PUBLIC NOTICE

The Boston Redevelopment Authority ("BRA"), pursuant to Article 80 of the Boston Zoning Code, hereby gives notice that a Project Notification Form for Large Project Review ("PNF") was filed by Cedar Valley Development, LLC (the "Proponent") on July 11, 2012 for the 105A South Huntington Avenue project (the "Proposed Project"), to be constructed on an approximately 1.1 acre vacant parcel of land between the Jamaicaway and South Huntington Avenue in Jamaica Plain, near the Mission Hill line, in Boston.

The Proposed Project includes a mix of approximately 195 one, two and three bedroom residential units, as well as approximately 1,600 square feet of retail space on the ground floor. The Proposed Project includes approximately 176 parking spaces in an enclosed garage.

The Proponent is seeking the issuance of a Scoping Determination by the BRA pursuant to Section 80B-5. The BRA, in the Scoping Determination for such PNF, may waive further review pursuant to Section 80B-5.3(d), if, after reviewing public comments, the BRA finds that such PNF adequately describes the Proposed Project's impacts.

The PNF may be reviewed in the office of the Secretary of the BRA, Room 910, Boston City Hall, 9th Floor, Boston MA 02201 between 9:00 AM and 5:00 PM, Monday through Friday, except legal holidays. Public comments on the PNF, including the comments of public agencies, should be submitted in writing to John Fitzgerald, BRA, at the address stated above within 45 days of this notice.

BOSTON REDEVELOPMENT AUTHORITY
Brian P. Golden, Executive Director/Secretary

Expanded Project Notification Form

105A S. Huntington Avenue

Submitted to:

Boston Redevelopment Authority
One City Hall Square
Boston, Massachusetts 02201

Prepared by:

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

Submitted by:

Cedar Valley Development, LLC
895 Huntington Avenue
Boston, Massachusetts 02115

In Association with:

Prellwitz/Chilinski Associates, Inc.
Goulston & Storrs
Howard/Stein-Hudson Associates, Inc.
Nitsch Engineering
McPhail Associates, Inc.

July 11, 2012

Epsilon
ASSOCIATES INC.

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July 11, 2012

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Chapter 1.0

Introduction/Project Description

1.0 INTRODUCTION / PROJECT DESCRIPTION

1.1 Introduction

Cedar Valley Development, LLC (the Proponent), proposes the development of an approximately 1.1 acre parcel of vacant land located at 105A South Huntington Avenue in Jamaica Plain, near the Mission Hill line, in Boston. The Project calls for the construction of approximately 195 high quality residential rental units, two small retail spaces and on-site parking for residents. The Project is designed to be a transit-oriented development (TOD) as it directly abuts the Massachusetts Bay Transportation Authority (MBTA) Green Line and existing bus stops. The Proponent envisions the property serving households who want to live and work near the Longwood Medical and Academic Area (LMA) and Mission Hill and Jamaica Plain neighborhoods. The Project's primary target market is young professional couples working in the Longwood Medical Area. The Project's design was conceived with the idea of providing apartment layouts conducive to modern family needs.

This Expanded Project Notification Form (PNF) is being submitted to the Boston Redevelopment Authority (BRA) to initiate review of the Project under Article 80B, Large Project Review, of the Boston Zoning Code.

1.2 Project Identification

Project Address/Location:	105A South Huntington Avenue
Developer:	Cedar Valley Development, LLC 895 Huntington Avenue Boston, MA 02115 (617) 731-0887 Alex Nader Anthony Nader
Architects:	Prellwitz/Chilinski Associates, Inc. 221 Hampshire Street Cambridge, MA 02139 (617) 547-8120 David Chilinski David Snell

Legal Counsel:	Goulston & Storrs 400 Atlantic Avenue Boston, MA 02110 (617) 482-1776 Matthew J. Kiefer Robert D. Caridad
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Cindy Schlessinger Geoff Starsiak Tyler Norod
Transportation and Parking Consultants:	Howard/Stein-Hudson Associates, Inc. 38 Chauncy Street Boston, MA 02111 (617) 482-7080 Joseph SanClemente
Civil Engineer:	Nitsch Engineering 186 Lincoln Street, Suite 200 Boston, MA 02111 (617) 338-0063 John Schmid
Geotechnical Consultant:	McPhail Associates, Inc. 2269 Massachusetts Avenue Cambridge, MA 02140 (617) 868-1420 Ambrose J. Donovan Jonathan W. Patch

1.3 Project Description

1.3.1 Project Site

The Project site is an approximately 1.1 acre vacant parcel of land located at 105A South Huntington Avenue in Jamaica Plain near the border with Mission Hill (see Figure 1-1). The Project site is bounded to the east by South Huntington Avenue and to the west by the Jamaicaway. The parcel is at a transition point between lower-scale residential uses and larger scaled institutional uses. Four and five story residential buildings line South

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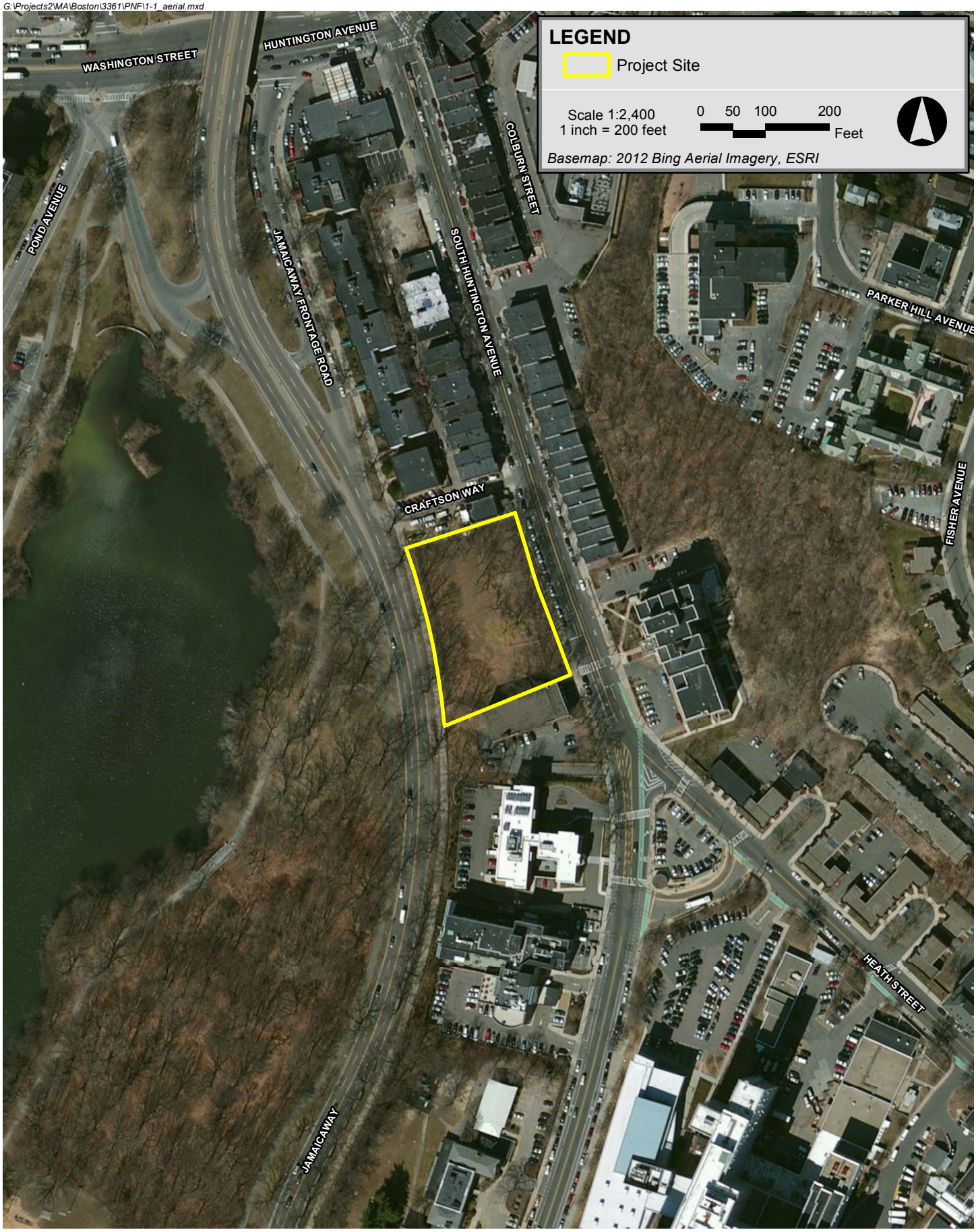

105A S. Huntington Avenue Boston, MA

Epsilon ASSOCIATES INC.

Figure 1-1
Aerial Locus Map

Huntington Avenue to the northeast. Directly to the east of the site along South Huntington Avenue lies the 11-story Back of the Hill apartment complex. Continuing south along South Huntington Avenue, the scale of the neighborhood transitions toward much taller institutional uses consisting of buildings 4-14 stories tall that are set back from the street and buffered by at-grade parking. The proposed Project respects this transition in scale while extending the pedestrian oriented streetscape along South Huntington Avenue to improve the public realm for future community use.

The site has more than a 22 foot topographic change from the high point on the southeast corner on South Huntington Avenue down towards the northwest corner on the Jamaicaway. The Jamaicaway borders the lower, western side of the site, which includes mature trees lining the edge. A site survey is included as Appendix A.

South Huntington Avenue is an active street with single car lanes and parking on both sides. The Project will be a transit oriented development served by both the MBTA Green Line and several MBTA bus lines.

1.3.2 Proposed Development

The Project site is currently an underutilized parcel located at the transition between a residential area and an institutional district. The proposed Project includes the creation of 195 high quality rental housing units that will complement the existing residential character of the neighborhood while contributing to the improved vibrancy of the public realm. The units will be a mixture of townhouse style and apartment style structures. Each townhouse unit will have direct street access to South Huntington Avenue to further improve public safety and the pedestrian friendly environment of the surrounding community. The four-story townhouse component along the Jamaicaway will step back to better align with the surrounding uses. These lower level units will be accessible from both the garage and courtyard with access from South Huntington Avenue. Figures 1-2 to 1-19 include floor plans and elevations of the Project.

1.3.2.1 Program

The proposed Project will consist of a mix of approximately 195 one, two and three bedroom units marketed towards couples and families working in the LMA and Mission Hill and Jamaica Plain neighborhoods of Boston. The Project will also incorporate two small neighborhood retail components along South Huntington Avenue totaling approximately 1,600 square feet (sf), improving the pedestrian experience while creating a new amenity for local residents and workers. Table 1-1 provides the Project program. The residential component includes one bedroom units ranging in size from approximately 610 sf to 900 sf, two bedroom units from approximately 810 sf to 1,270 sf, two bedroom townhouses from approximately 900 sf to 1,280 sf, and three bedroom units from approximately 1,140 sf to 1,200 sf.

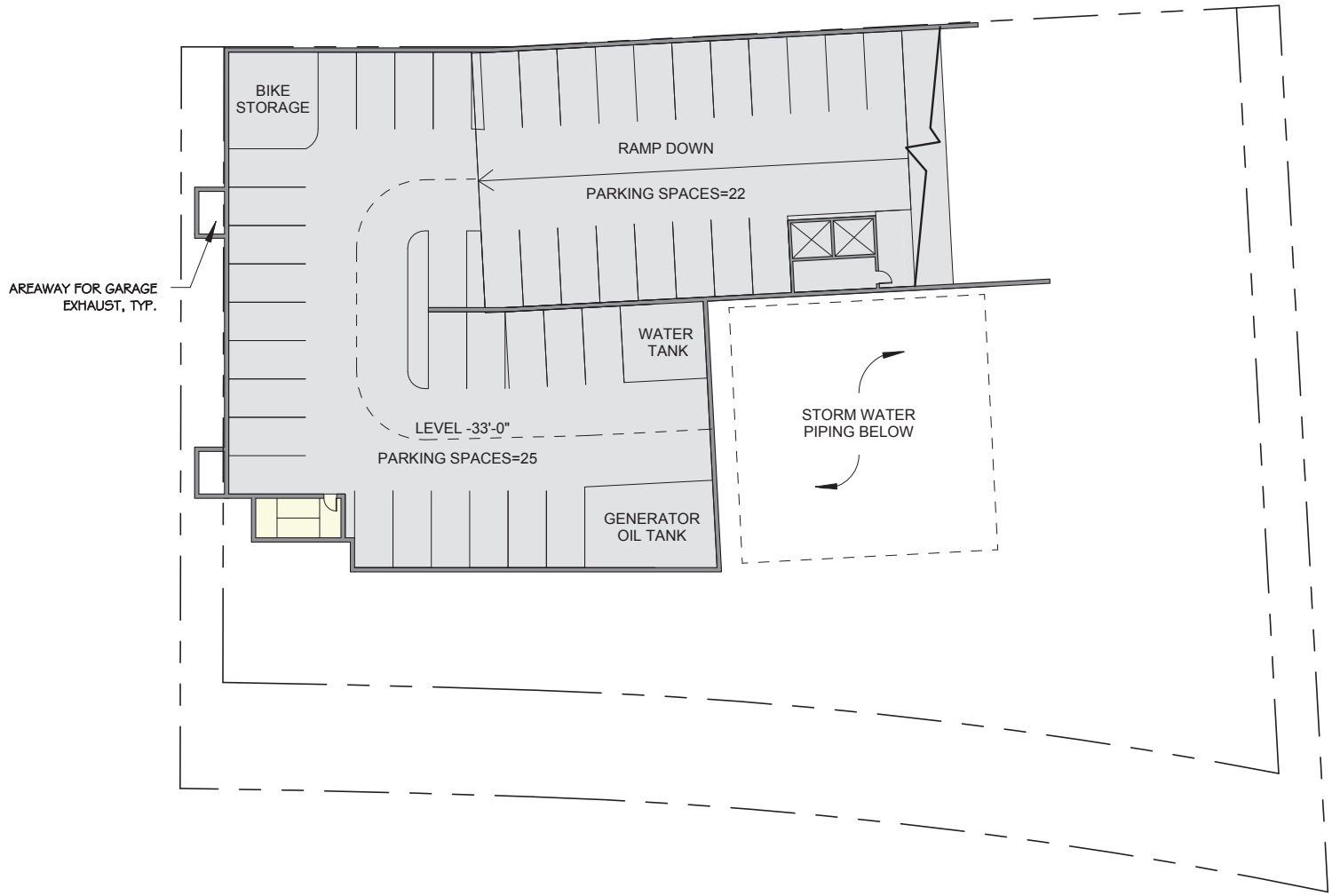

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Figure 1-2
Parking Level 2.5

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Figure 1-3
Parking Level 2

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Figure 1-4
Parking Level 1

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Figure 1-5
Floor Level 1

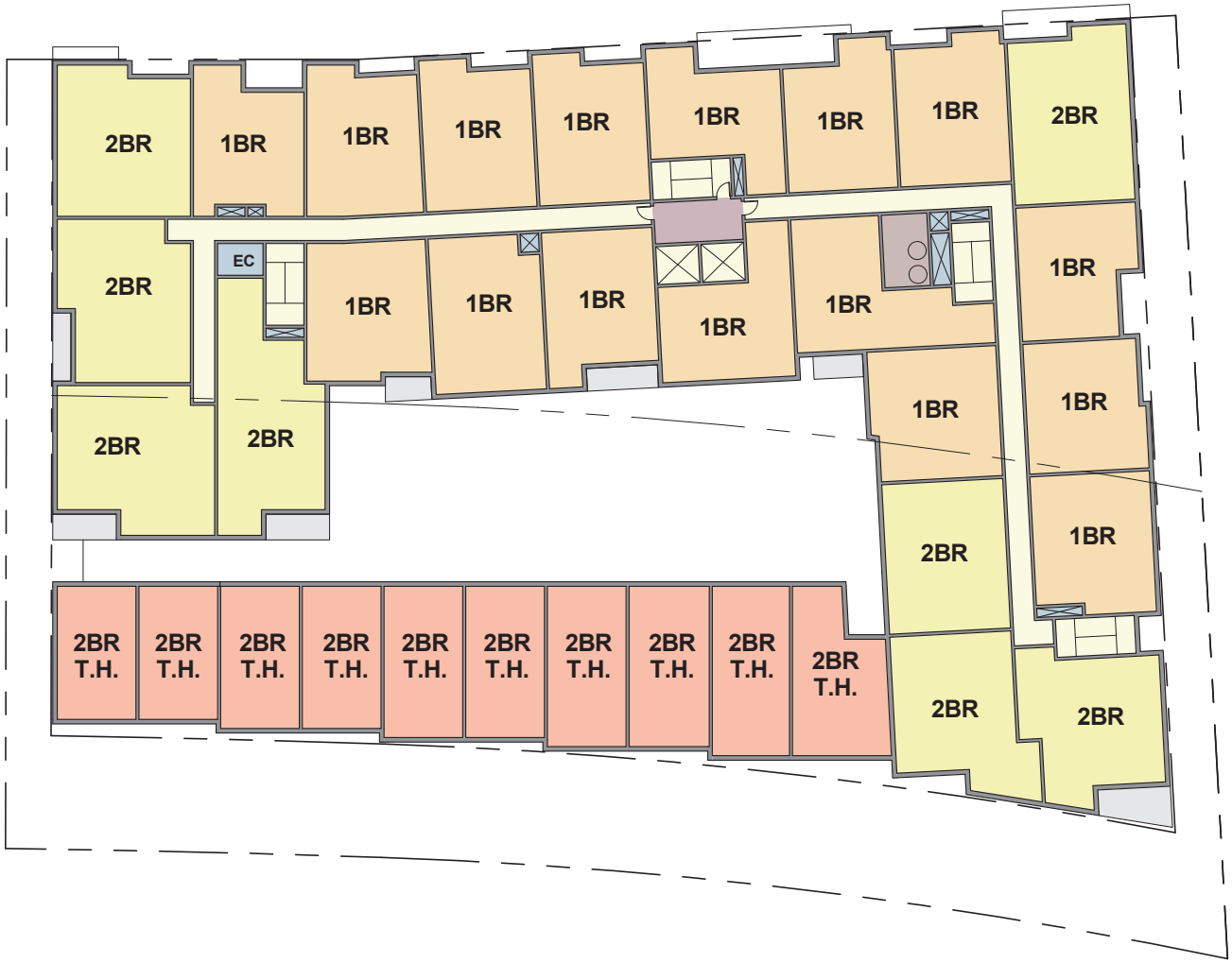

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Figure 1-6
Floor Level 2

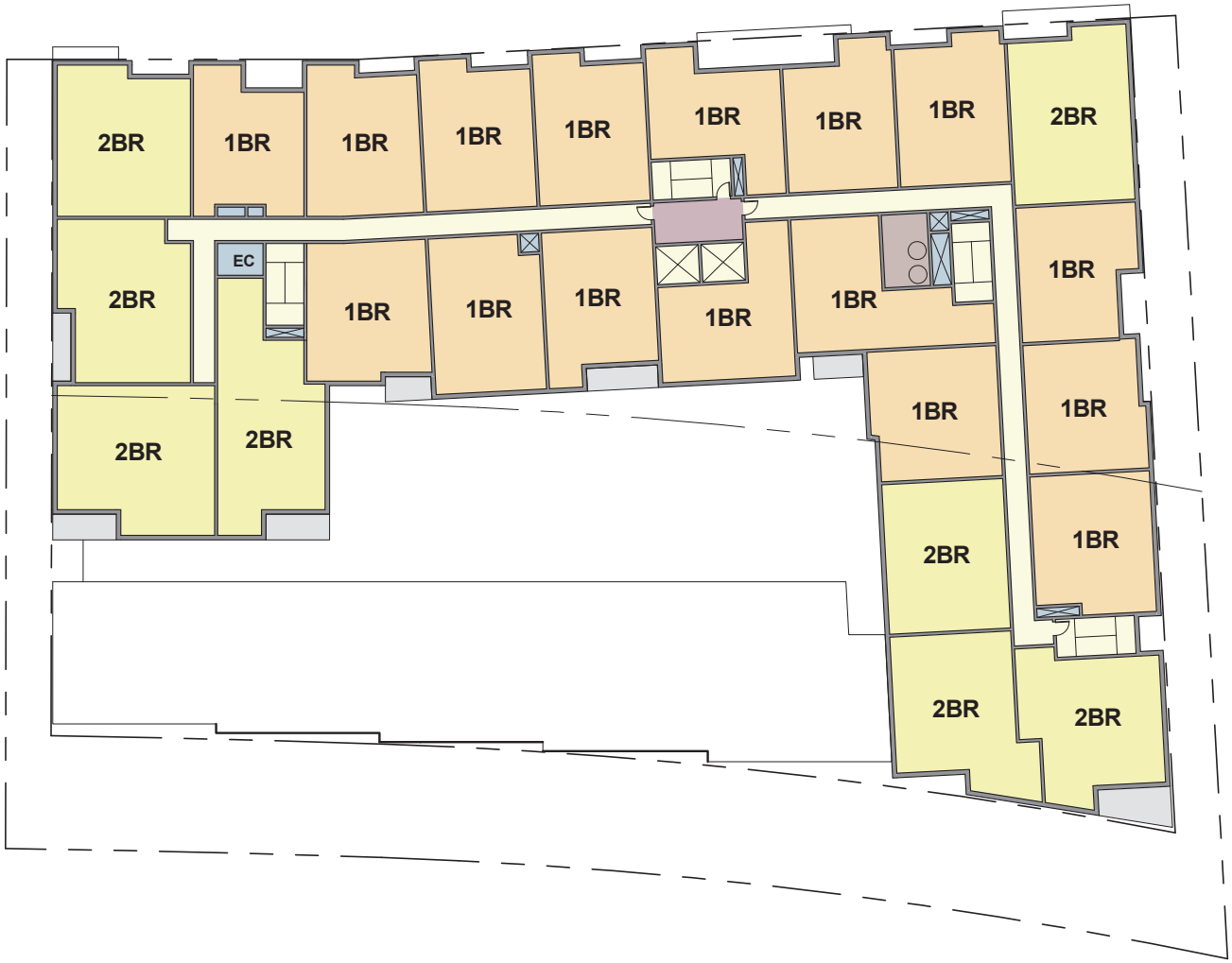

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Figure 1-7
Floor Level 3

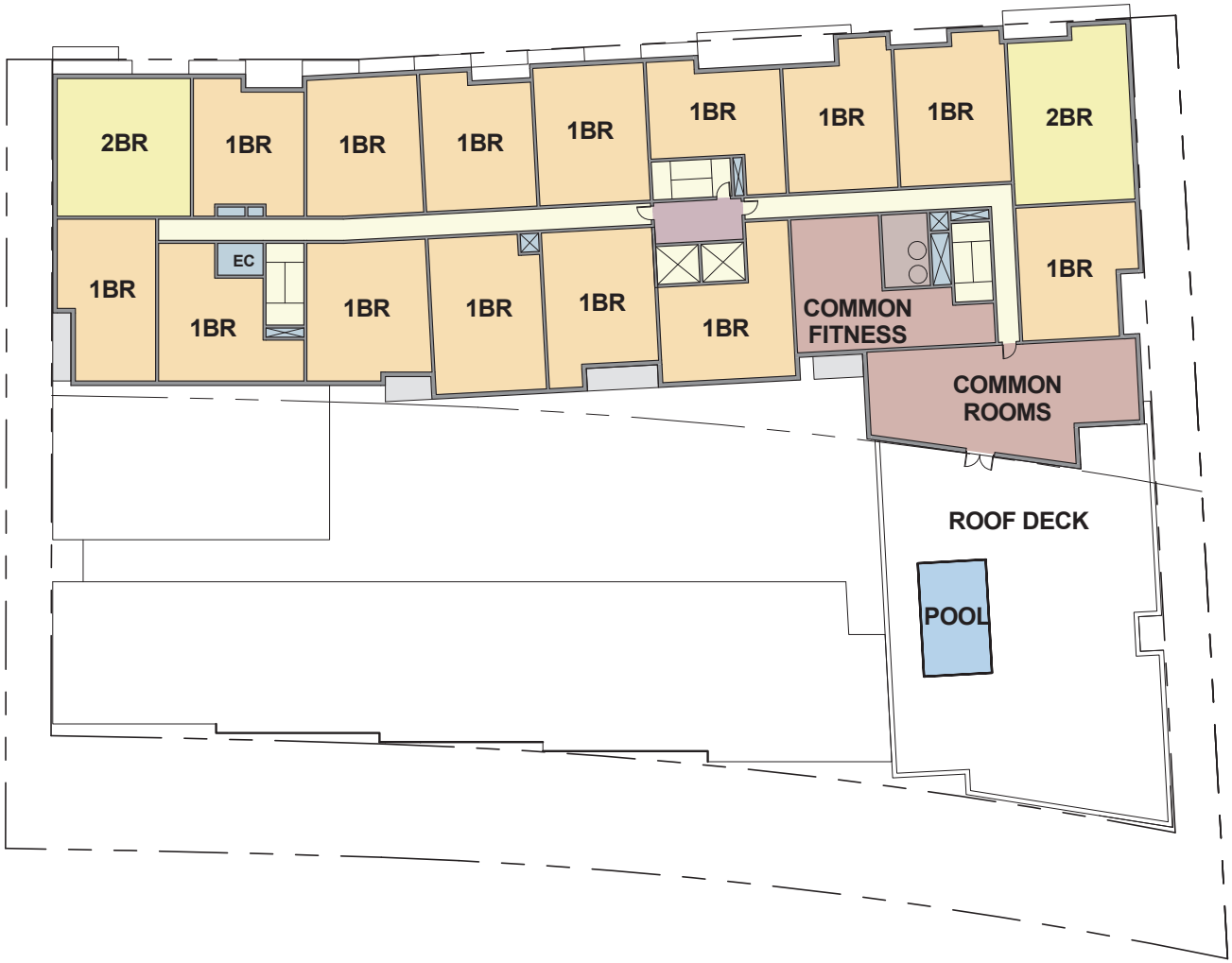

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Figure 1-8
Floor Level 4

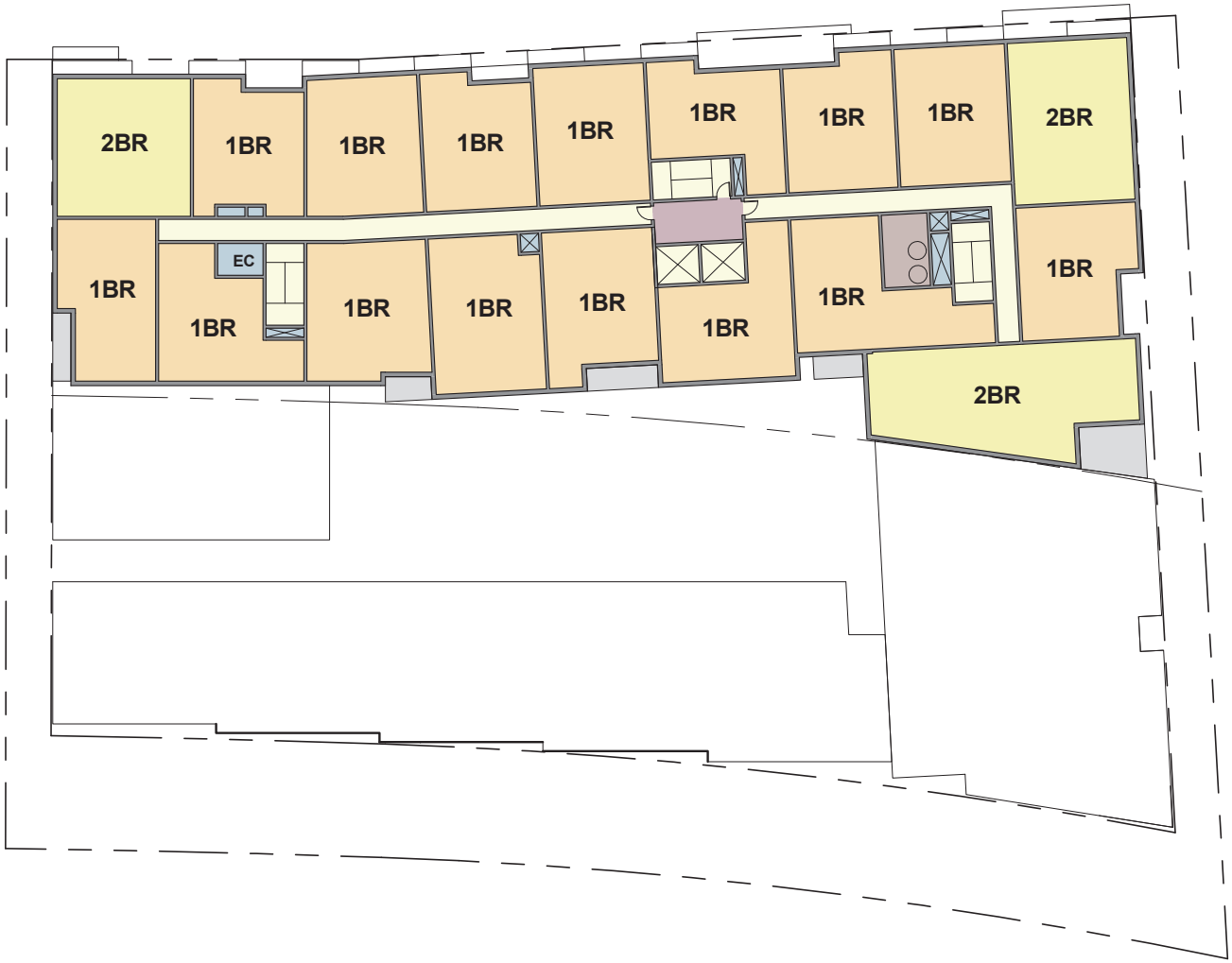

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Figure 1-9
Floor Level 5

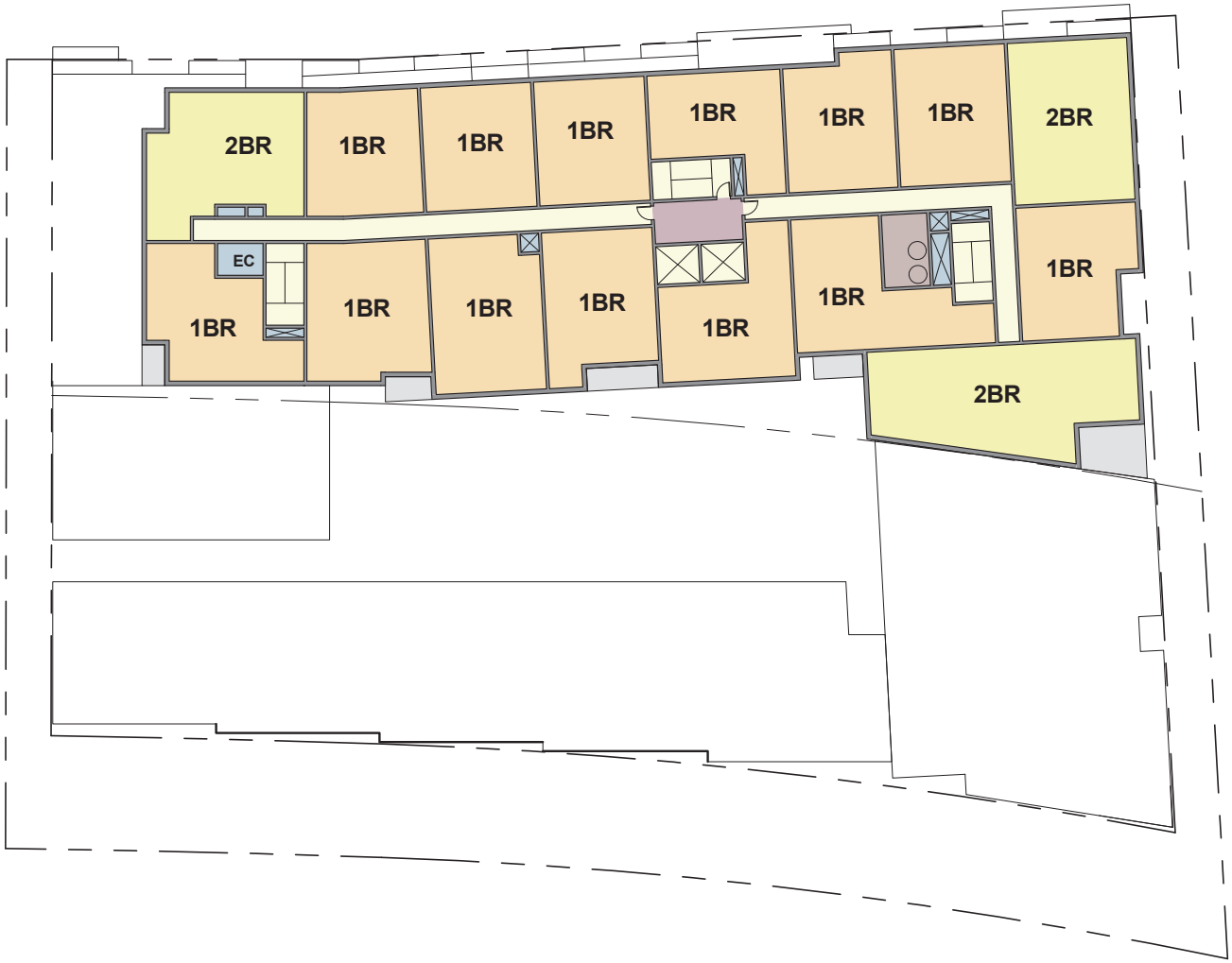

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Figure 1-10
Floor Level 6

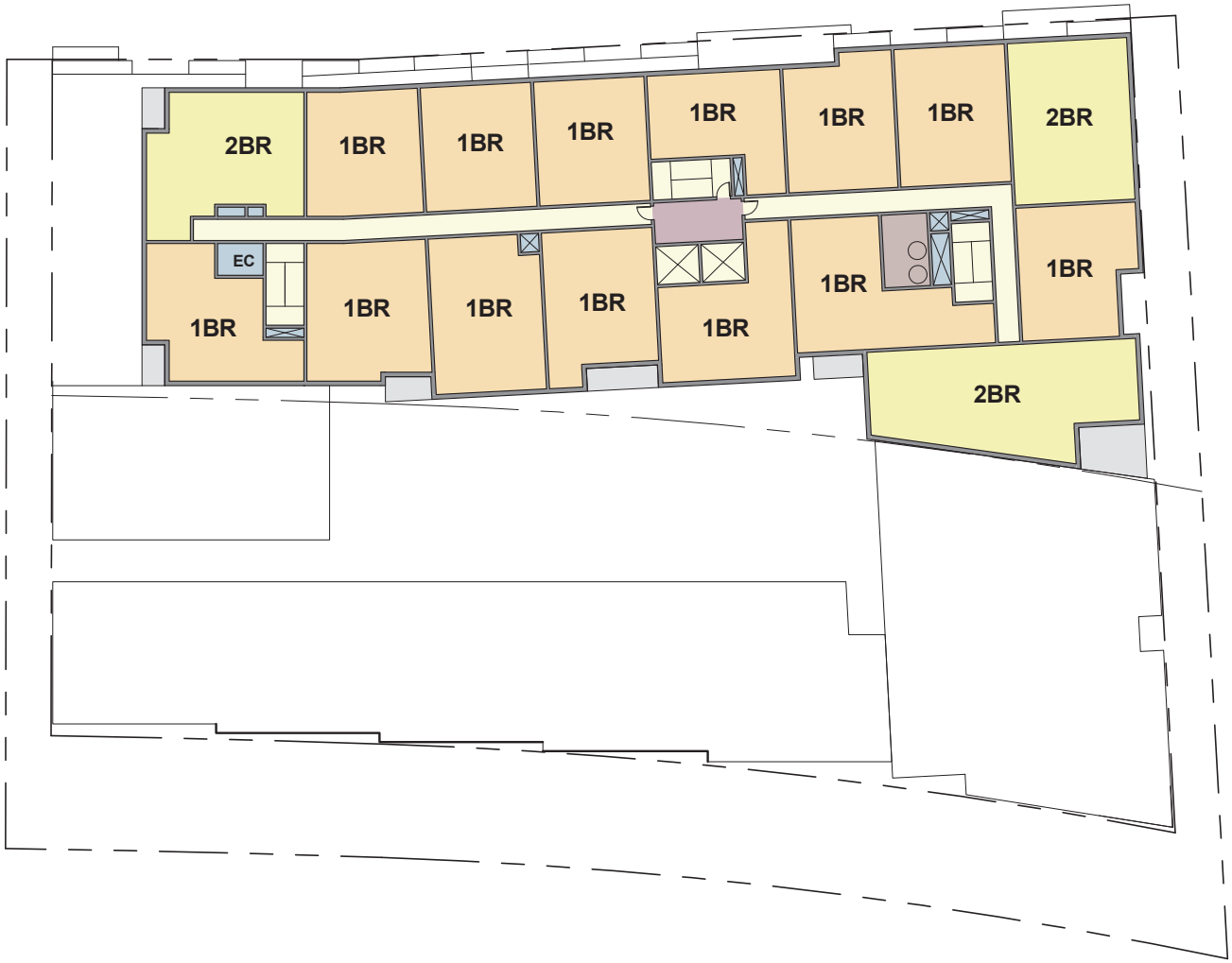

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Figure 1-11
Floor Level 7

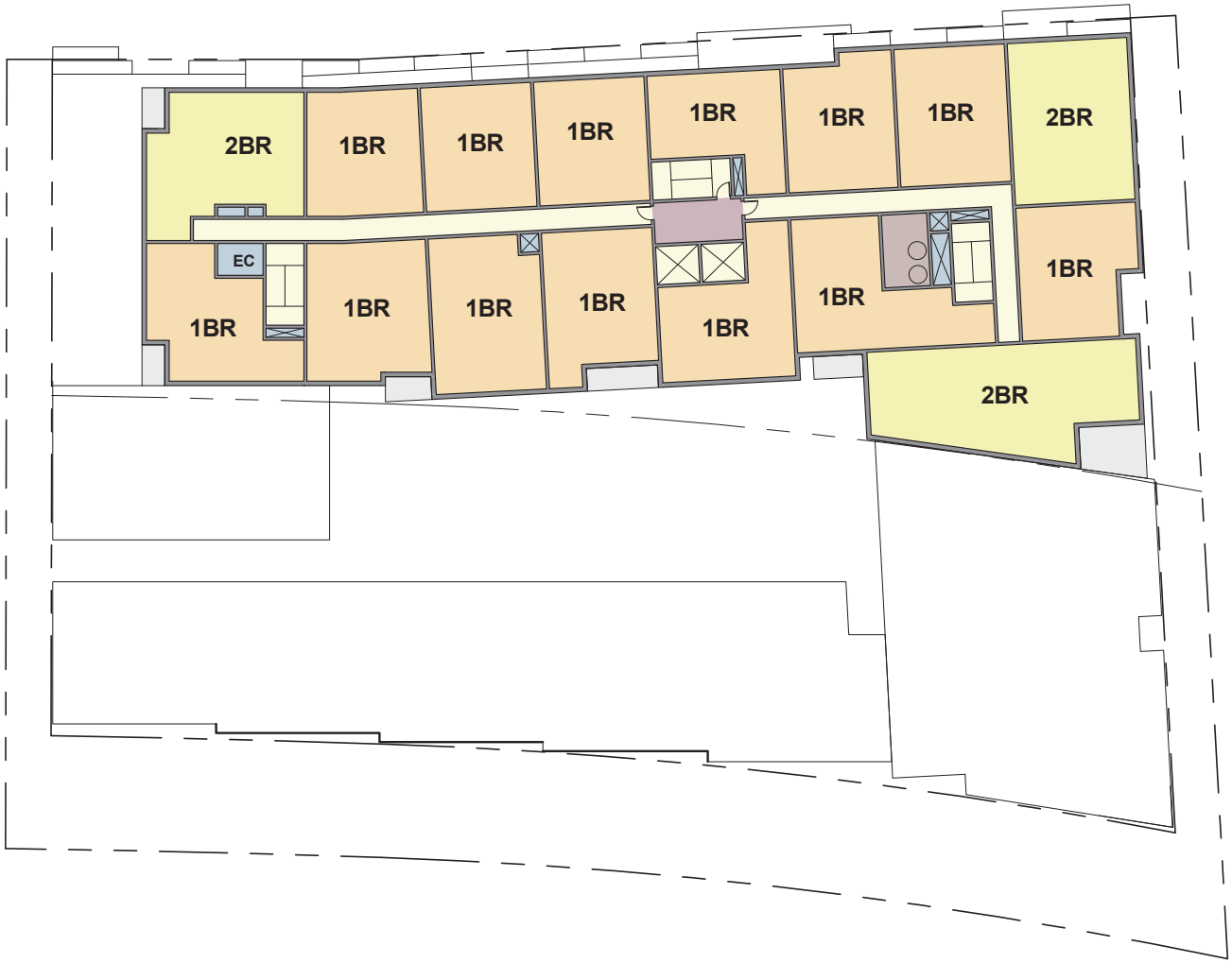

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Figure 1-12
Floor Level 8

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Figure 1-13
Floor Level 9

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Figure 1-14
Floor Level 10

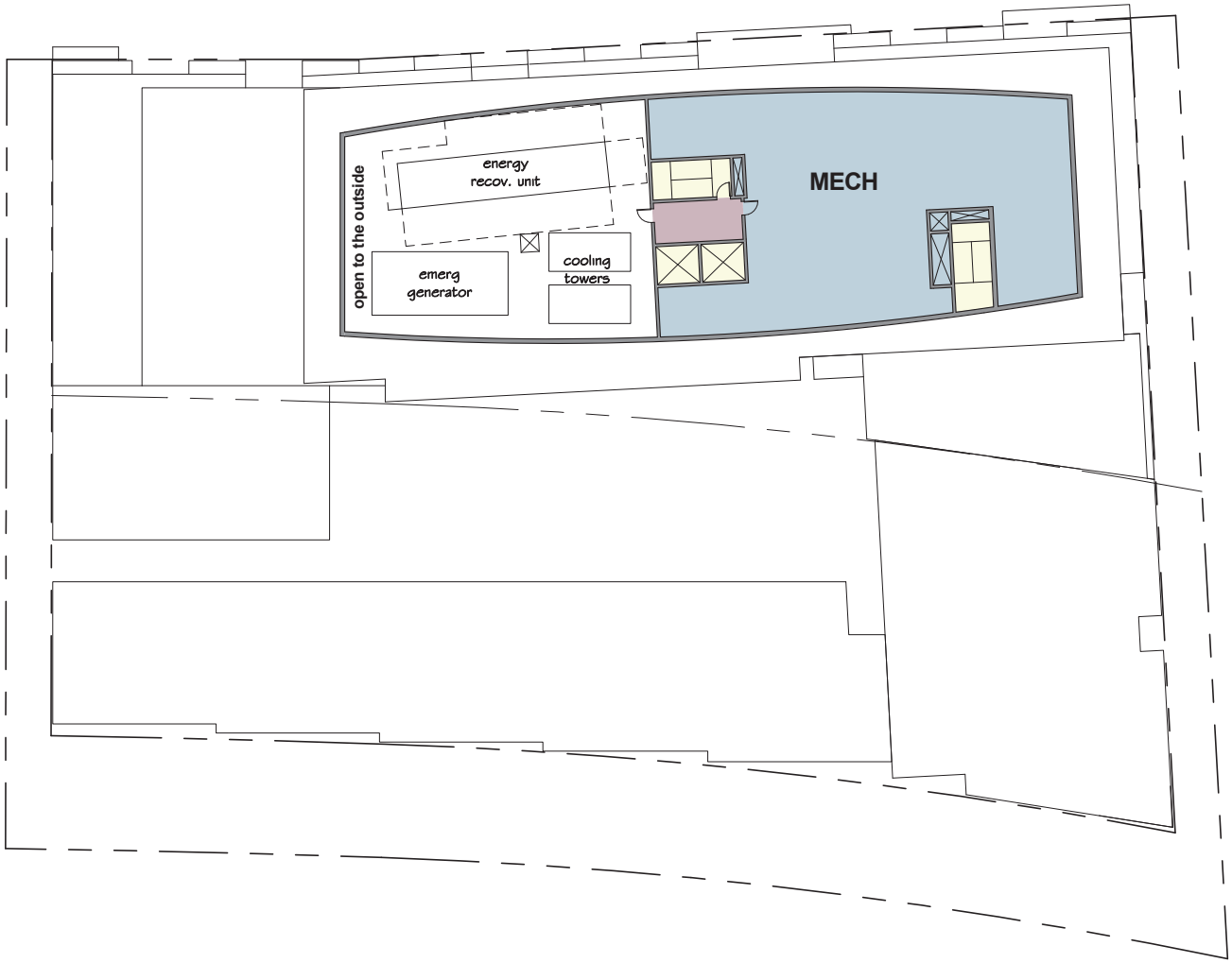

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Figure 1-15
Mechanical

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Figure 1-16
East Elevation

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Figure 1-17
North Elevation

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Figure 1-18
South Elevation

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Figure 1-19
West Elevation

Table 1-1 Program

Project Element	Approximate Dimension
Floor Area [1]	204,050 sf
Residential	202,450 sf / 195 units
Retail	1,600 sf
Building Height[2]	130 feet
Parking	176 spaces

[1] Under the Boston Zoning Code, residential garage space located at or below grade is not included in calculating floor area ratio. Accordingly, in calculating the Project's floor area and floor area ratio, (i) the enclosed loading area, located at grade with South Huntington Avenue, (ii) the parking garage, located entirely below the grade of South Huntington Avenue, and (iii) other areas of the building excludable under the Code (e.g., mechanical and storage facilities) have not been included. Due to the steep grade of the site from South Huntington down to the Jamaicaway and the definition of "grade" under the Zoning Code, it is possible that, as a technical zoning code matter, some or all of this parking or loading area will be included in gross floor area used to calculate floor area ratio. A final calculation will be performed once design of the building has advanced.

[2] Based on Boston Zoning Code

1.3.2.2 Parking and Access

Given its location proximate to the MBTA Green Line and nearby bus routes, the proposed Project has been designed as a transit oriented development. The Project proposes approximately 176 parking spaces, including approximately nine spaces for low-emitting and fuel efficient vehicles, and as discussed in Section 2.3.2.5, the parking ratio will be approximately 0.90 spaces per unit. The Boston Transportation Department's maximum parking ratio guidelines for residential use in Jamaica Plain is 0.75-1.25 spaces per unit. The Project will work with Zipcar to explore the feasibility of including access to Zipcar and explore the feasibility of an electric vehicle charging station as part of an enclosed ventilated parking garage nestled into the side of the property taking advantage of the steep grade change between South Huntington Avenue and the Jamaicaway. The garage will be accessed through a curb cut along South Huntington Avenue. There will be no vehicular access from the Jamaicaway. An existing curb cut along the Jamaicaway will be abandoned.

1.3.2.3 Landscape/Open Space

The landscape design for the Project consists of three distinct zones. The first zone is the frontage along South Huntington Avenue, the second zone is the outdoor inner courtyard area located within the building itself, and the third zone is the frontage along the Jamaicaway. Each zone is designed to respond to the unique character of the

surrounding space. By creating three separate zones specifically tailored to each immediate area, the Project will enhance the aesthetic environment of the entire surrounding area. Greater detail of each zone can be found in Section 4.5.

1.3.2.4 Project Alternatives and Evolution of Design

The Project site, a vacant parcel of land, was purchased from the Commonwealth of Massachusetts in 2005. The Proponent initially explored constructing an office/research and development/lab building on the site, given its proximity to the LMA. Although there was considerable interest in the site for LMA-oriented uses, this concept became financially infeasible after the economic downturn in 2008, and no formal permit filings were made for these uses.

As the economy began to recover, the Proponent explored the feasibility of a residential use for the Project site, which would take advantage of its location adjacent to the Emerald Necklace, Boston's incomparable historic park system, and would help address the shortage of high-quality rental housing in the Mission Hill and Jamaica Plain neighborhoods. Although the Project site was analyzed for a variety of other uses, the Proponent determined that a residential building was the most appropriate use for the property. The Project's scale will allow for the incorporation of a range of benefits and amenities consistent with the high-quality housing envisioned.

The resulting proposal described in this filing accommodates approximately 195 units on the site, with vehicular access solely from South Huntington Avenue, in a building which combines low-rise construction of four and five stories along the Jamaicaway, stepping up to a maximum of ten stories along South Huntington Avenue. This massing concept effectively bridges the height of the four and five story residential buildings to the north of the site along South Huntington Avenue and the high-rise Back of the Hill housing and Veterans Administration Hospital building south of the Project site.

1.4 Public Benefits

The Project will include numerous benefits to the neighborhood and the City of Boston, including:

- The Project will create approximately 195 new residential units proximate to public transportation and the LMA—a center of economic activity.
- Of the approximately 195 residential units, approximately 26 units will be affordable units in compliance with Mayor's Executive Order dated February 29, 2000 requiring that 15% of market rate units be affordable to specified levels of income households.

- Approximately 180 construction jobs and 14 permanent jobs will be created.

- The Proponent estimates that, upon Project completion, the Project will generate over $800,000 per year in property taxes, a substantial increase from the tax levied on the undeveloped Project site.

The proposed Project will provide a variety of urban design benefits to the surrounding neighborhood, including:

- The Project is designed to be physically compatible with the surrounding uses by aligning the new development to continue the existing streetwall along South Huntington Avenue.

- The façade will employ a palette of materials to bring appropriate scale elements to the street experience and help ease the neighborhood transition towards the multi-story apartment and hospital buildings nearby.

- Once built, the Project will fill in a void in the urban fabric while extending a high quality pedestrian oriented streetscape further south along South Huntington Avenue.

- The new development will have the dual benefit of increased street lighting and "eyes on the street" from residential units with direct street access, leading to enhanced neighborhood safety.

- The Project will be Leadership in Energy and Environmental Design (LEED) certifiable, as required by Article 37 of the Boston Zoning Code.

- The Project will include several benefits to the existing streetscape, such as:

  - The installation of decorative paving and landscape elements at the primary pedestrian entry along South Huntington Avenue.

  - As part of the Project, the Proponent will be re-grading and reconstructing the existing sidewalks to make a more pleasant pedestrian experience and eliminate any existing accessibility issues.

  - Small retail uses, such as a coffee shop or other compatible neighborhood amenity, will be included in the Project. Currently, surrounding residents must travel outside the immediate area in order to access similar commercial services.

- Along the Jamaicaway, the Project will:

  - Maintain and care for mature trees along the Jamaicaway site frontage and serve as a resource for the Boston community;

- Contribute to and cooperate with the Emerald Necklace Conservancy's Parkway Tree Initiative to care for mature trees along the parkway;
- Create a decorative fence and enhanced landscaping adjacent to the Jamaicaway;
- Enhance safety through passive observation along the public way; and
- Build character consistent with the general fabric of structures in the immediate area.

1.5 Legal Information

1.5.1 Legal Judgments Adverse to the Proposed Project

The Proponent is unaware of any legal judgments or pending legal actions that concern the Project.

1.5.2 History of Tax Arrears on Property

The Proponent is not in tax arrears in connection with any property owned within the City of Boston.

1.5.3 Site Control / Public Easements

By deed dated September 1, 2005, recorded at the Suffolk County Registry of Deeds in Book 37984, Page 178, Cedar Valley Holdings LLC acquired fee title to the Project site from the Commonwealth of Massachusetts, acting by and through its Division of Capital Asset Management and Maintenance.

The Project site is bounded along its east property line by the South Huntington Avenue right-of-way and along its west property line by the Jamaicaway. Based on the completed survey of the Project site, there are no public easements into, through, or surrounding the Project site which would materially impair the Proponent's ability to carry out the Project.

1.6 Consistency with Zoning

1.6.1 Large Project Review

Because the Project involves new construction in excess of 50,000 square feet of Gross Floor Area, the Project is subject to Large Project Review by the BRA. Under the Mayor's Executive Order dated October 10, 2000, and amended on April 3, 2001, regarding mitigation for development projects, the Mayor may appoint an Impact Advisory Group to advise the BRA on mitigation measures for projects undergoing Large Project Review. In

connection with the Project's Large Project Review, the Project will also be subject to: (i) Boston Civic Design Commission review; and (ii) the green building requirements of Article 37 of the Boston Zoning Code (the Code).

1.6.2 Zoning District

The Project site is located within the Veterans Administration Hospital Neighborhood Institutional Subdistrict (VA/NI Subdistrict) of the Jamaica Plain Neighborhood District (Article 55; Map 9B), and also within the Jamaicaway Greenbelt Protection Overlay District (GPOD) (Article 29; Section 55-27). Zoning relief will be required in connection with the Project, as summarized below.

1.6.3 Uses

Pursuant to the Code's Section 55-24 and Table D of Article 55, the Project's multi-family residential and accessory parking components are allowed as-of-right. However, due to the significant slope of the property, a number of the garden-level units facing the Jamaicaway, and located above the grade of the Jamaicaway, will be below the *site's* calculated zoning grade plane, which averages the high and low grades on the site, and, therefore, may technically require relief under the code. Moreover, certain accessory services for apartment residences are conditional uses, and many of the Project's potential first-floor retail uses are conditional or forbidden. Therefore, depending on the nature of the accessory services and the identity of the prospective occupant(s) of, the ground-floor retail space, the Project will likely require zoning relief with respect to these uses.

1.6.4 Building Dimensions

Within the VA/NI Subdistrict, the maximum building height is 45 feet, and the maximum Floor Area Ratio (FAR) is 1.0. Per Table I of Article 55, Residential Uses in the VA/NI Subdistrict require a minimum lot size of one acre and a maximum of 4.5 dwelling units per acre. Certain setback requirements also apply within the VA/NI Subdistrict, to include a Minimum Front Yard of 20 feet and a minimum side yard of 10 feet. Nearly flush with the South Huntington Avenue street line and including areaways in the side setbacks, at approximately 130 feet in building height[1], with an FAR of approximately 4.2[2], and with

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[1] Does not include roof structures, per article 2A of the Boston Zoning Code.

[2] Under the Boston Zoning Code, residential garage space located at or below grade is not included in calculating floor area ratio. Accordingly, in calculating the Project's floor area and floor area ratio, (i) the enclosed loading area, located at grade with South Huntington Avenue, (ii) the parking garage, located entirely below the grade of South Huntington Avenue, and (iii) other areas of the building excludable under the Code (e.g., mechanical and storage facilities) have not been included. Due to the steep grade of the site from South Huntington Avenue down to the Jamaicaway and the definition of "grade" under the Zoning Code, it is possible that, as a technical zoning code matter, some or all of this parking or loading area will be included in gross floor area used to calculate floor area ratio. A final calculation will be performed once design of the building has advanced.

approximately 195 units located on just over one acre, the Project will require relief from several of these dimensional requirements. Required off-street parking spaces and off-street loading facilities will be determined through Large Project Review.

1.6.5 Other Requirements

The Project requires a conditional use permit for work in the Jamaicaway GPOD and will be subject to the barrier-free access requirements of Article 30 of the Code and the Code's signage requirements. Furthermore, since the Project will create more than ten units of housing, it will be subject to the City's Inclusionary Development Program.

1.7 Anticipated Permits

Table 1-2 presents a preliminary list of permits and approvals from governmental agencies that are expected to be required for the Project, 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.

Table 1-2 List of Anticipated Permits and Approvals

Agency	Approval
Boston	
Boston Redevelopment Authority	Article 80B Large Project Review; Cooperation Agreement; Affordable Housing Agreement
Office of Jobs and Community Service	Memorandum of Understanding (as required); First Source Agreement (as required)
Boston Employment Commission	Construction Employment Plan
Boston Civic Design Commission	Design Review
Boston Water and Sewer Commission	Site Plan Review; Water and Sewer Connection Permits Cross Connection Backflow Prevention Approval (as required); Temporary Construction Dewatering Permit
Public Improvement Commission	Specific Repair Plan (as required); Permit/Agreement for Temporary Earth Retention Systems, Tie-Back Systems and Temporary Support of Subsurface Construction (as required); Permit for sign, awning, hood, canopy or marquee, etc. (as required)
Boston Transportation Department	Construction Management Plan; Transportation Access Plan Agreement
Boston Public Works Department	Curb Cut Permit(s); Street Opening Permit (as required); Street/Sidewalk Occupancy Permit (as required)

Table 1-2 List of Anticipated Permits and Approvals (Continued)

Agency	Approval
Public Safety Commission Committee on Licenses	Permit to Erect and Maintain Garage; Flammable Storage License
Boston Inspectional Services Department	Building Permits Certificate of Occupancy
Boston Zoning Board of Appeal	Zoning Relief
Boston Parks and Recreation Department	Approval of Construction within 100' of a parkway
State	
Department of Environmental Protection	Sewer connection self-certification; Notice of commencement of construction; Fossil Fuel Utilization permit (as required)
Massachusetts Historical Commission	Project Notification Form (as required)
Department of Conservation and Recreation	Access permit for sewer work in the Jamaicaway
Massachusetts Water Resources Authority	Temporary Construction Dewatering Permit (as required)
Federal	
Environmental Protection Agency	NPDES Construction General Permit; NPDES Remediation General Permit (as required)

1.8 Public Participation

A Letter of Intent was filed with the BRA on April 2, 2012 beginning the Project's formal public review process. The Proponent has met with a number of community groups and elected officials to date, and looks forward to working with its longtime neighbors and other stakeholders through the course of the Article 80 review process.

1.9 Schedule

It is anticipated that construction will commence in the spring of 2013. Once begun, construction is expected to last approximately 18 months.

Chapter 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

In accordance with the Boston Transportation Department's (BTD's) *Transportation Access Plan Guidelines* (2001) and the *BRA Development Review Guidelines* (2006), this Section describes roadway, pedestrian, and bicycle conditions; transportation issues; parking and loading; and transportation goals for the Project.

2.1.1 Project Description

The Project site, located at 105A South Huntington Avenue in Jamaica Plain near the Mission Hill line, is bounded by the Jamaicaway to the west, South Huntington Avenue to the east, residential buildings to the north and institutional-use buildings to the south (see Figure 2-1). The site is currently vacant.

The proposed Project will include construction of approximately 195 residential apartments, approximately 1,600 sf of ground floor retail space, and approximately 176 parking spaces. The approximately 176 parking spaces designed to support the residential units will be located in an enclosed, structured garage nestled into the property, taking advantage of the steep grade change.

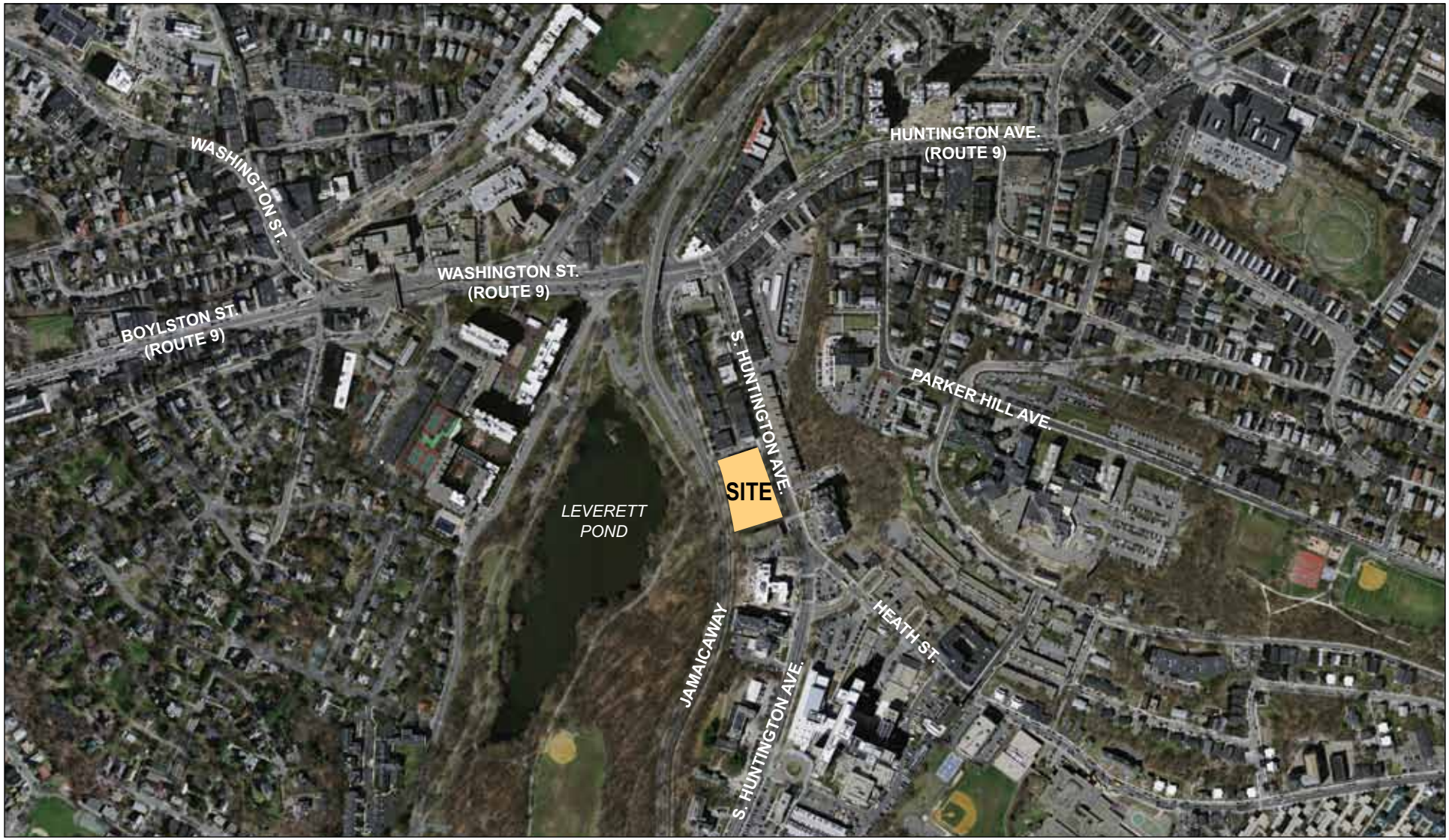
There is currently indirect vehicular access to the site from South Huntington Avenue via an easement across abutting property. An existing curb cut along the Jamaicaway is not currently in active use and will be abandoned. The proposed Project will provide direct vehicular access to the site from South Huntington Avenue through two, new approximately 24-foot wide curb cuts. The North Drive will provide two-way access to the below-grade parking garage and the South Drive will serve the loading area. No vehicular access will be provided from the Jamaicaway.

All loading, trash and recycling pick-up, and move-in/move-out activities will occur on-site at the South Drive, restricted to loading access only.

The primary pedestrian access to the residential buildings and ground floor retail use will be provided along South Huntington Avenue. Additional pedestrian access will be provided from the Jamaicaway.

2.1.2 Methodology

As described above, in accordance with the BTD *Transportation Access Plan Guidelines* (2001), the study team conducted a transportation analysis for the Project. The analysis is summarized in the following sections:



Not to scale.

105A South Huntington Avenue Boston, Massachusetts

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Figure 2-1
Locus Map

- The first section comprises an inventory of existing transportation conditions, including roadway and intersection conditions, parking, transit, pedestrian and bicycle circulation, and availability of shared bicycle and car services.

- The second section evaluates future transportation conditions and assesses potential traffic impacts associated with the Project and other neighboring projects. Long-term impacts are evaluated for the year 2017, based on a five-year horizon from the 2012 base year. Expected roadway, parking, transit, pedestrian, and deficiencies are identified. This section includes the following scenarios:

    - The No-Build Scenario (2017) includes general background growth and any proposed or planned projects that are large enough to potentially impact transportation conditions in the vicinity of the site such as 161 Huntington Avenue; and

    - The Build Scenario (2017) includes specific travel demand forecasts for the Project.

- A third section identifies measures to mitigate Project-related impacts identified in the previous phase.

- A fourth includes an evaluation of the short-term traffic impacts during construction.

- Finally, a brief summary and conclusions.

2.1.3 Study Area

The study area includes the following two intersections (see Figure 2-2):

1. Huntington Avenue/South Huntington Avenue (signalized); and

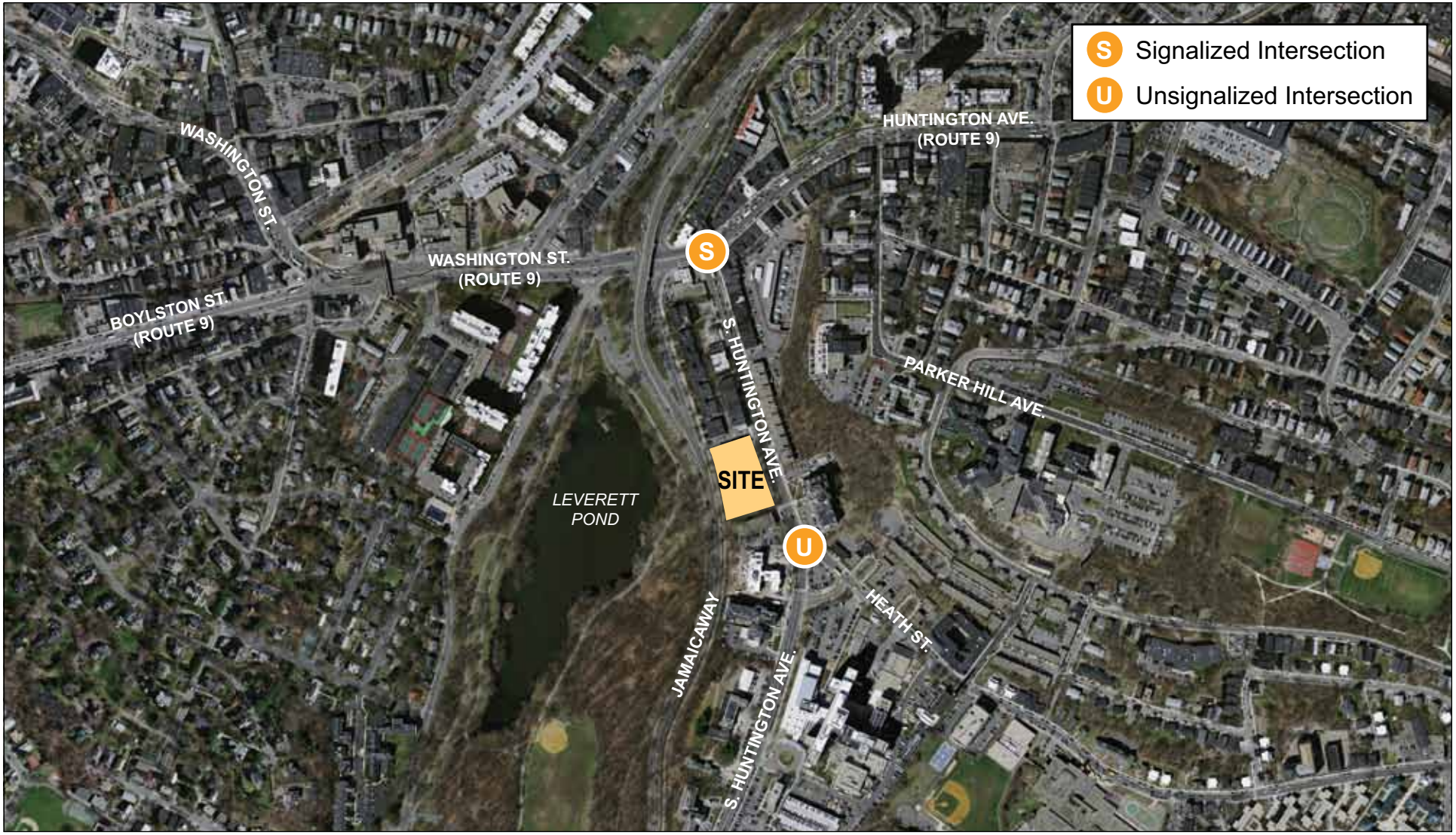
2. South Huntington Avenue/Heath Street (unsignalized).

2.2 Existing Conditions

2.2.1 Roadway Network

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

Huntington Avenue, an urban principal arterial, runs east-west between Dartmouth Street to the east and the Brookline Town line to the west, where Huntington Avenue turns into Boylston Street. Huntington Avenue generally consists of four travel lanes, two in each direction, plus sidewalks on each side. In the vicinity of the study area, the inside travel



Not to scale.

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Figure 2-2
Study Area Intersections

lanes are shared use with the Massachusetts Bay Transportation Authority (MBTA) Green E Line tracks. Huntington Avenue provides shared-use bicycle accommodations through the use of sharrow pavement markings. In the immediate vicinity of the Project site, east of South Huntington Avenue, parking is restricted to a two-hour limit Monday through Friday from 8:00 a.m. to 6:00 p.m., excluding Mission Hill resident stickers, while west of South Huntington Avenue, no parking is permitted. In addition, bus routes 39 and 66 serve several stops along Huntington Avenue.

South Huntington Avenue, an urban minor arterial, runs north-south between Huntington Avenue to the north and Centre Street to the south. North of Heath Street, South Huntington Avenue consists of two travel lanes in each direction that share use with the MBTA Green Line and bicycles. South of Heath Street, South Huntington Avenue consists of one travel lane and a bicycle lane in each direction. In the immediate vicinity of the Project site, unrestricted parking and MBTA bus stops occupy the curb fronts on both sides of the street. Sidewalks are provided on both sides of the roadway within the study area.

Heath Street, an urban minor arterial, runs east-west between Columbus Avenue to the east and South Huntington Avenue to the west. Heath Street consists of one travel lane in each direction, plus sidewalks on each side. In the immediate vicinity of the Project site, unrestricted parking and MBTA bus stops occupy the curb fronts on both sides of the street.

During field visits to the study area, Howard/Stein Hudson Associates, Inc. (HSH) also observed traffic conditions at *Craftson Way (a private way)*, which is located between South Huntington Avenue and the Jamaicaway approximately 75 feet north of the Project Site. According to the MassDOT Roadway Inventory File, Craftson Way is listed as an unaccepted roadway by the City and is signed as a "Private Way – Dangerous Passing" and "Not a Thru Street" on South Huntington Avenue; however, no such signage exists on the Jamaicaway. The only signage on the Jamaicaway in relation to Craftson Way is a "No Left Turn" sign directed to motorists traveling westbound on Craftson Way.

Craftson Way is currently being resurfaced and provides access to on-street parking and trash storage areas for the adjacent residential uses on the north side of the roadway; an alley on the north side of the roadway located between the residential buildings on the Jamaicaway and South Huntington Avenue; and a driveway for the hotel that is currently under construction on the south side of the roadway. The roadway ranges in width from approximately 20 feet wide at the intersection with the Jamaicaway and South Huntington Avenue to as much as 30 feet in width. However, the travel lane is reduced to as little as 15 feet due to the presence of seven angled spaces (for #70 Jamaicaway) and three parallel spaces assumed to be for the residential building on South Huntington Avenue. Craftson Way will not be used by the Project.

2.2.2 Intersection Conditions

2.2.2.1 Signalized Intersections

Huntington Avenue/South Huntington Avenue is a signalized intersection with three approaches. The Huntington Avenue eastbound approach consists of two 11-foot through lanes and one 10-foot exclusive right-turn lane. The Huntington Avenue westbound approach consists of an 11-foot exclusive left-turn lane and one 11-foot through lane. The South Huntington Avenue northbound approach consists of one 12-foot exclusive left-turn lane and a 12-foot exclusive right-turn lane. Field observations by HSH indicate that motorists occasionally make right turns from the left-turn lane. Sidewalks are provided on both sides of each approach. Restricted and unrestricted parking is provided along the westbound and northbound approaches, respectively. Crosswalks and push-button actuated pedestrian indications are provided across each approach.

2.2.2.2 Unsignalized Intersections

South Huntington Avenue/Heath Street is an unsignalized intersection with three approaches. The South Huntington Avenue northbound approach consists of a 10-foot through lane and a 10-foot exclusive right-turn lane. The South Huntington Avenue southbound approach consists of a 10-foot exclusive left-turn lane and a 10-foot through lane. A six-foot bicycle lane is provided along both sides of South Huntington Avenue south of Heath Street, and transitions to shared bicycle accommodations north of Heath Street. The Heath Street westbound approach, which operates under yield control, is an approximately 23-foot wide approach, striped as one 13-foot, shared left-turn/right-turn lane; however, field observations by HSH indicate show that motorists generally ignore the pavement markings and form two lanes: one left-turn lane and one right-turn lane. HSH also noted that the yield sign (R1-2) at the Heath Street westbound approach is currently missing. The MBTA Green E Line train turn-around area for Heath Street Station is located just south of the intersection. The striping of the intersection is generally in good condition, with the exception of a faded left-turn arrow pavement marking at the South Huntington Avenue southbound approach. Several unsignalized pedestrian crosswalks are also provided in close vicinity to the intersection, including two across the South Huntington Avenue northbound approach and two across the Heath Street westbound approach. A signalized mid-block pedestrian crosswalk is located approximately 150 feet north of the intersection.

2.2.3 Traffic Conditions

Turning movement counts were based on data collected during the weekday morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods on Tuesday, April 10, 2012. Based on these counts, the weekday peak hours were identified as 7:15–8:15 a.m. and 5:00–6:00 p.m. Figure 2-3 shows the existing peak-hour turning volumes for the study area intersections. Complete traffic count data are provided in Appendix B.

2.2.3.1 Traffic Operations

The study team used Trafficware's Synchro 6 software to analyze delay and the existing Level of Service (LOS) at study area intersections. This tool is based on the methodology specified in the Transportation Research Board's *2000 Highway Capacity Manual (HCM).* HCM methods analyze the capacity of an intersection by determining the LOS, delay (in seconds), volume-to-capacity (v/c) ratio, and 95th percentile queue length (in feet), based on the intersection geometry, traffic control, and available traffic data for each intersection.

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

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

Table 2-1, derived from the HCM, provides LOS criteria for signalized and unsignalized intersections. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition. LOS D is generally considered acceptable in an urban environment for signalized intersections, while LOS F is not uncommon for stop controlled approaches on minor streets intersecting arterial roadways.

Table 2-1 Level of Service Criteria (HCM Excerpt)

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

Existing Conditions signal timing and phasing information was provided by the BTD. Field observations were also made to verify Synchro model accuracy as well as to calibrate the model as necessary to match existing traffic conditions as closely as possible. To depict behavior as observed in the field, HSH modeled the Heath Street westbound approach at the intersection with South Huntington Avenue as two lanes, including a 60-foot storage lane for left turning vehicles and a dedicated right turn lane.

Not to scale.

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Figure 2-3
Existing Conditions (2012) Turning Movement Volumes, a.m. Peak Hour (7:15-8:15 a.m.) and p.m. Peak Hour (5:00–6:00 p.m.)

Table 2-2 and Table 2-3 summarize the existing weekday a.m. peak hour and p.m. peak hour LOS results for the study area intersections. Capacity analysis reports are provided in Appendix B.

Table 2-2 Existing Conditions (2012) Level of Service Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Huntington Avenue/ South Huntington Avenue	**D**	**37.4**	–	–
Huntington EB thru | thru	C	26.9	0.57	248
Huntington EB right	A	4.9	0.41	101
Huntington WB left	F	>80.0	>1.00	#214
Huntington WB thru	D	36.8	0.90	#548
South Huntington NB left	D	49.8	0.89	#438
South Huntington NB right	C	20.5	0.60	192
Unsignalized Intersections				
South Huntington Avenue/ Heath Street				
South Huntington NB thru	A	0.0	0.24	0
South Huntington NB right	A	0.0	0.18	0
South Huntington SB left	B	11.2	0.33	37
South Huntington SB thru	A	0.0	0.20	0
Heath WB left*	F	>50.0	>1.00	243
Heath WB right	C	15.3	0.46	60

=95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.

* Defacto lane-operates as a 60 foot storage lane for calibration purposes.

Table 2-3 Existing Conditions (2012) Level of Service Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Huntington Avenue/ South Huntington Avenue	**C**	**32.3**	–	–
Huntington EB thru | thru	C	29.9	0.57	225
Huntington EB right	B	12.5	0.57	210
Huntington WB left	D	41.0	0.62	210
Huntington WB thru	D	43.7	0.98	#839
South Huntington NB left	D	41.9	0.71	279
South Huntington NB right	B	11.5	0.27	92

Table 2-3 Existing Conditions (2012) Level of Service Summary, p.m. Peak Hour (Continued)

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Unsignalized Intersections				
South Huntington Avenue/ Heath Street				
South Huntington NB thru	A	0.0	0.17	0
South Huntington NB right	A	0.0	0.09	0
South Huntington SB left	A	10.0	0.36	41
South Huntington SB thru	A	0.0	0.20	0
Heath WB left*	F	>50.0	>1.00	459
Heath WB right	B	12.1	0.32	34

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.

* Defacto lane-operates as a 60 foot storage lane for calibration purposes.

All of the study area intersections operate at an acceptable overall LOS (typically LOS D or better) during both peak hours. Only two individual intersection approaches operate below LOS D:

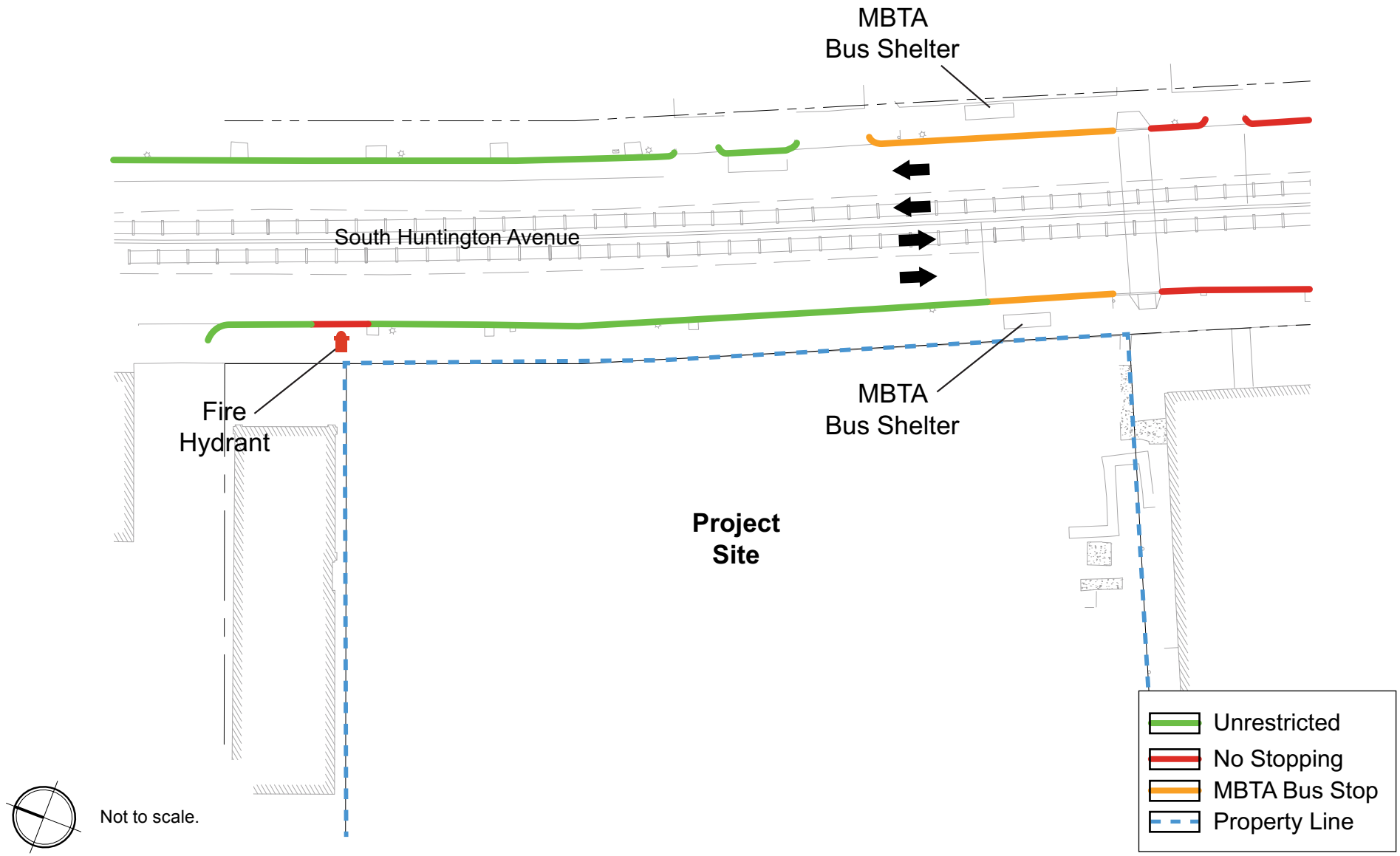
- ***Huntington Avenue/South Huntington Avenue*** – the Huntington Avenue westbound exclusive left-turn lane operates at LOS F during the a.m. peak hour due to the high volume of left turns at this approach (approximately 150 vehicles per hour), which share a travel lane with MBTA trains also turning left (approximately 10 trains per hour); and

- ***South Huntington Avenue/Heath Street*** – the Heath Street westbound, shared left turn operates at LOS F at both a.m. and p.m. peak hours due to the high volume of vehicles making a left onto South Huntington Avenue (131 vehicles during a.m. peak hour and 168 during p.m. peak hour). Traffic operations are also impacted by the MBTA Green Line train that travels through the intersection and turns around at Heath Street Station just south of the intersection.

2.2.4 Parking

2.2.4.1 On-street Parking

Figure 2-4 presents an inventory of existing curb use and parking restrictions along South Huntington Avenue adjacent to the Project site. On-street parking adjacent to the site consists mainly of unrestricted parking along both sides of the roadway. MBTA bus route 39 also serves several stops along both sides of South Huntington Avenue.



105A South Huntington Avenue Boston, Massachusetts

Figure 2-4
On-street Parking Adjacent to the Project Site

2.2.4.2 Off-street Parking

Within the study area, there is no public off-street parking available. Although, along Huntington Avenue there is currently two-hour parking provided Monday through Friday from 8:00 am to 6:00 pm.

2.2.5 Public Transportation in the Study Area

The Project site is located within convenient walking distance of the MBTA Green Line, as well as local bus service. MBTA bus shelters serving route 39 are located directly adjacent to the site on South Huntington Avenue. Public transportation services within approximately one quarter mile (5 to 10-minute walk) of the Project site are summarized in Table 2-4 and illustrated in Figure 2-5.

Table 2-4 MBTA Transit Service in the Study Area

Transit line/ Bus Route	Route Description	Peak Period Headway (minutes)[1]
Green Line-Heath Street (E)	Lechmere Station-Heath Street Station	6
14	Roslindale Square: Heath Street via Dudley Station	35
39	Forest Hills Station: Back Bay Station via Huntington Avenue	6
66	Harvard Square: Dudley Station via Allston	9

1. Source: MBTA.com, April 2012. Headways are approximate.

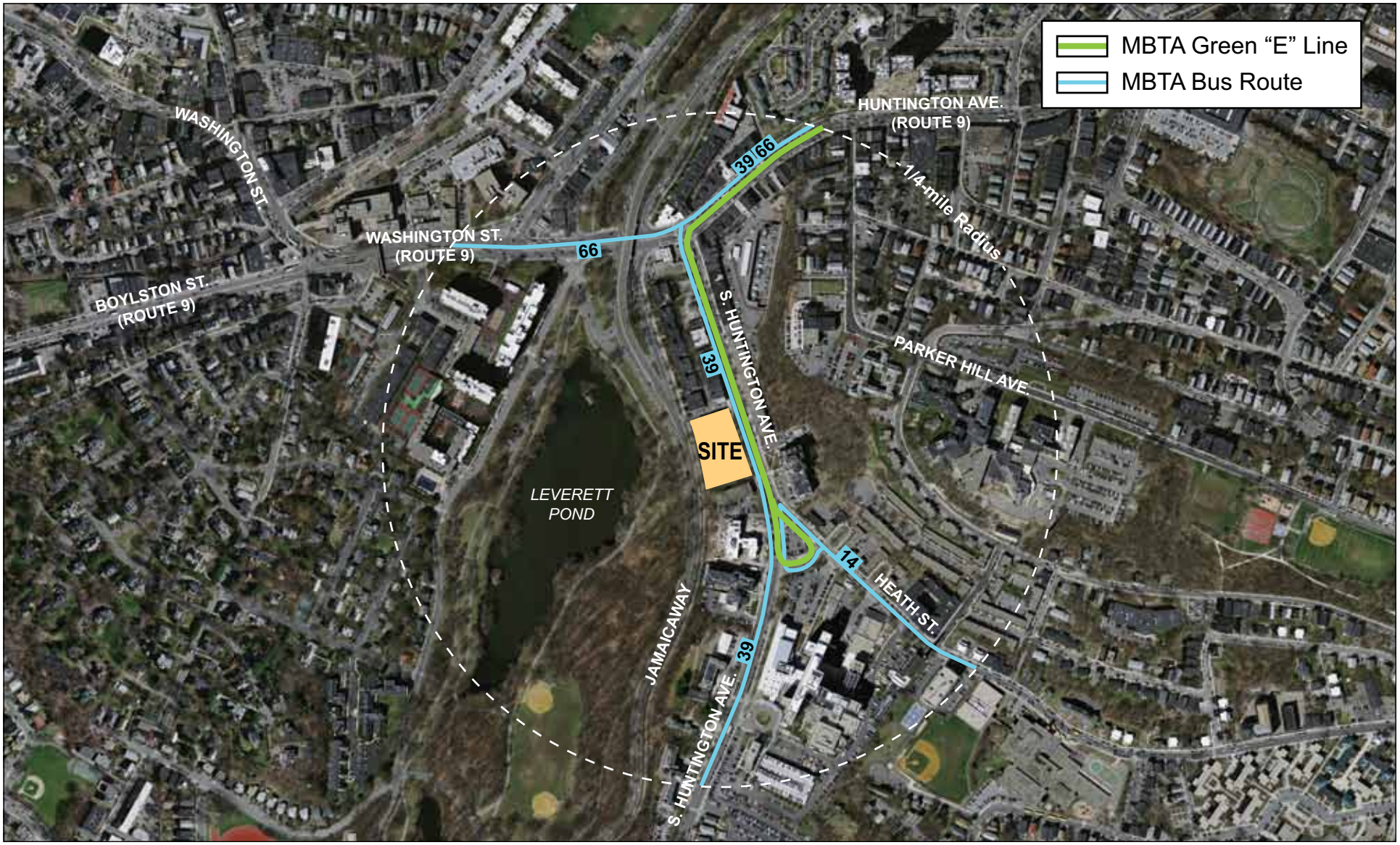
The Project is also located approximately one-half mile (a 10-15 minute walk) from the MBTA's Brookline Village stop on the Green Line Riverside (D) Branch, as well as several other MBTA bus routes.

2.2.6 Pedestrian Access and Circulation

Sidewalks are provided on both sides of all roadways within the study area. As is common in urban settings, the effective widths of sidewalks in the study area are narrowed due to the presence of light posts, parking meters, street trees, and other obstacles located along the sidewalk path. The conditions of the sidewalks within the study are described below:

- South Huntington Avenue – In the vicinity of the Project site, sidewalks are provided along both sides of South Huntington Avenue and range in width between 7 and 12 feet. Sidewalks are generally in good condition.

- Heath Street – Sidewalks are provided along both sides of Heath Street ranging in width between 7 and 10 feet. Sidewalks are generally in good condition.



Not to scale.

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Figure 2-5
Public Transportation in the Study Area

Crosswalks, handicap accessible ramps, and concurrent pedestrian phases are provided at the Huntington Avenue/South Huntington Avenue intersection. A signalized midblock pedestrian crossing is also provided on South Huntington Avenue adjacent to the Project site approximately 150 feet north of Heath Street. At the intersection of South Huntington Avenue and Heath Street, crosswalks and handicap accessible ramps are provided across the Heath Street westbound approach and South Huntington Avenue northbound approach. Figure 2-6 illustrates existing pedestrian volumes during the a.m. and p.m. peak hours.

2.2.7 Bicycle Accommodations

South Huntington Avenue is classified as suitable for "intermediate" cyclists according to the *2010 Bike Routes of Boston Map.* The Project site is also located across the street from the Jamaicaway Path, which is a recreational trail for the exclusive use of cyclists and pedestrians. The path travels from the southernmost part of Jamaica Pond to the MBTA Green Line Fenway Station.

In July 2011, the City of Boston launched Hubway, a bicycle sharing program. To date, Hubway hosts 600 bicycles at 60 different locations across the city. As part of this program, cyclists are able to rent a bicycle from one location and return it to any other station, facilitating point-to-point travel within the City. Two Hubway stations are proposed within approximately one mile of the Project site, including the intersections of Brigham Circle/Calumet Street and Tremont Street/Columbus Avenue. Except for the winter season, these bicycle facilities will be available to the public.

Bicycle volumes during the weekday am and pm peak hour are illustrated in Figure 2-7; bicycle volumes in the study area are generally moderate. No bicycle racks are currently provided on-site.

2.2.8 Shared Car Services

Shared-car service provider Zipcar has two locations within one-half mile walking distance (about a 10-15 minute walk) of the Project site. Five vehicles are provided at the Brigham Circle/Saint Albans Road location and two vehicles are provided at the MBTA Green Line Brookline Village Station.

2.3 Evaluation of Long-term Impacts

This section describes and evaluates the 2017 No-Build and Build Conditions. The methodology consistent with the City of Boston's *Transportation Access Plan Guidelines* (2001).

Not to scale.

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Figure 2-6

Existing Conditions (2012) Pedestrian Volumes, a.m. Peak Hour (7:15-8:15 a.m.) and p.m. Peak Hour (5:00–6:00 p.m.)

Not to scale.

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Figure 2-7

Existing Conditions (2012) Bicycle Volumes, a.m. Peak Hour (7:15-8:15 a.m.) and p.m. Peak Hour (5:00–6:00 p.m.)

2.3.1 No-Build Conditions

No-Build traffic conditions are independent of the proposed Project and include existing traffic plus any new traffic expected in the study area either from general background growth or identified development projects in the area.

2.3.1.1 Background Traffic Growth

Two procedures are generally used in combination to determine background traffic growth. The first procedure is to estimate traffic generated by planned new major developments and anticipated roadway changes. Additional traffic generated by the following projects were included in the background growth traffic volumes:

- ***161 South Huntington Avenue.*** The proposed project is located approximately 900 feet south of the 105A South Huntington Avenue Project site and includes the construction of approximately 196 residential apartments with approximately 170 parking spaces in an underground garage for building residents.

- ***VA Hospital Parking Garage.*** The Veterans Affairs (VA) medical center, located at 150 South Huntington Avenue began construction on a new approximately 500-space parking garage in April 2012. The new garage would replace approximately 100 surface parking spaces, resulting in a net increase of approximately 400 spaces. Vehicular access to the parking garage will continue to be provided via an existing curb cut on South Huntington Avenue. According to discussions with VA staff, the new garage would provide free parking for veterans that currently visit the medical center; however, no increases in the number of staff and/or the number of patients served at the medical facility are expected. Thus, the project is not expected to result in an increase in traffic volumes on adjacent roadways. In fact, the VA noted that the project would improve traffic conditions in the area by alleviating on-street parking demand in the neighborhood and eliminating the existing vehicle queue onto South Huntington Avenue that occurs during peak periods as veterans wait for parking spaces to become available. Any increases in vehicle trips associated with the project as a result of additional, and more convenient, parking at the VA is expected to be marginal and is included in the conservative background growth rate described below.

The second part of the procedure is to apply a general growth rate to account for other smaller planned/approved development projects and changes in demographics, auto usage, and auto ownership. For this study, a conservative background growth rate of approximately one-half percent per year was selected.

2.3.1.2 No-Build Conditions Traffic Operations

The 2017 No-Build analysis uses the methodology described under Existing Conditions. No-Build traffic volumes are shown in Figure 2-8. The resulting intersection operations are shown in Table 2-5 and Table 2-6. Complete Synchro reports are provided in Appendix B.

Table 2-5 No-Build Conditions (2017) Level of Service Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Huntington Avenue/ South Huntington Avenue	**D**	**39.7**	**–**	**–**
Huntington EB thru | thru	C	27.4	0.59	255
Huntington EB right	A	5.0	0.42	105
Huntington WB left	F	>80.0	>1.00	#223
Huntington WB thru	D	41.0	0.93	#572
South Huntington NB left	D	51.1	0.90	#453
South Huntington NB right	C	20.7	0.61	199
Unsignalized Intersections				
South Huntington Avenue/ Heath Street				
South Huntington NB thru	A	0.0	0.24	0
South Huntington NB right	A	0.0	0.18	0
South Huntington SB left	B	11.4	0.35	39
South Huntington SB thru	A	0.0	0.21	0
Heath WB left*	F	>50.0	>1.00	271
Heath WB right	C	15.8	0.47	64

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
* Defacto lane-operates as a 60 foot storage lane for calibration purposes.

Not to scale.

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Figure 2-8
No-Build Conditions (2017) Turning Movement Volumes, a.m. Peak Hour and p.m. Peak Hour

Table 2-6 No-Build Conditions (2017) Level of Service Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Huntington Avenue/ South Huntington Avenue	**D**	**36.1**	–	–
Huntington EB thru | thru	C	31.1	0.61	232
Huntington EB right	B	12.9	0.59	220
Huntington WB left	D	41.8	0.64	216
Huntington WB thru	D	54.4	>1.00	#871
South Huntington NB left	D	41.0	0.70	287
South Huntington NB right	B	11.3	0.28	95
Unsignalized Intersections				
South Huntington Avenue/ Heath Street				
South Huntington NB thru	A	0.0	0.18	0
South Huntington NB right	A	0.0	0.09	0
South Huntington SB left	B	10.2	0.37	44
South Huntington SB thru	A	0.0	0.21	0
Heath WB left*	F	>50.0	>1.00	499
Heath WB right	B	12.3	0.33	36

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
* Defacto lane-operates as a 60 foot storage lane for calibration purposes.
Gray cell shading indicates a decrease in LOS from Existing Conditions

As shown in Table 2-5 and Table 2-6, the LOS at all study area intersection approaches will remain unchanged under No-Build conditions; however, the overall LOS at the intersection of Huntington Avenue/South Huntington Avenue will decreases from a LOS C to LOS D during the p.m. peak hour, which is still considered acceptable. The change in LOS is a result of an increase in overall delay of less than four seconds, primarily due to background traffic growth in the area.

2.3.1.3 No-Build Public Transportation in the Study Area

The Project site is located within convenient walking distance of the MBTA Green Line, as well as local bus service. MBTA bus shelters serving route 39 are located directly adjacent to the site on South Huntington Avenue. Public transportation services within approximately one-quarter mile (5 to 10-minute walk) of the Project site are MBTA bus route 14, route 39 and route 66, and MBTA Green Line E branch. The MBTA has announced service updates effective July 1, 2012 that will impact some of the public transportation services within the study area. According to the MBTA website, as of June 2012, the MBTA has stated that the Green Line E branch services will end at the Brigham

Circle stop on weekends. The Brigham Circle stop is located one-half mile (10 to 15-minute walk) of the Project site. No changes are planned for the bus Route 39 that operates adjacent to the site and would continue to serve as an alternative to the Green Gine. MBTA fare hikes will also be in effect as of July 1, 2012. Bus services will rise to $1.50 for Charlie Card and $2.00 for Charlie Ticket, while Rapid Transit will increase to $2.00 and $2.50, respectively. No changes in service are expected during the weekday commuter peak periods.

2.3.2 Build Conditions

As summarized in Section 2.1.1, the Project will result in the construction of approximately 195 residential apartments, 1,600 sf of retail space, and 176 parking spaces. The site access and circulation plan is show in Figure 2-9.

2.3.2.1 Site Access and Circulation

There is currently no direct, active vehicular access to the site from either South Huntington Avenue or the Jamaicaway. The Project would provide vehicular access to the site from South Huntington Avenue through two, new approximately 24-foot wide curb cuts. The North Drive would provide two-way access to the enclosed parking garage and the South Drive would serve the loading and service area. No vehicular access will be provided from the Jamaicaway, and an existing curb cut along the Jamaicaway will be abandoned.

All loading, trash pick-up, and move-in/move-out activities will occur on-site at the South Drive off of South Huntington Avenue.

2.3.2.2 Trip Generation and Mode Split

Trip generation for the proposed retail uses was derived from the Institute of Transportation Engineers' (ITE) publication *Trip Generation* (8th edition, 2008), using the following Land Use Codes (LUC):

- *LUC 222 – High-Rise Apartment* – is used for rental dwelling units located within the same building that have more than 10 floors. The average rate was used to estimate person trips associated with daily residential and retail use, while the fitted curve equation was used for a.m. and p.m. residential and retail use.

- *LUC 820 – Shopping Center* – is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. The average rates and fitted curve equations were used to estimate the person trips associated with the proposed ground-floor retail space. The trip generation characteristics of this LUC are expected to provide a conservative estimate for the proposed retail space.

Not to scale.

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Figure 2-9
Site Circulation Plan

BTD publishes transit, walk/bike, and vehicle mode split rates for different areas of Boston; the Project is located within designated Area 5. Mode split assumptions based on BTD's Area 5 data and local vehicle occupancy rates from 2009 *National Household Travel Survey* and the 2000 U.S. Census are summarized in Table 2-7.

Table 2-7 Peak-Hour Mode Split

Land Use/Period	Direction	Transit Share[1]	Walk/Bike Share[1]	Auto Share[1]	Local Vehicle Occupancy Rate[2]
Daily					
Residential	In	15%	38%	47%	1.1
	Out	15%	38%	47%	1.1
Retail	In	21%	44%	35%	1.8
	Out	21%	44%	35%	1.8
a.m. Peak Hour					
Residential	In	22%	39%	39%	1.1
	Out	18%	45%	37%	1.1
Retail	In	29%	43%	28%	1.8
	Out	23%	50%	27%	1.8
p.m. Peak Hour					
Residential	In	18%	45%	37%	1.1
	Out	22%	39%	39%	1.1
Retail	In	23%	50%	27%	1.8
	Out	29%	43%	28%	1.8

1. Boston Transportation Department mode share data for Area 5.
2. 2000 Census data and 2009 National Household Travel Survey

Based on the land use trip rates, mode split assumptions, and local vehicle occupancy rates, the resulting transit, walk/bike, and vehicle trips were identified. The Project-generated trips are summarized in Table 2-8, with detailed trip generation information provided in Appendix B.

Table 2-8 Project Trip Generation

Land Use	Direction	Transit Trips	Walk/Bike Trips	Auto Trips
Daily				
Residential	In	68	171	192
	Out	68	171	192
	Total	136	342	384
Retail	In	12	26	11
	Out	12	26	11
	Total	24	52	22
Combined	In	80	197	203
	Out	80	197	203
	Total	160	394	406

Table 2-8 Project Trip Generation (Continued)

Land Use	Direction	Transit Trips	Walk/Bike Trips	Auto Trips
a.m. Peak Hour				
Residential	In	4	7	6
	Out	11	27	19
	Total	15	34	25
Retail	In	4	6	1
	Out	2	5	1
	Total	6	11	2
Combined	In	8	13	7
	Out	13	32	20
	Total	21	45	27
p.m. Peak Hour				
Residential	In	11	27	20
	Out	8	14	13
	Total	19	41	33
Retail	In	8	17	5
	Out	10	15	5
	Total	18	32	10
Combined	In	19	44	25
	Out	18	29	18
	Total	37	73	43

As shown in Table 2-8, the Project will only generate approximately 27 vehicle trips (7 trips entering and 20 trips exiting) during a.m. peak hour and 43 vehicle trips (25 trips entering and 18 trips exiting) during a.m. peak hour. This corresponds to less than one new vehicle trip per minute during the a.m. and p.m. peak hour on the adjacent roadway network, a negligible increase.

2.3.2.3 Trip Distribution

The vehicular trip distribution was based on existing traffic patterns and review of the adjacent roadway network. The Project-generated vehicle trips during the a.m. and p.m. peak hour were assigned to the roadway network using the resulting trip distribution and are illustrated in Figure 2-10.

The Project-generated vehicle trips were then added to the No Build traffic volumes to create the 2017 Build Condition traffic volumes. Figure 2-11 shows the 2017 Build a.m. and p.m. peak-hour traffic volumes.

Not to scale.

105A South Huntington Avenue Boston, Massachusetts

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Figure 2-10
Project-generated Trips, a.m. Peak Hour and p.m. Peak Hour

Not to scale.

105A South Huntington Avenue Boston, Massachusetts

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Figure 2-11
Build Conditions (2017) Turning Movement Volumes, a.m. Peak Hour and p.m. Peak Hour

The Project-generated vehicle trips were then added to the No Build traffic volumes to create the 2017 Build Condition traffic volumes. Figure 2-11 shows the 2017 Build a.m. and p.m. peak-hour traffic volumes.

2.3.2.4 Build Conditions Traffic Operations

The LOS analysis for the Build Conditions was conducted using the same methodology described for Existing and No-Build Conditions. The LOS summary appears in Table 2-9 and Table 2-10. Capacity analysis reports are provided in Appendix B.

Table 2-9 Build Conditions (2017) Level of Service Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Huntington Avenue/ South Huntington Avenue	**D**	**40.3**	**–**	**–**
Huntington EB thru | thru	C	27.6	0.59	255
Huntington EB right	A	5.1	0.42	106
Huntington WB left	F	>80.0	>1.00	#223
Huntington WB thru	D	41.9	0.93	#572
South Huntington NB left	D	52.1	0.91	#466
South Huntington NB right	C	20.8	0.62	203
Unsignalized Intersections				
South Huntington Avenue/ Heath Street				
South Huntington NB thru	A	0.0	0.25	0
South Huntington NB right	A	0.0	0.18	0
South Huntington SB left	B	11.5	0.36	41
South Huntington SB thru	A	0.0	0.21	0
Heath WB left*	F	>50.0	>1.00	279
Heath WB right	C	15.9	0.48	64
South Huntington Avenue/ North Drive				
South Huntington NB left/thru | thru	C	15.9	0.06	5
South Huntington SB thru | thru/right	A	0.0	0.29	0
North Drive EB left/right	A	0.0	0.22	0

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.

* Defacto lane-operates as a 60 foot storage lane for calibration purposes.

Table 2-10 Build Conditions (2017) Level of Service Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	95% Queue Length (ft)
Signalized Intersections				
Huntington Avenue/ South Huntington Avenue	**D**	**36.3**	–	–
Huntington EB thru | thru	C	31.1	0.61	232
Huntington EB right	B	13.2	0.60	228
Huntington WB left	D	42.5	0.66	222
Huntington WB thru	D	54.4	>1.00	#871
South Huntington NB left	D	42.0	0.72	294
South Huntington NB right	B	11.4	0.28	97
Unsignalized Intersections				
South Huntington Avenue/ Heath Street				
South Huntington NB thru	A	0.0	0.18	0
South Huntington NB right	A	0.0	0.09	0
South Huntington SB left	B	10.2	0.38	45
South Huntington SB thru	A	0.0	0.21	0
Heath WB left*	F	>50.0	>1.00	507
Heath WB right	B	12.4	0.34	37
South Huntington Avenue/ North Drive				
South Huntington NB left/thru | thru	C	17.2	0.07	5
South Huntington SB thru | thru/right	A	0.2	0.21	1
North Drive EB left/right	A	0.0	0.28	0

= 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.

* Defacto lane-operates as a 60 foot storage lane for calibration purposes.

With the addition of the small number of new vehicle trips added by the Project, all study area intersections will continue to operate at the same LOS as under No-Build Conditions and no adverse impacts will occur.

2.3.2.5 Parking Supply and Demand

The Project will provide up to 176 parking spaces within a parking garage for the 195 residential units, which corresponds to a parking ratio of 0.90 spaces per unit. The BTD has set parking space goals and guidelines throughout the City to establish the amount

of parking supply provided with new developments. BTD's maximum parking ratio guidelines for residential use in Jamaica Plain is 0.75-1.25 spaces per unit. The Project satisfies this guideline.

2.3.2.6 Public Transportation

As shown in Table 2-8, the Project will generate a combined estimated 160 daily transit trips; with 21 transit trips (13 boarding and 8 alighting) during the a.m. peak hour and 37 new trips (18 boarding and 19 alighting) during the p.m. peak hour. The small number of Project-generated transit trips is not expected to affect transit service adversely in the study area. The Proponent is committed to promoting transit use among Project residents and visitors, as discussed under the Transportation Demand Management section below.

2.3.2.7 Pedestrian Access and Circulation

On a daily basis, the Project will generate a combined estimated 394 pedestrian and bicycle trips in addition to the 160 new transit trips that will require a walk to or from the site. This results in an additional 554 new pedestrian or bicycle trips per day. Approximately 45 pedestrian and bicycle trips in and out of the site will occur during the a.m. peak hour, and 73 pedestrian or bicycle trips in and out will occur during the p.m. peak hour, plus the additional 21 and 37 transit trips, respectively. Pedestrian and bicycle trip generation is summarized in Table 2-8, with detailed trip generation data provided in Appendix B. The Proponent is committed to promoting bicycle use among Project residents, workers and visitors, as discussed under the Transportation Demand Management section below.

2.3.2.8 Bicycle Accommodations

Secure bicycle storage will be made available for building residents and tenants within the parking garage area and/or within the proposed building per City of Boston *Bicycle Parking Guidelines*, which require a minimum of one bicycle parking space per residential unit. Additional bicycle racks for workers, visitors, and guests will also be provided near main entrances to the new building.

All bicycle racks, signs, and parking areas will conform to BTD standards and be sited in safe, secure locations. The Proponent will work with BTD to identify the most appropriate quantity and location for bicycle racks on the Project site as part of the Transportation Access Plan Agreement (TAPA) process.

2.3.2.9 Loading and Service

All loading, trash pick-up, and move-in/move-out activities for the Project will occur on-site via the South Drive (see Figure 2-9).

The expected loading and service vehicle demands of the Project, by use, are presented in Table 2-11.

Table 2-11 Expected Loading and Service Activity

Land Use	Typical Vehicle & Size	Number of Vehicles (per day)	Typical Delivery Periods
Residential (195 units)	Car/Van to SU-36 and Trash	8 to 10[1]	7:00 a.m. to 7:00 p.m.
Retail (approx. 1,600 sf)	Car/Van to SU-36 and Trash	1 to 2[2]	7:00 a.m. to 5:00 p.m.

1. 0.04 trucks per day/1,000 sf residential, per HSH survey of Tremont-on-the-Common
2. 0.396 trucks per day/1,000 sf retail, per NCHRP Synthesis 298: Truck Trip Generation Data

As shown above, the loading demand for the Project is between 9 and 12 deliveries per day, which corresponds to between 18 and 24 total vehicle trips in and out per day; these trips are included in the trip generation estimates provided in Table 2-8. With the exception of trash pick-up and move-in/move-out activities, most residential and retail deliveries are made via smaller vehicles—cars, vans, or small panel trucks.

A Transportation Coordinator will be appointed by the Project to manage loading activity and to coordinate residential move-in/move-out activities. Where possible, these activities will be scheduled during off-peak hours. Permanent "No Idling" signs will be posted in the loading and parking areas.

2.4 Transportation Mitigation Measures

Due to the low volume of Project-generated vehicle trips, the LOS at all study area intersections will remain unchanged from No-Build Conditions. As such, mitigation is not warranted beyond providing safe vehicular and pedestrian access to and from the Project site and provision of transportation demand management (TDM) measures in support of the City's efforts to reduce dependency on the automobile. The Proponent will work with the BTD as part of the TAPA process to identify appropriate TDM measures.

TDM measures encourage travelers to use alternatives to driving, especially during peak periods, and will be facilitated by the nature of the Project and its proximity to public transit. The Proponent will emphasize the site's convenient transit and pedestrian access in marketing the Project to future residents and tenants. On-site management will provide transit information (schedules, maps, fare information) in the building lobbies for residents, workers, and visitors. Additional TDM measures may include, but are not limited to, the following:

- Bicycle Storage – The Proponent will provide secure bicycle storage for residents, workers, and visitors in accordance with the *City of Boston Bicycle Parking Guidelines* and will investigate the possibility of sponsoring a shared-bicycle location near the site.

- Constrained Parking – The Project does not exceed BTD district maximum parking ratios.

- Electric Vehicle Charging – The Proponent will explore the feasibility of providing electric vehicle charging stations on-site.

- Project Web Site – The Proponent will include public transportation information for residents and visitors on the Project's Web Site.

- Shared-Car Service -- The Proponent will also evaluate the feasibility of providing shared cars on-site (e.g., Zipcar) in an effort to reduce automobile ownership among residents.

- Tenant and Employee Orientation Packet – These packets will provide all new tenants with information concerning available TDM programs and public transportation in the area, including route maps, schedules, and fare information.

- Transportation Coordinator – An on-site transportation coordinator will oversee transportation issues, including parking, residential move-in and move-out, and service and loading. The transportation coordinator will also work with residents as they move in to raise awareness of public transportation alternatives.

As noted in Section 2.2.2, the Heath Street westbound yield-controlled approach at the intersection of South Huntington Avenue/Heath Street operates at LOS F during both peak hours under Existing Conditions, primarily due to the heavy left-turn volume at that approach (approximately 130 to 170 vehicles per hour). The Project will not add any vehicle trips to the Heath Street westbound left-turn approach and will result in only a very small increase in vehicle trips at this intersection—less than 2% during the peak period—an almost imperceptible change given that traffic volumes can vary as much as 10% from day to day. While the Project will only have a small impact at this intersection, this study has identified several issues impacting existing traffic and pedestrian/bicycle conditions that should be further evaluated, including, but not limited to:

- Lane usage and pavement markings;

- Traffic control (i.e., signalization vs. yield control);

- Signage; and

- Pedestrian crosswalk locations.

As the Project advances, the Proponent will cooperate with community and City of Boston efforts to identify/clarify existing operational and safety issues at this intersection.

2.5 Evaluation of Short-term Construction Impacts

Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (CMP) to be filed with BTD in accordance with the City's transportation maintenance plan requirements. The CMP will also address the need for pedestrian detours, lane closures, and/or parking restrictions, if necessary, to accommodate a safe and secure work zone.

To minimize transportation impacts during the construction period, the following measures will be incorporated into the CMP:

- Construction worker parking will be limited on-site. Workers will be encouraged to use public transportation and/or carpool;
- A subsidy for MBTA passes will be considered for full-time employees; and
- Secure spaces will be provided on-site for workers' supplies and tools so they do not have to be brought to the site each day.

Additional information on the Project's construction-period impacts is presented in Section 3.11 of this PNF.

2.6 Conclusions

With the addition of the small number of new vehicle trips added by the Project, all study area intersections will continue to operate at the same Level of Service (LOS) as under No-Build Conditions and no adverse impacts will occur. The Proponent will work with the BTD to identify appropriate TDM measures in support the City's efforts to reduce dependency on the automobile by encouraging travelers to use alternatives to driving, especially during peak periods. TDM will be facilitated by the site's proximity to public transportation.

Chapter 3.0

Environmental Protection Component

3.0 ENVIRONMENTAL PROTECTION COMPONENT

3.1 Wind

3.1.1 Introduction

Rowan Williams Davies & Irwin Inc. (RWDI) assessed the pedestrian wind conditions for the proposed Project. The objective of the qualitative analysis is to estimate the pedestrian wind conditions around the proposed Project when it is added to the existing surroundings.

This qualitative assessment is based on the following:

- A review of regional long-term meteorological data for the Boston area;
- Design drawings received by RWDI;
- RWDI's engineering judgment and knowledge of wind flows around buildings;[1]
- RWDI's experience of wind tunnel modeling of various building projects in the area; and
- Use of software developed by RWDI (*Windestimator*)[2] for estimating the potential wind comfort conditions around generalized building forms.

Based on this analysis, wind conditions at the entrances to the Project, surrounding pedestrian areas on South Huntington Avenue, the Jamaicaway and the Emerald Necklace, the courtyard and roofdeck are anticipated to be Comfortable for Walking or better based on the BRA mean wind criteria (as described in Section 3.1.4 below). No locations are predicted to be Uncomfortable for Walking or Dangerous.

3.1.2 Building and Site Information

The Project is located between South Huntington Avenue and the Jamaicaway in Boston, on a site currently consisting of an open lot with a perimeter of dense trees (see Figure 1-1).

The site is located on a valley slope with a hill to the east and Leverett Pond to the west. The surrounding buildings vary in height from three to six stories with an 11-story residential building to the east and the 14-story Veterans Administration hospital complex to the south. Further surroundings include dense, low to middle-rise buildings in all directions, with downtown Boston to the distant northeast.

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1 C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999). "Experience with Remedial Solutions to Control Pedestrian Wind Problems". *10th International Conference on Wind Engineering.* Copenhagen, Denmark.

2 H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter (2004). "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions". ASCE Structure Congress 2004. Nashville, Tennessee.

The proposed Project consists of an approximately 130 foot building[3] on a sloped site which tapers down towards the north and west. The townhouses along the west edge of the site are four stories above the Jamaicaway. Floor plans are provided in Chapter 1.

The following discussion of pedestrian wind conditions focuses on pedestrian areas on and around the site including residential and retail entrances, a central courtyard, a roof deck at Level 4 and public sidewalks along South Huntington Avenue and the Jamaicaway.

3.1.3 Local Wind Data

Figure 3.1-1 includes wind roses summarizing the seasonal wind climates in the Boston area, based on the long-term data from Logan International Airport between 1982 and 2011. The prevailing winds are from the west-northwest year-round, especially in the spring and winter seasons. Easterly winds are also frequent. In the summer and fall, the prevailing winds are from the southwest direction, but of lower speeds in general.

On an annual basis, the most common wind directions are those that originate between the southwest and northwest. Winds from the east are also relatively common. In the case of strong winds, west-northwest and northeast are the dominant directions. Based on the local wind directionality and the orientation of the buildings and streets in the area, winds from the west-northwest and northeast are considered most important, although winds from all other directions have also been taken into account in the analysis.

3.1.4 Wind Comfort Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed plus 1.5 times the root-mean-square wind speed) of 31 miles per hour (mph) should not be exceeded more than one percent of the time.

The second set of criteria used by the BRA to determine the acceptability of specific locations is based on the work of Melbourne.[4] The Melbourne criteria are used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing or walking. The criteria are expressed in terms of benchmarks for the one-hour mean wind speed exceeded one percent of the time (i.e., the 99-percentile mean wind speed), as shown in Table 3.1-1.

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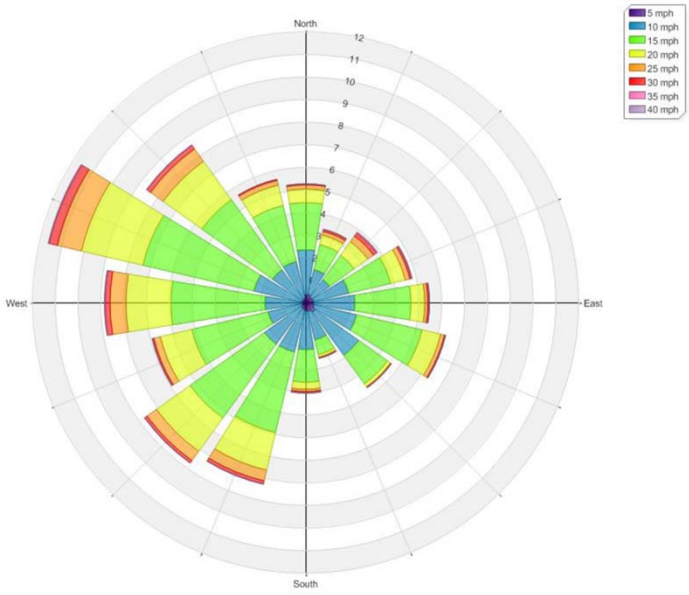
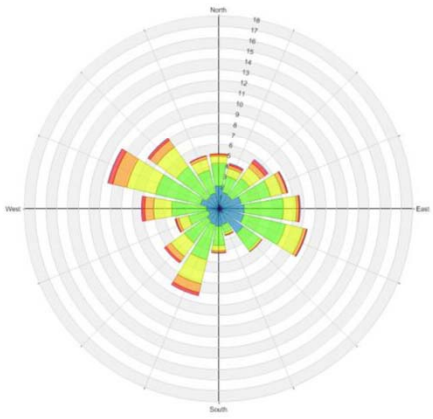
[3] As measured from the site's grade, per the Boston Zoning Code.

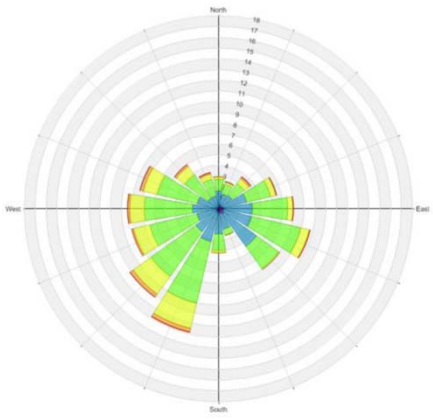
[4] Melbourne, W.H. (1978), "Criteria for Environmental Wind Conditions", *Journal of Industrial Aerodynamics*, vol. 3, pp. 241-249.



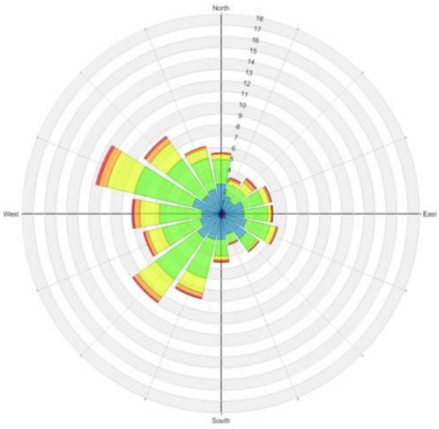
Annual winds



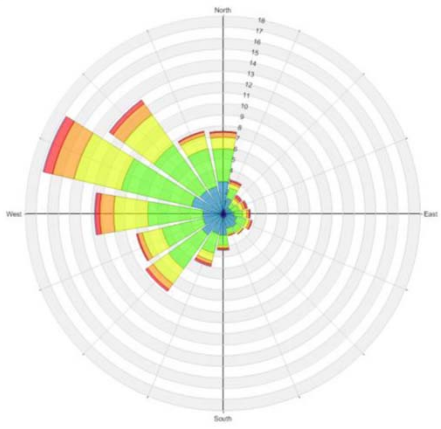
Spring (Mar. to May)



Summer (Jun. to Aug.)



Fall (Sept. to Nov.)



Winter (Dec. to Feb.)

105A S. Huntington Avenue Boston, MA

Figure 3.1-1

Wind Roses for Boston Area

Table 3.1-1 BRA Mean Wind Criteria*

Dangerous	> 27 mph
Uncomfortable for Walking	> 19 mph and ≤ 27 mph
Comfortable for Walking	> 15 mph and ≤ 19 mph
Comfortable for Standing	> 12 mph and ≤ 15 mph
Comfortable for Sitting	< 12 mph

*Applicable to the hourly mean wind speed exceed one percent of the time.

3.1.5 Predicted Wind Conditions

3.1.5.1 General

Typically, the summer and fall winds in Boston tend to be more comfortable than the annual winds, while the winter and spring winds are less comfortable than the annual winds. Wind data collected at Logan International Airport (Section 3.1.3) were adjusted for the Project site based on an analytical procedure that considered the topographic features of surrounding areas around both the airport and the site.

Generally, wind conditions comfortable for walking are appropriate for sidewalks and lower wind speeds comfortable for standing are desired for main building entrances. Calm wind conditions comfortable for sitting are desirable for courtyards and decks in the summer when these areas will typically be in use.

There are several positive features included in the Project that are expected to contribute to favorable wind conditions on and around the building. For instance, the hill to the east and northeast, together with large trees and buildings, will shelter the site from the prevailing easterly winds. The existing 11-story building to the east will also reduce the speed of easterly winds (see Figure 3.1-2). The proposed 10-story portion of the Project is located on the east portion of the site and it steps down towards the north and west (see Figure 3.1-3). These design features reduce the potential impact of winds from the prevailing west and west-northwest directions that would be reflected down by the tallest portion of the Project, thus improving the overall wind conditions at grade.

3.1.5.2 Predicted Wind Conditions

Figure 3.1-4 identifies key pedestrian areas at the grade level. These include the residential and retail entrances (Locations A1, A2 and A3), sidewalks along South Huntington Avenue (B1) and the Jamaicaway (B2), as well as the central courtyard (C) and associated building entries (D1, D2 and D3).

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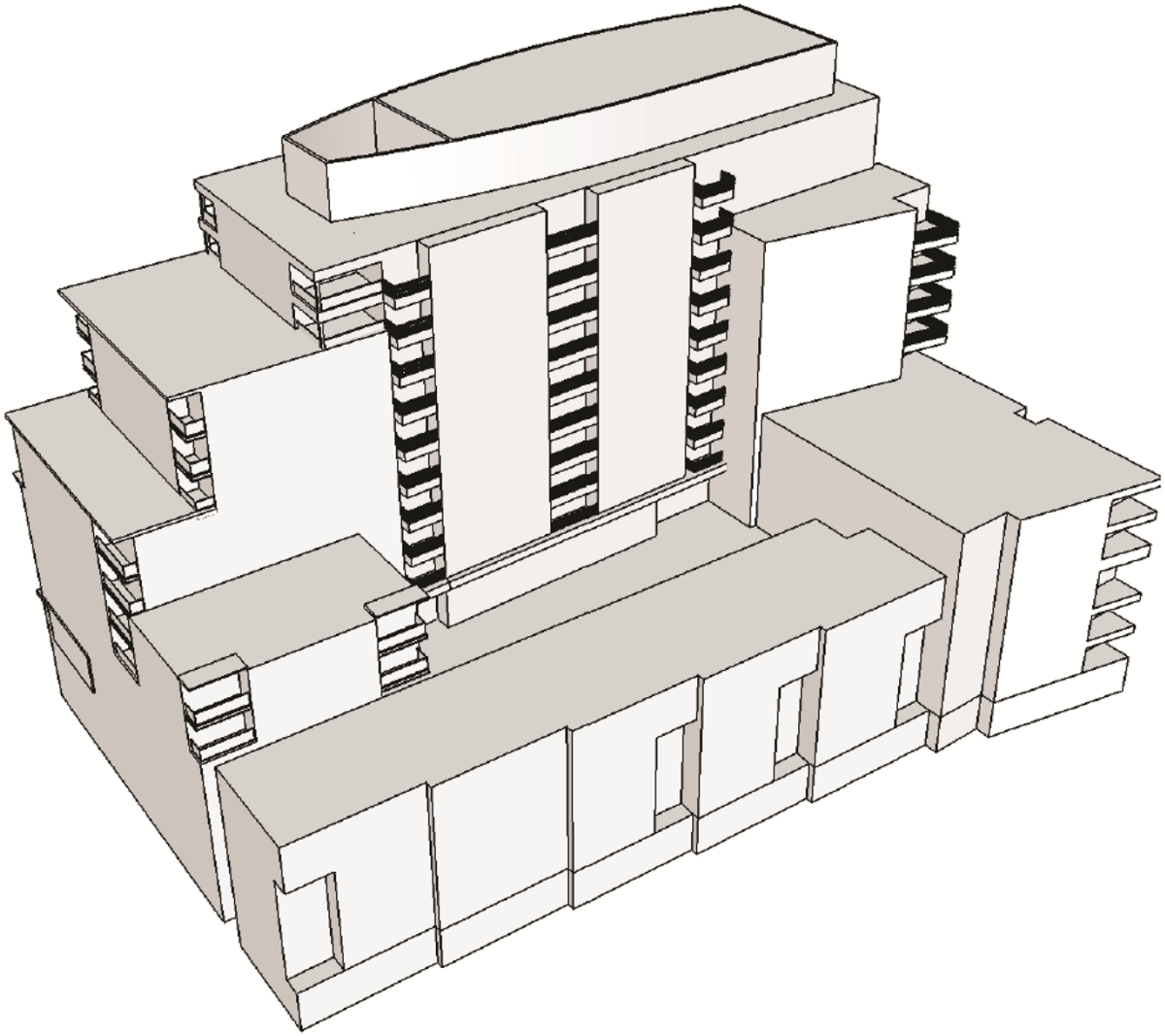
Figure 3.1-2
South Elevation



105A S. Huntington Avenue Boston, MA

Figure 3.1-3

Northwest View of the Proposed Building

In the following discussion, references to the building locations relate to "Project North", while the wind directions are referred to as "True North". These differ by approximately 20°. Typically the summer and fall winds in Boston tend to be more comfortable than the annual winds, while the winter and spring winds are less comfortable than the annual winds.

Building Entrances (Locations A1, A2 and A3)

Along South Huntington Avenue, the main residential entrance (A1) is close to the center of the east facade as well as two retail entrances near the building corners. The residential entrance (A1) is sheltered by the proposed development from the dominant westerly and northwesterly winds. The existing buildings and hill to the east also provide protection from the easterly winds. As a result, wind conditions comfortable for standing or sitting are predicted at the residential entrance throughout the year. The two retail entrances (A2 and A3) are close to the building corners, where higher wind activity is anticipated. The wind conditions are anticipated to be comfortable for walking and although the entrance locations to the retail spaces have yet to be finalized, the design will take into consideration these predicted wind conditions.

Sidewalks (Locations B1 and B2)

The sidewalk along South Huntington Avenue (Location B1) is generally sheltered by the proposed Project from the westerly and northwesterly winds. On the west side of the Project, the sidewalk (Location B2) is located away from the building, which is generally only four stories in height along the Jamaicaway. Limited downwashing flows are expected, as the trees between the sidewalk and the proposed Project will also disrupt the winds.

Overall, wind conditions on both of the sidewalks are predicted to be similar to those that currently exist. These wind conditions are considered suitable for the intended pedestrian use throughout the year.

Central Courtyard and Entries (Locations C and D)

As shown in Figure 3.1-4, there is a courtyard in the center of the building where low wind speeds comfortable for standing or sitting are predicted for the summer and fall seasons, when this area will typically be in use.

Low wind speeds are also expected at the entries/exits around the courtyard (Locations D1, D2 and D3). However, when winds are from the westerly directions, there will be the potential of high wind pressures on Entries D1 and D2, resulting in difficulties in door opening (D1) or closure (D2). The design of the building will take these predicted conditions into consideration when designing the doorways.

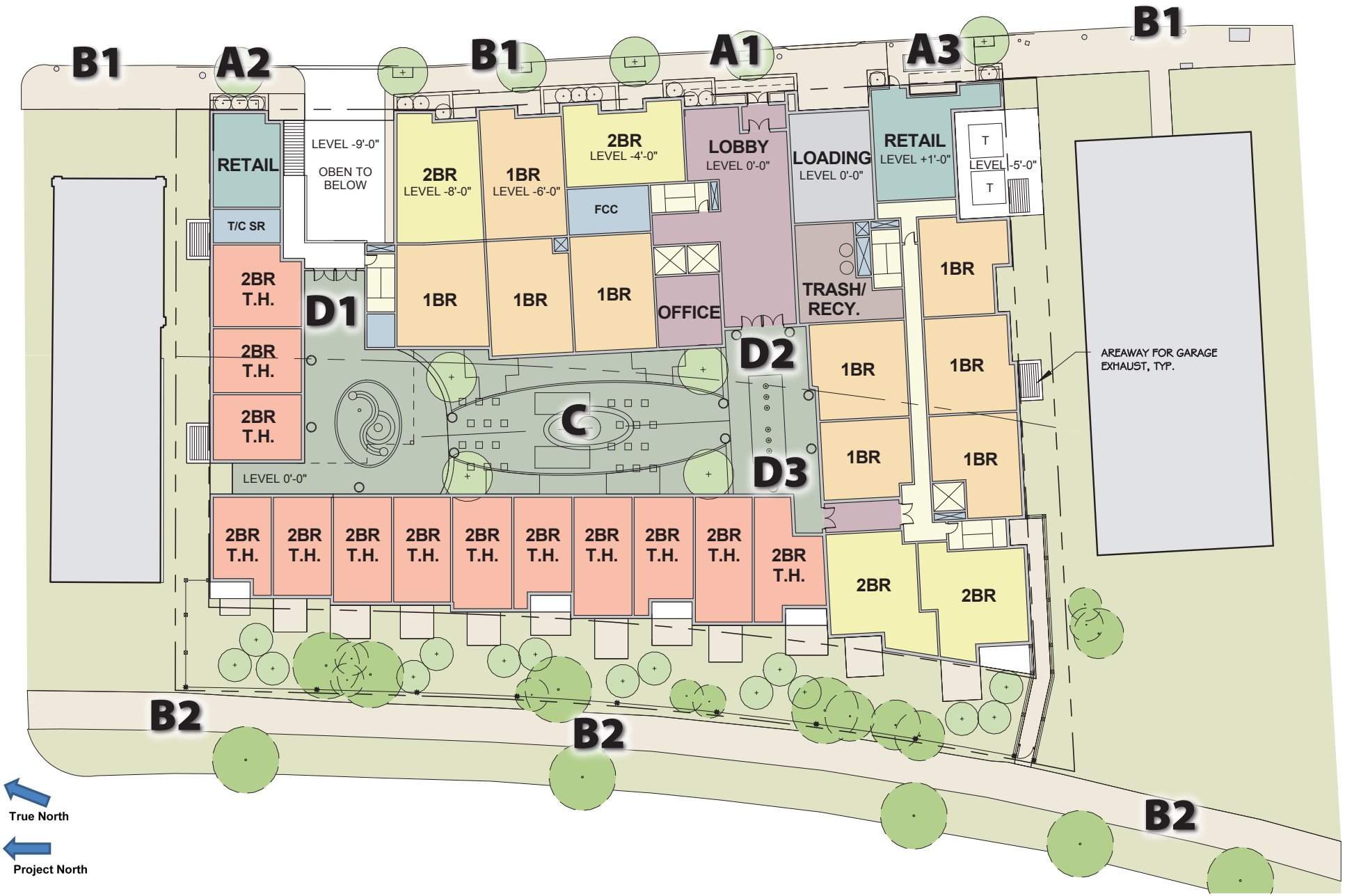


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Figure 3.1-4

Key Pedestrian Areas at Grade Level

Roof Deck (Location E)

The roof deck at Level 4 is identified for outdoor use (see Figure 3.1-5). Due to the increased elevation, the wind speeds on the deck are anticipated to be comfortable for walking. It is anticipated that the design of the building will include appropriate measures to improve the anticipated wind conditions such as tall parapets along the perimeter, landscaping/screens on the deck and/or overhead trellises over the east portion of the deck. With appropriate mitigation, wind conditions could be comfortable for sitting.

3.1.6 Conclusion

Based on RWDI's analysis of the local wind data and the proposed design, together with past wind tunnel experience for building projects in the area, the following predictions of wind conditions around the proposed Project at 105A South Huntington Avenue can be provided:

- Building entrances, courtyard, roof deck, and surrounding pedestrian areas are predicted to be Comfortable for Walking or better.

- Wind conditions at the main residential entrance are predicted to be comfortable for sitting or standing. Wind conditions along sidewalks are expected to be similar to those that currently exist and comfortable for walking or better throughout the year. The wind speeds at the courtyard are also predicted to be comfortable for the intended use in general. These wind conditions are considered appropriate.

- At the two retail entrances near the building corners, the annual wind speeds are predicted to be comfortable for walking. At the Level 4 roof deck, wind conditions are expected to be comfortable for standing or walking. These predicted conditions will be considered during the final design of the building to improve wind conditions where necessary and feasible.

- Wind impacts on the walking path immediately west of the site in the Emerald Necklace are anticipated to be negligible.

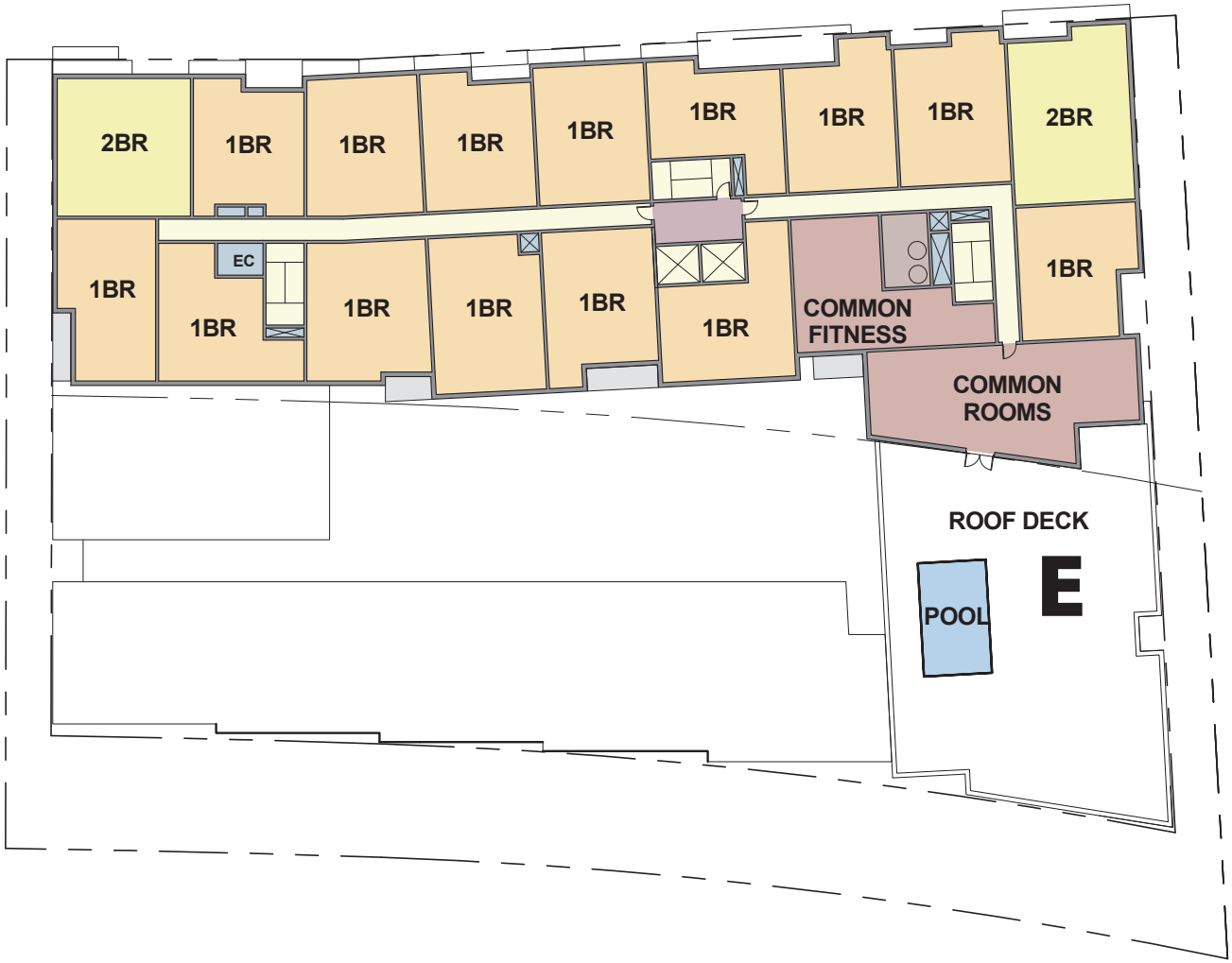

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Figure 3.1-5
Roof Deck

3.2 Shadow

3.2.1 Introduction and Methodology

A shadow impact analysis was conducted to investigate shadow impacts from the Project during three time periods (9:00 a.m., 12:00 p.m., and 3:00 p.m.) during the summer solstice (June 21), autumnal equinox (September 21), vernal equinox (March 21), and the winter solstice (December 21). In addition, shadow studies were conducted for the 6:00 p.m. time period during the summer solstice and autumnal equinox.

The shadow analysis presents the existing shadow and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. The shadow analysis does not include the proposed 161 Huntington Avenue project, as shadow from that project is not located proximate to the proposed building or its net new shadow. The analysis focuses on nearby open spaces, sidewalks and MBTA bus and trolley stops adjacent to and in the vicinity of the Project site. It should be noted that the model used for the analysis does not include trees, which can block new shadow from the proposed buildings during much of the year during certain time periods. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 3.2-1 to 3.2-14 at the end of this section.

As the Project site is currently vacant, new shadow will be cast onto the surrounding area, in particular the adjacent streets and sidewalks. No new shadow is cast onto the Emerald Necklace during 11 of the 14 time periods studied. New shadow cast onto the Emerald Necklace is expected to be limited to the morning hours lasting until 9:40 a.m. at the latest. No new shadow is cast onto the Back of the Hill Urban Wild during 12 of the 14 time periods studied. Adjacent bus stops are free from new shadow during 9 of the 14 time periods studied. During the summer and fall, net new shadow will be further limited by shade from existing tree canopies.

3.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow from the Project will be cast to the northwest. New shadow will be cast across the Jamaicaway, its sidewalk, and a portion of the Emerald Necklace.

At 12:00 p.m., new shadow is cast to the north. New shadow will be limited to the site and a small portion of Craftson Way.

At 3:00 p.m., new shadow will be cast to the northeast across South Huntington Avenue and its sidewalks. New shadow will also be cast on the bus stop adjacent to the site.

During the vernal equinox, new shadow will be cast onto the Project site and immediately surrounding streets. New shadow on the Emerald Necklace will be limited to the morning hours until approximately 9:40 a.m. New shadow on nearby bus stops will be limited to the afternoon hours. No new shadow will be cast onto the Back of the Hill Urban Wild during the time periods studied.

3.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow will be cast to the northwest. New shadow will be cast onto a portion of the Jamaicaway and its eastern sidewalk. Note that trees along the Jamaicaway will limit the new shadow from the Project on the Jamaicaway and its sidewalk.

At 12:00 p.m., new shadow will be cast to the north and will not be cast onto any public spaces.

At 3:00 p.m., new shadow will be cast to the northeast across South Huntington Avenue and its western sidewalk. New shadow will be cast onto the adjacent bus stop.

At 6:00 p.m., new shadow will be cast to the east. New shadow will be cast across South Huntington Avenue, its sidewalks, and two bus stops adjacent to the Project site.

During the summer solstice, no new shadow will be cast onto the Emerald Necklace or the Back of the Hill Urban Wild. New shadow will be cast onto the surrounding streets and sidewalks, although the extent will be minimized by street trees. Bus stops will have new shadow during the evening.

3.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, new shadow will be cast in a northeast direction. New shadow will be cast onto a small portion of the Emerald Necklace, and across the Jamaicaway and its sidewalks. New shadow on the Emerald Necklace and the Jamaicaway will be minimized by trees that currently line the Jamaicaway on both sides.

At 12:00 p.m., new shadow will be cast to the north. New shadow will be limited to a portion of the South Huntington Avenue western sidewalk and a small portion of Craftson Way.

At 3:00 p.m., new shadow is cast to the northwest. New shadow will be cast across South Huntington Avenue, its sidewalks, and two adjacent bus stops. No new shadow will be cast onto the Back of the Hill Urban Wild.

At 6:00 p.m., new shadow is cast to the west. New shadow will be cast across South Huntington Avenue, its sidewalks, and two adjacent bus stops. New shadow will also be cast onto a portion of the Back of the Hill Urban Wild.

During the autumnal equinox, new shadow will be cast onto a portion of the Emerald Necklace during the morning until approximately 9:25 a.m., although the impact will be minimized due to the shadow from existing streets. New shadow will be cast across the adjacent bus stops only during the afternoon and evening hours. The Back of the Hill Urban Wild will be free from new shadow except for the evening time period.

3.2.5 Winter Solstice (December 21)

The winter solstice creates the least favorable conditions for sunlight in New England. The sun angle during the winter is lower than in any other season, causing the shadows in urban areas to elongate and be cast onto large portions of the surrounding area.

At 9:00 a.m. during the winter solstice, new shadow is cast to the northwest. New shadow will be cast onto the Jamaicaway and its sidewalks. Only a small portion of the Emerald Necklace will be under new shadow.

At 12:00 p.m., new shadow will be cast to the north. New shadow will be cast across South Huntington Avenue and its sidewalks.

At 3:00 p.m., new shadow will be cast to the northwest. New shadow will be cast across South Huntington Avenue, its sidewalks, and a portion of the Back of the Hill Urban Wild.

During the winter solstice, new shadow will be cast onto only a small portion of the Emerald Necklace during the morning until approximately 9:15 a.m. New shadow will be cast onto the Back of the Hill Urban Wild during the afternoon.

3.2.6 Conclusions

The Project site is currently vacant, and therefore the new building will create new shadow in the surrounding area. New shadow is generally cast onto the surrounding streets and sidewalks. The Emerald Necklace is free from new shadow during 11 of the 14 time periods studied. Of the three time periods with new shadow, all are in the morning only and one will be in September when existing trees along the Jamaicaway already cast shadow onto much of the area where the Project would create new shadow. During the winter solstice, the new shadow is only on a small area. New shadow is expected to be cast on the Emerald Necklace only until approximately 9:40 a.m. during the spring, 9:25 a.m. during the fall, and 9:15 a.m. during the winter. The Back of the Hill Urban Wild will be free from new shadow during 12 of the 14 time periods studied. New shadow will be limited to the afternoon and evening hours during the autumn and winter. Adjacent bus stops are free from new shadow during 9 of the 14 time periods studied.

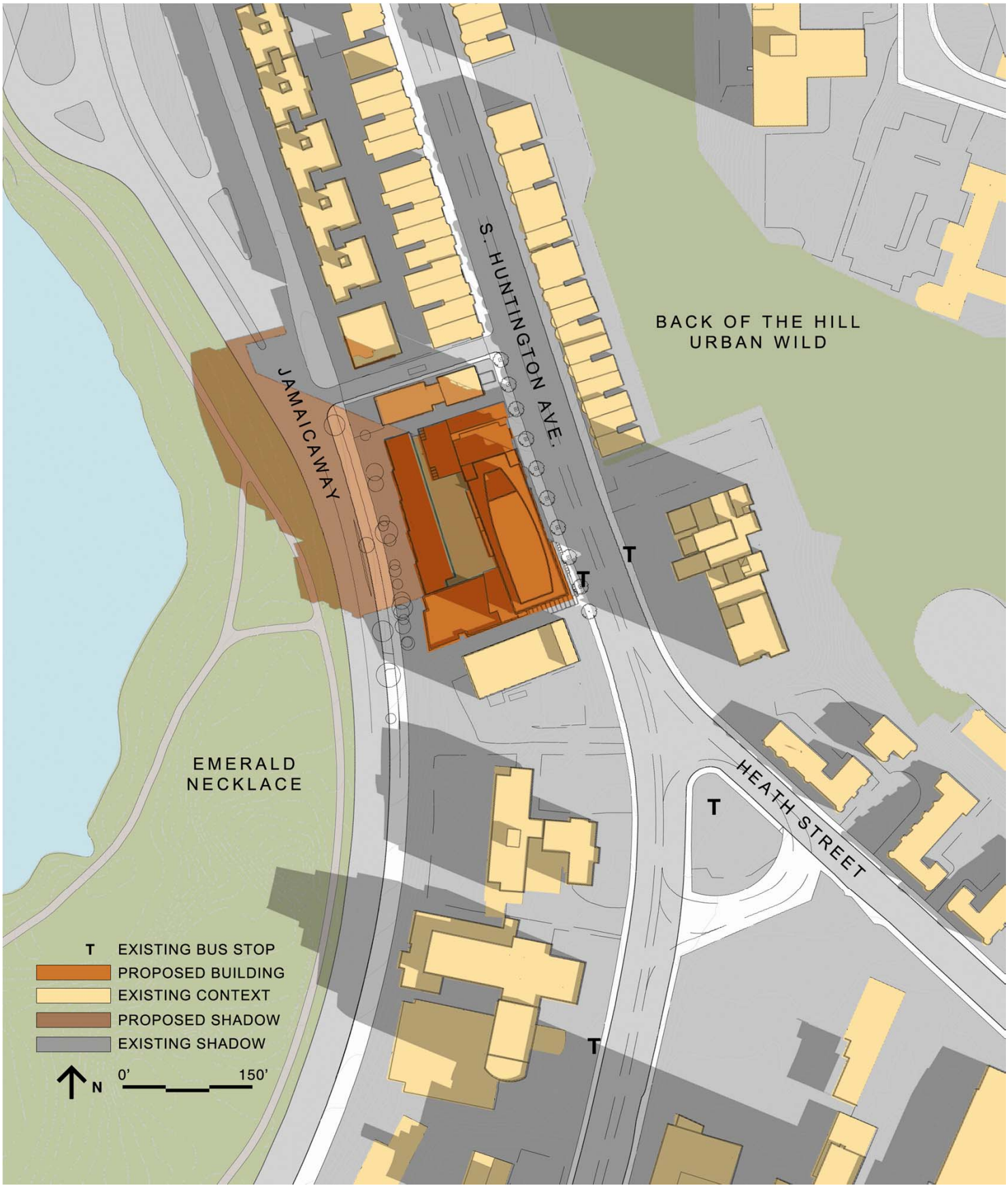

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Figure 3.2-1

March 21st – 9:00 a.m.

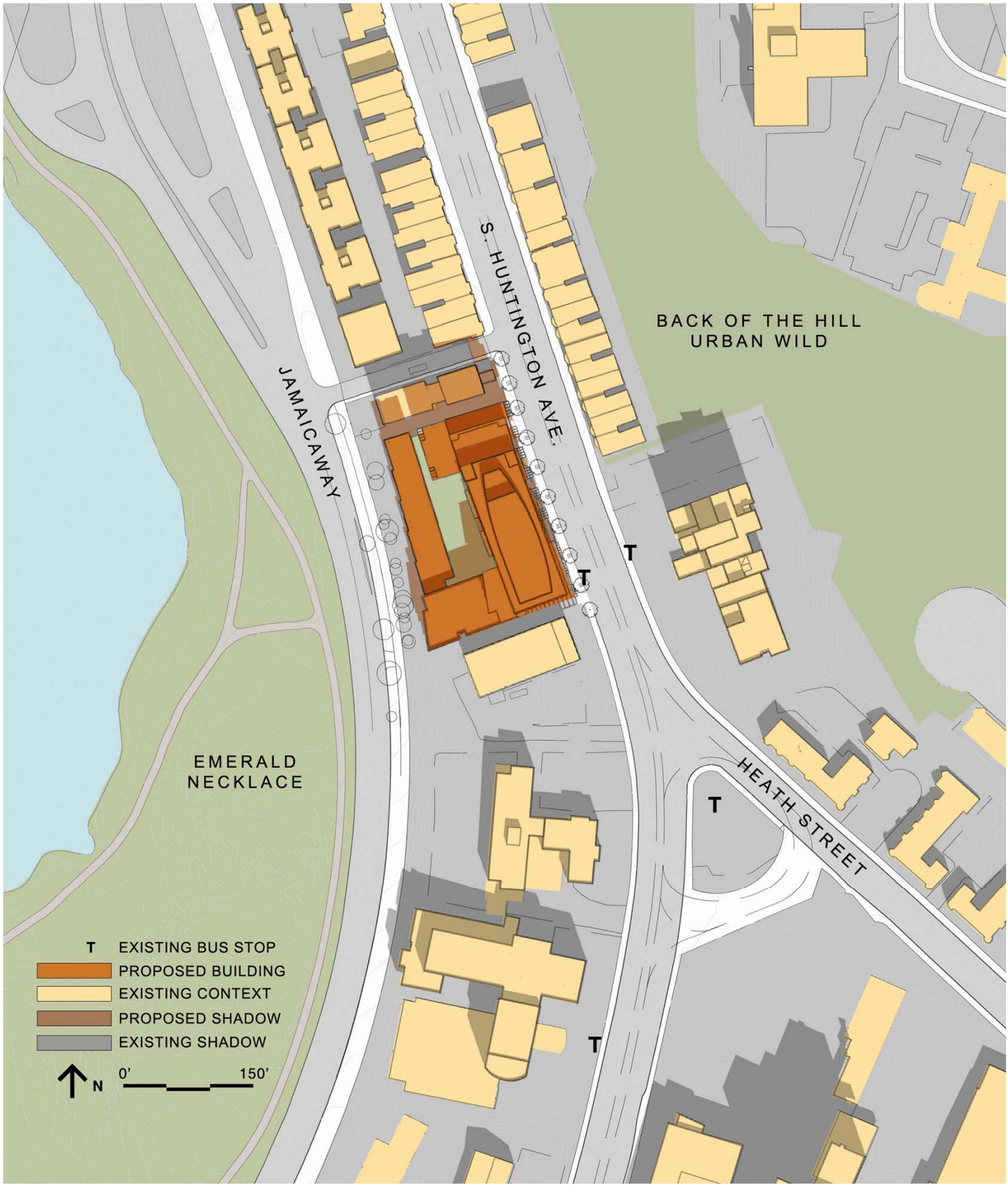

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Figure 3.2-2

March 21st – 12:00 p.m.

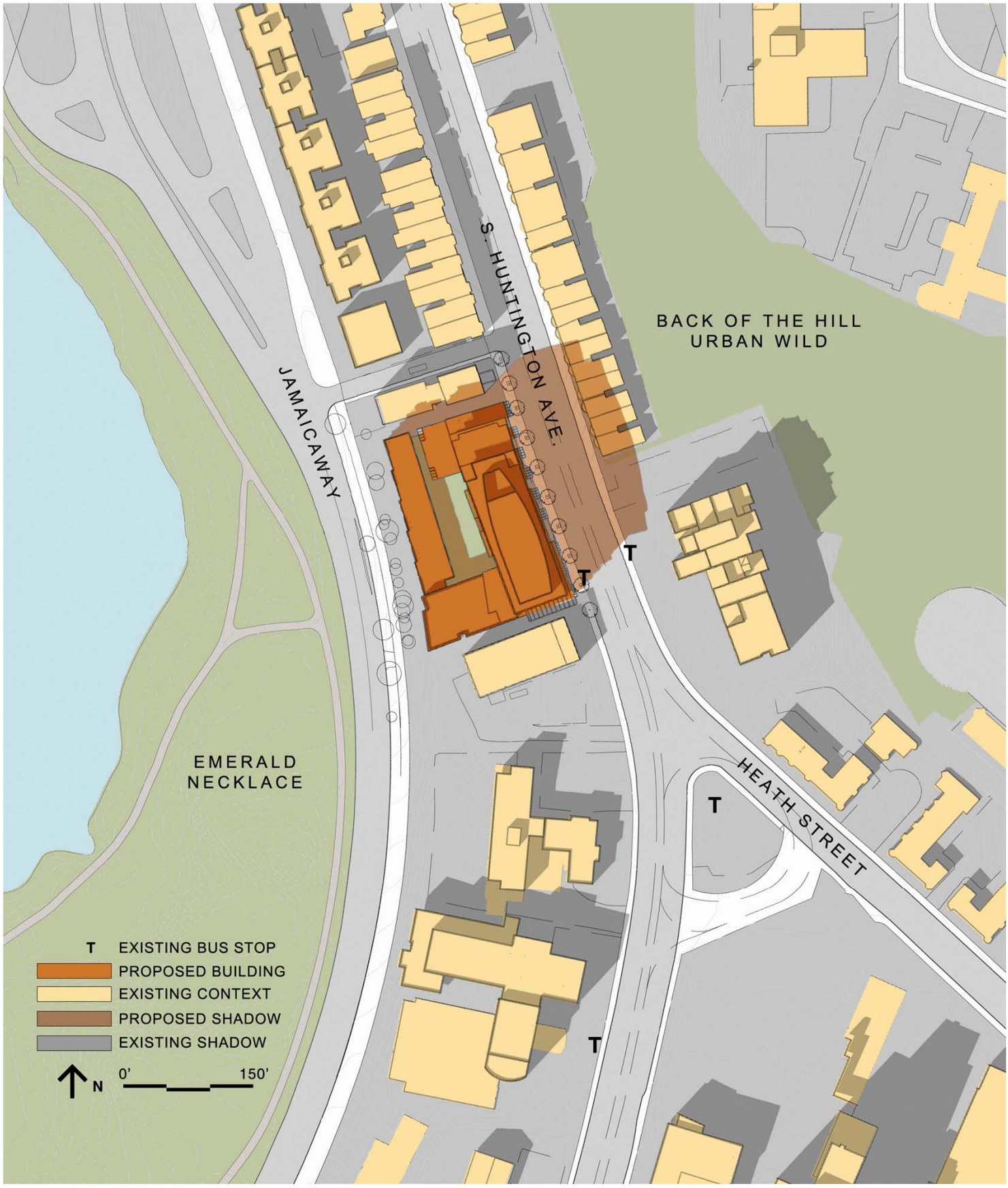

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Figure 3.2-3

March 21st – 3:00 p.m.

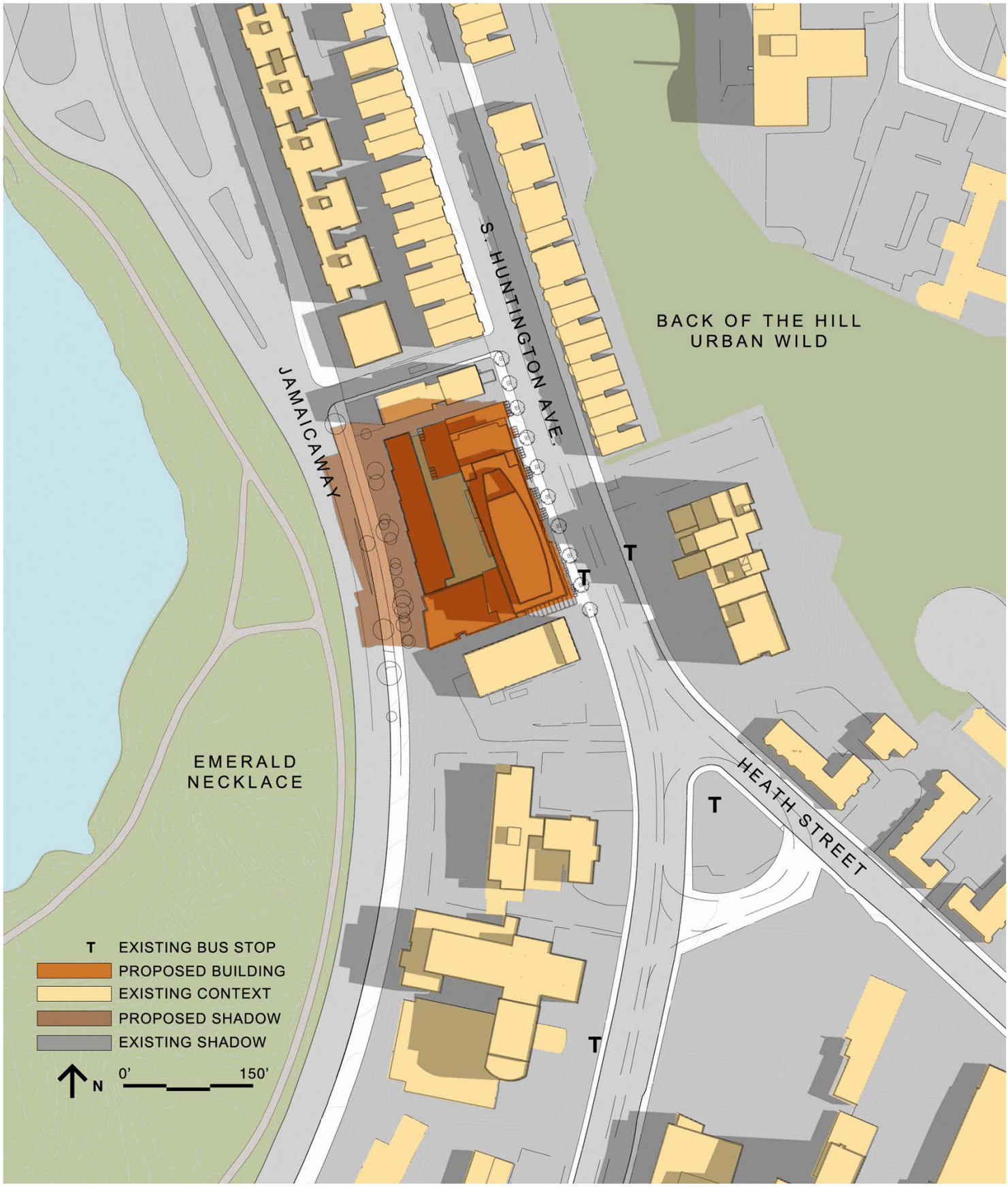

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Figure 3.2-4

June 21st – 9:00 a.m.

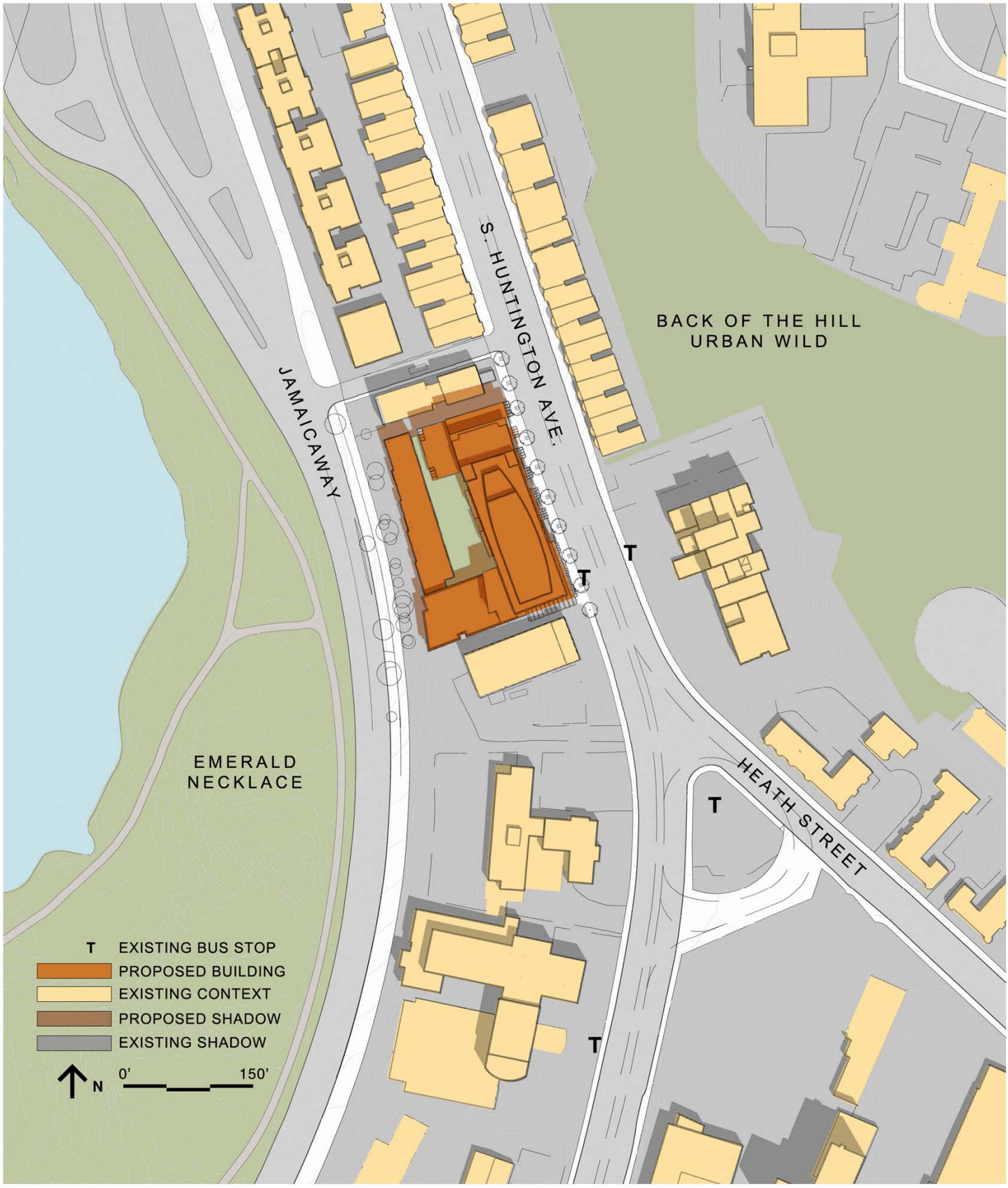

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Figure 3.2-5

June 21st – 12:00 p.m.

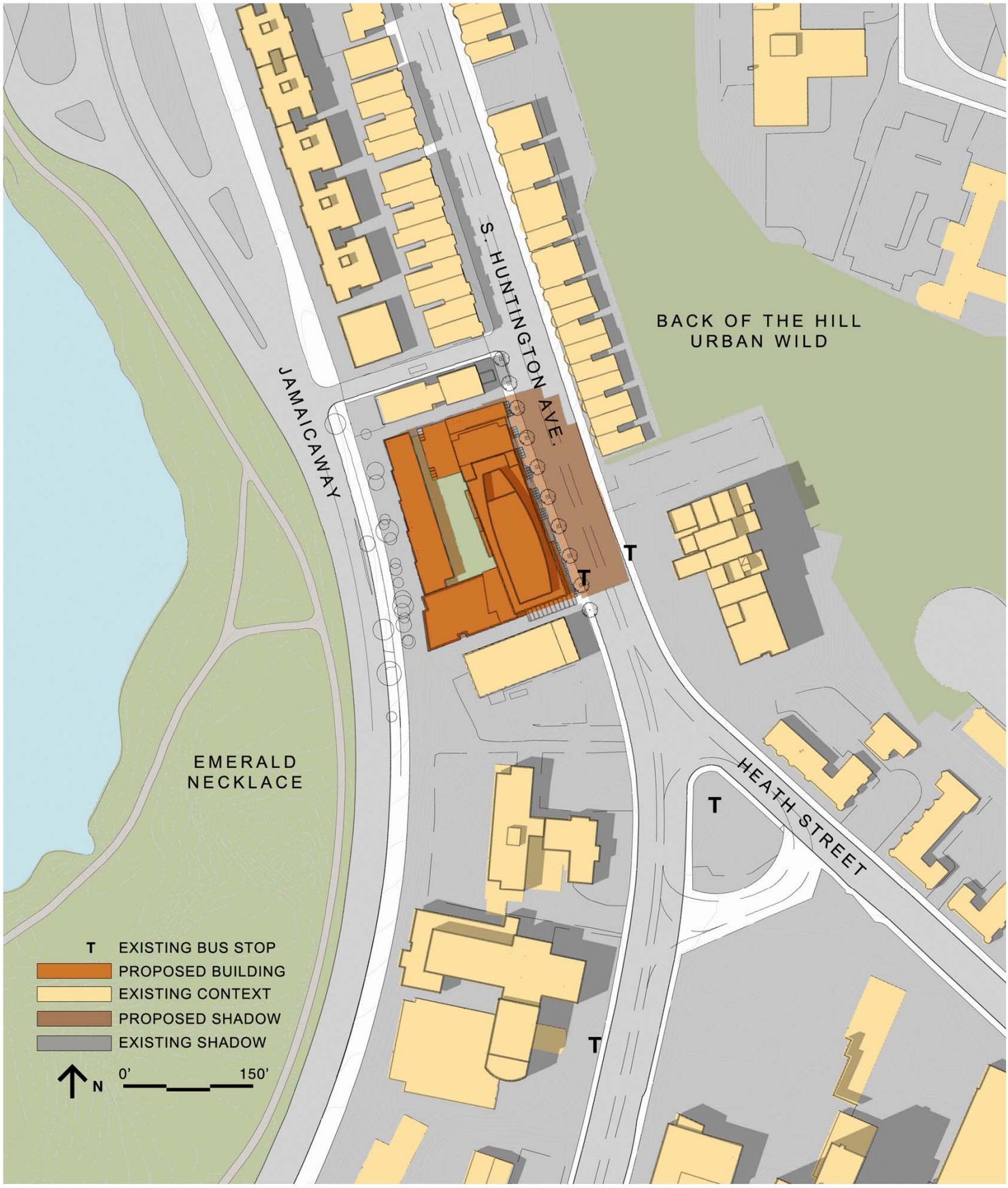

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Figure 3.2-6

June 21st – 3:00 p.m.

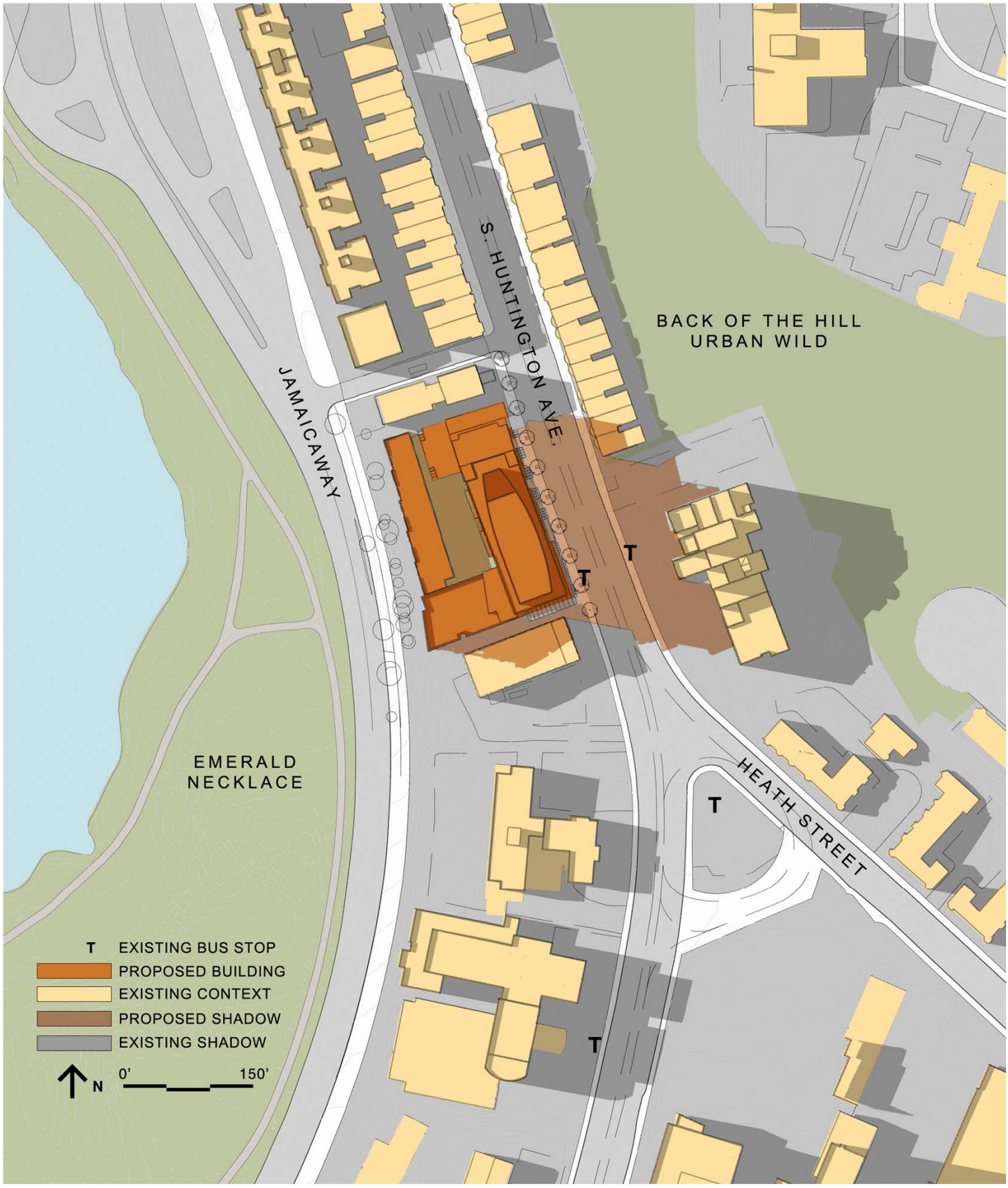

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Figure 3.2-7

June 21st – 6:00 p.m.

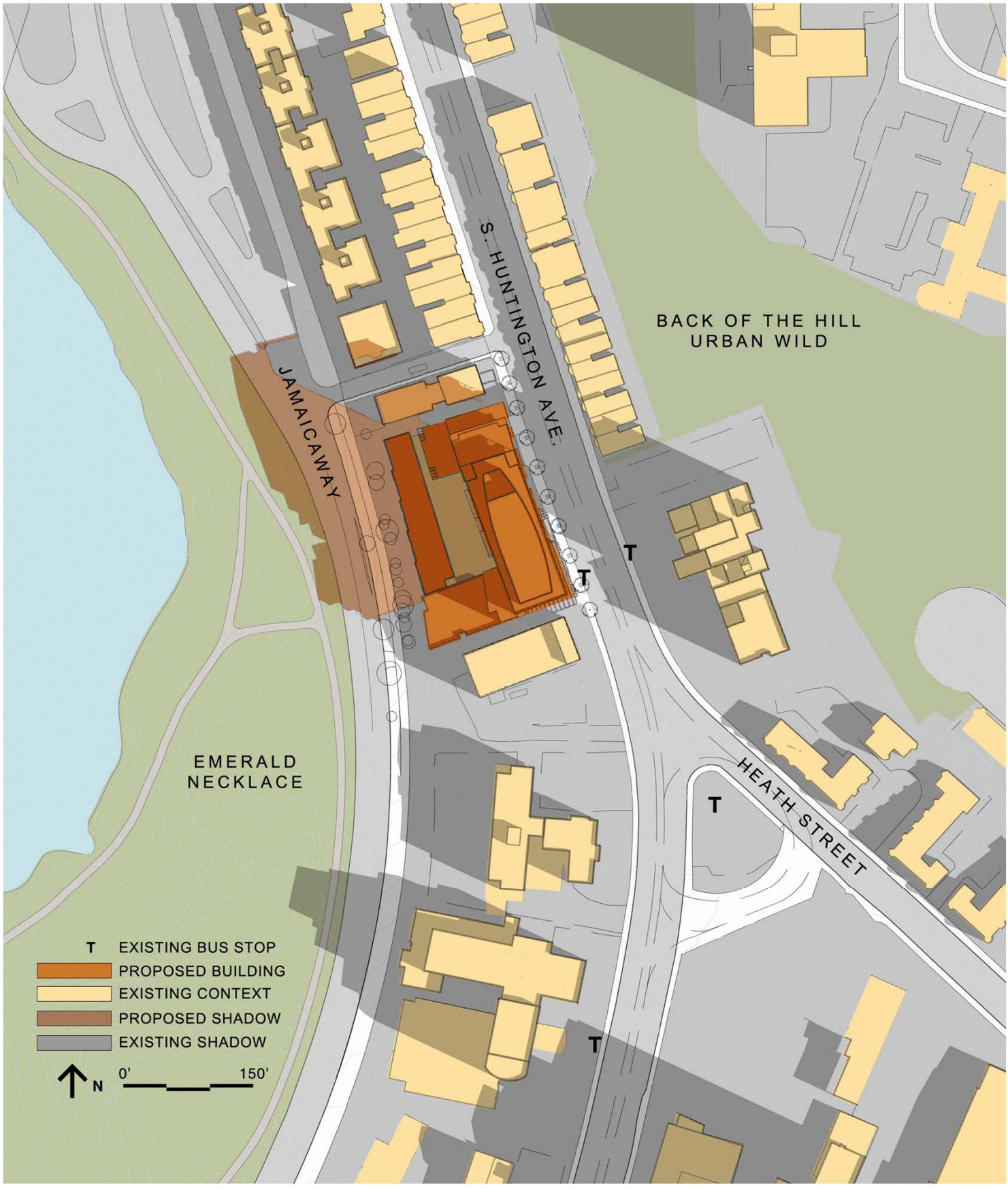

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Figure 3.2-8

September 21st – 9:00 a.m.

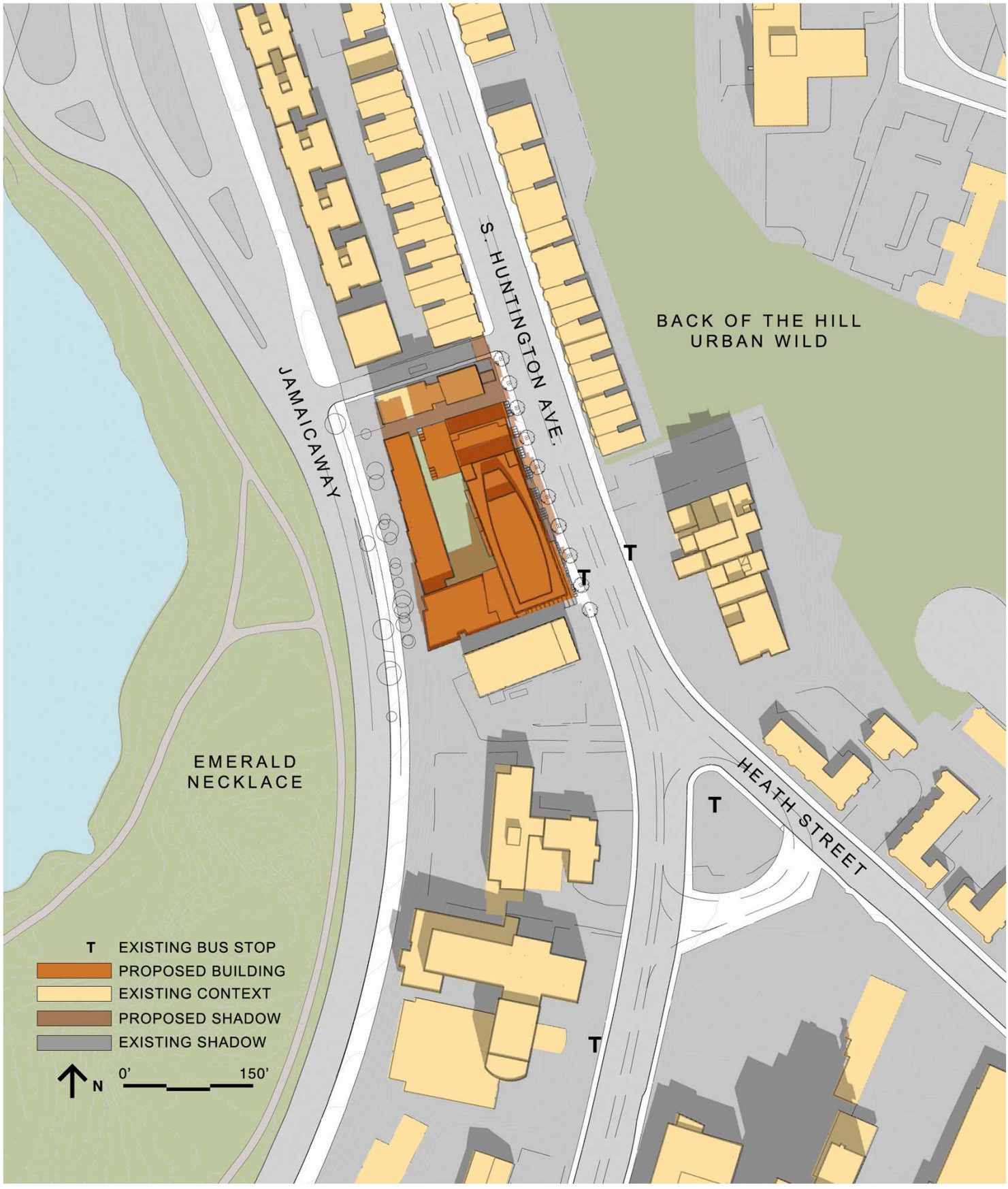

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Figure 3.2-9

September 21st – 12:00 p.m.

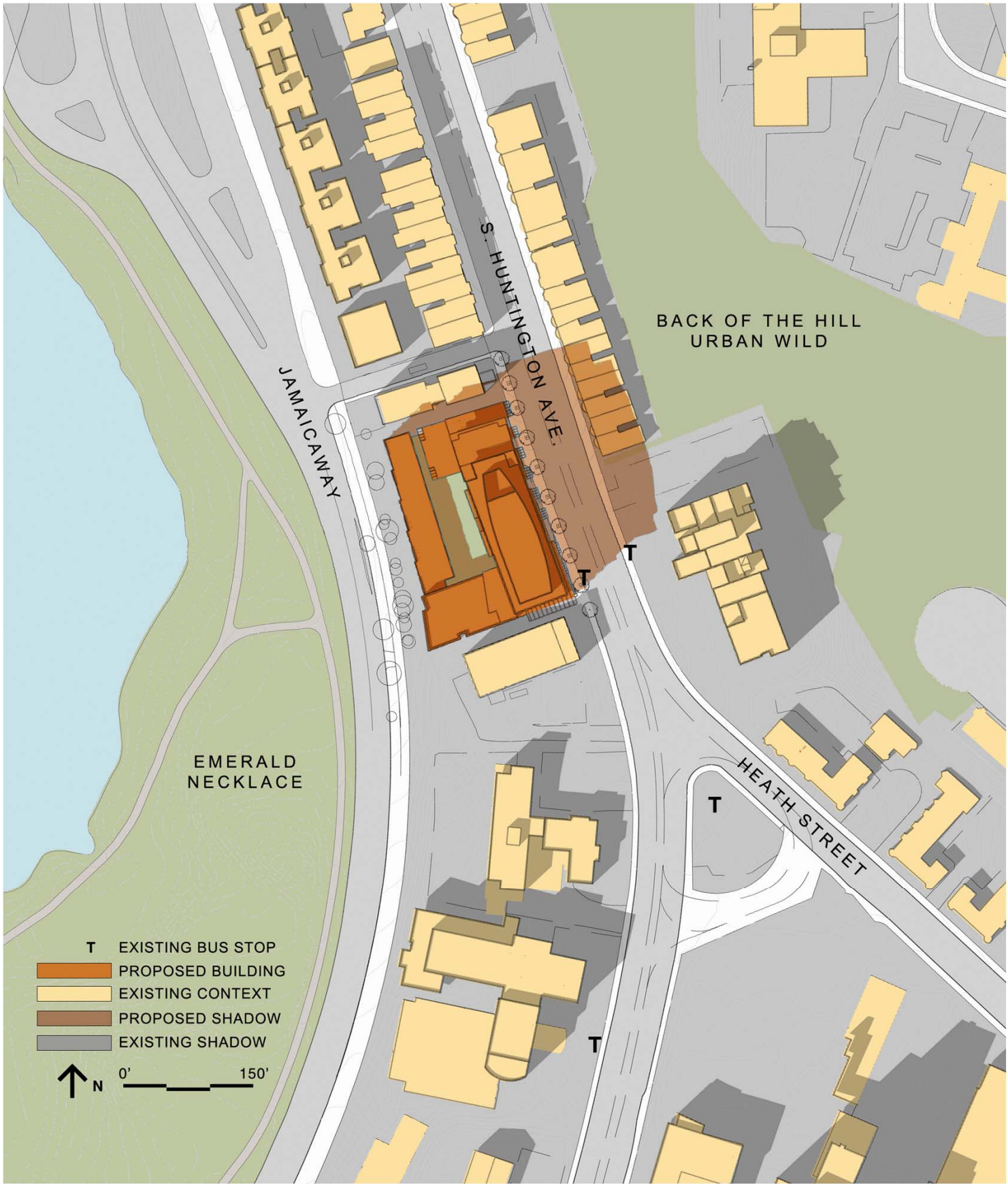

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Figure 3.2-10

September 21st – 3:00 p.m.

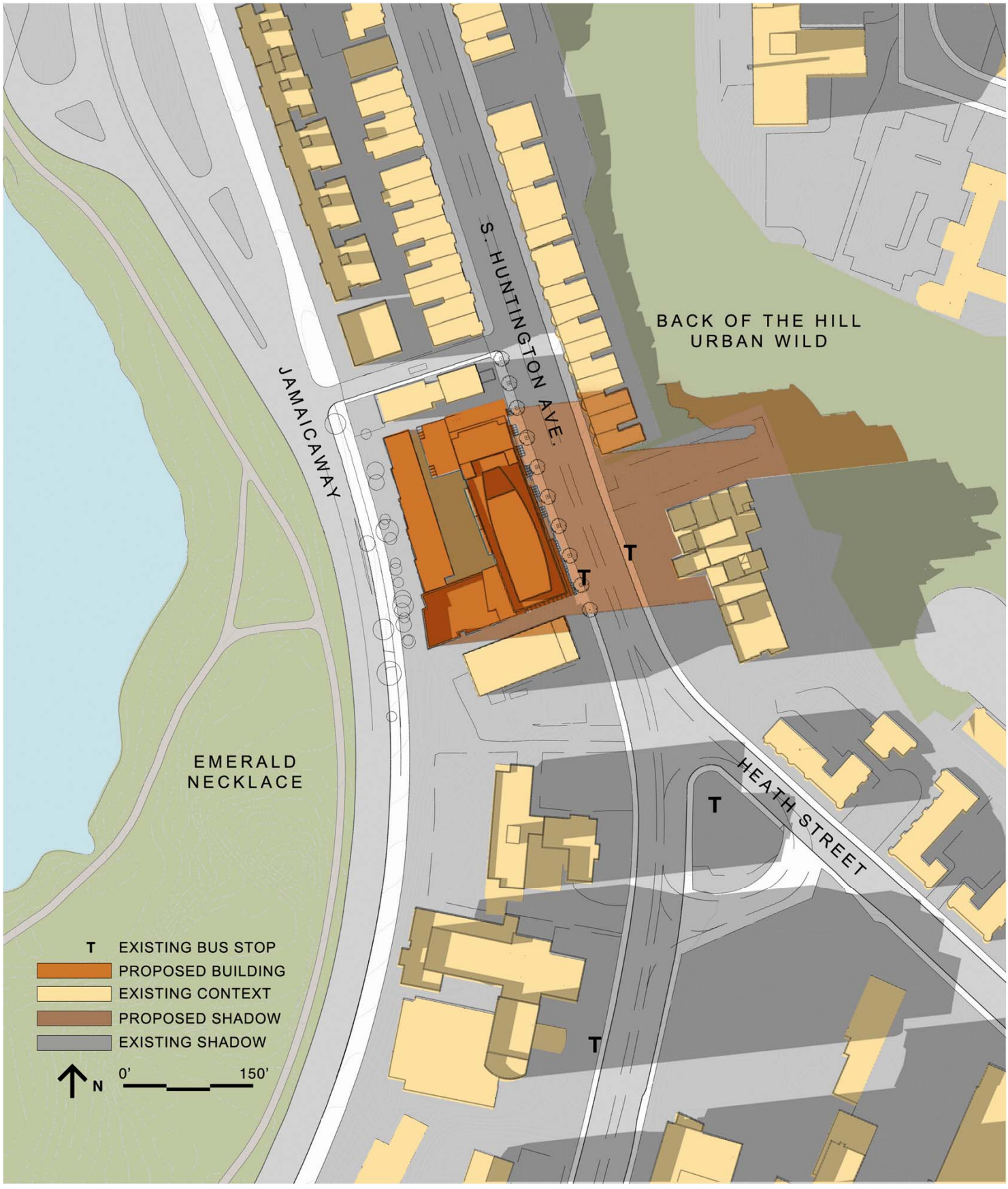

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Figure 3.2-11

September 21st – 6:00 p.m.

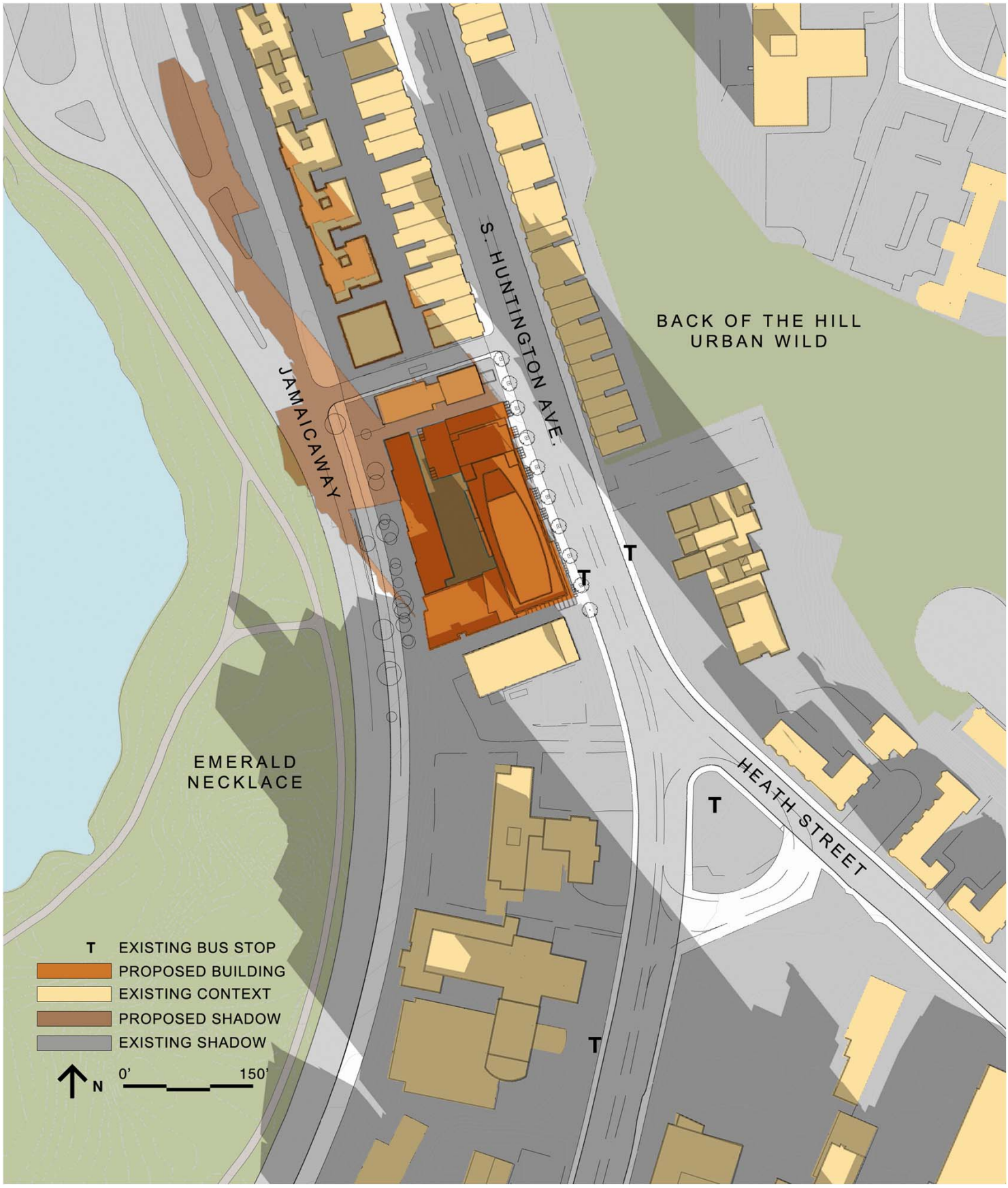

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Figure 3.2-12

December 21st – 9:00 a.m.

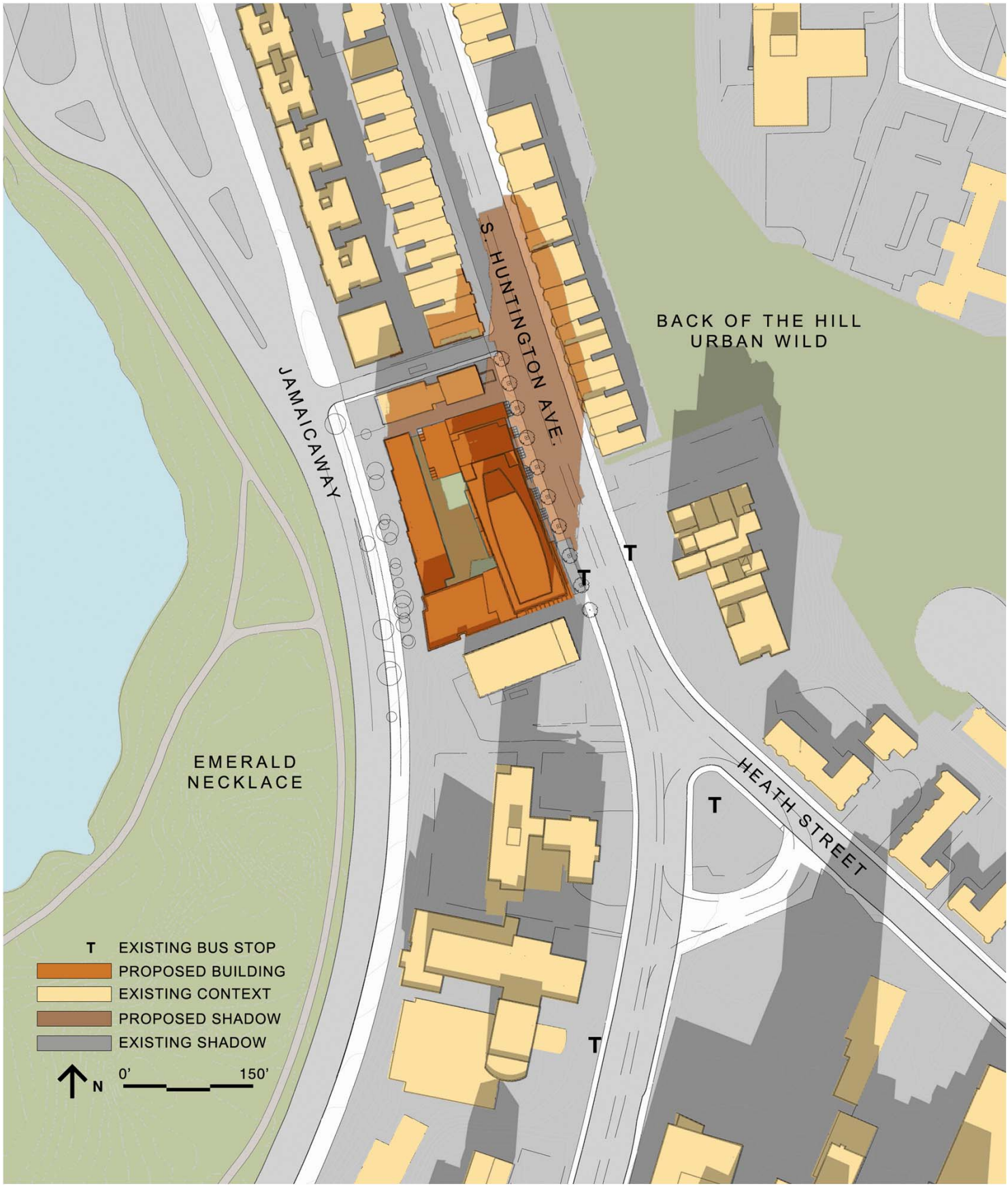

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Figure 3.2-13

December 21st – 12:00 p.m.

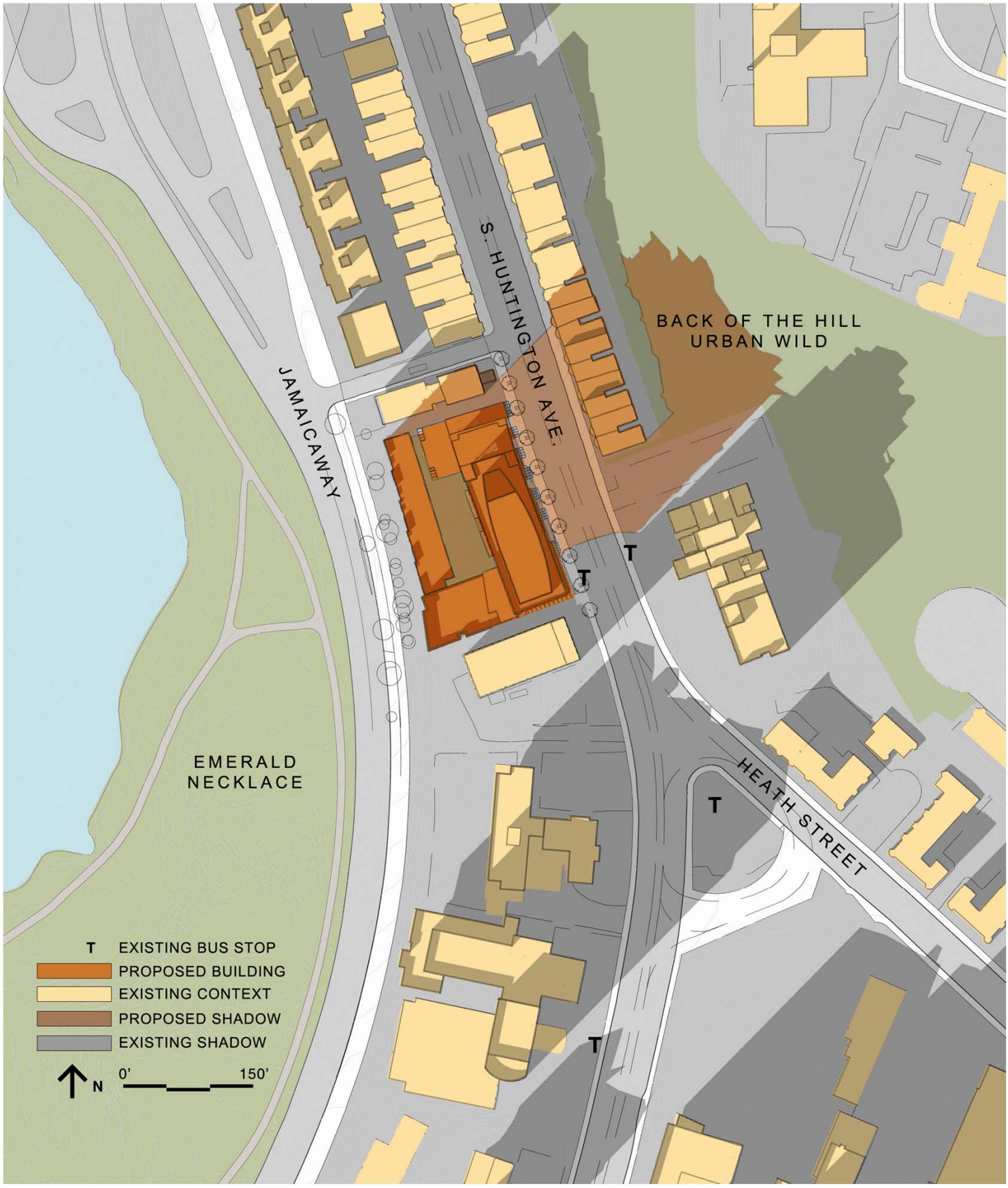

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Figure 3.2-14

December 21st – 3:00 p.m.

3.3 Daylight

3.3.1 Introduction

The purpose of a daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in its immediate vicinity. A daylight analysis for the proposed Project considers the existing and proposed conditions on the site and daylight obstruction values of the surrounding area.

Because the Project site currently consists of a vacant lot, the proposed Project will inherently increase daylight obstruction; however, the resulting conditions will be typical of a more urban public realm, and daylight obstruction will not be significant given the large amounts of open space and the spaces between existing buildings and the existing setbacks for parking in the vicinity of the Project site.

3.3.2 Methodology

The daylight analysis was performed utilizing the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program.[5] This program measures the percentage of sky that is obstructed by a project and is a useful tool in evaluating the net change in obstruction from existing to build conditions at a specific site.

Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent city streets or pedestrian ways centered on the proposed building. The façade of the building facing the viewpoint, including heights, setbacks, corners and other features, is plotted onto a base map using lateral and elevation angles. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from the viewpoint chosen. The BRADA program calculates the percentage of daylight that will be obstructed on a scale of zero to 100 percent based on the width of the view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building; the lower the number, the lower the percentage of obstruction of daylight from any given viewpoint.

The analysis compares three conditions: Existing Conditions; Proposed Conditions; and the context of the area. A single viewpoint along the Jamaicaway and one along South Huntington Avenue were chosen to evaluate daylight obstruction for the proposed and existing conditions. Four area context points were considered in order to provide a basis of comparison to existing conditions in the surrounding area. The viewpoints and area context viewpoints were taken in the following locations and are shown on Figure 3.3-1:

- **Viewpoint 1** – View from the Jamaicaway facing east toward the Project site.

[5] Method developed by Harvey Bryan and Susan Stuebing, computer program developed by Ronald Fergle, Massachusetts Institute of Technology, Cambridge, MA, September 1984.

- **Viewpoint 2** – View from South Huntington Avenue facing west toward the Project site.

- **Area Context Viewpoint AC1** – View from South Huntington Avenue facing east toward a series of attached brick row houses at 50-90 South Huntington Avenue.

- **Area Context Viewpoint AC2** – View from South Huntington Avenue facing east toward the Back of the Hill Apartment building at 100 South Huntington Avenue.

- **Area Context Viewpoint AC3** – View from South Huntington Avenue facing east toward the existing Veterans Administration Hospital building at 150 South Huntington Avenue.

- Area Context Viewpoint AC4 – View from Heath Street facing northeast toward a brick apartment building at 251 Heath Street.

3.3.3 Results

The results for each viewpoint are described in Table 3.3-1. Figure 3.3-2 through Figure 3.3-3 illustrates the BRADA results for each analysis.

Table 3.3-1 Daylight Obstruction Values

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	The Jamaicaway looking east at the western facade of the Proposed site	0%	80.5%
Viewpoint 2	South Huntington Avenue looking east at the eastern facade of the Proposed site	0%	74.3%
Area Context Points			
AC1	South Huntington Avenue facing east at a series of brick row houses located at 50 -90 South Huntington Avenue	51.7%	N/A
AC2	South Huntington facing east at the existing Back of the Hill Apartments located at 100 South Huntington Avenue	17.0%	N/A
AC3	View from South Huntington Avenue facing east towards the existing Veterans Administration Hospital located at 150 South Huntington Avenue	34.1%	N/A
AC4	View from Health Street facing northeast towards an existing brick apartment building located at 251 Heath Street	59.1%	N/A

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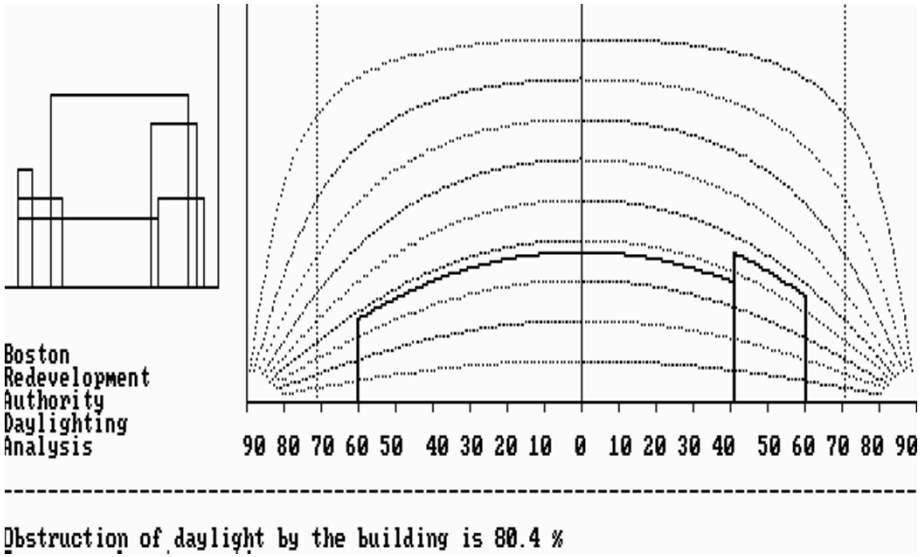
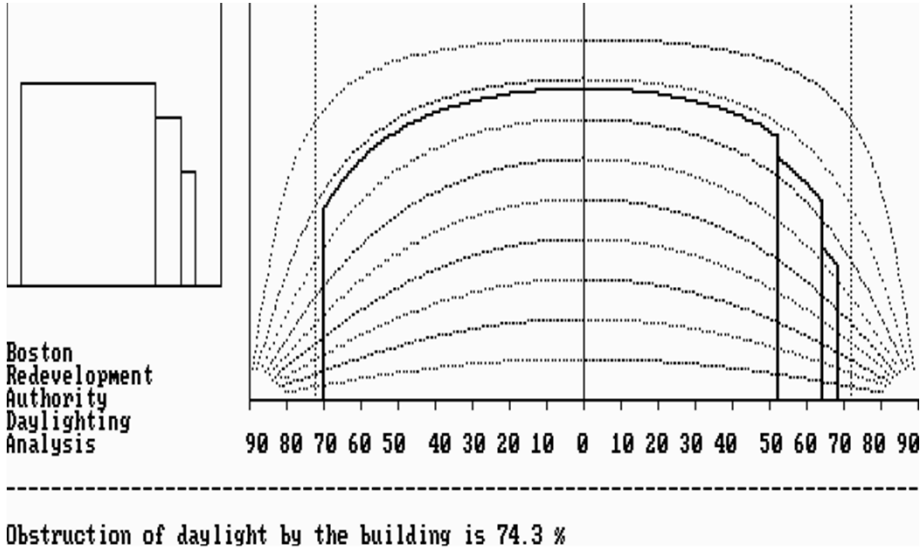
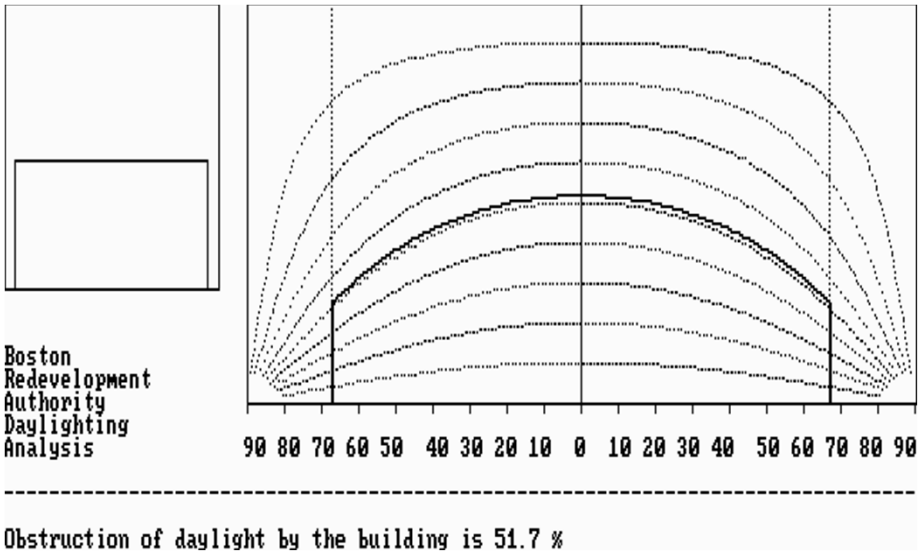
Figure 3.3-1
Viewpoint Locations



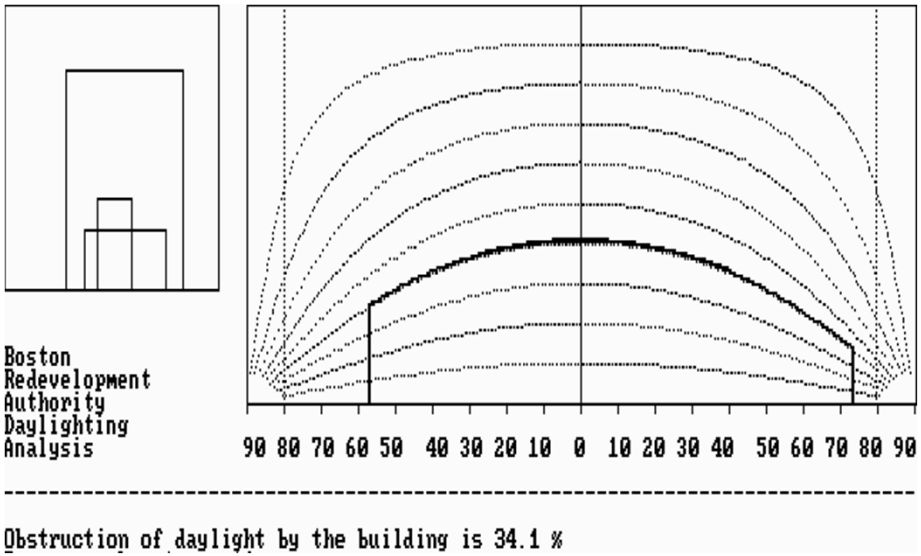
Viewpoint 1: Project from the Jamaicaway



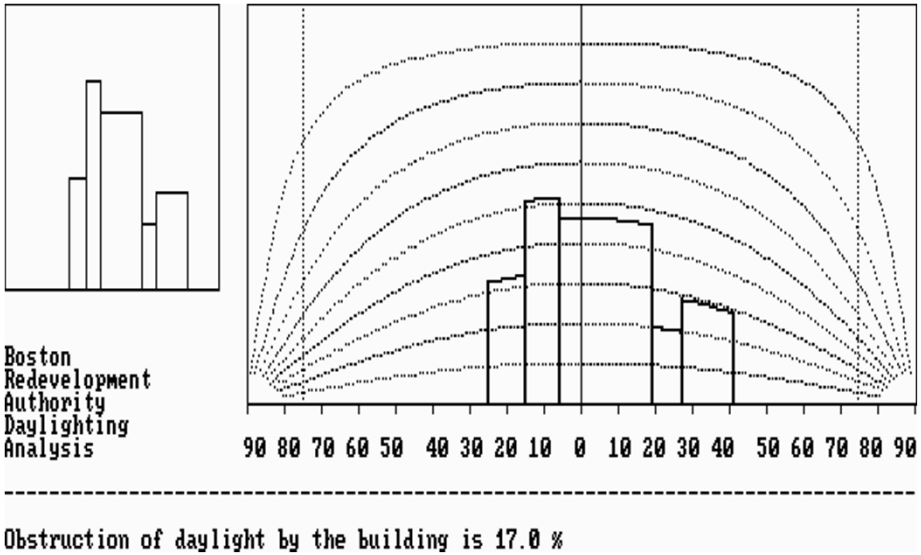
Viewpoint 2: Project from South Huntington Avenue



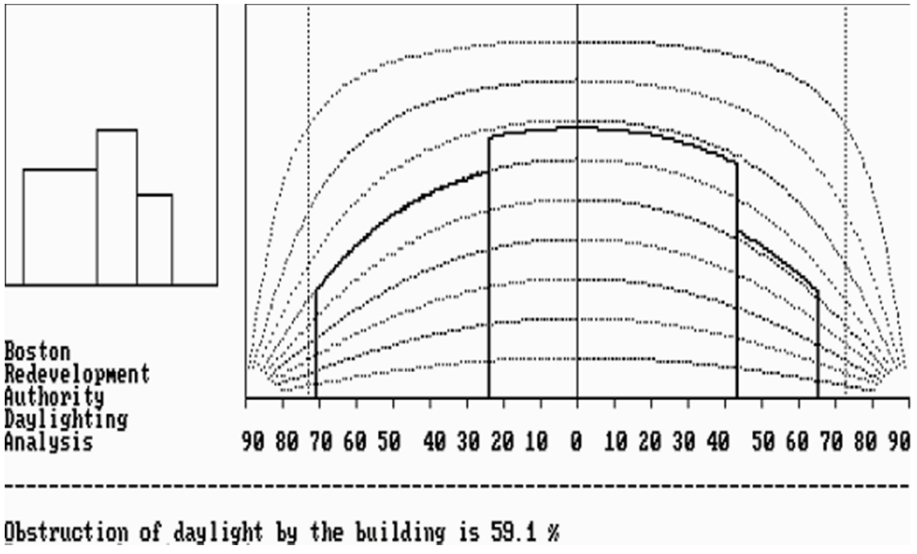
Area Context Viewpoint 1



Area Context Viewpoint 3



Area Context Viewpoint 2



Area Context Viewpoint 4

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Figure 3.3-3

Daylight Analysis – Area Context Results

The Jamaicaway – Viewpoint 1

The Jamaicaway borders the Project site to the west. Viewpoint 1 was taken from the center of the Jamaicaway, looking directly east at the Project site. The Project site is currently a vacant lot and has an existing daylight obstruction value of 0 percent. The development of the Project will increase daylight obstruction values to 80.5 percent. It should be noted that daylight obstruction due to tree canopies is not taken into account as part of the daylight analysis program. For most of the year mature trees extend over the Jamaicaway limiting views of the sky. This condition will continue as the Project site will continue to have trees in this location. Figure 3.3-4 provides a perspective of the building with the trees along the Jamaicaway, showing the limited impact of the Project on the sky dome.

South Huntington Avenue – Viewpoint 2

Viewpoint 2 was taken from the center of South Huntington Avenue, looking directly west at the eastern portion of the Project site. From this perspective, the development of the Project will increase daylight obstruction values to 74.3 percent. While this is an increase over existing conditions, the daylight obstruction value in the Project vicinity is minimized by spaces between buildings and large setbacks; limiting the impact of the proposed building on the sky dome in the surrounding area.

Area Context Views

The Project area is primarily characterized by residential and institutional uses. The buildings in the Project vicinity are comprised of a mix of heights, ranging between three story row houses, large residential apartment complexes and tall institutional buildings. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for four Area Context Points described above and shown on Figure 3.3-1. The daylight obstruction values ranged from 17.0 percent (AC2) on South Huntington Avenue to 59.1 percent on Heath Street (AC4). Given the significant amount of open space and building set backs in the surrounding vicinity, the construction of this Project is expected to have minimal impact on daylight for the surrounding area.

3.3.4 Conclusions

The daylight analysis conducted for the Project describes existing and proposed daylight obstruction conditions at the Project site and in the surrounding area. The results of the BRADA analysis indicate that while the development of the Project will result in increased daylight obstruction over existing conditions, the resulting conditions will not be significant when taken in context with the ample access to daylight available throughout the Project's vicinity.

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Figure 3.3-4

Perspective Looking North from the Jamaicaway

3.4 Solar Glare

Non-reflective glass will be included in the Project design to avoid adverse impacts from spot glare. Due to the height of the buildings and their orientation, solar glare impacts are not anticipated.

3.5 Air Quality

3.5.1 Introduction

The BRA typically requires that project-induced impacts to ambient air quality be addressed. The BRA requires a mesoscale analysis when a project will generate more than 10,000 vehicle trips per day. Since the proposed Project does not generate more than 10,000 trips per day, a mesoscale analysis was not performed.

It is expected that the majority of stationary sources (boilers, engines, etc) would be subject to the Massachusetts Department of Environmental Protection's (MassDEP) Environmental Results Program. Thus, any air quality impacts would be mitigated by this program and air impact analyses would be done at the time of permitting. Therefore, no formal air quality analysis of stationary source emissions has been performed.

For projects in Boston, the BRA typically requires the analysis of the effect on air quality of the increase in traffic generated by the Project. The Proponent is required to analyze local effects of the potential increase in traffic on ambient air quality near specific intersections. A microscale air quality analysis was conducted to determine the impact of pollutant emissions from mobile source emissions generated by the Project. A microscale analysis is performed to evaluate the potential air quality impacts of carbon monoxide (CO) due to traffic flow around the Project area.

The impacts were added to monitored background values and compared to the Federal National Ambient Air Quality Standards (NAAQS). The standards were developed by the United States Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety.

3.5.1.1 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, EPA promulgated National Ambient Air Quality Standards (NAAQS) for these criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM10 and PM2.5), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in Table 3.5-1. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS.

Table 3.5-1 National Ambient Air Quality Standards

Pollutant	*Averaging Period*	*National Ambient Air Quality Standards and Massachusetts Ambient Air Quality Standards (micrograms per cubic meter)*	
		Primary	*Secondary*
NO_2	Annual [1]	100	Same
	1-hour [7]	188	None
SO_2	Annual [1]	80	None
	24-hour [2]	365	None
	3-hour [2]	None	1,300
	1-hour [7]	195	None
PM10 [6]	Annual	50	Same
	24-hour [3]	150	Same
PM2.5	Annual [4]	15	Same
	24-hour [5]	35	Same
CO	8-hour [2]	10,000	Same
	1-hour [2]	40,000	Same
Ozone	8-hour [3]	235	Same
Pb	3-month [1]	1.5	Same

Notes:
[1] Not to be exceeded
[2] Not to be exceeded more than once per year.
[3] Not to be exceeded more than an average of one day per year over three years.
[4] Not to be exceeded by the arithmetic average of the annual arithmetic averages from 3 successive years.
[5] Not to be exceeded based on the 98th percentile of data collection.
[6] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM10 standard in 2006 (effective December 17, 2006). However, the annual standard remains codified in 310 CMR 6.00
[7] Not to be exceeded. Based on the three-yr average of the 98th (NO_2) or 99th (SO_2) percentile of the daily maximum one-hour concentrations.
Source: 40 CFR 50 and 310 CMR 6.00

NAAQS specify concentration levels for various averaging times and include both "primary" and "secondary" standards. Primary standards are intended to protect human health, whereas secondary standards are intended to protect public welfare from any known or anticipated adverse effects associated with the presence of air pollutants, such as damage to vegetation. The more stringent of the primary or secondary standards were applied when comparing to the modeling results for this Project.

A new one-hour NO_2 standard was promulgated on January 22, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly NO_2 NAAQS was published in the Federal Register on February 9, 2010 and became effective on April 12, 2010. The form of this standard is the three-year average of the 98th percentile of the daily maximum one-hour concentrations.

Similarly, a new one-hour SO_2 standard was promulgated on June 2, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly SO_2 NAAQS was published in the Federal Register on June 22, 2010 and became effective on August 23, 2010. The form of this standard is the three-year average of the 99th percentile of the daily maximum one-hour concentrations.

The NAAQS also reflect various durations of exposure. The short-term periods (24 hours or less) refer to exposure levels not to be exceeded more than once a year. Long-term periods refer to limits that cannot be exceeded for exposure averaged over three months or longer.

The inhalable particulate (PM10) NAAQS were promulgated on July 1, 1987 at the federal level with the intent of replacing the existing standards limiting ambient levels of Total Suspended Particulate (TSP). EPA also promulgated a Fine Particulate (PM2.5) NAAQS, effective December 2006, with an annual standard of 15 $\mu g/m^3$ and the 24-hour standard of 35 microgams per cubic meter ($\mu g/m^3$).

The impacts found through the analysis completed for the Project were added to monitored background values and compared to the NAAQS.

The modeling methodology was developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[6] The air quality analysis results show that CO, NOx, PM-10, PM-2.5, and SO_2 concentrations at all receptors studied are well under NAAQS thresholds.

Modeling assumptions and backup data for results presented in this section are provided in Appendix C.

3.5.2 Microscale Analysis

A microscale analysis is used to determine the effect on air quality of the increase in traffic generated by the Project. The Proponent is typically required to analyze local effects of the potential increase in traffic on ambient air quality near specific intersections. This microscale analysis is typically required for a project at intersections where 1) project traffic would impact intersections or roadway links currently operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D, E, or F; 2) project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or, 3) the project will generate 3,000 or more new average daily trips on roadways providing access to a single location.[7] The microscale analysis

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[6] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

[7] BRA, Development Review Guidelines, 2006.

involves modeling of CO emissions from vehicles idling at and traveling through signalized intersections. Predicted ambient concentrations of CO for the Build and No-Build cases are compared with federal and state ambient air quality standards for CO.

The microscale analysis typically examines breathing-level (1.8 meter) CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. NAAQS have been established by the EPA for CO to protect the public health (known as primary standards). These standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on late-model vehicles has reduced the occurrences of CO hotspots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The analysis followed the procedure outlined in EPA's intersection modeling guidance.[8]

The microscale analysis has been conducted using the latest versions of EPA MOBILE6.2 and CAL3QHC to estimate CO concentrations at sidewalk receptor locations.

Baseline (2012) and build year (2017) emission factor data calculated from the MOBILE6.2 model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections.

Existing background values of CO at the nearest monitor location in Kenmore Square were obtained from the MassDEP. CAL3QHC and AERMOD results were then added to background CO values of 1.9 ppm (one-hour) and 1.5 ppm (eight-hour), as provided by the MassDEP, to determine total air quality impacts due to the Project. This value was compared to the NAAQS for CO of 35 ppm (one-hour) and 9 ppm (eight-hour).

3.5.2.1 Intersection Selection

An analysis of the two intersections from the traffic study was conducted (see Chapter 2). Microscale modeling was performed for the sole signalized intersection that met the aforementioned BRA criteria for microscale analyses:

- the intersection of Huntington Avenue and South Huntington Avenue.

The traffic volumes and LOS calculations provided in Chapter 2 form the basis of evaluating the traffic data versus the microscale thresholds.

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[8] U.S. EPA, Guideline for Modeling Carbon Monoxide from Roadway Intersections; EPA-454/R-92-005, November 1992.

3.5.2.2 Emissions Calculations (MOBILE6.2)

The EPA MOBILE6.2 computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOBILE6.2 model are based on motor vehicle operations typical of daily periods. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the state specific vehicle age registration distribution. The input files for MOBILE6.2 for the baseline (2012) and build year (2017) are provided by MassDEP. As is typical, minor edits to the files were necessary to allow the program to output emission factors for the various speeds used in the analysis.

The current version of MOBILE6.2 does not explicitly calculate idle emissions. However, idle emissions can be obtained from a vehicle speed of 2.5 mph (the lowest speed MOBILE6 will model). The resulting emission rate given in (grams/mile) is then multiplied by 2.5 mph to estimate idle emissions (in grams/hour). Moving emissions are calculated based on actual speeds at which free-flowing vehicles travel through the intersections. A speed of 30 mph is used for all free-flow traffic. Speeds of 10 and 15 mph were used for right (and U-turns, if necessary) and left turns, respectively.

Winter CO emission factors are typically higher than summer. Therefore winter vehicular emission factors were conservatively used in the microscale analysis.

3.5.2.3 Receptors and Meteorology Inputs

A set of 65 receptors were placed in the vicinity of the modeled intersections. Receptors extended approximately 500 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersections are presented in Figure 3.5-1.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[9], a wind speed of one m/s, stability class D (4), and a mixing height of 1,000 meters was used. To account for the intersection geometry, wind directions from 0° to 350°, every 10°, were selected. A surface roughness length of 370 cm was selected for the urban intersection.[10]

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[9] U.S. EPA, *Guideline for Modeling Carbon Monoxide from Roadway Intersections.* EPA-454/R-92-005, November 1992.

[10] U.S. EPA, *User's Guide for CAL3QHC Version 2: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections.* EPA –454/R-92-006 (Revised), September 1995

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Figure 3.5-1

Link and Receptor Locations for CAL3QHC modeling of Intersection 1: the intersection of Huntington Avenue and South Huntington Avenue

3.5.2.4 Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-links at intersections, worst-case meteorological conditions, and traffic input data. The one-hour concentrations were scaled by a factor of 0.7 to estimate eight-hour concentrations.[11] The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling runs. The CAL3QHC input parameters are also described in Appendix C.

3.5.2.5 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports, was obtained for 2008 to 2010. MassDEP guidance specifies the use of the latest three years of available monitoring data from within 10 km of the Project site.

The closest monitor is located at Kenmore Square in Boston, with others at One City Square in Charlestown, and 174 North Street in Boston. A summary of the background air quality concentrations are presented in Table 3.5-2. Observed concentrations are currently in compliance with applicable NAAQS.

Background CO concentrations were determined from the closest available monitoring stations to the proposed Project. For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 1.9 ppm for one-hour and 1.5 ppm for eight-hour CO.

Table 3.5-2 Observed Ambient Air Quality Concentrations and Selected Background Levels

Pollutant	Averaging Time	2008	2009	2010	Background Concentration ($\mu g/m^3$)	NAAQS	Location
SO_2 [4]	1 HOUR	75.4	65	69.94	75.4	195	KEN
	3 HOUR	62.4	49.4	N/A	62.4	365	KEN
	24 HOUR	46.8	23.4	21.84	46.8	1,300	KEN
	ANNUAL	10.4	6.5	5.824	10.4	80	KEN
PM-10	24 HOUR	53	69	40	69	150	CTY
	ANNUAL	23	20.6	15.5	23	50	CTY
PM-2.5	24 HOUR [1]	26	19.1	21.9	22.33	35	NTH
	ANNUAL [2]	11.14	8.98	9.31	9.81	15	NTH

[11] U.S. EPA, Screening Procedures for Estimating the Air Quality Impact of Stationary Sources; EPA-454/R-92-019, October 1992

Table 3.5-2 Observed Ambient Air Quality Concentrations and Selected Background Levels (Continued)

Pollutant	Averaging Time	2008	2009	2010	Background Concentration ($\mu g/m^3$)	NAAQS	Location
NO_2	1 HOUR [3]	133.48	114.68	119.38	133.48	188	KEN
	ANNUAL	41.36	37.788	35.908	41.36	100	KEN
CO	1 HOUR	1938	1596	2166	2166	40,000	KEN
	8 HOUR	1482	1254	1710	1710	10,000	KEN

From 2008-2010 MassDEP Annual Data Summaries

KEN = Kenmore Sq. Boston; CTY = 1 City Sq. Boston, NTH = 174 North St. Boston

[1] Average of the 98th percentile 24-hour values.

[2] Average of the annual values.

[3] Maximum annual one-hour concentrations (EPA "first tier" method).

[4] The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520. The 2010 three-hour value is not reported in the 2010 Annual Data Summary

3.5.2.6 Microscale Analysis Results

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3.5-3 through 3.5-5 for the 2012 and 2017 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.7.[12]

The results of the one-hour and eight-hour maximum modeled CO ground-level concentrations from CAL3QHC were added to EPA supplied background levels for comparison to the NAAQS. These values represent the highest potential concentrations at the intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology. The highest one-hour traffic-related concentration predicted in the area of the Project, for the modeled conditions (2.3 ppm) plus background (1.9 ppm), is 4.2 ppm for the existing afternoon peak hour case. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (1.6 ppm) plus background (1.5 ppm), is 3.1 ppm, for the same case. Both concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

It would be expected that any other mitigation measures implemented to improve traffic flow at any of the modeled intersections would result in further improved air quality conditions.

[12] U.S. EPA, Screening Procedures for Estimating the Air Quality Impact of Stationary Sources; EPA-454/R-92-019, October 1992

3.5.2.7 Microscale Analysis Conclusions

Using conservative estimates, the CO concentrations at the nearest receptors for impacts from the intersection, plus monitored background values, are well under the CO NAAQS thresholds.

3.5.3 Stationary Sources

Stationary sources expected to be included in the proposed Project include boilers for heating and hot water and emergency generators for power generation. This equipment may be subject to additional air quality permitting requirements as regulated in 310 CMR 7.00.

3.5.3.1 Heating Equipment

All heating and hot water boilers are expected to be either within or well below the requirements of MassDEP's Environmental Results Program (ERP), since individual estimated heat inputs would be within or below the 10 to 40 mmBtu/hour ERP range. Boilers within this range would be required to meet applicable emissions limits and register in MassDEP's ERP program. The program includes notification requirements to provide MassDEP with boiler specifications, fuel usage, and related information. Any boilers below the ERP limit of 10 mmBtu/hour would not be required to register in MassDEP's ERP program. Boilers larger than 40 mmBtu/hour would be subject to the requirements of MassDEP's Major or Non-Major Comprehensive Plan Approval process for preconstruction permits of fuel combusting sources.

3.5.3.2 Emergency Generators

Depending on the final uses of Project buildings, there will likely be a need for emergency power units that would provide life safety and standby emergency power to the buildings. These units are typically diesel-fired and located in a mechanical area on the roof or in the basement of a building. The generators must be designed such that exhaust stacks extend at least 10 feet above the individual building roof height above ground level.

Typically, generators will operate for approximately one hour each month for testing and general maintenance. The ERP regulation applies to new emergency generators greater than 37 kW. The regulation is similar to the boiler ERP in that new engines are subject to emission standards, recordkeeping, certification, and compliance with the MassDEP noise policy. If the generator maximum rating capacity is greater than the ERP limit of 37 kW, it will be subject to the ERP program. Under the ERP, the generator owner will limit operation of the generator to less than 300 hours per year and submit a certification form to MassDEP within 60 days of installation.

Table 3.5-3 Summary of Microscale Modeling Analysis (Existing 2012)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Huntington Avenue & South Huntington Avenue	AM	2.1	1.9	4.0	35
	PM	2.3	1.9	4.2	35
8-Hour					
Huntington Avenue & South Huntington Avenue	AM	1.5	1.5	3.0	9
	PM	1.6	1.5	3.1	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

Table 3.5-4 Summary of Microscale Modeling Analysis (No-Build 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Huntington Avenue & South Huntington Avenue	AM	1.8	1.9	3.7	35
	PM	2.0	1.9	3.9	35
8-Hour					
Huntington Avenue & South Huntington Avenue	AM	1.3	1.5	2.8	9
	PM	1.4	1.5	2.9	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

Table 3.5-5 Summary of Microscale Modeling Analysis (Build 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Huntington Avenue & South Huntington Avenue	AM	1.8	1.9	3.7	35
	PM	2.0	1.9	3.9	35
8-Hour					
Huntington Avenue & South Huntington Avenue	AM	1.3	1.5	2.8	9
	PM	1.4	1.5	2.9	9

Notes:
CAL3QHC 8-hour impacts were conservatively obtained by multiplying 1-hour impacts by a screening factor of 0.7.

3.5.4 Conclusions

Based on the microscale analysis, the CO concentrations at the nearest receptors, plus monitored background values, are well under the CO NAAQS thresholds.

Additionally, all stationary sources will be permitted according to the applicable regulations.

3.6 Stormwater/Water Quality

Please see Chapter 6 for a discussion of stormwater and water quality.

3.7 Flood Hazard Zones/Wetlands

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates the FEMA Flood Zone Designations for the Project site (City of Boston, Community Panel Number 25025C0078G). The map for the Project site shows the Project is located outside of any designated flood zones. The Project site does not contain any wetlands.

3.8 Geotechnical/Groundwater

This section describes subsurface soil and groundwater conditions at the Project site, planned below grade construction activities, and mitigation measures for protection of adjacent structures and maintaining groundwater levels in the Project's vicinity during foundation and below-grade construction.

3.8.1 Site Conditions

According to Sanborn maps, dating as far back as to 1897, the Project site has been a vacant lot that shows no history of previous development. Currently, the site is lightly wooded with trees along the eastern, western and northern boundaries. The remaining portion of the site is covered in grass.

The existing ground surface along the South Huntington Avenue side of the site generally slopes downward from south to north from approximately Elevation +52 to Elevation +38 over a horizontal distance of approximately 240 feet. The existing ground surface along the Jamaicaway side of the site generally slopes downward from south to north from approximately Elevation +26 to Elevation +21 over a horizontal distance of approximately 240 feet. The site topography slopes steeply down from South Huntington Avenue for a distance of approximately 25 feet, then gradually toward the Jamaicaway.

3.8.2 Groundwater Levels

Groundwater was not observed within the test pits at the time of excavation. The test pits were terminated in the glacial outwash deposit at depths ranging from 12 to 12.5 feet below ground surface. It is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations of existing drainage patterns.

3.8.3 Foundation Construction

Based on the current design concept for the residential building and the subsurface conditions encountered during the subsurface investigation, it is anticipated that the proposed structure will be supported on a foundation system which transfers the building loads to the natural glacial outwash deposit. Specifically, it is anticipated that foundation support for the proposed development will be provided by footing and/or mat foundations in conjunction with a soil supported slab-on grade for the lowest level slab.

Footings and mats would bear directly on the undisturbed, glacial outwash deposit or on compacted structural fill placed directly over the surface of the glacial outwash deposit at locations where the surface of the marine deposit is located below the design bottom of footing or mat elevation.

An additional subsurface investigation may be performed to determine the subsurface conditions on the eastern side of the site in the vicinity of the steep slope adjacent to South Huntington Avenue and to obtain Standard Penetration Test N-values of the site soil to confirm the recommended design bearing pressure, the site class for seismic design, the depth to groundwater, and to evaluate the liquefaction potential of site soils.

3.9 Solid and Hazardous Waste

3.9.1 Hazardous Waste

McPhail Associates, Inc. completed a Phase 1 Environmental Site Assessment Report for the Project site in November 2011.

Surficial observations of the site and readily observable portions of nearby properties did not identify any Recognized Environmental Condition's (REC) with respect to the Project site. Searches for evidence of REC's through the City of Boston's and MassDEP's online database for records of permits for the storage and use of oil or hazardous material at the Project site did not indicate the presence of a REC.

EDR Inc.'s review of local, state and federal databases indicated that the subject site is not a MassDEP listed release site. Further, a review of the information provided in the available databases searched by EDR indicated that the majority of the properties located in the vicinity of the subject site do not pose a threat of impact to the subject site and are not considered RECs.

3.9.2 Operational Solid and Hazardous Waste Generation

The Project will generate solid waste typical of residential development and a small retail space. Based on a generation rate of four pounds per bedroom per day and 5.5 tons per year per 1,000 sf of retail space, solid waste generated by the Project will be approximately 200 tons per year.

Solid waste will include wastepaper, cardboard, glass, bottles, food waste, and other waste typical of residential and retail uses. The building will include areas for trash collection and recycling collection on each floor, and a trash room adjacent to the loading dock.

With the exception of "household hazardous wastes" typical of these uses (e.g., cleaning fluids), hazardous wastes will not be generated.

3.9.2.1 Recycling

Recycling facilities will be provided on-site for paper, glass, plastic and metal. A central facility on lower floors of the building will be available for recycling efforts by building residents.

3.10 Noise

3.10.1 Introduction

This section describes a noise analysis conducted for the Project, including a noise-monitoring program to determine existing background levels and an estimate of future sound levels when the Project is in operation. The scope of the analysis is consistent with BRA requirements for noise studies.

Baseline noise levels were measured in the vicinity of the proposed Project and were compared to predicted noise levels based on reference sound data for mechanical equipment identified by the Project architect. These predicted noise levels were compared to the City of Boston Zoning District Noise Standards and the MassDEP Noise Policy. The analysis indicates that predicted noise levels from Project mechanical equipment with appropriate noise attenuation measures will comply with both state and local regulations at all modeled locations, including within the Emerald Necklace.

3.10.2 Noise Terminology

There are several ways in which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The following information defines the noise measurement terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a three-decibel increase (to 53 dB), not a doubling to 100 dB. Thus, every three dB change in sound levels represents a doubling or halving of sound energy. Related to this is the fact that a change in sound levels of less than three dB is imperceptible to the human ear.

Another property of decibels is that if one source of noise is 10 dB (or more) louder than another source, then the total sound level is simply the sound level of the higher source. For example, a source of sound at 60 dB plus another source of sound at 47 dB is 60 dB.

The sound level meter used to measure noise is a standardized instrument. It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various circumstances. One network is the A-weighting network (there are also B- and C-weighting networks). The A-weighted scale (dBA) most closely approximates how the human ear responds to sound at various frequencies. Sounds are frequently reported as detected with the A-weighting network of the sound level meter. A-weighted sound levels emphasize the middle frequency (i.e., middle pitched—around 1,000 Hertz sounds), and de-emphasize lower and higher frequency sounds.

Because the sounds in our environment vary with time, they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n can have a value of 0 to 100 percent. For example:

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.

- L_{50} is the median sound level, the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.

- L_{max} is the maximum instantaneous sound level observed over a given period.

L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is also A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud, intrusive noises.

By using various noise metrics it is possible to separate prevailing, steady sounds (the L_{90}) from occasional, louder sounds (L_{10}) in the noise environment or combined average levels (L_{eq}). This analysis of sounds expected from the Project treats all noises as though they will be steady and continuous, and hence the L_{90} exceedance level was used. In the design of noise control treatments, it is essential to know something about the frequency spectrum of the noise of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design. The spectra of noises are usually stated in terms of octave band sound pressure levels, in dB, with the octave frequency bands being those established by standard. To facilitate the noise-control design process, the estimates of noise levels in this analysis are also presented in terms of octave band sound pressure levels.

3.10.3 Noise Regulations and Criteria

The primary set of regulations relating to the potential increase in noise levels is the City of Boston Zoning District Noise Standards (City of Boston Code – Ordinances: Section 16–26 Unreasonable Noise and City of Boston Air Pollution Control Commission Regulations for the Control of Noise in the City of Boston). Results of the baseline ambient noise level survey and the modeled noise levels were compared to the City of Boston Zoning District Noise Standards. Separate regulations within the Standards provide criteria to control different types of noise. Regulation 2 is applicable to the effects of the proposed Project, as completed, and was considered in this noise study. Table 3.10-1 includes the Zoning District Standards.

Additionally, MassDEP regulates community noise by its Noise Policy: DAQC policy 90-001. The MassDEP policy limits source sound levels to a 10-dBA increase in the ambient measured noise level (L_{90}) at the Project property line and at the nearest residences. The policy further prohibits pure tone conditions—when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by three decibels or more.

Table 3.10-1 City of Boston Zoning District Noise Standards, Maximum Allowable Sound Pressure Levels

Octave Band Center Frequency (Hz)	Residential Zoning District		Residential-Industrial Zoning District		Business Zoning District	Industrial Zoning District
	Daytime (dB)	All Other Times (dB)	Daytime (dB)	All Other Times (dB)	Anytime (dB)	Anytime (dB)
32	76	68	79	72	79	83
63	75	67	78	71	78	82
125	69	61	73	65	73	77
250	62	52	68	57	68	73
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
A-Weighted (dBA)	**60**	**50**	**65**	**55**	**65**	**70**

Notes: Noise standards are extracted from Regulation 2.5, City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976.
All standards apply at the property line of the receiving property.
dB and dBA based on a reference pressure of 20 micropascals.
Daytime refers to the period between 7:00 a.m. and 6:00 p.m. daily except Sunday.

3.10.4 Existing Conditions

3.10.4.1 Baseline Noise Environment

An ambient noise level survey was conducted to characterize the existing "baseline" acoustical environment in the vicinity of the Project, located at 105A South Huntington Avenue in the Jamaica Plain area of Boston near the Mission Hill line. Existing noise sources in the vicinity of the Project include: vehicular traffic (including trucks, buses, and MBTA Green Line trains) on the local roadways; birds; wind noise; pedestrian conversation and foot traffic; mechanical equipment located on the surrounding buildings; and the general din of the city.

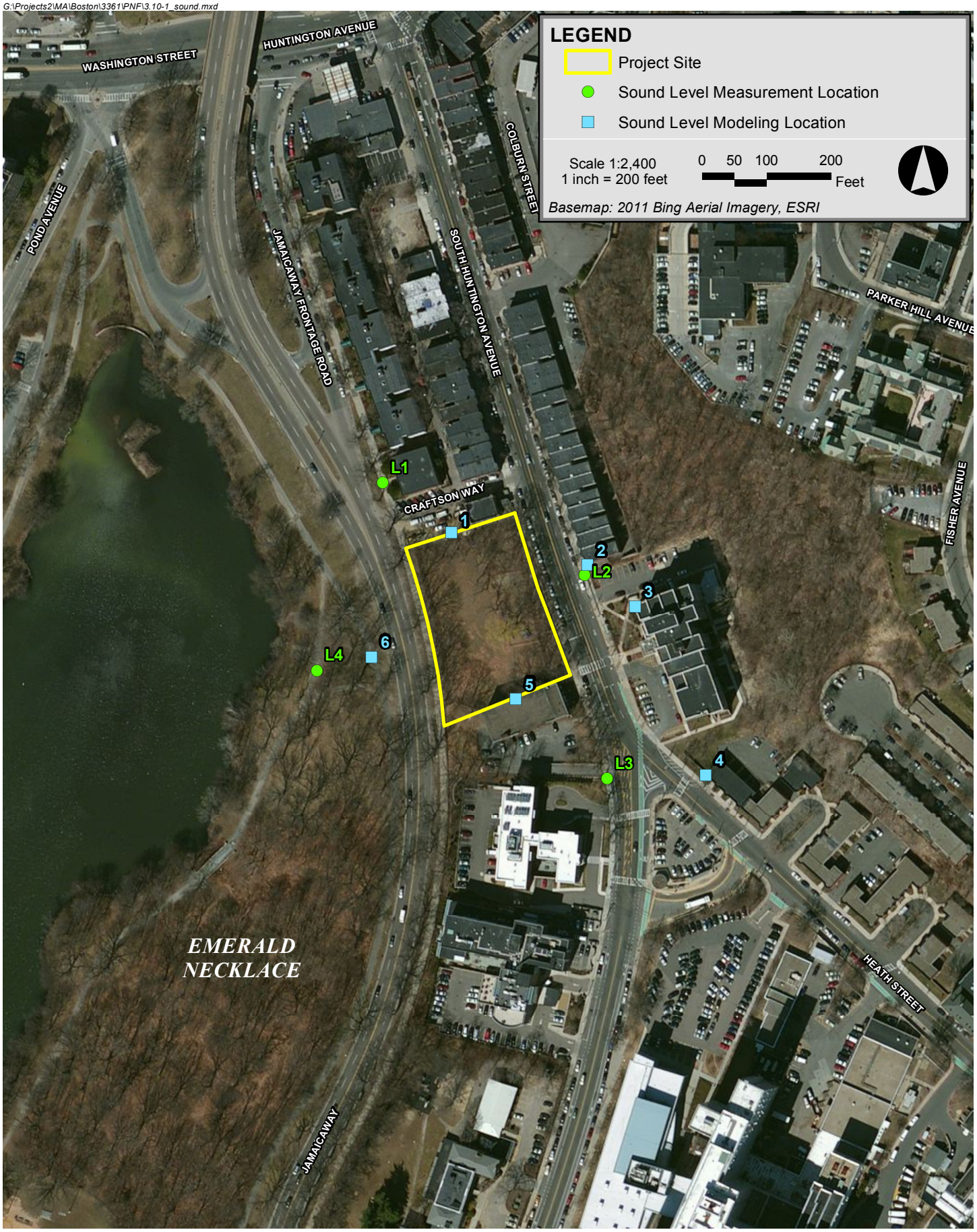
3.10.4.2 Noise Measurement Locations

The selection of the sound monitoring locations was based upon a review of the current land and building uses in the Project area. Four noise-monitoring locations were selected as representative in obtaining a sampling of the ambient baseline noise environment. The measurement locations are depicted in Figure 3.10-1 and are described below.

- Location L1 is north of the Project along the Jamaicaway near the intersection with Craftson Way.
- Location L2 is east of the Project along South Huntington Avenue.
- Location L3 is south of the Project along South Huntington Avenue adjacent to the intersection with Heath Street.
- Location L4 is west of the Project in the Emerald Necklace and is representative of pedestrian receptors within the park. This location was selected to conservatively capture existing ambient levels set back from the traffic along the Jamaicaway.

3.10.4.3 Noise Measurement Methodology

Sound level measurements were taken for 20 minutes per location during the daytime (12:00 p.m. to 2:00 p.m.) on May 7, 2012, and during nighttime hours (12:00 a.m. to 2:00 a.m.) on May 8, 2012. Since noise impacts are greatest at night when existing noise levels are lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to exclude peak traffic conditions.



105A South Huntington Avenue Boston, MA

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Figure 3.10-1

Sound Level Measurement and Modeling Locations

The sound levels were measured at publicly accessible locations at a height of approximately 1.5 meters above the ground. The measurements were made under low wind conditions and roadway surfaces were dry. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a General Tools digital psychrometer. Unofficial observations about meteorology, including wind speed, temperature, and humidity, as well as land use in the community were made solely to characterize the existing sound levels in the area and to estimate the noise sensitivity at properties near the proposed Project.

3.10.4.4 Measurement Equipment

A Larson Davis Model 831 sound level meter was used to collect ambient sound pressure level data. This instrumentation meets the "Type 1 - Precision" requirements set forth in American National Standards Institute (ANSI) S1.4 for acoustical measuring devices. The microphone was tripod-mounted at a height of 1.5 meters above ground and statistical descriptors (L_{eq}, L_{90}, etc.) were calculated for each 20-minute sampling period. Octave band levels for this study correspond to the same data set processed for the broadband levels. The measurement equipment was calibrated in the field before and after the surveys with an acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984.

3.10.4.5 Baseline Ambient Noise Levels

The existing ambient noise environment varied depending on location. Baseline noise monitoring results are presented in Table 3.10-2, and summarized below.

- The daytime residual background (L_{90}) measurements ranged from 56 to 60 dBA;
- The nighttime residual background (L_{90}) measurements ranged from 45 to 48 dBA;
- The daytime equivalent level (L_{eq}) measurements ranged from 62 to 73 dBA; and
- The nighttime equivalent level (L_{eq}) measurements ranged from 56 to 64 dBA.

Table 3.10-2 Baseline Ambient Noise Measurements

							Octave Band Center Frequency (Hz)								
Location and Period	Start	L_{10}	L_{50}	L_{90}	L_{eq}	L_{max}	32	63	125	250	500	1000	2000	4000	8000
	Time	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)	L_{90} (dB)
L1	1:03 PM	74	69	60	71	88	59	60	59	55	53	57	51	42	31
L2	12:39 PM	74	67	57	71	92	62	61	56	53	52	53	49	41	31
L3	12:15 PM	72	63	56	73	104	60	60	56	54	52	52	48	39	27
L4	1:28 PM	64	61	57	62	76	60	61	59	55	51	54	48	40	28
L1	1:14 AM	69	59	45	64	78	51	52	49	44	41	40	35	26	19
L2	12:51 AM	67	51	45	64	81	51	51	48	45	42	40	35	26	19
L3	12:26 AM	63	51	47	62	85	52	53	52	48	43	41	36	25	18
L4	12:01 AM	59	55	48	56	66	52	54	52	46	43	44	39	28	19

Notes:
1. Daytime weather: Temperature = 67° F, RH = 40%, mostly clear skies, winds 1-8 mph S.
   Nighttime weather: Temperature = 55° F, RH = 48%, mostly cloudy skies, winds 0-5 mph S.
2. Daytime measurements were collected on May 7, 2012. Nighttime measurements were collected on May 8, 2012.
3. All sampling periods were 20 minutes in duration.

3.10.5 Overview of Potential Project Noise Sources

The major sources of sound exterior to the proposed building are expected to be a pair of cooling towers, a single energy recovery unit (ERU), and four supply/exhaust fans for the parking garage. Noise emissions from the primary sources, as estimated from the equipment's capacity or from manufacturer-provided specifications, are presented in Table 3.10-3, which includes broadband (dBA), as well as octave-band, sound levels.

Secondary noise sources, including boilers, pumps, heat exchangers, and smaller exhaust fans are expected to have much lower sound levels (10 dBA or more) than the other, larger pieces of equipment and are not considered in this analysis.

The cooling towers and ERU are designed to be located on the 10th floor roof of the proposed building, shielded by a screening wall on three sides and the enclosed portion of the mechanical penthouse on one side. Two supply/exhaust fans are anticipated to be located on each side of the parking garage, above grade for a total of four fans. The remaining secondary mechanical equipment is designed to be housed within a mechanical penthouse on the 10th floor roof.

One emergency diesel generator is anticipated to be located at roof-level outside of the penthouse in a dedicated weather-proof enclosure, exhausted vertically. It is assumed that this generator will only operate during the day for brief, routine testing when the background sound levels are higher, or during an interruption of the electrical grid, in which case the rooftop mechanical equipment will not be operating.

Typical attenuation measures were included in the noise analysis. The rooftop emergency generator noise will be controlled using an exhaust silencer and weather-proof enclosure. The barrier wall surrounding the open rooftop sources will either be of solid construction or of acoustical louvers to reduce noise. Sound emissions from the four garage exhaust/supply fans will be mitigated either by duct silencers, acoustical louvers, the selection of a quieter fan model, or some combination thereof. A summary of the noise mitigation measures included in this analysis is presented in Table 3.10-4.

3.10.6 Modeling Methodology

Anticipated noise impacts associated with the Project were predicted at the nearest noise-sensitive receptors surrounding the Project using the CadnaA noise calculation software. This software uses the ISO 9613-2 industrial noise calculation methodology. CadnaA allows for octave band calculation of noise from multiple noise sources, as well as for computation of diffraction around building edges and multiple reflections off parallel buildings and solid ground areas. In this manner, all significant noise sources and geometric propagation effects are accounted for in the noise modeling. As a conservative assumption, no credit was taken for attenuation due to the penthouse walls.

Table 3.10-3 Reference Equipment Noise Levels – Per Unit

Noise Source	Form of Data	Ref. Distance (feet)	Overall Level	Sound Levels (dB) per Octave Band Center Frequency (Hz)									No.	Location
			(dBA)	32	63	125	250	500	1000	2000	4000	8000		
ERU (Supply + Exhaust Fan)[1]	Sound Power	-	102	95	95	96	101	99	97	95	92	87	1	10th Floor Roof
Cooling Tower[2]	Sound Power	-	89	92	92	91	92	87	83	77	72	69	2	10th Floor Roof
Garage Supply/Exhaust Fan (22,500 CFM each)[3]	Sound Power	-	89	102	102	98	89	85	82	78	73	68	4	Parking Garage
Emergency Generator - Mechanical (Enclosed)[4]	Sound Pressure	15m	-	85	85	79	75	66	60	57	55	49	1	10th Floor Roof
Emergency Generator - Exhaust (Unsilenced)[5]	Sound Pressure	1m	-	108	108	108	111	110	113	109	109	97	1	10th Floor Roof

Notes:

1. AAON Energy Recovery Unit (Configuration RL-075-3-0-BK04-353:FGCE-D00-HEM-DN0-D0A00CE-00-0B0000RAB)
2. BAC 3240C-JM Cooling Tower with Low Sound Fan
3. Assumed Greenheck 44-BISW-21, 22,000 CFM Centrifugal Fan
4. Caterpillar C18DE97 600 kW diesel generator set with C18 Sound Attenuating Enclosure
5. Caterpillar C18DE97 600 kW diesel generator set, Open exhaust

Table 3.10-4 Attenuation Values Used for Sound Level Modeling (dB)

Noise Source	Form of Mitigation	Octave Band Center Frequency (Hz)								
		32	63	125	250	500	1000	2000	4000	8000
Emergency Generator	Exhaust Silencer[1]	-	20	35	35	27	20	20	22	22
Garage Fans	Noise Reduction[2]	10	10	10	10	10	10	10	10	10
ERU	Noise Reduction[1]	0	0	0	0	0	5	5	5	5

1. Assumed Silex JB Series Critical Grade Cylindrical Silencer (JB-18); Noise reduction from acoustical enclosure included in reference mechanical noise levels
2. Noise reduction achieved through duct silencers, acoustical louvers, and/or quieter fans
3. Noise reduction due to shielding from rooftop screening wall

3.10.7 Future Sound Level of Project

An initial analysis considered all of the mechanical equipment without the emergency generator running, to simulate typical nighttime operating conditions at nearby receptors. A second analysis combined the mechanical equipment and the emergency generators, to reflect worse-case conditions during brief, routine testing of the generators during daytime hours. The results with and without the emergency generators as compared to existing ambient levels and the MassDEP criteria are shown in Tables 3.10-5 and 3.10-6, respectively, for receptors located 1.5 meters above-grade. Figure 3.10-1 shows the locations of each modeled receptor as well as the monitoring locations selected for background measurements. Predicted mechanical equipment noise levels from the Project at each receptor location, taking into account attenuation due to distance, structures, and noise control measures, are all below the MassDEP criteria of 10 dBA over the quietest nighttime sound levels. Additionally, no "pure-tone" conditions as defined by the MassDEP are present in the combined future levels shown in Tables 3.10-7 and 3.10-8.

The predicted Project-generated exterior sound levels with typical attenuation measures are expected to remain within the applicable zoning limits for the City of Boston at all nearby sensitive residential, commercial, and institutional receptors. It should be noted that since the City of Boston ordinance does not have a designation for "institutional" or "park" receptors, such structures can reasonably be compared to the daytime "residential" limits, given their daytime-only use. Octave-band sound levels at each of these modeled locations without the emergency generator and with the emergency generator, presented in Tables 3.10-7 and 3.10-8, respectively, are at or below applicable city limits as shown in Table 3.10-1.

Table 3.10-5 Comparison of Future Predicted Sound Levels with Existing Background – Without Emergency Generator

Modeling Location	Receptor ID	Representative Background Location	Project Only Sound Level (dBA)	L_{90} Background (dBA)	Total: Project + L_{90} Background (dBA)	Increase Over Background (dBA)[1]	Applicable MassDEP Noise Limit
1-Business	1	L1 Day	60	60	63	3	≤10
2-Residential	2	L2 Night	43	45	47	2	≤10
3-Residential	3	L2 Night	45	45	48	3	≤10
4-Residential	4	L3 Night	43	47	48	1	≤10
5-Institutional	5	L3 Day	58	56	60	4	≤10
6-Park	6	L4 Day	40	57	57	0	≤10

1. Calculation performed using data rounded to nearest whole decibel

Table 3.10-6 Comparison of Future Predicted Sound Levels with Existing Background – With Emergency Generator

Modeling Location	Receptor ID	Representative Background Location	Project Only Sound Level (dBA)	L_{90} Background (dBA)	Total: Project + L_{90} Background (dBA)	Increase Over Background (dBA)[1]	Applicable MassDEP Noise Limit
1-Business	1	L1 Day	60	60	63	3	≤10
2-Residential	2	L2 Day	47	57	57	0	≤10
3-Residential	3	L2 Day	48	57	57	0	≤10
4-Residential	4	L3 Day	46	56	56	0	≤10
5-Institutional	5	L3 Day	58	56	60	4	≤10
6-Park	6	L4 Day	48	57	57	0	≤10

1. Calculation performed using data rounded to nearest whole decibel

Table 3.10-8 Modeling Results – Without Emergency Generator

Modeling Receptor	Receptor ID	Evaluation Period	LA90	Octave-Band Sound Pressure Level, L90								
				31.5	63.0	125	250	500	1000	2000	4000	8000
			(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
1-Business	1	Day	60	75	75	71	62	58	50	46	41	35
2-Residential	2	Night	43	53	51	47	47	42	32	27	22	13
3-Residential	3	Night	45	53	52	50	49	44	35	30	22	10
4-Residential	4	Night	43	51	50	47	47	42	34	28	20	3
5-Institutional	5	Day	58	72	72	68	59	55	47	43	38	32
6-Park	6	Day	40	48	46	43	44	38	32	26	19	7
City of Boston Limits	**Residential Day**		**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Residential Night		**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business		**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

Table 3.10-8 Modeling Results – With Emergency Generator

Modeling Receptor	Receptor ID	Evaluation Period	LA90	Octave-Band Sound Pressure Level, L90								
				31.5	63.0	125	250	500	1000	2000	4000	8000
			(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
1-Business	1	Day	60	75	75	71	62	58	50	46	41	35
2-Residential	2	Day	47	67	62	54	50	43	39	34	30	16
3-Residential	3	Day	48	67	63	55	51	45	39	34	29	13
4-Residential	4	Day	46	65	60	53	49	43	38	31	23	4
5-Institutional	5	Day	58	73	72	68	59	55	47	43	38	32
6-Park	6	Day	48	67	64	56	51	42	42	35	28	10
City of Boston Limits	**Residential Day**		**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Residential Night		**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business		**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

3.10.8 Conclusions

Baseline noise levels were measured in the vicinity of the proposed Project and were compared to predicted noise levels that were derived based on information provided by the manufacturers of representative mechanical equipment or estimated from the equipment's capacity. The proposed Project, with the assumed equipment shown in Table 3.10-3 and typical attenuation measures shown in Table 3.10-4, will not introduce significant outdoor mechanical equipment noise into the surrounding community.

Predicted mechanical equipment noise levels from the Project at each receptor location including within the Emerald Necklace, taking into account attenuation due to distance, structures, and noise control measures, will be equal to or below the City of Boston Noise Zoning broadband requirements based on land-use, and will comply with all MassDEP A-weighted noise limits. When the aforementioned attenuation measures are included, the predicted sound levels from Project-related equipment are expected to remain below 50 dBA, within the most stringent nighttime residential zoning limits for the City of Boston at the nearest "residential" receptor. It should be noted that the existing ambient background levels immediately surrounding the Project already exceed 50 dBA without any contribution from the Project. The results in Section 3.10.7 indicate that the proposed Project can operate without significant impact on the existing acoustical environment.

At this time, the mechanical equipment and noise controls are conceptual in nature. During the final design phase of the Project, mechanical equipment and noise controls will be specified and designed to meet the applicable City of Boston broadband noise limit and the corresponding octave band limits, as well as the MassDEP noise criteria. Additional attenuation measures may include the selection of quieter units, acoustical louvers, screening walls, mufflers, or equipment enclosures, as needed.

3.11 Construction

3.11.1 Introduction

A Construction Management Plan (CMP) in compliance with the City's Construction Management Program will be submitted to the Boston Transportation Department (BTD) once final plans are developed and the construction schedule is fixed. The construction contractor will be required to comply with the details and conditions of the approved CMP.

Proper pre-planning with the City and neighborhood will be essential to the successful construction of the Project. Construction methodologies, which ensure public safety and protect nearby residences and businesses, will be employed. Techniques such as barricades, walkways and signage will be used. The CMP will include routing plans for trucking and deliveries, plans for the protection of existing utilities, and control of noise and dust.

During the construction phase of the Project, the Proponent will provide the name, telephone number and address of a contact person to communicate with on issues related to the construction.

The Proponent intends to follow the guidelines of the City of Boston and the MassDEP, which direct the evaluation and mitigation of construction impacts.

3.11.2 Construction Methodology/Public Safety

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

It may be necessary to occasionally occupy pedestrian walkways and portions of South Huntington Avenue. As the design of the Project progresses, the Proponent will meet with BTD to discuss the specific location of barricades, the need for lane closures, pedestrian walkways, and truck queuing areas. Secure fencing, signage, and covered walkways may be employed to ensure the safety and efficiency of all pedestrian and vehicular traffic flows. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to protect pedestrians and ensure their safety. Public safety for pedestrians on abutting sidewalks will also include covered pedestrian walkways when appropriate. If required by BTD and the Boston Police Department, police details will be provided to facilitate traffic flow. These measures will be incorporated into the CMP which will be submitted to BTD for approval prior to the commencement of construction work.

3.11.3 Construction Schedule

It is anticipated that construction will commence in the spring of 2013. Once begun, construction is expected to last approximately 18 months.

Typical construction hours will be from 7:00 a.m. to 6:00 p.m., Monday through Friday, with most shifts ordinarily ending at 3:30 p.m. No substantial sound-generating activity will occur before 7:00 a.m. If longer hours, additional shifts, or Saturday work is required, the construction manager will place a work permit request to the Boston Air Pollution Control Commission and BTD in advance. Notification should occur during normal business hours, Monday through Friday. It is noted that some activities such as finishing activities could run beyond 6:00 p.m. to ensure the structural integrity of the finished product; certain components must be completed in a single pour, and placement of concrete cannot be interrupted.

3.11.4 Construction Staging/Access

Access to the site and construction staging areas will be provided in the CMP.

Although specific construction and staging details have not been finalized, the Proponent and its construction management consultant will work to ensure that staging areas will be located to minimize impacts to pedestrian and vehicular flow. Secure fencing and barricades will be used to isolate construction areas from pedestrian traffic adjacent to the site. Construction procedures will be designed to meet all Occupational Safety and Health Administration (OSHA) safety standards for specific site construction activities.

3.11.5 Construction Mitigation

The Proponent will follow City and MassDEP guidelines which will direct the evaluation and mitigation of construction impacts. As part of this process, the Proponent and construction team will evaluate the Commonwealth's Clean Air Construction Initiative.

A CMP will be submitted to BTD for review and approval prior to issuance of a Building Permit. The CMP will include detailed information on specific construction mitigation measures and construction methodologies to minimize impacts to abutters and the local community. The CMP will also define truck routes which will help in minimizing the impact of trucks on City and neighborhood streets.

"Don't Dump - Drains to Charles River" plaques will be installed at storm drains that are replaced or installed as part of the Project.

3.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 180 construction jobs will be created over the length of construction. The Proponent will make reasonable good-faith efforts to have at least 50% of the total employee work hours be for Boston residents, at least 25% of total employee work hours be for minorities and at least 10% of the total employee work hours be for women. The Proponent will enter into a jobs agreement with the City of Boston.

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

3.11.7 Construction Truck Routes and Deliveries

Truck traffic will vary throughout the construction period, depending on the activity. The construction team will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. Construction truck routes to and from the site for contractor personnel, supplies, materials, and removal of excavations required for the development will be coordinated with BTD. Traffic logistics and routing will be planned to minimize community impacts. Truck access during construction will be determined by the BTD as part of the CMP. These routes will be mandated as a part of all subcontractors' contracts for the development. The construction team will provide subcontractors and vendors with Construction Vehicle & Delivery Truck Route Brochures in advance of construction activity.

"No Idling" signs will be included at the loading, delivery, pick-up and drop-off areas.

3.11.8 Construction Air Quality

Short-term air quality impacts from fugitive dust may be expected during excavation and the early phases of construction. Plans for controlling fugitive dust during excavation and construction include mechanical street sweeping, wetting portions of the site during periods of high wind, and careful removal of debris by covered trucks. The construction contract will provide for a number of strictly enforced measures to be used by contractors to reduce potential emissions and minimize impacts, pursuant to this Article 80 approval. These measures are expected to include:

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

3.11.9 Construction Noise

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

Mitigation measures are expected to include:

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

3.11.10 Construction Vibration

All means and methods for performing work at the site will be evaluated for potential vibration impacts on adjoining property, utilities, and adjacent existing structures. Acceptable vibration criteria will be established prior to construction, and vibration will be monitored, if required, during construction to ensure compliance with the agreed-upon standard.

3.11.11 Construction Waste

The Proponent will take an active role with regard to the reprocessing and recycling of construction waste. The disposal contract will include specific requirements that will ensure that construction procedures allow for the necessary segregation, reprocessing, reuse and recycling of materials when possible. For those materials that cannot be recycled, solid waste will be transported in covered trucks to an approved solid waste facility, per MassDEP Regulations for Solid Waste Facilities, 310 CMR 16.00. This requirement will be specified in the disposal contract. Construction will be conducted so that materials that may be recycled are segregated from those materials not recyclable to enable disposal at an approved solid waste facility.

3.11.12 Protection of Utilities

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

3.11.13 Rodent Control

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

3.11.14 Wildlife Habitat

The Project site is in an established urban neighborhood. According to the 2008 Natural Heritage online MassGIS data layer, there are no priority NHESP Estimated Habitats for Rare Wildlife on the Project site.

3.12 Sustainable Design

This section provides a discussion of the sustainability efforts the Proponent will pursue related to the Project.

The Proponent is committed to developing a building that is sustainably designed, energy efficient, environmentally conscious and healthy for the residents. As required under Article 37 of the Boston Zoning Code, projects that are subject to Article 80B, Large Project Review, will be Leadership in Energy and Environmental Design (LEED) certifiable. There are seven categories in the LEED certification guidelines: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, Innovation in Design Process and the additional Regional Priority Credits. The Project is targeting several credits which span the seven categories and enable the Project to meet the zoning requirement as described below. The LEED NC v2009 checklist is included in Appendix D.

The Project is anticipated to meet the Certification threshold with 45 credit points. However, there are 24 credits, listed in italics below, still being considered to determine if appropriate.

Sustainable Sites

The Project site is in an urban neighborhood close to several public transportation options. The proposed design includes leased retail space on the ground floor. All parking required by zoning will be located in a garage enclosed by the building.

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 proposed Project site is located on an urban site in Boston Proper.

Credit 4.1 Alternative Transportation, Public Transportation Access

The Heath Street Green line MBTA subway stop is located approximately 0.1 miles from the Project site. There are bus stops for the 14, 39 and 66 buses located proximate to the site.

SS Credit 4.2: Alternative Transportation—Bicycle Storage and Changing Rooms

The City of Boston requires one covered bike storage space per residential unit which is far in excess of the 15% required to achieve this credit. The Project will feature the bike storage within the garage.

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

The Project will provide preferred parking at 5% of the total vehicle parking capacity for low-emitting and fuel-efficient vehicles within the garage.

Credit 4.4 Alternate Transportation Parking Capacity

The Project features only the number of spaces required by zoning. In addition the Project aims to provide infrastructure and support programs to facilitate shared vehicle use such as carpool drop-off areas, designated parking for vanpools, ride boards, etc.

Credit 6.1 Stormwater Design, Quantity Control

Stormwater runoff generated from the roof of the Project building and landscaped and paved areas will be collected, treated, and conveyed through a closed drainage system to a groundwater recharge system that will overflow to the BWSC storm system in the adjacent

streets in large storm events. This system will likely be located beneath the garage slab on the western portion of the site. Any required site closed drainage systems will be designed so there will be no increase in the peak rate of stormwater discharge from the Project in the developed condition compared to the existing condition.

Credit 6.2 Stormwater Design, Quality Control

The Project team is analyzing the feasibility of treating stormwater prior to release into the municipal storm sewer system.

Credit 7.1 Heat Island Effect, Non-Roof

All parking will be located in a garage enclosed by the building and all roofing materials will have SRI values of 29 or greater.

Credit 7.2 Heat Island Effect, Roof

The Project will feature high-albedo roofing membranes. Additionally, there will be a component of a green roof in the courtyard area. Together these strategies will achieve the 75% rooftop coverage requirement.

Water Efficiency

The Project 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 Project 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 1 Water Efficient Landscaping

The Project will not have a permanent irrigation system. The vegetated roofs will have drought tolerant plant materials that may require occasional watering by hand. Much of the landscaping along the Jamaicaway, which is currently not irrigated, will remain, or be similar.

Credits 2 and 3 Innovative Wastewater Technologies and Water Use Reduction

Specified fixtures will include high efficiency toilets and urinals, low flow lavatory faucets and low flow shower heads. The team will perform the calculations to see if the Project will achieve a 30% reduction in water use and a 50% reduction in potable water use for building sewage conveyance.

Energy and Atmosphere

The building systems will be designed to optimize energy performance and will not use refrigerants that are harmful to the environment.

Prerequisite 1 Fundamental Commissioning of the Building Energy Systems

A third party Commissioning Agent (CxA) will be engaged by the owner for purposes of providing both basic and possibly 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 Project requirements.

Prerequisite 2 Minimum Energy Performance

The building performance rating will demonstrate a minimum of a 20% (as required by Stretch Code) 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 Project.

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 22% 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 Commissioning Agent (CxA) may be engaged during the design process. The CxA's role may include reviewing the owner's Project 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 team is evaluating specifying refrigerants for the systems which will have low Ozone-depletion and Global warming potentials.

Credit 5 Measurement and Verification

The Project plans to fill out an Energy and Water Data Release Form and register an account in ENERGY STAR's Portfolio Manager tool, sharing the Project file with the U.S.Green Building Council's master account.

Materials and Resources

Throughout the construction phase of the Project, the contractor will endeavor to divert Construction & 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 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.

Credit 3 Materials Reuse

The Project specifications may require up to 10% of materials based on total value of materials used for the Project be salvaged, refurbished, or reused materials.

Credit 4 Recycled Materials

The Project specifications will require materials to include pre- and or post-consumer recycled content. During construction, materials submittals will include a document indicating the percentage of both pre and post consumer recycled content. The CM will track the recycled content for each material with a Project goal to achieve 10% recycled-content materials based on overall Project materials costs. The Project may achieve a goal of 20% recycled content.

Credit 5 Regional Materials, 10% Extracted, Processed and Manufactured Regionally

The Project specifications will indicate which materials are to be extracted, harvested, recovered and manufactured within a 500 mile radius of the job site. The Project 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 Project target to achieve 10% regional materials based on overall Project materials costs. The Project may achieve a goal of 20% regional materials.

Credit 6 Rapidly Renewable Materials

The Project may use rapidly renewable materials for 2.5% of the total materials costs.

Credit 7 Certified Wood

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

Indoor Environmental Quality (IAQ)

The air quality will be monitored during the construction phase of the Project 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 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

All common areas in the building will be No Smoking areas.

Credit 1 Outdoor Air Delivery Monitoring

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

Credit 3.1 Construction IAQ Management Plan (during construction)

The CM will develop an IAQ Management Plan for the construction and pre-occupancy phases of the Project to meet/exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3). 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, the team may decide to conduct baseline IAQ testing to demonstrate that contaminant maximum concentrations are not exceeded.

Credits 4.1 Low-Emitting Materials, Adhesives & Sealants

The specifications will include requirements for adhesives and sealants to meet low Volatile Organic Compounds (VOC) criteria for adhesives and sealants.

Credits 4.2 Low-Emitting Materials, Paints and Coatings

The 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 Project will use composite wood and agrifiber products that contain no added urea-formaldehyde.

Credit 5 Indoor Chemical and Pollutant Source Control

The Project team will design the Project 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 and all units. The controls may include vacancy/occupancy sensors and day light dimming controls. Multi-occupant user spaces such as lobbies/club rooms 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 and all units.

IE Q Credit 7.1: Thermal Comfort—Design

The Project team plans to design heating, ventilating and air conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004.

IE Q Credit 7.2: Thermal Comfort—Verification

If the Project meets the requirements for IEQc7.1 the team will evaluate the feasibility of this credit.

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

It is the intent of 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

It is the intent of 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.

Innovation & Design Processes

The team has identified several possible ID credits which are listed below.

Credit 1 Exemplary Performance for SSc4.1

The Project site is located on several transit routes with a frequency of service resulting in over 200 transit rides per day.

Credit 2 Exemplary Performance for SSc4.2

The Project anticipates providing one covered bike storage space per unit which far exceeds the 15% required in SSc4.2

Credit 3 Exemplary Performance for MRc2.2

Due to the increasing demand for sorting and diverting construction waste in Massachusetts, the CM could divert 95% of the construction waste by weight from area landfills.

Credit 4 Low Mercury lighting

Building Facilities/Maintenance will establish a lighting purchasing plan to limit the levels of mercury containing lamps purchased for the building.

Credit 2 LEED Accredited Professional

A LEED AP will provide administrative services to oversee the LEED credit documentation process.

Regional Priority Credits

Regional Priority Credits (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a Project team achieves one of the designated RPCs, an additional credit is awarded to the Project. RPCs applicable to the Boston area include: SSc3, SSc6.1, SSc7.1, SSc7.2, EAc2 and MRc1.1. This Project anticipates two RPCs: SSc7.1-Heat Island Effect, Non-Roof and SSc7.2-Heat Island Effect, Roof.

Chapter 4.0

Urban Design

4.0 URBAN DESIGN

4.1 Project Context

The Project site is located at 105A South Huntington Avenue in Jamaica Plain, near the border of Mission Hill, in Boston. The site consists of an approximately 1.1 acre parcel with more than a two-story change in topography from east to west. The parcel is currently undeveloped and fenced off with a chain link fence running along the perimeter. It currently consists of trees, grass and other vegetation. The Project is bordered by the Jamaicaway and South Huntington Avenue along its west and east boundaries, respectively. There is an existing curb cut located along the Jamaicaway at the southeast corner of the site, which will be abandoned.

The Project is located in an area of transition from residential to institutional uses. Residential use at this site is consistent with the general character of the immediate neighborhood and will help fill in a "missing tooth" in the urban fabric. The site is within close proximity to the Emerald Necklace, the MBTA Green Line and is accessible to a myriad of institutional jobs. These amenities make the Project an excellent opportunity to transform a vacant and underutilized site into an attractive smart growth residential development. In return, the Project will serve to further strengthen the overall vibrancy of the immediate neighborhood.

The urban context of the site suggests that the Project will continue the alignment of the existing street wall along South Huntington Avenue. By extending the streetwall to the sidewalk, the Project hopes to improve the local environment for pedestrian use. The proposed design also attempts to respond to the varying heights of the surrounding multi-family buildings by providing a variety of heights and massings for the Project. Along the Jamaicaway the Project will offer a lower scale in response to the surrounding uses while other portions of the building will be set back at a higher scale to reflect the larger elevations of existing buildings directly across South Huntington Avenue and to the south of the site. Additionally, by employing a rich palette of materials to the façade, the Project will create an appropriate scale of elements to improve the street experience by fitting in with the nearby multi-story apartment and hospital buildings, as well as the existing brick row houses. Figures 4-1 and 4-2 include photographs of the existing site and surrounding area.

4.2 Urban Design Concept

The building has two distinctly different street edges that necessitate different design approaches. In an effort to contribute to a more pedestrian friendly streetscape, the building's façade along South Huntington Avenue will be located close to the property line in order to continue the street wall established by the residential row houses to the north (see Figure 4-3). In addition, the building's ground level will offer multiple entrances to

looking south on the jamaicaway

looking north on huntington avenue

looking south on huntington avenue

looking north on huntington ave and heath street

looking north on jamaicaway

looking south on jamaicaway

looking west toward leverett pond & brookline

105A S. Huntington Avenue Boston, MA

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Architecture Planning Interiors

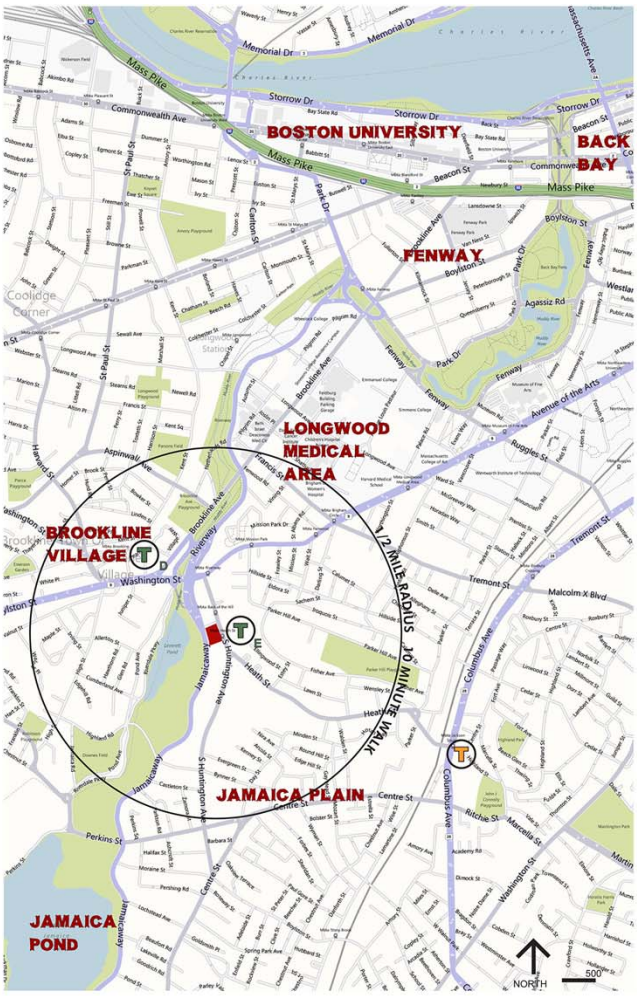
Figure 4-1

Existing Photos and Context

aerial view looking east

looking north on huntington avenue

view looking east on the jamaicaway



The site has frontage on the Jamaicaway overlooking Leverett Pond with easy access to recreational activites, parks, and waterways along the Emerald Neclace.

The site is within a 10 minute walk of shops, restaurants, and services in both Brookline Village and Centre Street in Jamaica Plain.

The site is within a 10 minute walk for people working in the medical field at either the VA Hospital or the Longwood Medical area.

aerial view looking east

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Figure 4-2

Existing Photos and Context

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Figure 4-3

Perspective – South on South Huntington Avenue

residential units, including the lobby to the main structure, as well as neighborhood retail space to possibly be used for cafés or other community amenities.

Along South Huntington Avenue, the lower masonry façade of the building will have a four-story cornice and be set back to relate to the adjacent row houses (see Figure 4-4). Through a series of horizontal and vertical setbacks, the building will step up to a smaller penthouse footprint on the southeast corner of the site across from the eleven-story Back of the Hill apartment complex.

Along the Jamaicaway, the Project proposes constructing a series of four-story townhouse style apartments. These lower level units will be accessible from both the parking garage and from the courtyard above. The expression of these townhouses is consistent with the general scale of the residential brick buildings to the north of the site. However, these townhouses will feel smaller in comparison to the existing abutting residences due to the significant change in topography (see Figure 4-5).

The northeast and southeast corners of the building will be occupied by either a residential unit accessed at grade or by the neighborhood retail uses. This retail use will serve as an amenity to the building and the neighborhood in general, which currently lacks sufficient street level retail options.

The residential entry into the main lobby, as well as the necessary loading and service facilities, will be located along South Huntington Avenue at the southerly end of the site. Utilizing the ten-foot grade change along the street edge, the vehicular entry to the lower level garage will be located near the northerly end of the building along South Huntington Avenue (see Figure 4-6).

The building's upper levels will consist of a mix of one and two bedroom apartments, arranged along a central corridor, with elevator access. The large format windows and modern finishes will create a high quality urban living experience oriented to the views of the surrounding open space and city skyline. As such, a number of units are designed to offer exterior balconies or roof deck amenities.

4.3 Height and Massing

The building massing will be articulated in response to the transitional nature of the surrounding built environment. The resulting variation of the building's form and mix of units is designed to take advantage of views while being respectful of the scale of the surrounding uses.

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Figure 4-4
East Elevation

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Figure 4-5

Perspective – North on the Jamaicaway

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Figure 4-6
Floor Level 1

Along South Huntington Avenue the building offers pedestrian scaled elements to relate to adjacent structures and to the street wall (see Figure 4-4). From there the building will step back to taller elements more in line with both the institutional uses to the south of the Project as well as the Back of the Hill Apartment building located directly across from the Project site (see Figure 4-7).

The height along the Jamaicaway is consistent with or lower than buildings within the Project's vicinity. The building will be set back about 25 feet from the sidewalk to retain the mature trees in the public parkway as well as the mature trees located on site along the Parkway. Seasonally these trees will provide a dense screen from the public way and Leverett Pond, often hiding much of the Project from public view (see Figures 4-8 and 4-9).

4.4 Character and Materials

The surrounding urban fabric contains an eclectic mix of building materials including brick, masonry, pre-cast concrete, and multiple colors of metal panels, stucco and wood. The Project's lower levels will be designed with brick to blend in with the abutting residential brick row houses. Acknowledging the more recent developments within the neighborhood, a light colored pre-cast and metal façade with glass accents at the corners and main entry area will bring a stylish modern presence to the building. This modern image will be tempered by the use of warmer materials, textures and accents at key locations. The building's composition will break the street facade of the building down to a more pedestrian scale and utilize a flat roofed metal canopy, adjacent planters and street trees to provide a pedestrian scaled entry in front of the building. This design will help encourage street level activities along South Huntington Avenue and further increase the vibrancy of the immediate area.

4.5 Streetscape and Landscaping

The Proponent is committed to investing in the community and improving the public realm. As such, the Project will provide new sidewalks and street trees along South Huntington Avenue to enhance the overall character of the immediate area (see Figures 4-10 and 4-11). A comprehensive tree survey was performed in June 2012 by Bartlett Tree Experts to identify species, maturity and condition.

As discussed in Chapter 1, the landscape design for the Project consists of three distinct zones (see Figure 4-11). The first zone is the frontage along South Huntington Avenue, the second zone is the outdoor inner courtyard area located within the building itself, and the third zone is the frontage along the Jamaicaway. Each zone is designed to complement the unique character of the surrounding space. By creating three separate zones specifically tailored to each immediate area, the Project will enhance the aesthetic environment of the entire surrounding area.

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Figure 4-7

Perspective – North on HeathStreet

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Figure 4-8

Perspective – South on the Jamaicaway

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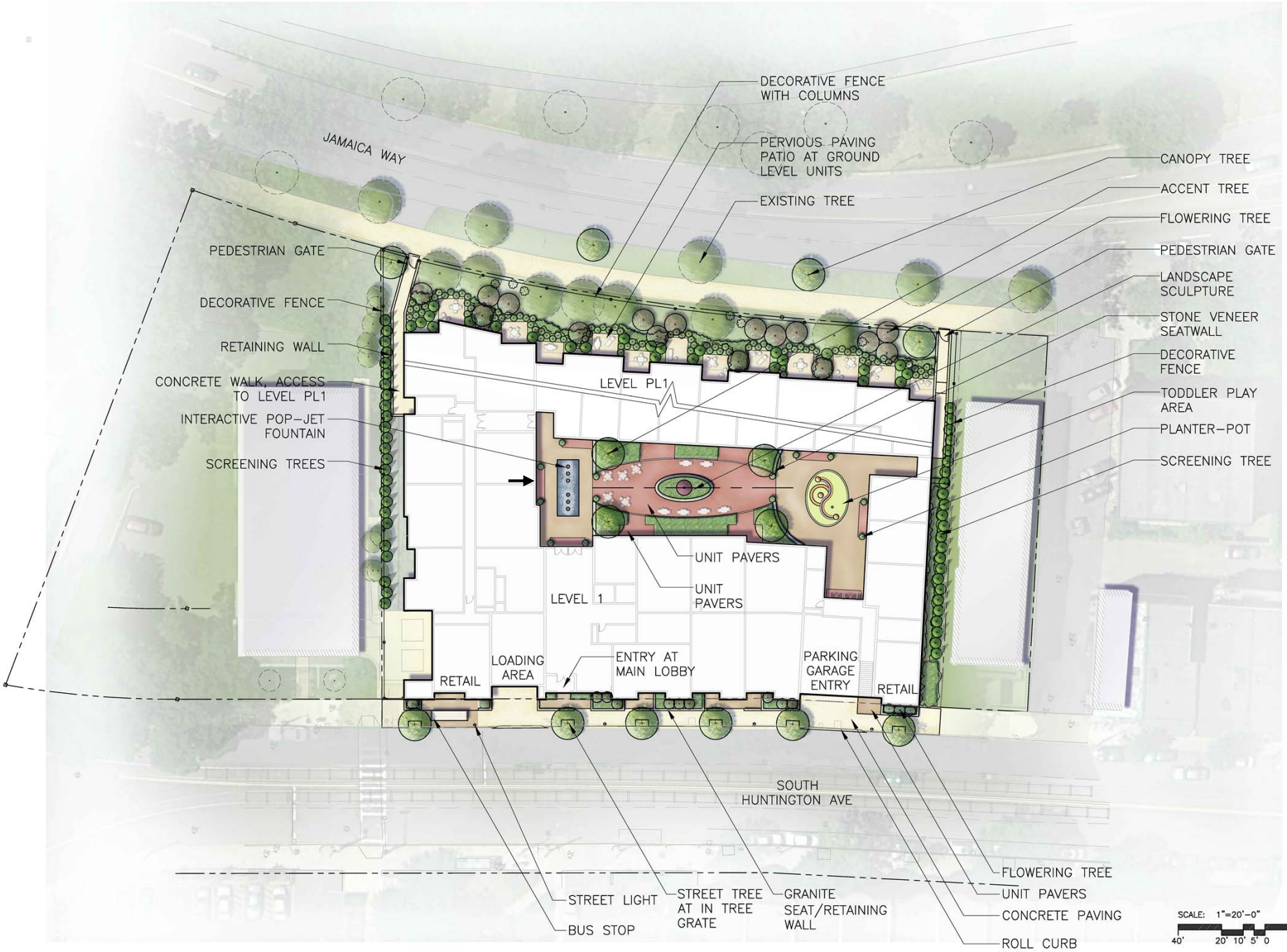
Figure 4-9

Perspective – South on the Jamaicaway (With Trees)



105A S. Huntington Avenue Boston, MA

Figure 4-10

Landscape Plan

105A S. Huntington Avenue Boston, MA

Figure 4-11

Existing Tree Assessment Plan

South Huntington Avenue Zone

The frontage along South Huntington Avenue acts as the face of the Project as it relates to an urban setting (see Figure 4-12). The preliminary design includes a streetscape from the edge of the street to an area approximately five feet from the face of the building. The streetscape will consist of street trees planted in pits covered by accessible tree grates, as well as the addition of street lights to comply with the City's current lighting standard.

The area located immediately adjacent to the face of the building will be re-graded using a series of seatwalls. The existing slope along South Huntington Avenue is approximately six percent for the length of the site's frontage. Constructing seatwalls at key areas along the building's face will allow the creation of flatter areas of refuge at building entries. The configuration of the walls will also create additional planting opportunities.

The existing trees along South Huntington Avenue are located behind the existing sidewalk on a steep slope. A significant portion of these trees consist of invasive species as well as declining or underperforming trees. Due to the location of the future building and the current condition and type of trees, existing trees along this edge will be removed. The Project will replace these invasive and underperforming trees with native tree species.

Interior Courtyard Zone

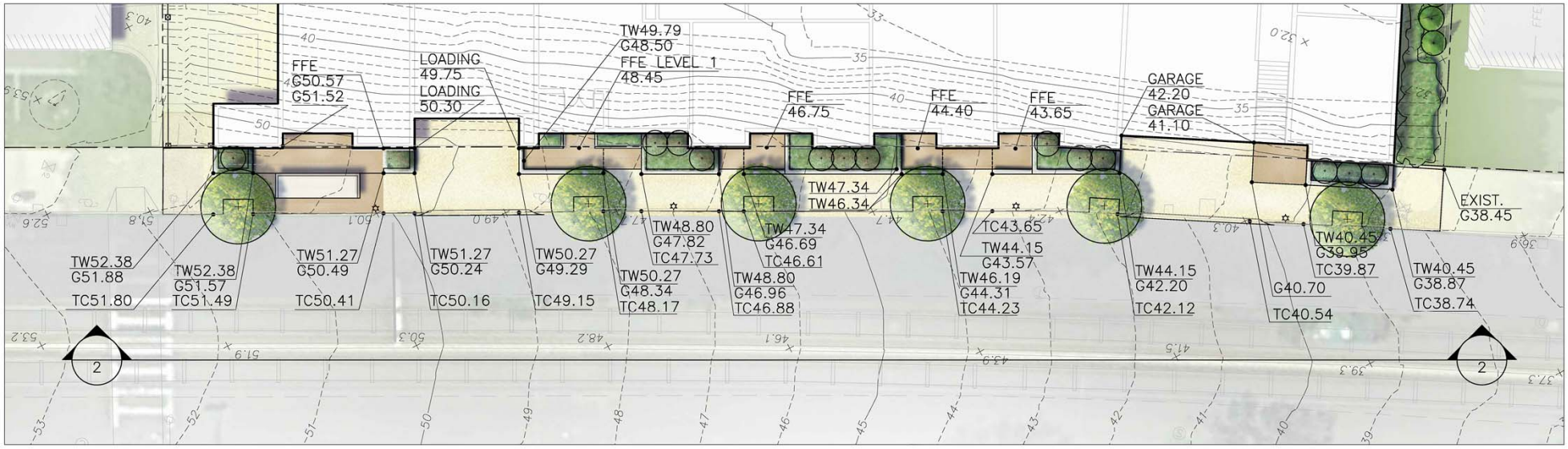
The building design creates an interior outdoor courtyard on the same level as the main entry along South Huntington Avenue, intended to be visible from the street through the lobby entrance. The proposed design program for the courtyard includes an interactive water feature which will be visible from the lobby and street providing an increased level of visible interest for pedestrians. The central area will act as an interior open space that will be accessible from the units facing the courtyard. The open space is proposed to include seatwalls, unit pavers and landscaping up to and including medium sized trees. The design program also includes a children's play area constructed of a resilient rubberized play surface and fixed play elements.

Jamaicaway Zone

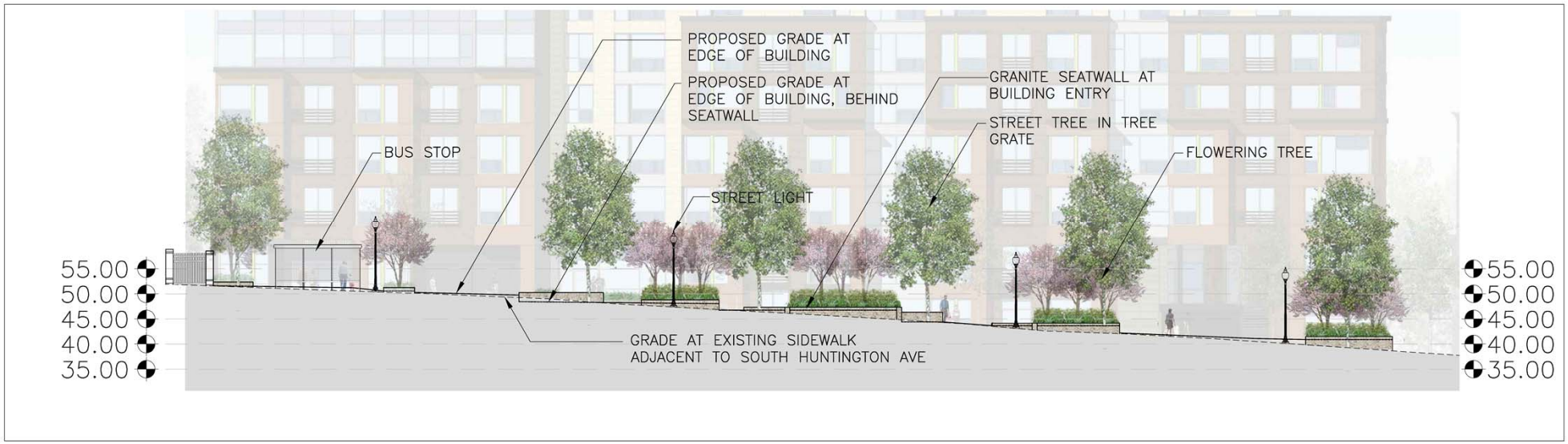
The frontage along the Jamaicaway, though not technically the Project's address, is one of the main amenities of this development. Access from Level 2 (see Figure 1-3) provides residents with a direct connection to the Emerald Necklace park system. The units on Level 2 will have patios at grade with the Emerald Necklace and views of Leverett Pond across the Jamaicaway. The Project will be formally separated from the Jamaicaway using an ornamental steel fence with masonry columns, complementing the similar systems used by both adjacent properties (see Figure 4-13). There will be resident access gates at each end of the site. The area between the fence and

the patios for the garden level units will be treated as a communal yard for residents. Along with several existing canopy trees to remain, the design proposes the addition of flowering and accent trees along with shrubs and ground cover to amend the existing landscape.

The existing trees on the site along the Jamaicaway are more substantial than those located along South Huntington Avenue. The location of the Project does not conflict with the existing trees along the Jamaicaway due to required setbacks along the Jamaicaway. This will allow the design team to keep seven existing trees on the site along the Jamaicaway (see Figure 4-11). These trees were chosen to remain because of their mature and healthy attributes. The Proponent proposes the selective thinning of smaller, invasive, or unhealthy trees located between the larger trees. The landscape plan will replace any specimen trees removed due to construction in this area. The existing trees along the Jamaicaway within the right of way will remain as well. All trees to remain will receive the most robust tree protection measures available. The Proponent also proposes to add two canopy trees within the Jamaicaway right-of-way where it appears trees were lost previously.



1 PRELIMINARY GRADING AT SOUTH HUNTINGTON AVE
SCALE: 1" = 10'

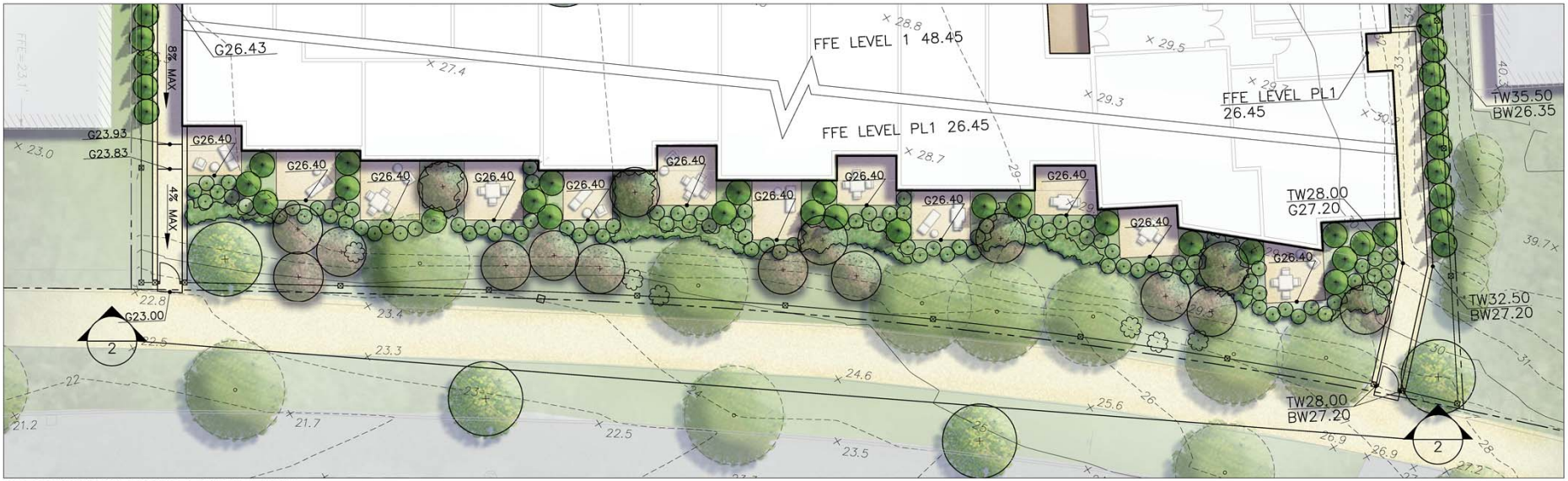


2 SECTION/ELEVATION AT SOUTH HUNTINGTON AVE
SCALE: 1" = 10'

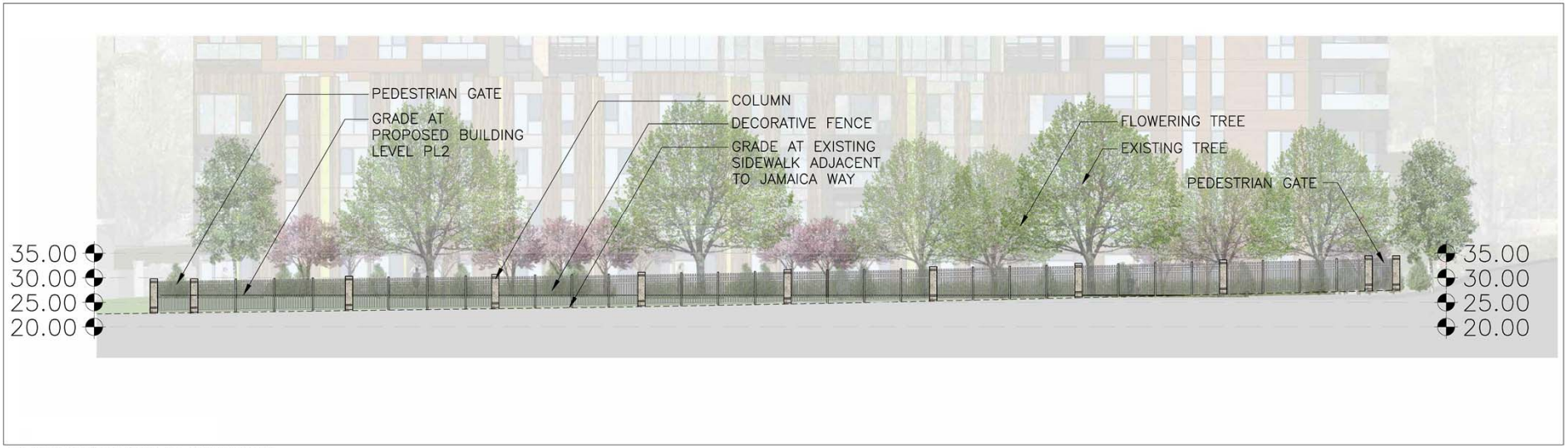
105A S. Huntington Avenue Boston, MA

Figure 4-12

South Huntington Avenue Elevation



1 PRELIMINARY GRADING AT JAMAICA WAY
SCALE: 1" = 10'



2 SECTION/ELEVATION AT JAMAICA WAY
SCALE: 1" = 10'

105A S. Huntington Avenue Boston, MA

Figure 4-13

Jamaicaway Elevation

Chapter 5.0

Historic and Archeological Resources

5.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

5.1 Project Site

This section of the PNF describes the history of the Project site, significant historic resources within the vicinity of the Project, and assesses potential Project-related impacts to historic and archaeological resources.

The Project site consists of a vacant 1.1 acre parcel of land, with no built structures, located at 105A South Huntington Avenue. Originally part of the adjoining property at 105 South Huntington Avenue, the Project site has been vacant since at least the mid-19th century. In 1913, the Boston School of Physical Education constructed the building currently located at 105 South Huntington Avenue and utilized the then adjoining and empty parcel at 105A South Huntington Avenue for outdoor exercise and recreation. The property was sold to the Commonwealth of Massachusetts during the mid-20th century and later subdivided in 2005, at which point the Project site was sold to the current landowner.

5.2 Historic Resources in the Project Vicinity

5.2.1 Olmsted Park and the Jamaicaway, Olmsted Park System/Emerald Necklace

Olmsted Park and the Emerald Necklace were designed by Frederick Law Olmsted as part of Boston's linear park system. Olmsted Park contains a chain of picturesque fresh-water ponds, alternating with attractive natural groves and meadows. Included in the plans for Olmsted Park was the creation of Leverett Pond from a swamp near Brookline Village. Originally named Leverett Park, the park's name was changed in 1900 by the Boston Parks Commissioners to honor Olmsted and his work.

Olmsted Park has three major ponds, a watercourse connecting them, six historic pedestrian bridges and attractive walkways and stone walls sheltered from the busy city by the densely wooded areas. The park has the second largest historic forest in the Emerald Necklace System with 17 acres of forest cover.

Land for the park construction was purchased between 1881 and 1894 from private property owners. Seven "Natural History" ponds were created between Ward's and Willow ponds in 1893 for Natural History Society educational programs. They were filled in during the last years of the 19th century.

The Jamaicaway forms the eastern boundary of the Olmsted Park. Also designed by Frederick Law Olmsted as part of the Boston Park System, the Jamaicaway originally served as a tree lined carriageway connecting Boston to Jamaica Plain, then a streetcar suburb. Today, the Jamaicaway is a heavily traveled, four lane, curvilinear undivided roadway lined with mature tree plantings.

Both Olmsted Park and the Jamaicaway are listed in the National Register of Historic Places as part of the National Register designation for the Olmsted Park System/Emerald Necklace, which is also a designated City of Boston Landmark.

5.2.2 Edward H. Haskell Home for Nurses

The Edward H. Haskell Home for Nurses, also known as the New England Baptist Hospital Training School for Nurses, is comprised of three interconnected red brick buildings executed in the Colonial Revival and Jacobethan styles, and arranged in a complex plan around a square inner courtyard. Edward H. Haskell, president of the New England Baptist Hospital Corporation and benefactor of the Home for Nurses, commissioned prominent Boston architect Edward Sears Read to design the original building in 1922. Large additions were made in 1931 and 1940 by hospital specialists Kendall Taylor and Company.

The facility's initial lodging accommodations (ca. 1896) were minimal, consisting of rows of beds organized in one room. As the student body rapidly increased, it became apparent that improved housing was necessary, beginning with the construction of a three-story building adjacent to the Hospital's Bond House in 1904. It was not until 1922 that the School was permanently relocated to its new campus at the southwest corner of Fisher and Parker Hill Avenues, complete with the proper housing requirements.

Figure 5-1 identifies the proximity of the Project site to the State and National Register listed Olmsted Park, Jamaicaway and Haskell Home for Nurses.

Table 5-1 State and National Register-Listed Properties and Historic Districts

Historic Resource	Address	Designation
Edward H. Haskell Home for Nurses	220 Fisher Avenue	National Register Property
Olmsted Park and the Jamaicaway	Jamaicaway	National Register Historic District & Boston Landmark

5.3 Project Impacts to Historic Resources

5.3.1 Design and Visual Impacts

As discussed in greater detail in Chapter 4, Urban Design, the design concept for the Project acknowledges its location in an area of transition from residential to institutional uses. Residential use at this site is consistent with the general character of the immediate neighborhood and will help fill in a gap in the urban fabric. Abutted on either side by two major roadways, the Jamaicaway and South Huntington Avenue, the Project has been designed to recognize each street edge. The building's façade along South Huntington Avenue will be located close to the property line in order to continue the street wall

established by the residential row houses to the north. Along the Jamaicaway, the Project proposes constructing a series of four-story townhouse style apartments delineated from the road by an ornamental fence set back from the adjacent path.

The height along the Jamaicaway is consistent with or lower than buildings within the Project's vicinity. The building will be set back to retain most of the mature trees located on site along the Parkway, and will plant new trees as well (see Section 4.5). Seasonally, these trees will provide a dense screen from the public way and Leveret Pond, often hiding much of the Project from public view.

5.3.2 Shadow Impacts

As discussed in greater detail in Chapter 3, the Project will result in some new shadow. The shadow impact analysis considered net new shadow created by the Project during 14 time periods. In order to provide a conservative shadow analysis, these studies did not take into consideration shadows cast by existing trees, which are significant due to the density of the large and mature stand of trees being maintained on the west boundary of the Project site.

The Project will not cast new shadow onto Olmsted Park, except for a small portion during the early hours during certain times of the year. New shadow will be off of the park by 9:40 a.m. at the latest. New shadows resulting from the Project will generally be limited to the wooded area located between the Project and Jamaicaway, space between the Project and the existing buildings to the north and south, and northeast across a portion of South Huntington Avenue.

All new shadows will be limited to isolated areas, will last a short duration and will not have any material impact on the integrity of Olmsted Park or the Jamaicaway. At no point will new shadow extend to the National Register-listed Edward H. Haskell Home for Nurses at 220 Fisher Avenue.

5.4 Archaeological Resources

The Project Site consists of a previously undeveloped urban parcel. There are no known archaeological sites located on the Project site, and it is not anticipated that there is significant archaeological potential due to previous development activities and disturbances around the site. One recorded archaeological site, 19-SU-86, is located south of the Project.

105A South Huntington Avenue Boston, MA

Epsilon ASSOCIATES INC.

Figure 5-1
Historic Resources

Chapter 6.0

Infrastructure

6.0 INFRASTRUCTURE

6.1 Introduction

This chapter outlines the existing utilities surrounding the Project site, the proposed connections required to provide service to the new structures, and any impacts on the existing utility systems that may result from the construction of the Proposed Project.

6.2 Wastewater

6.2.1 Existing Sanitary Sewer System

There are existing Boston Water and Sewer Commission (BWSC) sanitary sewer systems in South Huntington Avenue and the Jamaicaway adjacent to the Project site. The site is adjacent to the 12-inch sanitary sewer main in South Huntington Avenue that flows northerly to connect to the 24-inch x 31-inch combined sewer in Huntington Avenue that flows into the Town of Brookline sewer system. The existing sewer system adjacent to the site is illustrated in Figure 6-1. The Project site does not have any existing sewer connections to the BWSC system and there is no sanitary sewage discharge from the existing site.

6.2.2 Project Generated Wastewater Flow

The Project's sewer generation rates were estimated using the Massachusetts Division of Water Pollution Control Sewer System Extension and Connection Permit Program section 314 CMR 7.00, and the proposed building program. Section 314 CMR 7.00 lists typical generation values for the sources listed in Table 6-1 for the Project. Typical generation values are generally conservative values for estimating the sewage flows from new construction. Section 314 CMR 7.00 sewage generation values are used to evaluate new sewage flows or the increase in flows to existing connections. Table 6-1 describes the increased sewage generation in gallons per day (gdp) for each phase of the Project.

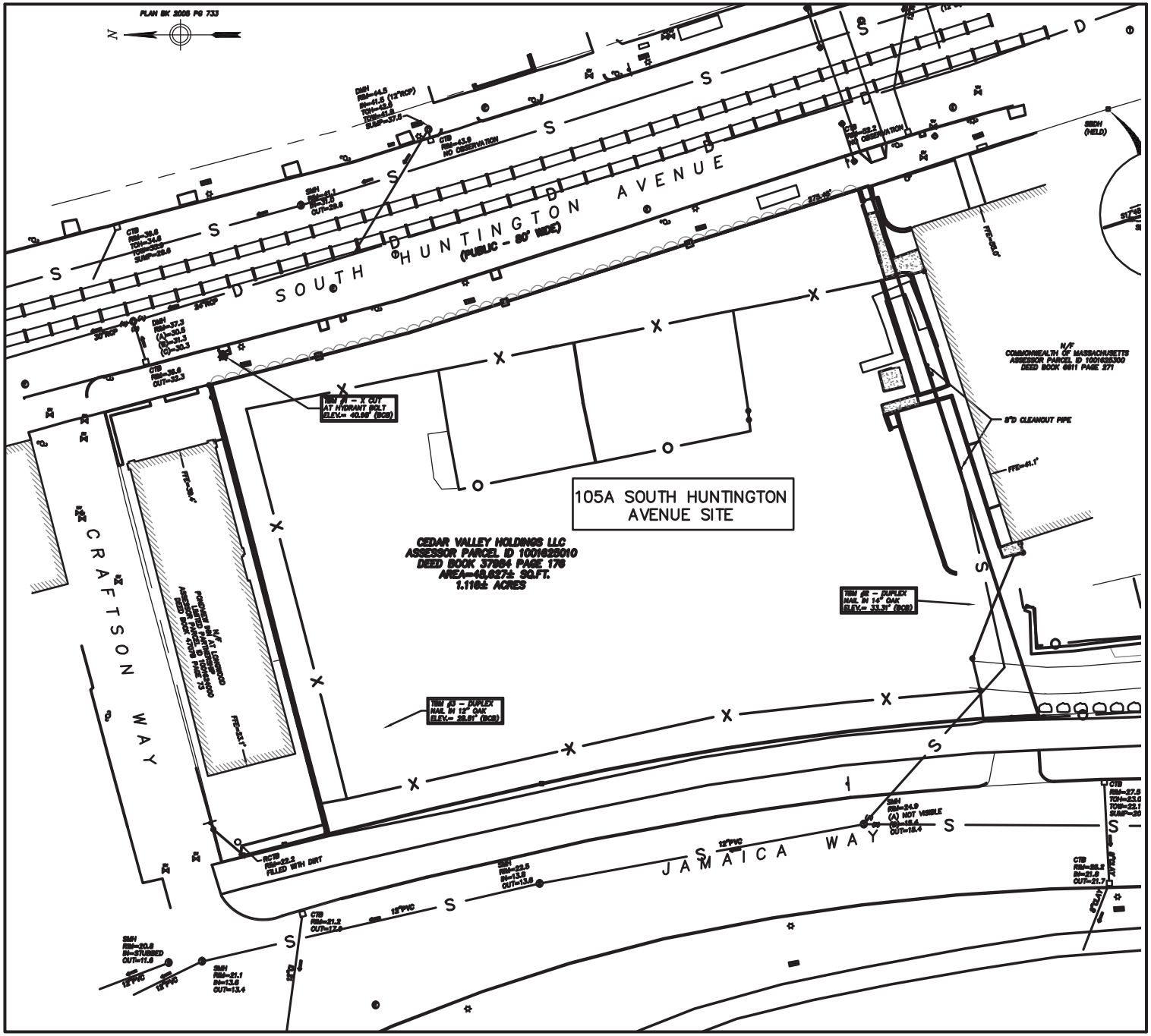
Table 6-1 Proposed Project Sewer Generation

Existing Flows

Room Use	Size	310 CMR Value (gpd/unit)	Total Flow (gpd)
Undeveloped Site			
		Total Existing Flows	**0**

Proposed Flows

Room Use	Size	310 CMR Value (gpd/unit)	Total Flow (gpd)
Residential Units	275 beds	110 /bed	30,250
Retail Space	1,600 sf	50 /1,000 sf	80
		Total Proposed Flows	**30,330**



105A S. Huntington Avenue Boston, MA

Nitsch Engineering

Figure 6-1

Existing Sewer System

6.2.3 Sanitary Sewer Connection

The Project's impact to the existing BWSC sewer systems in the adjacent streets was analyzed. The analysis was derived from information taken from the BWSC Sewer System Map no. 19G and flow calculations were based on the Manning Equation. With an effort to be conservative in the analysis, the South Huntington Avenue pipes were assumed to be vitrified clay. The existing sewer system capacity calculations are presented in Table 6-2.

Table 6-2 Sewer Hydraulic Capacity Analysis

Sewer System	Distance (feet)	Invert Elevation (Up)	Invert Elevation (Down)	Slope (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
S. Huntington Ave. (12")	335	45.5	31	4.33%	12	0.013	7.41	4.79
Jamaicaway (12")	252	15.40	13.60	0.71%	12	0.010	3.91	2.53

The existing adjacent roadway sewer systems in South Huntington Avenue and the Jamaicaway were analyzed for impacts due to the potential building service connections as part of the Project.

Results shown in Table 6-2 indicate the minimum hydraulic capacity of 12-inch sewer main within South Huntington Avenue near the Project is 4.79 million gallons per day (MGD) or 7.41 cubic feet per second (cfs). Capacity problems are not expected within the 12-inch sewer main in South Huntington Avenue based on the average daily flow estimate for the Project of 30,330 gdp or 0.31 MGD, (including a factor of safety of 10, total estimate = 0.031 MGD x 10 = 0.31 MGD).

Results shown in Table 6-2 indicate the minimum hydraulic capacity of the 12-inch sewer main within the Jamaicaway near the Project is 2.53 MGD or 3.91 cfs. Capacity problems are not expected within the 12-inch sewer main in the Jamaicaway based on the average daily flow estimate for the Project of 30,330 gpd or 0.31 MGD, (including a factor of safety of 10, total estimate = 0.031 MGD x 10 = 0.31 MGD).

Sanitary sewage generated by the Project will be discharged to the adjacent BWSC sanitary sewer systems. It is anticipated that the proposed building will discharge sanitary sewage to the 12-inch sanitary sewer main in the Jamaicaway based on the elevation of the site and the available sewer mains. This will be reviewed and approved by the BWSC engineering staff as part of the design process and the BWSC Site Plan Approval process for the Project.

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 Project progresses. The Proposed Project will generate new wastewater flows exceeding 15,000 gpd but less than 50,000 gpd, which will

require the completion of a Massachusetts Department of Environmental Protection Compliance Certification BRP WP 73, Sanitary and Industrial Connections Greater than 15,000 gdp but less than or equal to 50,000 gdp.

All improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's Site Plan Review process for the Project. This process includes a comprehensive design review of the proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts.

6.3 Water System

6.3.1 Existing Water Service

Water for the Project site will be provided by the BWSC. There are five different water systems within the city, and these provide service to portions of the city based on ground surface elevation. The five BWSC water systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high. There is a 12-inch southern high water main and 36-inch southern high water main beneath the northbound lanes of South Huntington Avenue. There is a 12-inch southern high water main that dead ends at the northeast corner of the site beneath the sidewalk adjacent to the site along South Huntington Avenue. There is a 12-inch southern low water main that dead ends at the northwest corner of the site within the Jamaicaway. The existing water system is illustrated in Figure 6-2.

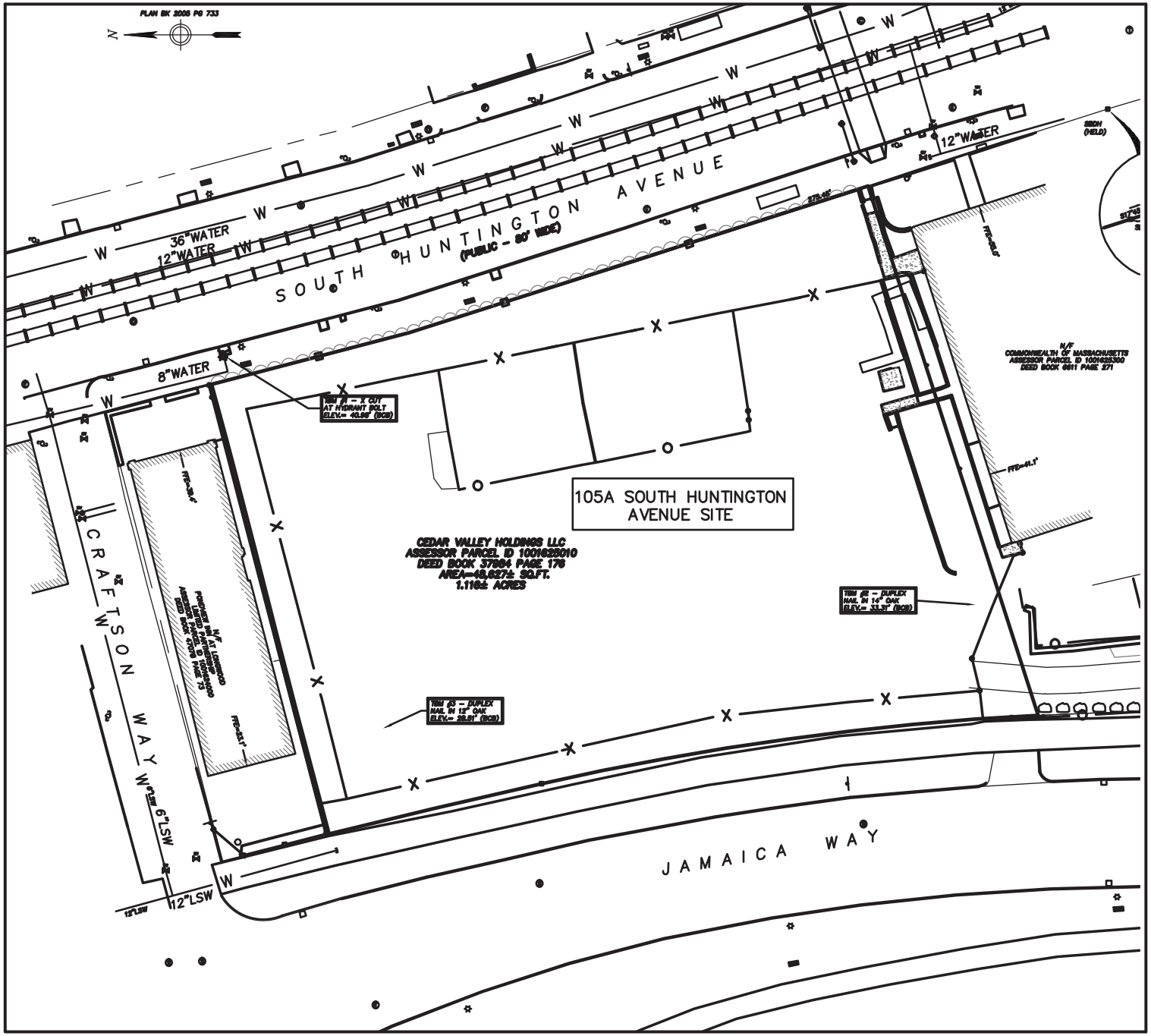
The Project site does not have any existing connections to BWSC systems.

6.3.2 Project Generated Domestic Water Consumption

The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described above. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater generation calculated with 314 CMR 7.00 values to account for consumption, system losses, and other usages to estimate an average daily water demand. The total estimated water demand due to the Project is approximately 33,363 gpd (based on a total sewage generation of 30,330 gpd) of domestic water. The water for the Project will be supplied by the BWSC system.

All new water services will be installed in accordance with the latest Local, State, and Federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC's Automatic Meter Reading (AMR) system.

BWSC record flow test data containing actual flow and pressure for a hydrant within the vicinity of the Project site was available. Additional testing will be required once the design progresses, as hydrant flow data should be less than a year old to be used as a design tool. The results of the BWSC testing near the Project site are indicated in Table 6-3.



105A S. Huntington Avenue Boston, MA

Nitsch Engineering

Figure 6-2

Existing Water System

Table 6-3 Existing Hydrant Flow Data

Flow Hydrant Number	Date of Test	Static Pressure (psi)	Residual Pressure (psi)	Total Flow (gpm)	Flow (gpm) at 20 psi	Flow (gpm) at 10 psi
H10 South Huntington Ave.	10/29/2010	66	50	2,004	3,545	3,942

6.3.3 Proposed Water Service

The domestic and fire protection water service connections required by the Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connection will be reviewed as part of BWSC's Site Plan Review process. This review includes, but is not limited to, sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.

6.3.4 Water Supply Conservation and Mitigation Measures

As part of the Project's compliance with Article 37 of the Boston Zoning Eode, the Project will be designed to be Leadership in Energy and Environmental Design (LEED) certifiable. Through this process, significant efforts to reduce water consumption will be made including the choice of incorporating aeration fixtures and appliances for their water conservation qualities.

6.4 Storm Drainage System

6.4.1 Existing Storm Drainage System

The existing Project site is currently vegetated and it does not have a closed drainage system or any existing storm drainage connections to BWSC systems.

There is an existing BWSC storm drain system in South Huntington Avenue. The site is adjacent to a 20-inch storm drain main in South Huntington Avenue which flows northerly to continue to the 24-inch storm drain main in Huntington Avenue and discharges to the Muddy River which ultimately connects to the Charles River. The existing storm drainage system is illustrated in Figure 6-1.

6.4.2 Proposed Storm Drainage System

Stormwater runoff generated from the roof of the Project building and landscaped and paved areas will be collected, treated, and conveyed through a closed drainage system to a groundwater recharge system that will overflow to the BWSC storm system in the adjacent streets in large storm events. This system will likely be located beneath the garage slab on the western portion of the site. The groundwater recharge system will have the capacity of collecting, storing and recharging ½-inch at a minimum to provide phosphorous treatment before the overflow discharges to the Muddy River.

The Project is expected to increase the amount of impervious area at the site compared to the existing condition. Any required site closed drainage systems will be designed so there will be no increase in the peak rate of stormwater discharge from the Project in the developed condition compared to the existing condition.

All improvements and connections to BSWC infrastructure will be reviewed as part of the BWSC's Site Plan Review process. This process includes a comprehensive design review of the proposed service connections, assessment of Project demands and system capacity, and compliance with required phosphorus mitigation for projects in the Charles River Watershed.

6.4.2.1 Phosphorus Mitigation

The Project site is located within the Charles River Watershed and therefore the Project is required to capture and treat at least ½-inch of stormwater runoff from impervious areas to provide phosphorus mitigation. Stormwater Best Management Practices (BMPs) that provide phosphorus treatment include groundwater recharge and mechanical devices (manufactured by Imbrium and Contech). Table 6-4 indicates the anticipated volume of runoff required to recharge the Project. The stormwater management system for the proposed building will include a groundwater recharge system. It is anticipated that the stormwater recharge system will work to passively infiltrate site runoff into the ground with a gravity overflow (if elevation allows) to the Jamaicaway or with a pumped overflow to the main in South Huntington Avenue.

Table 6-4 Phosphorus Mitigation Volume Calculations

	Site Area (sf)	0.5" Runoff Storage (ft)	Total Storage required (cf)	Total Storage required (gallons)
Assumed Site Areas	48,627 +/-	0.0417	2,026	15,155
Note: As the site design progresses, the total impervious area value may be reduced to account for proposed pervious areas, which will naturally recharge runoff and are not counted in the phosphorus mitigation calculations.				

6.5 Water Quality Impact

The Project will not affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, hay bales and/or crushed stone, to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until all areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Project will be in compliance with all local and state stormwater management policies.

6.5.1 MassDEP Stormwater Management Policy Standards

In March 1997, the Massachusetts Department of Environmental Protection (MassDEP) adopted a new Stormwater Management Policy to address non-point source pollution. In 1997, MassDEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy, which was revised in February 2008. The Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40.

A brief explanation of each Policy Standard and the system compliance is provided below:

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

Compliance: The proposed design will comply with this Standard. No new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

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

Compliance: The proposed design will comply with this Standard. The existing discharge rate will be met or decreased as a result of the improvements associated with the Project.

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

Compliance: The Project will meet this Standard to the maximum extent practicable. The Project will at a minimum comply with the requirement to treat ½-inch of stormwater over the entire impervious area of the site for phosphorus mitigation with groundwater recharge systems.

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

Compliance: The proposed design will comply with this Standard. Within the Project's limit of work, there will be mostly roof, landscaping, and pedestrian areas. Any paved areas would contribute unwanted sediments or pollutants to the existing storm drain system which will be collected by deep sump, hooded catch basins and conveyed through water quality units before discharging into the BWSC system.

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

Compliance: The proposed design will comply with this Standard. The Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-6).

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

Compliance: The proposed design will comply with this Standard. The Project will not discharge untreated stormwater to a sensitive area or any other area.

Standard #7: *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of*

Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Compliance: The proposed design will comply with this Standard. The Project is not a redevelopment.

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

Compliance: The proposed design will comply with this Standard. Sedimentation and erosion controls will be incorporated as part of the design of the Project and employed during construction. The Project is expected to disturb greater than one acre of land and will require a NPDES NOI filing with the United States Environmental Protection Agency. The Project will be required to meet the requirement put forth by the 2012 Construction General Permit.

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

Compliance: The Project will comply with this Standard. An O&M Plan including long-term BMP operation requirements will be prepared for the Project and will assure proper maintenance and functioning of the stormwater management system.

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

Compliance: The Project will comply with this Standard. There will be no illicit connections associated with the Project.

6.5.2 Protection Proposed During Construction

Existing public and private infrastructure located within nearby public rights-of-way will be protected during construction of the Project. The installation of proposed utility connections within public ways will be undertaken in accordance with BWSC, Boston Public Works Department, the Dig-Safe Program, and applicable utility company requirements. 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. All necessary permits will be obtained before the commencement of work.

The Proponent will continue to work and coordinate with the BWSC and the utility companies to ensure safe and coordinated utility operations in connection with the Project.

6.6 Energy Systems

The Proponent will work with the appropriate utility providers in the area as the design of the Project progresses.

Chapter 7.0

Coordination with Other Governmental Agencies

7.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

7.1 Architectural Access Board Requirements

The Project 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.

7.2 Massachusetts Environmental Policy Act (MEPA)

Because the Project Site was acquired from the Commonwealth, the Project is subject to MEPA jurisdiction. However, the Project does not exceed any MEPA review thresholds and accordingly will not require MEPA review.

7.3 Massachusetts Historical Commission

In the event that state or federal licenses, permits, approvals or funding is involved, the Proponent will file an MHC Project Notification Form to initiate review of the Project.

7.4 Boston Civic Design Commission

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

Chapter 8.0

Project Certification

8.0 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

Alex Nader

Cedar Valley Development, LLC
895 Huntington Avenue
Boston, MA 02115

JULY 6 2012
Date

Signature of Preparer

Geoffrey Starsiak

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

7-8-12
Date

Appendix A

Survey

LOCUS PLAN
N.T.S.

PLAN BK 2005 PG 733

LEGEND

- LOCUS PROPERTY LINE
- RIGHT OF WAY LINE
- W — WATER LINE
- S — SEWER LINE
- G — GAS LINE
- D — DRAIN LINE
- T — TELEPHONE LINE
- C — CABLE LINE
- E — ELECTRIC LINE
- OHW — OVERHEAD LINE
- 35 — MAJOR CONTOUR
- 31 — MINOR CONTOUR
- CHAINLINK FENCE
- CHAINLINK FENCE WITH BARB WIRE
- WOODEN FENCE
- TREE LINE/SCRUB LINE
- 31.5 x — SPOT ELEVATION
- SBDH — STONE BOUND WITH DRILL HOLE
- HYDRANT
- WATER VALVE
- GAS VALVE
- SIGN
- LIGHT POLE
- (S) — SEWER MANHOLE (SMH)
- CATCH BASIN (CTB)
- (D) — DRAIN MANHOLE (DMH)
- (T) — TELEPHONE MANHOLE (TMH)
- (C) — CABLE MANHOLE (CMH)
- UTILITY POLE DENOTES W/LIGHT/RISER/TRANSFORMER
- GUY WIRE
- ELECTRIC HAND HOLE
- GC — GRANITE CURB
- GCI — GRANITE CURB INLET
- EOP — EDGE OF PAVEMENT
- SRW — STONE RETAINING WALL
- CRW — CONCRETE RETAINING WALL
- FFE — FINISH FLOOR ELEVATION
- HRLM — METAL HAND RAIL
- DECIDUOUS TREE
- DSWL — DASHED SINGLE WHITE LINE
- SYL — SINGLE YELLOW LINE
- DYL — DOUBLE YELLOW LINE
- MGRL — METAL GUARD RAIL
- TROLLEY TRACKS

SOUTH HUNTINGTON AVENUE (PUBLIC - 80' WIDE)

JAMAICA WAY

CRAFTSON WAY

CEDAR VALLEY HOLDINGS LLC
ASSESSOR PARCEL ID 1001625010
DEED BOOK 37984 PAGE 176
AREA=48,627± SQ.FT.
1.116± ACRES

TBM #1 – 'X' CUT AT HYDRANT BOLT ELEV.= 40.98' (BCB)

TBM #2 – DUPLEX NAIL IN 14" OAK ELEV.= 33.31' (BCB)

TBM #3 – DUPLEX NAIL IN 12" OAK ELEV.= 28.51' (BCB)

S14°40'12"E 172.52'

S17°45'12"E 180.27'

S17°45'12"E 95.18'

S75°39'33"E 172.98'

Δ=9°53'10"
R=456.44'
L=78.76'
CHB=S12°48'37"E
CHD=78.66'

R=4000.00' L=82.83' Δ=1°11'11"
CHB=N13°18'46"W
CHD=82.82'

R=104.57' L=88.04' Δ=9°45'14"
CHB=N07°50'34"W
CHD=87.81'

R=104.57' L=90.85' Δ=4°42'44"
CHB=S00°36'34"E
CHD=90.82'

3 STORY BRICK BUILDING

N/F COMMONWEALTH OF MASSACHUSETTS ASSESSOR PARCEL ID 1001625300 DEED BOOK 6611 PAGE 271

LIMIT OF PARK'S DEPARTMENT JURISDICTION PER DEED BOOK 2247 PAGE 314

LIMIT OF NO BUILDING RESTRICTION PER DEED BOOK 2247 PAGE 314

PIONEER INN N/F EDGEWOOD HOTEL PARTNERSHIP ASSESSOR PARCEL ID 1001624900 DEED BOOK 47078 PAGE 73

BUILDING UNDER CONSTRUCTION

COMPILED LOCATION NO STRUCTURE OBSERVED

REVISIONS:

No.	DATE	

GENERAL NOTES:

1. TOPOGRAPHY AND DETAIL SHOWN HEREON ARE A RESULT OF AN ON-THE-GROUND SURVEY PERFORMED BY COLER & COLANTONIO INC. ON AUGUST 12 & 16 2005, AND SUPPLEMENTED IN MARCH, 2012.

2. CONTOURS AND ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE BOSTON CITY BASE (BCB) VERTICAL DATUM. REFERENCE BENCHMARK IS DESCRIBED BY THE CITY ENGINEERS AS THE LEFT OUTSIDE CORNER LOWER STONE STEP (LOCLSS) AT 61 SOUTH HUNTINGTON AVE. (ELEV.=29.93).

IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY, ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.

3. LOCATION OF SUBSURFACE UTILITIES SHOWN HEREON ARE APPROXIMATE AND BASED ON SURFACE OBSERVABLE STRUCTURES, FIELD LOCATED DIG-SAFE MARKINGS AND RECORD UTILITY PLANS. ADDITIONAL UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THIS PLAN. SUBSURFACE UTILITY INFORMATION IS NOT TO BE USED FOR CONSTRUCTION. PRIOR TO ANY CONSTRUCTION, CONTACT DIG-SAFE (1-888-344-7233) TO FIELD VERIFY LOCATION OF ALL UTILITIES.

4. LOCUS IS LOCATED IN THE NEIGHBORHOOD INSTITUTIONAL SUBDISTRICT AND THE GREENBELT PROTECTION OVERLAY DISTRICT AS SHOWN ON CITY OF BOSTON ZONING MAP 9B (JAMAICA PLAIN NEIGHBORHOOD DISTRICT) EFFECTIVE DATE DECEMBER 16, 2006.

DIMENSIONAL REQUIREMENTS:
MAXIMUM BUILDING HEIGHT:.....45 FT.
MINIMUM LOT SIZE:.....NONE
MINIMUM LOT WIDTH:.....NONE
MINIMUM LOT FRONTAGE:.....NONE
MINIMUM FRONT YARD:.....20 FT.
MINIMUM SIDE YARD:.....10 FT.
MINIMUM REAR YARD:.....20 FT.

5. THE LOCUS PROPERTY LIES IN FEMA ZONE 'X' (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SHOWN ON F.I.R.M. MAP NUMBER 25025C0078G, EFFECTIVE DATE SEPTEMBER 25, 2009.

6. THE LOCUS OWNER OF RECORD:
CEDAR VALLEY HOLDINGS LLC
ASSESSOR PARCEL ID 1001625010
DEED BOOK 37984 PAGE 176
AREA=48,627± SQ.FT. 1.116± ACRES

7. LOCUS PARCEL IS SUBJECT TO EASEMENTS AS DESCRIBED IN "RESERVATION AND GRANT OF EASEMENTS AGREEMENT" RECORDED IN DEED BOOK 37984 PAGE 179.

8. UNLESS OTHERWISE NOTED, DEED AND PLAN REFERENCES ARE TO THE SUFFOLK COUNTY REGISTRY OF DEEDS.

9. PLAN REFERENCES:
- PLAN OF LAND IN BOSTON, MASS." BY C.H. GANNET, C.E. DATED DEC. 1916. BOOK 4005 PAGE 13.
- PLAN OF LAND IN BOSTON, MASS." BY C.H. GANNET, C.E. DATED AUG. 1916. BOOK 3977 PAGE 470.
- RELOCATION PLAN AND PROFILE ON FILE AT THE CITY OF BOSTON ENGINEERING DEPARTMENT AS PLAN L-3927 DATED JUNE 20, 1906.
- PLAN BOOK 2005 PAGE 733

COLER & COLANTONIO INC
ENGINEERS AND SCIENTISTS
781-982-5400
www.col-col.com
101 Accord Park Drive
Norwell, MA 02061-1685

TITLE:

EXISTING CONDITIONS SURVEY
105 SOUTH HUNTINGTON AVENUE
JAMAICA PLAIN, MA
(SUFFOLK COUNTY)

PREPARED FOR:

CEDAR VALLEY DEVELOPMENT, LLC
895 HUNTINGTON AVE., SUITE 1
BOSTON, MA 02115

DATE: MAY 10, 2012	EC-1
COMP./DESIGN: JFS	
CHECK: WJD	
DRAWN: AMC	
SCALE: 1"=20'	
JOB NO.: F:\Project\MA\BOSTON\S HUNTINGTON\...\DWG=LDD	
DWG NO.: 26-233 EC.DWG	

20 10 0 20 40

Appendix B

Transportation

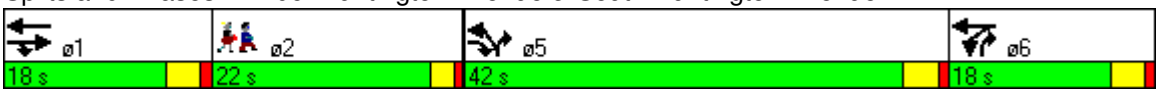
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	10	11	11	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)		100	0		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3049	1304	1298	1428	1562	1183	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3049	1304	1298	1428	1562	1183	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Headway Factor	1.19	1.25	1.19	1.38	1.14	1.31	
Link Speed (mph)	30			30	30		
Link Distance (ft)	356			295	432		
Travel Time (s)	8.1			6.7	9.8		
Volume (vph)	648	360	148	584	449	298	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)		6					
Peak Hour Factor	0.95	0.87	0.73	0.79	0.94	0.80	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	4%	21%	3%	4%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)				2		1	
Mid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	682	414	203	739	478	372	
Lane Group Flow (vph)	682	414	203	739	478	372	
Turn Type		pt+ov	Prot			pt+ov	
Protected Phases	1	1 5	6	1 6	5	5 6	2
Permitted Phases							
Detector Phases	1	1 5	6	1 6	5	5 6	
Minimum Initial (s)	8.0		8.0		8.0		2.0
Minimum Split (s)	13.0		13.0		21.0		22.0
Total Split (s)	18.0	60.0	18.0	36.0	42.0	60.0	22.0
Total Split (%)	18.0%	60.0%	18.0%	36.0%	42.0%	60.0%	22%
Maximum Green (s)	14.0		14.0		38.0		19.0
Yellow Time (s)	3.0		3.0		3.0		2.0
All-Red Time (s)	1.0		1.0		1.0		1.0
Lead/Lag	Lead		Lag		Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Minimum Gap (s)	3.0		3.0		3.0		3.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Time Before Reduce (s)	0.0		0.0		0.0		0.0
Time To Reduce (s)	0.0		0.0		0.0		0.0
Recall Mode	C-Min		Min		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	39.4	78.0	14.0	57.4	34.6	52.6	
Actuated g/C Ratio	0.39	0.78	0.14	0.57	0.35	0.53	
v/c Ratio	0.57	0.41	1.12	0.90	0.89	0.60	
Control Delay	26.9	4.9	142.5	36.8	49.8	20.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	26.9	4.9	142.5	36.8	49.8	20.5	
LOS	C	A	F	D	D	C	
Approach Delay	18.6			59.6	37.0		
Approach LOS	B			E	D		
Queue Length 50th (ft)	186	67	~150	426	268	143	
Queue Length 95th (ft)	248	101	#214	#548	#438	192	
Internal Link Dist (ft)	276			215	352		
Turn Bay Length (ft)		100					
Base Capacity (vph)	1203	1062	182	820	594	621	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.57	0.39	1.12	0.90	0.80	0.60	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 48 (48%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 37.4 Intersection LOS: D
Intersection Capacity Utilization 68.5% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 206: Huntington Avenue & South Huntington Avenue



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	398	282	223	272	131	266
Peak Hour Factor	0.98	0.93	0.76	0.80	0.91	0.92
Hourly flow rate (vph)	406	303	293	340	144	289
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				432		
pX, platoon unblocked						
vC, conflicting volume			709		1333	406
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			709		1333	406
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			67		0	54
cM capacity (veh/h)			876		111	634

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	NW 2
Volume Total	406	303	293	340	144	289
Volume Left	0	0	293	0	144	0
Volume Right	0	303	0	0	0	289
cSH	1700	1700	876	1700	111	634
Volume to Capacity	0.24	0.18	0.33	0.20	1.30	0.46
Queue Length 95th (ft)	0	0	37	0	243	60
Control Delay (s)	0.0	0.0	11.2	0.0	258.3	15.3
Lane LOS			B		F	C
Approach Delay (s)	0.0		5.2		96.1	
Approach LOS					F	

Intersection Summary			
Average Delay	25.3		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	10	11	11	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)		100	0		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3110	1343	1454	1457	1608	1183	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3110	1343	1454	1457	1608	1183	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Headway Factor	1.19	1.25	1.19	1.38	1.14	1.31	
Link Speed (mph)	30			30	30		
Link Distance (ft)	356			295	432		
Travel Time (s)	8.1			6.7	9.8		
Volume (vph)	557	416	207	884	303	167	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)		6					
Peak Hour Factor	0.92	0.82	0.88	0.97	0.95	0.89	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	1%	8%	1%	1%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)				2		1	
Mid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	605	507	235	911	319	188	
Lane Group Flow (vph)	605	507	235	911	319	188	
Turn Type		pt+ov	Prot			pt+ov	
Protected Phases	1	1 5	6	1 6	5	5 6	2
Permitted Phases							
Detector Phases	1	1 5	6	1 6	5	5 6	
Minimum Initial (s)	8.0		8.0		8.0		2.0
Minimum Split (s)	13.0		13.0		21.0		22.0
Total Split (s)	15.0	48.0	30.0	45.0	33.0	63.0	22.0
Total Split (%)	15.0%	48.0%	30.0%	45.0%	33.0%	63.0%	22%
Maximum Green (s)	11.0		26.0		29.0		19.0
Yellow Time (s)	3.0		3.0		3.0		2.0
All-Red Time (s)	1.0		1.0		1.0		1.0
Lead/Lag	Lead		Lag		Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Minimum Gap (s)	3.0		3.0		3.0		3.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Time Before Reduce (s)	0.0		0.0		0.0		0.0
Time To Reduce (s)	0.0		0.0		0.0		0.0
Recall Mode	C-Min		Min		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	34.0	66.0	26.0	64.0	28.0	58.0	
Actuated g/C Ratio	0.34	0.66	0.26	0.64	0.28	0.58	
v/c Ratio	0.57	0.57	0.62	0.98	0.71	0.27	
Control Delay	29.9	12.5	41.0	43.7	41.9	11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.9	12.5	41.0	43.7	41.9	11.5	
LOS	C	B	D	D	D	B	
Approach Delay	22.0			43.1	30.6		
Approach LOS	C			D	C		
Queue Length 50th (ft)	167	159	132	524	180	54	
Queue Length 95th (ft)	225	210	210	#839	279	92	
Internal Link Dist (ft)	276			215	352		
Turn Bay Length (ft)		100					
Base Capacity (vph)	1058	900	378	933	466	686	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.57	0.56	0.62	0.98	0.68	0.27	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 29 (29%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 32.3 Intersection LOS: C
Intersection Capacity Utilization 77.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 206: Huntington Avenue & South Huntington Avenue

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	260	110	318	327	168	212
Peak Hour Factor	0.89	0.74	0.79	0.96	0.81	0.90
Hourly flow rate (vph)	292	149	403	341	207	236
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				432		
pX, platoon unblocked						
vC, conflicting volume			441		1438	292
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			441		1438	292
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			64		0	68
cM capacity (veh/h)			1119		94	742

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	NW 2
Volume Total	292	149	403	341	207	236
Volume Left	0	0	403	0	207	0
Volume Right	0	149	0	0	0	236
cSH	1700	1700	1119	1700	94	742
Volume to Capacity	0.17	0.09	0.36	0.20	2.20	0.32
Queue Length 95th (ft)	0	0	41	0	459	34
Control Delay (s)	0.0	0.0	10.0	0.0	644.4	12.1
Lane LOS			B		F	B
Approach Delay (s)	0.0		5.4		308.2	
Approach LOS					F	

Intersection Summary			
Average Delay	86.4		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

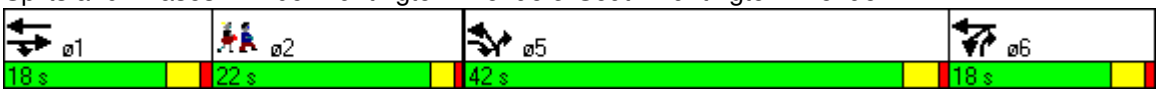
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	10	11	11	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)		100	0		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3049	1304	1298	1428	1562	1183	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3049	1304	1298	1428	1562	1183	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Headway Factor	1.19	1.25	1.19	1.38	1.14	1.31	
Link Speed (mph)	30			30	30		
Link Distance (ft)	356			295	432		
Travel Time (s)	8.1			6.7	9.8		
Volume (vph)	664	371	153	599	460	306	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)		6					
Peak Hour Factor	0.95	0.87	0.73	0.79	0.94	0.80	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	4%	21%	3%	4%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)				2		1	
Mid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	699	426	210	758	489	382	
Lane Group Flow (vph)	699	426	210	758	489	382	
Turn Type		pt+ov	Prot			pt+ov	
Protected Phases	1	1 5	6	1 6	5	5 6	2
Permitted Phases							
Detector Phases	1	1 5	6	1 6	5	5 6	
Minimum Initial (s)	8.0		8.0		8.0		2.0
Minimum Split (s)	13.0		13.0		21.0		22.0
Total Split (s)	18.0	60.0	18.0	36.0	42.0	60.0	22.0
Total Split (%)	18.0%	60.0%	18.0%	36.0%	42.0%	60.0%	22%
Maximum Green (s)	14.0		14.0		38.0		19.0
Yellow Time (s)	3.0		3.0		3.0		2.0
All-Red Time (s)	1.0		1.0		1.0		1.0
Lead/Lag	Lead		Lag		Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Minimum Gap (s)	3.0		3.0		3.0		3.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Time Before Reduce (s)	0.0		0.0		0.0		0.0
Time To Reduce (s)	0.0		0.0		0.0		0.0
Recall Mode	C-Min		Min		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	39.1	78.0	14.0	57.1	34.9	52.9	
Actuated g/C Ratio	0.39	0.78	0.14	0.57	0.35	0.53	
v/c Ratio	0.59	0.42	1.15	0.93	0.90	0.61	
Control Delay	27.4	5.0	154.5	41.0	51.1	20.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	27.4	5.0	154.5	41.0	51.1	20.7	
LOS	C	A	F	D	D	C	
Approach Delay	18.9			65.6	37.8		
Approach LOS	B			E	D		
Queue Length 50th (ft)	192	70	~159	449	277	149	
Queue Length 95th (ft)	255	105	#223	#572	#453	199	
Internal Link Dist (ft)	276			215	352		
Turn Bay Length (ft)		100					
Base Capacity (vph)	1192	1057	182	815	594	625	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.40	1.15	0.93	0.82	0.61	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 48 (48%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 39.7 Intersection LOS: D
Intersection Capacity Utilization 70.0% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 206: Huntington Avenue & South Huntington Avenue



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	408	289	229	282	135	273
Peak Hour Factor	0.98	0.93	0.76	0.80	0.91	0.92
Hourly flow rate (vph)	416	311	301	352	148	297
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				432		
pX, platoon unblocked						
vC, conflicting volume			727		1371	416
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			727		1371	416
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			65		0	53
cM capacity (veh/h)			863		103	626

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	NW 2
Volume Total	416	311	301	352	148	297
Volume Left	0	0	301	0	148	0
Volume Right	0	311	0	0	0	297
cSH	1700	1700	863	1700	103	626
Volume to Capacity	0.24	0.18	0.35	0.21	1.44	0.47
Queue Length 95th (ft)	0	0	39	0	271	64
Control Delay (s)	0.0	0.0	11.4	0.0	321.3	15.8
Lane LOS			B		F	C
Approach Delay (s)	0.0		5.3		117.6	
Approach LOS					F	

Intersection Summary			
Average Delay	30.6		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

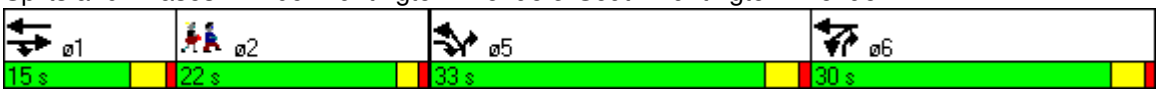
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	10	11	11	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)		100	0		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3110	1343	1454	1457	1608	1183	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3110	1343	1454	1457	1608	1183	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Headway Factor	1.19	1.25	1.19	1.38	1.14	1.31	
Link Speed (mph)	30			30	30		
Link Distance (ft)	356			295	432		
Travel Time (s)	8.1			6.7	9.8		
Volume (vph)	571	429	213	906	311	171	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)		6					
Peak Hour Factor	0.92	0.82	0.88	0.97	0.95	0.89	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	1%	8%	1%	1%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)				2		1	
Mid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	621	523	242	934	327	192	
Lane Group Flow (vph)	621	523	242	934	327	192	
Turn Type		pt+ov	Prot			pt+ov	
Protected Phases	1	1 5	6	1 6	5	5 6	2
Permitted Phases							
Detector Phases	1	1 5	6	1 6	5	5 6	
Minimum Initial (s)	8.0		8.0		8.0		2.0
Minimum Split (s)	13.0		13.0		21.0		22.0
Total Split (s)	15.0	48.0	30.0	45.0	33.0	63.0	22.0
Total Split (%)	15.0%	48.0%	30.0%	45.0%	33.0%	63.0%	22%
Maximum Green (s)	11.0		26.0		29.0		19.0
Yellow Time (s)	3.0		3.0		3.0		2.0
All-Red Time (s)	1.0		1.0		1.0		1.0
Lead/Lag	Lead		Lag		Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Minimum Gap (s)	3.0		3.0		3.0		3.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Time Before Reduce (s)	0.0		0.0		0.0		0.0
Time To Reduce (s)	0.0		0.0		0.0		0.0
Recall Mode	C-Min		Min		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	33.0	66.0	26.0	63.0	29.0	59.0	
Actuated g/C Ratio	0.33	0.66	0.26	0.63	0.29	0.59	
v/c Ratio	0.61	0.59	0.64	1.02	0.70	0.28	
Control Delay	31.1	12.9	41.8	54.4	41.0	11.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.1	12.9	41.8	54.4	41.0	11.3	
LOS	C	B	D	D	D	B	
Approach Delay	22.8			51.8	30.0		
Approach LOS	C			D	C		
Queue Length 50th (ft)	173	167	137	~589	185	56	
Queue Length 95th (ft)	232	220	216	#871	287	95	
Internal Link Dist (ft)	276			215	352		
Turn Bay Length (ft)		100					
Base Capacity (vph)	1026	886	378	918	466	698	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.61	0.59	0.64	1.02	0.70	0.28	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 29 (29%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 36.1 Intersection LOS: D
Intersection Capacity Utilization 78.8% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 206: Huntington Avenue & South Huntington Avenue



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	267	113	326	338	174	217
Peak Hour Factor	0.89	0.74	0.79	0.96	0.81	0.90
Hourly flow rate (vph)	300	153	413	352	215	241
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				432		
pX, platoon unblocked						
vC, conflicting volume			453		1477	300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			453		1477	300
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			63		0	67
cM capacity (veh/h)			1108		88	735

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	NW 2
Volume Total	300	153	413	352	215	241
Volume Left	0	0	413	0	215	0
Volume Right	0	153	0	0	0	241
cSH	1700	1700	1108	1700	88	735
Volume to Capacity	0.18	0.09	0.37	0.21	2.45	0.33
Queue Length 95th (ft)	0	0	44	0	499	36
Control Delay (s)	0.0	0.0	10.2	0.0	763.9	12.3
Lane LOS			B		F	B
Approach Delay (s)	0.0		5.5		366.4	
Approach LOS					F	

Intersection Summary			
Average Delay	102.3		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

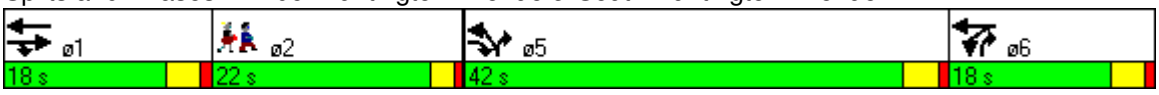
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	10	11	11	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)		100	0		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3049	1304	1298	1428	1562	1183	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3049	1304	1298	1428	1562	1183	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Headway Factor	1.19	1.25	1.19	1.38	1.14	1.31	
Link Speed (mph)	30			30	30		
Link Distance (ft)	356			295	300		
Travel Time (s)	8.1			6.7	6.8		
Volume (vph)	664	374	154	599	468	310	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)		6					
Peak Hour Factor	0.95	0.87	0.73	0.79	0.94	0.80	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	4%	21%	3%	4%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)				2		1	
Mid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	699	430	211	758	498	388	
Lane Group Flow (vph)	699	430	211	758	498	388	
Turn Type		pt+ov	Prot			pt+ov	
Protected Phases	1	1 5	6	1 6	5	5 6	2
Permitted Phases							
Detector Phases	1	1 5	6	1 6	5	5 6	
Minimum Initial (s)	8.0		8.0		8.0		2.0
Minimum Split (s)	13.0		13.0		21.0		22.0
Total Split (s)	18.0	60.0	18.0	36.0	42.0	60.0	22.0
Total Split (%)	18.0%	60.0%	18.0%	36.0%	42.0%	60.0%	22%
Maximum Green (s)	14.0		14.0		38.0		19.0
Yellow Time (s)	3.0		3.0		3.0		2.0
All-Red Time (s)	1.0		1.0		1.0		1.0
Lead/Lag	Lead		Lag		Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Minimum Gap (s)	3.0		3.0		3.0		3.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Time Before Reduce (s)	0.0		0.0		0.0		0.0
Time To Reduce (s)	0.0		0.0		0.0		0.0
Recall Mode	C-Min		Min		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	38.8	78.0	14.0	56.8	35.2	53.2	
Actuated g/C Ratio	0.39	0.78	0.14	0.57	0.35	0.53	
v/c Ratio	0.59	0.42	1.16	0.93	0.91	0.62	
Control Delay	27.6	5.1	156.3	41.9	52.1	20.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	27.6	5.1	156.3	41.9	52.1	20.8	
LOS	C	A	F	D	D	C	
Approach Delay	19.0			66.8	38.4		
Approach LOS	B			E	D		
Queue Length 50th (ft)	192	72	~160	449	284	152	
Queue Length 95th (ft)	255	106	#223	#572	#466	203	
Internal Link Dist (ft)	276			215	220		
Turn Bay Length (ft)		100					
Base Capacity (vph)	1183	1053	182	811	594	628	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.41	1.16	0.93	0.84	0.62	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 48 (48%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 40.3 Intersection LOS: D
Intersection Capacity Utilization 70.5% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

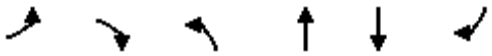
Splits and Phases: 206: Huntington Avenue & South Huntington Avenue



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	410	289	233	286	135	274
Peak Hour Factor	0.98	0.93	0.76	0.80	0.91	0.92
Hourly flow rate (vph)	418	311	307	358	148	298
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				432		
pX, platoon unblocked						
vC, conflicting volume			729		1389	418
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			729		1389	418
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			64		0	52
cM capacity (veh/h)			861		99	624

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	NW 2
Volume Total	418	311	307	358	148	298
Volume Left	0	0	307	0	148	0
Volume Right	0	311	0	0	0	298
cSH	1700	1700	861	1700	99	624
Volume to Capacity	0.25	0.18	0.36	0.21	1.50	0.48
Queue Length 95th (ft)	0	0	41	0	279	64
Control Delay (s)	0.0	0.0	11.5	0.0	345.2	15.9
Lane LOS			B		F	C
Approach Delay (s)	0.0		5.3		125.4	
Approach LOS					F	

Intersection Summary			
Average Delay	32.3		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	12	8	3	681	511	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	9	3	740	555	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					300	
pX, platoon unblocked						
vC, conflicting volume	934	280	560			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	934	280	560			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	100			
cM capacity (veh/h)	264	717	1007			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	22	250	493	370	189
Volume Left	13	3	0	0	0
Volume Right	9	0	0	0	4
cSH	353	1007	1700	1700	1700
Volume to Capacity	0.06	0.00	0.29	0.22	0.11
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	15.9	0.1	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.9	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	10	11	11	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)		100	0		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3110	1343	1454	1457	1608	1183	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3110	1343	1454	1457	1608	1183	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Headway Factor	1.19	1.25	1.19	1.38	1.14	1.31	
Link Speed (mph)	30			30	30		
Link Distance (ft)	356			295	300		
Travel Time (s)	8.1			6.7	6.8		
Volume (vph)	571	439	218	906	318	175	
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)		6					
Peak Hour Factor	0.92	0.82	0.88	0.97	0.95	0.89	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	1%	8%	1%	1%	10%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)				2		1	
Mid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	621	535	248	934	335	197	
Lane Group Flow (vph)	621	535	248	934	335	197	
Turn Type		pt+ov	Prot			pt+ov	
Protected Phases	1	1 5	6	1 6	5	5 6	2
Permitted Phases							
Detector Phases	1	1 5	6	1 6	5	5 6	
Minimum Initial (s)	8.0		8.0		8.0		2.0
Minimum Split (s)	13.0		13.0		21.0		22.0
Total Split (s)	15.0	48.0	30.0	45.0	33.0	63.0	22.0
Total Split (%)	15.0%	48.0%	30.0%	45.0%	33.0%	63.0%	22%
Maximum Green (s)	11.0		26.0		29.0		19.0
Yellow Time (s)	3.0		3.0		3.0		2.0
All-Red Time (s)	1.0		1.0		1.0		1.0
Lead/Lag	Lead		Lag		Lead		Lag
Lead-Lag Optimize?							
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Minimum Gap (s)	3.0		3.0		3.0		3.0

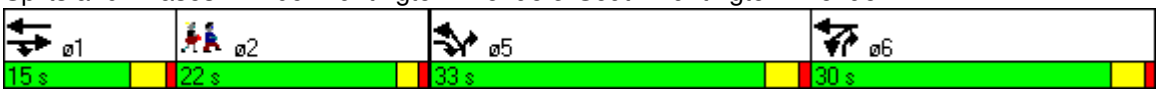
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø2
Time Before Reduce (s)	0.0		0.0		0.0		0.0
Time To Reduce (s)	0.0		0.0		0.0		0.0
Recall Mode	C-Min		Min		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							12.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	33.0	66.0	26.0	63.0	29.0	59.0	
Actuated g/C Ratio	0.33	0.66	0.26	0.63	0.29	0.59	
v/c Ratio	0.61	0.60	0.66	1.02	0.72	0.28	
Control Delay	31.1	13.2	42.5	54.4	42.0	11.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.1	13.2	42.5	54.4	42.0	11.4	
LOS	C	B	D	D	D	B	
Approach Delay	22.8			51.9	30.7		
Approach LOS	C			D	C		
Queue Length 50th (ft)	173	173	141	~589	191	57	
Queue Length 95th (ft)	232	228	222	#871	294	97	
Internal Link Dist (ft)	276			215	220		
Turn Bay Length (ft)		100					
Base Capacity (vph)	1026	886	378	918	466	698	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.61	0.60	0.66	1.02	0.72	0.28	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 29 (29%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 36.3 Intersection LOS: D
Intersection Capacity Utilization 79.2% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

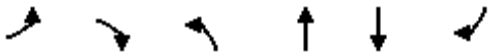
Splits and Phases: 206: Huntington Avenue & South Huntington Avenue



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Volume (veh/h)	272	113	330	342	174	222
Peak Hour Factor	0.89	0.74	0.79	0.96	0.81	0.90
Hourly flow rate (vph)	306	153	418	356	215	247
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)				432		
pX, platoon unblocked						
vC, conflicting volume			458		1497	306
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			458		1497	306
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			62		0	66
cM capacity (veh/h)			1103		84	730

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	NW 2
Volume Total	306	153	418	356	215	247
Volume Left	0	0	418	0	215	0
Volume Right	0	153	0	0	0	247
cSH	1700	1700	1103	1700	84	730
Volume to Capacity	0.18	0.09	0.38	0.21	2.55	0.34
Queue Length 95th (ft)	0	0	45	0	507	37
Control Delay (s)	0.0	0.0	10.2	0.0	809.7	12.4
Lane LOS			B		F	B
Approach Delay (s)	0.0		5.5		383.5	
Approach LOS					F	

Intersection Summary			
Average Delay	107.0		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	11	8	10	484	664	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	9	11	526	722	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					300	
pX, platoon unblocked						
vC, conflicting volume	1015	369	738			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1015	369	738			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	99			
cM capacity (veh/h)	232	628	864			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	186	351	481	257
Volume Left	12	11	0	0	0
Volume Right	9	0	0	0	16
cSH	315	864	1700	1700	1700
Volume to Capacity	0.07	0.01	0.21	0.28	0.15
Queue Length 95th (ft)	5	1	0	0	0
Control Delay (s)	17.2	0.7	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	17.2	0.2		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Cars - Trucks

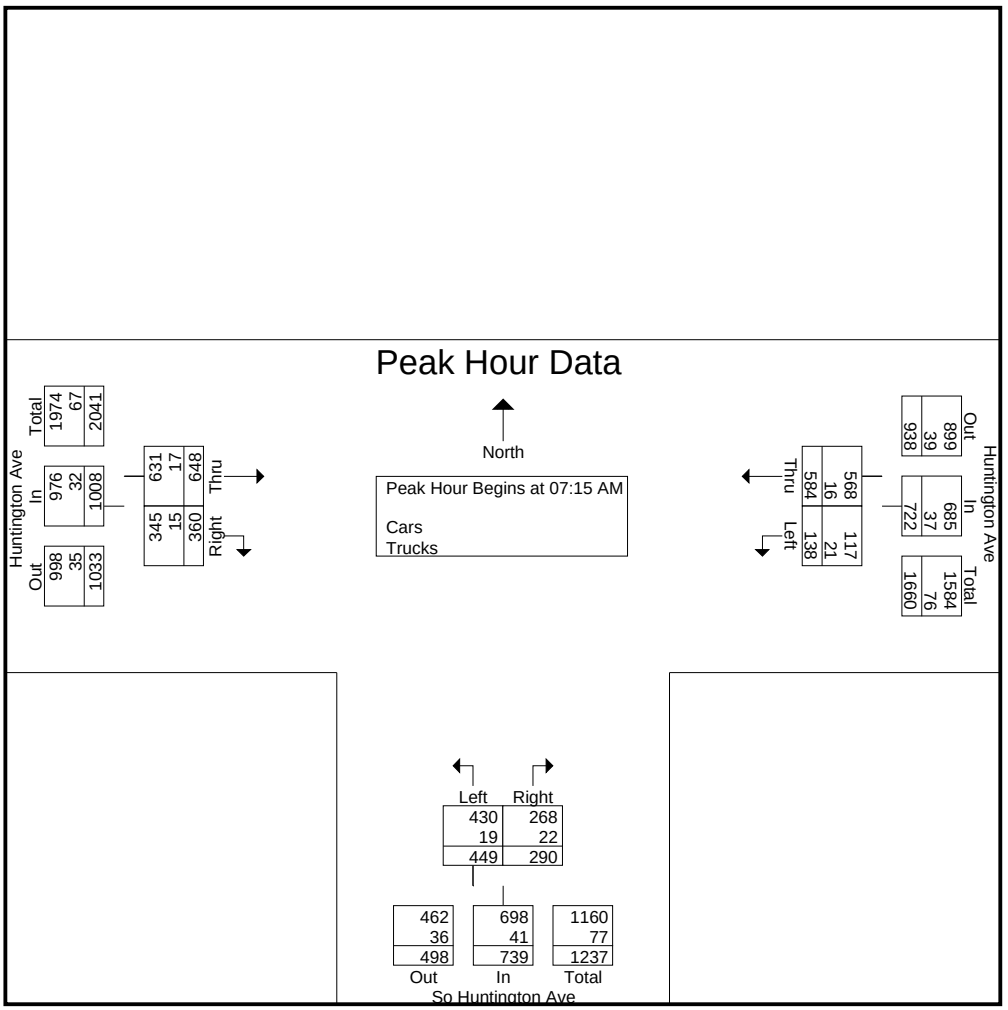
	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	28	93	84	49	163	101	518
07:15 AM	29	125	116	67	159	87	583
07:30 AM	48	143	119	66	171	103	650
07:45 AM	36	185	112	65	161	69	628
Total	141	546	431	247	654	360	2379
08:00 AM	25	131	102	92	157	101	608
08:15 AM	26	128	87	58	141	97	537
08:30 AM	22	116	95	52	171	99	555
08:45 AM	40	140	108	68	146	69	571
Total	113	515	392	270	615	366	2271
Grand Total	254	1061	823	517	1269	726	4650
Apprch %	19.3	80.7	61.4	38.6	63.6	36.4	
Total %	5.5	22.8	17.7	11.1	27.3	15.6	
Cars	215	1025	785	473	1237	696	4431
% Cars	84.6	96.6	95.4	91.5	97.5	95.9	95.3
Trucks	39	36	38	44	32	30	219
% Trucks	15.4	3.4	4.6	8.5	2.5	4.1	4.7

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	29	125	154	116	67	183	159	87	246	583
07:30 AM	**48**	143	191	**119**	66	185	**171**	**103**	**274**	**650**
07:45 AM	36	**185**	**221**	112	65	177	161	69	230	628
08:00 AM	25	131	156	102	**92**	**194**	157	101	258	608
Total Volume	138	584	722	449	290	739	648	360	1008	2469
% App. Total	19.1	80.9		60.8	39.2		64.3	35.7		
PHF	.719	.789	.817	.943	.788	.952	.947	.874	.920	.950
Cars	117	568	685	430	268	698	631	345	976	2359
% Cars	84.8	97.3	94.9	95.8	92.4	94.5	97.4	95.8	96.8	95.5
Trucks	21	16	37	19	22	41	17	15	32	110
% Trucks	15.2	2.7	5.1	4.2	7.6	5.5	2.6	4.2	3.2	4.5

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 2



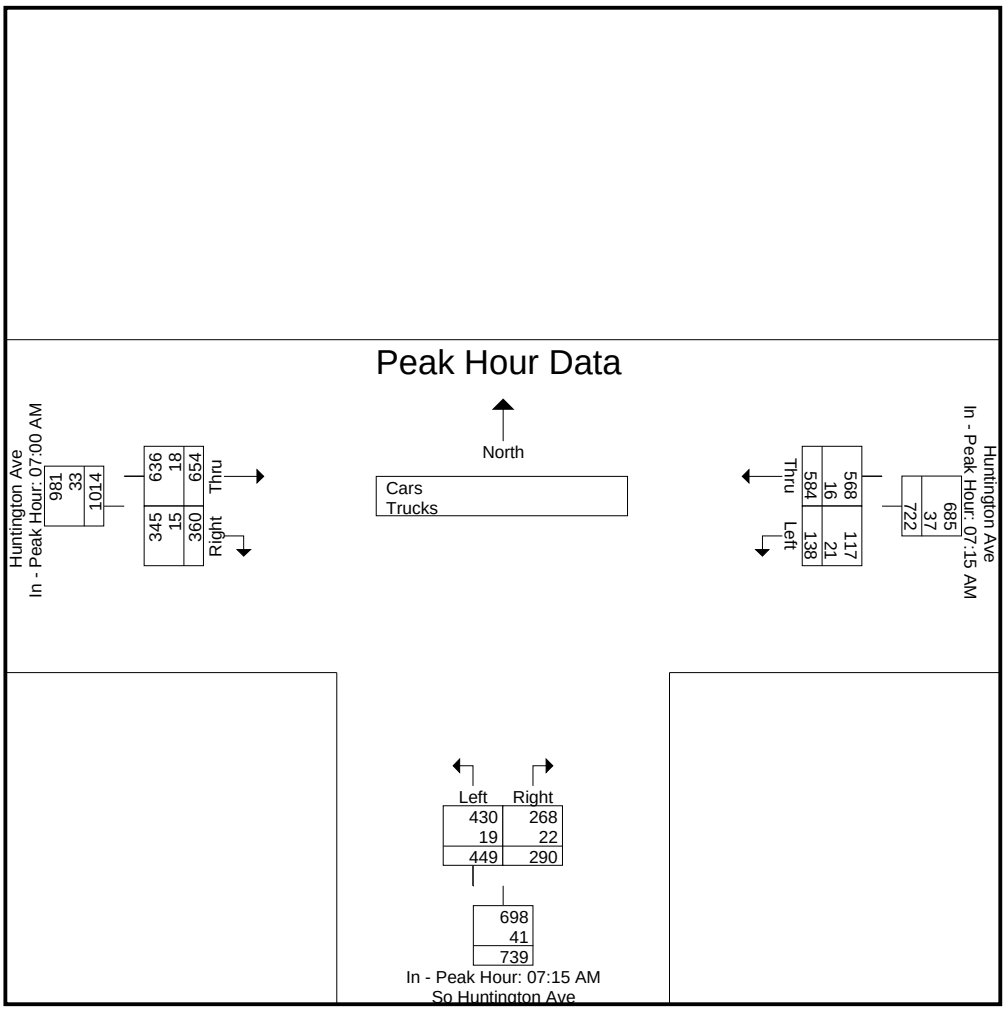
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:00 AM		
+0 mins.	29	125	154	116	67	183	163	101	264
+15 mins.	**48**	143	191	**119**	66	185	159	87	246
+30 mins.	36	**185**	**221**	112	65	177	**171**	**103**	**274**
+45 mins.	25	131	156	102	**92**	**194**	161	69	230
Total Volume	138	584	722	449	290	739	654	360	1014
% App. Total	19.1	80.9		60.8	39.2		64.5	35.5	
PHF	.719	.789	.817	.943	.788	.952	.956	.874	.925
Cars	117	568	685	430	268	698	636	345	981
% Cars	84.8	97.3	94.9	95.8	92.4	94.5	97.2	95.8	96.7
Trucks	21	16	37	19	22	41	18	15	33
% Trucks	15.2	2.7	5.1	4.2	7.6	5.5	2.8	4.2	3.3

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Cars

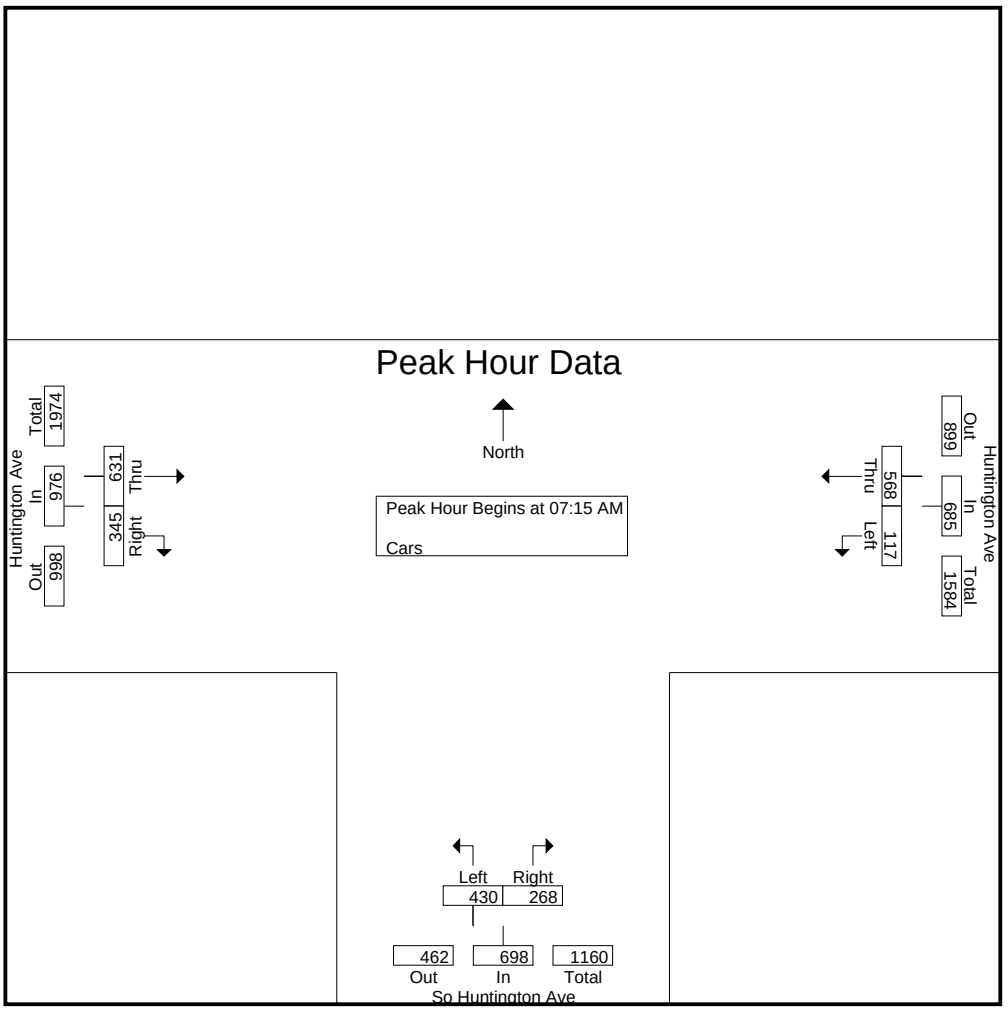
	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	22	82	79	41	159	97	480
07:15 AM	24	121	113	59	151	83	551
07:30 AM	41	141	114	61	168	98	623
07:45 AM	32	181	107	60	158	67	605
Total	119	525	413	221	636	345	2259
08:00 AM	20	125	96	88	154	97	580
08:15 AM	23	125	85	53	140	94	520
08:30 AM	17	114	89	48	163	94	525
08:45 AM	36	136	102	63	144	66	547
Total	96	500	372	252	601	351	2172
Grand Total	215	1025	785	473	1237	696	4431
Apprch %	17.3	82.7	62.4	37.6	64	36	
Total %	4.9	23.1	17.7	10.7	27.9	15.7	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	24	121	145	113	59	172	151	83	234	551
07:30 AM	**41**	141	182	**114**	61	175	**168**	**98**	**266**	**623**
07:45 AM	32	**181**	**213**	107	60	167	158	67	225	605
08:00 AM	20	125	145	96	**88**	**184**	154	97	251	580
Total Volume	117	568	685	430	268	698	631	345	976	2359
% App. Total	17.1	82.9		61.6	38.4		64.7	35.3		
PHF	.713	.785	.804	.943	.761	.948	.939	.880	.917	.947

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 2



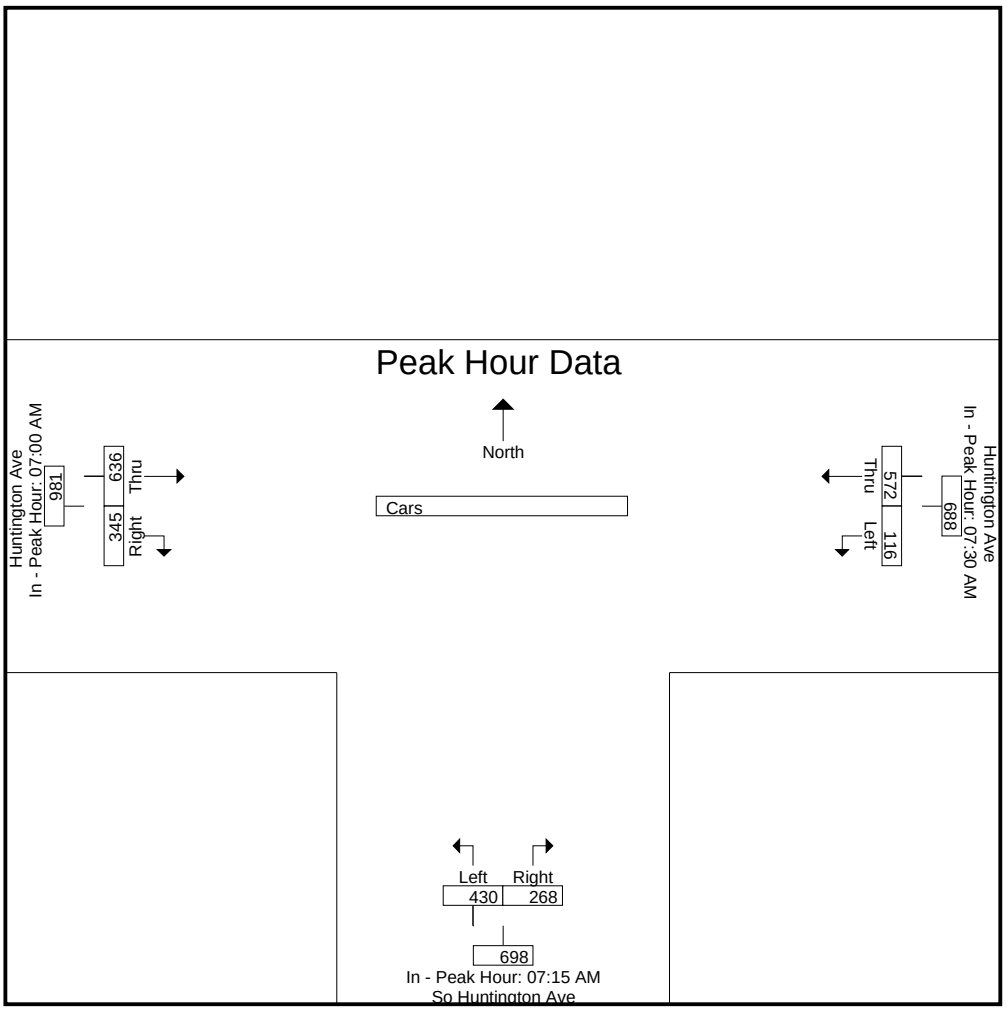
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM			07:15 AM			07:00 AM		
+0 mins.	**41**	141	182	113	59	172	159	97	256
+15 mins.	32	**181**	**213**	**114**	61	175	151	83	234
+30 mins.	20	125	145	107	60	167	**168**	**98**	**266**
+45 mins.	23	125	148	96	**88**	**184**	158	67	225
Total Volume	116	572	688	430	268	698	636	345	981
% App. Total	16.9	83.1		61.6	38.4		64.8	35.2	
PHF	.707	.790	.808	.943	.761	.948	.946	.880	.922

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Trucks

	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	6	11	5	8	4	4	38
07:15 AM	5	4	3	8	8	4	32
07:30 AM	7	2	5	5	3	5	27
07:45 AM	4	4	5	5	3	2	23
Total	22	21	18	26	18	15	120
08:00 AM	5	6	6	4	3	4	28
08:15 AM	3	3	2	5	1	3	17
08:30 AM	5	2	6	4	8	5	30
08:45 AM	4	4	6	5	2	3	24
Total	17	15	20	18	14	15	99
Grand Total	39	36	38	44	32	30	219
Apprch %	52	48	46.3	53.7	51.6	48.4	
Total %	17.8	16.4	17.4	20.1	14.6	13.7	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	6	**11**	**17**	**5**	**8**	**13**	4	4	8	**38**
07:15 AM	5	4	9	3	8	11	**8**	4	**12**	32
07:30 AM	**7**	2	9	5	5	10	3	**5**	8	27
07:45 AM	4	4	8	5	5	10	3	2	5	23
Total Volume	22	21	43	18	26	44	18	15	33	120
% App. Total	51.2	48.8		40.9	59.1		54.5	45.5		
PHF	.786	.477	.632	.900	.813	.846	.563	.750	.688	.789

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
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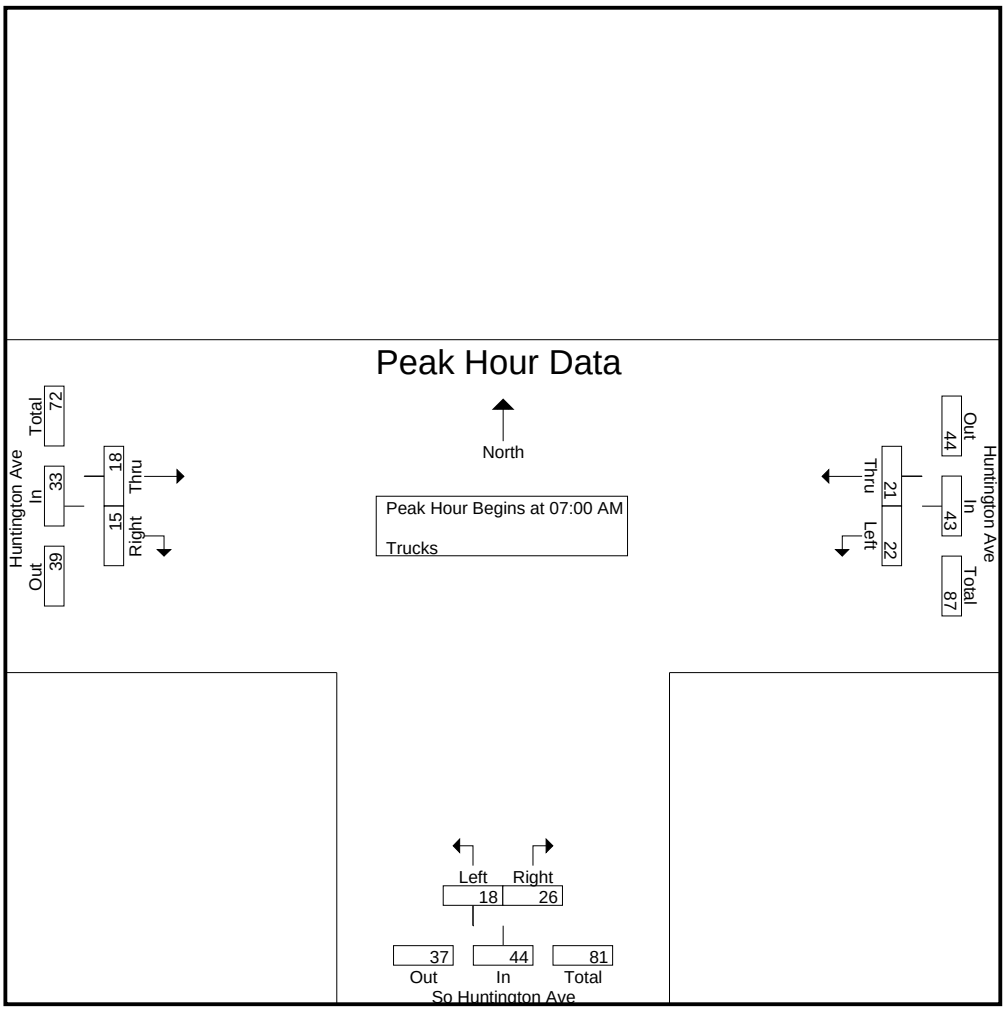


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

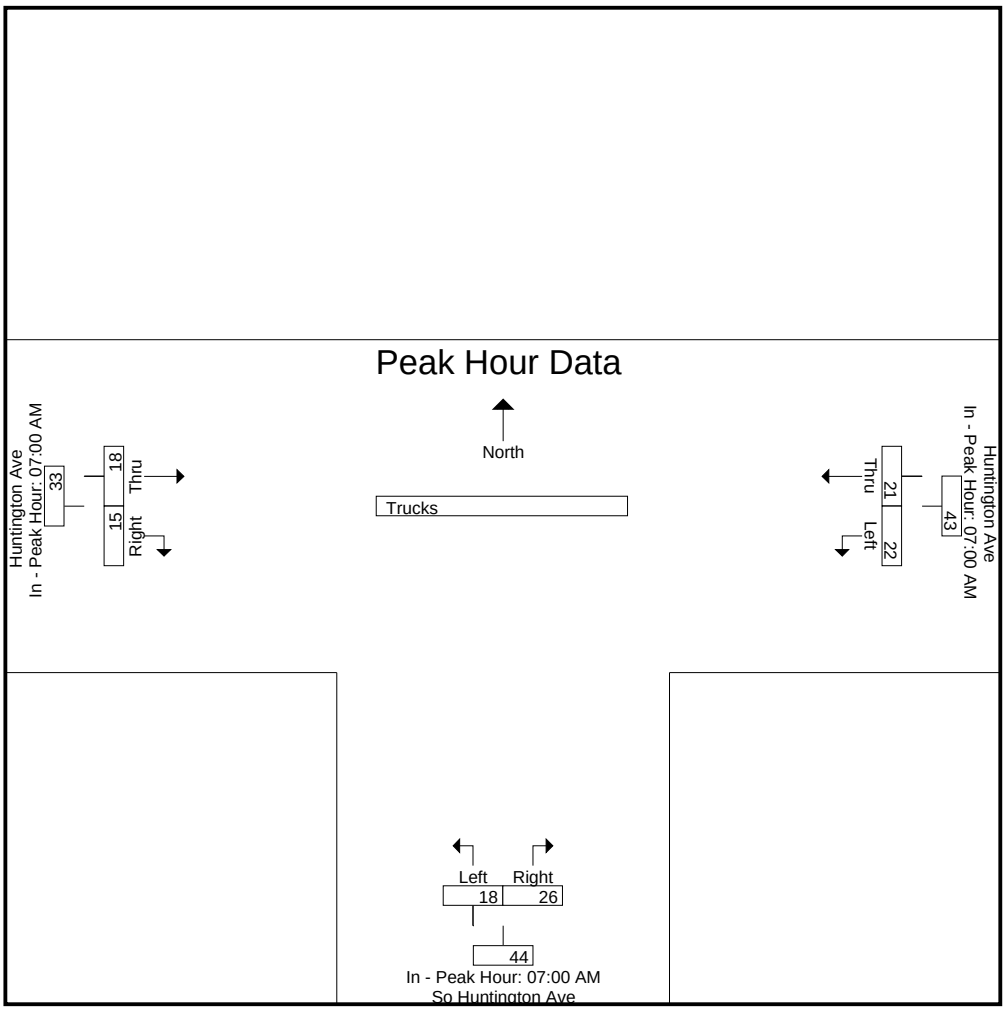
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	6	**11**	**17**	**5**	**8**	**13**	4	4	8
+15 mins.	5	4	9	3	8	11	**8**	4	**12**
+30 mins.	**7**	2	9	5	5	10	3	**5**	8
+45 mins.	4	4	8	5	5	10	3	2	5
Total Volume	22	21	43	18	26	44	18	15	33
% App. Total	51.2	48.8		40.9	59.1		54.5	45.5	
PHF	.786	.477	.632	.900	.813	.846	.563	.750	.688

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Trains

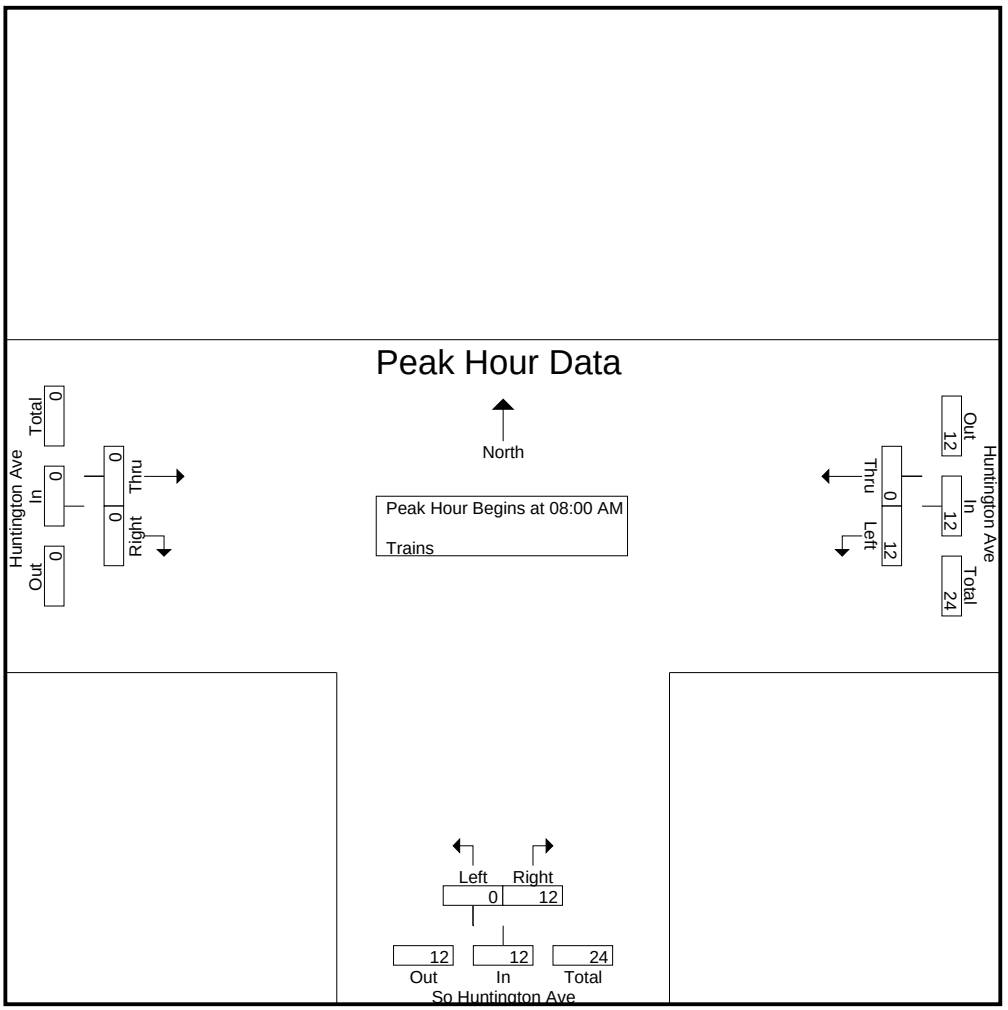
	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	3	0	0	3	0	0	6
07:15 AM	2	0	0	2	0	0	4
07:30 AM	3	0	0	3	0	0	6
07:45 AM	2	0	0	2	0	0	4
Total	10	0	0	10	0	0	20
08:00 AM	3	0	0	1	0	0	4
08:15 AM	2	0	0	5	0	0	7
08:30 AM	4	0	0	3	0	0	7
08:45 AM	3	0	0	3	0	0	6
Total	12	0	0	12	0	0	24
Grand Total	22	0	0	22	0	0	44
Apprch %	100	0	0	100	0	0	
Total %	50	0	0	50	0	0	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	3	0	3	0	1	1	0	0	0	4
08:15 AM	2	0	2	0	**5**	**5**	0	0	0	**7**
08:30 AM	**4**	0	**4**	0	3	3	0	0	0	7
08:45 AM	3	0	3	0	3	3	0	0	0	6
Total Volume	12	0	12	0	12	12	0	0	0	24
% App. Total	100	0		0	100		0	0		
PHF	.750	.000	.750	.000	.600	.600	.000	.000	.000	.857

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:00 AM		
+0 mins.	3	0	3	0	1	1	0	0	0
+15 mins.	2	0	2	0	**5**	**5**	0	0	0
+30 mins.	**4**	0	**4**	0	3	3	0	0	0
+45 mins.	3	0	3	0	3	3	0	0	0
Total Volume	12	0	12	0	12	12	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.750	.000	.750	.000	.600	.600	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
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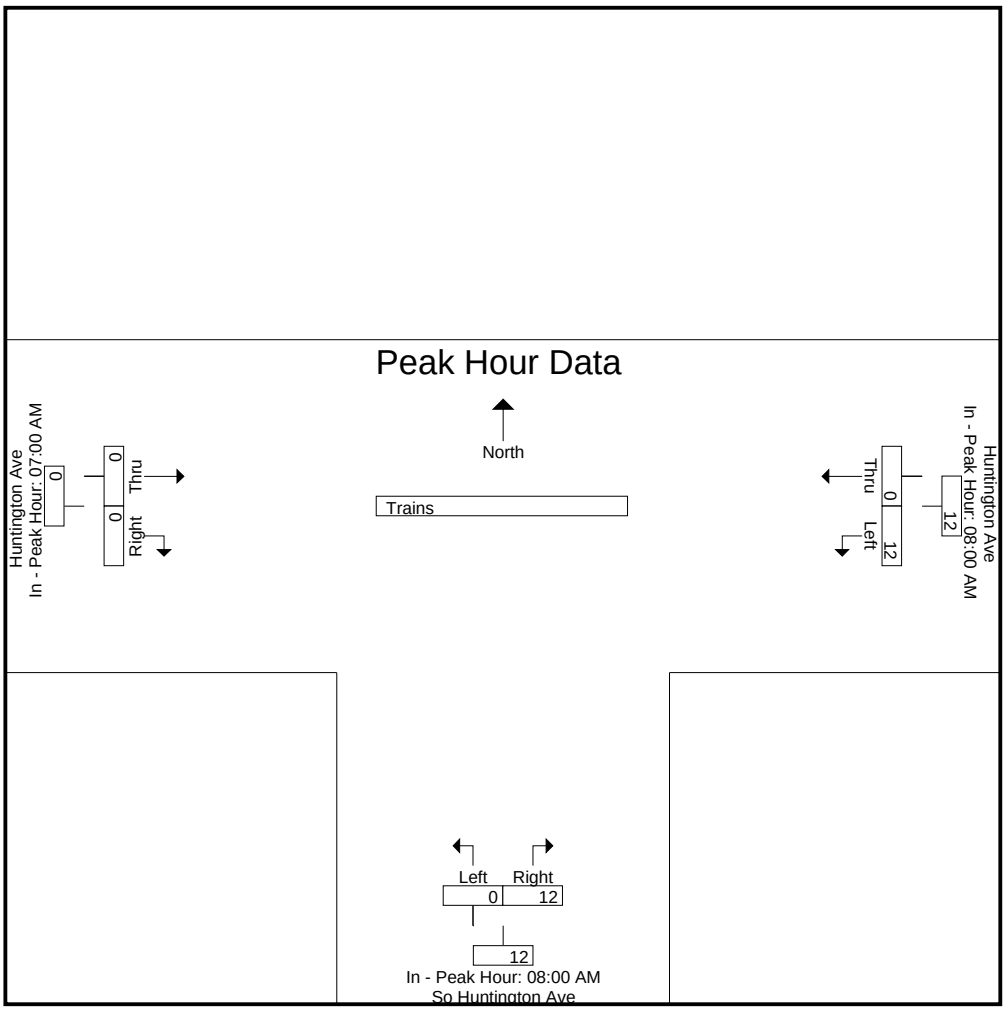


Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Bikes Peds

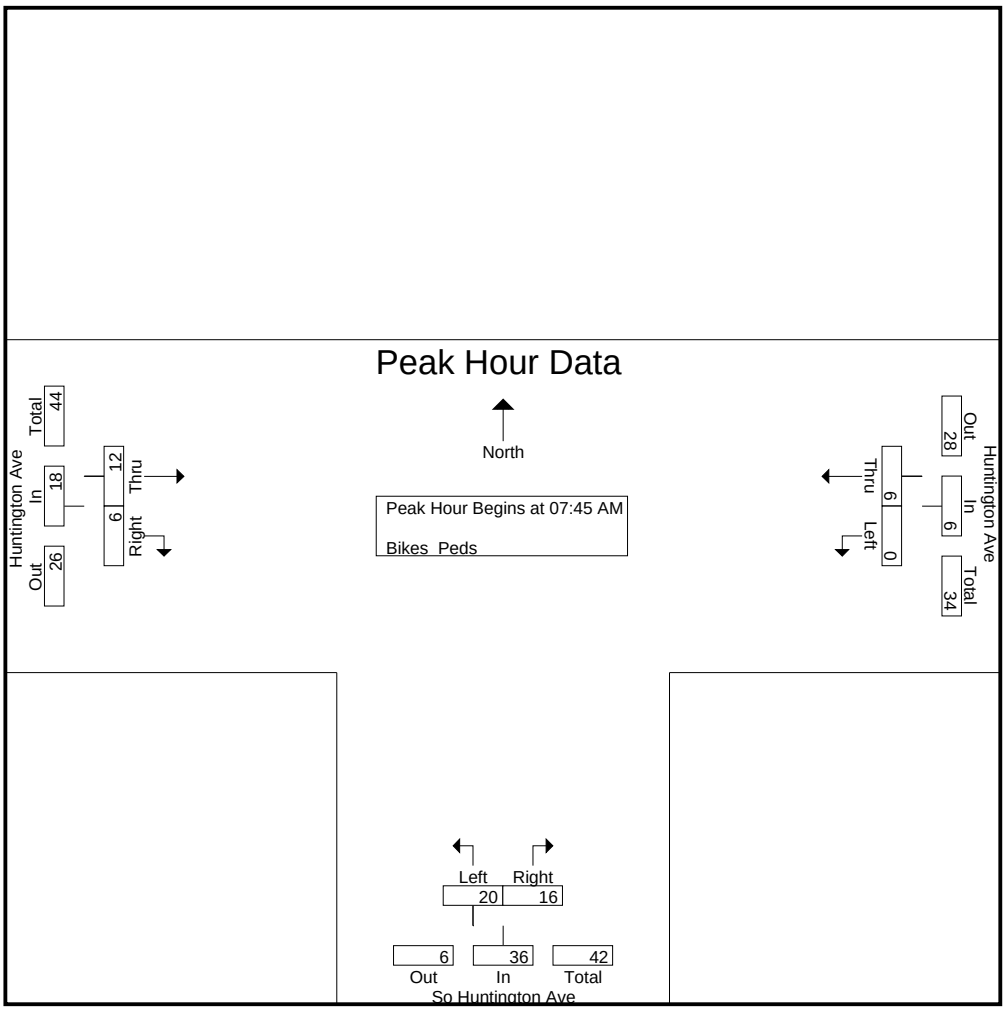
	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	12	1	1	24	0	1	2	38	3	41
07:15 AM	0	1	26	2	2	23	2	2	4	53	9	62
07:30 AM	0	0	37	2	1	23	5	1	5	65	9	74
07:45 AM	0	3	34	8	2	21	5	1	11	66	19	85
Total	0	4	109	13	6	91	12	5	22	222	40	262
08:00 AM	0	0	24	3	3	40	2	2	5	69	10	79
08:15 AM	0	0	45	4	2	35	3	0	12	92	9	101
08:30 AM	0	3	33	5	9	31	2	3	13	77	22	99
08:45 AM	1	3	30	6	2	33	4	3	8	71	19	90
Total	1	6	132	18	16	139	11	8	38	309	60	369
Grand Total	1	10	241	31	22	230	23	13	60	531	100	631
Apprch %	9.1	90.9		58.5	41.5		63.9	36.1				
Total %	1	10		31	22		23	13		84.2	15.8	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	**3**	**3**	**8**	2	10	**5**	1	**6**	19
08:00 AM	0	0	0	3	3	6	2	2	4	10
08:15 AM	0	0	0	4	2	6	3	0	3	9
08:30 AM	0	3	3	5	**9**	**14**	2	**3**	5	**22**
Total Volume	0	6	6	20	16	36	12	6	18	60
% App. Total	0	100		55.6	44.4		66.7	33.3		
PHF	.000	.500	.500	.625	.444	.643	.600	.500	.750	.682

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			07:15 AM		
+0 mins.	0	0	0	**8**	2	10	2	**2**	4
+15 mins.	0	0	0	3	3	6	**5**	1	**6**
+30 mins.	0	**3**	3	4	2	6	5	1	6
+45 mins.	**1**	3	**4**	5	**9**	**14**	2	2	4
Total Volume	1	6	7	20	16	36	14	6	20
% App. Total	14.3	85.7		55.6	44.4		70	30	
PHF	.250	.500	.438	.625	.444	.643	.700	.750	.833

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
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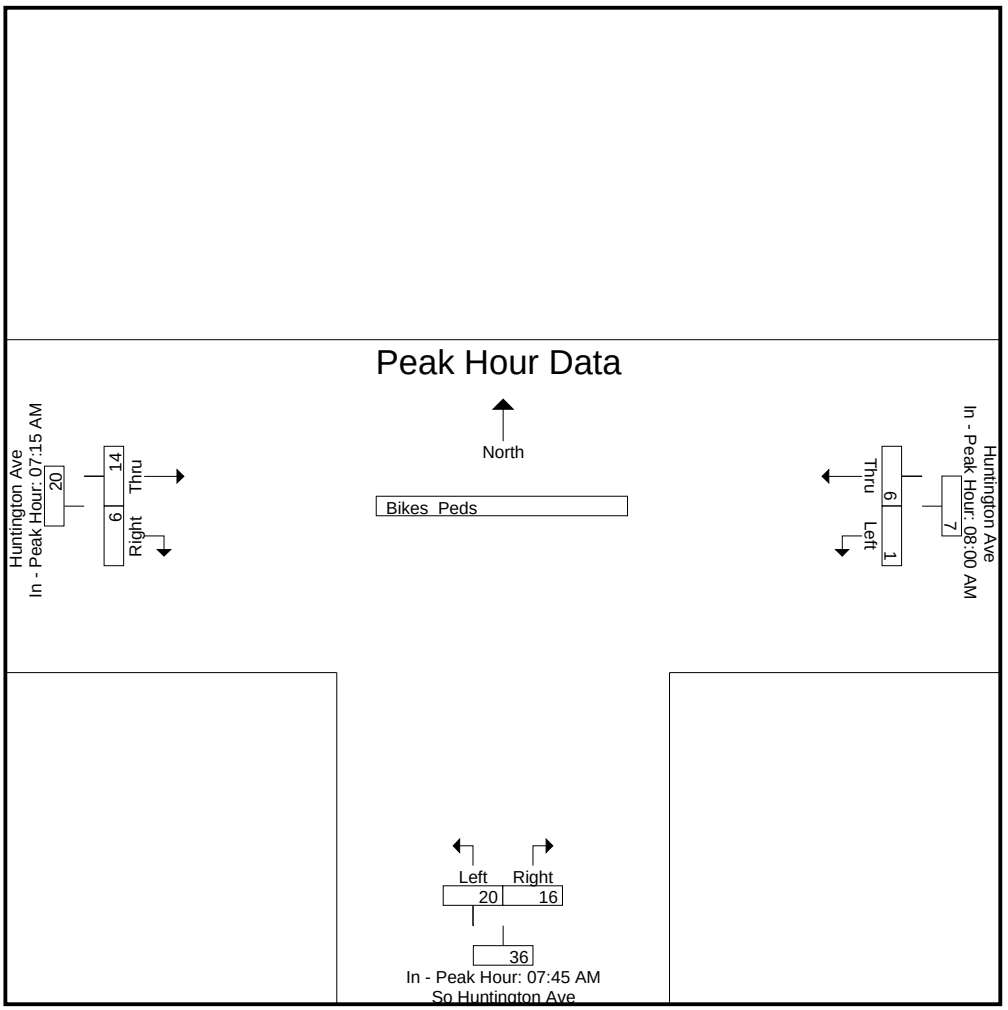

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Cars - Trucks

	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	39	197	80	57	129	122	624
04:15 PM	35	206	93	59	127	99	619
04:30 PM	42	203	81	39	125	85	575
04:45 PM	37	192	71	44	129	79	552
Total	153	798	325	199	510	385	2370
05:00 PM	57	211	74	42	129	101	614
05:15 PM	45	229	75	46	140	127	662
05:30 PM	57	224	74	34	137	92	618
05:45 PM	42	220	80	38	151	96	627
Total	201	884	303	160	557	416	2521
Grand Total	354	1682	628	359	1067	801	4891
Apprch %	17.4	82.6	63.6	36.4	57.1	42.9	
Total %	7.2	34.4	12.8	7.3	21.8	16.4	
Cars	335	1664	623	336	1051	790	4799
% Cars	94.6	98.9	99.2	93.6	98.5	98.6	98.1
Trucks	19	18	5	23	16	11	92
% Trucks	5.4	1.1	0.8	6.4	1.5	1.4	1.9

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**57**	211	268	74	42	116	129	101	230	614
05:15 PM	45	**229**	274	75	**46**	**121**	140	**127**	**267**	**662**
05:30 PM	57	224	**281**	74	34	108	137	92	229	618
05:45 PM	42	220	262	**80**	38	118	**151**	96	247	627
Total Volume	201	884	1085	303	160	463	557	416	973	2521
% App. Total	18.5	81.5		65.4	34.6		57.2	42.8		
PHF	.882	.965	.965	.947	.870	.957	.922	.819	.911	.952
Cars	190	873	1063	300	150	450	549	413	962	2475
% Cars	94.5	98.8	98.0	99.0	93.8	97.2	98.6	99.3	98.9	98.2
Trucks	11	11	22	3	10	13	8	3	11	46
% Trucks	5.5	1.2	2.0	1.0	6.3	2.8	1.4	0.7	1.1	1.8

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
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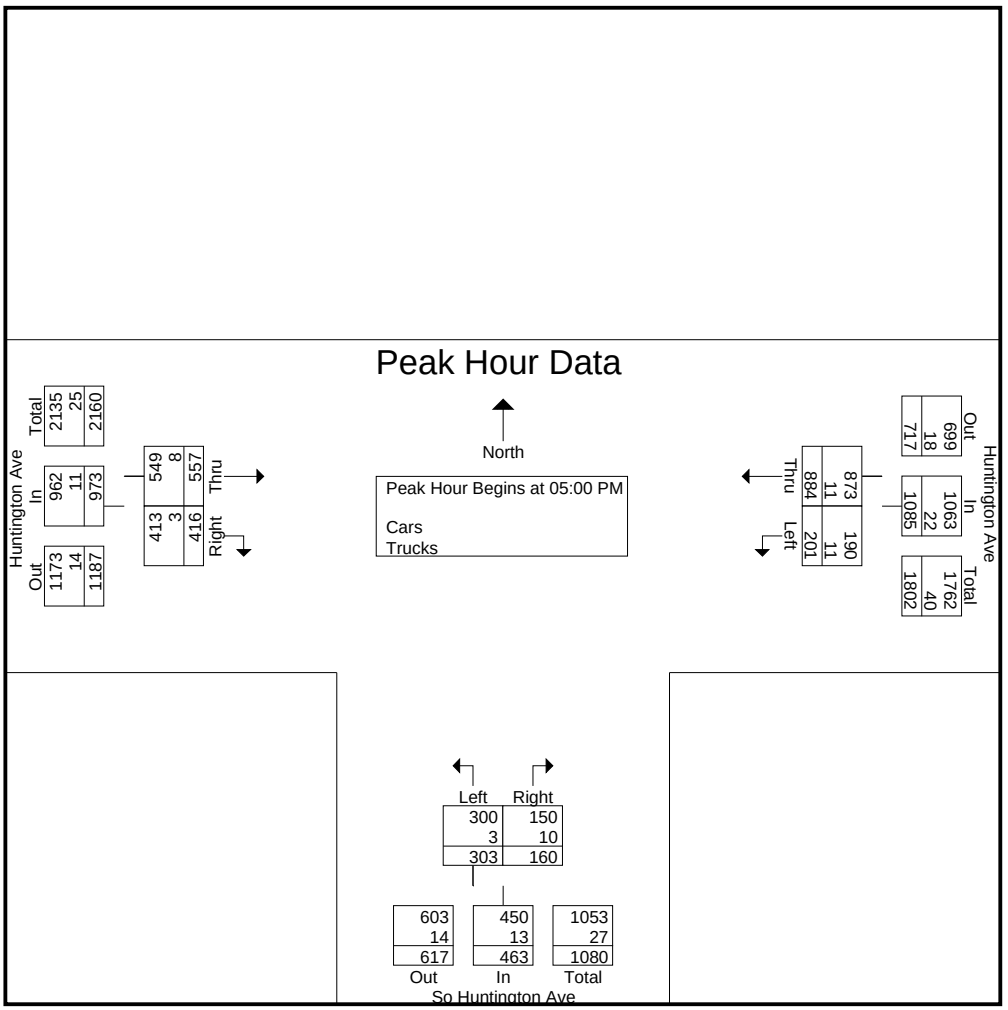

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			05:00 PM		
+0 mins.	**57**	211	268	80	57	137	129	101	230
+15 mins.	45	**229**	274	**93**	**59**	**152**	140	**127**	**267**
+30 mins.	57	224	**281**	81	39	120	137	92	229
+45 mins.	42	220	262	71	44	115	**151**	96	247
Total Volume	201	884	1085	325	199	524	557	416	973
% App. Total	18.5	81.5		62	38		57.2	42.8	
PHF	.882	.965	.965	.874	.843	.862	.922	.819	.911
Cars	190	873	1063	323	186	509	549	413	962
% Cars	94.5	98.8	98	99.4	93.5	97.1	98.6	99.3	98.9
Trucks	11	11	22	2	13	15	8	3	11
% Trucks	5.5	1.2	2	0.6	6.5	2.9	1.4	0.7	1.1

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
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Start Date : 4/10/2012
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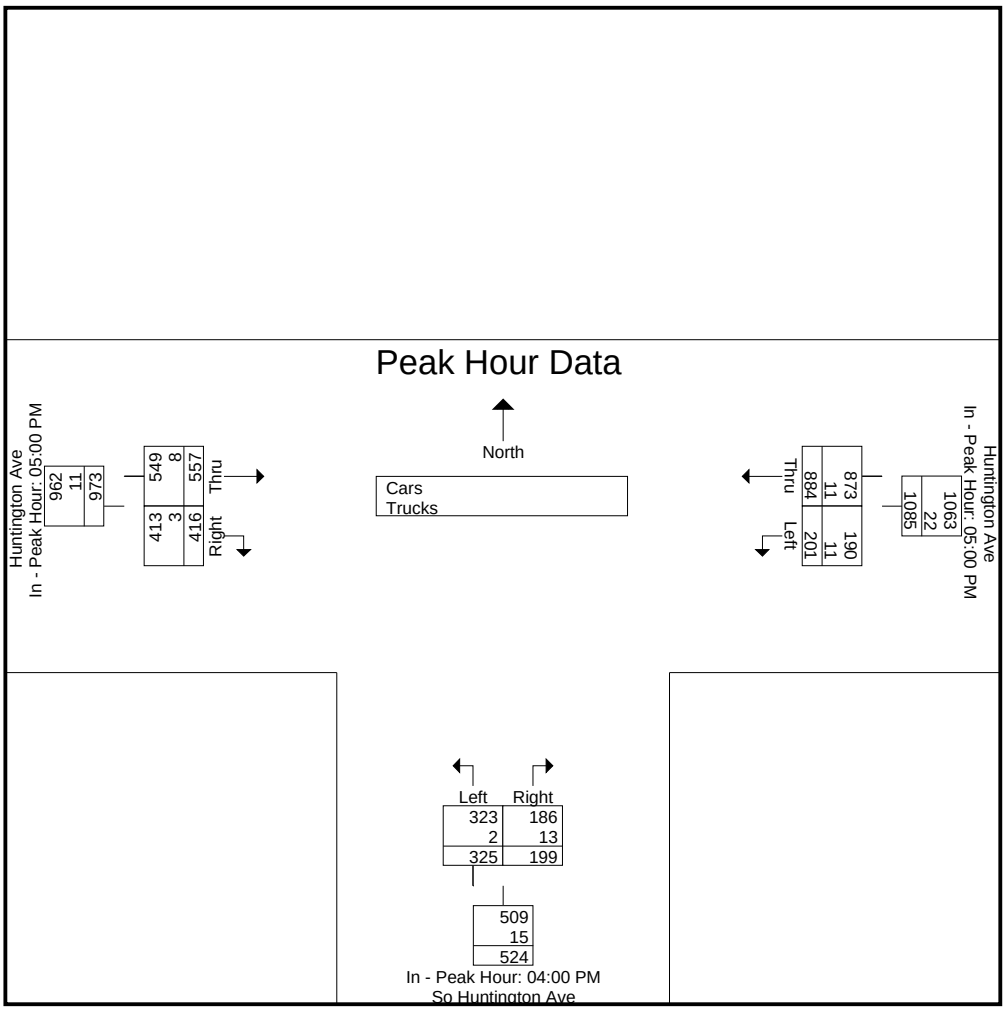

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Cars

	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	38	195	80	55	127	120	615
04:15 PM	33	204	92	57	124	96	606
04:30 PM	39	202	80	35	124	83	563
04:45 PM	35	190	71	39	127	78	540
Total	145	791	323	186	502	377	2324
05:00 PM	55	209	73	41	127	101	606
05:15 PM	43	225	75	42	136	126	647
05:30 PM	52	221	73	30	137	90	603
05:45 PM	40	218	79	37	149	96	619
Total	190	873	300	150	549	413	2475
Grand Total	335	1664	623	336	1051	790	4799
Apprch %	16.8	83.2	65	35	57.1	42.9	
Total %	7	34.7	13	7	21.9	16.5	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**55**	209	264	73	41	114	127	101	228	606
05:15 PM	43	**225**	268	75	**42**	**117**	136	**126**	**262**	**647**
05:30 PM	52	221	**273**	73	30	103	137	90	227	603
05:45 PM	40	218	258	**79**	37	116	**149**	96	245	619
Total Volume	190	873	1063	300	150	450	549	413	962	2475
% App. Total	17.9	82.1		66.7	33.3		57.1	42.9		
PHF	.864	.970	.973	.949	.893	.962	.921	.819	.918	.956

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
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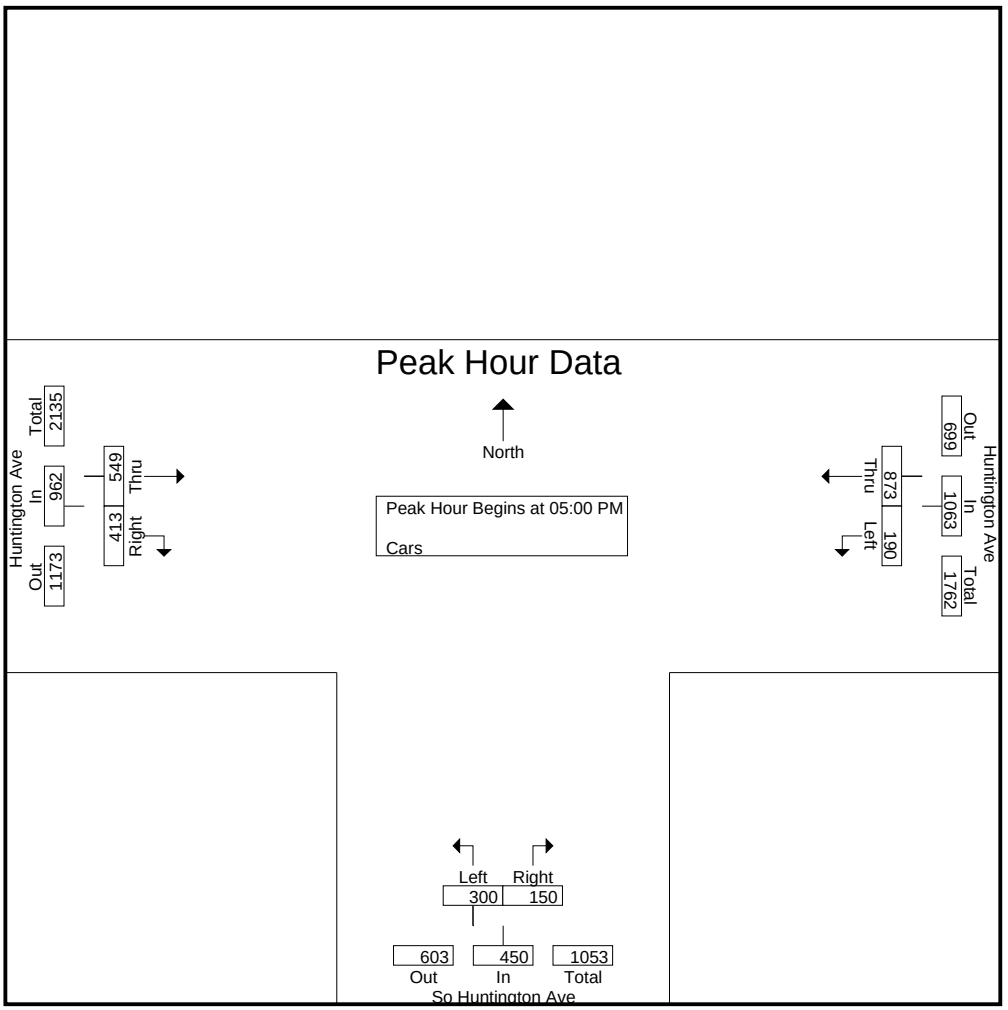


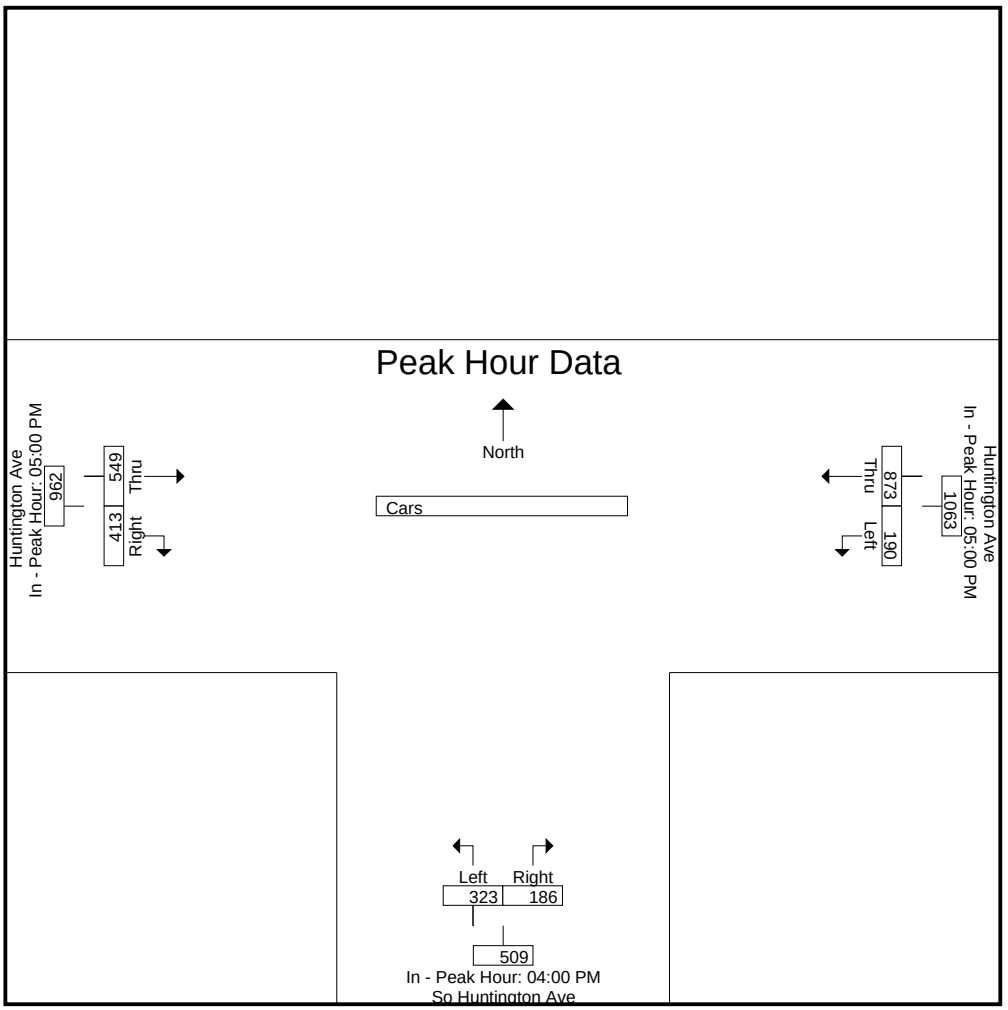
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			05:00 PM		
+0 mins.	**55**	209	264	80	55	135	127	101	228
+15 mins.	43	**225**	268	**92**	**57**	**149**	136	**126**	**262**
+30 mins.	52	221	**273**	80	35	115	137	90	227
+45 mins.	40	218	258	71	39	110	**149**	96	245
Total Volume	190	873	1063	323	186	509	549	413	962
% App. Total	17.9	82.1		63.5	36.5		57.1	42.9	
PHF	.864	.970	.973	.878	.816	.854	.921	.819	.918

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Trucks

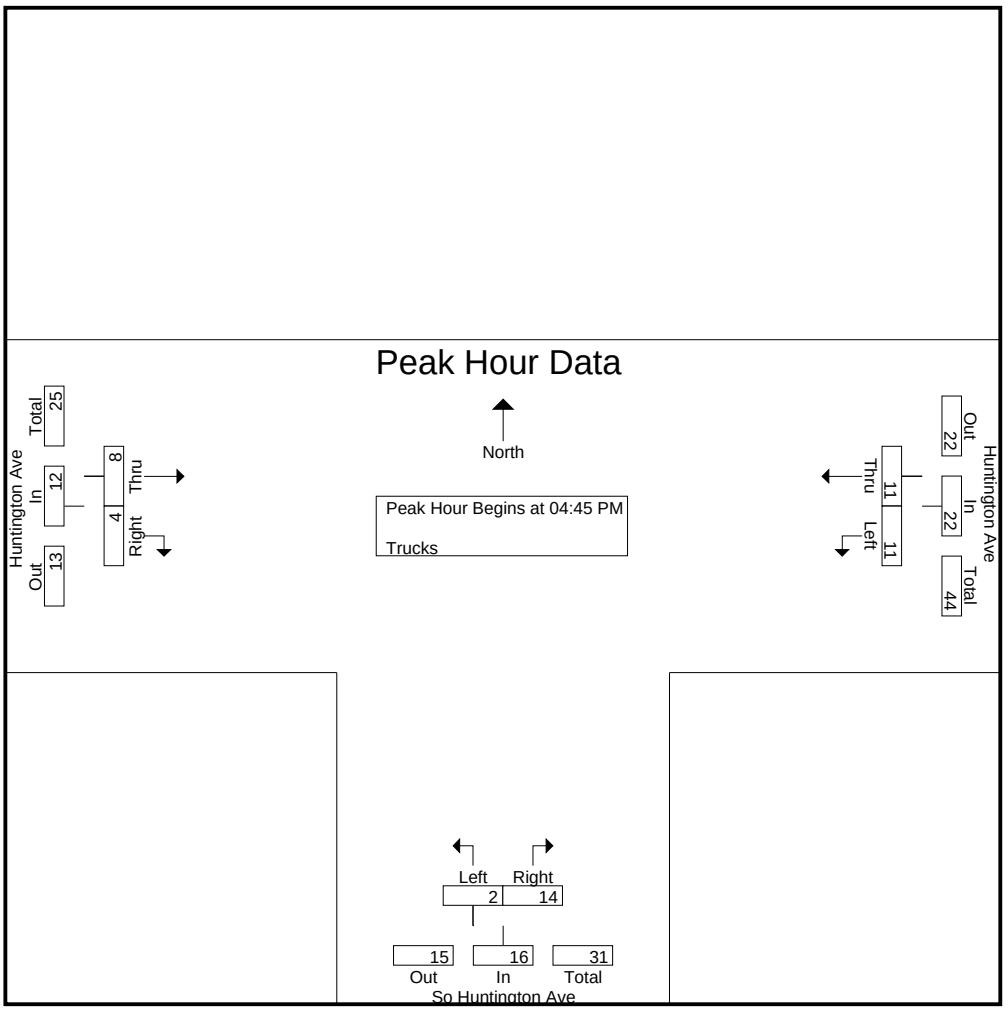
	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	1	2	0	2	2	2	9
04:15 PM	2	2	1	2	3	3	13
04:30 PM	3	1	1	4	1	2	12
04:45 PM	2	2	0	5	2	1	12
Total	8	7	2	13	8	8	46
05:00 PM	2	2	1	1	2	0	8
05:15 PM	2	4	0	4	4	1	15
05:30 PM	5	3	1	4	0	2	15
05:45 PM	2	2	1	1	2	0	8
Total	11	11	3	10	8	3	46
Grand Total	19	18	5	23	16	11	92
Apprch %	51.4	48.6	17.9	82.1	59.3	40.7	
Total %	20.7	19.6	5.4	25	17.4	12	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	2	2	4	0	**5**	**5**	2	1	3	12
05:00 PM	2	2	4	**1**	1	2	2	0	2	8
05:15 PM	2	**4**	6	0	4	4	**4**	1	**5**	**15**
05:30 PM	**5**	3	**8**	1	4	5	0	**2**	2	15
Total Volume	11	11	22	2	14	16	8	4	12	50
% App. Total	50	50		12.5	87.5		66.7	33.3		
PHF	.550	.688	.688	.500	.700	.800	.500	.500	.600	.833

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



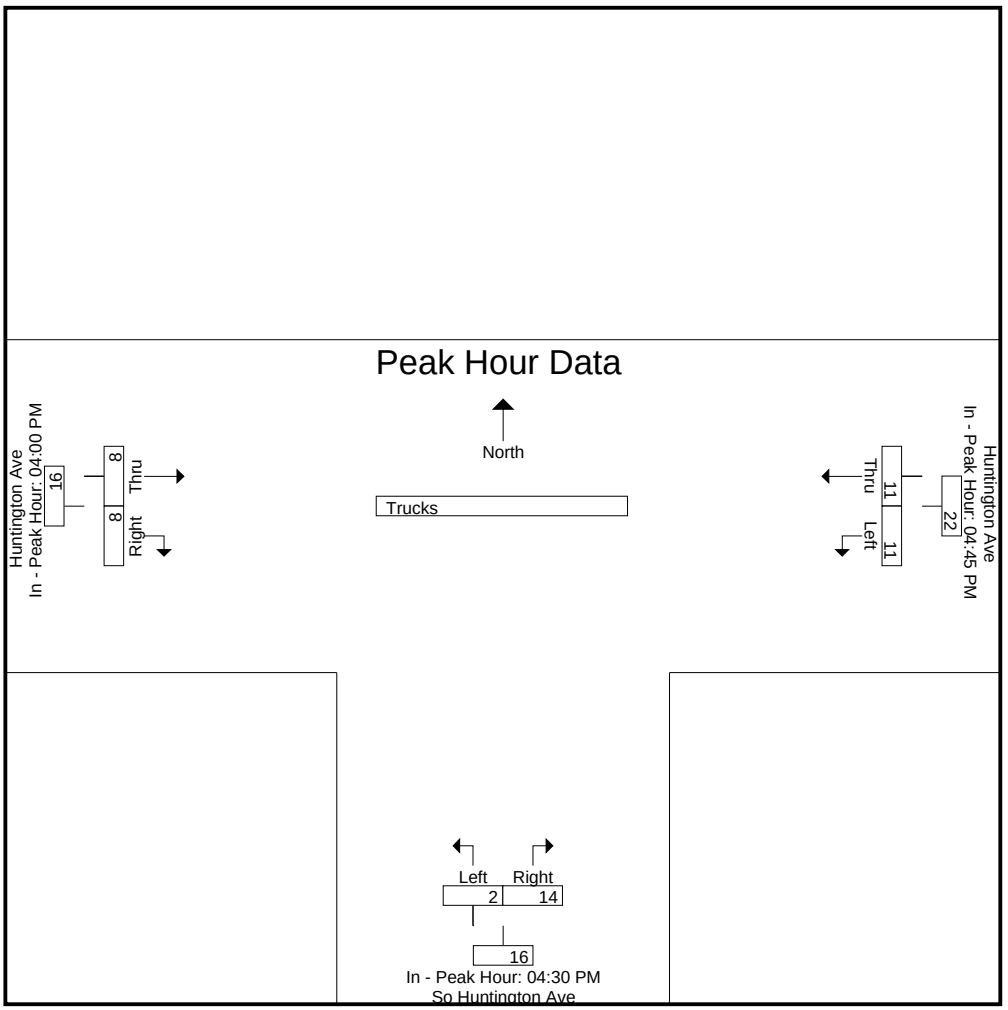
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:30 PM			04:00 PM		
+0 mins.	2	2	4	**1**	4	**5**	2	2	4
+15 mins.	2	2	4	0	**5**	5	**3**	**3**	**6**
+30 mins.	2	**4**	6	1	1	2	1	2	3
+45 mins.	**5**	3	**8**	0	4	4	2	1	3
Total Volume	11	11	22	2	14	16	8	8	16
% App. Total	50	50		12.5	87.5		50	50	
PHF	.550	.688	.688	.500	.700	.800	.667	.667	.667

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Trains

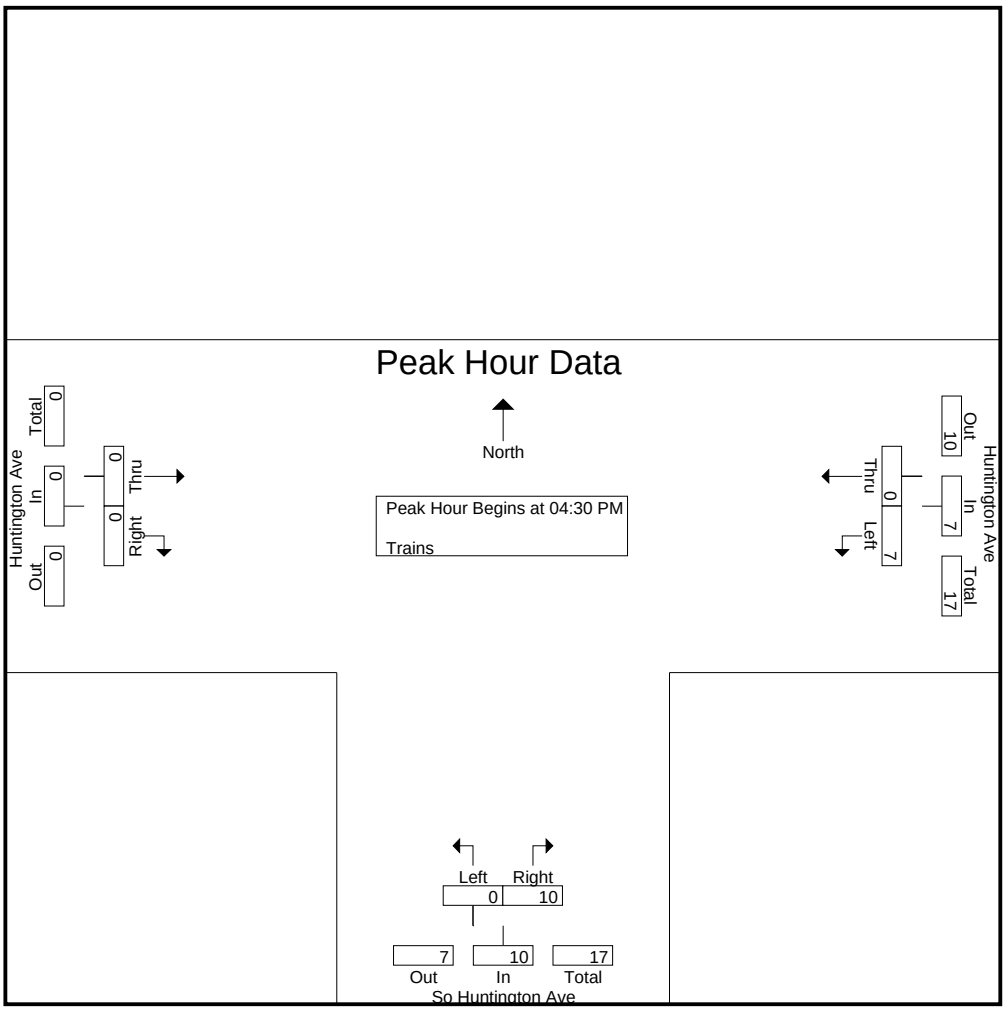
	Huntington Ave From East		So Huntington Ave From South		Huntington Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	2	0	0	2
04:15 PM	1	0	0	0	0	0	1
04:30 PM	2	0	0	4	0	0	6
04:45 PM	2	0	0	3	0	0	5
Total	5	0	0	9	0	0	14
05:00 PM	2	0	0	2	0	0	4
05:15 PM	1	0	0	1	0	0	2
05:30 PM	1	0	0	1	0	0	2
05:45 PM	2	0	0	3	0	0	5
Total	6	0	0	7	0	0	13
Grand Total	11	0	0	16	0	0	27
Apprch %	100	0	0	100	0	0	
Total %	40.7	0	0	59.3	0	0	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	**2**	0	**2**	0	**4**	**4**	0	0	0	**6**
04:45 PM	2	0	2	0	3	3	0	0	0	5
05:00 PM	2	0	2	0	2	2	0	0	0	4
05:15 PM	1	0	1	0	1	1	0	0	0	2
Total Volume	7	0	7	0	10	10	0	0	0	17
% App. Total	100	0		0	100		0	0		
PHF	.875	.000	.875	.000	.625	.625	.000	.000	.000	.708

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

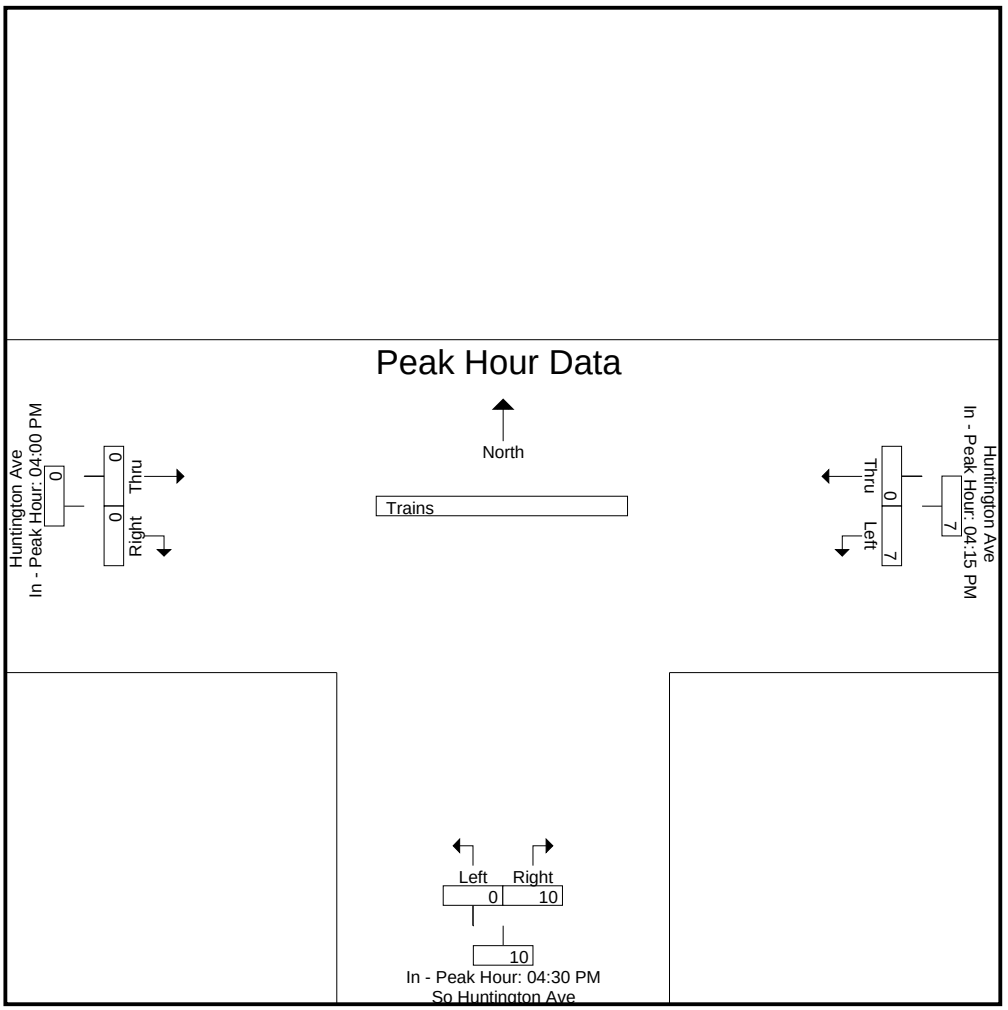
Peak Hour for Each Approach Begins at:

	04:15 PM			04:30 PM			04:00 PM		
+0 mins.	1	0	1	0	**4**	**4**	0	0	0
+15 mins.	**2**	0	**2**	0	3	3	0	0	0
+30 mins.	2	0	2	0	2	2	0	0	0
+45 mins.	2	0	2	0	1	1	0	0	0
Total Volume	7	0	7	0	10	10	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.875	.000	.875	.000	.625	.625	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
Page No : 1

Groups Printed- Bikes Peds

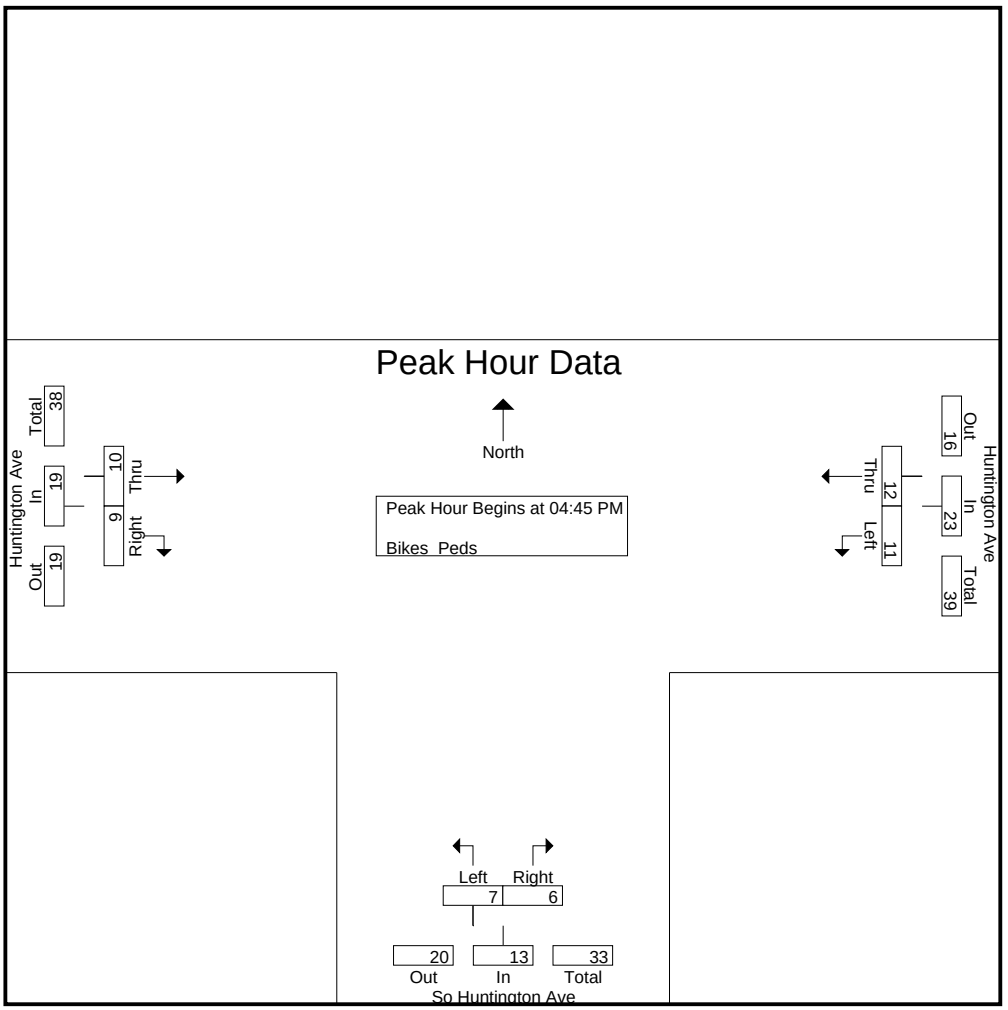
	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	2	28	0	1	18	1	3	5	51	8	59
04:15 PM	2	3	15	2	1	16	2	4	11	42	14	56
04:30 PM	2	0	21	3	1	18	0	1	7	46	7	53
04:45 PM	2	4	12	1	3	26	1	2	9	47	13	60
Total	7	9	76	6	6	78	4	10	32	186	42	228
05:00 PM	4	4	5	2	1	26	3	1	8	39	15	54
05:15 PM	3	1	30	2	1	19	4	2	15	64	13	77
05:30 PM	2	3	30	2	1	24	2	4	23	77	14	91
05:45 PM	1	4	18	0	0	22	1	3	5	45	9	54
Total	10	12	83	6	3	91	10	10	51	225	51	276
Grand Total	17	21	159	12	9	169	14	20	83	411	93	504
Apprch %	44.7	55.3		57.1	42.9		41.2	58.8				
Total %	18.3	22.6		12.9	9.7		15.1	21.5		81.5	18.5	

	Huntington Ave From East			So Huntington Ave From South			Huntington Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	2	**4**	6	1	**3**	**4**	1	2	3	13
05:00 PM	**4**	4	**8**	**2**	1	3	3	1	4	**15**
05:15 PM	3	1	4	2	1	3	**4**	2	**6**	13
05:30 PM	2	3	5	2	1	3	2	**4**	6	14
Total Volume	11	12	23	7	6	13	10	9	19	55
% App. Total	47.8	52.2		53.8	46.2		52.6	47.4		
PHF	.688	.750	.719	.875	.500	.813	.625	.563	.792	.917

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:15 PM			05:00 PM		
+0 mins.	2	**4**	6	2	1	3	3	1	4
+15 mins.	**4**	4	**8**	**3**	1	**4**	**4**	2	**6**
+30 mins.	3	1	4	1	**3**	4	2	**4**	6
+45 mins.	2	3	5	2	1	3	1	3	4
Total Volume	11	12	23	8	6	14	10	10	20
% App. Total	47.8	52.2		57.1	42.9		50	50	
PHF	.688	.750	.719	.667	.500	.875	.625	.625	.833

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Huntington Avenue
City/State : Boston, MA
Weather : Clear

File Name : 11066001
Site Code : 11066001
Start Date : 4/10/2012
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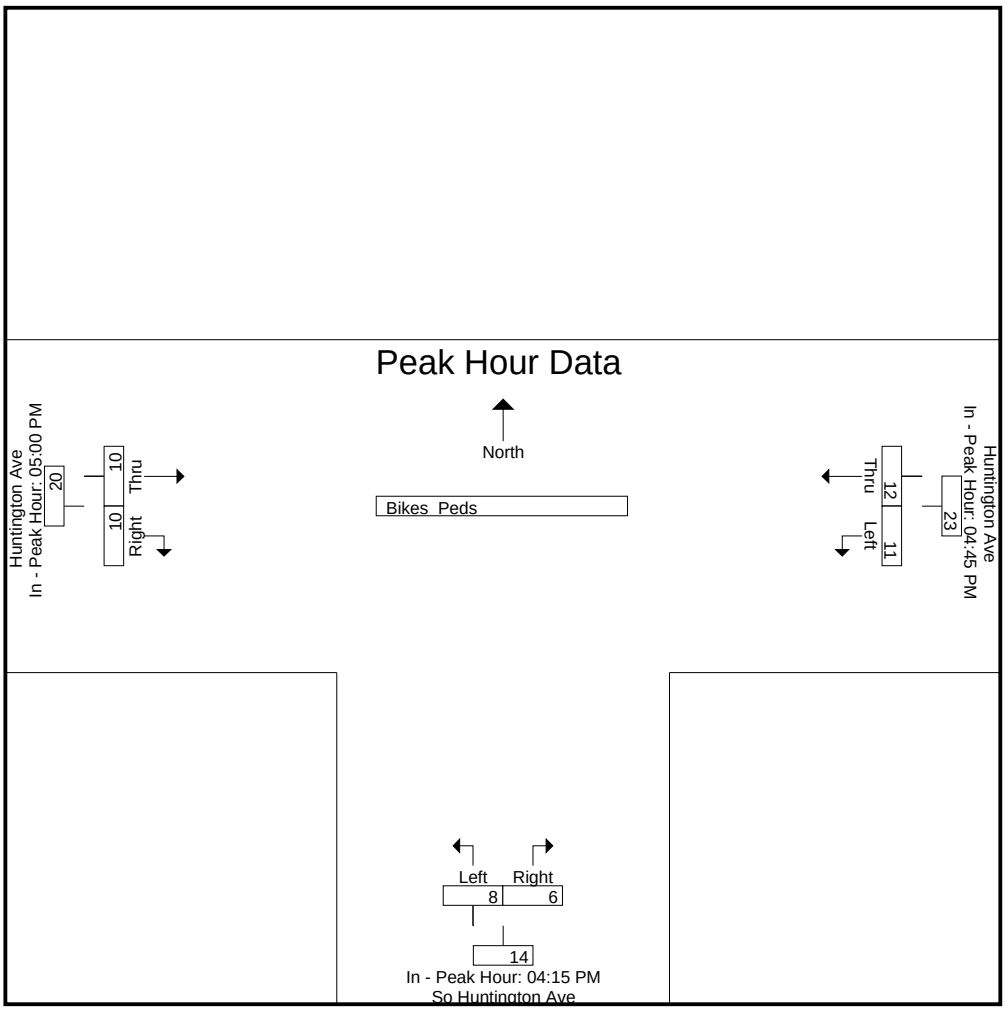


Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 1

Groups Printed- Cars - Trucks

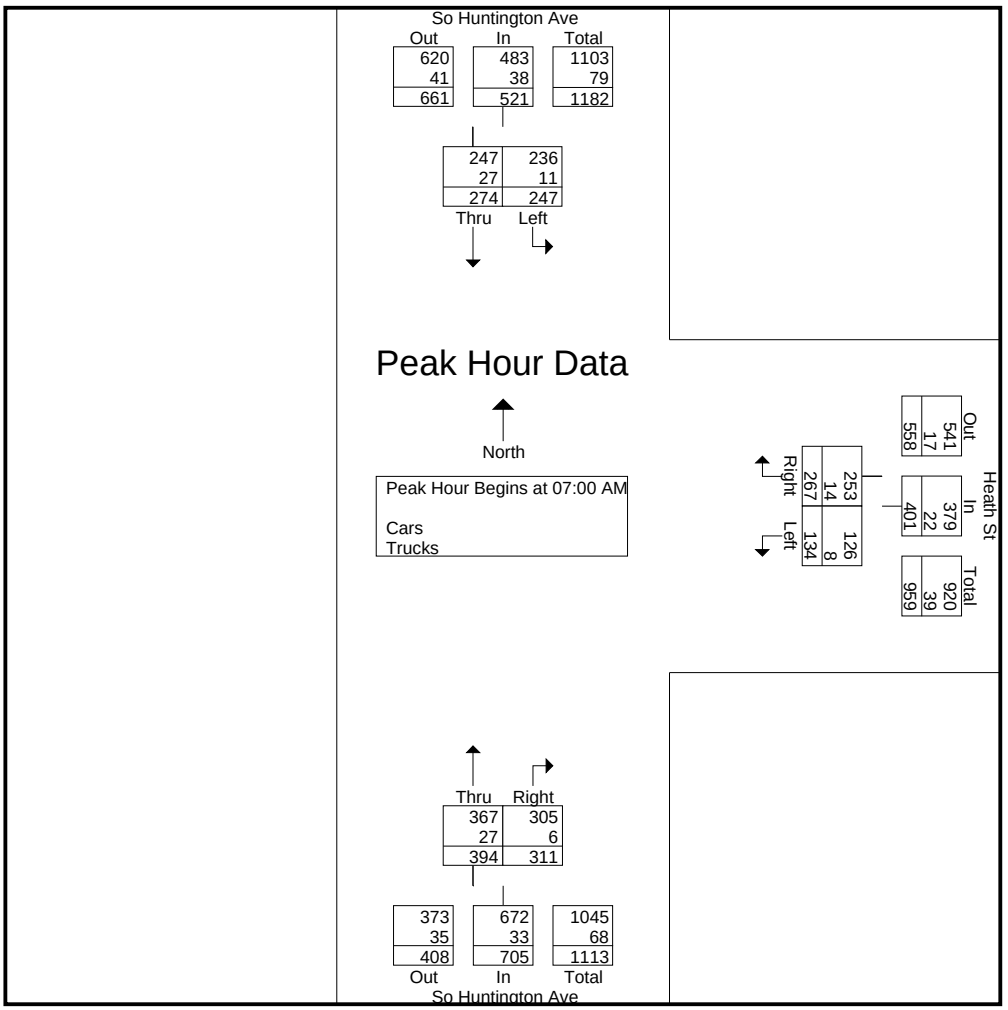
	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	73	68	34	63	94	84	416
07:15 AM	57	53	36	69	100	75	390
07:30 AM	73	82	34	65	98	76	428
07:45 AM	44	71	30	70	102	76	393
Total	247	274	134	267	394	311	1627
08:00 AM	49	57	31	56	98	55	346
08:15 AM	79	45	25	41	91	81	362
08:30 AM	68	54	30	60	81	108	401
08:45 AM	56	51	27	56	94	82	366
Total	252	207	113	213	364	326	1475
Grand Total	499	481	247	480	758	637	3102
Apprch %	50.9	49.1	34	66	54.3	45.7	
Total %	16.1	15.5	8	15.5	24.4	20.5	
Cars	475	432	233	456	703	626	2925
% Cars	95.2	89.8	94.3	95	92.7	98.3	94.3
Trucks	24	49	14	24	55	11	177
% Trucks	4.8	10.2	5.7	5	7.3	1.7	5.7

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**73**	68	141	34	63	97	94	**84**	**178**	416
07:15 AM	57	53	110	**36**	69	**105**	100	75	175	390
07:30 AM	73	**82**	**155**	34	65	99	98	76	174	**428**
07:45 AM	44	71	115	30	**70**	100	**102**	76	178	393
Total Volume	247	274	521	134	267	401	394	311	705	1627
% App. Total	47.4	52.6		33.4	66.6		55.9	44.1		
PHF	.846	.835	.840	.931	.954	.955	.966	.926	.990	.950
Cars	236	247	483	126	253	379	367	305	672	1534
% Cars	95.5	90.1	92.7	94.0	94.8	94.5	93.1	98.1	95.3	94.3
Trucks	11	27	38	8	14	22	27	6	33	93
% Trucks	4.5	9.9	7.3	6.0	5.2	5.5	6.9	1.9	4.7	5.7

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

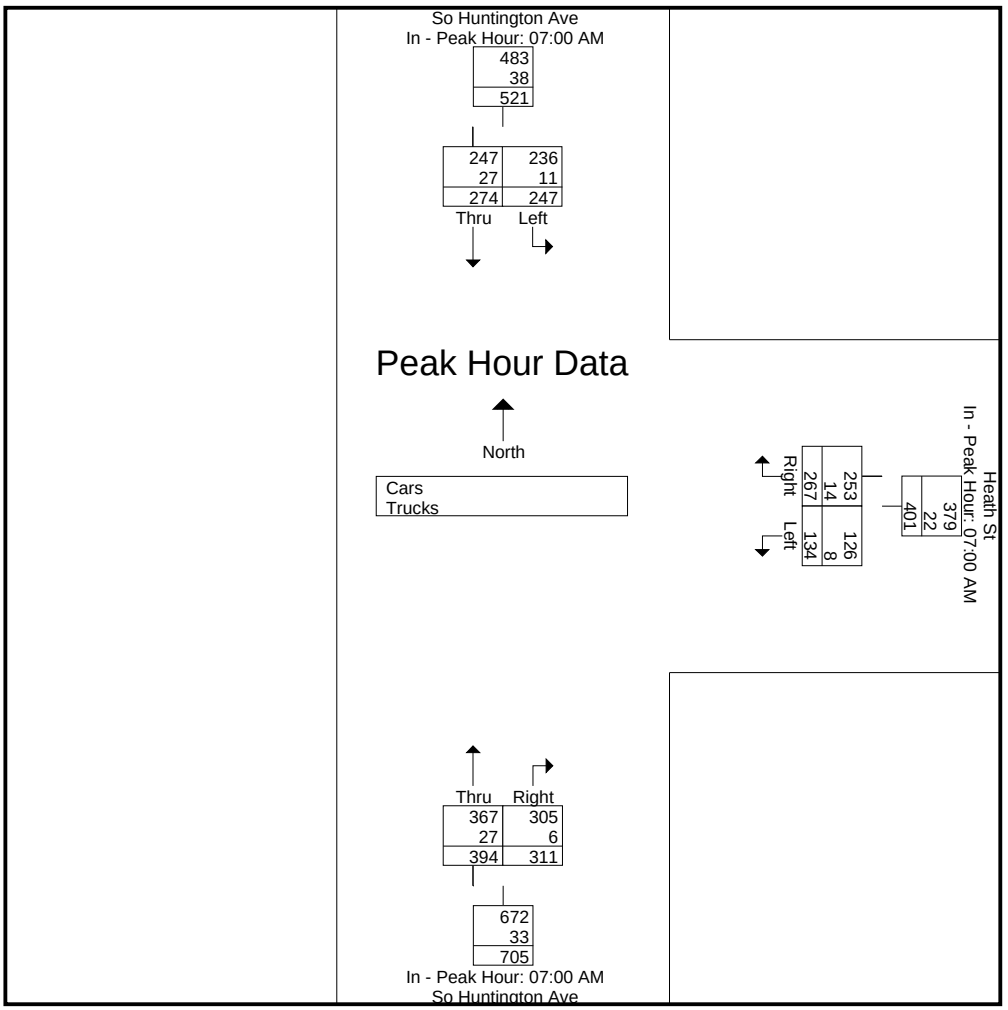
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	**73**	68	141	34	63	97	94	**84**	**178**
+15 mins.	57	53	110	**36**	69	**105**	100	75	175
+30 mins.	73	**82**	**155**	34	65	99	98	76	174
+45 mins.	44	71	115	30	**70**	100	**102**	76	178
Total Volume	247	274	521	134	267	401	394	311	705
% App. Total	47.4	52.6		33.4	66.6		55.9	44.1	
PHF	.846	.835	.840	.931	.954	.955	.966	.926	.990
Cars	236	247	483	126	253	379	367	305	672
% Cars	95.5	90.1	92.7	94	94.8	94.5	93.1	98.1	95.3
Trucks	11	27	38	8	14	22	27	6	33
% Trucks	4.5	9.9	7.3	6	5.2	5.5	6.9	1.9	4.7

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 1

Groups Printed- Cars

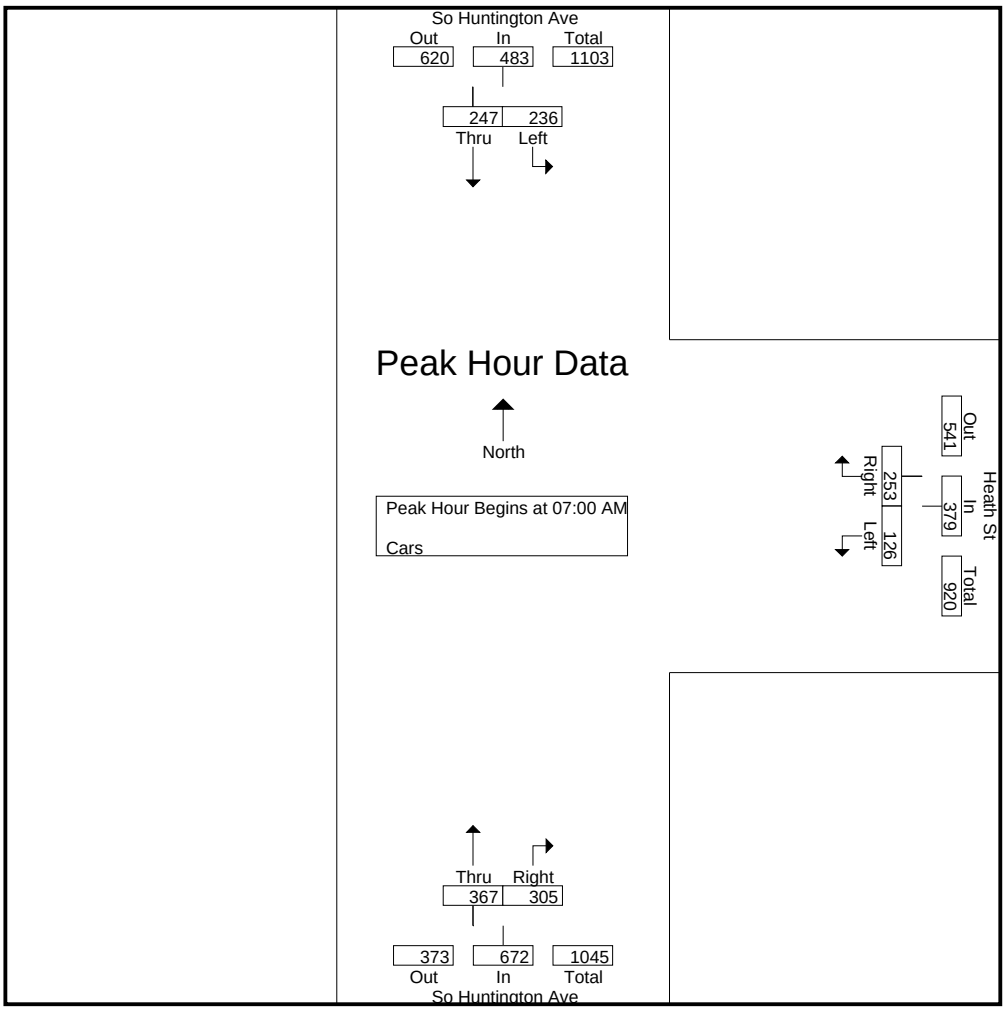
	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	72	60	32	58	85	81	388
07:15 AM	54	46	36	64	95	73	368
07:30 AM	66	76	32	63	92	75	404
07:45 AM	44	65	26	68	95	76	374
Total	236	247	126	253	367	305	1534
08:00 AM	47	51	29	52	91	55	325
08:15 AM	77	41	25	41	85	80	349
08:30 AM	64	46	30	57	73	105	375
08:45 AM	51	47	23	53	87	81	342
Total	239	185	107	203	336	321	1391
Grand Total	475	432	233	456	703	626	2925
Apprch %	52.4	47.6	33.8	66.2	52.9	47.1	
Total %	16.2	14.8	8	15.6	24	21.4	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**72**	60	132	32	58	90	85	**81**	166	388
07:15 AM	54	46	100	**36**	64	**100**	**95**	73	168	368
07:30 AM	66	**76**	**142**	32	63	95	92	75	167	**404**
07:45 AM	44	65	109	26	**68**	94	95	76	**171**	374
Total Volume	236	247	483	126	253	379	367	305	672	1534
% App. Total	48.9	51.1		33.2	66.8		54.6	45.4		
PHF	.819	.813	.850	.875	.930	.948	.966	.941	.982	.949

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

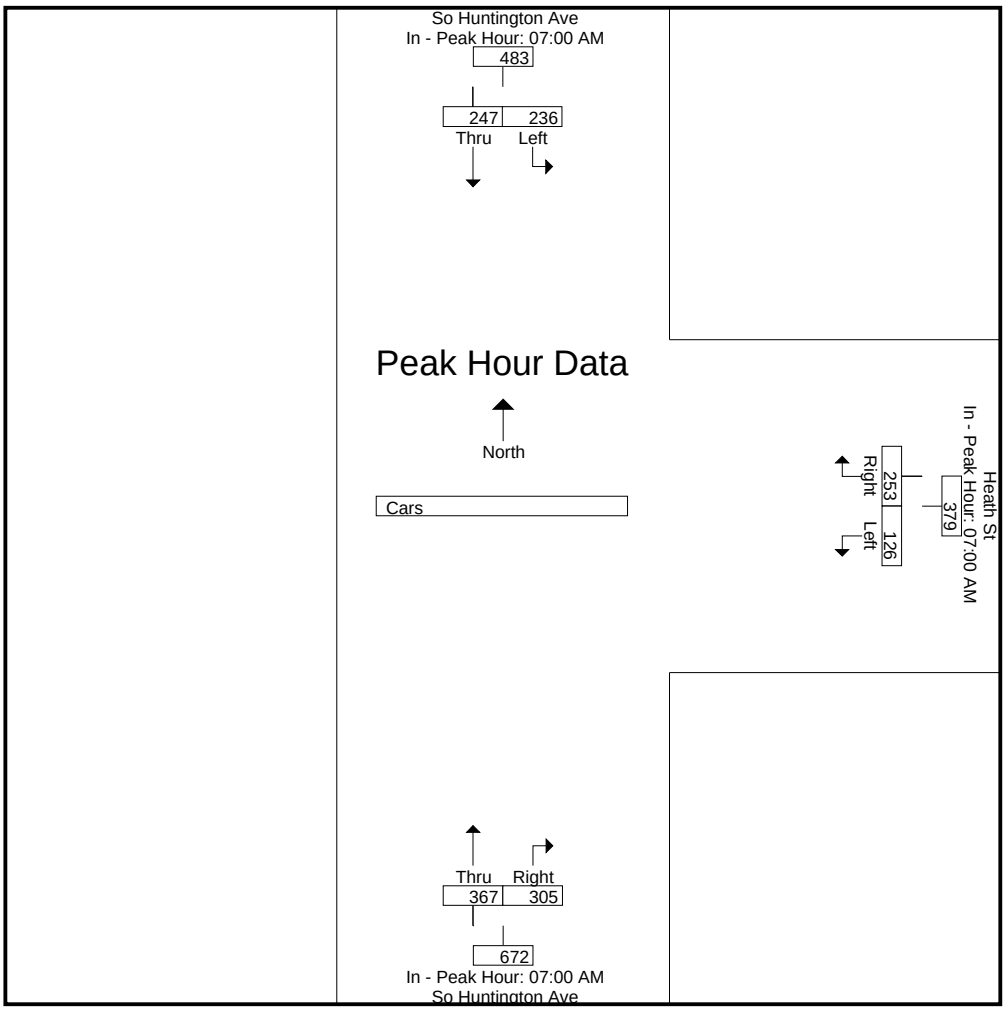
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	**72**	60	132	32	58	90	85	**81**	166
+15 mins.	54	46	100	**36**	64	**100**	**95**	73	168
+30 mins.	66	**76**	**142**	32	63	95	92	75	167
+45 mins.	44	65	109	26	**68**	94	95	76	**171**
Total Volume	236	247	483	126	253	379	367	305	672
% App. Total	48.9	51.1		33.2	66.8		54.6	45.4	
PHF	.819	.813	.850	.875	.930	.948	.966	.941	.982

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 1

Groups Printed- Trucks

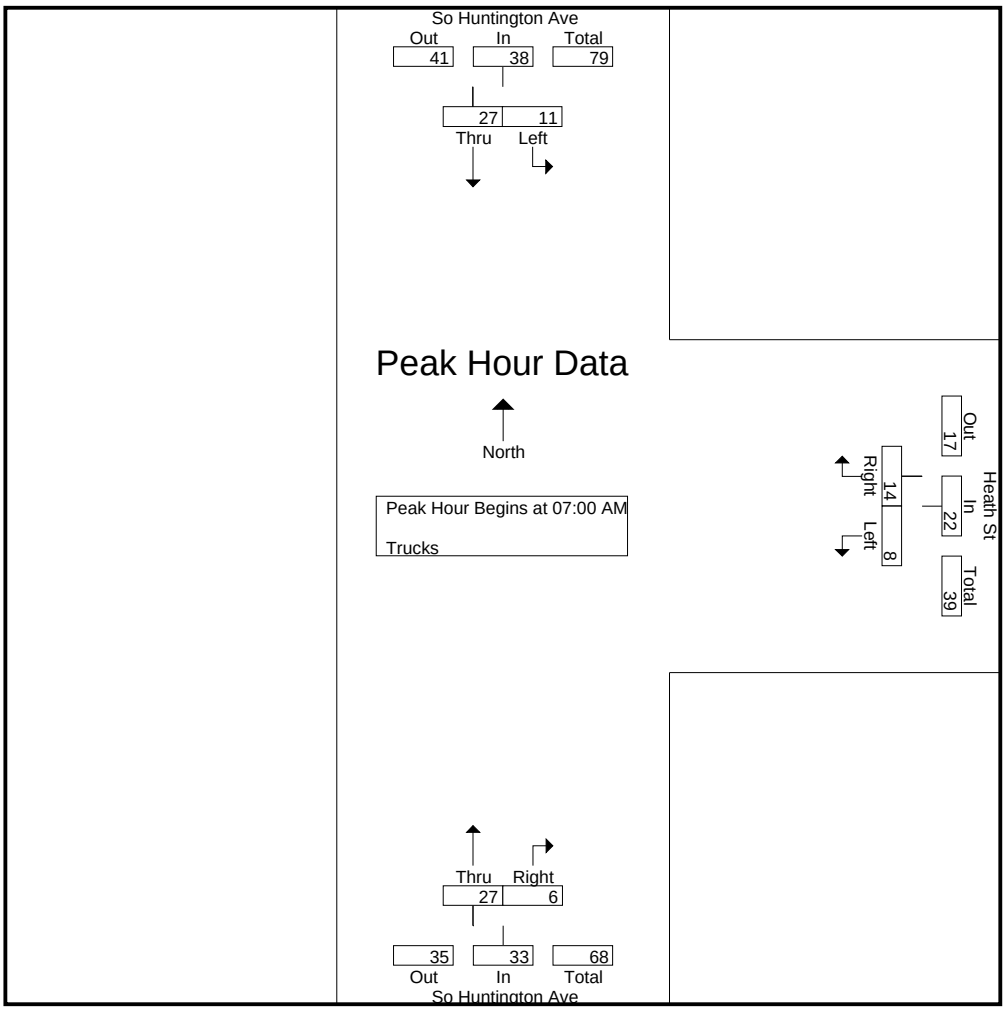
	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	8	2	5	9	3	28
07:15 AM	3	7	0	5	5	2	22
07:30 AM	7	6	2	2	6	1	24
07:45 AM	0	6	4	2	7	0	19
Total	11	27	8	14	27	6	93
08:00 AM	2	6	2	4	7	0	21
08:15 AM	2	4	0	0	6	1	13
08:30 AM	4	8	0	3	8	3	26
08:45 AM	5	4	4	3	7	1	24
Total	13	22	6	10	28	5	84
Grand Total	24	49	14	24	55	11	177
Apprch %	32.9	67.1	36.8	63.2	83.3	16.7	
Total %	13.6	27.7	7.9	13.6	31.1	6.2	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	1	**8**	9	2	**5**	**7**	**9**	**3**	**12**	**28**
07:15 AM	3	7	10	0	5	5	5	2	7	22
07:30 AM	**7**	6	**13**	2	2	4	6	1	7	24
07:45 AM	0	6	6	**4**	2	6	7	0	7	19
Total Volume	11	27	38	8	14	22	27	6	33	93
% App. Total	28.9	71.1		36.4	63.6		81.8	18.2		
PHF	.393	.844	.731	.500	.700	.786	.750	.500	.688	.830

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

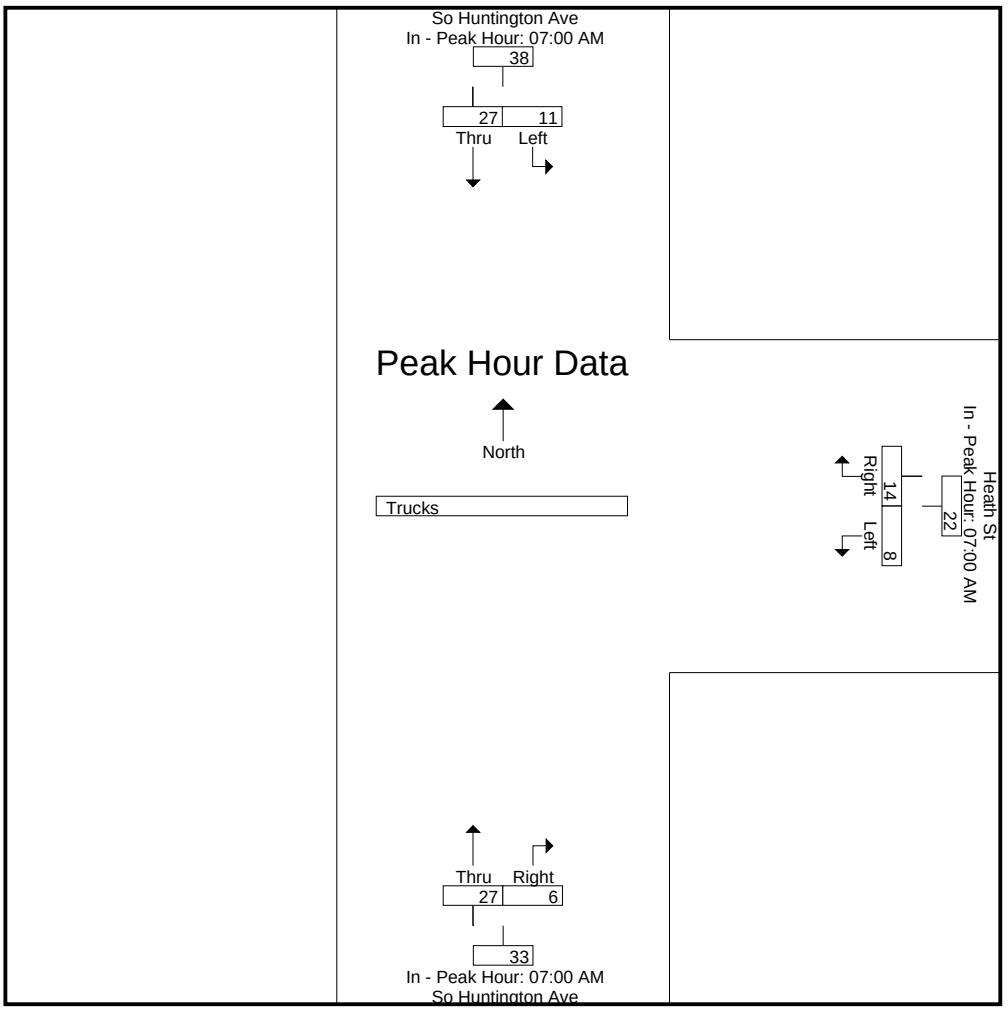
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	1	**8**	9	2	**5**	**7**	**9**	**3**	**12**
+15 mins.	3	7	10	0	5	5	5	2	7
+30 mins.	**7**	6	**13**	2	2	4	6	1	7
+45 mins.	0	6	6	**4**	2	6	7	0	7
Total Volume	11	27	38	8	14	22	27	6	33
% App. Total	28.9	71.1		36.4	63.6		81.8	18.2	
PHF	.393	.844	.731	.500	.700	.786	.750	.500	.688

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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Groups Printed- Trains

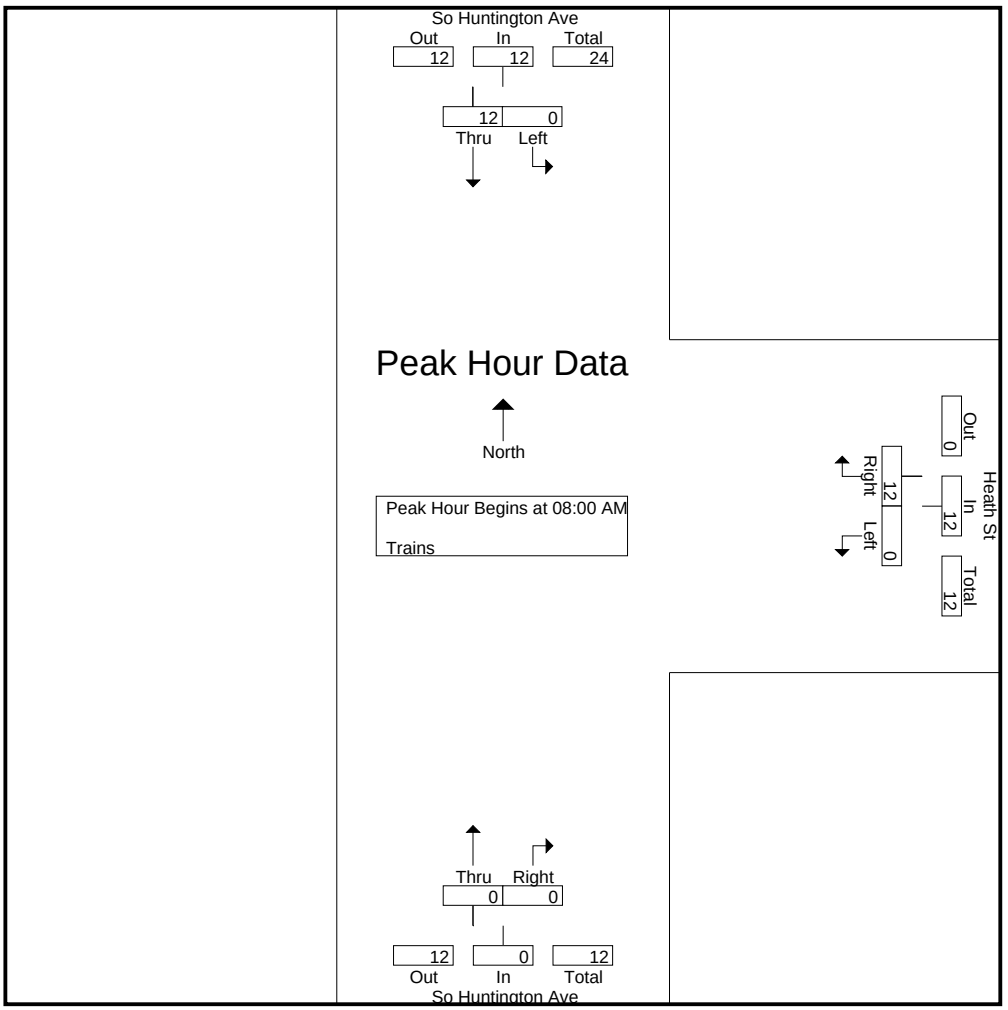
	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	4	0	5	0	0	9
07:15 AM	0	2	0	2	0	0	4
07:30 AM	0	3	0	1	0	0	4
07:45 AM	0	2	0	2	0	0	4
Total	0	11	0	10	0	0	21
08:00 AM	0	2	0	1	0	0	3
08:15 AM	0	4	0	5	0	0	9
08:30 AM	0	3	0	3	0	0	6
08:45 AM	0	3	0	3	0	0	6
Total	0	12	0	12	0	0	24
Grand Total	0	23	0	22	0	0	45
Apprch %	0	100	0	100	0	0	
Total %	0	51.1	0	48.9	0	0	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	2	2	0	1	1	0	0	0	3
08:15 AM	0	**4**	**4**	0	**5**	**5**	0	0	0	**9**
08:30 AM	0	3	3	0	3	3	0	0	0	6
08:45 AM	0	3	3	0	3	3	0	0	0	6
Total Volume	0	12	12	0	12	12	0	0	0	24
% App. Total	0	100		0	100		0	0		
PHF	.000	.750	.750	.000	.600	.600	.000	.000	.000	.667

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			08:00 AM			07:00 AM		
+0 mins.	0	2	2	0	1	1	0	0	0
+15 mins.	0	**4**	**4**	0	**5**	**5**	0	0	0
+30 mins.	0	3	3	0	3	3	0	0	0
+45 mins.	0	3	3	0	3	3	0	0	0
Total Volume	0	12	12	0	12	12	0	0	0
% App. Total	0	100		0	100		0	0	
PHF	.000	.750	.750	.000	.600	.600	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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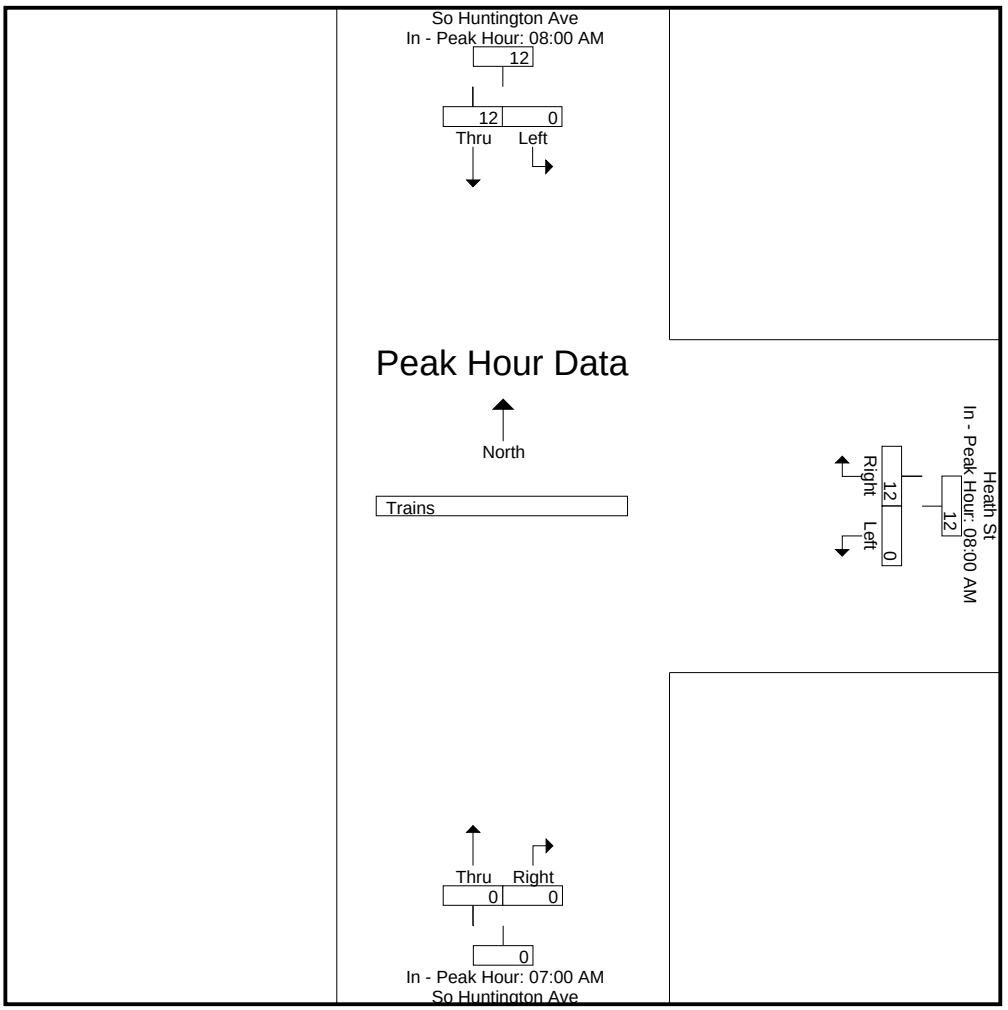

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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Groups Printed- Bikes Peds

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	0	0	0	3	1	0	0	5	5
07:15 AM	1	1	0	0	2	3	2	0	1	4	6	10
07:30 AM	0	1	1	0	0	8	5	0	0	9	6	15
07:45 AM	0	0	0	0	2	7	8	0	0	7	10	17
Total	1	3	1	0	4	18	18	1	1	20	27	47
08:00 AM	1	0	0	0	0	8	8	0	0	8	9	17
08:15 AM	1	0	0	0	4	10	4	0	0	10	9	19
08:30 AM	0	2	0	0	0	3	10	0	0	3	12	15
08:45 AM	1	3	0	0	2	7	8	0	0	7	14	21
Total	3	5	0	0	6	28	30	0	0	28	44	72
Grand Total	4	8	1	0	10	46	48	1	1	48	71	119
Apprch %	33.3	66.7		0	100		98	2				
Total %	5.6	11.3		0	14.1		67.6	1.4		40.3	59.7	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**1**	0	1	0	0	0	8	0	8	9
08:15 AM	1	0	1	0	**4**	**4**	4	0	4	9
08:30 AM	0	2	2	0	0	0	**10**	0	**10**	12
08:45 AM	1	**3**	**4**	0	2	2	8	0	8	**14**
Total Volume	3	5	8	0	6	6	30	0	30	44
% App. Total	37.5	62.5		0	100		100	0		
PHF	.750	.417	.500	.000	.375	.375	.750	.000	.750	.786

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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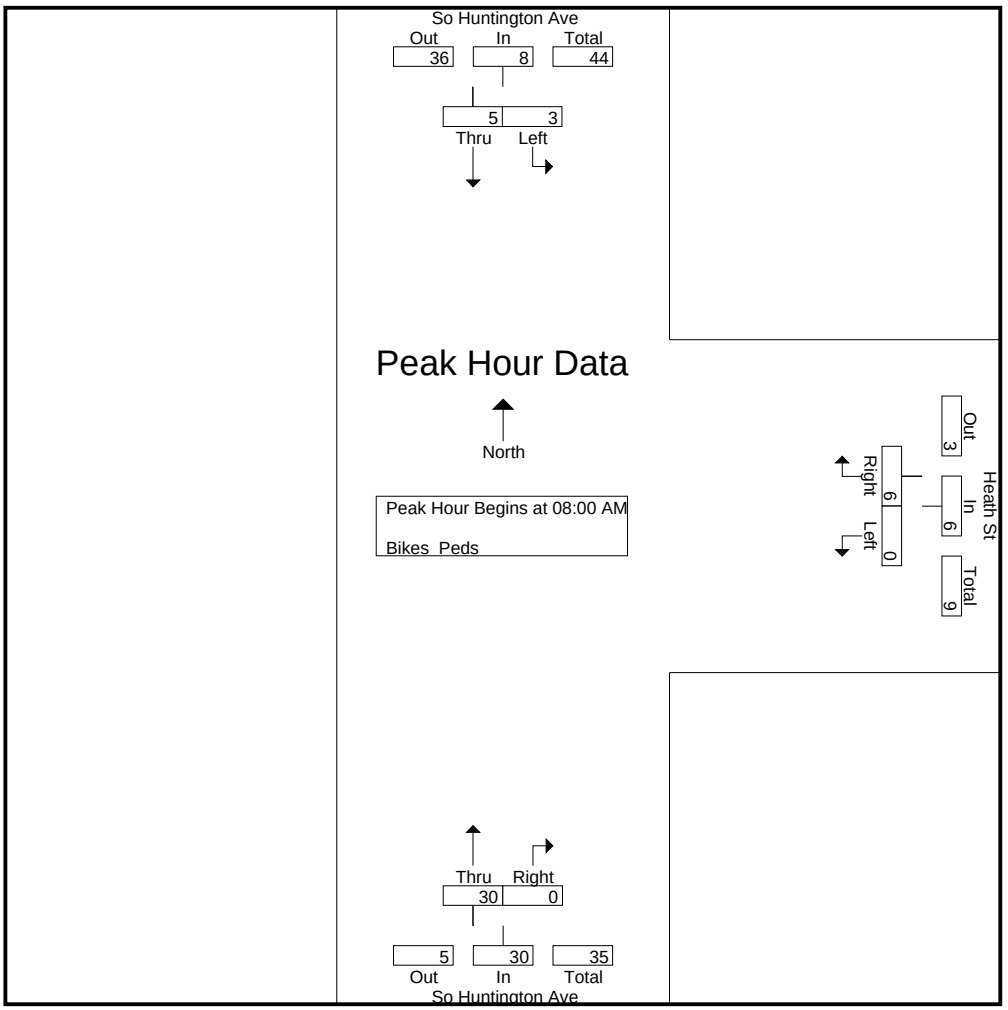

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM			07:30 AM			07:45 AM		
+0 mins.	**1**	0	1	0	0	0	8	0	8
+15 mins.	1	0	1	0	2	2	8	0	8
+30 mins.	0	2	2	0	0	0	4	0	4
+45 mins.	1	**3**	**4**	0	**4**	**4**	**10**	0	**10**
Total Volume	3	5	8	0	6	6	30	0	30
% App. Total	37.5	62.5		0	100		100	0	
PHF	.750	.417	.500	.000	.375	.375	.750	.000	.750

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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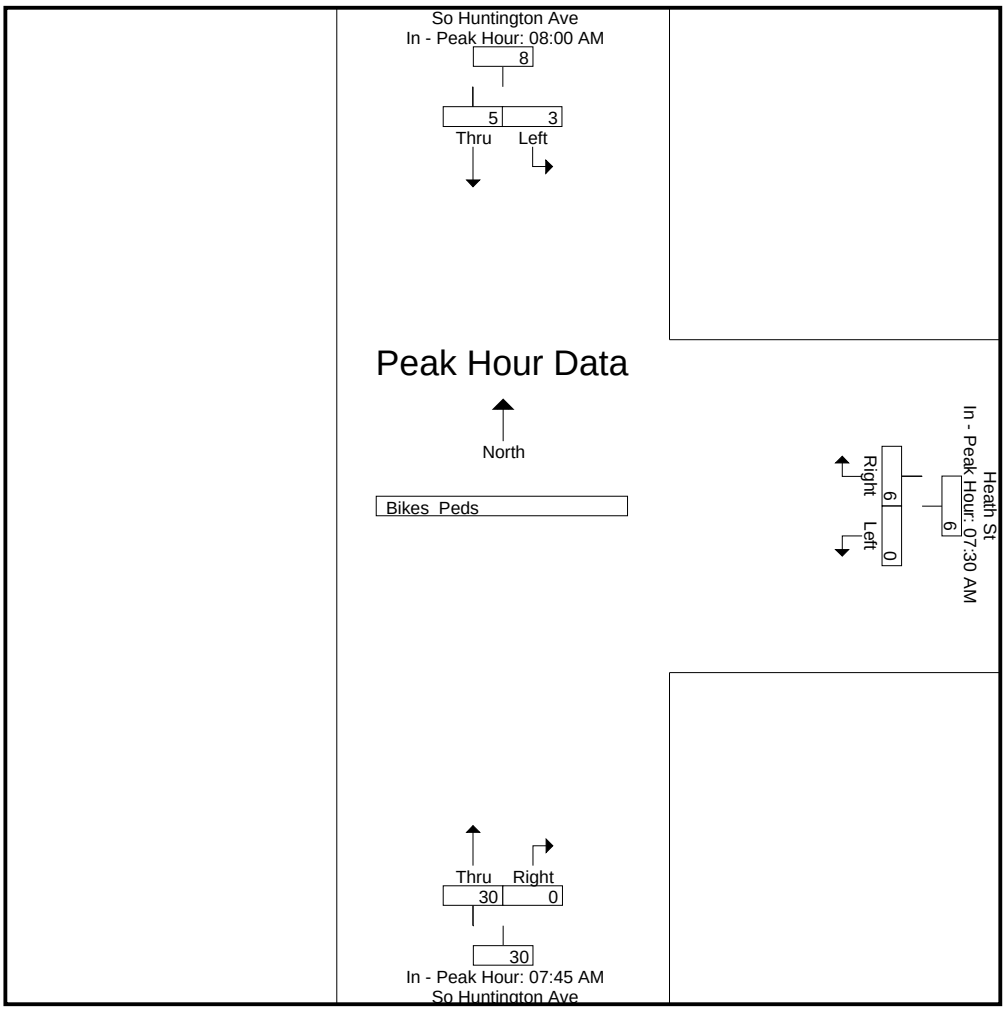

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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Groups Printed- Cars - Trucks

	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	83	82	48	51	92	41	397
04:15 PM	63	73	59	54	86	31	366
04:30 PM	61	66	54	53	60	25	319
04:45 PM	55	73	50	57	58	27	320
Total	262	294	211	215	296	124	1402
05:00 PM	77	79	35	46	65	23	325
05:15 PM	101	79	52	59	59	26	376
05:30 PM	83	84	43	50	73	37	370
05:45 PM	57	81	38	51	63	24	314
Total	318	323	168	206	260	110	1385
Grand Total	580	617	379	421	556	234	2787
Apprch %	48.5	51.5	47.4	52.6	70.4	29.6	
Total %	20.8	22.1	13.6	15.1	19.9	8.4	
Cars	564	596	373	412	535	227	2707
% Cars	97.2	96.6	98.4	97.9	96.2	97	97.1
Trucks	16	21	6	9	21	7	80
% Trucks	2.8	3.4	1.6	2.1	3.8	3	2.9

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**83**	**82**	**165**	48	51	99	**92**	**41**	**133**	**397**
04:15 PM	63	73	136	**59**	54	**113**	86	31	117	366
04:30 PM	61	66	127	54	53	107	60	25	85	319
04:45 PM	55	73	128	50	**57**	107	58	27	85	320
Total Volume	262	294	556	211	215	426	296	124	420	1402
% App. Total	47.1	52.9		49.5	50.5		70.5	29.5		
PHF	.789	.896	.842	.894	.943	.942	.804	.756	.789	.883
Cars	252	285	537	207	209	416	286	120	406	1359
% Cars	96.2	96.9	96.6	98.1	97.2	97.7	96.6	96.8	96.7	96.9
Trucks	10	9	19	4	6	10	10	4	14	43
% Trucks	3.8	3.1	3.4	1.9	2.8	2.3	3.4	3.2	3.3	3.1

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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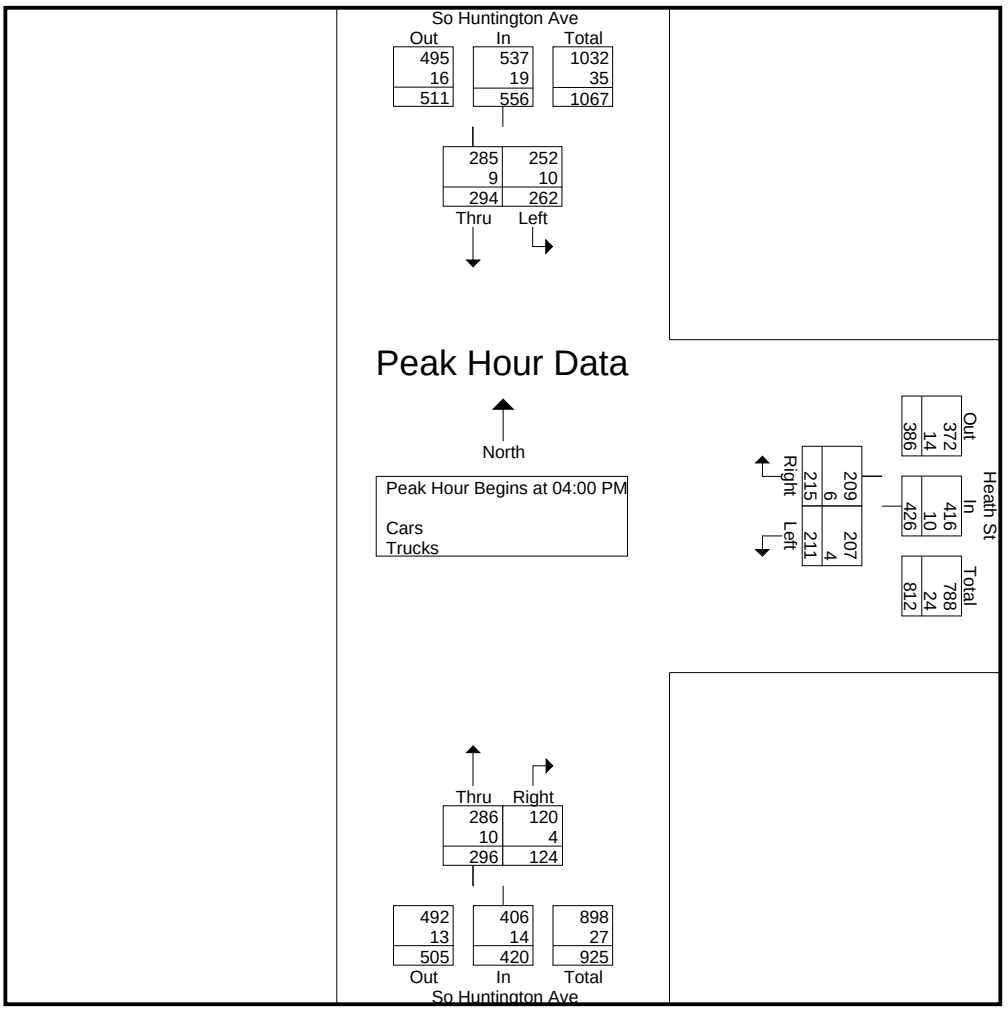

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			04:00 PM		
+0 mins.	77	79	156	48	51	99	**92**	**41**	**133**
+15 mins.	**101**	79	**180**	**59**	54	**113**	86	31	117
+30 mins.	83	**84**	167	54	53	107	60	25	85
+45 mins.	57	81	138	50	**57**	107	58	27	85
Total Volume	318	323	641	211	215	426	296	124	420
% App. Total	49.6	50.4		49.5	50.5		70.5	29.5	
PHF	.787	.961	.890	.894	.943	.942	.804	.756	.789
Cars	312	311	623	207	209	416	286	120	406
% Cars	98.1	96.3	97.2	98.1	97.2	97.7	96.6	96.8	96.7
Trucks	6	12	18	4	6	10	10	4	14
% Trucks	1.9	3.7	2.8	1.9	2.8	2.3	3.4	3.2	3.3

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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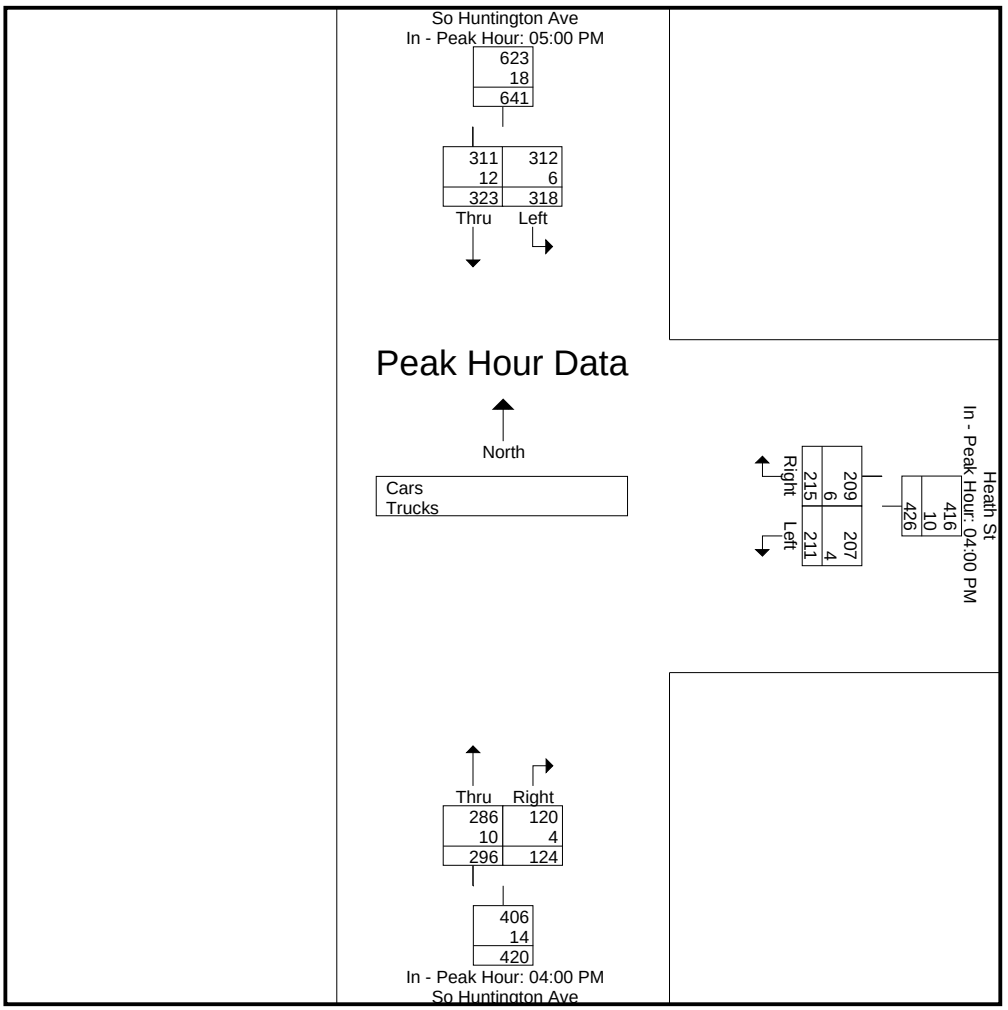

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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Groups Printed- Cars

	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	79	80	48	51	90	40	388
04:15 PM	60	71	59	53	83	31	357
04:30 PM	59	63	51	48	58	23	302
04:45 PM	54	71	49	57	55	26	312
Total	252	285	207	209	286	120	1359
05:00 PM	76	77	35	45	63	22	318
05:15 PM	97	77	51	59	56	26	366
05:30 PM	82	78	43	48	70	35	356
05:45 PM	57	79	37	51	60	24	308
Total	312	311	166	203	249	107	1348
Grand Total	564	596	373	412	535	227	2707
Apprch %	48.6	51.4	47.5	52.5	70.2	29.8	
Total %	20.8	22	13.8	15.2	19.8	8.4	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**79**	**80**	**159**	48	51	99	**90**	**40**	**130**	**388**
04:15 PM	60	71	131	**59**	53	**112**	83	31	114	357
04:30 PM	59	63	122	51	48	99	58	23	81	302
04:45 PM	54	71	125	49	**57**	106	55	26	81	312
Total Volume	252	285	537	207	209	416	286	120	406	1359
% App. Total	46.9	53.1		49.8	50.2		70.4	29.6		
PHF	.797	.891	.844	.877	.917	.929	.794	.750	.781	.876

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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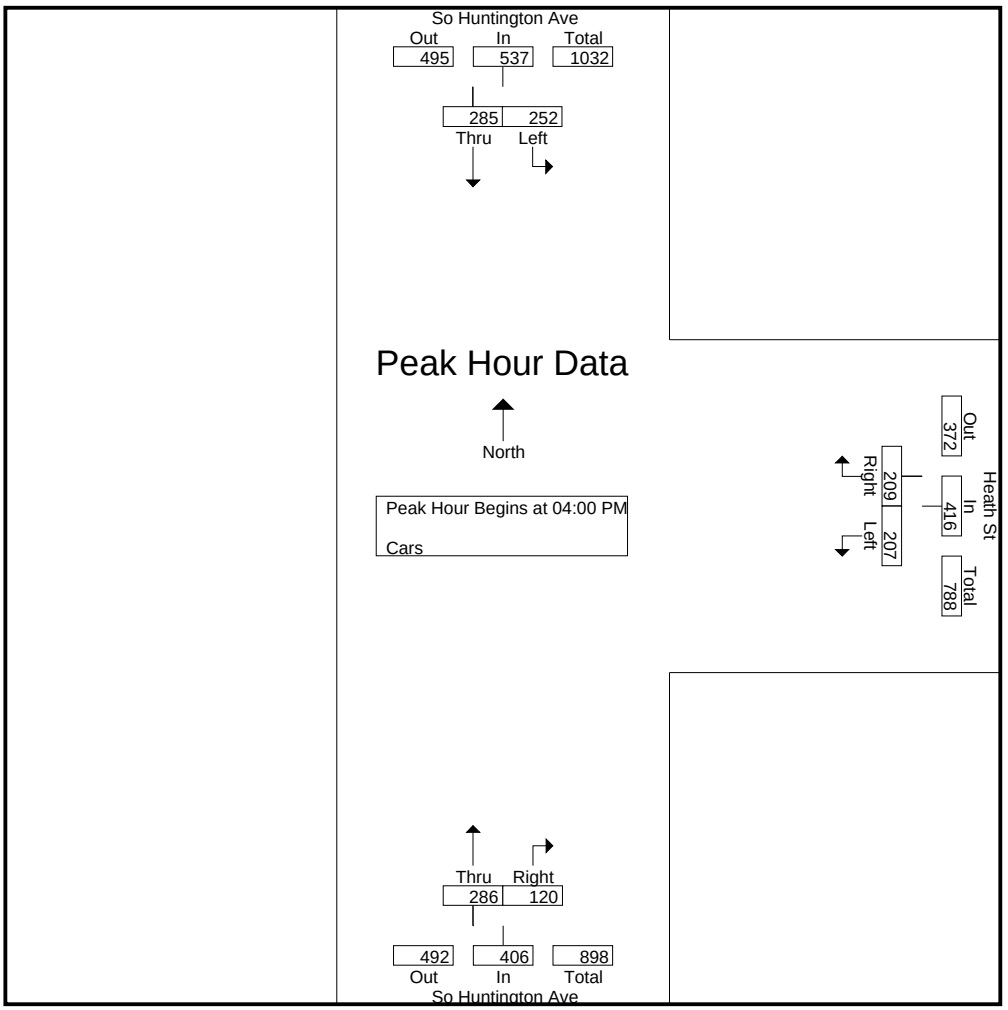

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			04:00 PM		
+0 mins.	76	77	153	48	51	99	**90**	**40**	**130**
+15 mins.	**97**	77	**174**	**59**	53	**112**	83	31	114
+30 mins.	82	78	160	51	48	99	58	23	81
+45 mins.	57	**79**	136	49	**57**	106	55	26	81
Total Volume	312	311	623	207	209	416	286	120	406
% App. Total	50.1	49.9		49.8	50.2		70.4	29.6	
PHF	.804	.984	.895	.877	.917	.929	.794	.750	.781

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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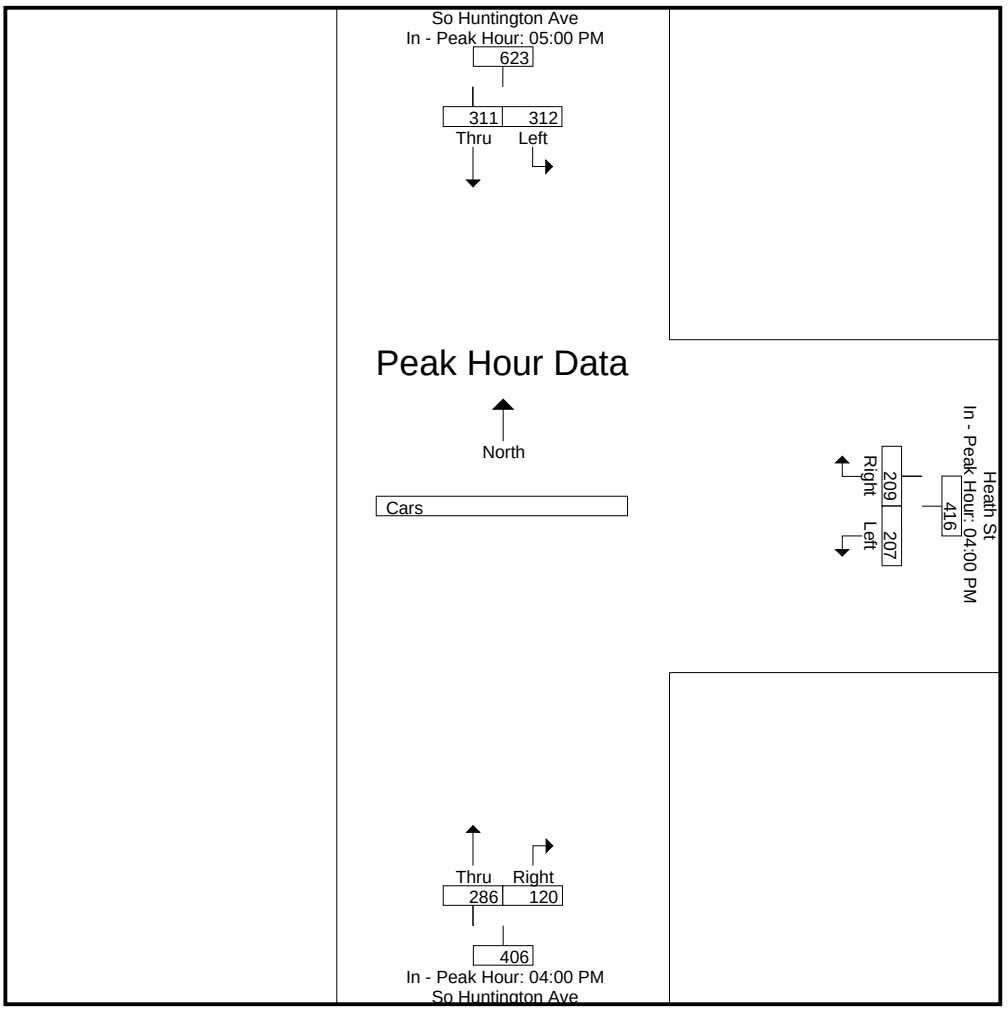

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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Groups Printed- Trucks

	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	4	2	0	0	2	1	9
04:15 PM	3	2	0	1	3	0	9
04:30 PM	2	3	3	5	2	2	17
04:45 PM	1	2	1	0	3	1	8
Total	10	9	4	6	10	4	43
05:00 PM	1	2	0	1	2	1	7
05:15 PM	4	2	1	0	3	0	10
05:30 PM	1	6	0	2	3	2	14
05:45 PM	0	2	1	0	3	0	6
Total	6	12	2	3	11	3	37
Grand Total	16	21	6	9	21	7	80
Apprch %	43.2	56.8	40	60	75	25	
Total %	20	26.2	7.5	11.2	26.2	8.8	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**4**	2	**6**	0	0	0	2	1	3	9
04:15 PM	3	2	5	0	1	1	**3**	0	3	9
04:30 PM	2	**3**	5	**3**	**5**	**8**	2	**2**	**4**	**17**
04:45 PM	1	2	3	1	0	1	3	1	4	8
Total Volume	10	9	19	4	6	10	10	4	14	43
% App. Total	52.6	47.4		40	60		71.4	28.6		
PHF	.625	.750	.792	.333	.300	.313	.833	.500	.875	.632

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
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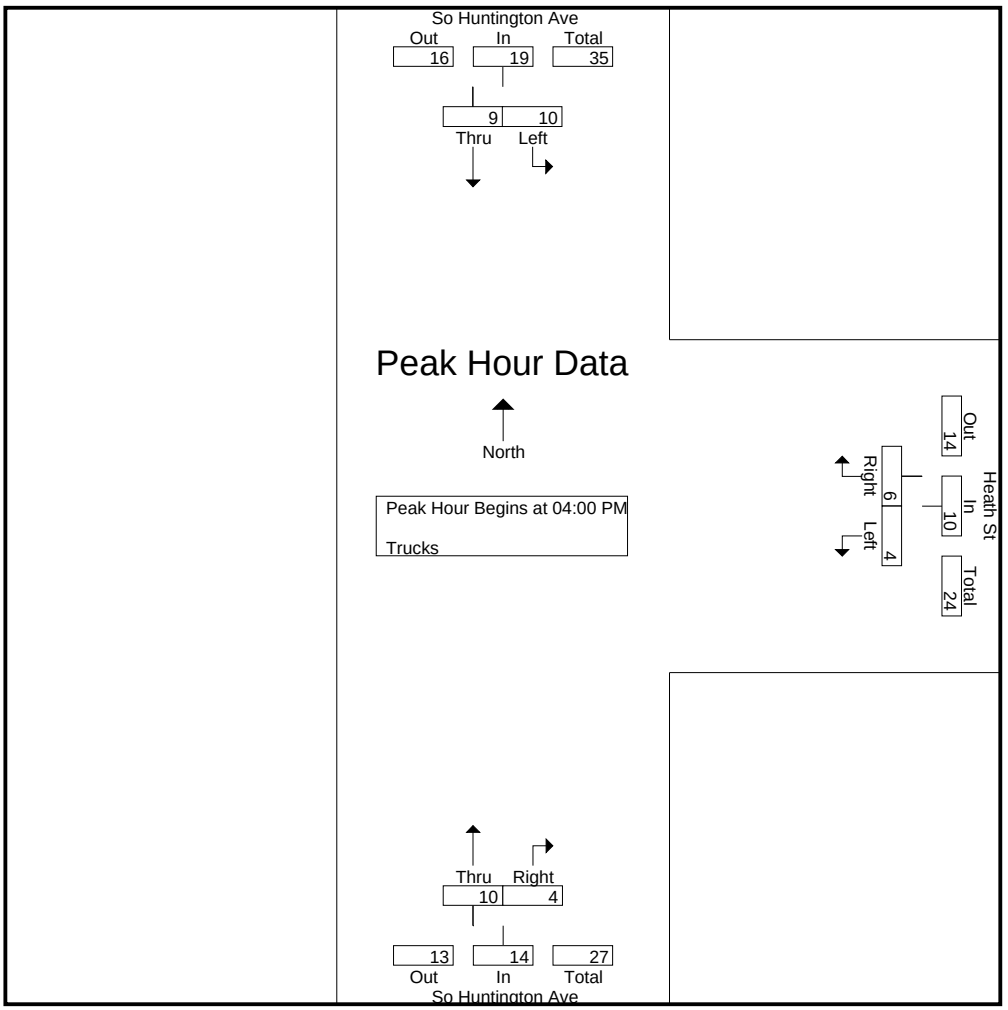


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

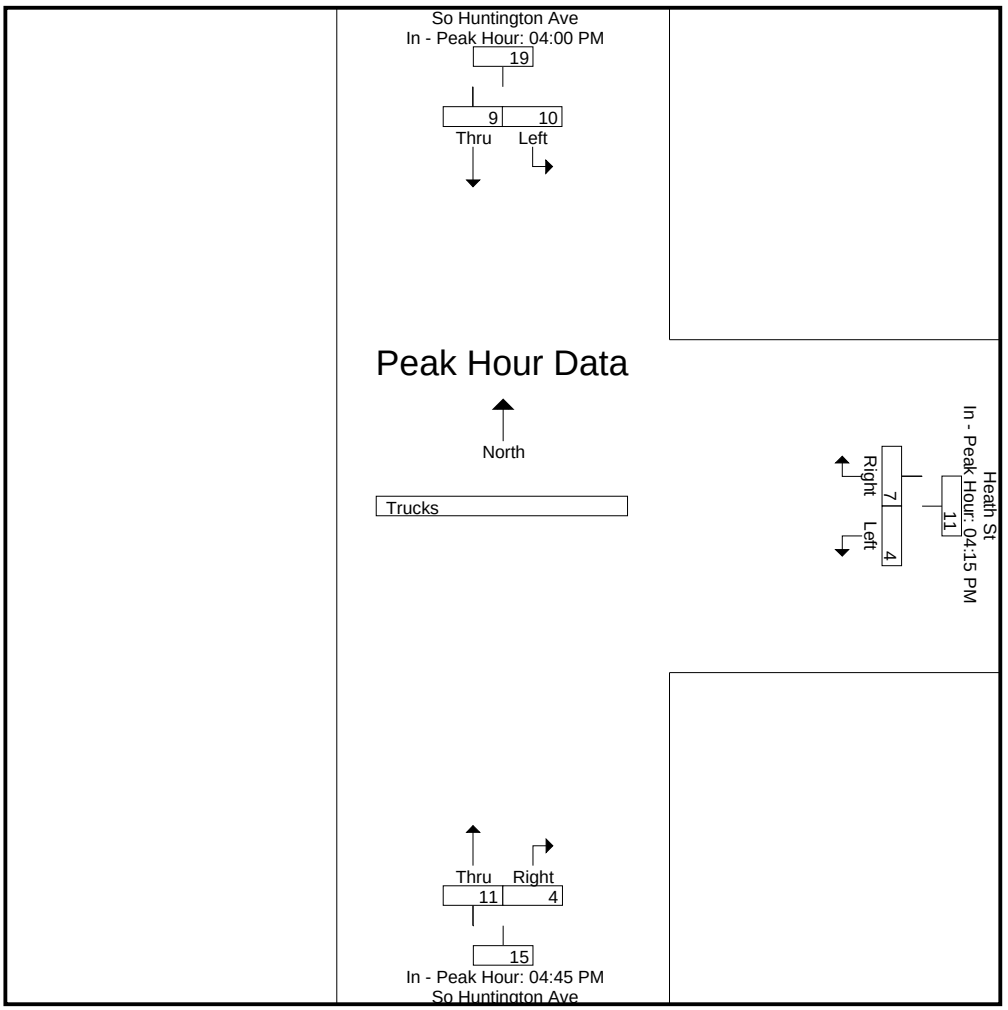
Peak Hour for Each Approach Begins at:

	04:00 PM			04:15 PM			04:45 PM		
+0 mins.	**4**	2	**6**	0	1	1	**3**	1	4
+15 mins.	3	2	5	**3**	**5**	**8**	2	1	3
+30 mins.	2	**3**	5	1	0	1	3	0	3
+45 mins.	1	2	3	0	1	1	3	**2**	**5**
Total Volume	10	9	19	4	7	11	11	4	15
% App. Total	52.6	47.4		36.4	63.6		73.3	26.7	
PHF	.625	.750	.792	.333	.350	.344	.917	.500	.750

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 1

Groups Printed- Trains

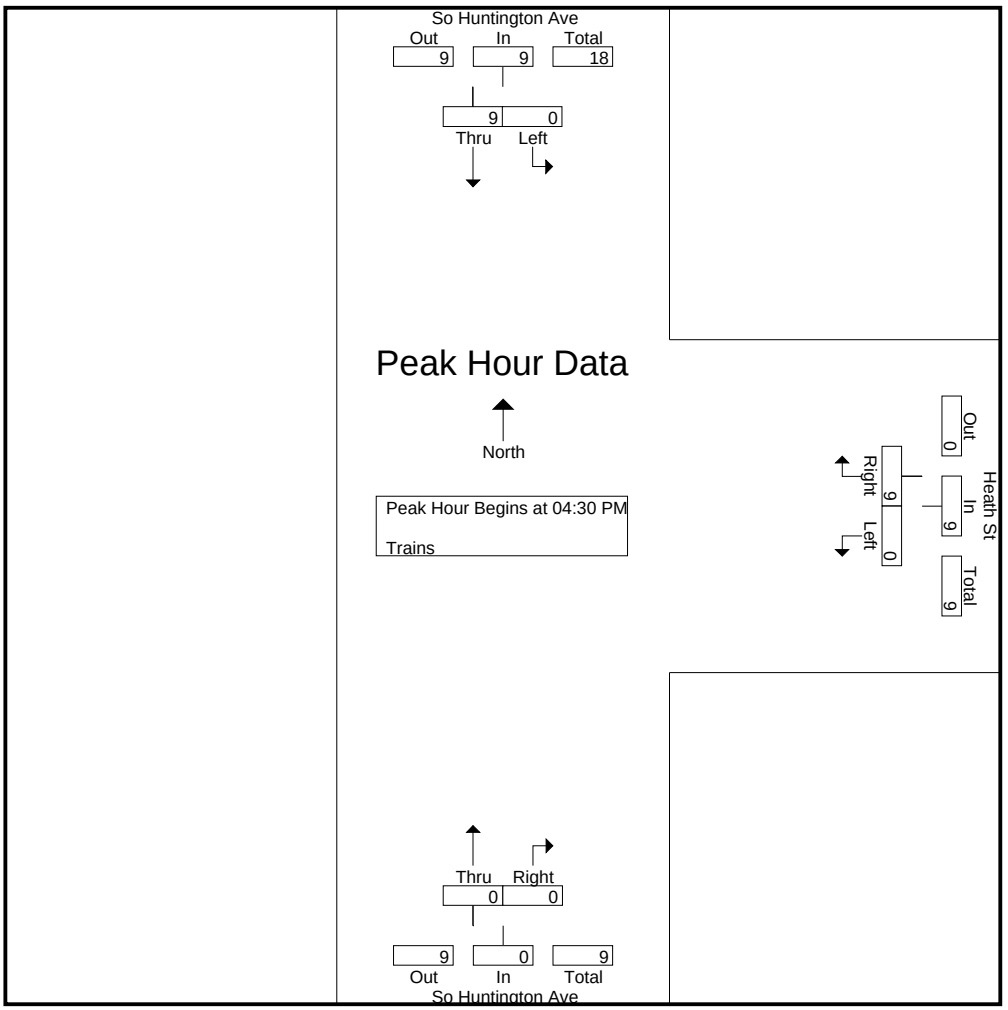
	So Huntington Ave From North		Heath St From East		So Huntington Ave From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	1	0	0	1
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	5	0	5	0	0	10
04:45 PM	0	3	0	2	0	0	5
Total	0	8	0	8	0	0	16
05:00 PM	0	0	0	2	0	0	2
05:15 PM	0	1	0	0	0	0	1
05:30 PM	0	1	0	2	0	0	3
05:45 PM	0	2	0	2	0	0	4
Total	0	4	0	6	0	0	10
Grand Total	0	12	0	14	0	0	26
Apprch %	0	100	0	100	0	0	
Total %	0	46.2	0	53.8	0	0	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	**5**	**5**	0	**5**	**5**	0	0	0	**10**
04:45 PM	0	3	3	0	2	2	0	0	0	5
05:00 PM	0	0	0	0	2	2	0	0	0	2
05:15 PM	0	1	1	0	0	0	0	0	0	1
Total Volume	0	9	9	0	9	9	0	0	0	18
% App. Total	0	100		0	100		0	0		
PHF	.000	.450	.450	.000	.450	.450	.000	.000	.000	.450

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

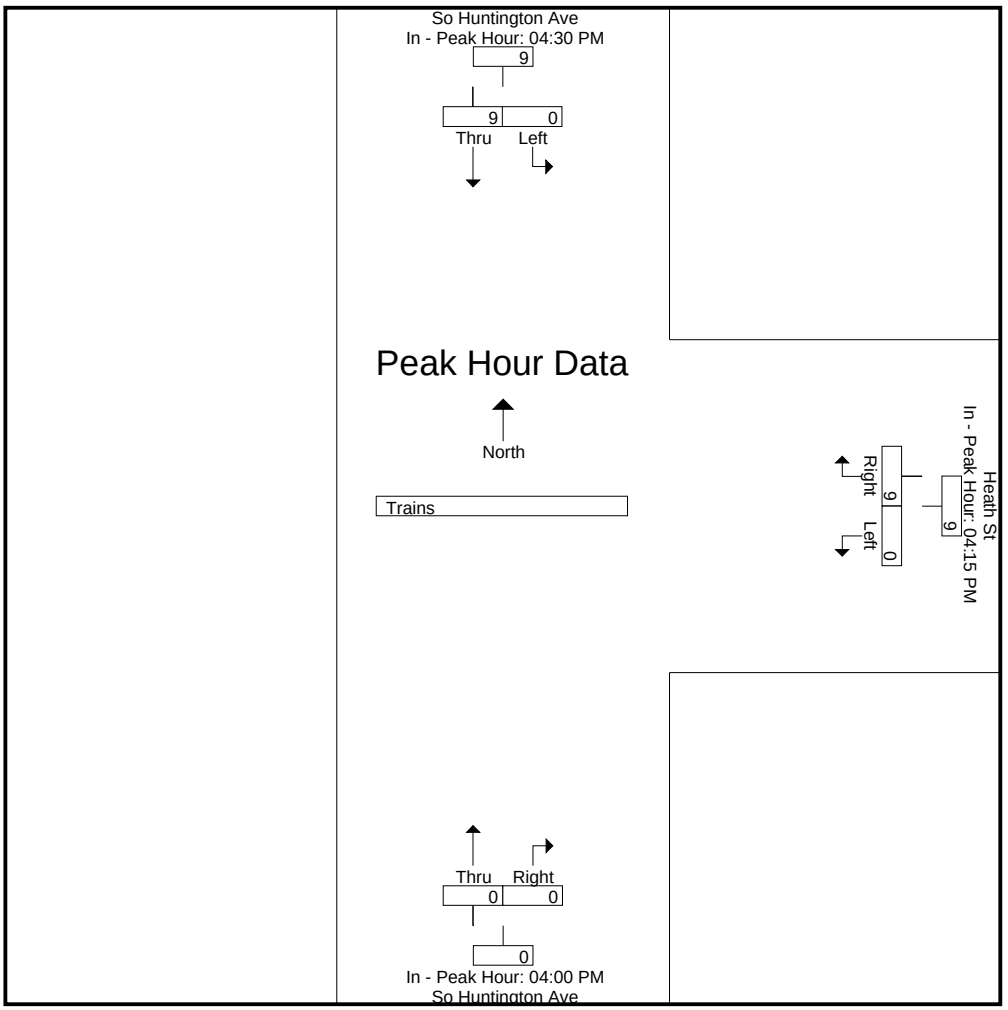
Peak Hour for Each Approach Begins at:

	04:30 PM			04:15 PM			04:00 PM		
+0 mins.	0	**5**	**5**	0	0	0	0	0	0
+15 mins.	0	3	3	0	**5**	**5**	0	0	0
+30 mins.	0	0	0	0	2	2	0	0	0
+45 mins.	0	1	1	0	2	2	0	0	0
Total Volume	0	9	9	0	9	9	0	0	0
% App. Total	0	100		0	100		0	0	
PHF	.000	.450	.450	.000	.450	.450	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012

Groups Printed- Bikes Peds

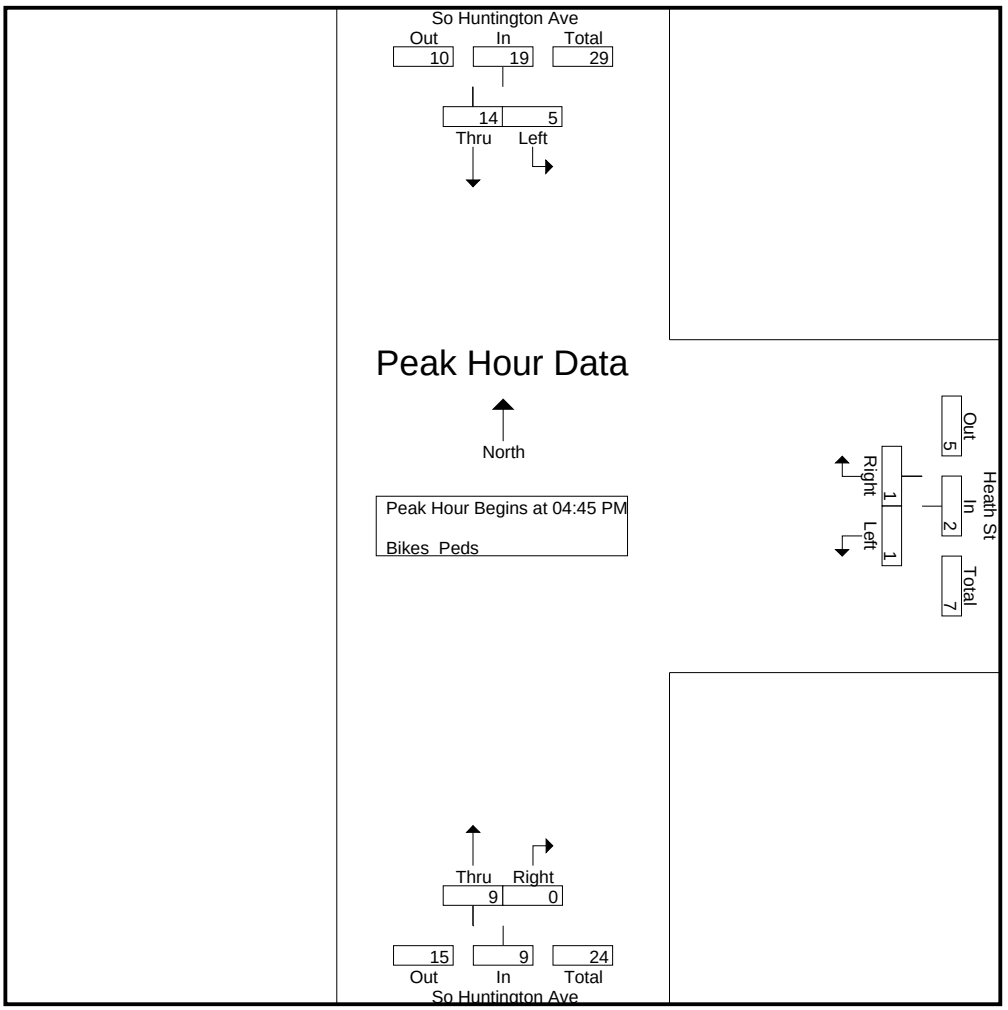
	So Huntington Ave From North			Heath St From East			So Huntington Ave From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	3	0	0	1	7	2	0	0	7	7	14
04:15 PM	0	3	0	1	0	10	2	0	0	10	6	16
04:30 PM	0	3	0	0	0	4	2	0	0	4	5	9
04:45 PM	2	2	0	1	0	4	2	0	0	4	7	11
Total	3	11	0	2	1	25	8	0	0	25	25	50
05:00 PM	1	2	0	0	1	4	2	0	0	4	6	10
05:15 PM	2	3	0	0	0	5	2	0	2	7	7	14
05:30 PM	0	7	1	0	0	3	3	0	0	4	10	14
05:45 PM	0	3	0	0	0	10	2	0	0	10	5	15
Total	3	15	1	0	1	22	9	0	2	25	28	53
Grand Total	6	26	1	2	2	47	17	0	2	50	53	103
Apprch %	18.8	81.2		50	50		100	0				
Total %	11.3	49.1		3.8	3.8		32.1	0		48.5	51.5	

	So Huntington Ave From North			Heath St From East			So Huntington Ave From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	**2**	2	4	**1**	0	**1**	2	0	2	7
05:00 PM	1	2	3	0	**1**	1	2	0	2	6
05:15 PM	2	3	5	0	0	0	2	0	2	7
05:30 PM	0	**7**	**7**	0	0	0	**3**	0	**3**	**10**
Total Volume	5	14	19	1	1	2	9	0	9	30
% App. Total	26.3	73.7		50	50		100	0		
PHF	.625	.500	.679	.250	.250	.500	.750	.000	.750	.750

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

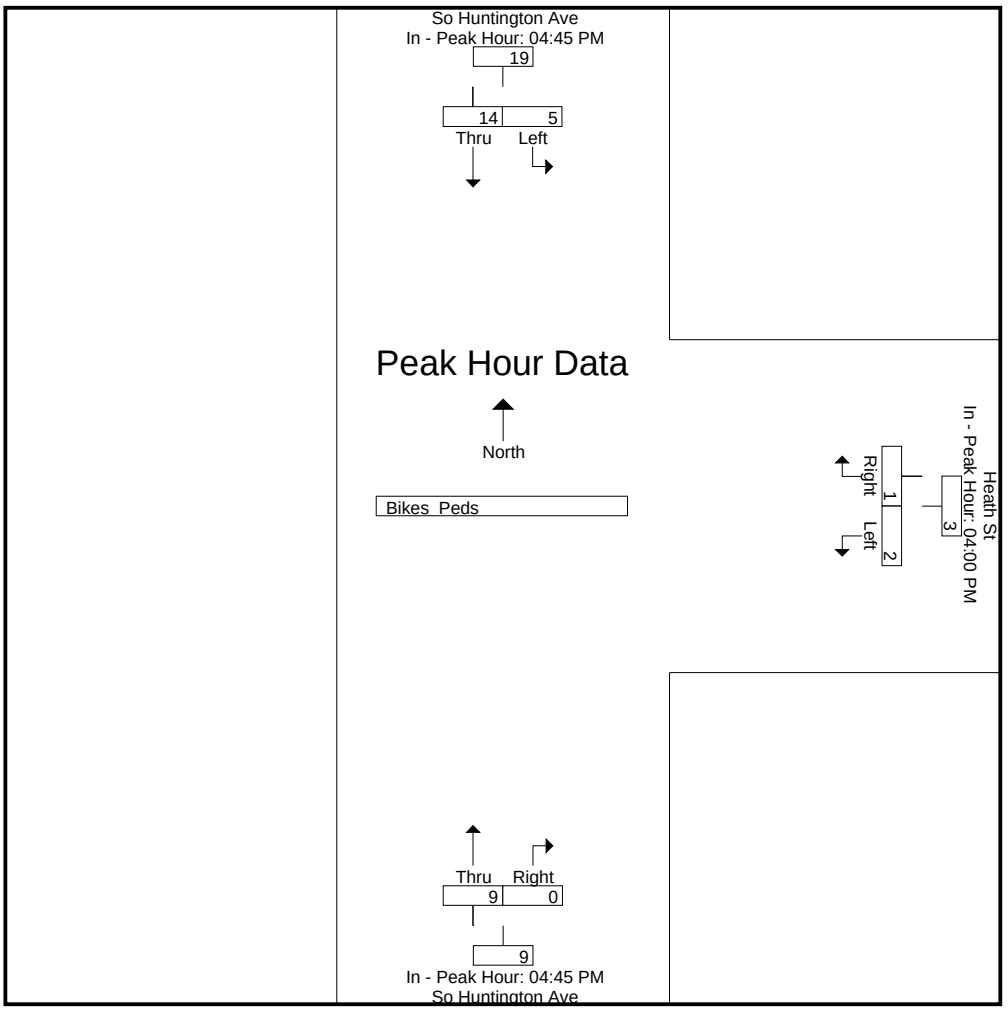
Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:45 PM		
+0 mins.	**2**	2	4	0	**1**	**1**	2	0	2
+15 mins.	1	2	3	**1**	0	1	2	0	2
+30 mins.	2	3	5	0	0	0	2	0	2
+45 mins.	0	**7**	**7**	1	0	1	**3**	0	**3**
Total Volume	5	14	19	2	1	3	9	0	9
% App. Total	26.3	73.7		66.7	33.3		100	0	
PHF	.625	.500	.679	.500	.250	.750	.750	.000	.750

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street : Heath Street
City/State : Boston, MA
Weather : Clear

File Name : 11066002
Site Code : 11066002
Start Date : 4/10/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Crosswalk
City/State : Boston, MA
Weather : Clear

File Name : 11066003
Site Code : 11066003
Start Date : 4/24/2012
Page No : 1

Groups Printed- Peds

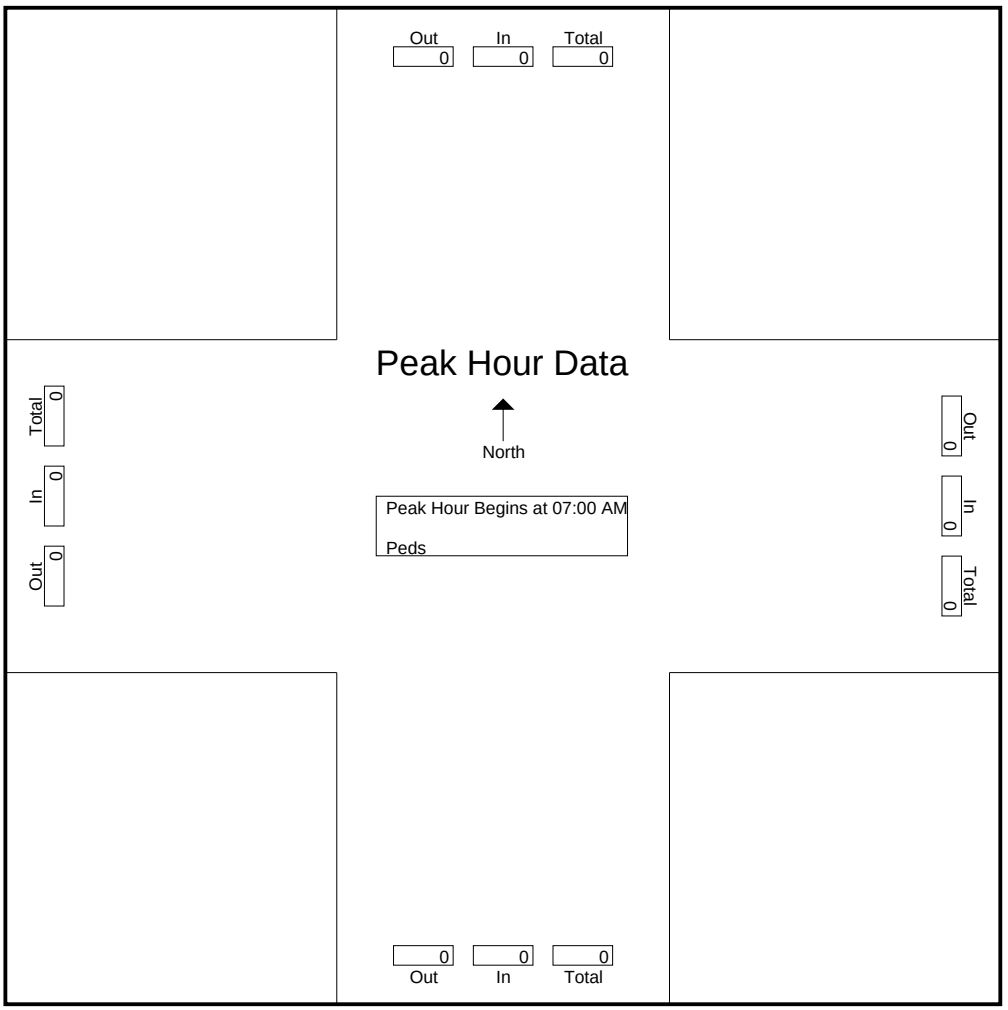
	From North			
Start Time	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	2	0	2
07:15 AM	2	2	0	2
07:30 AM	3	3	0	3
07:45 AM	7	7	0	7
Total	14	14	0	14
08:00 AM	2	2	0	2
08:15 AM	4	4	0	4
08:30 AM	7	7	0	7
08:45 AM	5	5	0	5
Total	18	18	0	18
Grand Total	32	32	0	32
Apprch %				
Total %		100	0	

	From North	From East	From South	From West	
Start Time	App. Total	App. Total	App. Total	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 07:00 AM					
07:00 AM	0	0	0	0	0
07:15 AM	0	0	0	0	0
07:30 AM	0	0	0	0	0
07:45 AM	0	0	0	0	0
Total Volume	0	0	0	0	0
% App. Total					
PHF	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Crosswalk
City/State : Boston, MA
Weather : Clear

File Name : 11066003
Site Code : 11066003
Start Date : 4/24/2012



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

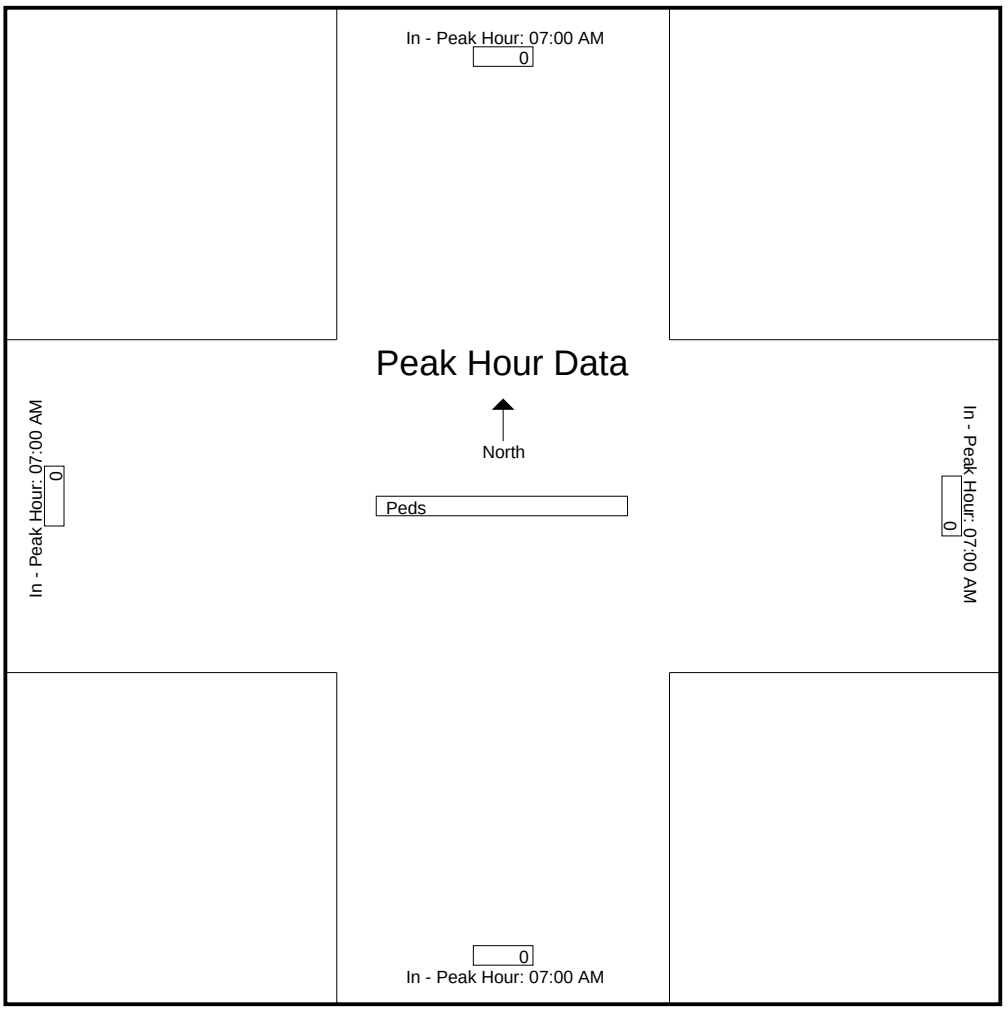
Peak Hour for Each Approach Begins at:

	07:00 AM	07:00 AM	07:00 AM	07:00 AM
+0 mins.	0	0	0	0
+15 mins.	0	0	0	0
+30 mins.	0	0	0	0
+45 mins.	0	0	0	0
Total Volume	0	0	0	0
% App. Total				
PHF	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Crosswalk
City/State : Boston, MA
Weather : Clear

File Name : 11066003
Site Code : 11066003
Start Date : 4/24/2012
Page No : 3



Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Crosswalk
City/State : Boston, MA
Weather : Clear

File Name : 11066003
Site Code : 11066003
Start Date : 4/24/2012
Page No : 1

Groups Printed- Peds

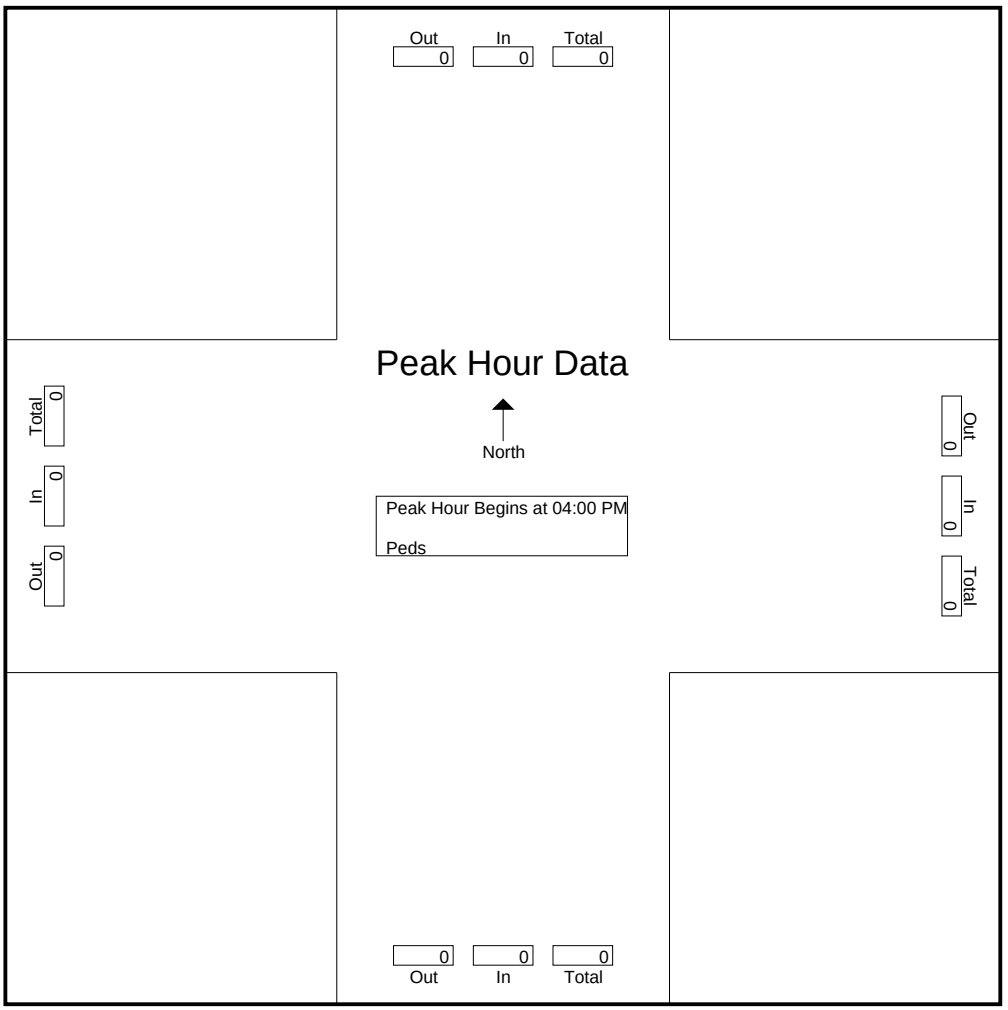
	From North			
Start Time	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	5	5	0	5
04:15 PM	8	8	0	8
04:30 PM	11	11	0	11
04:45 PM	3	3	0	3
Total	27	27	0	27
05:00 PM	3	3	0	3
05:15 PM	7	7	0	7
05:30 PM	6	6	0	6
05:45 PM	6	6	0	6
Total	22	22	0	22
Grand Total	49	49	0	49
Apprch %				
Total %		100	0	

	From North	From East	From South	From West	
Start Time	App. Total	App. Total	App. Total	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:00 PM					
04:00 PM	0	0	0	0	0
04:15 PM	0	0	0	0	0
04:30 PM	0	0	0	0	0
04:45 PM	0	0	0	0	0
Total Volume	0	0	0	0	0
% App. Total					
PHF	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Crosswalk
City/State : Boston, MA
Weather : Clear

File Name : 11066003
Site Code : 11066003
Start Date : 4/24/2012



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

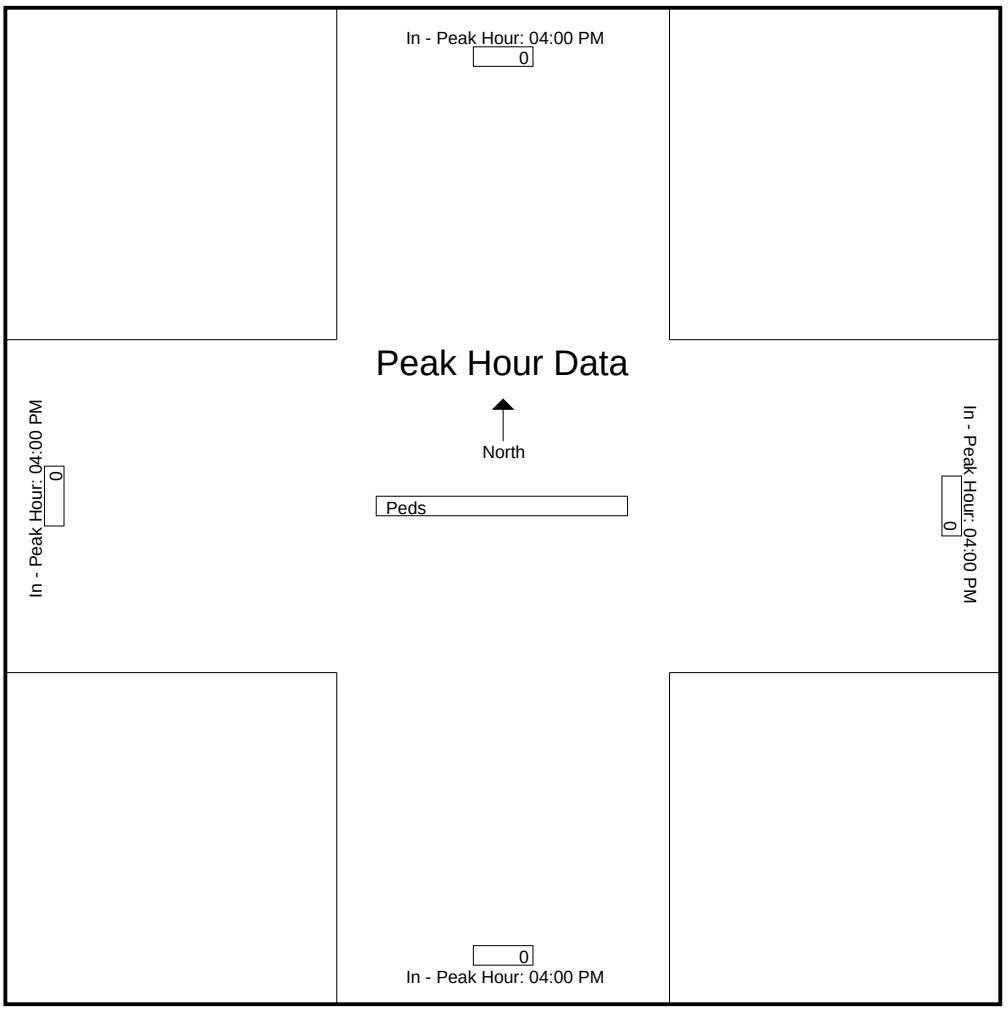
Peak Hour for Each Approach Begins at:

	04:00 PM	04:00 PM	04:00 PM	04:00 PM
+0 mins.	0	0	0	0
+15 mins.	0	0	0	0
+30 mins.	0	0	0	0
+45 mins.	0	0	0	0
Total Volume	0	0	0	0
% App. Total				
PHF	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : South Huntington Avenue
E/W Street: Crosswalk
City/State : Boston, MA
Weather : Clear

File Name : 11066003
Site Code : 11066003
Start Date : 4/24/2012
Page No : 3



105 South Huntington Ave

Proposed Peak Hour Trip Generation Estimation

Howard/Stein-Hudson Associates
April 30, 2012

Land Use	Size	Category	Trip Rates (Trips/ksf or unit)	Unadjusted Vehicle Trips: Average Rate	Unadjusted Vehicle Trips: Fitted Curve Equation	Assumed national vehicle occupancy rate[1]	Converted to Person trips	Transit Share[2]	**Transit Trips**	Walk/Bike/ Other Share[2]	**Walk/ Bike/ Other Trips**	Vehicle Share[2]	Vehicle Person Trips	Assumed local vehicle occupancy rate[3]	**Total Adjusted Vehicle Trips**
Daily															
Residential - Apartment[4]															
	195	Total	4.20	819		1.1	901	15%	**135**	38%	**342**	47%	423	1.1	**385**
	Units	In	2.10	410		1.1	450	15%	**68**	38%	**171**	47%	212	1.1	**192**
		Out	2.10	410		1.1	450	15%	**68**	38%	**171**	47%	212	1.1	**192**
Retail[5]															
	1.5	Total	42.94	64		1.8	116	21%	**24**	44%	**51**	35%	41	1.8	**23**
	KSF	In	21.47	32		1.8	58	21%	**12**	44%	**26**	35%	20	1.8	**11**
		Out	21.47	32		1.8	58	21%	**12**	44%	**26**	35%	20	1.8	**11**
Total		Total		883			1,017		**159**		**393**		464		**407**
		In		442			508		**80**		**197**		232		**204**
		Out		442			508		**80**		**197**		232		**204**
AM Peak Hour															
Residential - Apartment[4]															
	195	Total	0.36		70	1.1	77		**15**		**34**		29	1.1	**26**
	Units	In	0.08		15	1.1	17	22%	**4**	39%	**7**	39%	7	1.1	**6**
		Out	0.28		54	1.1	60	18%	**11**	45%	**27**	37%	22	1.1	**20**
Retail[5]															
	1.5	Total	8.62		13	1.8	23		**6**		**11**		6	1.8	**4**
	KSF	In	5.26		8	1.8	14	29%	**4**	43%	**6**	28%	4	1.8	**2**
		Out	3.36		5	1.8	9	23%	**2**	50%	**5**	27%	2	1.8	**1**
Total		Total			83		100		**21**		**44**		35		**30**
		In			23		31		**8**		**13**		11		**8**
		Out			60		69		**13**		**32**		25		**22**
PM Peak Hour															
Residential - Apartment[4]															
	195	Total	0.45		88	1.1	97		**19**		**42**		37	1.1	**33**
	Units	In	0.28		55	1.1	60	18%	**11**	45%	**27**	37%	22	1.1	**20**
		Out	0.17		34	1.1	37	22%	**8**	39%	**14**	39%	14	1.1	**13**
Retail[5]															
	1.5	Total	25.44		38	1.8	69		**18**		**32**		19	1.8	**10**
	KSF	In	12.46		19	1.8	34	23%	**8**	50%	**17**	27%	9	1.8	**5**
		Out	12.97		19	1.8	35	29%	**10**	43%	**15**	28%	10	1.8	**5**
Total		Total			127		166		**37**		**73**		56		**44**
		In			73		94		**19**		**44**		31		**25**
		Out			53		72		**18**		**29**		24		**19**

Notes:

1. 2009 National vehicle occupancy rates - 1.13 for home to work (residential); 1.78 for shopping (retail)
2. Mode shares based on peak-hour BTD Data for Area 5
3. Local vehicle occupancy rates based on 2000 Census and 2009 National Household Travel Survey.
4. ITE Trip Generation, 8th Edition, LUC 222 (High-Rise Apartment), average rate
5. ITE Trip Generation Rate, 8th Edition, LUC 820 (Shopping Center), average rate

Appendix C

Air Quality

APPENDIX C AIR QUALITY

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale air quality analyses.

Motor Vehicle Emissions

The EPA MOBILE6.2 computer program generated motor vehicle emissions used in the mobile source CAL3QHC modeling. The model input parameters were provided by MassDEP. Emission rates were derived for 2012 and 2017 for speed limits of 2.5, 10, 15, and 30 mph for use in the microscale analyses.

CAL3QHC

For the intersections studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOBILE6.2. The intersection's queue links and free flow links were input to the model along with sensitive receptors at all locations nearby each intersection. The meteorological assumptions input into the model were a 1.0 meter per second wind speed, Pasquill-Gifford Class D stability combined with a mixing height of 1000 meters. For each direction, the full range of wind directions at 10 degree intervals was examined. In addition, a surface roughness (z_0) of 175 cm was used for the intersection. Idle emission rates for queue links were based on 2.5 mph emission rates derived in MOBILE6.2 and converted from grams per mile to grams per hour. Emission rates for speeds of 10, 15, and 30 mph were used for right turn, left turn, and free flow links, respectively.

105A South Huntington Ave.
Calculation of Microscale Modeling Emission Rates
Summary of MOBILE6.2 Output

Carbon Monoxide Only

Queues	Idle
Free Flow	30 mph
Right Turns	10 mph
Left Turns	15 mph

Summer	**2012**	**2017**	**Units**
Idle	32.245	27.355	g/hr
2.5 mph	12.898	10.942	g/mile
10 mph	5.783	4.952	g/mile
15 mph	4.897	4.185	g/mile
30 mph	4.017	3.397	g/mile

Winter	**2012**	**2017**	**Units**
Idle	50.753	43.320	g/hr
2.5 mph	20.301	17.328	g/mile
10 mph	10.920	9.468	g/mile
15 mph	9.803	8.531	g/mile
30 mph	8.727	7.636	g/mile

Due to excessive size AERMOD, CAL3QHC, and MOBILE6.2 input and output files are available on digital media upon request.

Appendix D

LEED Checklist

LEED 2009 for New Construction and Major Renovations

Project Checklist

105 South Huntington Avenue, Boston MA

Y	?	N			
16	1	9	**Sustainable Sites**	Possible Points:	**26**
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
		5	Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
	1		Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

4	4		**Water Efficiency**	Possible Points:	**10**
Y			Prereq 1	Water Use Reduction—20% Reduction	
4			Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
	2		Credit 3	Water Use Reduction	2 to 4

7	6	9	**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	
6			Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
	2		Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
1	2		Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

4	6	4	**Materials and Resources**	Possible Points:	**14**
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
	2		Credit 3	Materials Reuse	1 to 2

Y	?	N			
			Materials and Resources, Continued		
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

8	6	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

4	2		**Innovation and Design Process**	Possible Points:	**6**
1			Credit 1.1	Innovation in Design: Exemplary Performance for SSc4.2	1
1			Credit 1.2	Innovation in Design: Exemplary Performance for MRc2.2	1
1			Credit 1.3	Innovation in Design: Low Mercury Lighting	1
	1		Credit 1.4	Innovation in Design: Specific Title	1
	1		Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

2			**Regional Priority Credits**	Possible Points:	**4**
1			Credit 1.1	Regional Priority: Specific Credit	1
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

45	25	23	**Total**	Possible Points:	**110**

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