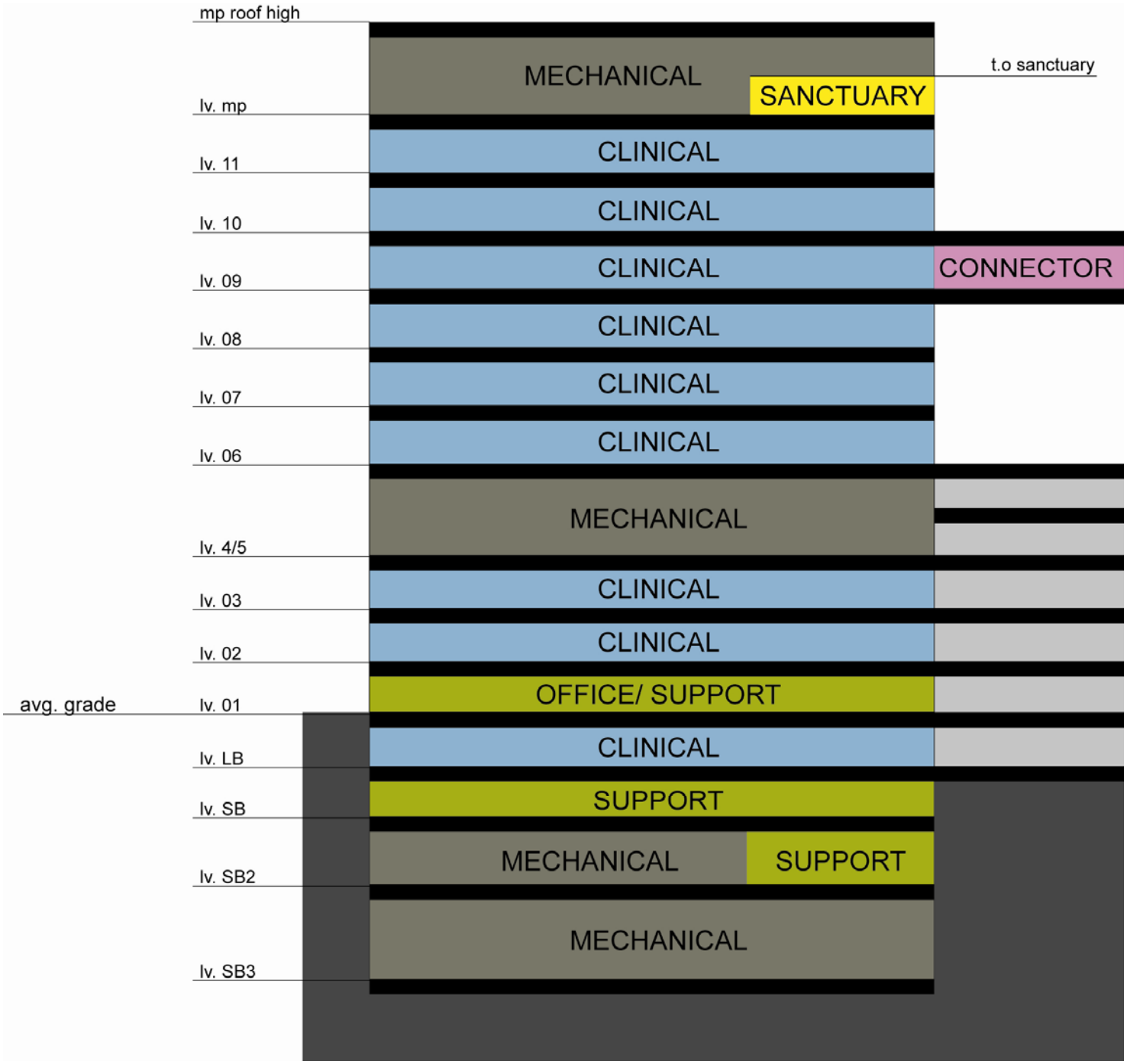

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Figure 2-3

Children's Clinical Building Section

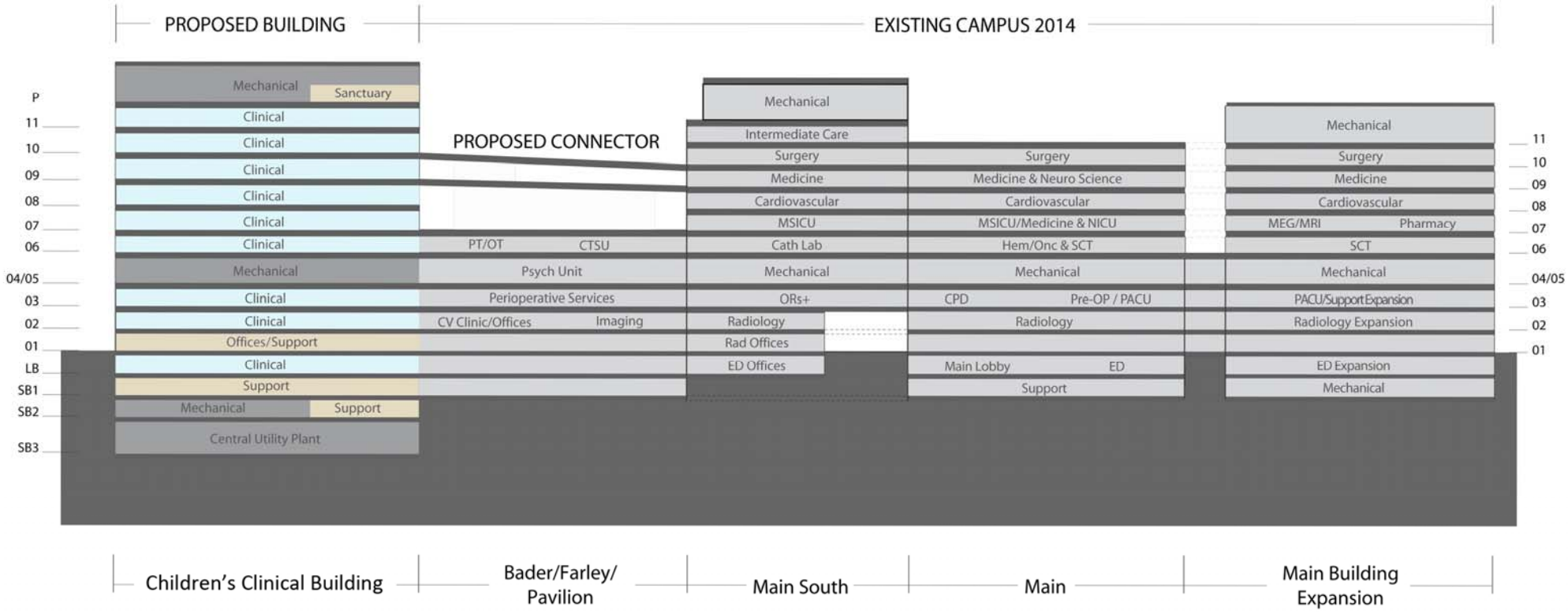

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Figure 2-4

Campus Section

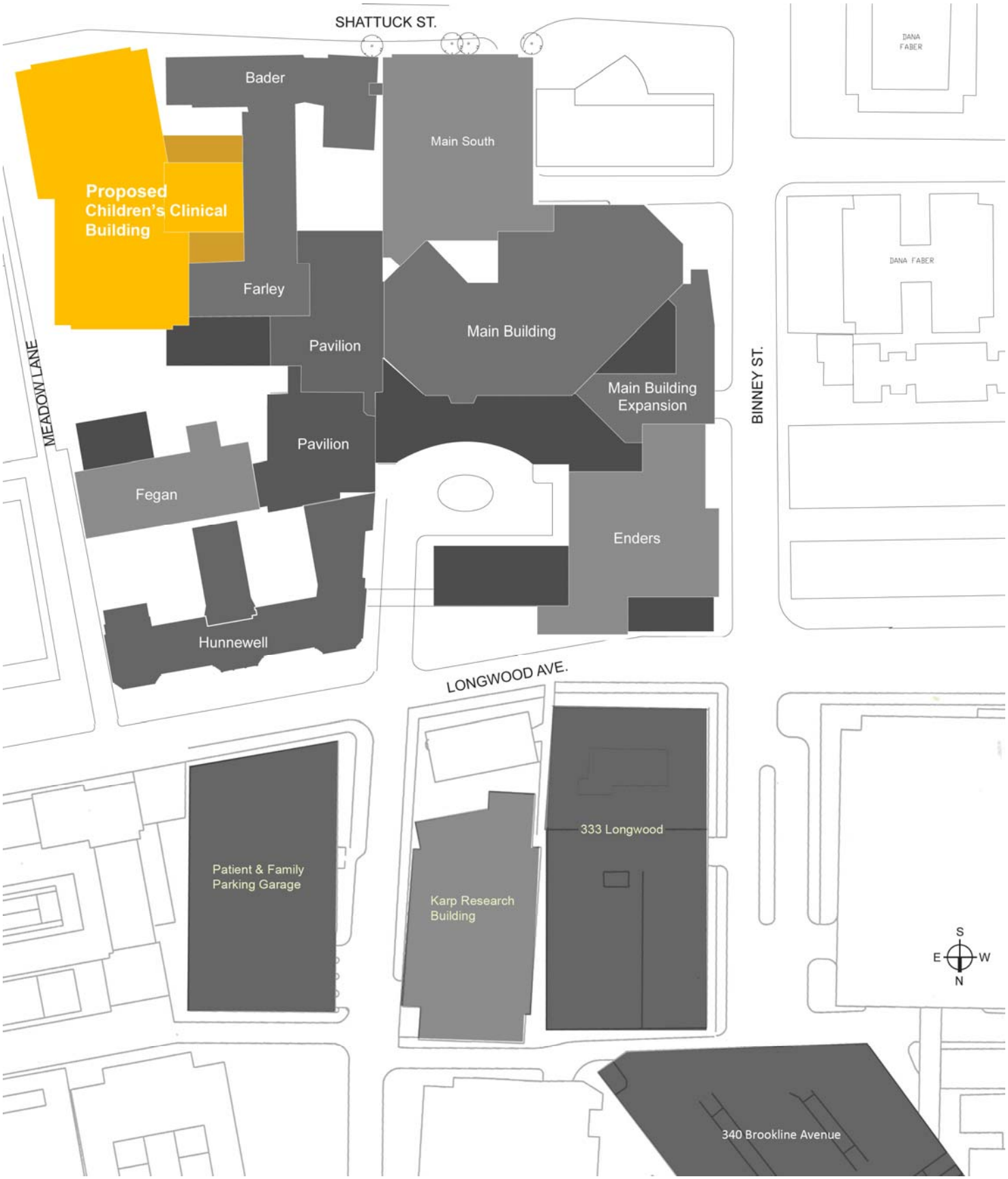

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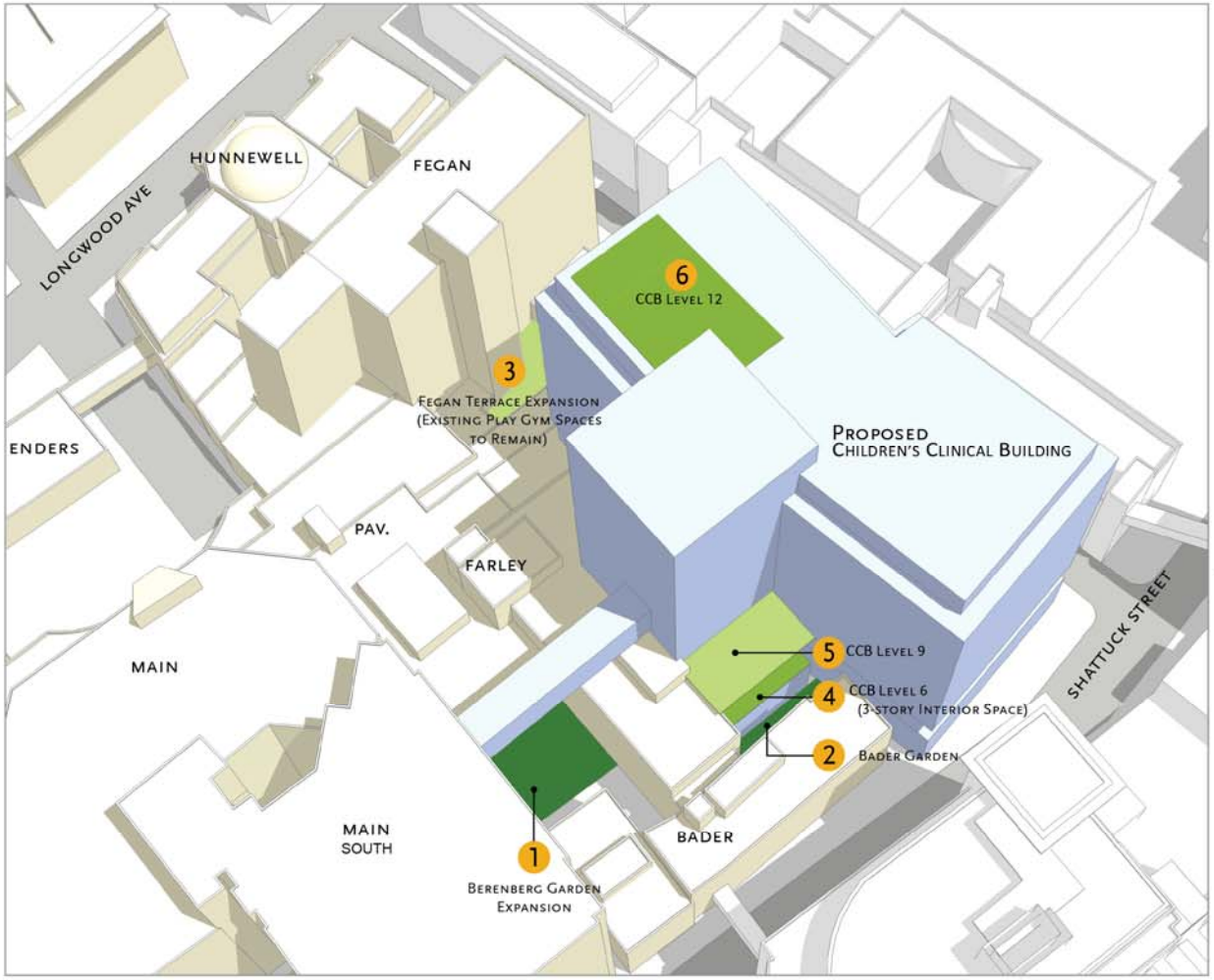
Figure 2-5

Children's Clinical Building Site Plan

AERIAL VIEW SHOWING FINAL BUILD OUT - GARDENS LOCATIONS AFTER PHASE 2



AT GRADE GARDEN INDOOR GARDEN ROOF TERRACE

PLAN VIEW OF GARDENS LOCATION

GARDEN SF DETAIL

BERENBERG GARDEN EXPANSION	1	2,500 SF
BADER GARDEN	2	1,800 SF
FEGAN TERRACE EXPANSION (EXISTING PLAY GYM SPACES TO REMAIN)	3	9,200 SF
CCB LEVEL 6 (3-STORY INTERIOR SPACE)	4	3,500 SF
CCB LEVEL 9	5	3,500 SF
CCB LEVEL 12 (SANCTUARY INTERIOR SPACE)	6	6,000 SF

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Figure 2-6

Children's Clinical Building Open Spaces

- Children's Clinical Building Level 6 – Winter Garden: The three level interior winter garden will provide patients with an all-season, sheltered open space. The winter garden will be located on the inpatient floors providing easier access for patients and families. The winter garden will also have separate but connected protected areas for patients with higher acuity illnesses to enjoy the space.

- Children's Clinical Building Level 9 – Roof Terrace: The roof terrace will provide an outdoor patient space separated from main public circulation, providing a quieter outdoor space. There will also be a protected area for the patients.

- Children's Clinical Building Penthouse – Sanctuary: The Sanctuary will provide a spiritual retreat and meditation space for patients and their families; a place of rest and quietness in the middle of a large, busy hospital.

Combined Heat and Power Facilities

Combined Heat and Power is the simultaneous production of electrical or mechanical energy (power) and useful thermal energy from a single energy source. By capturing and using heat energy from an effluent stream that otherwise would be discharged to the environment, CHP (or cogeneration) systems can operate at efficiencies that are not achieved when heat and power are produced through separate processes.

In view of current concerns about the costs and consequences of fossil-fuel consumption, a CHP plant can present a very economically and environmentally responsible solution. Traditional power plants operate with efficiencies around 35%, while cogeneration allows for efficiencies of up to approximately 80% due to the capture and use of the generators' waste heat.

Children's is currently considering several cogeneration options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to evaluate these and other options and alternatives as its planning evolves.

The CHP facilities would commence operation by serving the Children's Clinical Building at the time of the Children's Clinical Building's opening. In cogeneration options that serve buildings on the Core Campus beyond the Children's Clinical Building and/or buildings of other institutions adjoining Children's campus, the remainder of the CHP facilities would begin serving such additional buildings in 2021. If Children's proceeds with CHP facilities that will also serve buildings of other institutions adjoining Children's campus (a Joint Institution CHP), the basement portion of the Children's Clinical Building containing the

CHP facilities will likely be leased to a Joint Institution affiliate or a third party operator, who will own and/or lease and operate the equipment contained within the CHP facilities on the Core Campus. In addition, in the event that Children's participates in a Joint Institution CHP, Children's anticipates entering into an easement agreement with Harvard Medical School whereby Children's or a Joint Institution affiliate will have a right and easement to install a below grade vault containing chiller equipment in the area of Harvard Medical School's property identified on Figure 2-7.

Children's is continuing to study the viability and feasibility of the various CHP alternatives. The feasibility studies will address siting, sizing, permitting and financing issues relevant to the CHP facilities. Any potential CHP facilities designs will include the necessary redundancy in the equipment to provide a reliable energy source for the Children's Clinical Building, the Children's Core Campus and for any other institutional users who may be involved in a Joint Institution CHP.

2.1.3 Patient and Family Parking Garage Addition

The proposed Children's Patient and Family Parking Garage Addition includes one level of 86 parking spaces (76 net new due to the elimination of 10 parking spaces in connection with the Children's Clinical Building) on top of the existing garage structure (see Figure 2-8). The addition also includes some modification to the garage exit area to accommodate one additional exit lane along with a remote payment system (i.e., "pay-on-foot") to reduce vehicle queuing at the exit. The exterior of the added level will be closely matched to the existing garage to create a seamless addition. Figure 2-8 shows a perspective of the proposed addition and the redesigned exit.

For information on the impact of the new parking spaces, please see Section 3.1.

2.1.4 819 Beacon Street

To further BCH's mission of providing the best clinical care to children and to continue its role as provider of tertiary and quaternary care on its Core Campus, a portion of the office and administrative space, as well as parking for staff, must be moved from the Core Campus to nearby locations outside of the LMA. To that end, BCH is proposing redeveloping property at 819 Beacon Street to include a 10-story building that contains approximately 211,170 sf of office/retail and 249 replacement parking spaces and 277 net new parking spaces, of which 158 spaces will support the uses within 819 Beacon Street and of which 119 spaces will be available to support the needs of Children's employees working in the LMA, within a 526 parking space garage. The ground level retail, measuring approximately 8,700 sf, will create an active street presence along Beacon Street.

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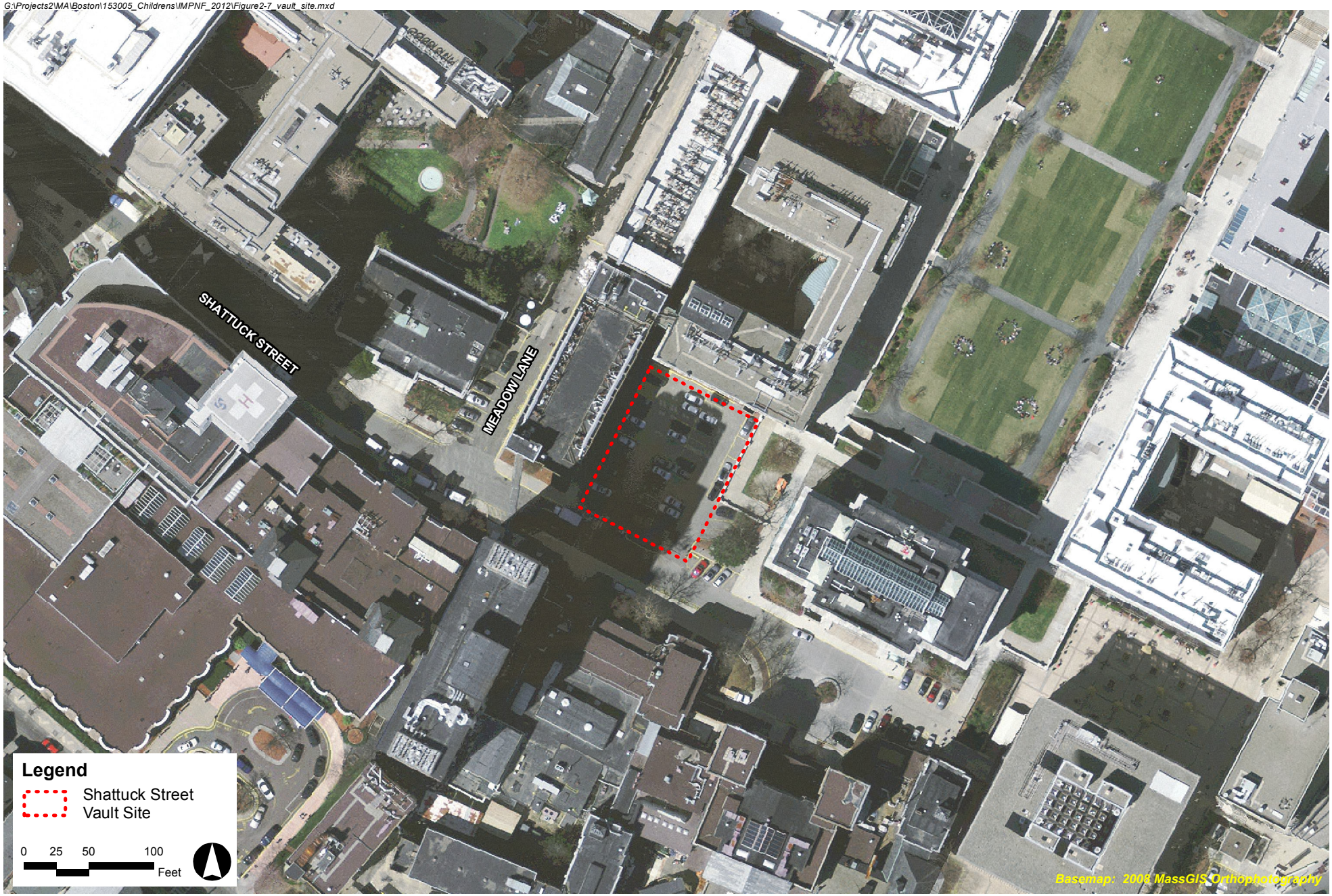

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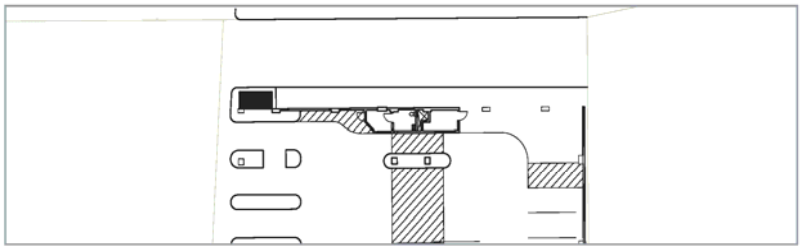
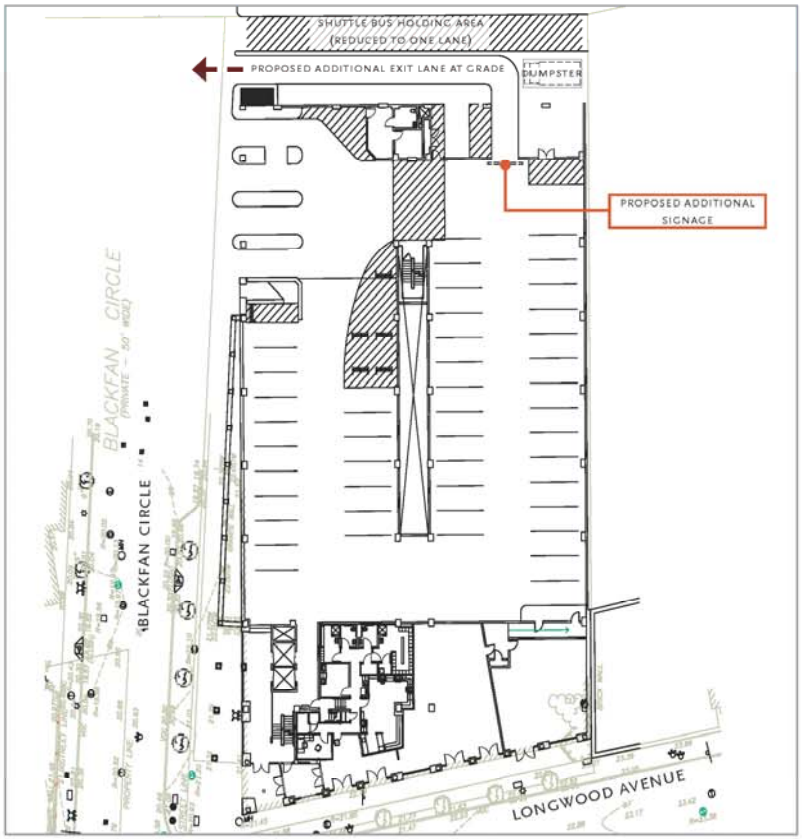
Epsilon ASSOCIATES INC.

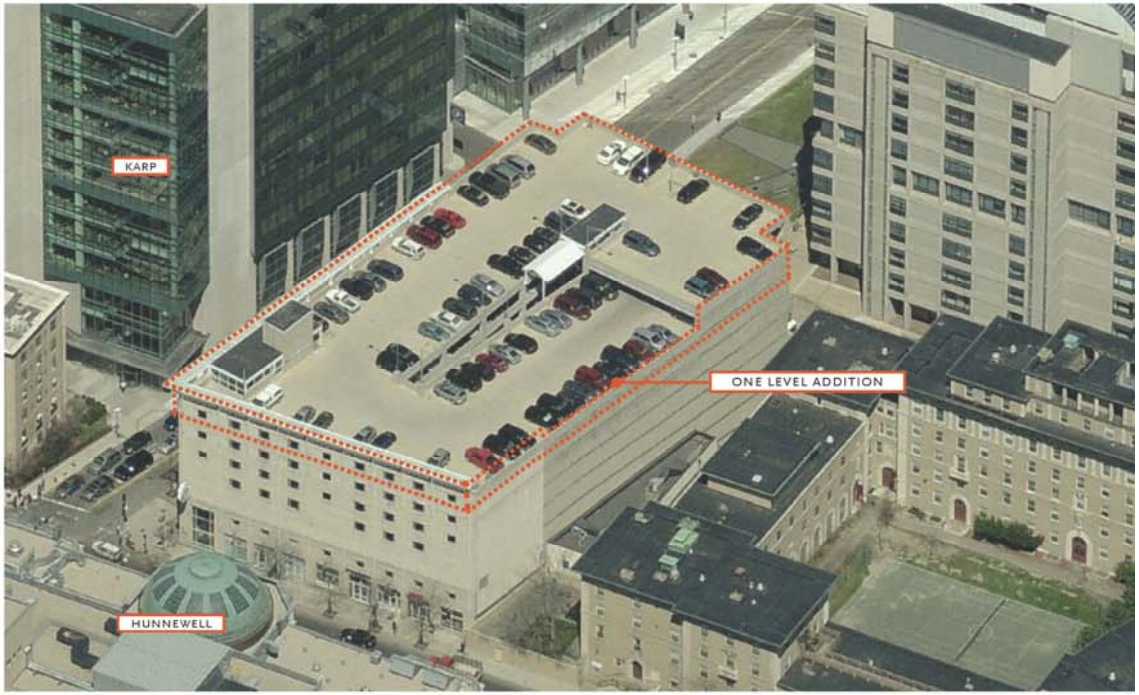
Figure 2-7
Shattuck Street Vault Site



ALTERNATE GARAGE EXIT AND MANAGEMENT OFFICE CONFIGURATION



CHB EXISTING GARAGE PLAN



CHB GARAGE PROPOSED ONE LEVEL ADDITION

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Figure 2-8

Patient and Family Parking Garage Addition – Perspective and Redesigned Exit

The 819 Beacon Street site is currently used for surface parking by Children's employees working in the LMA, as well as public parking for Fenway Park events on weekdays after 6:00 p.m. and on weekends. The site area is approximately 69,892 sf (see Figures 2-9 and 2-10).

In the fall of 2009, Children's became aware of several potential transit-related public infrastructure projects that are proposed to abut and, in some instances, occupy space on the 819 Beacon Street site, including, without limitation, the proposed future alignments of MassDOT's Urban Ring and the BRA's multi-use pedestrian path. The Property could also become impacted by the redesigning and reconstructing of Maitland Street to provide access to the new Yawkey Way Commuter Station.

In planning and designing a building for 819 Beacon Street, Children's has attempted to balance its immediate and increasing need for administrative space in close proximity to its Core Campus with these potential infrastructure projects. To that end, Children's has analyzed a variety of design alternatives for the 819 Beacon Street site in order to create a building that will suit its needs. Consideration of the site constraints associated with the future public projects has resulted in a proposed single structure to accommodate both the office space and parking with a colonnade of the garage space over the southern-most 14 feet of the Property (along the common boundary with the MBTA) in order to provide room at-grade in this area to accommodate the proposed multi-use pedestrian path and Urban Ring projects. Figure 2-11 shows the proposed site plan. Figure 2-12 shows a section of the 819 Beacon Street building.

2.2 Consistency with LMA Interim Guidelines

The mission and objectives described in this IMPNF/PNF and the proposed Projects within the LMA are generally consistent with the objectives of the LMA Interim Guidelines. The Hospital's strategic plan envisions an emphasis within the Core Campus on acute care and services dependent on proximity to inpatient facilities and the LMA, while actively promoting the use of off-campus space for non-essential administrative functions (such as 819 Beacon Street) and ambulatory care (such as suburban satellite locations). In addition, the urban design objectives of the Hospital's strategic planning within the LMA concentrate on development within the Core Campus. The IMP Amendment will comprehensively describe each proposed Core Campus Project's relationship with the LMA Interim Guidelines. In terms of the height of the Children's Clinical Building, the Children's Clinical Building is within the third height zone within which height up to 205 feet can be earned with exceptional public benefits. Such exceptional public benefits regarding the location of appropriate uses outside of the LMA, workforce development and urban design will be provided to earn the height of 161 feet from grade to the top of the highest occupiable story, and of 175 feet from grade to the top of the highest occupiable story, and of 175 feet from grade to the top of mechanical floors.

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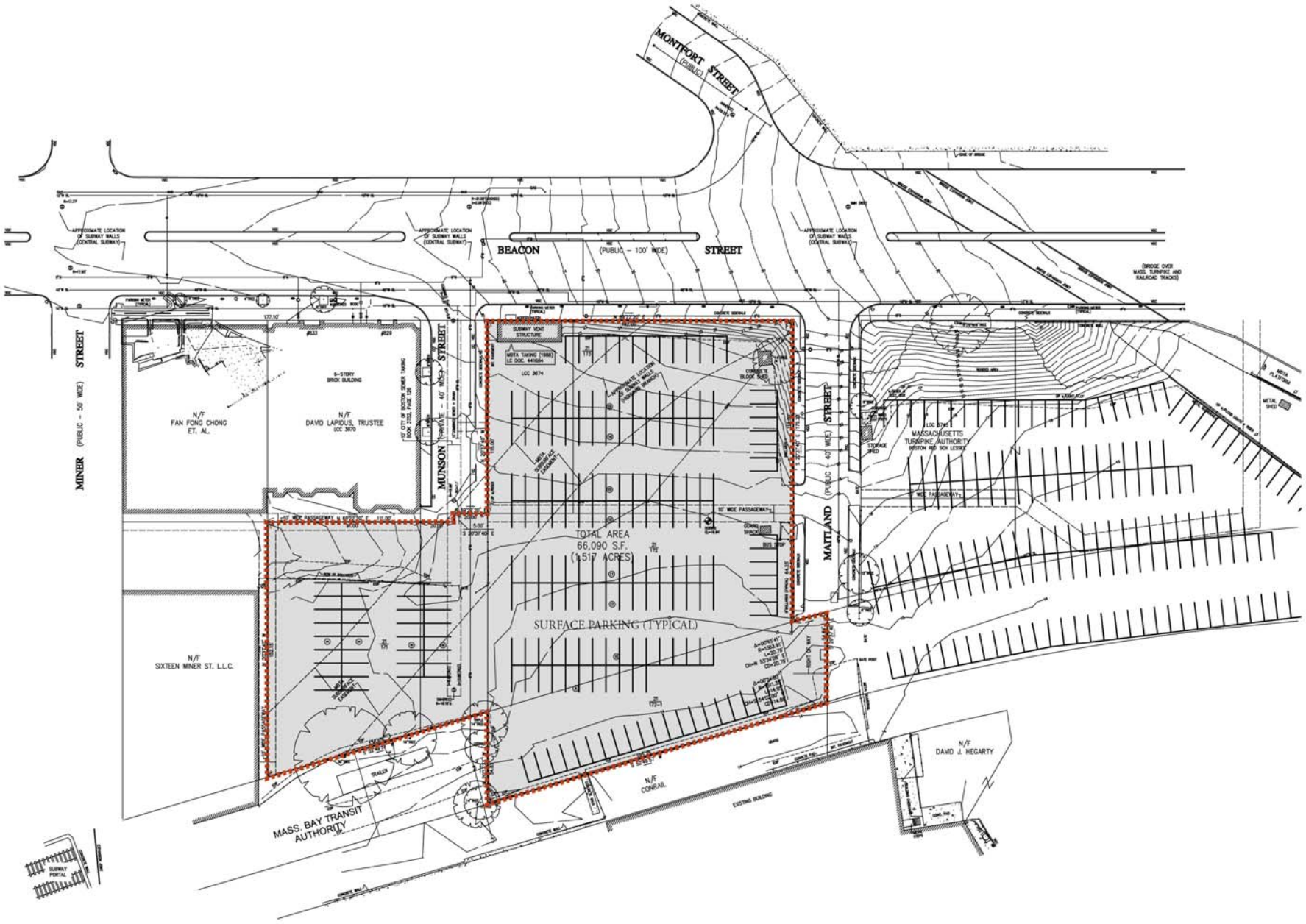
Figure 2-9

819 Beacon Street – Site Location



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ARCHITECTS

Figure 2-10

819 Beacon Street – Existing Site Plan

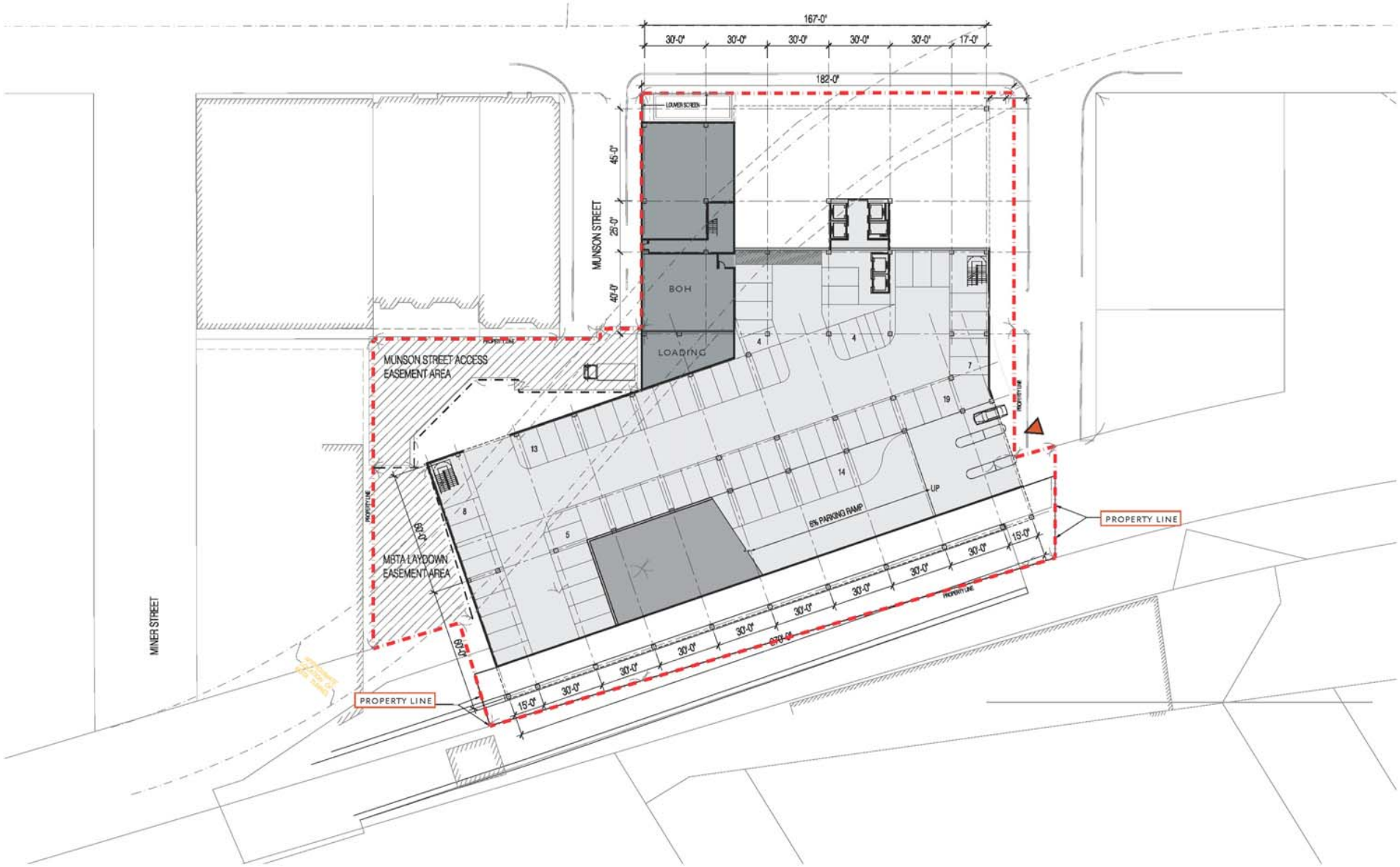

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Figure 2-11

819 Beacon Street – Proposed Site Plan

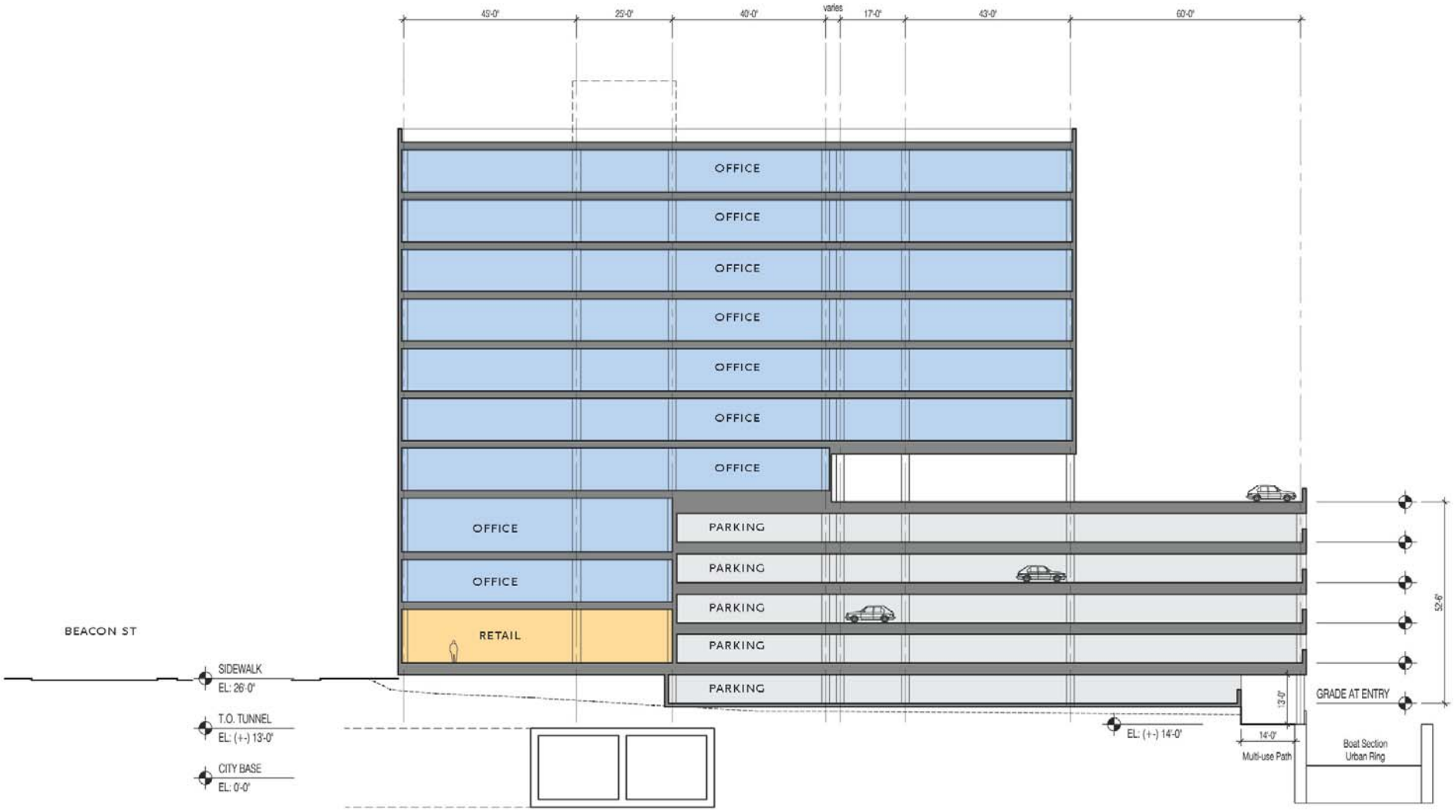

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Figure 2-12

819 Beacon Street – Section

2.3 Campus Maintenance and Improvement Projects

As part of the 2008 Main Building Vertical Addition, Children's had planned to undertake a series of lobby improvements. With the decision to eliminate the 2008 Main Building Vertical Addition and to substitute the Main Building Expansion at Binney Street, Children's plans for the lobby improvements were also deferred.

However, with the Fegan Elevator project and related "Ambulatory Enhancement" project now underway, including floor by floor upgrades of all outpatient clinics in the Fegan and Farley buildings and a new Ambulatory Lobby (with three new public elevators) connected to the Main Lobby, Children's is now proceeding with the planned renovation of its Main Lobby. The Main Lobby improvements are being implemented as part of general operational improvements to circulation across Children's campus. Since the Core Campus is bisected by Longwood Avenue, Children's has identified and is assessing potential opportunities to improve at grade traffic and pedestrian circulation at the Longwood Avenue/Blackfan Circle intersection. Children's also continues to explore expansion of an LMA-wide elevated pedestrian pathway network across Longwood Avenue in the interests of safety to allow for valet operations at the Patient and Family Parking Garage.

In addition to the foregoing campus improvement projects, Children's has a number of ongoing maintenance and improvement projects in an effort to upgrade finishes and maintain patient care areas. The ambulatory enhancement project will add self check-in kiosks and upgrade the finishes in the outpatient exam rooms, as well as treatment and waiting areas. In addition, finishes in patient tub and shower rooms will be upgraded along with the finishes in inpatient rooms. Finish upgrades for activity rooms and other family resource/lounges on the inpatient units are also planned. Many of the finish upgrades are scheduled to coincide with the completion of the Main Building Expansion. Once the Main Building Expansion opens, there will be a series of backfill renovations as existing programs shift into the new space. Children's also upgrades the spaces in the various research buildings annually.

2.4 Leased Space

Children's continues to evaluate its current plans and facility needs in regard to leased space.

2.5 Zoning

2.5.1 IMP Uses

Core Campus: All uses permitted under the 2008 IMP and the 2009 IMP Amendment for the Core Campus as shown on Figure 1-1 are allowed. The 2008 IMP and the 2009 IMP Amendment together approved the following uses in the Core Campus: (1) All Hospital Uses; (2) Any additional uses permitted in the Development Plan for PDA No. 29, as

amended; (3) Any additional uses permitted in the Development Plan for PDA No. 61 (Phase 2), as amended; (4) Any additional uses permitted in the Development Plan for PDA No. 16, as affected by Zoning Board of Appeal Decision No. BZC-6897 (1984); and (5) All existing and likely future uses, including retail, restaurant, service, transient residences (such as for families of patients receiving treatment at the Hospital), educational, and general and professional office use. The 2012 IMP Amendment will additionally specifically approve High Impact Subuses of ambulatory clinical care facility, power plant, centralized heating or cooling plant, and parking facility as part of the Projects.

One and 21-25 Autumn Street: All uses permitted under the 2008 IMP and the 2009 IMP Amendment for One and 21-25 Autumn Street are allowed. The 2008 IMP and the 2009 IMP Amendment approved the following uses at One and 21-25 Autumn Street: office uses (as defined in Section 2A of the Boston Zoning Code) and research and clinic laboratory uses.

819 Beacon Street: The 2012 IMP Amendment will specifically approve retail, restaurant, service, educational and general and professional office use, and 526 above-grade parking spaces at 819 Beacon Street. In addition, prior to commencement of construction of the Project at 819 Beacon Street, the 2012 IMP Amendment will specifically approve continued use of that site as an open air parking lot for 249 vehicles as permitted under Zoning Board of Appeal Decision No. BZC-6224 (1983), Decision No. BZC-10.137 (1987) and Decision No. BZC-28707 (2008), as such Decisions may be reissued and/or extended.

2.5.2 IMP Dimensional Requirements

Core Campus: The Core Campus includes the areas formerly included in PDA No. 29, as amended, PDA No. 61, Phase 2, and PDA No. 16. For the purposes of this IMPNF/PNF and for the purposes of determining FAR under the 2012 IMP Amendment, all FAR Lot Areas for all such PDAs are based on and incorporate the information contained in the Development Plans for such PDAs. To the extent the Development Plans for such PDAs may have included in the FAR Lot Area private ways open to public travel which should have been excluded from the definition of Lot Area under Article 2A, inclusion of such areas as part of the FAR Lot Area was approved in the 2008 IMP and the 2009 IMP Amendment for purposes of determining and approving dimensional requirements under the IMP.

The 2008 IMP and the 2009 IMP Amendment together incorporated the dimensional approvals under the pre-existing Development Plans for PDA No. 29, as amended, for PDA No. 61, Phase 2, and for PDA No. 16, as affected by Zoning Board of Appeal Decision No. BZC-6897 (1984).

PDA No. 29 and PDA No. 61: Under the Development Plan for PDA No. 29, as amended, the PDA Area was 429,481 sf (which excludes Shattuck Street) and the FAR Lot Area within PDA No. 29 was 414,704 sf (which excludes Shattuck Street and the approximately 14,777 sf portion of Blackfan Circle north of Longwood Avenue but which appears to include Children's Way a/k/a Children's Road and Children's Place a/k/a the Blackfan Street

Extension, both south of Longwood Avenue) and was subject to a maximum of 1,698,276 sf[5] of gross floor area (GFA), a maximum building height of 185 feet (the Research Building to the top of the last occupiable floor) and a maximum FAR of 4.1. No front, side or rear yards or parapet setbacks were required, except for a 12 foot parapet setback for the Research Building on the Blackfan Circle side. Under the Development Plan for PDA No. 61, as amended, the PDA Area and the FAR Lot Area within PDA No. 61, Phase 2 was 46,677 sf (which may include portions of an unnamed alley) and was subject to a maximum of 440,000 sf of GFA, a maximum building height of 298 feet and an FAR of approximately 9.43. Other proposed dimensions were approved as referenced in the Development Plans for PDA No. 29, as amended, and PDA No. 61, as amended.

PDA No. 16: Under the Development Plan for PDA No. 16, the PDA Area within PDA No. 16 was 48,891 sf and the FAR Lot Area within PDA No. 16 was 47,970 sf (consisting of 48,891 sf approved as PDA No. 16 in the Development Plan of which 921 sf has been excluded since it became subject to a sidewalk easement), which was subject to a maximum of 243,504 sf of GFA, consisting of an office building of approximately 98,176 sf and an above grade garage of approximately 145,328 sf of GFA, and an FAR of 5. Other proposed dimensions were approved as referenced in Zoning Board of Appeal Decision No. BZC-6897 (1984). A front yard reduction to 8 feet was approved, and no side yard, rear yard or rear parapet setback were required. A reduction of the loading requirements to one loading bay also was approved.

2009 IMP Amendment: The 2009 IMP Amendment approved the Main Building Expansion of 79,975 sf (7,000 sf of which was a replacement for the prior 7,000 sf Binney Street building) and construction to a height of approximately 124'8" measured to the top of the last occupiable floor, measured from a base elevation of 37 feet as required under Article 2A of the Code. The 2009 IMP Amendment also contemplated a 1,300 sf Fegan elevator bank addition. In connection with the 2009 IMP Amendment, the Boston Zoning Commission approved Map Amendment No. 581 adding PDA No. 16 (48,891 sf) and an area over the Binney Street sidewalk (6,240 sf) to the IMP Area. As built, the Main Building Expansion is 82,750 sf (7,000 sf of which was a replacement for the prior 7,000 sf Binney Street Building) and the Fegan elevator bank addition is 5,871 sf.

As a result, the IMP Area of the Core Campus is currently 531,289 sf [viz. 429,481 sf + 46,677 sf + 48,891 sf + 6,240 sf], and the FAR Lot Area is currently 509,351 sf [viz. the IMP Area excluding the 14,777 sf portion of Blackfan Street north of Longwood Avenue, the 921 sf area of Longwood Avenue in front of 333 Longwood and the 6,240 sf area of Binney Street][6].

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[5] This number assumed the demolition of 57 Binney Street containing approximately 7,000 sf. This building has now been demolished in connection with construction of the Main Building Expansion on Binney Street.

[6] The area of the Core Campus does not include a portion of Longwood Avenue that would be included in the IMP Area under a Map Amendment in connection with the campus improvement pedestrian bridge being explored over Longwood Avenue.

The GFA of the Core Campus after construction of the Main Building Expansion (with a final GFA of 82,750 net new sf), the Fegan elevator bank addition (with a final GFA of 5,871 net new sf) and the portion of a bridge within PDA No. 29 between the Karp Research Center and the Blackfan Research Center (with a final GFA of 60 net new sf) and taking into account the improvements constructed or to be constructed under PDA No. 29, as amended, PDA No. 61, as amended, Phase 2 (the Longwood Research Institute), and PDA No. 16 or otherwise existing is 2,513,262 sf of GFA, including 42,800 sf of GFA in prior renovation and maintenance projects referenced in the 2009 IMP Amendment.

Accordingly, the FAR within the FAR Lot Area of the Core Campus within the 509,351 sf FAR Lot Area of the Core Campus IMP Area is currently approximately 5 [viz. 4.93].

The Children's Clinical Building is proposed to include the addition of approximately 403,311 net new sf of GFA (after the demolition of approximately 41,689 sf of GFA) of inpatient, outpatient and medical support spaces, reaching a height of approximately 145 feet measured to the top of highest clinical use, 161 feet to the top of the highest occupiable story and 175 feet to the top of the mechanical floors[7] measured from a base elevation of 38'6" as required under Article 2A of the Code. Since above-grade parking is included as GFA under the Boston Zoning Code, the Patient and Family Parking Garage Addition is proposed to include the addition of approximately 29,370 new sf of GFA of parking facilities, reaching a height of approximately 79'8", measured from a base elevation of approximately 21'4" feet as required under Article 2A of the Code.[8] In total, the Projects proposed in this IMPNF/PNF will add approximately 432,681 new sf of GFA to the Core Campus. The IMP Area of the Core Campus will be 531,289 sf[9] and the FAR Lot Area will be 509,351 sf [viz. the IMP Area excluding the 14,777 sf portion of Blackfan Street north of Longwood Avenue, the 921 sf area of Longwood Avenue in front of 333 Longwood and the 6,240 sf area of Binney Street].

The FAR for the Core Campus after construction of the Children's Clinical Building and the Patient and Family Parking Garage Addition, and taking into account the improvements constructed or to be constructed under the 2008 IMP and the 2009 IMP Amendment (2,945,943 sf of GFA), within the 509,351 sf FAR Lot Area of the Core Campus IMP Area will be approximately 5.8 [viz. 2,513,262 + 432,681 sf divided by 509,351 sf].

Longwood Research Institute: In recognition of the fact that the commencement of construction of the Longwood Research Institute will depend on market forces, the 2009

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[7] Mechanical penthouse space which occupy more than 1/3 of the total area of the roof is included in height under Article 2A of the Boston Zoning Code.

[8] The GFA does not include the pedestrian bridge and elevated pedestrian pathway campus improvement project which is being explored.

[9] The IMP Area does not include the portion of Longwood Avenue that would be included in the IMP Area under a Map Amendment in connection with the campus improvement pedestrian bridge over Longwood Avenue which is being explored and evaluated.

IMP Amendment eliminated the requirement that the building permit for the Longwood Research Institute must be applied for not later than ten years following November 21, 2003 (which was the date of issuance of the Adequacy Determination for the Blackfan Research Center).

One and 21-25 Autumn Street: The 2008 IMP and the 2009 IMP Amendment approved the existing structures located at One and 21-25 Autumn Street. No new project is proposed at this location at this time.

819 Beacon Street: 819 Beacon Street is proposed to include the addition of approximately 424,130 new sf of GFA of office, retail and parking use (including 526 above-grade parking spaces, of which 249 are replacement spaces and 277 are net new parking spaces), in 10 stories reaching a height of approximately 142 feet measured to the top of the last occupiable floor[10] measured from a base elevation of 24 feet as required under Article 2A of the Code. The FAR Lot Area of 819 Beacon Street is 69,892[11] sf and the GFA of 819 Beacon Street will be approximately 424,130 sf of GFA. Accordingly, the FAR for 819 Beacon Street will be approximately 6.1.

2.5.3 IMP Parking and Loading

Core Campus: The 2008 IMP approved parking and loading for the Core Campus taking into account the improvements constructed or to be constructed under PDA No. 29, as amended, and PDA No. 61, Phase 2 (the Longwood Research Institute) or otherwise to be existing as 2,286 parking spaces, nine loading docks, and seven dumpster bays. The 2009 IMP Amendment approved use by the Hospital of one loading dock and 405 parking spaces in the garage at 333 Longwood Avenue. The garage at 333 Longwood contains 490 parking spaces in total. Children's leases the entirety of the parking garage to a third party operator who operates the garage. Currently, 410 of the parking spaces are used by Children's and 80 parking spaces within the garage are committed to use by third parties by way of parking leases or language in space leases for the office and retail components of 333 Longwood. As such leases expire, it is possible that some or all of the 80 spaces committed to third parties will be leased by Children's or otherwise available for Children's use.

Parking under the 2008 IMP and the 2009 IMP Amendment was subject to variation as leases expired and were either not renewed or replaced. Of these, consistent with PDA No. 61, 18 spaces are to be used by BMR-Blackfan, LLC the current owner of Phase 1 of PDA No. 61 (which are replacement spaces for spaces lost in construction). The 2008 IMP also permits the 454 spaces in the 340 Brookline Avenue Garage (formerly known as the

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[10] 819 Beacon Street will also include a mechanical penthouse roof above the highest occupiable floor, occupying less than 1/3 of the total roof area of the 819 Beacon Street roof. Such mechanical penthouse is not included in height under Article 2A of the Boston Zoning Code.

[11] This number assumes the discontinuance of Munson containing 4,727 feet.

BIDMC East Campus Parking Garage), to be used on an interim basis until commencement of construction of the Longwood Research Institute; a portion of the 454 spaces is being leased to BIDMC and Children's leases from BIDMC 198 BIDMC controlled spaces at the Center for Life Sciences Boston (CLSB). Finally, since the 2009 IMP Amendment, there have been various changes to the parking spaces available to Children's through leases as shown on Table 3-1.

The Patient and Family Parking Garage Addition will include one new level of parking with approximately 86 parking spaces (76 net new parking spaces within the Core Campus due to the elimination of 10 spaces in connection with the Children's Clinical Building).

A loading dock will be constructed as part of the Children's Clinical Building. The loading dock is currently being designed and any zoning relief required regarding loading will be identified in the 2012 IMP Amendment.

819 Beacon Street: 819 Beacon Street is proposed to include 526 above-grade parking spaces (including 249 replacement spaces and 277 net new parking spaces, of which 158 spaces will support the uses within 819 Beacon Street and of which 119 spaces will be available to support the needs of Children's employees working in the LMA), and one loading area with two loading bays.

2.5.4 Proposed Zoning Controls

At the time of approval of the 2008 IMP, Boston Zoning Map 1 was amended to eliminate the PDA Overlay Districts for PDA No. 29, as amended, PDA No. 61, as amended, (Phase 2 only), and to create an overlay district known as the Children's Hospital Boston Institutional Master Plan Area. Accordingly, the 2008 IMP incorporated by reference the provisions of PDA No. 29, as amended, and PDA No. 61 pertaining to Phase 2, except to the extent modified by the 2008 IMP. In connection with the 2009 IMP Amendment, the Boston Zoning Commission approved Map Amendment No. 581, which amended Boston Zoning Map 1 to eliminate the PDA Overlay District for PDA No. 16, and added the same (48,891 sf) and an area over the Binney Street sidewalk (6,240 sf) to the Children's Hospital Boston Institutional Master Plan Area for the Core Campus. In addition, the 2008 IMP included One and 21-25 Autumn Street within the Children's Hospital Boston Institutional Master Plan Area.

Consistent with this IMPNF/PNF, Boston Zoning Map 1 will be further amended to include 819 Beacon Street (69,892 sf)[12]. The resulting IMP Area, which is depicted on Figure 2-13, will encompass all property owned by Children's within Boston Proper.

[12] The IMP Area shown on Figure 2-13 does not include a portion of Longwood Avenue that would be included in the IMP Area under a Map Amendment in connection with the campus improvement pedestrian bridge being explored over Longwood Avenue.

2.5.5 Portions of the IMP Area within the Groundwater Conservation Overlay District

Portions of the Core Campus, consisting of the area north of Longwood Avenue (the areas formerly part of PDA No. 16 and PDA No. 61, Phase 2 and the area added to PDA No. 29 by Map Amendment No. 366), but excluding the areas south of Longwood Avenue (viz. the area originally part of PDA No. 29 under Map Amendment No. 212 and One and 21-25 Autumn Street), are located within the Groundwater Conservation Overlay District (GCOD) governed by Article 32 of the Zoning Code[13]. 819 Beacon Street falls outside of the GCOD. For any and all proposed improvements within the IMP Area to which the provisions of Article 32 are applicable[14] (including Projects and other campus improvements that meet the groundwater conservation standards set forth in Article 32), Children's 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 for any proposed improvements in the portions of the IMP Area within the GCOD. Accordingly, Children's will not be required to obtain a conditional use permit from the Board of Appeal for each such proposed improvements.

The Children's Clinical Building site is located approximately one block south of Longwood Avenue and is not located within the GCOD, and 819 Beacon Street is not located in the GCOD. Accordingly, the Children's Clinical Building and 819 Beacon Street are not subject to the requirements of Article 32. However, Children's will coordinate with the Boston Groundwater Trust as necessary. General good groundwater management practices will be employed during construction operation.

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[13] It is unclear where the GCOD boundary is as to Longwood Avenue itself.

[14] Article 32 is applicable in cases involving, (a) the erection or extension of any structure, where such new structure or extension will occupy more than fifty (50) square feet of lot area; (b) the erection or extension of any structure designed or used for human occupancy or access, mechanical equipment, or laundry or storage facilities, including garage space, if such construction involves the excavation below grade to a depth equal to or below seven (7) feet above Boston City Base (other than where such excavation is necessary for, and to the extent limited to, compliance with the requirements of this article); (c) to Substantially Rehabilitate any structure; or (d) any paving or other surfacing of lot area.

Boston Children's Hospital

Epsilon Associates Inc.

Figure 2-13
Proposed IMP Area

2.5.6 Effect of Approval of IMP

Pursuant to Article 80D of the Code, upon approval of the IMP by the BRA and its adoption by the Boston Zoning Commission, uses or structures existing or described in the IMP as proposed Projects including leased space will be deemed to be in compliance with the use, dimensional, parking and loading requirements of underlying zoning (including special purpose overlay districts) and may be reconstructed after casualty, notwithstanding any provision of underlying zoning to the contrary and without the requirement of further zoning relief. Such approvals shall apply whether such uses or structures are conducted or occupied by Children's or any other entity, whether for-profit or non-profit, and notwithstanding any requirement that any such entity undertake such uses or occupy such structures pursuant to an Institutional Master Plan.

So long as the existing uses or structures and the proposed Projects are consistent with the provisions of the IMP and the proposed Projects are subject to the BRA design approval process, the existing uses or structures and the proposed Projects may be located on multiple contiguous parcels or lots, whether or not any portion of the existing uses or structures or the proposed Projects on a particular parcel or lot satisfies the provisions of the underlying zoning. Consistent therewith, any yard and setback requirements shall be measured at the exterior property lines of the IMP Area, and shall not apply to any interior lots that may exist or be created within the IMP Area. Height shall be measured to the top of the last occupiable floor and shall not include mechanical floors or penthouses, whether or not such mechanical floor exceeds 1/3 of the roof area. FAR shall be measured separately with respect to the Core Campus of the IMP Area as a whole, One and 21-25 Autumn Street as a whole and 819 Beacon Street as a whole.

Design Review of Proposed Project(s)

Final plans and specifications for the proposed Projects shall be subject to review and approval by the BRA in accordance with its Development Review Guidelines (2006). The final plans and specifications, as approved by the BRA, shall be deemed to be approved under this Institutional Master Plan.

Future Building Renovation and Maintenance Projects

Throughout the term of the IMP, Children's anticipates conducting ongoing building alteration or renovation projects and other campus improvements which may consist of an erection or extension of an Institutional Use but which may be below the thresholds for IMP Review or Large Project Review. So long as each such alteration, project or improvement is below 20,000 sf GFA, such work may be conducted without amendment of the IMP and the permitted FAR under the IMP shall be deemed adjusted accordingly.

Campus improvement projects which result in an increase in GFA shall be subject to review and approval by the BRA in accordance with its Development Review Guidelines (2006).

The final plans and specifications, as approved by the BRA, shall be deemed to be approved under this Institutional Master Plan. Although the fee interest in the portion of Longwood Avenue which bisects the Core Campus is owned by Children's, a pedestrian bridge across Longwood Avenue would be subject to a Map Amendment including such portions of Longwood Avenue in the IMP Area.

Future Leased or Purchased Space

From time to time during the term of the IMP, Children's may purchase or lease space and parking facilities located outside of the IMP Area. Any such facilities, regardless of whether they exceed IMP exemption thresholds, will not require an amendment to the IMP as long as the use category of the underlying zoning which most closely described the use of such facility is either allowed as of right by the underlying zoning or is allowed by zoning relief obtained by the property owner. This will give Children's the needed flexibility to meet its space and parking needs.

Future Transfers of Space

During the term of the IMP, it is also possible that Children's will transfer certain property described in the IMP. In such event, Children's may, by written notice to the BRA, elect to remove such property from the IMP and/or IMP Area, whereupon:

a) such transferred properties, to the extent that they do not conform to the underlying zoning, shall be deemed to be lawful prior nonconforming uses and structures; and

b) remaining uses and structures described in the IMP shall be deemed to be lawful prior nonconforming uses and structures to the extent they do not conform to underlying zoning, notwithstanding the creation of a new lot as a result of such transfer.

Future Reallocation of Certain High Impact Subuses

From time to time during the term of the IMP, Children's may reallocate Gross Floor Area among the various Hospital Subuses, including all High Impact Subuses. Any such reallocation will not require an amendment to the IMP. This will give Children's the needed flexibility to meet its operational needs.

2.6 Anticipated Permits and Approvals

Although the design has not advanced sufficiently to definitively identify all the approvals for the proposed Projects, Table 2-2 includes a list of public permits and approvals that may be required for the various Projects.

Table 2-2 Anticipated Permits and Approvals

AGENCY	APPROVAL
Applicable to All Projects included in the 2012 IMP Amendment	
City of Boston	
Boston Redevelopment Authority	Article 80B Large Project Review or Article 80E Small Project Review /Article 80D Institutional Master Plan Review
Boston Zoning Commission	Institutional Master Plan Amendment Approval
State	
Executive Office of Energy and Environmental Affairs -- Massachusetts Environmental Policy Act	Review in accordance with MEPA regulations
Massachusetts Historical Commission	Review in accordance with MHC regulations
Specifically Applicable to Children's Clinical Building	
City of Boston	
Boston Redevelopment Authority	Design Review
Boston Civic Design Commission	Schematic Plan Design Review
Boston Landmarks Commission	Demolition Delay Review
Boston Water and Sewer Commission	Site Plan Review/Water and Sewer Connection Permits (if applicable)/Construction Dewatering Permit (if required)
Public Improvement Commission	Specific Repairs/Earth Retention (if required)
Boston Transportation Department	Construction Management Plan/Transportation Access Plan Agreement
Boston Public Works Department	Curb Cut Permit(s) (if required)
Public Safety Commission/Joint Committee on Licenses	Flammable Storage License (if required)
Boston Inspectional Services Department	Demolition/Building Permits
State	
Department of Public Health	Determination of Need Plan Review
Department of Environmental Protection Division of Water Pollution Control	Sewer extension/connection permit(s) (if applicable)
Department of Environmental Protection Division of Air Quality	Fossil Fuel Utilization Approval (if required)
Massachusetts Water Resources Authority	Sewer Use Discharge Permit Construction Dewatering Permit (if required)
Federal	
Federal Aviation Administration	Determination of No Hazard to Air Navigation (if required for cranes)
Environmental Protection Agency	NPDES Permits (if required)

Table 2-2 Anticipated Permits and Approvals (Continued)

AGENCY	APPROVAL
Specifically Applicable to Combined Heat and Power Plant Facility	
City of Boston	
Public Improvement Commission	Discontinuance/license for subsurface area (if required for Longwood Avenue subsurface)
Public Safety Commission/Joint Committee on Licenses	Flammable Storage License (if required)
State	
Department of Environmental Protection Division of Air Quality	310 CMR 7.26(30)-(37) Boilers only for boilers or duct burners 10-40 MMBtu/hr/310 CMR 7.26(43) Engines and Turbines
Federal	
Environmental Protection Agency	Federal Clean Air Act, administered through MassDEP and implemented through state permits
Specifically Applicable to Patient and Family Parking Garage Addition	
City of Boston	
Boston Redevelopment Authority	Design Review
Boston Civic Design Commission	Schematic Plan Design Review
Boston Transportation Department	Construction Management Plan/Transportation Access Plan Agreement
Public Safety Commission/Joint Committee on Licenses	Garage Permit/Flammable Storage License
Boston Inspectional Services Department	Building Permits
Specifically Applicable to 819 Beacon Street	
City of Boston	
Boston Redevelopment Authority	Recommendation to BZC of Map Amendment Increasing IMP Overlay District to include 819 Beacon Street/ Design Review
Boston Zoning Commission	Map Amendment Increasing IMP Overlay District to include 819 Beacon Street
Boston Civic Design Commission	Schematic Plan Design Review
Boston Water and Sewer Commission	Site Plan Review/Water and Sewer Connection Permits (if applicable)/ Construction Dewatering Permit (if required)
Public Improvement Commission	Specific Repairs/Earth Retention (if required) Discontinuance of Rights of Public in Munson Street (a Private Way Open to Public Use)
Boston Transportation Department	Construction Management Plan/Transportation Access Plan Agreement
Boston Public Works Department	Curb Cut Permit(s)
Public Safety Commission/Joint Committee on Licenses	Garage Permit/Flammable Storage License
Boston Inspectional Services Department	Building Permits

Table 2-2 Anticipated Permits and Approvals (Continued)

AGENCY	APPROVAL
State	
Department of Environmental Protection Division of Water Pollution Control	Sewer extension/connection permit(s) (if applicable)
Department of Environmental Protection Division of Air Quality	Fossil Fuel Utilization Approval (if required)
Massachusetts Water Resources Authority	Sewer Use Discharge Permit Construction Dewatering Permit (if required)
Federal	
Federal Aviation Administration	Determination of No Hazard to Air Navigation (if required for cranes)
Environmental Protection Agency	NPDES Permits (if required)

The above tables present a preliminary list of permits and approvals from governmental agencies that are expected to be required for the proposed Projects based on currently available information. It is possible that only some of these permits or actions will be required, or that additional permits or actions will be required.

2.7 Schedule

Although the final schedule and phasing of construction has not been definitively determined, construction of 819 Beacon Street and/or the Children's Clinical Building is expected to start within 24 months. The construction of the additional level of parking on the Patient and Family Parking Garage is also anticipated to commence in the first quarter of 2014 and anticipated to be completed within 12 months. Ongoing and proposed maintenance and improvement projects may occur prior to, simultaneous with and/or subsequent to the construction of the 2012 IMP Amendment Projects.

Chapter 3.0

Assessment of Development Review Components

3.0 ASSESSMENT OF DEVELOPMENT REVIEW COMPONENTS

3.1 Transportation

This section presents an overview of the existing Boston Children's Hospital transportation infrastructure and a summary of the 2012 Institutional Master Plan Amendment from a transportation perspective.

The first section includes a description of Children's existing transportation infrastructure on its Core Campus. The section includes a discussion of parking, passenger pick-up/drop-off, valet operations, shuttle services, loading activities, and current transportation demand management (TDM) actions. The second section provides a brief discussion of transportation infrastructure in the LMA and the Audubon Circle area. The third section provides preliminary trip generation estimates and an overview of the parking supply with the completion of the proposed Projects as part of BCH's IMP Amendment. The final section provides a discussion of anticipated transportation-related construction management actions.

3.1.1 Overview of Proposed Projects

As described previously in Chapter 2, Children's is currently proposing three Projects, two are located within its existing Core Campus in the Longwood Medical and Academic Area, and one is located in the nearby Audubon Circle area. The Projects are described in more detail in Chapter 2 and include the Children's Clinical Building, including the consideration of several cogeneration options, and a new level of parking on the Patient and Family Parking Garage. In the Audubon Circle neighborhood, a retail and office building with parking is proposed.

Over the last several years, Children's has studied various additional or alternative potential projects, including the construction of the approved Longwood Research Institute (LRI). However, due to funding constraints and the limitations on the number of projects moving forward simultaneously, these undertakings are not contemplated to proceed in the foreseeable future.

3.1.2 Boston Children's Hospital Core Campus

Boston Children's Hospital is located in the heart of Boston's Longwood Medical and Academic Area. The Core Campus is at 300 Longwood Avenue at the intersection of Longwood Avenue and Blackfan Circle.

3.1.2.1 Parking Conditions

Children's currently controls approximately 3,452 off-street parking spaces either by ownership or through leases from other institutions or organizations. Of the 3,452 spaces, 1,047 spaces are available for public use by Children's patients and visitors, and 2,405

parking spaces are subscribed to staff and physicians. About 896 of these employee parking spaces are located on the Core Campus or in close proximity to the Core Campus within the LMA. The 1,509 off-site spaces that are used by employees require shuttle services to the Core Campus by dedicated Children's and/or MASCO-operated shuttle services. Table 3-1 provides a summary of existing Children's parking facilities.

Table 3-1 BCH Existing Parking Space Inventory (May 2012)

Parking Facility	Current Number of Parking Spaces			Lease Expiration Date
On Campus / LMA	Total	Patient/Visitor	Employee/Physician	
Patient and Family Garage (O)	643[1]	643	0	
Karp Research Facility (O)	300	224	76	
333 Longwood (O)	410	180	230	
375 Longwood (L)	240	0	240	Renewed Annually
Emmanuel (L)	78	0	78	Renewed Annually
Center for Life Sciences (1) (L)	64	0	64	2023
Center for Life Sciences (2) (L)	198	0	198	5+ Years
Wolbach (O)	10	0	10	
Total On-Campus/Adjacent Parking Spaces	**1,943**	**1,047**	**896**	
Off-Campus Parking	Total	Patient/Visitor	Employee/Physician	
Renaissance Park (L)	500	0	500	2012
Simmons College (L)	325	0	325	2023
819 Beacon Street (O)	249	0	249	
Ipswich Street	42	0	42	Renewed Annually
Kenmore	38	0	38	Renewed Annually
1249 Boylston/Swan Lot	48	0	48	Renewed Annually

[1] The Patient and Family Parking Garage is licensed for 652 spaces.

Table 3-1 BCH Existing Parking Space Inventory (May 2012) (Continued)

Parking Facility	Current Number of Parking Spaces			Lease Expiration Date
Off-Campus Parking	Total	Patient/Visitor	Employee/Physician	
Trilogy	42	0	42	Renewed Annually
1295 Garage (L)	64	0	64	2013
1295 Deck (L)	13	0	13	2013
Chestnut Hill (L)	21	0	21	Renewed Annually
Landmark Center	167*	0	167	2019
Total Off-Campus Parking Spaces	**1,509**	**0**	**1,509**	
Existing Grand Total Children's Parking Spaces	**3,452**	**1,047**	**2,405**	

(O) = Owned by Boston Children's Hospital.
(L) = Leased by Boston Children's Hospital.
BCH leases 454 spaces to BIDMC at 340 Brookline Avenue. These spaces are not included in the total space count.
* As part of BCH's lease at Landmark Center, BCH has the right to control up to 167 parking spaces.

Table 3-2 provides a summary of parking spaces that will come online as either Children's owned or leased spaces from other approved projects. Accounting for these projects, Children's will control 3,700 spaces in the LMA independent of parking modifications that are proposed during the term of the IMP.

Table 3-2 Boston Children's Hospital Future Approved Parking Space Inventory

Parking Facility	Anticipated Number of Parking Spaces		
Approved Future Parking	Total	Patient/Visitor	Employee/Physician
Longwood Research Institute (O)	330*	0	330*
Existing Parking Supply	3,452	1,047	2,405
Total Future Approved Parking Spaces	**3,782**	**1,047**	**2,735**

(O) = Owned by Boston Children's Hospital.
*330 net new parking spaces are planned at LRI

3.1.2.2 Valet Operations and Passenger Pick-Up/Drop-Off

BCH's patient and visitor parking is currently located at the Patient and Family Parking Garage across Longwood Avenue from the Main Entrance. As a result, patients and visitors must cross the busy intersection at Longwood Avenue during all weather conditions to access the Hospital. Children's provides valet parking services at the Main Entrance to ameliorate this inconvenient campus parking condition and in an effort to improve safety. Also, patients of Children's are often brought in strollers or need to be carried, thus making valet operations and close proximity parking a necessity. Valet staff move the vehicles from the Main Entrance across Longwood Avenue to the Karp Garage on Blackfan Circle.

On average, the Hospital valets about 400 vehicles daily. During peak hours, there can be a considerable delay in parking and retrieving vehicles due to high demand (up to 80 vehicles per hour) resulting in congestion at the Main Entrance and in waiting time for patients and visitors.

3.1.2.3 Loading Activities

The Hospital's loading and service activities are handled at several dedicated service facilities at its Core Campus. Children's operates off-street loading areas, including its primary loading facility which is connected to the Main Building and accessed via Binney Street near Children's Way, at the Hunnewell Building via Meadow Lane, at the Enders Building from Binney Street, and at an additional area located at 333 Longwood Avenue. In addition, some deliveries and contractors arriving by van or passenger vehicle arrive at the Main Entrance. For this reason, the five designated valet spaces at the Main Entrance are occasionally used by short-term vendor and delivery parking at the Main Entrance. These spaces are managed by the valet operator.

3.1.2.4 Ambulance Operations

Ambulances primarily access the Emergency Department from Binney Street where they are provided with three dedicated, off-street ambulance bays. Children's also handles transfer ambulance activity via its rear entrance along Children's Way (off of Binney Street and Shattuck Street).

3.1.2.5 Bicycle Storage

Children's encourages employees to bicycle to work. Currently, Children's maintains approximately 600 bicycle spaces throughout its LMA campus. These racks serve employees and visitors. Additional racks will be provided with the opening of the Main Building Expansion on Binney Street which is currently under construction (and expected to be completed and opened in the third quarter of 2013).

Additionally, the City of Boston recently initiated its Hubway bicycle sharing program. The Hubway maintains several bicycle sharing stations in close proximity to the Children's campus. Sharing stations are located at the intersection of Longwood Avenue and Binney Street, and at the intersection of Longwood Avenue and Avenue Louis Pasteur.

3.1.2.6 BCH Shuttles

Shuttle transportation is vital to the Hospital's strategy for encouraging employees to use public transportation and off-site parking. BCH parking shuttles run on a continuous loop from all BCH off-site parking locations to and from the Hospital. Shuttles run approximately every 10 minutes during the morning and afternoon rush hours. Current service routes include:

- Renaissance Parking Shuttle runs between Children's Core Campus and the Renaissance Garage.
- Beacon Street Lot Shuttle operates between the Core Campus and the 819 Beacon Street parking lot.
- 1295 Boylston Street Shuttle operates between Children's Core Campus, 1 Autumn Street, and 1295 Boylston Street.
- Back Bay Shuttle operates between the Core Campus and Back Bay Station. This shuttle is used by Children's and Dana-Farber Cancer Institute employees.
- 1295 Boylston/Ruggles Express Shuttle runs between Ruggles Station and the off-campus 1295 Boylston Street building.
- North Station Shuttle is a cooperative shuttle between BCH, Dana-Farber Cancer Institute and Beth Israel Deaconess Medical Center (BIDMC). This shuttle runs between the LMA and North Station.

The pick-up and drop-off location for all BCH Core Campus shuttles is on Children's Way at the South Main Entrance.

3.1.2.7 Transportation Demand Management

Children's seeks to minimize the impact of traffic on surrounding neighborhoods, while ensuring that families and employees can also conveniently access the campus. To work towards this goal, BCH utilizes a variety of transportation demand management strategies, including:

- **CommuteWorks TMA.** Both for transportation and health benefits, the Hospital encourages biking, walking, running, or rollerblading to work. Toward this end, Children's is an active member of the CommuteWorks Transportation Management Association, which is operated by MASCO. CommuteWorks offers an array of

ongoing programs (discussed further below) designed to encourage employees to choose alternative options for commuting. Children's monitors CommuteWorks programs, posts and distributes announcements, holds promotional events for employees to encourage alternative modes of transportation such as the Bike Week Commuter Challenge, and provides transit schedules and other information to facilitate alternative transportation.

- **Transit pass subsidies.** Children's employees regularly purchase monthly T-passes and choose public transportation as their primary mode to work. To encourage employees to do so, the Hospital provides a 50 percent subsidy in the cost of T and commuter-rail passes for employees. The cost of passes is deducted on a pre-tax basis, resulting in an additional cost savings to employees. The Hospital also implemented a new program, called "Three for Free", to promote the use of public transportation rather than driving. Employees who give up their parking spots for three months will receive a free T or commuter rail pass for that period.

- **Carpool assistance.** Ridematching services are provided to employees through MASCO's CommuteWorks. Preferential parking is provided for carpools registered with CommuteWorks. Carpools of three or more are guaranteed parking at nearby garages, while two-person carpools are guaranteed spaces at remote MASCO lots.

- **Emergency Ride Home.** CommuteWorks provides an Emergency Ride Home program which covers the cost of taxi or car rental vouchers up to five times a year (per person) for commuters who need to get home quickly due to personal emergencies, but who do not commute by car.

- **Bicycling/walking incentives and amenities.** Children's participates in CommuteWorks' Commute Fit Program that provides rewards to employees who bicycle, walk, or rollerblade to work, based on the miles they log. The Hospital also provides a secure bike cage for employees.

- **Location-priced parking.** Children's recognizes that there are still employees who will need or want to drive to work, but Children's strives to control congestion in the LMA by encouraging staff members to carpool and to park off-site. To discourage parking on campus, the Hospital subsidizes the cost of off-site parking, giving those employees a reduced rate compared to those who park on campus.

- **Telecommuting and compressed workweeks.** Children's has an informal policy of encouraging telecommuting and compressed workweeks for employees.

- **Promotional efforts.** Children's promotes alternative transportation through a variety of newsletters, information kiosks, websites, e-mail, and special events.

Children's will continue to promote and improve its TDM program to benefit its employees and reduce traffic impacts to roadways and parking facilities within the LMA and nearby neighborhoods.

3.1.3 Existing LMA Transportation Infrastructure

The next sections provide a discussion of public transportation services to the LMA proximate to the Children's Clinical Building and Patient and Family Parking Garage Addition Projects.

3.1.3.1 LMA Core Campus Roadway Network

The Children's Core Campus is located on Longwood Avenue in the LMA at the intersection of Blackfan Circle. The campus is loosely bound by Longwood Avenue, Binney Street, Shattuck Street, and Meadow Lane. Children's also owns and operates the Patient and Family and Karp parking garages on Blackfan Circle across from the Hospital's Main Entrance. In addition to Longwood Avenue, arterial roadways serving the area include Brookline Avenue, the Riverway, the Fenway, Park Drive, Boylston Street, and Huntington Avenue.

3.1.3.2 LMA Public Transportation

Children's Core Campus in the LMA is well served by public transportation. The Hospital is located between the Arborway (E) Branch and the Riverside (D) Branch of the MBTA Green Line, and is also served by several branches of the MBTA's Commuter Rail system, as described below:

- **Green Line D Branch** – The D (or Riverside) Branch of the Green Line light rail subway line runs on a dedicated right-of-way from Riverside Station in Newton through multiple stations in Newton, Brookline, and Boston before turning north along the Riverway and joining the main below-grade Green Line east of Fenway Station. The main line continues through the Back Bay, Government Center, and North Station to its terminus at Lechmere Station. The LMA is served by the line's Longwood and Brookline Village stops, both located west of the Muddy River. Passengers traveling to Children's would either walk half a mile from the Longwood stop, or transfer to any of three local buses (60, 65 and 66) at Brookline Village.

- **Green Line E Branch** – The E (or Heath Street) Branch of the Green Line light rail subway line originates at Heath Street Station and runs east at grade within the median of Huntington Avenue. South of Massachusetts Avenue, the line descends below grade to serve Symphony and Prudential stations before joining the main Green Line (described previously in the D Branch section) at Copley. Children's is served by the line's Brigham Circle and Longwood stops. Passengers traveling to Children's from either of these stops would walk approximately a quarter of a mile.

- **Orange Line** – The Orange Line heavy rail subway line runs from Oak Grove Station in Malden through Medford, Charlestown, downtown Boston, the South End, and Roxbury, before reaching Forest Hills Station in Jamaica Plain. The Orange Line connects with the Green Line and with all northern commuter rail lines at North Station, with the Green Line at Haymarket, with the Blue Line at State Street, and with the Red Line at Downtown Crossing. Orange Line passengers traveling to Children's would either walk approximately two-thirds of a mile from Roxbury Crossing Station or walk approximately three quarters of a mile, or take the MASCO Ruggles Express shuttle service, from Ruggles Station. Children's provides shuttle service to the Renaissance Park, which is also used for access to Ruggles Station.

- **Framingham/Worcester Commuter Rail Line** – This commuter rail line runs from Boston's western suburbs, making stops in Natick, Wellesley, and Newton. Approximately half of the daily trains originate or terminate at Worcester; the other half originate or terminate at Framingham. The line makes Boston stops at Yawkey Station, Back Bay Station, and South Station. The LMA is served by the line's Yawkey Station, located east of Fenway Park, approximately two-thirds of a mile from the LMA.

- **Needham Commuter Rail Line** – This commuter rail line serves the Boston suburb of Needham, making four stops there, before serving the Boston neighborhoods of West Roxbury, Roslindale, and Jamaica Plain en route to its downtown terminus at South Station. Needham Line passengers traveling to Children's would walk or take a shuttle from Ruggles Station.

- **Franklin Commuter Rail Line** – This commuter rail line serves suburbs southwest of Boston including Franklin, Norwood, and Dedham en route to its downtown terminus at South Station. Franklin Line passengers traveling to Children's would walk or take a shuttle from Ruggles Station.

- **Attleboro/Providence Commuter Rail Line** – This commuter rail line serves communities south of Boston including Providence (RI), Attleboro, and Sharon en route to its downtown terminus at South Station. The Attleboro Line merges with the Franklin Line at Readville Station in the Hyde Park neighborhood of Boston. Attleboro Line passengers traveling to Children's would walk or take a shuttle from Ruggles Station.

- **Stoughton Commuter Rail Line** – This commuter rail line serves southern suburbs of Boston including Stoughton and Canton en route to its downtown terminus at South Station. The Stoughton Line merges with the Attleboro Line at Canton Junction Station. Attleboro Line passengers traveling to Children's would walk or take a shuttle from Ruggles Station.

The MBTA also operates eight bus routes that provide service within one-half mile of Children's Core Campus:

- **Crosstown 2 (CT2)** bus route operates between Sullivan Square Station on the Orange Line and Ruggles Station on the Orange Line. CT2 makes a stop on Longwood Avenue.

- **Crosstown 3 (CT3)** bus route operates between Brookline Avenue at BIDMC East Campus and Andrew Square Station on the Red Line Station in Dorchester. CT3 makes a stop on Longwood Avenue.

- **Route 8** operates between Kenmore Square and UMass Boston, with high-frequency service between Kenmore Square and the Ruggles Street MBTA Orange Line/Commuter Rail Station during peak commuter periods. This route stops on Longwood Avenue.

- **Route 19** runs between Fields Corner Station on the Red Line and Kenmore Station on the Green Line. During peak hours, this route stops at Ruggles Station on the Orange Line and on Brookline Avenue. During the midday, this route only provides service between Fields Corner and Ruggles Station.

- **Route 39** provides service between the Forest Hills Station on the Orange Line and Back Bay Station on the Orange Line. This route makes stops on Huntington Avenue at Brigham Circle and at Longwood Avenue.

- **Route 47** provides service between Central Square Station on the Red Line and Broadway Station on the Red Line via Ruggles Station on the Orange Line. This route stops on Longwood Avenue.

- **Route 60** provides service between Chestnut Hill in Newton and Kenmore Square via Brookline Village Station on the Green Line D Branch. This route stops on Brookline Avenue.

- **Route 65** provides service between Brighton Center and Kenmore Square via Washington Street Station on the Green Line B Branch, Washington Square Station on the Green Line C Branch, and Brookline Village Station on the Green Line D Branch. The route stops on Brookline Avenue.

- **Route 66** provides service between Harvard Square in Cambridge and Dudley Square. This route stops at Brigham Circle.

In addition to MBTA bus routes, MASCO operates several shuttle routes that provide service within one-half mile of the Core Campus:

- **M2 Cambridge Shuttle** connects the LMA to Harvard Square, with interim stops along Massachusetts Avenue at Putnam Street, Bay Street, Central Square, MIT, and Beacon Street, the Fenway and Kenmore MBTA station, as well as Simmons and Vanderbilt Hall. The general public may ride this shuttle but must purchase an advance ticket.

- **M6 Chestnut Hill Shuttle** connects the LMA with the Mishkan Tefila Parking Lot on Hammond Pond Parkway in Chestnut Hill (Newton).

- **Ruggles Express** provides continuous service between the MBTA's Ruggles Station and the LMA throughout the day. At Ruggles Station, passengers can connect to the Orange Line subway and the Needham, Franklin, Attleboro/Providence and Stoughton Commuter Rail Lines in addition to other buses.

- **Wentworth Shuttle** serves MASCO member employees who park at the Wentworth lots in Mission Hill.

- **JFK/UMass Shuttle** connects the LMA and the JFK/UMass Station via Andrew Square on the MBTA's Red Line.

- **Crosstown Shuttle** connects the LMA and the Crosstown Center Parking Facility at the intersection of Massachusetts Avenue and Melnea Cass Boulevard.

3.1.4 Fenway (Off-campus) Existing Transportation Infrastructure

The following section provides a discussion of public transportation services to the Fenway area.

3.1.4.1 Fenway Roadway Network

Children's proposed 819 Beacon Street development site is located on Beacon Street in the Fenway between Audubon Circle and Kenmore Square. 819 Beacon Street is currently a 249 space surface parking lot used by Children's employees during the daytime and Red Sox patrons during games. The site is bound by Beacon Street to the north, the MBTA and CSX right-of-way to the south, Maitland Street to the east, and loosely bounded by Munson Street to the west. Additional arterials serving the site include Park Drive, Commonwealth Avenue, and Boylston Street.

3.1.4.2 Audubon Circle Public Transportation

819 Beacon Street is well served by public transportation. The site is located between the Green Line's Kenmore Station, St. Mary's Street stop on the Green Line's C Branch, and the Fenway stop on the Green Line's D Branch. The site is also well served by the Yawkey

Station Commuter Rail stop. Yawkey Station will be reconstructed as part of the Parcel 7 Fenway Center development which abuts the 819 Beacon Street site on Maitland Street. Additional public transportation services include:

- **Green Line C Branch** – The C (or Cleveland Circle) Branch of the Green Line light rail subway line runs on a dedicated right-of-way from Cleveland Circle in Brighton through multiple stations on Beacon Street in Brookline before joining the main below-grade Green Line at Fenway Station. The main line continues through the Back Bay, Government Center, and North Station to its terminus at Lechmere Station. The site is served by the line's St. Mary's Street stop as well as Kenmore Station.

- **Green Line D Branch** –discussed previously in Section 3.1.3.2, provides a stop at Fenway Station near the site.

- **Framingham/Worcester Commuter Rail Line** –discussed previously, stops at the nearby Yawkey Station.

- **Crosstown 2 (CT2)** - discussed previously, stops on Park Drive at Audubon Circle.

- **Route 8** – discussed previously, stops at Kenmore Station.

- **Route 19** – discussed previously, stop on Brookline Avenue at Yawkey Station during peak hours.

- **Route 47** – discussed previously, stops on Park Drive at Audubon Circle.

- **Route 57** runs between Kenmore Station and the Watertown Yard via Brighton Center and Newton Corner.

- **Route 60** – discussed previously, stops at the nearby Kenmore Station.

- **Route 65** – discussed previously, stops at the nearby Kenmore Station.

3.1.5 Preliminary Trip Generation

This section provides a summary of preliminary trip generation estimates for the Children's 2012 IMP Amendment Projects. Included are preliminary estimates of person- and vehicle-trip generation growth that are expected. As discussed previously, in Chapter 2, the following Projects are proposed.

- The Children's Clinical Building is a 445,000 sf clinical care facility (403,311 net-new square feet) to be located on the BCH Core Campus.

Children's is currently considering several cogeneration options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to evaluate these and other options and alternatives as its planning evolves.

- The Patient and Family Parking Garage Addition includes a new level of parking and 86 new spaces in the existing garage (76 net new spaces due to the elimination of 10 spaces in connection with the Children's Clinical Building), and will include circulation modifications aimed at improving garage egress.

- 819 Beacon Street includes approximately 211,170 sf, of retail and office space, and approximately 249 replacement parking spaces and 277 net new parking spaces within a 526 parking space garage. This Project is located in the Audubon Circle neighborhood.

Table 3-3 provides a summary of planned development activities that will contribute to additional traffic growth through the term of the IMP Amendment.

Table 3-3 2012 IMP Amendment Projects

Project	Facility Size (sf)*	Demolition/Existing (sf)	Net New (sf)*
Children's Clinical Building	445,000	41,689	403,311
819 Beacon Street	211,170	0	211,170
Total Construction	**656,170**	**41,689**	**614,481**

* Square footages are estimates, as defined by the Boston Zoning Code.

Note: Garage Space within 819 Beacon Street or additional level of Patient and Family Garage not included.

Tables 3-4 and 3-5 present the person and vehicle trip generation estimates for the LMA Core Campus (Children's Clinical Building) and 819 Beacon Street in the Audubon Circle. Trip generation was based on the Institute of Transportation Engineers (ITE) Land Use Code 610 (Hospital), 710 (Office), and 820 (Shopping Center). LUC 820, Shopping Center, is typically used for undefined ground-floor retail space.

Trip generation results were then adjusted for Boston Transportation Department (BTD) mode share rates for the LMA and Audubon Circle, and a vehicle occupancy rate of 1.2 persons per vehicle.

Table 3-4 Children's Clinical Building (Core Campus) Trip Generation Estimate

Time Period	Person-Trips				Adjusted Vehicle Trips
	Auto	Transit	Walk/Bicycle	Total	
Morning Peak Hour					
Enter	82	78	90	250	69
Exit	57	54	63	174	48
Total	139	132	153	424	117
Evening Peak Hour					
Enter	52	50	58	160	44
Exit	74	68	79	221	62
Total	126	118	137	381	106
Average Daily	1,630	1,038	2,274	4,942	1,358

Table 3-5 819 Beacon Street (Off Campus) Trip Generation Estimate

Time Period	Person-Trips				Adjusted Vehicle Trips
	Auto	Transit	Walk/Bicycle	Total	
Morning Peak Hour					
Enter	132	135	91	358	110
Exit	20	20	14	54	16
Total	152	155	105	412	126
Evening Peak Hour					
Enter	32	33	26	91	25
Exit	122	125	87	334	99
Total	154	158	113	425	124
Average Daily	1,436	1,024	972	3,432	1,136

As shown in Table 3-4, IMP actions on the Core Campus are expected to generate approximately 117 net new vehicle trips (69 in, 48 out) during the weekday morning peak hour, and 106 net new vehicle trips (44 in, 62 out) during the weekday evening peak hour.

As shown in Table 3-5, 819 Beacon Street is expected to generate approximately 126 new vehicle trips (110 in, 16 out) during the weekday morning peak hour, and 124 new vehicle trips (25 in, 99 out) during the weekday evening peak hour once the building is completed and fully occupied.

Note, however, that the trip generation estimates presented within Tables 3-4 and 3-5 must be considered preliminary. A more detailed, empirically-based estimate of future trip generation based on employment and patient projections and comprehensive review of existing transportation conditions will be developed for the IMP. Specifically, empirical data is expected to show that hospital employees providing patient care have a different traffic pattern of arrivals and departures than the customary peak hours. The expected effects of the growth will be evaluated on nearby streets and at area intersections as part of the IMP process. Also, note that BCH anticipates studying the transportation impacts of the CCB and 819 Beacon Street portions of the IMP Amendment separately. These two new facilities are over a mile apart from each other, and each generates its own specific traffic impacts. It is expected that separate study areas and transportation studies would be prepared for those two Projects of the BCH 2012 IMP Amendment.

3.1.6 Future Parking Conditions

This section describes future parking actions that are anticipated within the Children's IMP Area. Table 3-6 summarizes proposed changes to the Children's parking supply once all of its currently proposed Projects are completed.

Table 3-6 Proposed Parking Inventory Changes

	Parking Spaces	
	On-Campus/LMA	Off-Campus
Existing Spaces	1,943	1,342
Approved LRI Spaces	+330	0
Sub Total Existing + Future Approved Spaces	**2,273**	**1,342**

Table 3-6 Proposed Parking Inventory Changes (Continued)

	Parking Spaces	
	On-Campus/LMA	Off-Campus
Children's Hospital IMP Parking Additions		
819 Beacon Street	-	+ 277
Patient and Family Parking Garage Addition	+86	-
Children's Hospital IMP Parking Taken out of Service		
Construction of CCB	**(-10)**	
IMP Net Change	**+76**	**+277**
Grand Total	**2,349**	**1,619**

As currently contemplated within this IMPNF/PNF, Children's proposes the development of approximately 614,481 square feet of net-new development and 363 (353 net new) parking spaces in both on-campus and off-campus Projects. This amount of parking complies with the guidelines set by the LMA Interim Guidelines and BTD parking guidelines for the Fenway/Audubon Circle neighborhood. In total, the Children's IMP will create approximately 0.59 net new parking spaces per 1,000 gsf of development.

Upon completion of Children's proposed Projects, its overall campus parking ratio is expected to decrease from 0.97 to 0.86. Existing and proposed parking ratios for the Core Campus and Autumn Street are shown in Table 3-7.

Table 3-7 Children's Hospital Parking Ratios (Core Campus and Autumn Street)

Children's Core Campus and Autumn Street *	Floor Area (sf)	Parking Spaces**	Parking Ratio (spaces/1,000 sf)
Existing + Approved Development***	2,341,876	2,273	0.97
Future w/IMP Actions On Campus***	2,745,187	2,349	0.86

* Includes owned and leased building area within the LMA.
** Includes owned and leased parking spaces within the LMA.
*** Does not include Patient and Family Parking Garage and parking floor area in 333 Longwood.

As mentioned previously, the proposed 86 parking spaces at the Patient and Family Garage (76 net new spaces) will provide additional patient and visitor parking for the Core Campus. This garage consistently fills to capacity on weekdays, and Children's takes proactive measures to screen vehicles entering the garage to ensure they are affiliated with BCH.

Those that cannot find parking at the Patient and Family Garage often rely on valet services at the Main Entrance which in turn, creates more vehicle traffic since the valets need to cross Longwood Avenue to bring the vehicles to the Karp garage. The additional spaces will provide for much needed patient and visitor parking. In considering future parking conditions, Children's also continues to explore expansion of an LMA-wide elevated pedestrian pathway network across Longwood Avenue in the interests of safety and to allow for valet operations at the Patient and Family Parking Garage.

Additional parking spaces at 819 Beacon Street will provide the opportunity to accommodate some parking on site to support new building space that is proposed as part of the 819 Beacon Street Project. However, most spaces at 819 Beacon Street will continue to be utilized to support BCH's goal of relocating employee parking outside of the LMA, which will allow for BCH patients to park in close proximity to the Core Campus, in the Patient and Family, Karp, and 333 Longwood parking garages. The 819 Beacon Street site is best suited to BCH employees that travel to work from the north or Storrow Drive. BCH staff will then be shuttled to the LMA so that there is an overall reduction in traffic in the LMA. Most parkers at this location currently serve in specific patient care provider roles at BCH, and as such, have a different arrival and departure pattern from traditional office/administrative-type positions (i.e., their time of travel straddles the traditional peak commuter hours). Additionally, the site is served by multiple access routes that allow it to quickly disperse traffic and minimize impacts to any single travel route in the Fenway/Kenmore neighborhood.

3.1.7 Construction Management

Children's will develop a detailed evaluation of potential short-term construction-related transportation impacts during the course of its proposed Projects, including construction vehicle traffic, parking supply and demand, and pedestrian access to the Core Campus and to the off-campus Project at 819 Beacon Street. Detailed Construction Management Plans will be developed and submitted to the BTD for its approval on each Project. These plans will detail construction vehicle routing and staging.

3.1.7.1 Construction Vehicle Traffic

Construction vehicles will be necessary to move construction materials to and from the Projects' sites. Every effort will be made to reduce the noise, control dust, and minimize other disturbances associated with construction traffic. It is anticipated that Longwood Avenue will serve as the principal construction traffic route to the Core Campus. Beacon Street will serve as the primary construction route to 819 Beacon Street.

Truck staging and lay-down areas for the Projects will be carefully planned. The need for street occupancy (lane closures) along roadways adjacent to the Projects' sites is not known at this time.

3.1.7.2 Construction Parking Issues

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

3.1.7.3 Pedestrian Access During Construction

During the construction period, pedestrian access on the Core Campus may need to be re-routed around the construction sites. A variety of measures will be considered and implemented to protect the safety of pedestrians traversing those portions of the campus affected by construction. Temporary walkways, appropriate lighting, and new directional and informational signage to direct pedestrians around the construction sites will be provided. After construction is complete, finished pedestrian sidewalks will be permanently reconfigured around the new facilities. Any damage as a result of construction will be repaired per City standards. This reconfiguration of pedestrian paths will be carefully considered as the Projects' designs proceed.

3.2 Environmental Protection Component

3.2.1 Wind

The Children's Clinical Building is proposed to be approximately 161 feet to the top of the occupiable space with mechanical space above. Wind impacts from the Children's Clinical Building are anticipated to be limited due to its location on the campus and the shielding effect of nearby buildings to the northwest and southwest, due to their heights. The addition to the Patient and Family Parking Garage will add approximately 10 feet to the height of the existing garage. Wind impacts from the addition to the Patient and Family Parking Garage are anticipated to be minimal due to the existing structure and the adjacent buildings which are a similar height or taller. The 819 Beacon Street building is proposed to be approximately 142 feet to the top of the occupied space with mechanical space above. Due to the location of the 819 Beacon Street building and its height, the building may impact the wind in the vicinity of the site.

3.2.2 Shadow

The locations of the proposed Projects are anticipated to limit the shadow impacts on their surrounding areas. The Children's Clinical Building is located on the southern side of the Children's campus and is anticipated to cast shadow mostly on rooftops in the surrounding

area. The location and heights of buildings surrounding the Patient and Family Parking Garage will limit the Project's shadow impacts on the surrounding area. The 819 Beacon Street building will cast shadows onto Beacon Street and the Massachusetts Turnpike, but is not anticipated to cast shadow on any open spaces in the vicinity of the site.

3.2.3 Daylight

The Projects will be located in areas with buildings of similar height and massing. Daylight obstruction values are anticipated to be similar to areas in the immediate vicinity of the proposed sites, as well as daylight obstruction values found in urban areas.

3.2.4 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 that include brick, stone, pre-cast concrete, and glass. 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.

3.2.5 Air Quality

Transportation Impacts: Potential long-term air quality impacts can result from emissions from vehicular traffic generated by the proposed Projects.

Children's currently implements an aggressive vehicle trip reduction program which will be implemented for its proposed Projects as applicable.

CHP Impacts: Children's is currently considering several cogeneration options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to consider and evaluate these and other options and alternatives as its planning evolves. CHP, which is being promoted by the Massachusetts Department of Energy Resources and the U.S. Department of Energy for its energy efficiency and environmental (air emissions) benefits, utilizes an engine-generator to produce electricity and then utilizes the waste heat from that process to generate steam or hot water for heating, cooling, or process uses.

A new CHP unit, which would have a very low emissions profile, may have multiple potential benefits, including:

- Favorable economics, reducing the operating costs of the Hospital.

- Reducing regional air pollutant emissions by displacing electricity otherwise purchased from the regional grid. The mix of power plants providing energy to the grid do so at higher emission rates than a CHP.

- Reducing greenhouse gas emissions by operating more efficiently than the separate generation of electricity and steam. Thermal energy is recovered from waste heat, displacing fossil fuels that would otherwise be used.

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.

3.2.6 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 Children's Clinical Building is proposed to include green roofs that will limit the amount of runoff from its rooftops.

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 0078G for the Children's Core Campus and Community Panel Number 25025C 0076G for 819 Beacon Street). The maps for the Core Campus and 819 Beacon Street show that the Projects' sites are located outside of the 500-year flood plain. The Core Campus and 819 Beacon Street site do not contain any wetlands.

3.2.7 Geotechnical/Groundwater

The following summary of geotechnical related information is provided for the Children's Clinical Building on the Children's Core Campus and the 819 Beacon Street site.

3.2.7.1 Subsurface Conditions

Children's Clinical Building

Subsurface conditions at the Children's Clinical Building site are based on review of historic test boring information. Subsurface conditions in the general location of the site consist of miscellaneous fill soils overlying a relatively thick deposit of marine soils. Glacial till directly underlies the marine soils at an approximate depth of 60 feet (El. -25 +/- Boston City Base) below adjacent street grades. Bedrock consisting of Roxbury Conglomerate underlies the glacial deposit at approximately El. -35 +/-, about 65 to 70 feet below adjacent street grades.

Groundwater levels are anticipated to vary from 18 to 20 feet below existing ground surface, corresponding to approximately Elevation +12 to +15.

The Children's Clinical Building site is located approximately one block south of Longwood Avenue and outside the limits of the Groundwater Conservation Overlay District (GCOD). Accordingly, the Children's Clinical Building is not required to comply with Article 32. Groundwater management practices will be employed during construction.

Development of the Children's Clinical Building site will require excavation adjacent to portions of existing Children's Hospital buildings (Bader, Farley/Pavilion, the Ida C. Smith building, Library, and Fegan). The type and design of both the temporary earth support system for the excavation and the permanent foundation wall system, will provide for adequate support of the structures and utilities, be compatible with the subsurface conditions, and be capable of maintaining groundwater levels outside the site at or near pre-construction levels.

Patient and Family Garage

The Patient and Family Parking Garage is located within the Groundwater Conservation Overlay District, although there should be no construction at grade or subsurface.

819 Beacon Street

Based on results from a preliminary subsurface exploration program, the 819 Beacon Street site is underlain by an eight to 10-foot thick fill deposit consisting of sands and gravels with varying amounts of ash and cinders. Underlying the fill deposit is an organic deposit which could be up to five feet in thickness. Directly below the fill and organic deposits is a fluvial sand deposit that varies in thickness from 10 to 15 feet in thickness. Underlying the fluvial deposit is a relatively thick marine deposit consisting of silty clay and silts. The marine

deposit ranges in thickness from 160 to 180 feet. A glacial till deposit is located between the bottom of the marine deposit and top of bedrock. The top of the glacial till is anticipated to extend to depths of 200 to 210 feet below existing ground surface. Bedrock consisting of Cambridge Argillite underlies the glacial till at about 200 feet below adjacent street grades.

The MBTA Green Line tunnel bisects the 819 Beacon Street site between Beacon Street to the north and the southwest corner of the site. The roof of the tunnel is approximately Elevation +13, and the bottom of the tunnel section is approximately Elevation -7.5.

Groundwater levels were observed to range between five and eight feet below existing site grades, corresponding to approximately Elevation +10 to Elevation +12 Boston City Base Datum.

The 819 Beacon Street site is located outside the GCOD. Accordingly, the 819 Beacon Street site is not required to comply with Article 32. Groundwater management practices will be employed during construction.

The proposed 819 Beacon Street building is anticipated to be supported on deep foundations with a structural slab. The pile foundations will bear in both the fluvial sands and marine deposit, or be driven to bear in the glacial till or underlying bedrock. Pre-auguring may be necessary to remove obstructions before installing deep foundations. The proposed slab will be roughly the same elevation as the existing site grade along Beacon Street. With the exception of the intersection of Maitland and Beacon streets, limited excavation support will likely be required. A temporary earth support system for the excavation will be required along portions of Beacon and Maitland streets to maintain existing sidewalks, streets, and utilities.

3.2.8 Solid and Hazardous Waste

3.2.8.1 Hazardous Wastes On-site

Children's Clinical Building

Characterization of the soil and groundwater at the Children's Clinical Building site has not been conducted to date. Evaluation of site environmental conditions will be conducted and management of soil and groundwater will be in accordance with applicable local, state, and federal laws and regulations.

819 Beacon Street

Based upon results of the preliminary chemical analyses conducted on samples of the site soils, two extractable petroleum hydrocarbon compounds were detected above reportable concentrations. The two reportable compounds were attributed to the presence of ash and cinders present in the fill deposit and did not require reporting to the Massachusetts

Department of Environmental Protection (MassDEP), but based on these preliminary results the fill is considered regulated for off-site disposition.

Results of groundwater testing did not identify the presence of contaminants above reportable concentrations.

Additional characterization of soil and groundwater is planned at the appropriate stage of the design process to further evaluate site environmental conditions and soil management requirements in accordance with applicable local, state, and federal laws and regulations.

3.2.8.2 Solid Waste

The proposed Projects will generate solid waste typical of institutional hospital and office uses. All waste will be segregated at the point of origin into separate streams. Solid waste is expected to include wastepaper, styrofoam, cardboard, glass bottles and food. The proposed Children's Clinical Building Project will also generate biomedical and infectious wastes typical of medical facilities. Management of hazardous waste is highly regulated for the safety of the public, the environment and the Hospital community. Children's has an existing hazardous waste collection program, which will be used to handle and dispose of all wastes generated by existing and proposed Hospital facilities in accordance with applicable laws and regulations.

3.2.9 Noise

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

Intermittent increases in noise levels will occur in the short-term during construction. Construction work will comply with the requirements of the City of Boston noise ordinance. 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.

3.2.10 Construction

A Construction Management Plan in compliance with the City's Construction Management Program will be submitted to the Boston Transportation Department for the proposed Projects (i.e., Children's Clinical Building, Patient and Family Parking Garage Addition and 819 Beacon Street).

Short-term minor air quality impacts from fugitive dust may be expected during the construction of the proposed Projects. Mitigation measures, such as the use of wetting agents where needed, and removal of spoils from the site using covered trucks, will be utilized.

Noise impacts will be controlled during construction through the use of mufflers on heavy outdoor equipment, as appropriate, and exterior construction hour restrictions.

Construction methodologies that ensure public safety and protect the public will be employed for the Projects. Techniques such as barricades, walkways, and signage will be used. Construction management and scheduling will minimize impacts on the surrounding environment. This will include plans for construction worker commuting and parking, routing plans for trucking and deliveries, and control of noise and dust.

The proposed construction staging plan for the proposed Projects will be designed to isolate the construction while providing safe access for pedestrians and automobiles during normal day-to-day activity and emergencies.

3.2.11 Rodent Control

A rodent extermination certificate will be filed with the building permit application for the proposed Projects. Rodent inspection monitoring and treatment will be carried out before, during, and at the completion of all construction work for the proposed Projects, in compliance with the City's requirements.

3.2.12 Wildlife Habitat

The Children's Core Campus and 819 Beacon Street site are in established urban neighborhoods. There are no wildlife habitats on or near the Projects' sites.

3.2.13 Sustainable Design

Children's is committed to developing buildings that are sustainably designed, energy efficient, and environmentally conscious. As required under Article 37 of the Boston Zoning Code, projects that are subject to Article 80B, Large Project Review, shall be Leadership in Energy and Environmental Design (LEED) certifiable. Appendix B includes the LEED checklists for the Children's Clinical Building and 819 Beacon Street Projects.

3.2.13.1 Children's Clinical Building

The Children's Clinical Building is anticipated to meet the LEED Healthcare certifiable threshold as required under Article 37 of the Boston Zoning Code. (Descriptions in *italics* are credits that are still being studied.)

Sustainable Sites

Prerequisite 1: Construction Activity Pollution Prevention

The Construction Manager will submit and implement an Erosion and Sedimentation Control (ESC) Plan for construction activities related to the demolition of the existing buildings and the construction of the new building. The ESC Plan will conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit and specific municipal requirements for the City of Boston.

Prerequisite 2: Environmental Site Assessment

Prior to the start of construction, Children's will conduct a Phase 1 Environmental Site Assessment per ASTM E1527-05. If there is contamination suspected on the site, a Phase 2 Environmental Site Assessment will be conducted per ASTM E1903-97.

Credit 1: Site Selection

The site is located on previously developed urban site of the Boston Children's Hospital Campus in the Longwood Medical and Academic Area.

Credit 2: Development Density and Community Connectivity

The site is on the Boston Children's Hospital Campus in the Longwood Medical and Academic Area bordering many other hospital institutions and research facilities. The surrounding community is replete with housing, restaurants, shops, educational institutions, and other community amenities.

Credit 3: Brownfield Redevelopment

The site may be classified as a Brownfield Site and will be assessed for hazardous materials.

Credit 4.1: Alternative Transportation, Public Transportation Access

The site is located within a ½ mile of a wide array of alternative mode choices. BCH is located near two major MBTA Green Line stations. To the east, the Longwood Medical Station is located along the Green Line-E Branch at the intersection of Huntington Avenue and Longwood Avenue. To the west, the Green Line's Longwood Station, on the D Branch, is located along Chapel Street. The Core Campus is also located within ¼ mile of more than 10 public bus routes that are operated by the MBTA, providing access to and from downtown Boston, Cambridge, and the suburbs. Ruggles Station, a commuter rail and Orange Line station and bus hub is located just under a mile away from the Core Campus. MASCO and Children's both provide private shuttle buses from Longwood Avenue to Ruggles Station during peak commuter hours.

Credit 4.2: Alternative Transportation—Bicycle Storage and Changing Rooms

Appropriate bicycle storage facilities may be provided to encourage cycling as an alternate form of transportation. BCH and/or tenants will provide appropriate measures to ensure that cycling is a convenient form of transportation.

BCH currently maintains nearly 606 bicycle spaces throughout their LMA campus. These racks serve both employees and visitors. Additional racks will be provided with the opening of 57 Binney Street which is currently under construction. Additionally, Children's participates in CommuteWorks' Commute Fit Program that provides rewards to employees who bicycle, walk, or rollerblade to work, based on the miles they log.

As part of ongoing planning, BCH is exploring the feasibility of providing new bicycle storage for up to 5 percent of total new employees, and shower and changing facilities for up to 0.5 percent of total new employees that would be employed with the Children's Clinical Building.

Credit 4.3: Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles

The current Patient and Family Parking Garage provides several parking spots dedicated to Zipcar vehicles. The Children's Clinical Building will explore adding additional parking spots for Low Emitting and Fuel Efficient Vehicles.

Credit 4.4: Alternate Transportation Parking Capacity

There is no parking (existing or new) associated with the development.

Credit 5.1: Site Development, Protect or Restore Habitat

The plantings on the roof terrace and expansion of existing gardens will be considered for contributions to restoring natural habitat.

Credit 5.2: Site Development—Maximize Open Space

The overall area of the roof terrace and the expansion of gardens contribute to the urban open spaces. This credit is being studied.

Credit 6.1: Stormwater Design—Quantity Control

The site has existing impervious areas that are greater than 50 percent of the entire site. The Proponent will study the ability to implement a stormwater management plan that results in a 25 percent decrease in the volume of stormwater runoff from the two-year, 24-hour design storm.

SS Credit 6.2: Stormwater Design – Quality Control

BCH will study the implementation of a stormwater management plan that reduces impervious cover, promotes infiltration, and captures and treats the stormwater runoff from 90% of the average annual rainfall using acceptable BMPs. The BMPs studied will be capable of removing 80% of the average annual post-development total suspended solids (TSS) load based on existing monitoring reports. BCH will work with the BWSC and the state in adopting a design that meets the city and state standards.

Credit 7.1: Heat Island Effect, Non-Roof

The development may use sidewalk surfacing materials that meet or exceed SRI value limits.

Credit 9.1: Connection to the Natural World—Places of Respite

The development's various green open spaces will provide patients and families places of respite for 5% of the net program area and a staff respite area for 2% of the net program area.

Water Efficiency

Prerequisite 1: Water Use Reduction, 20% Reduction

Through the use of low flow and high efficiency plumbing fixtures, the development will implement water use reduction strategies that use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

Prerequisite 2: Minimize Potable Water Use for Medical Equipment Cooling

The selected medical equipment will be selected to reduce usage of potable water.

Credits 1: Water Efficient Landscaping, Reduce by 50%, No Potable Use or No Irrigation

The development will not have a permanent irrigation system. Vegetated roofs will have drought tolerant plant materials that may require occasional watering by hand.

Credit 2: Water Use Reduction: Measurement & Verification

Children's has a rigid measurement and verification program for its M/E/P systems.

Credit 3: Water Use Reduction

Specified fixtures will include high efficiency toilets and urinals, low flow lavatory faucets and ultra-low flow shower heads. The goal is an overall water savings of 30% above the calculated baseline.

Credit 4.1: Water Use Reduction—Building Equipment

Building system equipment will be selected to minimize use of potable water for non-potable process use.

Credit 4.2: Water Use Reduction—Cooling Towers

Cooling towers will be selected to minimize use of potable water.

Energy and Atmosphere

Prerequisite 1: Fundamental Commissioning of the Building Energy Systems

A third party Commissioning Agent (CxA) will be engaged by BCH for purposes of providing both basic and enhanced commissioning services for the building energy related systems, including heating, ventilation, air conditioning, and refrigeration (HVAC & R), lighting and domestic hot water systems. The CxA will verify the building systems are installed, calibrated and performing to the building owner's requirements.

Prerequisite 2: Minimum Energy Performance

The building performance rating will demonstrate a minimum of a 10% improvement compared to the baseline building performance calculated using the rating method in Appendix G of ANSI/ASHREA/IESNA Standard 90.1-2007. A whole building energy simulation will demonstrate the projected energy savings for the development.

Prerequisite 3: Fundamental Refrigerant Management

The specifications for refrigerants used in the building HVAC & R systems will NOT permit the use of CFC based refrigerants. All refrigerants specified will be acceptable to LEED standards.

Credit 1: Optimize Energy Performance

The proposed building systems will target a performance level of a minimum of 20% improvement over a baseline building performance rating. The team will develop a whole building energy model to demonstrate the expected performance rating of the designed building systems.

Children's is currently considering several cogeneration options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to consider and evaluate these and other options and alternatives as its planning evolves.

CHP is the simultaneous production of electrical energy (power) and useful thermal energy from a single energy source. By capturing and using heat energy from an effluent stream that otherwise would be discharged to the environment, CHP (or cogeneration) systems can operate at efficiencies that are not achieved when heat and power are produced through separate processes.

Traditional power plants operate with efficiencies around 35%, while cogeneration allows for efficiencies around 80% due to the capture and use of the systems waste heat. The degree of use of the available waste heat will determine the overall system efficiency, and thus is the critical factor in economic feasibility.

The feasibility and design of the CHP system will depend on the magnitude, duration, and coincidence of electrical and thermal loads for the service area. Integrating design of the Children's Clinical Building and the campus electrical and thermal requirements with the CHP plant is required for optimum economic performance.

Credit 3: Enhanced Commissioning

The CxA will be engaged during the design process. The CxA's role will include reviewing the owner's development requirements, creating, distributing and implementing a commissioning plan, and performing a design review of the design development and construction documents.

Credit 4: Enhanced Refrigerant Management

Long life, high-efficiency mechanical equipment will be specified for the HVAC systems, and the refrigerants specified for the systems will have low ozone-depletion and global warming potentials. All refrigerants specified will be acceptable to LEED standards.

Credit 5: Measurement and Verification

Children's will continue to develop and implement a measurement and verification plan for its campus. New energy meters will be included in the design of the building.

Material & Resources

Prerequisite 1: Storage and Collection of Recyclables

Storage of collected recyclables shall be accommodated throughout the building.

Prerequisite 2: PBT Source Reduction—Mercury

The development will comply with 2010 FGI Guidelines for Design and Construction of Health Care Facilities.

Credits 2: Construction Waste Management

Prior to the start of construction, the Construction Manager (CM) will prepare a Construction Waste Management plan. The CM will endeavor to divert as much demolition debris and construction waste from area landfills as possible with a goal of achieving 75% diversion.

Credits 3: Sustainably Sourced Materials and Products

The development specifications will require sustainably sourced materials and products. During construction, materials submittals will include a document indicating the origin, recycled content, and sustainable product certification. The CM will track the material with a goal to achieve 20% sustainably sourced materials and products based on overall materials costs.

Credits 4.1: PBT Source Reduction—Mercury in Lamps

The development specifications will require lighting products that meet LEED Healthcare credit 4.1 requirements. During construction, materials submittals will include documentation that meets the criteria.

Credits 4.2: PBT Source Reduction—Lead, Cadmium, and Copper

The development specifications will require materials and paint, exterior/interior, that are lead free. During construction, materials submittals will include documentation that meets the criteria.

Credits 5: Furniture and Medical Furnishings

The development specifications will require sustainably sourced materials and products for all furniture and medical furnishing. During construction, materials submittals will include a document indicating the origin, recycled content, and sustainable product certification. The CM will track the material with a goal to achieve 30% sustainably sourced materials and products based on overall materials costs.

Indoor Environmental Quality

Prerequisite 1: Minimum Indoor Air Quality (IAQ) Performance

The building mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standard 61.1-2007 sections 4 through 7 and/or applicable building codes.

Prerequisite 2: Environmental Tobacco Smoke (ETS) Control

The building will be a non-smoking environment.

Credit 1: Outdoor Air Delivery Monitoring

The development will incorporate permanent CO_2 sensors and measuring devices to provide feedback on the performance of the HVAC system. Devices will be programmed to generate an alarm when the conditions vary by 10% from a set point.

Credit 2: Acoustic Environment

The development will be designed to meet the sound and vibration criteria outlined in the 2010 FGI Guidelines for Design and Construction of Health Care Facilities and the Sound and Vibration Design Guidelines for Design and Construction of Health Care Facilities.

Credit 3.1: Construction IAQ Management Plan (during construction)

The CM will develop an Indoor Air Quality Management Plan for the construction and pre-occupancy phases of the building to meet/exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter3). Absorptive materials stored on site will be protected from moisture damage.

Credit 3.2: Construction IAQ Management Plan (before occupancy)

After the completion of construction and prior to occupancy, Children's will conduct baseline IAQ testing to demonstrate that contaminant maximum concentrations are not exceeded.

Credits 4: Low-Emitting Materials, Adhesives & Sealants

The specifications will include requirements for all materials to meet low Volatile Organic Compounds (VOC) criteria.

Credit 5: Indoor Chemical and Pollutant Source Control

The development team will design the building to minimize and control the entry of pollutants into the building and to contain chemical use areas.

Credit 6.1: Controllability of Systems, Lighting

It is the intent of the design to provide individual lighting controls for regularly occupied spaces. The controls may include vacancy/occupancy sensors and day light dimming controls. Multi-occupant user spaces such as classrooms will have multi-level lighting controls for modifying light levels as necessary for the various uses. All controls in the different types of space will meet guidelines specified in LEED for Health Care.

Credit 6.2: Controllability of Systems, Thermal Comfort

It is the intent of the design to provide individual temperature controls for regularly occupied spaces and every patient room.

Credit 7: Thermal Comfort—Design and Verification

The development will meet ASHRAE Standard 55-2004 Thermal Comfort Condition for Human Occupancy and 2010 FGI Guidelines for Design and Construction of Health Care Facilities. A permanent monitoring system will also be implemented to monitor building performance to meet the criteria above.

Innovation in Design

Credit 1: Innovation in Design: Development Density

Option 1 of Credit 2 requires that a new building or renovation project on a previously developed site and in a community with a minimum density of 60,000 sf per acre. An exemplary performance credit can be achieved for a new building or renovation project on a previously developed site and in a community with a minimum density of 120,000 sf per acre. The LMA has an average density that far exceeds the minimum density requirement for the surrounding area. Further, a development density of 120,000 sf per acre equates to an overall Floor Area Ratio of about 2.8. The Children's Clinical Building is proposed at a density in exceedance of the minimum threshold set forth by SS Credit 2: Development Density.

Credit 1.2: Innovation in Design: Public Transportation

Children's has a wide network of shuttles for staff, patient, and family that augment MBTA facilities.

Credit 2: LEED Accredited Professional

The development team will include a LEED Accredited Professional.

3.2.13.2 819 Beacon Street

The 819 Beacon Street building will be certifiable, at minimum, currently anticipated to receive 48 credit points. There are 11 additional credits, listed in italics below, still being considered to determine if appropriate.

Sustainable Sites

The 819 Beacon Street site is in a dense urban neighborhood close to several public transportation options. The proposed design includes leased retail space on the ground floor. The development includes 277 net new parking spaces.

Prerequisite 1 Construction Activity Pollution Prevention

The Construction Manager will submit and implement an Erosion and Sedimentation Control (ESC) Plan for construction activities related to the construction of the new building specific to this project. The ESC Plan will conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit and specific municipal requirements for the City of Boston.

Credit 1 Site Selection

The site is currently used as surface parking lot with a capacity of 249 parking spaces.

Credit 2 Development Density and Community Connectivity

The site is in the Audubon Circle neighborhood of Boston bordering on the Back Bay neighborhood. The surrounding community is replete with housing, restaurants, shops, grocery stores, educational and religious institutions, performance venues and other community amenities.

Credit 4.1 Alternative Transportation, Public Transportation Access

There are three MBTA subway stations located within approximately 0.1 mile from the site. There are 10 bus routes that pass directly by or in close proximity to the site. Other MBTA stations in close proximity include the Symphony Green Line station (0.3 mile), the

Prudential Green Line station (0.3 mile), and the Massachusetts Avenue Orange Line station (0.4 mile). Additionally, the Yawkey Commuter Rail station is approximately 500 feet away.

Credit 4.2 Alternate Transportation-Bicycle Storage and Changing Rooms

Bicycle racks or storage will be provided for at least 5% of all building users. Shower and changing facilities for 0.5% of full-time occupants will be provided.

Credit 4.3 Alternate Transportation-Low-emitting and Fuel-efficient Vehicles

The development may consider dedicating 5% of the vehicle parking capacity to low-emitting and fuel-efficient vehicles.

Credit 6.1 Stormwater Design, Quantity Control

The development will implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the two-year, 24-hour design storm.

Credit 6.2 Stormwater Design, Quality Control

The development may consider treating captured stormwater prior to release into the municipal storm sewer system.

Credit 7.1 Heat Island Effect, Non-Roof

The development will use sidewalk surfacing materials that meet or exceed SRI value limits.

Credit 8 Light Pollution Reduction

The development will design interior and exterior lighting that meets or exceeds requirements to minimize light pollution.

Water Efficiency

The development will specify low flow and high efficiency plumbing fixtures to achieve Water Efficiency.

Prerequisite 1 Water Use Reduction, 20% Reduction

Through the use of low flow and high efficiency plumbing fixtures, the development will implement water use reduction strategies that use 20% less water than the water use baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

Credit 2 Innovative Wastewater Technologies

The development will implement measures that reduce potable water use for building sewage conveyance by 50%.

Credit 3 Water Use Reduction

Specified fixtures will include high efficiency toilets and urinals, low flow lavatory faucets and ultra low flow shower heads. The development's goal is an overall water savings of 30% above the calculated baseline.

Energy and Atmosphere

The building systems will be designed to optimize energy performance and will not use refrigerants that are harmful to the environment. The owner will engage a CxA to confirm the building systems are installed and function as intended and designed.

Prerequisite 1 Fundamental Commissioning of the Building Energy Systems

A third party CxA will be engaged by the owner for purposes of providing both basic and enhanced commissioning services for the building energy related systems, including HVAC & R, lighting and domestic hot water systems. The CxA will verify the building systems are installed, calibrated and performing to the building owner's requirements.

Prerequisite 2 Minimum Energy Performance

The building performance rating will demonstrate a minimum of a 10% improvement compared to the baseline building performance calculated using the rating method in Appendix G of ANSI/ASHREA/IESNA Standard 90.1-2007. A whole building energy simulation will demonstrate the projected energy savings for the building.

Prerequisite 3 Fundamental Refrigerant Management

The specifications for refrigerants used in the building HVAC & R systems will NOT permit the use of CFC based refrigerants.

Credit 1 Optimize Energy Performance

The proposed building systems will target a performance level of a minimum of 20% improvement over a baseline building performance rating. The team will develop a whole building energy model to demonstrate the expected performance rating of the designed building systems.

Credit 3 Enhanced Commissioning

The CxA will be engaged during the design process. The CxA's role will include reviewing the owner's building requirements, creating, distributing and implementing a commissioning plan, and performing a design review of the design development and construction documents.

Credit 5 Measurement and Verification

A measurement and verification plan will be developed and implemented for the building.

Credit 6 Green Power

Children's may choose to purchase 'green power' via a two-year renewable energy contract to provide a minimum of 35% of the building's electricity from renewable sources.

Materials and Resources

Throughout the construction phase, the development team will endeavor to divert construction and demolition waste from area landfills and procure materials that have recycled content and/or are manufactured locally.

Prerequisite 1 Storage and Collection of Recyclables

Storage of collected recyclables will be accommodated throughout the building.

Credit 2 Construction Waste Management

Prior to the start of construction, the CM will prepare a Construction Waste Management plan. The CM will endeavor to divert as much demolition debris and construction waste from area landfills as possible with a goal of achieving 50% diversion.

Credit 4 Recycled Content

The development may specify materials to include pre- and or post-consumer recycled content. During construction, materials submittals may include a document indicating the percentage of both pre-and post-consumer recycled content. The CM may track the recycled content for each material with a goal to achieve 10% recycled-content materials based on overall materials costs.

Credit 5 Regional Materials

The development specifications will indicate which materials are to be extracted, harvested, recovered and manufactured within a 500 mile radius of the site. The development team's goal is that 10% of the materials used be regional materials. The CM will track the source location for each material with a target to achieve 10% regional materials based on overall materials costs.

Credit 6 Rapid Renewable Materials

The development may specify rapidly renewable building materials and products for 2.5% of the total value of all building materials and products used.

Credit 7 Certified Wood

The development will use a minimum of 50% FSC certified wood for wood permanently installed inside the building envelope.

Indoor Environmental Quality

The air quality will be monitored during the construction phase of the building and likely prior to occupancy. Low emitting materials will be used throughout construction to maintain and improve air quality. The building occupants will be able to maintain a comfortable environment through access to thermal and lighting controls.

Prerequisite 1 Minimum Indoor Air Quality (IAQ) Performance

The building mechanical systems are designed to meet or exceed the requirements of ASHRAE Standard 61.1-2007 sections 4 through 7 and/or applicable building codes.

Prerequisite 2 Environmental Tobacco Smoke (ETS) Control

The building will be a non-smoking environment.

Credit 1 Outdoor Air Delivery Monitoring

The development will incorporate permanent CO_2 sensors and measuring devices to provide feedback on the performance of the HVAC system. Devices will be programmed to generate an alarm when the conditions vary by 10% from a set point.

Credit 2 Increased Ventilation

The development will incorporate measures that meet the requirements of providing additional outdoor air ventilation to improving indoor air quality.

Credit 3.1 Construction IAQ Management Plan (during construction)

The CM will develop an Indoor Air Quality Management Plan for the construction and pre-occupancy phases of the development to meet/exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied Buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter3). Absorptive materials stored on site will be protected from moisture damage.

Credit 3.2 Construction IAQ Management Plan (before occupancy)

After the completion of construction and prior to occupancy, Children's will conduct baseline IAQ testing to demonstrate that contaminant maximum concentrations are not exceeded.

Credits 4.1 Low-Emitting Materials, Adhesives & Sealants

The development specifications will include requirements for adhesives and sealants to meet low VOC criteria for adhesives and sealants.

Credits 4.2 Low-Emitting Materials, Paints and Coatings

The development specifications will include requirements for paints and coatings to meet low VOC criteria for paints and coatings.

Credits 4.3 Low-Emitting Materials, Flooring Systems

The specifications will include requirements for hard surface flooring materials to be FloorScore certified and carpet systems will comply with the Carpet Institute Green label program.

Credit 4.4 Low Emitting Materials, Composite Wood and Agrifiber Products

The development team will endeavor to use composite wood and agrifiber products that contain no added urea-formaldehyde.

Credit 5 Indoor Chemical and Pollutant Source Control

The development team will design the building to minimize and control the entry of pollutants into the building and to contain chemical use areas.

Credit 6.1 Controllability of Systems, Lighting

It is the intent of the design to provide individual lighting controls for regularly occupied spaces. The controls may include vacancy/occupancy sensors and day light dimming controls. Multi-occupant user spaces will have multi-level lighting controls for modifying light levels as necessary for the various uses.

Credit 6.2 Controllability of Systems, Thermal Comfort

It is the intent of the design to provide individual temperature controls for regularly occupied spaces.

Credit 7.1 Thermal Comfort - Design

The development team will design HVAC systems and the building envelope to meet requirements of ASHRAE standard 55-2004, and demonstrate design compliance in accordance with the Section 6.1.1 documentation.

Credit 7.2 Thermal Comfort - Verification

Children's will conduct a thermal comfort survey of building occupants within 6 to 18 months after occupancy, and make the necessary adjustment to maximize building occupant's thermal comfort over time.

Credit 8.1 Daylight and Views, Daylight for 75% of the spaces

The development team may develop the design to locate regularly occupied spaces along the perimeter of the floor plate with ample vision glass to achieve daylight for 75% of the areas.

Credit 8.2 Daylight and Views, Views for 90% of the spaces

The development team may develop the design to locate regularly occupied spaces along the perimeter of the floor plate with ample vision glass to achieve views for 90% of the areas, below-grade areas excepted.

Innovation & Design Processes

Credit 1.1 Double Transit Ridership

The site's close adjacency to several subway, bus and commuter rail stations with a frequency of service results in over 200 transit rides per day.

Credit 2 LEED Accredited Professional

A LEED accredited professional will be part of the 819 Beacon Street development team.

3.3 Urban Design

3.3.1 Core Campus Projects

Children's Clinical Building

The Children's Clinical Building site is bounded by Shattuck Street on the south, Meadow Lane on the east, the Fegan Building on the north and the Farley Building on the west. Currently, Meadow Lane and Shattuck Street are not frequently used by pedestrians. The area is mostly a service zone, shared by Harvard Medical School (HMS), Brigham and Women's Hospital (BWH), Children's and Dana-Farber Cancer Institute (for the Jimmy Fund Building). Along Shattuck Street, there are entries for the BWH ambulance dock, the Children's staff shuttle, a loading dock for both Children's and BWH and a loading dock for the Jimmy Fund Building. Meadow Lane is currently owned by HMS, and there are mechanical spaces under the street serving the HMS campus.

The site of the proposed Children's Clinical Building will provide approximately 37,500 sf of buildable area at ground level and below. In order to achieve a feasible floor plate area for the inpatient bed floors and to maximize the site, the floor plate will increase with building height. This increase of the floor plate size will be achieved on levels 2 through 10.

The height of the Children's Clinical Building will be approximately 161 feet to the top of the last occupiable floor and 175 feet above grade to the top of mechanical floors, which is similar to Children's Main South Building and other buildings in the vicinity. In addition, the existing helicopter path to BWH necessitates that the building's roof be below the height of the helipad. The mechanical penthouse has been designed to be lower along Shattuck Street to clear the required helicopter approach path.

The Children's Clinical Building will meet the prevailing setbacks of the area, which currently vary along Shattuck Street. Along Meadow Lane, the set back will be approximately eight feet from the property line. Section 2.2 includes a discussion of the consistency with the LMA Interim Guidelines.

Patient and Family Parking Garage Addition

The additional parking level on the Patient and Family Parking Garage will have minimum visual impact on the surroundings due to its shorter height in comparison to adjacent buildings, including the 16-story Karp Family Research Laboratories and 18-story Center for Life Science Boston. The exterior of the added floor will be closely matched to the existing garage to create a seamless addition.

3.3.2 819 Beacon Street

The 819 Beacon Street site currently includes a surface parking lot surrounded by a mix of uses, including surface parking lots, commercial, institutional, entertainment and residential space. The design of the 819 Beacon Street building is based on a mixed-use approach that not only responds to the physical constraints associated with this complex site, but also complements and connects the existing urban fabric.

The massing is defined by the mid-rise residential building to the west and the adjacent Fenway Center development ranging from seven to 27 stories across Maitland Street. The garage portion of the building is placed at the lower elevation of the site to minimize the visual impact from public streets. The garage is also located on the southern side of the site away from the more residential areas in the neighborhood. The retail and office programs are placed along Beacon Street to shield the garage and to promote a continuous and pedestrian-friendly street experience which activates the streetscape.

3.4 Historic and Archaeological Resources

3.4.1 Historic Resources within the Vicinity of Boston Children's Hospital Campus

3.4.1.1 Children's Campus

Children's owns 19 buildings in and around the LMA, most of which are located within the Core Campus on Longwood Avenue. None of the buildings owned by Children's are listed in the State and National Registers of Historic Places. Two properties owned by Children's are included in the *Inventory of Historic and Archaeological Assets of the Commonwealth* (the Inventory) maintained by the Massachusetts Historical Commission (MHC); these include:

- Hunnewell Building/Formerly known as Children's Hospital Administration Building, 300 Longwood Avenue, (MHC# BOS.7513); and
- Wolbach Building/formerly known as Thomas M. Rotch Jr. Memorial Hospital For Infants, 55 Shattuck Street (MHC# BOS.7683).

3.4.1.2 Historic Resources within the Vicinity of the Children's Campus

Five historic resources listed in the State and National Registers of Historic Places are in the vicinity of the Children's campus, defined here as within a quarter-mile radius of the campus. These properties include: the Olmsted Park System, the Isabella Stewart Gardner Museum, Massachusetts School of Art, the site of the Massachusetts Mental Health Center, and the Mission Hill Triangle District.

In addition, several properties included in the Inventory are located in the vicinity of the Children's campus. The properties listed in the State and National Registers of Historic Places, and properties included in the MHC Inventory within a quarter-mile radius of the

Children's campus are listed in Table 3-8. Figure 3-1 depicts the locations of these properties.

Table 3-8 Historic Resources Within and in the Vicinity of the Core Campus

No.	Name	Address
State and National Register-Listed Resources		
A	Olmsted Park System	Sections of the Back Bay Fens, Emerald Necklace Parks
B	Isabella Stewart Gardner Museum	280 The Fenway
C	Massachusetts School of Art	364 Brookline Avenue
D	Massachusetts Mental Health Center site and complex	74 Fenwood Road
E	Mission Hill Triangle District	Huntington Avenue, Smith, Worthington, Wigglesworth and Tremont streets
Properties included in the *Inventory of Historic and Archaeological Assets of the Commonwealth*		
1	Southwest Fenway District	The Fenway
2	Emmanuel College Main Building	400 The Fenway
3	Simmons College Main Building	300 The Fenway
4	Francis Street and Fenwood Road District	Francis Street and Fenwood Road
5	Winsor School	103 Pilgrim Road
6	Simmons College, North Hall	86 Pilgrim Road
7	Simmons College, Refectory	Behind Pilgrim Road
8	Simmons College, South Hall	321 Brookline Avenue
9	Former New England Deaconess Hospital Building	175 Pilgrim Road
10	Former Palmer Hospital Building	195 Pilgrim Road
11	Boston Public Latin School	78 Avenue Louis Pasteur
12	Vanderbilt Hall	245 Longwood Avenue
13	Boston Lying In Hospital	221 Longwood Avenue
14	Massachusetts College of Pharmacy	179 Longwood Avenue
15	Girl's Latin School and Normal School	Palace Road, Tetlow Street, Huntington Avenue
16	Hunnewell Building / Former Children's Hospital Administration Building*	300 Longwood Avenue
17	Harvard Medical School District	210, 220, 230, 240, 260 Longwood Avenue and 25 Shattuck Street
18	Harvard Dental School	188 Longwood Avenue
19	Former Angell Memorial Hospital	180 Longwood Avenue
20	Westcourt Apartment Block	164 Longwood Avenue
21	Carlton Apartment Block	160 Longwood Avenue
22	Wolbach Building/Former Thomas M. Rotch Jr. Memorial Hospital For Infants *	55 Shattuck Street
23	Peter Bent Brigham Hospital	721 Huntington Avenue/ 15 Francis Street
24	Farragut School	10 Fenwood Road
25	Thomas Maquire Apartment Houses	6-16 Wait Street

Key: * Property located within the Children's Campus

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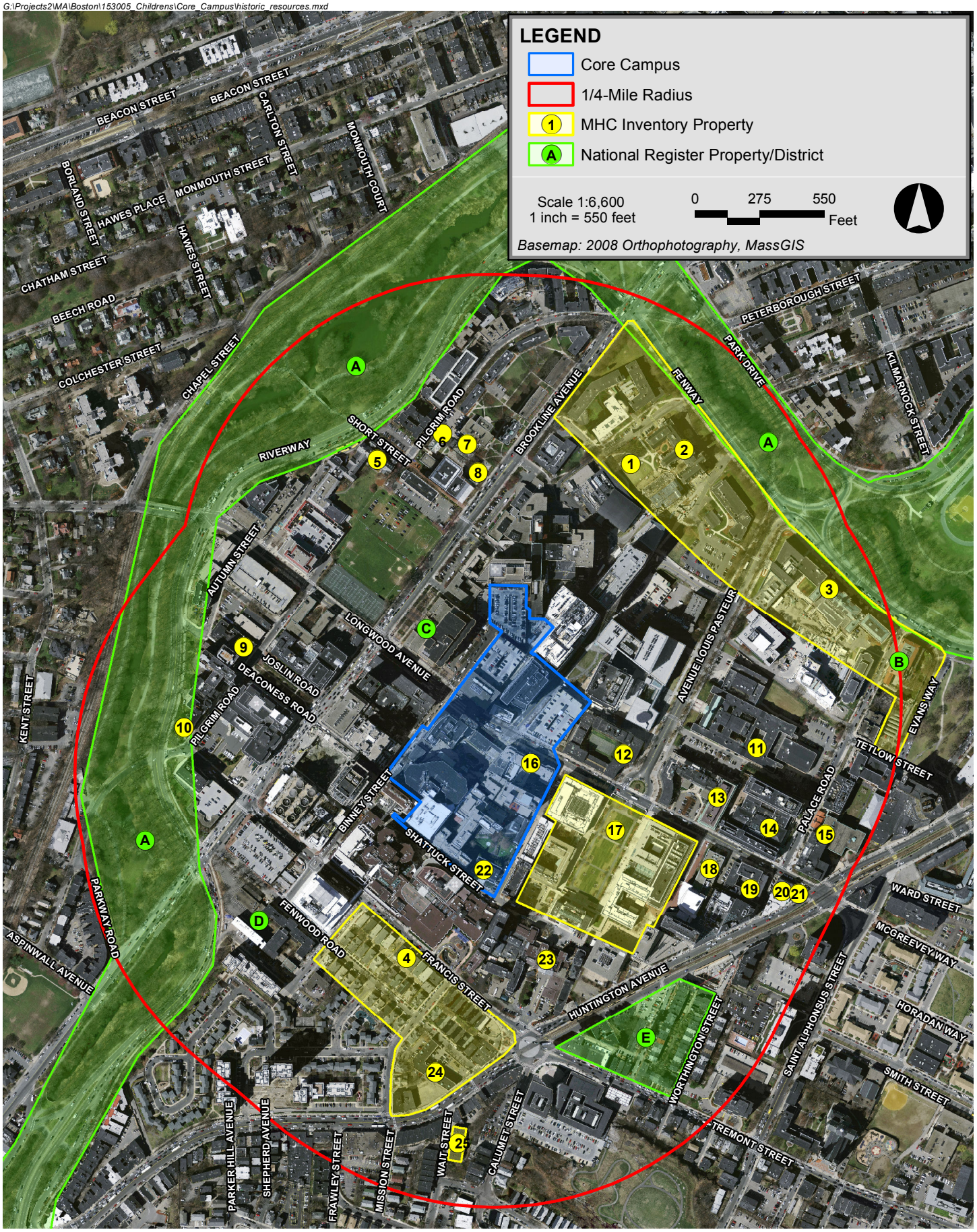

Boston Children's Hospital

Epsilon Associates Inc.

Figure 3-1

Historic Resources Proximate to Core Campus

3.4.2 Historic Resources within the Vicinity of 819 Beacon Street

3.4.2.1 819 Beacon Street

The 819 Beacon Street site currently consists of a surface parking lot with no built structures. In the vicinity of the site are numerous properties and historic districts included in the State and National Registers of Historic Places and in the MHC Inventory. Historic districts in the vicinity of the Project site include the Back Bay Fens, the Bay State Road – Back Bay West Architectural Conservation District and the Charles River Basin Historic District. Figure 3-2 depicts historic resources within a one-quarter mile radius of the Project area. These historic resources are also listed in Table 3-9 below.

3.4.3 Archaeological Resources

There are no known archaeological resources within the Children's Core Campus or on the 819 Beacon Street site. Both Project sites are previously developed urban parcels. A review of the Inventory indicates there are no previously identified archaeological resources within the Project sites. Due to previous development and related site disturbances, it is anticipated that neither site contains significant archaeological resources.

3.4.4 Potential Impacts

Development of the Children's Clinical Building will require some demolition activities on the Children's campus, including the Wolbach Building. As the Children's Clinical Building advances, Children's will coordinate review of the CCB by the Boston Landmarks Commission (BLC) in accordance with Article 85 of the Boston Zoning Code, as necessary.

Children's will consult with MHC in accordance with M.G.L. Chapter 9, Sections 26-27C (950 CMR 71.00), as necessary, to assess potential impacts to significant historic resources. If impacts associated with any proposed Project are unavoidable, Children's will work with MHC and interested parties, such as BLC and the Boston Preservation Alliance, in developing appropriate measures to mitigate Project impacts to historic resources.

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Boston Children's Hospital

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Figure 3-2

Historic Resources Proximate to 819 Beacon Street Site

Table 3-9 Historic Resources in the Vicinity of 819 Beacon St.

No.	State and National Register Listed Properties	Address
A	Sears Roebuck Mail Order Store	309 Park Drive
B	Back Bay Fens	Emerald Necklace
C	Charles River Basin Historic District	Both banks of the Charles River from the Eliot Bridge to the Charles River Dam
D	Bay State Road Architectural Conservation District	Bay State Road
Properties included in the *Inventory of Historic and Archaeological Assets of the Commonwealth*		
1	Audubon Circle District	Park Drive, Beacon, St. Mary's, Aberdeen, Keswick and Medford Streets
2	Richardson Building	5-15 Jersey Street, 76-88 Brookline Avenue
3	Fenway Park	24 Yawkey Way
4	Industrial building	2 Cummington Street
5	Nash New England Company Building	30-38 Cummington Street
6	Industrial building	48-60 Cummington Street
7	Industrial building	64-86 Cummington Street
8	William A. Hayes Automobile Garage	96-100 Cummington Street
9	Henry Turner Stable and Blacksmith Shop	110-112 Cummington Street
10	Commonwealth Hall Apartment Building	718 Commonwealth Avenue
11	Braman House	714 Commonwealth Avenue
12	Sleeper House	710 Commonwealth Avenue
13	Neal House	708 Commonwealth Avenue
14	Alden Hall Apartment House	704 Commonwealth Avenue
15	Boston University	685-771 Commonwealth Avenue
16	Boston University Communication Park	630-640 Commonwealth Avenue
17	Nash New England Company Building	640 Commonwealth Avenue
18	Temple Adath Israel	602 Commonwealth Avenue
19	Remington Rand Building	635 Commonwealth Avenue
20	Cummings-Wolf House	627 Commonwealth Avenue
21	Fannie Hurlburt House – Commonwealth Hospital	621 Commonwealth Avenue
22	S.M. Slapleigh House – Commonwealth Hospital	619 Commonwealth Avenue
23	Lahey Clinic	605 Commonwealth Avenue
24	590 Commonwealth Avenue Plaza	590 Commonwealth Avenue
25	General Tire and Rubber Company	565 Commonwealth Avenue
26	Hotel Buckminster	645 Beacon Street
27	Industrial building	677 Beacon Street
28	Wedgemere Chambers Apartment House	806-820 Beacon Street
29	WD Vinal & George Wheatland Jr Rowhouses	822-836 Beacon Street
30	Audubon Restaurant	838 Beacon Street
31	Apartment houses	840-842 Beacon Street
32	Arundel Apartment House	844 Beacon Street

Table 3-9 Historic Resources in the Vicinity of 819 Beacon St. (Continued)

No.	State and National Register Listed Properties	Address
Properties included in the *Inventory of Historic and Archaeological Assets of the Commonwealth*		
33	WD Vinal Apartment House	848-852 Beacon Street
34	Apartment houses	854 Beacon Street
35	Wheatland & Vinal Rowhouses	856-864 Beacon Street
36	WD Vinal Rowhouse	872 Beacon Street
37	Mountfort Chambers	46 Mountfort Street
43	Carminea Apartment House	24 Buswell Street
44	Longford Apartment Building	1 Buswell Street
45	Melbourne Apartment House	1A Buswell Street
46	Warren Vinal Rowhouses	3-11 Buswell Street
47	Rowhouses	15-17 Buswell Street
48	Plymouth Apartment House	509 Park Drive
49	Royal Apartment House	515 Park Drive
50	Amsterdam Apartment House	519 Park Drive
51	Audubon Court Apartment House	514-522 Park Drive
52	Apartment House	506 Park Drive
53	Rowhouse	27 Buswell Street
54	Warren Vinal Rowhouse	29-47 Buswell Street
55	George White Two Family House	8-16 Aberdeen Street
56	Mark Lewis Row House	25-27 Aberdeen Street
57	Martin Millmore School	85 Peterborough Street
58	Edison Electric Illuminating Transformer Station	693 Beacon Street
59	Back Bay Realty Association Garage	111 Cummington Street
60	Mayfield Chambers	96 Mountfort St
61	Howard Coon Row House	845-847 Beacon St
62	Kenmore Subway Station	Commonwealth Ave

3.5 Infrastructure Systems

This section includes a description of the infrastructure systems that will support the BCH 2012 IMP Amendment Projects. Various Projects will connect to existing City and utility company systems in the adjacent public streets. A preliminary evaluation is provided for the following utilities: wastewater, water, stormwater management, natural gas, electricity, and telecommunications. In addition, the feasibility of sustainable elements of the energy supply provision for the Core Campus is under consideration.

The final design process will include required engineering analyses, and will adhere to applicable protocols and design standards ensuring that the proposed buildings are properly supported by, and in turn properly use the City's infrastructure. Detailed design of the Project's utility systems will proceed in conjunction with the final design of the buildings and their interior mechanical systems.

The systems discussed below include those owned or managed by the Boston Water and Sewer Commission (BWSC), private utility companies, and on-site infrastructure systems. There will be close coordination among these entities and with the Projects' engineers and architects during the construction process.

All improvements and connections to BWSC infrastructure will be reviewed by BWSC 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.

3.5.1 Regulatory Framework

All connections will be designed and constructed in accordance with city, state, and federal standards.

- BWSC approval will be required for all water, sewer, and stormwater systems.
- Sewer connection self-certifications and/or permits will be filed with MassDEP depending on the total expected sewer discharge expected from each building.
- The Boston Fire Department will review the proposed Projects with respect to fire protection measures, such as siamese connections, hydrants, and standpipes.
- Design of the site access, hydrant locations, and energy systems (gas 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.
- MassDEP approvals and permits will be secured as required for the CHP facilities.

Additional information on the regulatory framework for each utility system is included in subsequent sections of this section.

A more complete list of state and local permits anticipated is included in Chapter 2.

3.5.2 Wastewater

3.5.2.1 Existing Wastewater

Local sanitary sewer service in the City is provided by the BWSC. Both the Core Campus and 819 Beacon Street sites are serviced by sewer mains in the adjacent public and privately-owned streets. Adjacent to the Core Campus are the following sanitary sewer lines:

- A 12-inch gravity sewer in Binney Street;
- 39 x 41-inch gravity sewer in Blackfan Circle;
- 12-inch gravity sewer in Children's Way; and
- 15-inch and 24-inch gravity sewers in Longwood Avenue.

The 819 Beacon Street site is located adjacent to a 20-inch gravity sewer main located in Beacon Street.

All wastewater collected by BWSC facilities are conveyed to the Massachusetts Water Resources Authority's (MWRA) Deer Island treatment plant where, after treatment, it is discharged 9.5 miles out into Massachusetts Bay.

3.5.2.2 Demand

The CCB and 819 Beacon Street will require either new or modified sanitary sewer service. The Children's Clinical Building, which will consist of mostly medical clinical space, some outpatient services, and office/administrative space, is located on the Core Campus and will generate approximately 77,525 gallons per day (gpd) of wastewater, not including the potential Combined Heat and Power Facility, as broken down in greater detail in Table 3-10.

A Combined Heat and Power Facility is the simultaneous production of electrical or mechanical energy (power) and useful thermal energy from a single energy source. By capturing and using heat from an effluent stream that otherwise would be discharged to the environment, the cogeneration systems can operate at efficiencies that are not achieved when heat and power are produced through separate processes. In view of concerns about the costs and consequences of fossil-fuel consumption, a combined heating and power plant could present a very economical and environmentally responsible solution. Traditional power plants operate with an efficiency of around 35 percent, while cogeneration allows for efficiencies of up to around 80 percent due to the capture and use of the generators' waste heat.

Children's is currently considering several cogeneration options whose primary facilities will be located in the sub-basement of the Children's Clinical Building. These options range in size from a stand-alone CHP facility that would serve only the Children's Clinical Building to larger CHP facilities that, working in conjunction with CHP facilities on adjoining institutional campuses, would serve the Core Campus as well as several buildings of other institutions. Children's is also considering an option that would serve only the Core Campus. Children's will continue to consider and evaluate these and other options and alternatives as its planning evolves. The CHP facility under consideration would include an underground distribution system throughout the campus and could produce approximately 75,000 gpd of wastewater during peak use operations. The generation will vary depending on the option implemented.

The 819 Beacon Street site will be primarily office and administrative space, which according to the Massachusetts State Environmental Code (Title V) at 310 CMR 15.203 will generate approximately 15,619 gpd of wastewater, again, as broken down in greater detail in Table 3-10.

Table 3-10 Wastewater Generation – Full Build Out

Proposed Project	Gross Floor Area	Flow Rate (gpd)	Sewage Generation (gpd)
Children's Clinical Building[1]			
Clinical	354,700	200/1,000 sf	70,940
Office/Administrative	87,800	75/1,000 sf	6,585
Potential Combined Heat & Power Facility			
SB3 Level of Children's Clinical Building			75,000[2]
Patient & Family Garage Addition			
Open Air Parking	29,370	NA	0
819 Beacon Street	**819 Beacon Street**	**819 Beacon Street**	**819 Beacon Street**
Office/Administrative	Office/Administrative	Office/Administrative	Office/Administrative
Retail	Retail	Retail	Retail
Total New Wastewater Generation			**98,144-193,144**

1 The Children's Clinical Building square footage does not include mechanical areas or other areas excluded from GFA under Article 2A of the Boston Zoning Code.

2 Estimated wastewater generation during peak day operations. The generation will vary depending on CHP option implemented.

Each building will have separate connections to the municipal sewer system. The Children's Clinical Building at 445,000 sf will generate over 50,000 gpd of sewage. Buildings generating these flow rates are required to file a Sewer Connection Permit with MassDEP.

The 819 Beacon Street building will individually generate between 15,000 and 50,000 gpd. Buildings generating these flow rates are required to file a Sewer Connection Self-certification with MassDEP.

3.5.2.3 Proposed Connection

The sewer service connections at the Core Campus will tie directly into the 15-inch main located in Longwood Avenue. The 819 Beacon Street building will potentially tie directly into the 20-inch main located in Beacon Street.

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. In addition, the Proponent will submit a General Service Application and site plan for review as the Projects progress.

3.5.3 Water Infrastructure

3.5.3.1 Existing Water Supply System

Domestic and fire protection water is provided by the BWSC. There are five different water systems/service districts within the City which provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high. Children's Core Campus is serviced by the BWSC southern low water system. BWSC has the following water mains in the street adjacent to the Core Campus:

- 8-inch main in Binney Street;
- 12-inch main in Blackfan Circle;
- 8-inch and 12-inch main in Children's Way; and
- 12-inch main in Longwood Avenue.

The 819 Beacon Street site is adjacent to:

- 12-inch main in Beacon Street.

Domestic water demand is based on estimated sewage generation with an added factor of 10 percent for consumption, system losses, and other use. Based upon these assumptions, the Children's Clinical Building will require approximately 85,278 gallons of water per day; 819 Beacon Street will require approximately 17,181 gallons of water per day. The Combined Heat and Power Facility will require approximately 150,000 gpd of water to operate as a high efficiency heating and cooling facility depending on the option implemented. The proposed Patient and Family Garage Addition does not have any net water use demands associated with its implementation.

3.5.3.2 Proposed Connection

The proposed Children's Clinical Building and Combined Heat and Power Facility being considered will both connect to the BWSC's low service system located on Longwood Avenue. The 819 Beacon Street building will most likely connect to the existing water main in Beacon Street. Service connections required by the proposed Project will meet the applicable city and state codes and standards, including cross-connection backflow prevention.

Compliance with the standards for the water system service connections will be reviewed as part of BWSC's Site Plan Review process. The review includes, but is not limited to, sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, location of hydrants and siamese connections, and conformance to BWSC and Boston Fire Department requirements.

3.5.4 Stormwater Management

The Children's Clinical Building will be constructed on land that has some pervious surfaces under existing conditions. In order to meet City and MassDEP Stormwater regulations, Children's intends to investigate and install measures which will mitigate the post development discharge volume and rate to maintain compliance with regulatory requirements. One option for mitigation includes the use of stormwater holding tanks located within the building which will reduce peak flows and volumes leaving the site.

The remainder of the proposed Projects' sites are mostly impervious to rainfall percolation. Therefore, construction of the components will not produce increases in the rate of stormwater runoff and will provide a reduction in the volume of stormwater runoff.

Stormwater management controls will be established in compliance with BWSC standards, and the Projects will not result in the introduction of any peak flows, pollutants, or sediments that would potentially impact the receiving waters of the local BWSC stormwater drainage system.

3.5.4.1 Existing Conditions

The BCH Core Campus is serviced by 15-inch and 24-inch drain lines in Longwood Avenue which discharges to the Muddy River Conduit (MRC) in Brookline Avenue. The 819 Beacon Street site will also tie into the MRC, which flows northeast up Beacon Street where it eventually discharges into the Charles River.

With the exception of portions of the Children's Clinical Building site, the existing sites are mostly impervious to rainfall infiltration and include little to no stormwater controls. Much of both of the site's runoff discharges untreated to the drainage systems in the surrounding streets.

3.5.4.2 Proposed Conditions

Construction of the proposed Projects will result in a decrease in the rate and quantity of stormwater runoff from the Children's Clinical Building site and the 819 Beacon Street site. As part of the BWSC's review process, Children's will consider measures wherever applicable to minimize flows from the site.

Stormwater Quantity

Children's is exploring the use of holding tanks and/or stormwater infiltration systems on the Children's Clinical Building and 819 Beacon Street sites (and possibly vegetated terrace areas on the Children's Clinical Building) that will promote the infiltration of stormwater runoff into the ground and evapotranspiration, reducing the rate and quantity of stormwater discharge to the drainage system and MRC.

Stormwater Quality

The possible implementation of holding tanks, and/or infiltration systems at the Children's Clinical Building and 819 Beacon Street sites (and possibly vegetated terrace areas on the Children's Clinical Building) will have a positive impact on the quality of the stormwater discharged from the Projects' sites. When put in place, rooftop vegetation and subsurface stormwater infiltration create an opportunity to replicate the natural water cycle in a dense urban core environment.

Stormwater management controls will be established in compliance with BWSC standards, and the Projects will reduce peak flows, pollutants, or sediments that would potentially impact the Charles River. In conjunction with the site plan and the General Service Application, Children's will submit a Stormwater Management Plan to the BWSC. Compliance with the standards for the final site design will be reviewed as part of the BWSC Site Plan Review process.

3.5.4.3 Boston Zoning Code Article 32 Compliance

Children's will assess and implement, where feasible, groundwater recharge systems to comply with the City of Boston Groundwater Conservation Overlay District (Article 32 of the Boston Zoning Code) regulations in those portions of the Core Campus and 819 Beacon Street that lay within the Overlay District. Article 32 requires that one inch of stormwater over the entire impervious area of the site be recharged into the ground. It is BCH's intention to implement measures aimed at complying with Article 32. Groundwater management practices will be employed during construction for portions of the Core Campus not within the Overlay District.

3.5.5 Fire Protection and Control

The fire protection systems for the buildings will be designed in compliance with the latest Massachusetts Building Code, which refers to the *National Fire Protection Association Handbook.* In addition, the fire protection system will meet all applicable standards and requirements as set forth in the *Boston Fire Prevention Code*, the *Massachusetts Fire Prevention Regulation* (527 CMR), and the *Massachusetts Fire Prevention Laws* (MGL CH 148).

Compliance with the standards for the fire protection system connections will be determined as part of BWSC's Site Plan Review process.

The proposed fire suppression systems will connect to the BWSC's low service system located in Longwood Avenue and Brookline Avenue, respectively. Fire protection will be provided by the low service system. Water service connections required by the Projects will meet the applicable city and state codes and standards, including cross-connection backflow prevention.

The current edition [8th] of the Massachusetts State Building Code (780 CMR) requires that high-rise buildings in certain seismic design categories provide on-site storage of a sufficient volume of water to service the most demanding zone of the building fire protection system for a period of 90 minutes. To meet this requirement, the Children's Clinical Building will include storage for 150,000 gallons of fire protection water. The building's transformer vaults will be constructed in accordance with utility company requirements. To ensure a fire-safe design and reduce the potential impacts of a vault fire on the remainder of the building, it is anticipated that the vault will include three-hour fire resistance rated construction; dedicated, continuous vault ventilation; limited combustible fluid filled transformers; and vault smoke detection. The construction of the vault will comply with applicable requirements of the 8th edition of the Massachusetts State Building Code to allow the vault to be non-sprinkled according to 780 CMR Section 903.2 exception no.6.

Emergency vehicle site access to the Projects, including the siamese building connections, will be provided. Children's will seek input from the Boston Fire Department as the Projects' designs progress.

Children's will obtain required licenses for the storage of flammable materials, pursuant to the Boston Fire Prevention Code, CMR 527 and MGL Chapter 148, and parking garage permits, pursuant to St. 1913, c. 577, as amended (as required for erection of a parking garage in the City of Boston).

3.5.6 Anticipated Energy Needs

3.5.6.1 Natural Gas Service

It is anticipated that National Grid will provide gas service from a 20 psi main for the Children's Clinical Building and, if constructed, the Combined Heat and Power Facility. The demand associated with the CHP being considered is such that National Grid would provide reinforcement to the existing grid to handle the load. Children's will work with National Grid to confirm adequate system capacity as the Project designs are finalized.

3.5.6.2 Electrical Service

The electrical service for each building is anticipated to be provided by the local electrical utility, NSTAR. The Children's Clinical Building will require an NSTAR service entrance room and a 15KV, 3 phase, 3 wire switchgear lineup. The Combined Heat and Power Facility, located within the Children's Clinical Building, will also require a separate, additional, NSTAR service entrance room and a 15KV, 3 phase, 3 wire switchgear lineup. The proposed 819 Beacon Street building will require an exterior pad mounted transformer. Estimated loads for each aspect of the proposed Project would be as follows: Children's Clinical Building – 4 MW, the Combined Heat and Power Facility – 4 to 15 MW depending on the option implemented, and 819 Beacon Street – 2 MW.

3.5.6.3 Telecommunications

Children's will select private telecommunications companies to provide telephone, cable, and data services. There are several potential candidates with substantial downtown Boston networks capable of providing service. Upon selection of a provider or providers, Children's will coordinate service connection locations and obtain appropriate approvals.

3.5.7 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 BWSC, Boston Public Works Department, the Dig-Safe Program, and governing utility company requirements. Necessary permits will be obtained before the commencement of work. Specific methods for constructing proposed utilities where they are near to, or connect with, existing water, sewer, and drain facilities will be reviewed by the BWSC as part of its Site Plan Review process.

3.5.8 Construction Coordination

Children's will continue to work and coordinate with the utility companies to ensure compliance and integrity to the proposed Projects.

3.5.9 Sustainable Design/Energy Conservation

Energy conservation measures will be an integral part of the Projects' infrastructure designs. The buildings will employ energy-efficient and water-conservation features for mechanical, electrical, architectural, and structural systems, assemblies, and materials where possible. The base configuration of the proposed buildings will meet the Massachusetts Energy Code. Mechanical and HVAC systems will be installed to the current industry standards, and full cooperation with the local utility providers will be maintained during design and construction. Additional information on sustainable design is provided in Section 3.2.13.

The potential CHP facility would be designed to utilize a gas fired combustion turbine with a heat recovery medium pressure steam generator. While such a plant's production of medium pressure steam is usually fully utilized during the heating season, for heating needs, much of the output would be wasted during the cooling season. By using steam as the power source to drive chillers for cooling, instead of electricity, the proposed cogeneration plant would make full use of its summertime production. Steam driven turbine chillers would make use of the excess generated steam in the summertime and provide cooling for the proposed building and the campus.

3.5.10 Conclusion

The Projects will use the existing water, sewer, electrical, and natural gas systems available in public streets adjacent to the Projects' sites and inclusion of a CHP facility is under consideration. The proposed Projects will be designed with the goal to be consistent with MassDEP's Stormwater Management Policy, and incorporate a number of sustainable design and energy conservation measures.

Chapter 4.0

Coordination With Other Government Agencies

4.0 COORDINATION WITH OTHER GOVERNMENT AGENCIES

4.1 Architectural Access Board Requirements

The Projects will comply with the requirements of the Massachusetts Architectural Access Board and will be designated to comply with the standards of the Americans with Disabilities Act.

4.2 Massachusetts Environmental Policy Act (MEPA)

It is anticipated that Massachusetts Environmental Policy Act (MEPA) review will be required because state funding is likely to be involved and the Children's Clinical Building Project will involve the demolition of a building on the Inventory of Historical and Archaeological Assets of the Commonwealth.

4.3 Massachusetts Historical Commission

Because state permits and/or funding are likely to be involved, certain Projects will be subject to review by the Massachusetts Historical Commission (MHC) in accordance with M.G.L., Chapter 9, Sec. 26-27c, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00). The ENF to be prepared as part of the MEPA process will be submitted to the MHC to initiate the Chapter 254 review process.

4.4 Boston Landmarks Commission

In the City of Boston, complete or partial demolition of properties greater than 50 years old are subject to review in accordance with the Boston Landmarks Commission (BLC) Article 85 (Demolition Delay) ordinance. Because the Children's Clinical Building Project will involve the demolition of buildings greater than 50 years old, the BLC's Article 85 (Demolition Delay) review will be required. The Proponent will consult with BLC staff and submit an Article 85 application at the appropriate time.

4.5 Boston Civic Design Commission

The Projects will comply with the provisions of Article 28 of the Boston Zoning Code as appropriate. This IMPNF/PNF will be submitted to the Boston Civic Design Commission by the BRA as part of the Article 80 review process.

4.6 Other Permits and Approval

Section 2.6 contains a list of agencies from which permits and approvals for the proposed Projects will be sought.

Chapter 5.0

Project Certification

5.0 PROJECT CERTIFICATION

This form has been submitted to the Boston Redevelopment Authority as required by the Boston Zoning Code, Article 80.

Signature of Proponent's Representative

Boston Children's Hospital
300 Longwood Avenue
Boston, MA 02115

10-11-12
Date

Signature of Preparer

Cindy Schlessinger

Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754

10-11-12
Date

Appendix A

Spotlight April 2012

The Office of Child Advocacy's
spotlight
childrenshospital.org/community | 2012 Annual Report | Boston Children and Families

Home Field Advantage:

Children's therapists team up with schools to improve mental health where kids live and learn

Cheryl Watson-Harris, principal, Tobin K–8 School; CHNP social workers, Karen Capraro-Gentuso, LICSW, EdM and Mwaniki Mwangi, MSW, LICSW

By the Numbers >

Children's Hospital Neighborhood Partnerships Program

1,961 students received services from CHNP in 15 partner schools during the 2010 – 2011 school year

293 teachers participated in professional development workshops by CHNP

756 families who participated in parent workshops and community events

10 number of days students wait for CHNP therapy services in the schools, as compared with 42 days in outpatient settings

90% of teachers feel that CHNP services contribute to their students' ability to do well in the classroom

Five years ago, Kevin was struggling academically and acting up in class. Joanne Cox, MD, his primary care provider at Children's Hospital Boston suggested he see the school-based therapist, Shella Dennery, PhD, LICSW, who directs Children's Hospital Neighborhood Partnerships (CHNP), the community mental health program in Children's Department of Psychiatry. As part of CHNP, Dennery worked in Boston area schools to provide free-of-charge mental health services to children and their families. "Many students in urban schools are unable to receive the mental health care they need—not because families don't want it, but because access to services and navigating the mental health system is challenging," says Dennery.

Established in 2002, CHNP has 15 school partnerships throughout Boston. By offering services in environments that are familiar to children and their families, CHNP aims to increase access to care, promote social-emotional development, build the capacity of partnering schools to address mental health and reduce the stigma associated with mental health needs. This model allows clinicians to work with students from preschool through high school providing a range of services from individual therapy, crisis management, group counseling, family engagement and classroom interventions.

The need for such services is huge: Nationwide, one in five kids has a mental health problem, and only 20 to 30 percent receive the proper care. In low-income, urban settings, these numbers are much higher, since issues like poverty, exposure to violence and systemic discrimination put children at greater risk for developing mental health problems. These problems manifest in the classroom, where teachers struggle to help children with self-regulation, family stress and behavioral problems. Two of CHNP clinicians, Mwaniki Mwangi, LICSW and Karen Capraro-Gentuso, LICSW, EdM have seen Kevin and two of his siblings at the Maurice J. Tobin K–8 school in Roxbury for years. "At first, I was nervous," says Maria, a single mother of four. *continued p.6 >*

Children's Hospital Boston

About the OCA

The Office of Child Advocacy (OCA) is a leader in bringing together hospital and community resources to advance solutions that address the health needs of Boston's children.

Waiting to Exhale

Reducing asthma triggers through home visits and family education

Susan Sommer, NP, CAI clinical director; Margarita Lorenzi, asthma educator and home visitor

Miguel's asthma troubles started at an exceptionally early age. Whereas most children aren't diagnosed with asthma until they're older than 2, at just 22 months old, Miguel had already had several asthma attacks severe enough to require aggressive treatment in the Emergency Department (ED). Living in a run-down apartment in an urban Boston neighborhood didn't help; in fact, this was a significant contributing factor.

Poorly controlled asthma can lead to severe, even life-threatening attacks, according to Susan Sommer, NP, clinical director of the Children's Hospital Boston Community Asthma Initiative (CAI). What's more, when a child has poorly controlled asthma, the frequent trips to the ED tax both his family and the health care system. "A child's asthma can impact his whole family's life in multiple ways," says Sommer. "A child can't run and play, which further affects his health. The child, his siblings and his parents don't sleep well at night because he's coughing or wheezing. And the child misses a lot of school and his parents have to miss work, which causes a host of related problems."

Children's developed the CAI in 2005 to find a cost-effective way to help families directly address problems like these, which affect an alarmingly high number of children who live in Boston's urban neighborhoods. While asthma is a widespread chronic disease that affects millions of kids, it's most prevalent in low-income areas and among Latino and Black children, whose rate of hospital admissions is three to five times higher than for white children.

Soon after Miguel was referred to CAI by a nurse practitioner in Children's primary care clinic, Sommer traveled to his apartment complex to meet his family and provide one-on-one assistance. Sommer's case management takes myriad forms, depending on a family's medical and social needs, but it always includes a home assessment, asthma management and medication education, working with the child's health care providers and helping the family remove barriers to improving the child's asthma control.

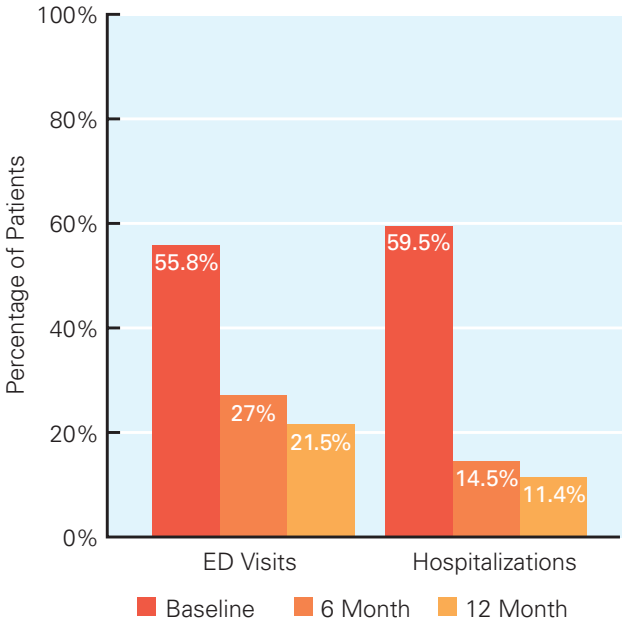
Providing direction on how to reduce asthma-inducing conditions in homes is a major part of her work, and one that can be much more complex than it might seem. "It can be hard for some families to have someone they don't know come into their home," says Sommer. "I appreciate that, and I always approach my work, not from a judgmental place, but from the perspective of working together to make the home more "asthma-friendly."

When Sommer met Miguel at his home in April, he'd had a tough year, including several ED visits due to asthma attacks. Little storage space in the family's small apartment had led to some problems with clutter, which attracted dust and pests—two big asthma triggers. But the unit's general state of disrepair was a larger problem. "There were so many holes, and they were so big, there was no way for the family to repair them," she says. "Parts of the bathroom walls and tiles were falling off, and a plastic sheet covered a window that didn't close."

One of the biggest triggers, unfortunately, was the family cat, to which, it was recently discovered, Miguel was allergic. While the family was receptive to his doctor's recommendation to find the cat a new home, they worried that the apartment's mouse problem would worsen without it. Over the years they'd lived there, the family had had a hard time getting the landlords to repair the holes where the mice came in.

During the home visit, Sommer showed Miguel's family how to minimize mice by blocking entry points, tightly sealing trash, storing food in sealed plastic containers, reducing sources of water and

Reduction in the Percentage of Patients Who Experienced Any Emergency Department Visits and Hospitalizations*



* Based on parent-reported data about their child and themselves in the past 6 months.

areas where rodents can nest. She also supplied them with pest management materials, a HEPA vacuum cleaner and dust mite proof bedding encasements.

Sommer also made a referral to Inspectional Services Department (ISD), the city housing inspectors, since there was a clear need for the property management to repair the bathroom and many holes, as well as professional pest control services. "We're lucky in Boston, in that there's a simple referral process for medical providers to refer apartments for inspection if they think there are code violations that are asthma triggers," she says. "It's a great tool because families are often reluctant to call ISD themselves because they're afraid the landlord will retaliate."

Soon, ISD visited the home and cited the landlord for numerous code violations. The property management company quickly responded to the citation, and by May, many improvements were made. Sommer was also quick to partner with Miguel's primary care provider to identify a medication combination that controlled his symptoms.

For Sommer, the unusually fast pace at which this case progressed was hugely gratifying. CAI follows families for a year, in general, but longer, if needed, until a child's asthma is under good control—that is, the child can sleep through the night, play as much as he wants, attend school regularly and isn't requiring ED visits for acute symptoms. "Miguel is so young, and a lot may still evolve with his asthma," she says. "But I'm happy to say that by eliminating the mice and the need for a cat, as well as making sure that the parents understand his asthma medications, we seem to have made a lot of progress in keeping his asthma well under control."

For more information on CAI, visit childrenshospital.org/community

By the Numbers >

Community Asthma Initiative

800 patients enrolled since 2005

81% drop in percentage of patients who have had any asthma-related hospitalizations

62% drop in percentage of patients who have had any emergency department visits

41% decrease in the percentage of children who have had any missed school days

46% decrease in the percentage of parents/caregivers who have had any missed work days

Providing a Safety Net for Young Parents

The Young Parents Program (YPP), a specialty clinic within the Children's Hospital Boston's Primary Care Center (CHPCC), provides comprehensive medical care, mental health services and advocacy to high-risk, urban teen parents and their young children. Launched in 1980, YPP deploys a multidisciplinary team of experts in medical, social and developmental issues of adolescence and early childhood who serve approximately 250 teenage mothers, 75 young fathers and 300 babies annually. In 2011 alone, YPP had 1,534 appointments. "Young parents must flourish physically, mentally and socially for their children to succeed," says Joanne Cox, MD, director of CHPCC. "That's why YPP provides specialized services to meet the unique needs of this vulnerable population."

> "Everyone thinks I'm the exception, I've beaten the odds. But I had extraordinary help. If everyone had help, achievement like mine could be the norm."
>
> — Former YPP mother, Advisory Board member, college graduate and master's degree candidate

Ensuring access to care, support and services

Embedded within the YPP teen-tot medical clinic, Project Connect recently completed its fourth year of a five-year federal grant from the Department of Health and Human Services. Project Connect serves mothers 18 and younger, fathers under the age of 25, and their children. Its goals are three-fold: to provide comprehensive pediatric and adolescent care; to integrate social services, primary care and health education with case management; and to provide linkages to community services, including teen living programs, schools, daycares, home visiting and job training. By remaining focused on these goals, Project Connect improves parenting knowledge and skills—lessening the chances of subsequent pregnancies and promoting adolescents' growth toward healthy, self-sufficient adulthood. To date, 220 individuals have participated in Project Connect: 152 mothers and 68 fathers.

Focusing on fathers

"A father's connection to his child is important to the child's long-term health and well being. Yet, young fathers often lack parenting knowledge and confidence or may have high levels of conflict with the child's mother," says Cox. To address these issues, Project Connect developed fathers' groups that focused on parenting knowledge, self-efficacy and relationship skills. Fathers were included in all of their child's medical visits to emphasize the importance of being an equal partner and parent. During these visits, the young fathers and staff discussed co-parenting, employment, health and relationships. Fathers reported that gentle persistence from YPP staff helped them become comfortable seeking support with medical care, mental health services and vocational assistance.

Reaching out to the community

The YPP team provides outreach and support to the community in several ways. Families can access educational workshops focused on children over the age of one. Workshops are open to extended family members and friends in order to benefit anyone caring for the child. Topics include developmental milestones, playing with your toddler and setting limits.

In addition to participating in health fairs and other community functions, YPP staff has disseminated findings from YPP and Project Connect at various conferences such as the Society for Adolescent Health and Medicine and Pediatric Academic Societies. Manuscripts were also accepted with the Journal of Maternal and Child Health and the American Journal of Public Health.

"YPP staff and patients are strong voices advocating for change and influencing policy as well," says Cox. YPP is a member of Massachusetts Alliance on Teen Pregnancy, a policy group for organizations and agencies working with pregnant and parenting teens, and participates in their annual event to bring together teen parents and their children and supporters to advocate for young parent programs. YPP also recently supported and helped to establish S.T.E.P.P.S. (Summit for Teen Empowerment Progress and Parenting Success), a joint project with Children's, Massachusetts Alliance on Teen Pregnancy, Brigham and Women's Hospital, Northeastern University, March of Dimes and the Mt. Pleasant Fund. Workshops focused on child development, stress management, budgeting and raising a child in someone else's home. More than 85 young parents, including YPP families, attended to share stories and learn how to access resources.

For more information on YPP, visit:
childrenshospital.org/ypp

Responding to Violence

Making Boston neighborhoods safer for children and families

The Jamaica Plain Violence Intervention and Prevention Collaborative (JP VIP) was created in response to numerous incidents of violence in the neighborhood immediately surrounding Martha Eliot Health Center (MEHC). Mildred Hailey, former executive director of the Bromley Heath-Tenant Management Corporation and Jim Cote, former executive director of MEHC took the lead in bringing together the community organizations to create a coalition to address this violence.

Since its inception in 2008, the mission of the JP VIP has been to help youth and families of Jamaica Plain and neighboring communities live safe and healthy lives by providing education about mental health services and helping families to access resources. In 2011, JP VIP responded to 19 fatal incidents. "By intervening in the immediate aftermath of a traumatic event, we want to reduce the long term effect of trauma on youth and family members," says Patricia Knight, JP VIP Trauma Response coordinator.

Recognizing the strong correlation between mental health issues and violence, the JP VIP wanted to get feedback from community residents. "We know that families are faced with intense socioeconomic pressures such as poverty, lack of education or housing issues and this stress can lead to feelings of hopelessness." says Deborah Dickerson, director of Community Health Initiatives for the Office of Child Advocacy at Children's. Focus groups with over 100 residents from Jamaica Plain and Roxbury were held to get the community's input on mental health issues and their experiences with access to available resources. "The focus groups confirmed our belief that some of the resources available to families are not culturally sensitive and that more education about mental health is needed," says Dickerson.

The JP VIP is planning to take the information they learned from these focus groups and plan a community-wide forum in the spring. The goal of the forum will be to further educate families on mental health and resources available.

JP VIP Community Partners

- Academy, Bromley, Egleston Safety Task Force
- Boston Public Health Commission
- Bromley-Heath Tenant Management Corporation
- Brookside Community Health Center
- Children's Hospital Boston
- The Dimock Center
- Ecumenical Social Action Committee, Inc. (ESAC)
- Family Service of Greater Boston
- JP Unidos/United
- Martha Eliot Health Center
- MassHousing
- New Academy Estates
- Southern Jamaica Plain Health Center
- Spontaneous Celebrations/Beantown Society
- West Roxbury Courthouse

COACH students from the 2011 program

By the Numbers >

Children's Workforce Development Efforts

72 students were hired last summer as part of Children's COACH Program (Community Opportunities Advancement Children's Hospital); 70 were from Boston

17 students participated in SCOOP (Student Career Opportunity Outreach Program) to learn about nursing careers; 6 were from Boston

5 students from Sociedad Latina were hired for after-school jobs at Children's

30% of Children's 9,500 employees reside in Boston

Home Field Advantage *(continued from p.1)*

"I didn't know how much to share, and what they'd think of my situation. But they made us feel comfortable and my son wanted to talk to his therapist—and even looked forward to it. He needed that time to express himself and ended up loving them. We all did." Soon, the CHNP team was meeting regularly with Maria's whole family. "Our therapists help us express ourselves and come up with ideas on how to solve problems, whether they're about home or school matters," says Maria. "Family sessions are amazing; we find out what's at the heart of an issue and what we can we do better." Maria finds her own relationship with the therapists to be an invaluable outlet. "It can be overwhelming to juggle a full-time job, going to school at night and the kids, and it helps to have someone just listen."

The consistent, ongoing relationships that the clinicians have developed with Maria's family have allowed her children to feel comfortable talking to them about nearly any topic. "My teenage daughter is more comfortable talking about peer pressure and sex with her therapist than with me, and her therapist fills that communication gap for us," she says. Maria has seen the direct relationship between having mental health services and her children's performance at school. Concerned phone calls about Kevin's academics and behavior have given way to glowing report cards. "Now, teachers say how wonderfully he's doing, and that has a lot to do with the help he gets from Children's," she says. "He does his homework, and he's on the honor roll."

What makes CHNP unique is its integration into the fabric of the school and how closely its clinicians work with teachers. In working hand in hand with schools, the program builds the capacity of schools to address students' mental health. The partnership's benefits—to students, teachers and the community —are clear to Cheryl Watson Harris, principal of the Tobin K–8 school. "Because the clinicians are school-based, the supports are aligned with school-wide practices, and the children and parents feel as though the approach is more holistic and comprehensive," she says. "Many of my colleagues have marveled at this partnership, as the support from CHNP helps create a comprehensive care program that maintains open communication among school staff, parents and CHNP. Most students served by CHNP have made tremendous improvements—classes have been turned around."

For Maria, the effects are long-lasting. "My children are good influences on each other," she says. "In our family sessions, we've cried together and we've laughed together, and that has made us stronger. And having people who care about us and help us cope with things differently, we've become like a family. These are people my kids will never forget. I know I won't."

Q&A with Mwaniki F. Mwangi, MSW, LICSW, and Karen Capraro-Gentuso, LICSW, EdM, clinical social workers in CHNP

Why is CHNP important to the schools you work in?
MM: We're extremely flexible and can help each student, teacher, classroom and school with the specific issues they're facing each day. This lets us provide our services in a meaningful, comprehensive way. When a class was having a particular issue, we taught a curriculum empowering the kids to make healthy, safe choices. If there's a class struggling, we go in and work to help the children learn new behaviors, like social skills and anti-bullying behavior.

How is CHNP different?
KC: We don't just come in, do therapy and leave. We're in the school with the teachers and kids every day. We're a regular presence and we make sure we're seen by students and parents. Teachers really value that we're part of the school. It's also less stigmatizing for the kids to talk to us if they're having problems since we're seen as part of the school community.

How does CHNP help teachers?
MM: Teachers find it helpful to get our perspective on difficulties they're having in the classroom. For example, my consultation with a teacher who has a student with ADHD included setting up a plan for the first 10 minutes of the class to help the student focus on a routine for starting class. We talked about the student's behavior not from a disciplinary perspective but from a mental health perspective.

What made you want to be a part of CHNP?
KC: When you treat children's mental health issues in a hospital, you don't see the kids in their natural environment. School is where they're really comfortable it's their second home. Since the kids are comfortable, it breaks down barriers.

For more information on this story, visit:
childrenshospital.org/community/stories

Innovation in

Mental Health Service Delivery

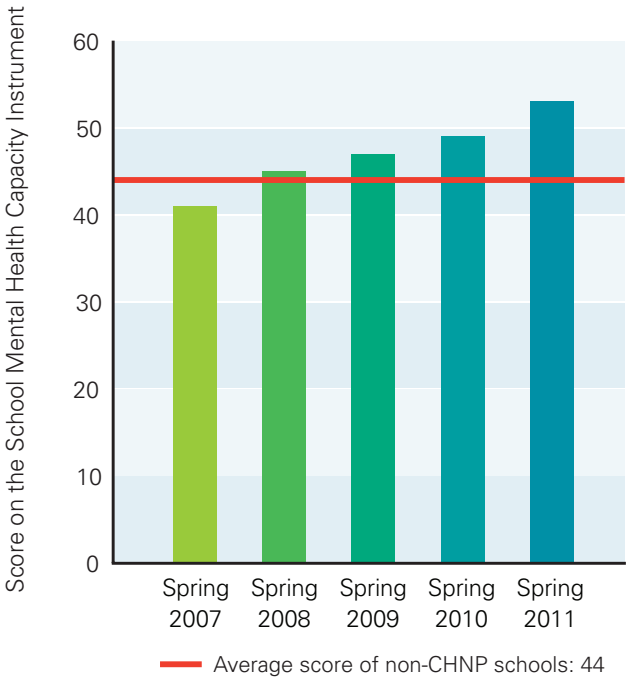
Founded in 2002, the Children's Hospital Neighborhood Partnerships (CHNP) began as a program to partner with individual schools. Now in its 10th year, the program has evolved into a model that is positioned to help schools across the city and state build the necessary internal capacity to proactively address student behavioral health issues that impact academic and life success. (See chart.)

Based on lessons learned through the CHNP and the hospital's psychiatry program, Children's has identified the need to address pediatric mental health issues on a much broader scale. In 2006, Children's partnered with the Massachusetts Society for the Prevention of Cruelty to Children (MSPCC) to co-found the Children's Mental Health Campaign (CMHC) in an effort to change how children's mental health services are provided in Massachusetts. CMHC's work resulted in the enactment of three landmark laws that together improved access to mental health services, spurred early identification of children with mental health needs, increased schools' capacity to address the mental health needs of students, expanded insurance coverage for children in need of mental healthcare services and reduced the number of kids "stuck" in inappropriate care settings.

CHNP was a leader in the development of the approach to reforms in education and children's mental health. CHNP's founding director was instrumental in drafting the legislative language that created the Task Force on Behavioral Health and Public Schools. With representation from Children's and CHNP, the Task Force created a Safe and Supportive Schools Framework, which would require all schools to develop action plans for creating safe and supportive environments by 2017. From testifying in support of the legislation to chairing the CMHC Workgroup on Education and Mental Health, CHNP continues to be involved in the advocacy efforts to pass this pending legislation.

Eager to implement this proposal, the Boston Public Schools (BPS) has invited CHNP to be its main partner in the development of a district wide behavioral health model that will pilot many of the bill's elements and will serve as a model for school districts across the country. The model will enable schools to provide a comprehensive system of care that integrates appropriate levels of behavioral support for all students. In preparation for these changes, CHNP is also playing a larger role in BPS's professional development practices. Drawing on its experience at the school level, CHNP is co-sponsoring and leading monthly professional development workshops for teachers and administrators district-wide. This presents yet another opportunity to promote systemic change by building capacity within BPS.

Change in CHNP Schools*
Mental Health Capacity Scores



* Teachers rate the extent to which systems, procedures and policies to address mental health are integrated into the school.

CHNP currently reaches almost 2,000 children in 15 Boston schools. Yet, the program's model and relationships it has developed with education agencies and policy makers offer the potential to impact the lives of Boston's 57,000 students and students across the Commonwealth.

For more information on CHNP, visit:
childrenshospital.org/chnp

Bridging the Gap

Between Research and the Community

The Children's Hospital Boston Collaborative Center for Community Research (C-CORE) was created in 2010 with funding from the National Institutes of Health and Children's. C-CORE aims to reduce child health disparities in Boston through an innovative partnership among four local cornerstones of child health and education — Children's, the Boston Public Health Commission, Boston Public Schools and the Boston Conference of the Massachusetts League of Community Health Centers. "Our goal is to support folks from Children's and the Boston community in conducting research to improve the health of Boston's youth, families and communities," says Mark Schuster, MD, PhD, chief of General Pediatrics at Children's, William Berenberg Professor of Pediatrics at Harvard Medical School and C-CORE's director.

C-CORE activities are guided by the principles of community-based participatory research (CBPR), an approach that engages community members and researchers in a partnership throughout the research process. "Our team is dedicated to ensuring that research represents community interests and that results have the potential to lead to sustainable programs and policies," says General Pediatrics research director Laura Bogart, PhD, associate professor of Pediatrics and C-CORE's associate director. To ensure that C-CORE is responsive to community needs, its activities are informed by a 40-member Community-Academic Advisory Board of stakeholders from local community organizations and researchers from Children's and other academic institutions. C-CORE also receives input from the Mayor's Youth Council, a group composed of high school students representing every Boston neighborhood.

C-CORE facilitates collaborations between researchers and community partners, identifies community health priorities and research opportunities and works to design, implement and evaluate new projects. In December 2011, with funds made available by Children's, C-CORE provided two grants to community organizations conducting CBPR pilot projects in partnership with Children's faculty.

In an effort to fill a gap in understanding health and health disparities among Boston's youth, C-CORE is supporting partners at the BPHC to conduct the Boston Child Health Study. This study, another project funded by Children's, will create the first comprehensive inventory of child health and health disparities in Boston using phone surveys, Medicaid claims data, and resource assessments of local neighborhoods. In addition, C-CORE will be completing a needs assessment of Children's researchers this spring to better understand their community-based research experiences and interests, as well as their need for resources to foster and maintain community research partnerships.

As part of its teaching mission, C-CORE aims to educate academic and community partners about child health issues and CBPR. Activities include a planned June 2012 Community-Academic Forum entitled, "Misunderstanding & Mistrust of Health Research and Health Care: Opening a Dialogue in Boston."

Disseminating C-CORE's work through community outreach and a public website is an important function as it will reinforce the use of community-based research in addressing child health disparities. In the long-term, dissemination activities will strengthen capacity for conducting high-quality community research that improves the health and well-being of Boston's children and youth.

For more information on C-CORE, visit:
childrenshospital.org/ccore

C-CORE Leadership

Mark Schuster, MD, PhD, General Pediatrics, Children's (Director)

Laura Bogart, PhD, General Pediatrics, Children's (Associate Director)

Deborah Allen, ScD, Boston Public Health Commission (Community Research Associate)

April Allen, MPA, MA, General Pediatrics, Children's

Jill Carter, EdM, MA, Boston Public Schools

Paula McNichols, Massachusetts League of Community Health Centers and Brookside Community Health Center

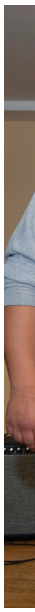
Shari Nethersole, MD, Office of Child Advocacy, Children's

John Riordan, MCRP, Office of Child Advocacy, Children's

Diana Santiago, JD, MPH, Boston Public Health Commission

Snehal Shah, MD, MPH, Boston Public Health Commission

Shanna Shulman, PhD, General Pediatrics, Children's



Children's first Annual

William L. Boyan Award Honors Sociedad Latina

Back row, from left, Giovanny Martinez, Sociedad Latina; William L. Boyan, former Children's Board of Trustees chair and chair of Children's Board Committee on Community Service; James Mandell, MD, Children's chief executive officer; Joseph Monge, Sociedad Latina; Alexandra Oliver-Dávila, executive director, Sociedad Latina and Stephen R. Karp, chairman Children's Board of Trustees. **Front row, from left,** Giovanna Franco, Joel Colon and Marcos Suares of Sociedad Latina.

On November 14, 2011, Children's Hospital Boston awarded the first annual William L. Boyan Award for Excellence in Community Health to Sociedad Latina, a youth development organization located in Roxbury. The William L. Boyan Award honors a community organization for their work and commitment to the children and families of Boston. Each year, the theme of the award will change. The focus for the 2011 award was to support a program within a community organization, health center, city agency or Boston school that addressed the mental health needs of children.

The $50,000 award will help Sociedad Latina to expand their mental health services by hiring a full time case manager. Sociedad Latina will be an internship site for Boston College social work students who will provide weekly mental health workshops for families. These workshops will help Sociedad families access resources, better understand mental health and work together to promote good mental health in the Latino community.

For more information on Sociedad Latina, visit:
sociedadlatina.org

Children's helps celebrate the launch of the

Madison Park Recreation Center

On December 10, 2011, Boston Centers for Youth and Families (BCYF) launched the Recreation Center at Madison Park, a re-purposed facility that will allow BCYF's Recreation Division to expand and enhance its current program offerings as well as to develop new initiatives to improve the quality and accessibility of recreation, sports and fitness programs citywide. The Recreation Center, which is shared space with Madison Park High School, features two gymnasiums, a swimming pool, football field, dance studio, tennis courts, running track and a workshop training room.

"This is all about individuals and organizations from across the city coming together to improve people's lives," said Mayor Thomas M. Menino, who attended the event. "Madison Park is going to be a great conveyor for youth sports in our city, and I am looking forward to seeing the programs and activities that are going to come out of here that really help people."

Healthy Kids, Healthy Futures (HKHF), a partnership between Northeastern and Children's Hospital Boston, holds its Saturday Open Gym free play program at Madison Park. HKHF provides education and training to prevent childhood obesity in the neighborhoods of Fenway, Mission Hill, Jamaica Plain and Roxbury with its cornerstone being the Saturday Open Gym for Boston families with young children.

For more information on HKHF, visit:
northeastern.edu/healthykids

Shari Nethersole, MD, medical director for community health, Children's Hospital Boston; Daphne Griffin, executive director, Boston Centers for Youth and Families; Mayor Thomas M. Menino, City of Boston; Ryan Fitzgerald, director of recreation and sport, Boston Centers for Youth & Families; Dr. Carol R. Johnson, superintendent, Boston Public Schools; Councilor Tito H. Jackson, Boston City Councilor, District 7; Robert Gittens, vice president, Government Relations and Community Affairs, Northeastern University and member, Children's Board Committee for Community Service.

Making a Difference, Big Time

Proven Community Health Programs Move toward Systemic Change

By M. Laurie Cammisa, Esq., vice president for Child Advocacy

Nearly 20 years ago, Children's Hospital Boston was among the first in the country to expand the traditional academic missions of patient care, teaching and research to embrace a fourth core mission: community health.

Back then, our community health mission consisted of a few programs that provided services to Boston children and families. Over the years, our approach to improving community health has evolved and matured. We've embraced partnerships. We've proactively engaged our communities. We've concentrated our community health programs in core areas where we have the expertise and resources to make the most difference and where significant public health needs exist.

This gradual evolution has resulted in what is today a wholly strategic approach to improving child health. We have two key aims — focusing on the most pressing health care needs of children and providing services through program models that not only work but can lead to systemic change.

Along the way, our strategy evolution has included taking a critical look at how we are organized. We developed a clear operating model that defines our work and a performance measurement system that guides our activities — things like measuring and tracking performance, reporting progress and results and learning from data to make informed decisions. We developed a program evolution model, which is a framework that informs the development and growth of our programs in our four core health areas (asthma, obesity, mental health and child development) and ensures that these programs are making progress toward systemic change.

A Portfolio of Programs

The hospital views four key programs (Advocating Success for Kids, Children's Hospital Neighborhood Partnerships, Community Asthma Initiative and Fitness in the City) as a portfolio, and we manage this portfolio with a triple focus.

One focus is to guarantee that the hospital's investment of resources (human and financial) is targeted to programs that address local needs, alleviate health disparities, partner and engage with our community and provide services through models that lead to systemic change. For Children's, systemic change encompasses a range of activities: taking a program to scale, replicating the program, ensuring needed public policy changes, building capacity and sharing knowledge that leads to changes in pediatric practice.

Another is to ensure that, by employing a uniform set of standards and criteria, these programs measure value and social impact—things like improving health outcomes and quality of life, proving cost-effectiveness and building community capacity.

A third is to align with the hospital's overall need to excel in a changing health care environment. The hospital fits our focus areas and interventions into a continuum of care model that looks for ways to prevent short- and long term illness and eliminate or avoid medical costs. By doing so, we are setting the stage for a number of key elements of national health care reform, including reductions in medical costs, the patient-centered medical home and population health management.

Working toward Systemic Change

The portfolio approach allows us to measure progress and demonstrate quantitatively that our programs work. But how can we make a difference on a larger scale? There are two answers, both of which the hospital is employing to work toward systemic change.

In the first place, we are building community capacity—to arm our community partners with the tools they need to broaden the programs we have created together. An example is Fitness in the City (see page 14), which our health center partners have adapted in a variety of ways to involve more children and families in addressing obesity through nutrition education and exercise opportunities.

Secondly, we are taking our programs "to scale" by bringing the proven model to a larger population through public policy advocacy. The hospital's approach to community mental health programming, through the Children's Hospital Neighborhood Partnerships (CHNP,) is one example of scalability and advocacy working together toward systemic change (see page 1). Asthma care is another.

Children's developed its Community Asthma Initiative (CAI) in 2005. CAI provides case-management and home visits, offers education to caregivers and providers, distributes asthma control supplies and connects families to resources.

Rigorous evaluation of the program demonstrated that CAI has improved health outcomes for children and also is cost-effective. Armed with quantitative measures of success, the hospital worked with the Asthma Regional Council of New England to make a business case for replication locally, state-wide and regionally, urging payers to ensure that all children have access to these types of asthma services. Using this business case, we worked with an even broader coalition of local and state asthma organizations in Massachusetts to advocate for public policy changes.

The coalition has been successful. The state legislature earmarked $3 million in its FY11 Medicaid budget for a demonstration project that will provide case management services to children with asthma. The Centers for Medicare and Medicaid Services (CMS) approved Massachusetts' Medicaid waiver renewal proposal, including this pilot program. Soon, we expect the state's Medicaid program to issue a request for proposals and select six pediatric practices to participate in the asthma pilot.

Working on another front — sharing lessons learned — to expand the impact of the CAI, we partnered with the Boston Public Health Commission as they created the Boston Home Visiting Collaborative. This collaborative has developed tools, standards and processes for asthma home visits across the city, with a universal referral system and training of community health workers to expand capacity. Significant portions of this work are based on what we have learned through the CAI.

So, while the hospital's CAI program has reached 800 Boston children with moderate to severe asthma since its inception, it is building a model that has the potential to reach every child in Massachusetts who suffers from asthma.

I'd say that is making a difference, big-time.

For more information on Children's community mission, visit: childrenshospital.org/community

Leading the Community Mission

Board Committee for Community Service

Members of the Board Committee for Community Service offer insight and review the hospital's strategy for its community mission. The Board provides insight into the needs of the community as well as approves the hospital's community benefits plan.

Winston Henderson, JD, chair
Nano Terra, Inc.

Zamawa Arenas
ARGUS Communications

Tristram Blake
formerly of South End Community Health Center

Sandra L. Fenwick (ex-officio)
Children's Hospital Boston

Robert Gittens
Northeastern University

Steven Gortmaker, PhD
Harvard School of Public Health

James Mandell, MD (ex-officio)
Children's Hospital Boston

Margaret M. Noce
Chair of the Community Advisory Board
Jamaica Plain Coalition: Tree of life/Arbol de Vida

Robert Restuccia
Community Catalyst

Marta T. Rosa, MEd
Wheelock College

Mark Schuster, MD, PhD
Children's Hospital Boston

Adita Vazquez
Chair of the Martha Eliot Health Center Advisory Board
Salem District Court

Wendy A. Watson
formerly of State Street Bank

Gregory J. Young, MD
Pediatric Physician's Organization at Children's Hospital

M. Laurie Cammisa, Esq., staff
Children's Hospital Boston

Going to ASK for Answers

Through Children's support, a family finds a path to a brighter future

Theresa left her home and family in Cape Verde for Boston when she was 10, and grew up in DSS custody. So when learning difficulties left her unable to finish high school, she didn't have many people to turn to for help. Then, when her own young daughter, Claudia, showed similar signs of learning difficulties, she felt alone, all over again. "I'm a young parent—I'm 26—and I just finished high school only a few years ago," she says. "Watching my daughter have the same problems at school is the hardest part of being a mother, since all I want is for her to succeed in school."

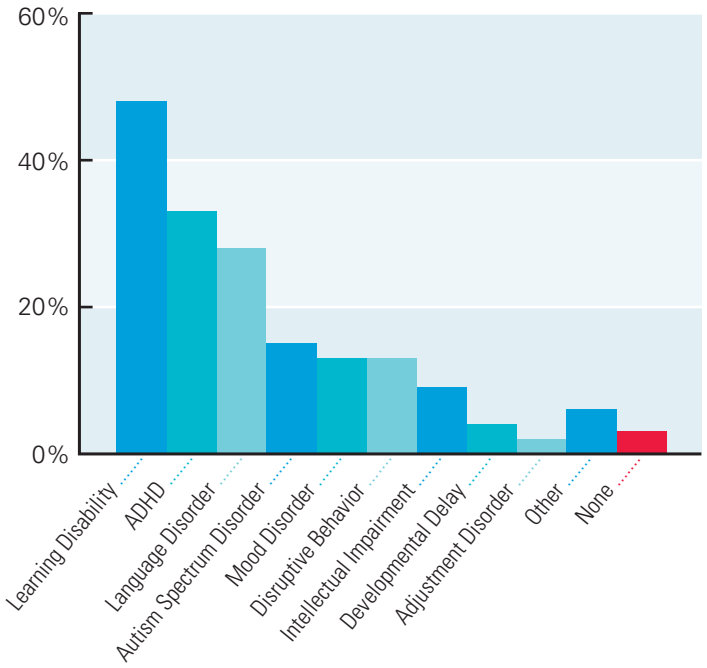
Claudia, now 7, showed signs of having learning disabilities when she started kindergarten, and her primary care provider at Dorchester's Bowdoin Street Health Center referred her to the Advocating Success for Kids (ASK) Program for an evaluation. Started in 2000, Children's Hospital Boston formed ASK to address primary care physicians' concerns about many of their patients' unmet learning, developmental, emotional or behavioral needs.

Today, ASK is staffed by two physicians, a psychologist, a nurse practitioner, three pediatric fellows, two post-doctoral psychology fellows, four social workers and an educational specialist, who work together to evaluate children referred from Children's primary care team, as well as from three community health centers. The families they see, like Theresa's, are mostly low-income minority families living in urban areas who otherwise wouldn't have access to such a comprehensive developmental service. While the program has grown tremendously over the years, ASK retains its core approach: developing an understanding of a child's unique challenges in school and at home, proposing interventions (such as school evaluation and in-school and/or home-based supports), working with parents to get those interventions in place and advocating on their child's behalf. Its goal also remains the same: to optimize children's health and success at school, positioning them for a brighter future.

"Parents have so much on their plates already, that it can be overwhelming to find ways to address their children's learning or behavioral challenges," says ASK social worker Casey Walsh, LICSW, who has worked with Theresa's family for years. "Kids like Claudia with unclear learning needs may not get adequate support in the classroom, and parents need help figuring out how to access the right resources."

This kind of help can take many forms, including connecting families to community specialty services, setting up medical appointments, referring to specialty education programs and coordinating with a child's teachers. For Claudia, it centered on first completing a comprehensive evaluation, communicating with her teachers and observing her in school. Then the team documented the nature of her learning issues so that an appropriate Individualized Education Program (IEP) for her school could be developed. But ASK didn't leave it at that: Walsh stayed involved to see the plan through, and to act as a source of support for Theresa. "That's the great thing about ASK," says Walsh. "Our program allows us to partner with parents so they better understand their child's diagnostic concerns and special education rights. When parents are armed with this knowledge they develop the confidence to advocate for their kids."

Common Diagnosis for ASK Patients



Theresa had tried everything to get her daughter the extra help she needed at school, to no avail. "I work hard and my husband works hard just to make a living, and it's challenging to get to the IEP meetings and constantly follow up about them," she says. "It was too much, and so I called Casey. Within a week, she had an IEP on my doorstep. It was amazing."

Over the years, Walsh has worked with Theresa on everything from finding a new school for her daughter and attending the IEP meetings with her, to coordinating appointments for specialty care for Claudia. Once, when a school failed to implement Claudia's IEP, the ASK team arranged a lawyer to represent the family and helped Theresa through the ensuing due process, including testifying on Claudia's behalf.

"Casey has been wonderful," says Theresa. "If I attend a school meeting that I don't understand, she's always willing to explain it. She gives me the motivation and the ability to organize so I can be there for my kids."

Last year, Theresa brought her now 3-year-old son, Richard, for an ASK evaluation because he still wasn't talking, and the team recommended early intervention to address his developmental delays. They set up appointments for speech therapy and hearing tests and coordinated his placement in a nutrition program at Children's.

Claudia is still followed by ASK and Theresa relies on Walsh to support her at school meetings to ensure Claudia is making progress. "If I'm having a rough day, Casey will sit on the phone and talk, and I like knowing I have that support," she says. Theresa sees ASK as a valuable resource to other struggling parents. "Like me, some of them don't have anybody. The help I got in the past five years has transformed me from a teen mom into a grown woman who takes care of my own house and my small, but great, family," she says. "There are lots of hardworking people who get left behind, and who need some help. ASK stepped in and helped me and I don't know where I'd be without it."

For more information on ASK, visit:
childrenshospital.org/ask

By the Numbers >

Advocating Success for Kids

356 children served by ASK each year

67% have public insurance

7.5 average age of ASK children

48% of children in the program have a learning disability

33% have ADHD

15% are on the autism spectrum

Providing a Community Voice

Community Advisory Board

Community Advisory Board (CAB) members identify opportunities for partnership, serve as advocates and ambassadors and help connect hospital experts with local organizations.

Margaret Noce, chair
Jamaica Plain Coalition: Tree of life/Arbol de Vida

Dorys Alarcon
Children's Hospital Boston

M. Laurie Cammisa, Esq.
Children's Hospital Boston

Jill Carter, EdM, MA
Boston Public Schools

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Hyde Square Task Force

Katherine Cook, NP
Bowdoin Street Health Center

Lauren Dewey-Platt
Fenway Resident

Patricia Flaherty
Mission Hill Resident

Alexandra Oliver-Dávila
Sociedad Latina

Sheneal Parker
Fenway Resident

Laurie Sherman
Mayor Thomas Menino's Office

Christopher Sumner
Wheelock College

Roland Tang, MD
South Cove Community Health Center

Michelle Urbano
Boston Public Health Commission

Andrea Swain
Yawkey Club of Roxbury

May Vaughn-Ebanks
Roxbury YMCA

John Riordan, staff
Children's Hospital Boston

Fitness in the City:

A low-tech, community-based, highly effective approach to weight management

Katherine Cook, NP, Bowdoin Street and Roland Tang, MD, South Cove

Watching fewer hours of television. Drinking fewer cans of soda. Increasing the amount of time spent exercising. Lowering body mass index (BMI). What's this a prescription for? Reducing obesity among children aged 6–18 who are seen in 11 Boston community health centers.

That's the goal of Fitness in the City (FIC), a partnership between Children's Hospital Boston and the health centers, which is supported by Kohl's Cares. Launched in 2005, FIC relies on nutrition services, education, and physical activity opportunities coordinated at each site by a case manager. Over 900 obese and overweight children are referred by their health center-based primary care provider to participate every year.

"The case manager is the program's secret weapon," said Shari Nethersole, MD, medical director for community health in the Office of Child Advocacy at Children's. "He or she serves as a 'coach' to participants –providing motivation and connecting them with culturally appropriate, accessible and affordable resources. Case managers are the main link with the child's primary care provider and parents."

Case managers conduct intake and follow-up surveys with participants, engage parents to help develop wellness goals, support participants through nutrition and physical activity referrals, educate health center staff about available local resources, perform data management and meet to share best practices.

Grassroots approach helps health centers build capacity

While Children's has a well-established and highly successful hospital-based obesity management program, OWL (Optimal Weight for Life) is only able to reach a fraction of the overweight and obese children in Boston's urban core neighborhoods. So the hospital explored a more grassroots, community-based approach and capitalized on its longstanding relationships with community health centers.

"Many obesity initiatives focus on schools, but we felt that the participation of family members was vital to a child's success in managing overweight and obesity," said Nethersole. "Health centers were chosen because family members would be more likely to be engaged in a child's treatment program if it was located in their health center. In addition, health centers know their populations intimately, can address cultural and linguistic needs, and can mold the program to address barriers and leverage resources in their own communities."

FIC has become an integral part of the health centers' obesity efforts. "We have benefited greatly from our participation in regular meetings convened by Children's with other health centers in the program," says Roland Tang, MD, a pediatrician at South Cove Community Health Center in Chinatown. "The meetings often include best-practice presentations, and the open exchange of ideas about what works and what doesn't for other health centers. It has helped us make informed decisions about the direction of our own program." The program also has helped centers develop or improve their data collection systems. "Prior to having Fitness in the City, we were not collecting BMI data on all our young patients," said Katherine Cook, PNPC, MSN, at Bowdoin Street Health Center in Dorchester. "Today, through Children's evaluation support, we're able to track BMI measures as well as other important behavioral change indicators."

FIC's grassroots approach has proven to be a "low-tech" solution to a vexing and increasing child health problem.

For more information on FIC, visit:
childrenshospital.org/community

FIC Participating Health Centers

- Martha Eliot Health Center, Jamaica Plain
- Bowdoin Street Health Center, Dorchester
- Brookside Community Health Center, Jamaica Plain
- The Dimock Center, Roxbury
- Joseph M. Smith Community Health Center, Allston
- Roxbury Comprehensive Community Health Center
- South Cove Community Health Center, Chinatown
- South End Community Health Center
- Southern Jamaica Plain Health Center
- Upham's Corner Health Center, Dorchester
- Whittier Street Health Center, Roxbury

By the Numbers >

Fitness in the City

60% of children in FIC decreased or maintained their Body Mass Index (BMI)

245 scholarships were awarded to motivated FIC participants to join local gyms or other physical activity resources

Number of weekend TV-hours watched by FIC kids decreased from **4.3** to **3.54**

Numbers of cans of soda or juice consumed per day decreased from **2.5** to **2.3**

Number of days per week FIC kids exercised 30 minutes or more increased from **3.2** to **3.5**

Improving a Community's Odds

When two of Maria Baker's three sons, Arthur 12, and Michael, 6, went from a healthy weight to overweight, with one bordering on obese, their pediatrician knew they needed help.

They're not alone. Childhood obesity is on the rise nationwide, with Black and Latino children affected at a higher rate than white children. Some suffering from conditions once considered strictly adult diseases, such as type 2 diabetes, hypertension and sleep apnea — obese children may face shorter life spans than their parents. And overweight children are more than twice as likely to be hospitalized.

The odds weren't in her sons' favor, but that's changing with the help of Fitness in the City (FIC). Living in public housing, Maria felt there were few outlets for her boys to be active. Through FIC, the case manager gave them a free YMCA membership. Now Maria takes the boys to the Y three times a week for karate and swimming, and she works out too. FIC keeps costs low by connecting families to existing community resources, such as the Y.

The family's also making healthier nutrition choices. "I used to eat anything," says Arthur, referring to the junk food he often bought after school. "Now, I'm healthy. I even feel more focused on school."

Martha Eliot Health Center

A resource for teens and families

Located in Jamaica Plain, the Martha Eliot Health Center (MEHC) was established in 1966 to address the needs of inner-city children, adolescents and families. Many of Martha Eliot's patients reside in the neighborhoods surrounding the health center— Jamaica Plain, Mission Hill, Roxbury and Dorchester—all parts of Boston hit by violence and persistent poverty. Many patients are recent immigrants to Boston from countries as varied as the Dominican Republic, Somalia and Haiti. As Children's Hospital Boston's community health center, MEHC embodies more than 40 years of commitment to provide and ensure that families can access the highest quality of health care.

Adolescent Services Program (ASP)

In addition to poverty and violence, MEHC's adolescent patients struggle with pregnancy, sexually transmitted diseases, chemical or alcohol dependency, as well as school and behavioral problems. These adolescent patients find many obstacles to treatment—too old for pediatricians, too young for adult providers and striving for independence from their parents. Addressing the urgent needs of these vulnerable young adults is challenging. The MEHC's Adolescent Services Program (ASP) has been essential to supporting these teens and meeting their unique needs. ASP reaches across multiple disciplines, combining the efforts of the mental health, medical and youth development staff at MEHC. Together, the team helps these at-risk youth build confidence, develop crucial decision-making skills and enhance their ability to resolve conflicts. What's the ultimate goal? To ensure these adolescents grow into healthy, productive adult members of their community.

Just in Time (JIT)

A key component of the Adolescent Services Program, Just in Time (JIT) is a mental health and crisis intervention service for urban youth who struggle with the effects of violence and poverty. JIT's structure incorporates the services of a mental health counselor with expertise in issues related to adolescents within the primary care setting. This innovative model enables the JIT social worker to handle mental health issues as they arise. As most adolescents are unlikely to schedule separate counseling appointments, JIT prevents adolescents in crisis from becoming lost.

Last year, the JIT social worker handled 95 referrals and was able to provide each teen with a short-term intervention to address concerns such as educational stressors or the challenges of pregnancy and parenting. For others, JIT handled issues related to both domestic and community violence. Through JIT, 37 adolescents received referrals to longer-term therapy last year. A referral to longer-term therapy allowed these adolescents to benefit from continued support around their stressors. To ensure that adolescents adhered to recommendations for long-term treatment, JIT staff worked closely with Adolescent Services to follow up on these referrals and get at-risk youth the help they so desperately needed.

For more information on MEHC, visit childrenshospital.org/mehc

Helping Youth in Crisis

Luz, 17, came to MEHC anxious and depressed. During her meetings with the JIT social worker, Luz revealed that her life had been deeply affected by gang violence. Luz's father was incarcerated for gang-related activities. Her boyfriend had been a gang member who was shot and killed in 2010 during a fight with a rival gang; sadly, the same fate had befallen her mother's boyfriend several years earlier. JIT paired Luz with a home-based therapist who worked intensively with her on anxiety, grief and plans for the future—something Luz had never before been able to envision. Today Luz is entering her last year of high school and is preparing to attend college. She still meets regularly with her home-based therapist and for the first time in her life, is feeling hopeful about what lies ahead.

Children's and the Boston Public Schools

Working together to build the capacity of families and schools

Children Hospital Boston's overarching goal in its work with the Boston Public Schools (BPS) has been to help support students while building the capacity of families and individual schools to address the health-related issues that can impact a student's ability to focus on learning. For over 10 years, Children's has partnered with the BPS in a variety of ways, including efforts to prepare families for their preschoolers' entrance into the BPS system, promote positive child health and development, offer training for school staff as well as help students overcome barriers that may prevent them from functioning in school.

Supporting students

For more than 10 years, the Children's Hospital Neighborhood Partnership (CHNP) has been in Boston schools providing a comprehensive array of mental health services to youth. In SY10–11, CHNP provided prevention, early intervention and clinical intervention services to over 1900 students in 15 CHNP partner schools. (For more information on CHNP, see page 1.)

Bolstering school personnel

- Beyond supporting students, CHNP has facilitated professional development opportunities for 293 teachers and was successful in supporting schools to better address student mental health issues, as measured by steady increases in capacity over time. (See chart page 7.)
- BPS school nurses are eligible for hospital-funded scholarships to assist their professional development. Since 2005, Children's has invested approximately $25,000 to offer 340 scholarships to 75 BPS nurses. Additional programs provide training and support to teachers and staff on topics such as asthma, autism and social, emotional and behavioral health.
- Children's has provided support to convert the school paper medical records to an electronic medical record format that allows school medical personnel to better track individual student health issues.

Encouraging parents

- Children's experts lead workshops at BPS' Parent University, which helps parents to better understand the connection between health and school success, enhance their ability to address health issues such as asthma and support their children's ability to develop self-regulation skills.
- Since its inception, Children's has supported Countdown to Kindergarten, a program to help children and families with the transition to kindergarten, as well as the initiative's Play to Learn program at the Hennigan School in Jamaica Plain, which serves as a bridge between pre-school and the BPS system.

Moving forward

BPS is eager to begin implementation of the Safe and Supportive Schools Framework developed by the Massachusetts Task Force on Behavioral Health and Public Schools and has invited CHNP to be its partner in the development of a district-wide behavioral health model that will pilot many of the elements in the framework. As BPS prepares for these changes, CHNP is co-sponsoring and leading monthly district-wide workshops for teachers and administrators in support of BPS's professional development practice. (For more details, see page 7.)

Community Health Centers:

Partners in health and access for local children

In 1965, the first community health center in the U.S. was founded at Columbia Point in Dorchester. Today, 52 health centers at 280 sites serve one of every nine Massachusetts residents.

The idea initially was to bring quality health care to low- and moderate-income people in inner cities and rural communities, who often had limited access to primary care services and limited means to pay for them. In a way, health centers were ahead of their time. The array of services they provide – primary, preventive and dental care, plus mental health, substance abuse and other services – mirrors many of the building blocks for the "medical home" concept, as do other health center hallmarks such as team-based care and care management and coordination. In addition, health centers often are cited as part of the solution to rising health costs.

Working with community health centers, Children's Hospital Boston focuses on two goals: 1) ensuring that pediatric care at health centers is able to grow, thrive and evolve; and 2) having a greater impact on child health and health disparities by ensuring accessible, high quality prevention and treatment services.

In pursuit of those goals, Children's supports community health centers to:

- build capacity to provide a full range of services and position themselves as part of the solution to managing health care costs through the use of a pediatric medical home model
- provide pediatric services that address the most pressing health issues affecting children
- demonstrate their value through effective assessment and reporting of quality outcomes

Building capacity

Health centers are essential partners in Children's efforts to increase access to preventive care, manage chronic disease and provide treatment for some of the most prevalent health issues facing Boston children and youth. Because of the important role centers play, Children's supports their efforts both to ensure the quality of pediatric care they deliver and to help them expand their range of services as part of a patient-centered medical home.

In today's economy, one of the greatest resources Children's can bring to health centers is financial support. In FY11, Children's provided more than $1 million in grants and services to its partner health centers. Half of this funding was flexible, allowing the centers to use it as needed to support their pediatric needs. For more than a decade, Children's has been providing this type of support to 10 Boston community health centers. In December 2011, Children's formed a new affiliation with MattapanCommunity Health Center. Together, these centers provide primary care and support services to an estimated 33,000 Boston children and their families in urban core neighborhoods.

The hospital has also provided significant capital funds to help health centers with needed construction or renovation, such as new projects at the Whittier Street and Mattapan Health Centers.

Addressing health needs

Additional funding supports specific services and programs in community health centers that allow them to address high-priority health needs consistent with Children's community mission. For example, to help combat childhood obesity, 11 centers are part of the Fitness in the City Program (see page 14) and four host "OWL on the Road" a mobile version of the hospital-based OWL (Optimal Weight for Life) clinic that provides medical obesity treatment services by subspecialty clinicians. Three health centers participate in the hospital's Advocating Success for Kids (ASK) program (see page 12) for children experiencing school-functioning problems. To increase access to much-needed mental health services, part-time psychiatrists are available at five health centers through Children's Hospital Neighborhood Partnerships (CHNP), the hospital's community mental health program (see page 1). As a result of these programs, health centers are able to reach nearly 1500 children each year.

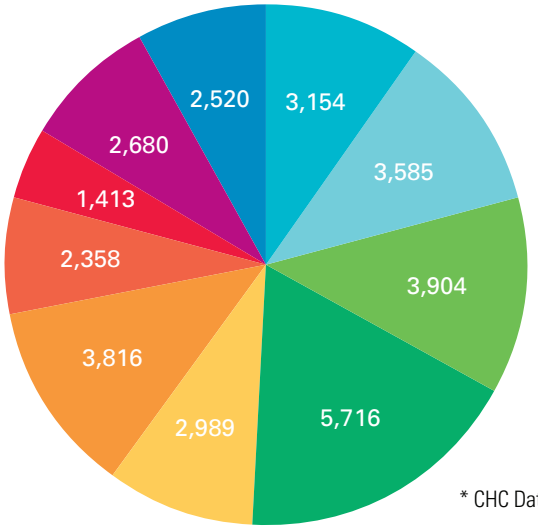
The Dimock Center in Roxbury participates in Fitness in the City, OWL on the Road and CHNP. "For us, this means support for our nutritionist and a Children's endocrinologist who comes once a month. These professionals are invaluable in helping us work with young patients who are, or are at risk for, obesity," says Myechia Minter-Jordan, MD, MBA, chief medical officer at Dimock. "We also benefit from the weekly presence of a bilingual child psychiatrist who works with the social worker and therapist in our pediatric clinic team. Children's commitment to the mental health needs of children and adolescents has been critical to our ability to address these issues locally."

Focusing on quality and outcomes

While funding is imperative, the role that Children's has in supporting the quality initiatives at partner community health centers is equally important. As an increasing number of payers

Total Pediatric Population in 10 Affiliated Community Health Centers (CHCs*)

N = 32,135 for 10 health centers



* CHC Data CY11

- Bowdoin Street
- South End
- Dimock
- South Cove
- Southern Jamaica
- Upham's
- Joseph M. Smith
- Roxbury
- Whittier
- Brookside

adopt quality reporting requirements, Children's and its affiliated health centers have been developing and sharing best practices to assess, report and monitor pediatric quality data.

In 2009, Children's provided additional funding to support more robust reporting and analysis of quality data. The centers now have three years of experience in collecting data and using the information to track their progress in areas such as asthma care, immunization rates, obesity and child development. "The health centers came together to discuss results and share best practices for improvement," says Shari Nethersole, MD, medical director for community health in the Office of Child Advocacy at Children's. "The centers also collect demographic information such as volume of patients, age, gender, race and ethnicity, plus payer, staff and other data and can track the prevalence of health issues such as asthma, depression and ADHD." This allows them to assess needs on an ongoing basis and adapt their approaches and staffing to provide more efficient, timely, patient centered and comprehensive services, all necessary requirements of the medical home model.

Improving access

While Children's has affiliation agreements with 11 health centers, the hospital also supports the Boston Public Health Commission and the Massachusetts League of Community Health Centers in their efforts to promote better utilization and coordination of care with health centers.

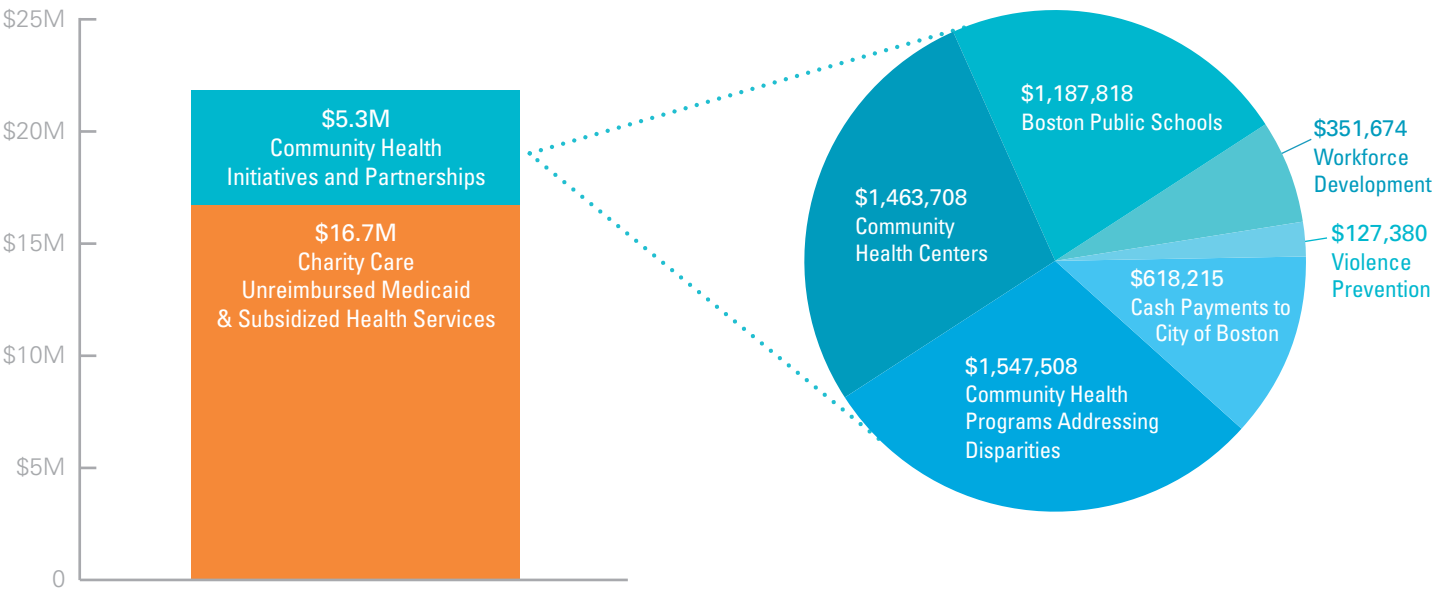
And finally, health centers and Children's share a desire to address children's health issues on a broader level. Children's works with community organizations, health centers and city, state and federal policy-makers to bring attention to children's health issues, such as improved access to asthma care or needed reforms in the state's mental health system. Minter-Jordan said, "Bringing to light issues that affect our community and being a voice for those who don't often get heard is important, and the hospital does an excellent job in advocating for children's issues."

Children's-Affiliated Community Health Centers

- Bowdoin Street Health Center, Dorchester
- Brookside Community Health Center, Jamaica Plain
- The Dimock Center, Roxbury
- Joseph M. Smith Community Health Center, Allston
- Martha Eliot Health Center, Jamaica Plain *
- Mattapan Community Health Center, Mattapan
- Roxbury Comprehensive Community Health Center
- South Cove Community Health Center, Chinatown
- South End Community Health Center
- Southern Jamaica Plain Health Center
- Upham's Corner Health Center, Dorchester
- Whittier Street Health Center, Roxbury

* Children's owned and operated.

FY11 Investment in Boston Children and Families



Invested to Benefit the Heath & Well-Being of Boston Children and Families: **$22 Million Total**

$5.3 Million Invested to Support Community Health Initiatives and Partnerships

spotlight

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Children's Listens and Learns From Residents and Stakeholders

Everything Children's Hospital Boston does in fulfilling its community mission is based on how it can best utilize its expertise and resources to address the critical health issues families face today. A comprehensive assessment helps the hospital to identify and understand the current issues. "Children's uses both formal and informal methods to listen and learn from our community," says Christine Healey, manager for Program and Community Partnerships in the Office of Child Advocacy at Children's. This process involves continued community engagement—seeking input and having ongoing conversations with families and community leaders including key partners like the City of Boston, the Boston Public Health Commission (BPHC) and the Boston Public Schools.

Guided by Children's Community Advisory Board, Children's conducts a formal health assessment every three years to "takes the pulse" in Boston neighborhoods surrounding the hospital. Focus groups with residents, interviews with key stakeholders and an analysis of data and best practice literature provides an in-depth view of not just concerns and needs, but also the strengths and assets of the community. "Our goal is to use the information gathered to develop the hospital's action plan which aims to leverage resources and find synergies," says Healey.

The results also impact Children's community mission which is focused on: 1) improving access to care and serving as a safety net hospital, 2) implementing programs to improve health in four key areas (asthma, obesity, mental health and child development) and achieve systemic change, and 3) supporting partners to address the social determinants of health that affect the entire community.

Children's last formal report was completed in 2009 and the hospital is now preparing for its next assessment. The data collection process is underway as the hospital embarks on the Boston Child Health Study, in partnership with the BPHC. (See page 8.)

For more details on the needs assessment process, visit childrenshospital.org/community

Appendix B

LEED Checklists

LEED 2009 for Healthcare: New Construction and Major Renovations

Project Checklist

Boston Children's Hospital - Clinical Building w/ Cogen

Y	?	N			
9	7	2	**Sustainable Sites**	Possible Points:	**18**
Y			Prereq 1	Construction Activity Pollution Prevention	
Y			Prereq 2	Environmental Site Assessment	
Y			Credit 1	Site Selection	1
Y			Credit 2	Development Density and Community Connectivity	1
	?		Credit 3	Brownfield Redevelopment	1
Y			Credit 4.1	Alternative Transportation—Public Transportation Access	3
	?		Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
	?		Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicl	1
Y			Credit 4.4	Alternative Transportation—Parking Capacity	1
	?		Credit 5.1	Site Development—Protect or Restore Habitat	1
	?		Credit 5.2	Site Development—Maximize Open Space	1
Y			Credit 6.1	Stormwater Design—Quantity Control	1
	?		Credit 6.2	Stormwater Design—Quality Control	1
	?		Credit 7.1	Heat Island Effect—Non-roof	1
Y			Credit 7.2	Heat Island Effect—Roof	1
		N	Credit 8	Light Pollution Reduction	1
Y			Credit 9.1	Connection to the Natural World—Places of Respite	1
		N	Credit 9.2	Connection to the Natural World—Direct Exterior Access for Patients	1

Y	?	N			
6	1	2	**Water Efficiency**	Possible Points:	**9**
Y			Prereq 1	Water Use Reduction—20% Reduction	
Y			Prereq 2	Minimize Potable Water Use for Medical Equipment Cooling	
	?		Credit 1	Water Efficient Landscaping—No Potable Water Use or No Irrigation	1
Y			Credit 2	Water Use Reduction: Measurement & Verification	1 to 2
Y			Credit 3	Water Use Reduction	1 to 3
Y			Credit 4.1	Water Use Reduction—Building Equipment	1
Y			Credit 4.2	Water Use Reduction—Cooling Towers	1
		N	Credit 4.3	Water Use Reduction— Food Waste Systems	1

Y	?	N			
21	0	18	**Energy and Atmosphere**	Possible Points:	**39**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
Y			Credit 1	Optimize Energy Performance	1 to 24
		N	Credit 2	On-Site Renewable Energy	1 to 8
Y			Credit 3	Enhanced Commissioning	1 to 2
Y			Credit 4	Enhanced Refrigerant Management	1
Y			Credit 5	Measurement and Verification	2
		N	Credit 6	Green Power	1
		N	Credit 7	Community Contaminant Prevention—Airborne Releases	1

Y	?	N			
7	0	3	**Materials and Resources**	Possible Points:	**16**
Y			Prereq 1	Storage and Collection of Recyclables	
Y			Prereq 2	PBT Source Reduction—Mercury	
		N	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		N	Credit 1.2	Building Reuse—Maintain Interior Non-Structural Elements	1
Y			Credit 2	Construction Waste Management	1 to 2
Y			Credit 3	Sustainably Sourced Materials and Products	1 to 4
Y			Credit 4.1	PBT Source Reduction—Mercury in Lamps	1
Y			Credit 4.2	PBT Source Reduction—Lead, Cadmium, and Copper	2
Y			Credit 5	Furniture and Medical Furnishings	1 to 2
		N	Credit 6	Resource Use—Design for Flexibility	1

Y	?	N			
10	0	8	**Indoor Environmental Quality**	Possible Points:	**18**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
			Prereq 3	Hazardous Material Removal or Encapsulation	
Y			Credit 1	Outdoor Air Delivery Monitoring	1
Y			Credit 2	Acoustic Environment	1 to 2
Y			Credit 3.1	Construction IAQ Management Plan—During Construction	1
Y			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
Y			Credit 4	Low-Emitting Materials	1 to 4
Y			Credit 5	Indoor Chemical and Pollutant Source Control	1
Y			Credit 6.1	Controllability of Systems—Lighting	1
Y			Credit 6.2	Controllability of Systems—Thermal Comfort	1
Y			Credit 7	Thermal Comfort—Design and Verification	1
		N	Credit 8.1	Daylight and Views—Daylight	2
		N	Credit 8.2	Daylight and Views—Views	1 to 3

Y	?	N			
3	0	3	**Innovation in Design**	Possible Points:	**6**
Y			Prereq 1	Integrated Project Planning and Design	
Y			Credit 1.1	Innovation in Design: Development Density	1
Y			Credit 1.2	Innovation in Design: Public Transportation	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
Y			Credit 2	LEED Accredited Professional	1
			Credit 3	Integrated Project Planning and Design	1

			Regional Priority Credits	Possible Points:	**4**
			Credit 1.1	Regional Priority: Specific Credit	1
			Credit 1.2	Regional Priority: Specific Credit	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1

56	8	36	**Total**	Possible Points:	**110**

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

LEED 2009 for New Construction and Major Renovations

Project Checklist

819 Beacon Street

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
		N	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
		N	Credit 4.4	Alternative Transportation—Parking Capacity	2
		N	Credit 5.1	Site Development—Protect or Restore Habitat	1
		N	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
		N	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	
		N	Credit 1	Water Efficient Landscaping	2 to 4
2			Credit 2	Innovative Wastewater Technologies	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	
Y			Prereq 3	Fundamental Refrigerant Management	
5			Credit 1	Optimize Energy Performance	1 to 19
		N	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
		N	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	
		N	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		N	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
1			Credit 2	Construction Waste Management	1 to 2
		N	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
	1		Credit 4	Recycled Content	1 to 2
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	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
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: double transit ridership	1
			Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

			Credit 1.1	Regional Priority: Specific Credit	1
			Credit 1.2	Regional Priority: Specific Credit	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1

Total — Possible Points: 110

48	10		Total

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