General Heath Square Apartments

Expanded Project Notification Form

Submitted to
Boston Redevelopment Authority
One City Hall, 9th Floor
Boston, MA 02201

In association with
Prellwitz Chilinski Associates
Catherine Oranchak/Landscape Architect
Klein Hornig LLP
Nitsch Engineering
McPhail Associates
Conservation Services Group

Proponent
BOTH/NDC Community Initiative LLC
c/o JPNDC
31 Germania Street
Jamaica Plain, MA 02130

Prepared by
vhb
99 High Street
Boston, MA 02110

October 7, 2015

www.vhb.com

October 7, 2015

Ref: 13208.00

Brian Golden, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Re: Expanded Project Notification Form
General Heath Square Apartments
Heath Street & Bromley Street, Jamaica Plain

Dear Director Golden:

BOTH/NDC Community Initiative LLC is pleased to submit an Expanded Project Notification Form for a residential project known as *General Heath Square Apartments* (the "Project") to be located in the Jamaica Plain neighborhood at 61 Heath Street on an approximately 0.66 acre site. The Project will be a new construction affordable housing real estate development intended to transform a vacant underutilized lot into a thriving community with 47 residential units. It will complement the fabric of land uses in the area and will contribute to the affordable housing production goals of the City and the Commonwealth. At approximately 56,290 total square feet, the Project is subject to Large Project Review under Article 80B of the City of Boston Zoning Code. The Project is designed to be consistent with the guidelines set forth in the South Huntington Avenue Framework for Future Development Review.

We look forward to working with you and your staff in your review of the Project. If you have any questions or would like any additional information, please do not hesitate to contact me.

Sincerely,

Stephanie Kruel

Stephanie Kruel

Senior Environmental Planner
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Jamaica Plain, Massachusetts

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General Information and Project Description

BOTH/NDC Community Initiative LLC ("BOTH/JPNDC," the Proponent) submits this "expanded" Project Notification Form (PNF) to the Boston Redevelopment Authority (the "BRA") to initiate the Article 80B, Large Project Review process required by the Boston Zoning Code and Enabling Act for construction of an affordable residential development consisting of 47 affordable units located on currently vacant land near Jackson Square on the Jamaica Plain/Mission Hill border, in Boston (the "Project"). See Figure 1.1 for a location map.

This chapter provides an overview of the history of the Project to date and existing site conditions and describes the Project and its public benefits. It also identifies the anticipated required permits and approvals. Finally, it describes how the Project is consistent with applicable plans and policies.

1.1 Project History

BOTH/NDC Community Initiative LLC ("BOTH/JPNDC") is a partnership of Jamaica Plain Neighborhood Development Corporation and Back of the Hill Community Development Corporation. BOTH/JPNDC was created in 1999 for the purpose of facilitating community input and developing affordable housing in the Back of the Hill section of the Mission Hill neighborhood of Boston. That year, BOTH/NDC facilitated a community planning process to study and plan for development of vacant parcels along and adjacent to Heath Street. From 2000 to 2005, BOTH/JPNDC developed 80 units of permanently affordable housing in three phases including both rental and homeownership. In 2004-2005, BOTH/JPNDC undertook additional community planning to explore uses on the General Heath Square Site. After considering non-residential uses, including adult day care for the elderly and other non-profit uses, the process yielded support for affordable housing.

On October 2, 2014, the City issued a Request for Proposals for disposition of the ten parcels comprising the General Heath Square Site. On December 22, 2014, BOTH/JPNDC submitted a complete proposal to the City. BOTH/JPNDC was the only proposer. The City held a

community meeting on March 5, 2015 in order to present the BOTH/JPNDC proposal. On May 6, 2015, the City's Public Facilities Commission designated JPNDC (representing the BOTH/JPNDC partnership) as developer of the site for a 12 month period, renewable, subject to conditions to be determined by the City of Boston.

1.2 Site Context and Existing Conditions

The Project will be located on ten contiguous vacant City of Boston-owned parcels bordered by New Heath Street, Bromley Street, Heath Street, and the General Heath Square rotary (the "Project Site"). The Proponent expects, immediately after site acquisition, to consolidate the ten parcels into a single parcel, which will be known as 61 Heath Street. The Site encompasses 28,872 square feet of previously developed land. The Site is currently bordered by a chain link fence and contains grass and several trees (Figures 1.2 and 1.3). Adjacent to the Site is a four-story residential structure with first floor commercial space. Across Bromley Street to the east lie the Southwest Corridor Park Operations building and Family Services of Greater Boston. Across Heath Street to the south lies the Bromley Heath Housing Development. The site is located within one-quarter mile of MBTA's Jackson Square Orange Line station and is close to community resources and open space, including the Southwest Corridor Park (Figure 1.4).

In addition to residential uses, the area has historically been occupied by industrial and manufacturing uses. Most notably, several of Boston's two dozen breweries were located in the vicinity of the Project Site. Historic maps show several small single family residences dividing the site into nearly a dozen parcels.

1.3 Project Description

General Heath Square ("GHS") will be a new construction affordable housing real estate development, developed by BOTH/NDC Community Initiative LLC. GHS will transform a vacant underutilized lot into a thriving residential community which will complement the fabric of land uses in the area and will contribute to the affordable housing production goals of the City and the Commonwealth. See Figures 1.5 through 1.10 for the proposed site plan, aerial axonometric plans, floorplans, building sections, perspectives, and elevations.

1.3.1 Development Program

GHS will be a new construction project of approximately 56,290 gross square feet. The residential units at GHS will serve a variety of household sizes. There will be a mix of one-bedroom units, two-bedroom units, and three-bedroom units. The current unit floor plan designs emphasize livability and include average one-bedroom units at 630 square feet, average two-bedroom units at 850 square feet, and average three-bedroom units at 1070 square feet, all of which meet or exceed City and State minimums. The current design includes an approximately 895 square foot commercial space. Due to concerns regarding the viability of a retail use at this location, the commercial space is currently intended to accommodate

office, service or studio uses and could also be reprogrammed to a residential use if a desirable and feasible commercial use is not identified.

TABLE 1.1 PROPOSED DEVELOPMENT PROGRAM

Lot Area	28,872 sf
Building Gross Square Footage	56,290 gsf
FAR	1.95
Height	4 stories
Residential	47 units
1 Bedroom	11 units
2 Bedroom	22 units
3 Bedroom	14 units
Commons/Community Space	1,116
Commercial/Office	1,006
Parking	20 spaces
Bicycles	47 spaces

1.3.2 Affordability/Target Population

BOTH/JPNDC intends to provide housing at various levels of affordability and serving various populations:

- 16 units (34% of total) will be reserved for Project Based Section 8 or Mass Rental Voucher Program (MRVP) rental subsidy (household income ≤ 30% Area Median Income). These units will also be Low Income Housing Tax Credit (LIHTC) compliant. Of these 16 units:
  - 8 units (17% of total) will be permanently affordable to "extremely low income households" (household income ≤ 30% AMI) regardless of the availability of project-based rental subsidy.
  - 5 units (11% of total) will be permanently reserved for formerly homeless individuals or families (≤30% AMI); these are the "Boston Homeless Set-Aside" units.
- 2 units (4.3% of total) will be permanently reserved for clients of the Massachusetts Department of Developmental Services (≤ 30% AMI).
- 22 units (46.8% of total) will be LIHTC compliant (household income ≤ 60% AMI), with no project-based rental subsidy support.
- 7 units (14.9% of total) will be reserved for moderate income households (household income ≤ 80% AMI).

1.3.3 Funding and Financing

- Anticipated predevelopment sources may include Community Economic Development Assistance Corporation and/or Local Initiatives Support Corporation.
- Anticipated permanent sources for the residential development include: the City of Boston, the Commonwealth of Massachusetts, and Low Income Housing Tax Credit equity.
- Construction financing will be provided by a local bank.
- A permanent mortgage will be provided by a quasi-public or a private lending institution.

- Operating costs will be supported by project-based rental subsidy and by tenant rent payments.

1.3.4 Schedule

The preliminary Project schedule is as follows:

Designation from the City:	May 2015
Finance Closing / Acquisition:	*December 2017*
Construction Start:	*December 2017*
Construction Completion:	*February 2019*
Full Occupancy:	*May 2019*

This schedule assumes two funding application "rounds" at the state level; if state funding is awarded in the second quarter of 2016 the schedule may be accelerated.

1.3.5 Summary of Public Benefits

The Project provides numerous public benefits including:

- Provision of 47 new affordable housing units, in an environment in which the demand for affordable housing production is high.
- Development of currently underutilized vacant lots which border or are near active land uses such as the Bromley-Heath Housing Development, Family Services of Greater Boston, the Southwest Corridor Park maintenance facility, and a New England Baptist Hospital satellite maintenance and parking facility.
- Transit-Oriented Development within 0.25 miles of the MBTA Jackson Square Orange Line station.
- Bold design by award-winning architects Prellwitz Chilinski Associates.
- Environmentally friendly design and construction (adhering to LEED and Energy Star standards).
- Resident services for tenants, including services for special needs populations as appropriate.
- Workforce development and diversity through generation of construction employment for local residents. BOTH/JPNDC is committed to meeting or exceeding all City minority- and women-owned business procurement and local resident, female and minority hiring goals.
- New streetscaping and landscaping highlighting native and edible vegetation.

1.4 Regulatory Context

This section lists the anticipated permits and approvals as well as the local planning and regulatory controls applicable to the Project.

1.4.1 Anticipated Permits/Approvals

Table 1.2 lists the permits and approvals from local governmental agencies that are anticipated to be required for the Project.

TABLE 1.2 ANTICIPATED PROJECT PERMITS AND APPROVALS

Agency/Department	Permit/Approval/Action
City of Boston	
Boston Redevelopment Authority	Article 80B Large Project Review Article 37 Green Building Review Certificate of Compliance
Zoning Board of Appeals	Use and Dimensional Variances
Boston Transportation Department	Construction Management Plan Transportation Access Plan Agreement
Boston Water & Sewer Commission	Water and Sewer Connection Permits Construction Dewatering Discharge Permit General Service Application Site Plan Review
Boston Inspectional Services Department	Building Permit Certificate(s) of Occupancy
Department of Parks and Recreation	Approval of construction within 100 feet of a park or parkway

1.4.2 Local Planning and Regulatory Controls

The Project is subject to the Boston Zoning Code, and with a gross square footage of 56,290 square feet triggers Article 80B Large Project Review.

Boston Zoning Code

The Project Site is located in a Multi-Family Residential (MFR) sub-district of the Jamaica Plain Neighborhood District, and is subject to Article 55 of the Boston Zoning Code. Multi-family housing is a permitted use in this district. The great majority of non-residential uses are forbidden or conditional. The Site is not located within any overlay districts. The boundary of the Mission Hill Neighborhood District is just across New Heath Street from the Site, and Columbus Avenue, a short distance from the Site, marks the boundary of the Roxbury Neighborhood.

Table 1.3 below outlines the dimensional regulations for the MFR sub-district as well as the proposed Project dimensions. This table assumes the consolidation of the ten existing parcels into a single parcel.

TABLE 1.3 ZONING CODE DIMENSIONAL REGULATIONS VS. PROPOSED PROJECT DIMENSIONS

Dimensional Requirements	MFR District	Proposed Project
Lot Area (min per DU)	4,000 sf for first 3 units	--
Additional Lot Area (per add'l DU)	1,000 sf	--
Total Lot Area (min per 47 DU)	48,000 sf	28,872 sf
Lot Width (min feet)	40	99 ft
Lot Frontage (min feet)	40	99 ft
FAR (max)	1.0	1.95
Building Height Max (stories, feet)	3, 35	4, 48
Usable Open Space (min sf for total DU)	7,050	5,030
Front Yard (min depth feet)	15	2.3 ft (Heath St)
Side Yard (min depth feet)	10	41.5-55 ft (Bromley St) 13.6 ft (Parker St)
Rear Yard (min depth feet)	20 (reduced to 10 by operation of Section 55-41.9)	10 ft (New Heath St)
Rear Yard (max occupancy by accessory buildings, percent)	25	N/A

Pursuant to Article 55, the off-street parking and loading requirements for projects subject to Large Project Review under Article 80 are determined through the Article 80 review process. If the Project were not subject to Large Project Review under Article 80, the off-street parking requirement under Article 55 would be 33 (0.7 x 47 DU) and the off-street loading requirement under Article 55 would be 1 (assuming Gross Floor Area of less than 50,000). The proposed off-street parking space count is 21 and the proposed off-street loading bay count is 0. See Chapter 3 of this PNF for more detailed discussion.

Zoning Approvals

An initial building permit application was filed at Boston ISD on 9/17/15. The application number is ERT#520621. The assigned street address is 61 Heath Street, Jamaica Plain. We anticipate that the application will result in a determination of zoning violations. Anticipated violations are outlined in the Zoning Analysis on the cover sheet of the Architectural Drawings. They are:

- *Lot Area per Dwelling Unit – Variance*
- *Floor Area Ratio – Variance*
- *Building Height – Variance*
- *Usable Open Space per Dwelling Unit – Variance*
- *Front Yard Setback – Variance*
- *Rear Yard Setback – Variance*
- *Use – Variance or Conditional Use Permit likely needed prior to initiation of non-residential use (the particular non-residential use is not yet determined)*

City of Boston Parks and Recreation Commission jurisdiction is implicated on the basis of the "100 foot rule," which is derived from Section 7-4.11 of the Boston Municipal Code, which provides in relevant part that "[n]o building or structure shall hereafter be erected or altered within a distance of one hundred (100') feet from park or parkway in the City of Boston, without permission in writing having first been obtained from the Parks and Recreation Commission . . . ." The Heath Street Rotary open space, which is within 100 feet of the Project Site, is owned by the City of Boston Parks Department.

City of Boston Zoning Code Article 80 – Large Project Review

The Project exceeds the threshold of 50,000 square feet of development, which requires Large Project Review by the BRA pursuant to Article 80B, Large Project Review of the Code. The Proponent has commenced Large Project Review under Article 80 of the Code with the filing of a Letter of Intent with the BRA on July 31, 2015, that indicated the Proponent's intent to file an expanded PNF (EPNF) in connection with the Project. A copy of this letter is provided in Appendix A.

This EPNF aims to meet the BRA's Article 80 Large Project Review requirements and presents details about the Project and provides an analysis of transportation, environmental protection, infrastructure, and other components of the proposed Project, in order to inform city agencies and neighborhood residents about the Project, its potential impacts and mitigation proposed to address those potential impacts. Based on a comprehensive approach to address potential impacts similar to the level of information normally presented in a Draft Project Impact Report (DPIR), the Proponent requests that the BRA, after reviewing public and agency comments on this EPNF and any further responses to comments made by the Proponent, issue a Scoping Determination Waiving Further Review pursuant to the Article 80B process.

Jackson Square Planning Initiative

In June 1999 the Jackson Coordinating Group (JCG) was formed to oversee the Jackson Square Planning Initiative. The goal of the initiative was to build community consensus around the type of development that is appropriate for the area and to ensure that development benefits the existing community. According to the *Jackson Square Development Priorities* (September 2003), a key community goal is to provide critically needed new affordable housing resources within a quarter-mile radius target area surrounding the Jackson Square MBTA station.

Although the Project Site was not part of this planning effort, the Project is consistent with many of the goals and objectives of the plan including:

Affordable Housing (Jackson Square Development Priorities, page 6): Permanently affordable rental housing, targeted 100% to households at or below 80% of Area Median Income, 45% to households between 30% and 60% AMI, and 30% to households at or below 30% AMI.

Small Scale Commercial Uses on First and Second Floors (Priorities, page 9): Commercial uses (which) serve community needs… and provide employment and business opportunity in the Jackson Square area while maximizing… the use of public transportation.

Massachusetts Environmental Policy Act

The Project is not subject to environmental review by the Secretary of the Executive Office of Energy and Environmental Affairs, as the Project will not exceed any of the MEPA review thresholds set forth in 301 CMR 11.03.

1.5 Agency Coordination and Community Outreach

The Project Team has been meeting with residents, neighborhood groups, community leaders, business owners, elected officials, City of Boston officials, and other stakeholders to seek input and feedback as they developed the redevelopment plan. A detailed description of the public process is included in Chapter 6 of this PNF.

1.6 Development Team

The development team is comprised of the BOTH/NDC Community Initiative LLC ("BOTH/JPNDC") partnership of Jamaica Plain Neighborhood Development Corporation and Back of the Hill CDC, as well as support from a team of architects, landscape architects, legal counsel, permitting specialists, sustainable design professionals, and transportation, civil, geotechnical, environmental, structural, and mechanical engineers.

Proponent	Jamaica Plain Neighborhood Development Corporation 31 Germania Street Jamaica Plain, MA 02130 617-522-2424 x260 *Contact:* Matt Henzy
Architect	Prellwitz Chilinski Architects 221 Hampshire St Cambridge, MA 02139 617-547-8120 *Contact:* Mark Eclipse
Landscape Architect	Catherine Oranchak/Landscape Architect 122 Sunset Road Arlington, MA 02474 781 752 8879 *Contact:* Cate Oranchak
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Transportation & Permitting	VHB 99 High Street, 10th Floor Boston, MA 02110 617-728-7777 *Contact:* Stephanie Kruel, Project Manager Sean Manning, P.E., Transportation
Civil Engineering & Survey	Nitsch Engineering Center Plaza, Suite 430 Boston, MA 02108 617-338-0063 *Contact:* John Schmid, P.E.
Sustainable Design	Conservation Services Group 50 Washington Street Suite 3000 Westborough, MA 01581 *Contact:* Matt Root
Geotechnical Engineer & Environmental Engineer	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140 617-868-1420 *Contact:* Joseph G. Lombardo, Jr., L.S.P
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MEP	Wozny/Barbar & Associates, Inc. 1090 Washington Street Hanover, MA 02339 781-826-4144 EXT 107 *Contact:* Zbigniew Wozny
Property Management	Peabody Properties 536 Granite Street Braintree, MA 02184 781-794-1000 *Contact:* Laurie McGrath, Regional Operations Director

1.7 Legal Information

1.7.1 Legal Judgments

There are no legal judgements or actions pending concerning the proposed Project.

1.7.2 History of Tax Arrears

There is no history of tax arrears on property owned in Boston by the Proponent.

1.7.3 Site Control/Public Easements

Site acquisition for GHS will be achieved through the public disposition (a form of conveyance) of ten contiguous vacant City of Boston owned parcels. On May 6, 2015, the City's Public Facilities Commission designated JPNDC (representing the BOTH/JPNDC partnership) as developer of the site for a 12 month period, renewable, subject to conditions to be determined by the City of Boston.

2

Urban Design & Sustainability

This chapter discusses design goals and urban design characteristics for the Project, as well as open space improvements, including proposed landscaping. It also provides information on sustainability and climate resiliency. Refer to Figure 1.5 for the proposed conditions site plan.

2.1 Key Findings and Benefits

The key findings and benefits of the Project related to urban design and sustainability are list below.

- The design is sensitive to the site context, providing active street-level uses, funneling vehicular traffic to the rear of the site, and echoing the scale of surrounding buildings.
- The site is located in close proximity to a variety of public open spaces.
- Landscaping will emphasize both native and edible plants.
- An internal courtyard and a common room terrace provide outdoor gathering spaces for residents.
- The Project will be LEED gold certifiable under LEED v4 for Building Design and Construction: Multi-family Mid-rise.
- The Project will meet or exceed green design and construction standards including the Massachusetts Stretch Energy Code and the MassSave Multi-family Residential New Construction High-rise Program.
- The Project will be resilient to projected changes in climate including extreme weather and heat events.

2.2 Design Concept and Development

The design of the building responds to the unique orientations of the site.

- The Main Entrance is oriented to the primary pedestrian destinations, which include the Jackson Square T Station, playground and sports courts along the Southwest Corridor Park and adjacent to Bromley-Heath and the commercial activity along Centre Street and Columbus Avenue. Each is a 5 minute walk away.

- Active uses face the Heath Street, which include building support offices, laundry, and a possible community-oriented commercial space.
- Apartments on the Heath Square Rotary and New Heath Street have direct street-level entrances and covered entries, similar to existing homes on New Heath, Wensley, and Parker Streets.
- Vehicular entry to the site is located on Bromley Street, away from the heavier traffic at the rotary.
- A large common room is located on the ground floor, adjacent to the main entrance and to the outdoor space. It is for resident use and will also be made available to the community for meetings and other functions.

2.2.1 Building Design, Massing and Materials

The building forms a U-shape, with the main massing at the north, west and south sides of the site, and forming a landscaped space inside the U.

- The proposed 4-story structure is similar in height to the adjacent buildings on the same block, as well as the Family Services of Greater Boston Building across Bromley Street. The scale is also compatible with the 3 and 4 story residential buildings to the north up Mission Hill and the 3 to 6 story buildings to the south.
- The design includes setbacks, changes in wall plane, cornices, and porches that help the building to fit with the surrounding architecture.
- The proposed materials and detailing are also compatible – brick, clapboard siding, and paneling with trim boards.
- The building is organized to enhance the feeling of community with common spaces (commons room, laundry, management offices, main entrance, vertical circulation, and outdoor terrace) adjacent to each other. This encourages chance meetings and get-togethers.
- Four units on the ground floor have direct access to the outdoors.

2.3 Open Space

Private open space for the residents is provided adjacent to the building, screened from the heaviest traffic at the Heath Square rotary. This outdoor space is open to the southeast for maximum daytime sun, while being shaded on summer afternoons. The common room opens directly onto an outdoor terrace, allowing functions to be both indoors and outdoors.

A semi-private open space forms a front yard along Heath Street. It is intended to be a more passive, landscaped space that enhances the building and street scape. There is a ten- to thirteen-foot landscaped space along the rotary and New Heath Streets, giving residents a buffer from the most heavily travelled streets and forming small front yards for the apartments along New Heath.

Nearby open spaces are abundant and varied (see Figures 2.1a and 2.1b). Heath Square is a vehicular rotary formed by the intersection of four different roads including Heath, New Heath, Bromley and Parker Streets. Within its grassed center is a ring of five Sweet Gum trees. Its perimeter is paved in cobblestones with a flush granite curb along the inside and a raised

granite curb along the outside of the circular space. Pedestrian access to the space is challenging due to the traffic volume yet pleasant views into this urban green space are provided.

The Southwest Corridor Park can be accessed a short two blocks away from the Project Site. The Park is a 4.7 mile long fifty acre linear park connecting Boston's Back Bay to Forest Hills Orange Line "T" stations; with open space constructed atop and adjacent to the railroad tracks. Along the way, several Boston neighborhoods are linked including the South End, Back Bay, Roxbury and Jamaica Plain. In addition to the mass transit system, the open space houses numerous active recreation uses for visitors of all ages including tot lots, spray pools, basketball courts, tennis courts, and street hockey rinks. Recreational and commuter biking are popular uses as are jogging, dog walking and strolling. Dozens of gardens exist throughout the Park, both ornamental and productive. In addition, there are two amphitheaters within the Park.

Some three blocks southwest of the Project Site is the Bromley Heath Play Area which includes a tot lot, a spray pool and a basketball court in addition to benches and walks.

McLaughlin Playground, which is a steep climb up Parker Street to Fisher Avenue or Parker Hill Avenue, is a large open space that offers active recreation uses such as a tot lot, basketball courts and baseball diamonds. The large expanse of land also includes a dense canopy of vegetation with walking paths. Access from Fisher Avenue is achieved by way of one of several sets of steps, each navigating terrain dozens of feet high. Access from Parker Hill Avenue is, however, at street level.

Other open spaces in the vicinity include Marcella Playground, a six minute-walk east of the site, which boasts a baseball diamond, tennis and basketball courts, and play structures; Kevin Fitzgerald Park, a passive recreation park located within a 15 minute walk to the north of the Project Site; and the Mission Hill Community Garden, approximately four blocks to the north. Other smaller open spaces can be found scattered throughout the area.

2.3.1 Landscaping

High quality, drought resistant, and native plant materials will be provided. The landscape design is important in the Project's "fit" into the neighborhood and in creating useful and enjoyable space for the residents. Functional and ornamental aspects of the landscape design will be considered, including the possibility of having a more functional landscape. A goal is to incorporate edible plants within the general landscape, integrating aesthetics and function (see Figures 2.2a and 2.2b).

Today the site is a grassy plain with a handful of Norway Maple (*Acer platanoides*), Box Elder (*Acer Negundo*), Black Locust (*Robinia sp.*), and Elm (*Ulmus sp*). While a few of the existing trees are sizable, none of them are vigorous, well-formed specimen. Limits of the proposed building footprint necessitate the removal of all existing trees.

Street trees within the public right-of-way are minimal: One (1) shade tree sits facing the General Heath Rotary, and two Callery Pear (*Pyrus calleranya*) sit along Heath Street and look to be in fair to good health.

2.3.2 Preliminary Landscape Plan

See Figure 2.3 for a Preliminary Landscape Plan and Figure 2.4 for illustrative precedent images.

Courtyard

A concrete paved path provides access to the building entrance. The Courtyard space is divided into several smaller spaces. Seat and retaining walls define the various spaces that include raised planted areas, dramatically sloped lawn and intimate paved spaces. Here residents can stroll, sit, and/or watch the goings on.

Common Room Terrace

A fenced outdoor terrace is partially covered with a steel and wood pergola that provides some relief from the hot sun. The terrace is enhanced by the use of special paving. A gate opens to the north.

Bromley Street Landscape

Shade trees, shrubs and groundcover are proposed to be planted along Bromley Street providing shade for the sidewalk and a vegetative filter between the proposed parking lot and the neighborhood.

Heath Square Landscape

A set of concrete steps for each residential unit and a walk provide access to the units facing Heath Square and again on New Heath Street. Upper-level planting beds, adjacent to the units would be filled with colorful evergreen and deciduous groundcover as well as perennial plants. Extra paved space is provided at each side of the door to accommodate outdoor seating or potted plants. A narrow curved perching wall is backed by evergreen and perennial planting and offers gathering space for the community whether as an individual or in small groups.

An informal cluster of ornamental or understory trees are proposed to be planted on the planted slopes at the intersection of Parker and New Heath Streets and again on New Heath and Bromley Streets.

Urban Streetscape

Facing Heath Square three (3) shade trees will be planted to replace the existing trees that have died. Two (2) existing Callery Pear (*Pyrus calleryana*) trees planted on Heath Street will remain.

2.4 Historic Resources

The Project Site is not within any of Boston's Historic Districts, nor is it in the vicinity of any locally designated landmarks.

2.5 Sustainability Design/Green Building

This section provides an overview of the sustainable design elements proposed as part of the Project at this time of preliminary design to demonstrate that the Project will meet the requirements of Article 37 of the Boston Zoning Code relative to the City's Green Building policies and procedures (i.e., "LEED certifiable").

The design team for the Project includes several LEED Accredited Professionals (AP), including Matt Root with CLEAResult, Mark Eclipse with Prellwitz Chilinski Associates and Catherine Oranchak ASLA, LEED AP. The Proponent and Project design team has and will continue to evaluate and incorporate sustainable design and energy conservation as the design process continues.

2.5.1 Regulatory Context

Massachusetts Stretch Energy Code

Per the Boston City Council adoption of the Stretch Energy Code November, 2010, General Heath Square Apartments is required to comply with Massachusetts Stretch Energy Code Chapter 5, Advanced Commercial Energy Efficiency. The compliance method selected by the Project team is Section 501.1.4 Performance Option for Buildings from 5,000 to 100,000 sq. ft. The Project is being designed to achieve energy use per square foot at least 20% below the energy requirements of ASHRAE/IESNA Standard 90.1-2007, Energy Standard for Buildings Except for Low-Rise Residential Buildings. This will be verified using an industry accepted energy modeling practice.

Article 37 – Green Buildings of the Boston Zoning Code

Per the adoption of Article 37 by the City of Boston in January, 2007, General Heath Square apartments is required to achieve a minimum level of LEED Silver Certifiable. With the necessary support from Project team LEED Accredited Professionals (AP) and oversight by a LEED for Homes Green Rater, General Heath Square Apartments will be designed, constructed, and managed to achieve LEED Gold certifiable, which is beyond the Article 37 minimum requirement of LEED Silver certifiable. The Project will strive to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston.

2.5.2 Approach to Sustainability/Compliance with Article 37

GHS will meet or exceed the following green design and construction standards:

- LEED v4 for Building Design and Construction: Multi-family Mid-rise
- Massachusetts Stretch Energy Code
- MassSave Multi-family Residential New Construction High-rise Program

General Heath Square Apartments is currently tracking for 63.5 points and will meet the LEED Gold certification level of 60-79 points.

Integrative Process (IPc)	[0 of 2 points]
Location & Transportation (LTp)	[15 of 15 points]
Sustainable Sites (SSp)	[7 of 7 points]
Water Efficiency (WEp)	[9 of 12 points]
Energy & Atmosphere (EAp)	[24 of 37 points]
Materials & Resources (MRp)	[6 of 9 points]
Indoor Environmental Quality (EQp)	[7.5 of 18 points]
Innovation (INc)	[2.5 of 6 point]
Regional Priority (RPc)	[2 of 4 points]
Total Points	[73 of 110 points]
Multifamily Home Size Adjuster	[-9.5 points]
Overall Point Total	63.5 points

See full scorecard and Multifamily Home Size Adjuster in Appendix C.

Location and Site

The site is located close to transit, community resources, and open space, including the Southwest Corridor Park. The design of the building is oriented to these pedestrian destinations. The site has been previously developed.

Landscape

In outdoor spaces, turf grass will be limited to areas designed for active play, and all plantings will be drought tolerant and native to the area. Irrigation will be minimized or eliminated. Stormwater will be addressed with subsurface infiltration systems and low impact landscape approaches to retain and infiltrate stormwater on site.

Productive Landscape

In partnership with Wetland.io, the Project will explore the feasibility of productive food growth in the open space, possibility in concert with the planned non-residential space in the building. This program would include strong participation from the resident population and potential partnerships with local organizations such as The Food Project, Boston Natural Areas Network, Green City Growers, City Soil, and Higher Ground Farm.

Water Efficiency

With a planned efficient envelope and smaller, more efficient heating and cooling systems, domestic hot water production represents a much more significant percentage of the

expected overall energy use and cost. The team will use highly efficient hot water heaters, low flow/high performance plumbing fixtures, and efficient distribution systems (compact design, strategic pipe size selection and insulation).

Energy Use

Energy use reduction is a critical issue and one where the design can have a large impact in a cost effective way. Careful attention will be paid to ensure an exterior envelope assembly with high effective R values and thorough air sealing. High efficiency windows and doors will also be used. This allows mechanical systems that have been designed to meet reduced heating and cooling loads that still ensure comfort. We will investigate and give preference to minimizing the amount of on-site combustion based equipment in the Project. It will be designed to be ready to accept photovoltaics or solar hot-water systems in the future as funding permits. Electrical load will be reduced with good lighting design using efficient fixtures (fluorescent and LED) and controls. Appliances will be Energy Star rated.

Materials

The team will investigate and incorporate materials with local and recycled content, and that are produced with responsibly harvested and rapidly renewable resources.

Indoor Environmental Quality

Indoor air quality is also an important consideration. We will accomplish this with both ventilation and material selection. Ventilation systems will be designed to provide fresh supply air directly to each apartment and there will be direct exhaust for kitchens and bathrooms with heat recovery systems. Toxins and contaminants will be minimized by specifying low VOC and no added urea formaldehyde materials. Allergens will be minimized by eliminating carpeting.

Awareness and Education

We will provide enhanced training in sustainable strategies for all tenants and building management. Topics for trainings / meetings may include:

- Effective use of water saving and energy efficient systems, including the impact on the property budget and on personal budgets
- Recycling and composting practices
- On-site productive food growth as described above
- Local organizations such as Boston Building Resources may be recruited to participate

Innovation: Recycled Building Materials

In partnership with Wetland.io, we will investigate the feasibility of a program for utilization of recycled building materials. Highlights of this program would include:

- Procurement of surplus or gently used building materials that may be sourced from local businesses such as Boston Building Resources, Boston ReStore (Habitat for Humanity

International), Save That Stuff, Inc., Extras for Creative Reuse, and other partners to be identified.

- The cost of recycled building materials would be net neutral or less, with respect to the cost of new building materials. The team's objective would be to remain within the Project's budget while supplying materials such as tiles, doors, ceiling fans, bathroom sinks and low flush toilets, and kitchens cabinets, that meet required performance specifications. The focus would be on interior and common spaces rather than the structural envelope.
- Wetland.io will develop a "harvest map" that offers a geographic representation that identifies and prioritizes waste and surplus materials in the vicinity of the Project Site.

2.6 Climate Resiliency

This section discusses the approach to preparing for anticipated changes in climate, in accordance with Appendix 7 of Article 80 of the Code. The required Climate Change Resiliency and Preparedness Checklist has been completed for the Project and is provided in Appendix C of this PNF.

2.6.1 Extreme Weather and Heat Events

As a result of climate change, the Northeast is expected to experience more frequent and intense storms. The IPCC has also predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from 5 to 20 days. To prepare for this, the Project will minimize the heat island effect by installing site landscaping, utilize light-colored paving materials on the pedestrian-oriented hardscape, and a reflective rooftop membrane to absorb less heat.

To minimize the Project's susceptibility to drought, the landscape design is anticipated to incorporate regionally appropriate robust native and adaptive vegetation that will require minimal irrigation. The Project will also incorporate low-flow fixtures to conserve potable water.

To minimize the Project's impact on climate change, the Project's energy performance is anticipated to be 20 percent more efficient than the base energy code at minimum, in compliance with the current Stretch Energy Code, which will help reduce GHG emissions associated with building energy sources that contribute to global warming.

2.6.2 Sea Level Rise and Storms

Rising sea levels and more frequent extreme storms increase the probability of coastal and riverine flooding and enlarging of the 100 Year flood plain. This Project is not in the vicinity of the coast, and is over one-half mile from the nearest waterbody (Leverett Pond). Therefore it is not likely to be affected by these phenomena.

3

Transportation and Parking

This chapter provides a detailed and comprehensive evaluation of the existing and proposed transportation conditions in the study area, and identifies traffic impacts as a result of the Project. The analysis captures in detail the operational characteristics of the Project, and provides a basis for determining to what extent, if any, Project-related traffic is likely to affect the wider transportation network.

3.1 Project Overview

The Project Site is currently an undeveloped lot in the Jamaica Plain neighborhood of Boston. The Project is bordered by New Heath Street to the north, Heath Street to the south, Bromley Street to the east, and Heath Square to the west as shown in Figure 3.1. The Proponent proposes to construct a four-story, approximately 56,290 gross square foot (GSF), residential building with 20 off-street parking spaces. The proposed Project will provide 47 affordable units (11 one-bedroom, 22 two-bedroom, and 14 three-bedroom units). While pedestrians will be able to access the building from Heath Street and New Heath Street, vehicle access to the site driveway and parking lot will be provided solely from Bromley Street. A site plan is illustrated in Figure 3.2.

A summary of the proposed uses for the Project are provided in Table 3.1.

TABLE 3.1 PROJECT DEVELOPMENT PROGRAM

Land Use	Size
Residential	47 units
Parking	20 spaces

3.2 Summary of Findings and Benefits

The Project is expected to have minimal and limited impacts on the area's traffic operations. During the morning peak hour, the Project is expected to generate 10 vehicle trips (2 in and 8 out) and during the evening peak hour, it is expected to generate 16 vehicle trips (10 in and 6 out). The results of the analysis indicate that there will be no substantial changes in level of

service in the study area from Project related traffic. The Project will also implement a proactive TDM program to market the units to those without personal automobiles and encourage mobility without a vehicle.

Parking will be reserved only for residents of the building. There is unregulated on-street parking on the streets surrounding the Project that may be used in the event that the provided on-site parking is not sufficient. Secure, covered bicycle storage and outdoor, public bike parking will be provided at the Site consistent with City of Boston Bike Parking Guidelines.

The Project will provide many key benefits to the Heath Square area including:

- 47 affordable residential units
- Reconstruction of sidewalk and accessible ramps abutting the Site
- Activation of a currently undeveloped area

3.3 Study Methodology

The analysis presented in this chapter provides a detailed description of the Project's transportation characteristics and evaluates key impacts to the transportation infrastructure. The transportation analysis presented in this chapter conforms to the Boston Transportation Department (BTD) Transportation Access Plans Guidelines.

The transportation analysis includes the projection of Project-related trips based on Institute of Transportation Engineers (ITE) Trip Generation rates and the application of local travel characteristics established through the *Access Boston 2000-2010* initiative. Synchro 8 software was used to facilitate the evaluation of traffic operations based on Highway Capacity Manual[1] (HCM) methodologies.

3.3.1 Traffic Study Area

Based on the Project program and the surrounding vehicular network, four study intersections were determined. As shown in Figure 3.3, the following intersections were included in the study area for the analysis:

- Heath Square Roundabout (unsignalized)
- Heath Street/Bromley Street (unsignalized)
- Heath Street/Columbus Avenue/Centre Street (signalized)
- New Heath Street/Bromley Street (unsignalized)

[1] Highway Capacity Manual; Transportation Research Board; Washington D.C.; 2000.

3.3.2 Analysis Conditions

The transportation analysis considers the following primary analysis scenarios:

- **2015 Existing Condition** – based on traffic data collection conducted within the study area in September 2015.
- **2020 No-Build Condition** – future conditions for a five-year time horizon as expected to occur if the Project was not constructed.
- **2020 Build Condition** – future conditions for a five-year time horizon assuming construction and full occupancy of the Project.

3.4 2015 Existing Conditions

This section describes existing transportation conditions, including an overview of roadway conditions, transit, pedestrian and bicycle facilities, and general site conditions.

3.4.1 Roadways

The Project Site is located east of Heath Square and is bordered by Heath Street, New Heath Street, and Bromley Street.

- **Heath Street** connects South Huntington Avenue to the west with Columbus Avenue (Route 28) to the east of the Project Site. The segment of Heath Street bordering the Project Site consists of one lane in each direction and unregulated parking along the north side of the street. Parking is prohibited along the south side of Heath Street.
- **New Heath Street** connects Heath Square to Terrace Street along the northern edge of the Project Site. The roadway provides one lane in each direction. There is a small segment of unregulated parking allowed on the north side of the street approaching the roundabout, but, otherwise, no on-street parking is allowed.
- **Bromley Street** connects New Heath Street to Heath Street to the east of the Project Site. Although there are no lane markings, this street allows two-way traffic. Unregulated parking is allowed along the east side of the street, but there is no parking allowed along the west side of the street.

3.4.2 Study Area Intersections

The study area consists of four study intersections previously shown in Figure 3.3 and which are described below. Traffic operations and level of service (LOS) analysis are presented later in this chapter.

- **Heath Square Roundabout –** The intersection of Heath Street at New Heath Street/Parker Street/Wensley Street is an unsignalized, roundabout intersection to the west of the Project Site. Heath Street and New Heath Street run east/west, Parker Street runs north/south, and Wensley Street runs one-way south. All of the streets approach the roundabout with one general purpose lane, and there is no parking allowed at any of the approaches. The

roundabout allows one lane of travel in a counter-clockwise direction. It also contains a bus stop for the MBTA along the southern portion of the traffic roundabout. Crosswalks are provided at all approaches, and there are sidewalks leading to each approach.

- **Heath Street/Bromley Street** – The intersection of Heath Street at Bromley Street is a three-leg, unsignalized intersection south of the Project Site. Heath Street is free-flowing with one general purpose lane in each direction. Bromley Street runs north/south and provides one general purpose lane at the southbound approach. There is no stop sign present, but for analysis purposes, this approach is coded as stop-controlled. Unrestricted parking is allowed along the north side of Heath Street, and parking is allowed on the east side of Bromley Street. A bus stop is provided at the Heath Street northwest-bound approach. Although sidewalks are provided, no crosswalks are provided at this intersection.

- **Heath Street/Columbus Avenue** – The intersection of Heath Street at Columbus Avenue is a signalized intersection southeast of the Project Site. The Heath Street eastbound approach provides one general purpose lane. Heath Street becomes Centre Street east of the intersection and provides one general purpose land at the westbound approach. Columbus Avenue northbound consists of one through/right lane, one through lane and one left-turn only lane. The southbound approach provides one through/right lane, one through lane, and one through/left lane. The northbound and southbound lanes along Columbus Avenue are separated with a four foot stone median. There is no parking allowed along any of the approaches. Pedestrians are accommodated with concurrent pedestrian phases. Sidewalks and crosswalks are provided at all intersection approaches.

- **New Heath Street/Bromley Street** – The intersection of New Heath Street at Bromley Street is an unsignalized intersection northeast of the Project Site. New Heath Street is free flowing with one general purpose lane in each direction. No parking is allowed at the New Heath Street intersection approaches. The Bromley Street northbound approach provides one right/left turn lane with parking along the east side of the street. Sidewalks are provided along all intersection approaches, while no crosswalks are provided for pedestrians.

3.4.3 Data Collection

To properly assess the traffic conditions of the surrounding street network, manual turning movement counts (TMCs) were collected at the study area intersections. TMCs were collected on Tuesday, September 15, 2015 during a typical weekday morning peak commuter period (7:00 AM – 9:00 AM) and evening peak commuter period (4:00 PM – 6:00 PM). Since the counts were completed while the area schools were in session, no seasonal adjustments were needed.

The TMCs were used to establish the study area network peak hour volumes for the 2015 Existing Condition analysis. The weekday morning peak hour was determined to be 7:15 AM to

8:15 AM and the weekday evening peak hour from 5:00 PM to 6:00 PM. The existing morning peak hour traffic volumes are shown in Figure 3.4, and the existing evening peak hour traffic volumes are shown in Figure 3.5. Pedestrian morning and evening peak volumes are shown in Figure 3.6 and Figure 3.7, respectively. Bicycle morning peak volumes are shown in Figure 3.8, and the evening peak hour bicycle volumes are shown in Figure 3.9. The raw count data are included in Appendix B.

3.4.4 Pedestrian Environment and Accessibility

The study area is pedestrian friendly with sidewalks and limited crosswalks provided at many of the study area intersections. The southwest corner of Heath Street at Columbus Avenue provides the community with a tennis court, basketball court, and children's play area. The Southwest Corridor Park contains a bicycle/walking path that runs through the community and extends north into Back Bay and south to Forest Hills. Heath Street at Bromley Street, south of the Project Site, does not have any crosswalks and the provided accessible ramps are not ADA-compliant. North of this intersection, New Heath Street at Bromley Street has new ADA-compliant accessible ramps across Bromley Street, but there are no crosswalks at the intersection approaches. The Roundabout provides pedestrian treatments such as crosswalks and medians at all approaches.

Pedestrian volumes at the study area intersections were collected in conjunction with the TMCs on Tuesday, September 15, 2015. Figure 3.6 and Figure 3.7 present the 2015 Existing Condition Pedestrian Volumes. The highest pedestrian volumes in the study area were observed at the intersection of Heath Street/Columbus Avenue/Centre Street due to the nearby Southwest Corridor Park and higher density of retail and residential land uses in the area.

3.4.5 Bicycles

Bicycle volumes, shown in Figure 3.8 and Figure 3.9, at the study area intersections were collected simultaneously with the TMCs and pedestrian volume counts on Tuesday, September 15, 2015. Within the immediate study area, there are no bicycle parking accommodations or shared bicycle lanes provided.

The closest Hubway Station is at Jackson Square Station at Centre Street, slightly over a quarter-mile from the Project Site. This station provides 19 docking stations. Another Hubway Station is located at Roxbury Crossing, approximately a half-mile from the Project Site. This station provides 14 docking stations. Both of these stations are located along the Southwest Corridor.

3.4.6 Public Transportation

The Project Site is easily accessible by a variety of public transit options that provide numerous connections to most other MBTA public transit services, allowing the Site to be reached by bus and subway from many locations within the City of Boston and the surrounding suburbs.

The MBTA currently provides local bus and Orange Line service within walking distance (1/2 mile) of the Project Site. Figure 3.10 illustrates existing MBTA services and Table 3.2 provides a summary of the bus and rail services. A detailed description of each service is also provided.

TABLE 3.2 MBTA SERVICES

Service	Origin / Destination	Peak-hour Frequency (minutes)	Closest Stop (distance in miles)
Bus Route 14	Roslindale Square / Heath Street Station	38 – 45	Heath Street @ Bromley Street (<0.1 miles)
Bus Route 22	Ashmont Station / Ruggles Station	8 – 9	Columbus Ave @ Centre Street (0.1 miles)
Bus Route 29	Mattapan Station / Jackson Square Station	16 – 20	Columbus Ave @ Centre Street (0.1 miles)
Bus Route 41	Centre & Eliot Streets / JFK/UMass Station	22 – 30	Columbus Ave @ Centre Street (0.1 miles)
Bus Route 44	Jackson Square Station / Ruggles Station	12 – 16	Jackson Square (0.3 miles)
Bus Route 66	Harvard Square / Dudley Station	9 – 10	Roxbury Crossing (0.5 miles)
Orange Line	Oak Grove / Forest Hills	6	Jackson Square (0.3 miles)
Green Line – "E" Branch	Lechmere / Heath Street	6	Heath Street (0.6 miles)

Source: MBTA

- **Route # 14 – Roslindale Square – Heath Street Station –** This route connects Heath Street Station in Jamaica Plain to Roslindale Square in Roslindale via Heath Street, Blue Hill Avenue, American Legion Highway, and Cummins Highway with stops at Dudley Square and Jackson Square. The closest stop to the Project Site is Heath Street at Bromley Street, less than one-tenth of a mile away. Various stops along the route connect to the Green Line, Orange Line, and Needham Commuter Rail. During the weekday, Route 14 operates from 6:00 AM to 8:00 PM with 38-45 minute headways during the peak hours. On Saturdays, the bus operates from 6:45 AM to 7:40 PM. There is no service on Sundays.

- **Route # 22 – Ashmont Station – Ruggles Station –** This route connects Ruggles Station in the South End of Boston to Ashmont Station in Dorchester via Tremont Street, Columbus Avenue, Seaver Street, Blue Hill Avenue, and Talbot Avenue. The closest stop to the Project Site is Columbus Avenue at Centre Street, approximately one-tenth of a mile away. Various stops along the route connect to the Red Line, Orange Line, Needham Commuter Rail, Franklin Commuter Rail, and Providence/Stoughton Commuter Rail. During the weekday, Route 22 operates from 4:55 AM to 1:30 AM with 8 – 9 minute

headways during peak hours. On Saturdays, the bus operates from 5:00 AM to 1:20 AM, and Sunday service runs from 6:05 AM to 1:20 AM.

- **Route # 29 – Mattapan Station – Jackson Square Station –** This route connects Jackson Square in Roxbury to Mattapan Station in Mattapan via Columbus Avenue, Seaver Street, and Blue Hill Avenue. The closest stop to the Project Site is Columbus Avenue at Centre Street, approximately one-tenth of a mile away. Various stops along this route connect to the Orange Line and the Mattapan High Speed Line. During the weekday, Route 29 operates from 5:55 AM to 1:20 AM with 16-20 minute headways during the peak hours. On Saturdays, the bus operates from 8:10 PM to 1:10 AM. There is no service on Sundays.

- **Route # 41 – Centre & Eliot Streets – JFK/UMass Station –** This route connects Centre Street and Eliot Street in Jamaica Plain to the JFK/UMass Station in Dorchester via Centre Street, Dudley Street, and Columbia Road. The closest stop to the Project Site is Columbus Avenue at Centre Street, approximately one-tenth of a mile away. Various stops along this route connect to the Red Line and Orange Line. During the weekday, Route 41 operates from 5:00 AM to 9:25 PM with 22-30 minute headways during peak hours. On Saturdays, the bus operates from 7:00 AM to 8:10 PM, and Sunday service runs from 10:00 AM to 6:45 PM.

- **Route # 44 – Jackson Square Station – Ruggles Station –** This route connects Ruggles Station in the South End of Boston to Jackson Square in Roxbury via Tremont Street, Malcom X Boulevard, Warren Street, Humboldt Avenue, Seaver Street, and Columbus Avenue. The closest stop to the Project Site is Jackson Square Station, just over a quarter-mile away. Various stops along this route connect to the Orange Line, Needham Commuter Rail, Franklin Commuter Rail, and Providence/Stoughton Commuter Rail. During the weekday, Route 44 operates from 5:10 AM to 1:15 AM with 12-16 minute headways during peak hours. On Saturdays, the bus operates from 5:25 AM to 1:15 AM, and Sunday service runs from 6:15 AM to 12:50 AM.

- **Route # 66 – Harvard Square – Dudley Station –** This route connects Harvard Square in Cambridge to Dudley Station in Roxbury via Harvard Street, Huntington Avenue, and Tremont Street. The closest stop to the Project Site is Roxbury Crossing, approximately a half-mile away. Various stops along this route connect to the Green Line, Red Line, and Orange Line. During the weekday, Route 66 operates from 4:45 AM to 1:35 AM with 9-10 minute headways during the peak hours. On Saturdays, the bus operates from 4:40 AM to 1:35 AM, and Sunday service runs from 5:50 AM to 1:35 AM. Route 66 offers late night service on Friday and Saturday nights until 2:50 AM with the extension of the MBTA Late Night Service through 2016.

- **Orange Line – Oak Grove – Forest Hills –** This subway line connects Oak Grove in Malden to Forest Hills in Roslindale with 6 minute headways during the peak hours. The Orange line operates from 5:15 AM to 12:35 AM on weekdays, 5:15 AM to 1:50 AM on Saturdays, and from 6:00 AM to 12:35 AM on Sundays. Under the MBTA Late Night Service

Program, the Orange Line has extended service to 1:50 AM on Fridays. The closest stop to the Project Site is Jackson Square, just over a quarter-mile away. The Orange Line connects to the commuter rail at Back Bay Station, the Silver Line at Tufts Medical Center and Chinatown, the Red Line at Downtown Crossing, the Blue Line at State Street, and the Green Line at Haymarket and North Station.

- **Green Line E Branch – Heath Street – Lechmere –** The E Branch of the Green Line travels from Lechmere in East Cambridge to Heath Street in Jamaica Plain with 6 minute headways during the peak hours. The line operates from 5:00 AM to 12:50 AM on weekdays, 5:00 AM to 2:05 AM on Saturdays and from 5:35 AM to 12:45 AM on Sundays. Under the MBTA Late Night Service Program, the Green Line E Branch has extended service until 2:05 AM on Fridays. The closest stop to the Project Site is Heath Street, approximately a half-mile away. The Green Line E Branch connects to the Orange Line and the Red Line at Park Street and other Green Line branches at Copley Station.

3.4.7 Existing Parking

The Site currently provides no parking because it is an undeveloped lot. Unregulated on-street parking is available along various segments of Heath Street and along the east side of Bromley Street. Figure 3.11 shows on-street parking regulations within a quarter-mile radius of the Site.

There is a carsharing location approximately 300 feet from the Project Site (ZipCar) at 166 Terrace Street (Oliver Lofts North Lot and South Lot). The North Lot ZipCar site provides one vehicle, and the South Lot provides two vehicles. The second closest Zipcar location is approximately a quarter-mile from the Project Site on Centre Street, and this Site has seven vehicles. Other surrounding ZipCar locations include Columbus Avenue at New Heath (two vehicles), 225 Centre Street – Jamaica Plain (two vehicles), and Columbus Avenue at Ritchie Street (three vehicles).

3.5 Future Conditions

To assess future transportation conditions, the analysis considered the following two future scenarios for a five-year time horizon (2020) from the time of the existing conditions described earlier:

- **2020 No-Build Condition** – assumes no changes to the Project Site, but with background growth associated with other planned projects and general regional growth, along with any planned infrastructure improvements; and
- **2020 Build Condition** – assuming the same background growth and any planned infrastructure improvements, but includes the development of the Project Site.

3.5.1 2020 No-Build Condition

The 2020 No-Build Condition was developed to evaluate future transportation conditions in the study area without consideration of the Project. In accordance with BTD Guidelines, this

future analysis year represents a five-year horizon (2020) from Existing Conditions (2015). The No-Build Condition provides insight to future traffic conditions resulting from regional growth as well as traffic generated by specific projects that are expected to affect the local roadway network.

Background Growth

A background growth rate of one-half (1/2) percent per year was applied to the existing traffic volumes to account for population growth and projects that cannot be specifically identified. This background growth rate is consistent with other traffic studies in the area.

Site Specific Growth

After a review of projects on file with the Boston Redevelopment Authority (BRA), it was determined that there are no individual projects in the surrounding area to incorporate in the development of No-Build Condition. In addition, there are no planned roadway improvement projects planned in the area with the five-year planning horizon.

No-Build Condition Traffic Volumes

The background growth was added to the site-specific growth to create the 2020 No-Build Traffic Volumes. In this case, since there are no future developments within the Project study area, the 2020 No-Build Condition volumes consists of only the defined background traffic growth from 2015 to 2020.

Figures 3.12 and 3.13 presents the 2020 No-Build Condition traffic volumes accounting for background growth for the weekday morning and evening peak hours, respectively.

3.5.2 2020 Build Condition

The 2020 Build Condition includes the No-Build background traffic growth with the addition for the Project-generated trips. The Project will create a site driveway off of Bromley Street. Figure 3.2, presented previously, illustrates the proposed site plan for the Project.

Project Generated Trips

To assess the traffic impacts of the Project, trip estimates were based on standard rates from the ITE Trip Generation Handbook[2]. Trip generation for the proposed residential building was estimated based on the ITE Land Use Codes as shown in Table 3.3 below.

▼

[2] Trip Generation; Ninth Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

TABLE 3.3 TRIP GENERATION LAND USE CODES

Lane Use	ITE Land Use Code (LUC)	Independent Variable
Residential	200 – Apartments	Dwelling Units

Source: ITE Trip Generation Handbook

To account for alternative modes of transportation, mode shares for the area, based on the BTD guidelines, were applied to the unadjusted ITE trip results. Mode shares are presented in Table 3.4.

TABLE 3.4 RESIDENTIAL MODE SPLIT

Mode	Residential
Daily	
Automobile	46%
Public Transit	16%
Walk/Bike/Other	38%
AM/PM Peak	
Automobile	37%
Public Transit	18%
Walk/Bike/Other	45%

Source: BTD Zone 5 Mode Split

Vehicle Occupancy Rates (VOR) were also applied to the ITE trip generation to convert the ITE estimated unadjusted vehicle trips to person trips. A VOR of 1.67 persons per vehicle for residential land use was used based on the 2009 National Household Travel Survey. After VOR is applied to the ITE unadjusted vehicle trips to produce person trips, these trips are split into modes based on the mode splits shown above in Table 3.4. The VOR is again applied to the vehicle trips to produce unadjusted vehicle trips.

The estimated Project generated trips are shown in Table 3.5.

TABLE 3.5 PROJECT GENERATED TRIPS

Time Period/ Direction	Public Transportation	Walk/Bike/Other	Vehicle
Daily			
Enter	55	129	94
Exit	55	129	94
Total	**110**	**258**	**188**
AM Peak			
Enter	2	4	2
Exit	6	16	8
Total	**8**	**20**	**10**
PM Peak			
Enter	8	21	10
Exit	5	11	6
Total	**13**	**32**	**16**

Source: Trip Generation, 9th Edition, Institute of Transportation Engineers, Washington D.C. (2012).
Notes: Land Use Code (LUC) 220 – Apartment. The base trip generation estimates were subsequently categorized into transit, walk, bike or vehicular trips following BTD's guidelines for Zone 5.

Automobile Trip Distribution

Trip distribution was based on BTD's guidelines for Zone 5 (where the Project Site is located). These guidelines, based on 2000 Census data, provide information on where area residents work and were area employees live. Using these data, Project vehicle trips were then assigned to the roadway network. A summary of the regional trip distribution results is presented in Table 3.6 and shown graphically in Figure 3.14.

TABLE 3.6 TRIP DISTRIBUTION

Corridor	In	Out
Heath Street (to/from West)	39%	40%
Parker Street (to/from North)	22%	-
Terrace Street (to/from South)	-	21%
Columbus Avenue (to/from North)	31%	31%
Columbus Avenue (to/from South)	6%	8%
Centre Street (to/from East)	2%	-
Total	**100%**	**100%**

Source: BTD Zone 5 Trip Distribution

The Project-generated vehicle trips were added to the No-Build Condition traffic networks using the local trip distribution patterns described above. The Project generated trips are shown in Figure 3.15 and Figure 3.16. The resulting 2020 Build Condition networks are shown in Figure 3.17 and Figure 3.18 for the weekday morning and evening peak hours.

Pedestrian Environment and Accessibility

The main residential pedestrian access is from Heath Street and is oriented toward the main pedestrian destinations near the Site (Jackson Square MBTA Station, Southwest Corridor Park, and Centre Street commercial). The Project is proposing a possible community-oriented commercial space that would have pedestrian access off of Heath Street. Four apartments will have direct access from Parker Street (the rotary) and New Heath Street in addition to their interior corridor access. The Project will also reconstruct the sidewalk and accessible ramps abutting the Site.

Bicycle Access

The Project will provide covered and secure bicycle spaces under the building overhang accessed through the site driveway and parking lot on Bromley. The Project will also provide outdoor, public bike racks around the building to provide parking for visitors to the residents and the proposed community space. All bike parking will conform to the City of Boston's Bicycle Parking Guidelines.

Loading and Service

The proposed Project will service trash pickup within the surface parking lot as indicated in Figure 3.2. Move-in/move-out loading will be accommodated within the parking lot accessed off of Bromley, behind the building.

3.6 Transportation Demand Management

Consistent with the City's goals to reduce auto-dependency, the Project and its Proponent will incorporate proactive transportation demand management (TDM) measures to encourage alternative modes of transportation. Building management will provide transit information (schedules, maps, fare information) in the building lobbies for residents. Management will also work with tenants as they move in to raise awareness of public transportation options.

The following discusses an array of TDM measures that could be implemented. A description of the TDM elements is presented in this section along with information on how those elements aid Project residents. Measures being considered as part of the Project include:

- The Proponent will designate a Transportation Coordinator to oversee parking, loading, and move-in/move-out operations as well as promote the use of alternative transportation measures and carpooling.
- The Proponent will provide transit information such as maps and schedules to new residents in an orientation package and provide this information in the residential lobby.
- The Project includes both covered/secure bicycle storage and public outdoor bicycle spaces. These bicycle spaces will be provided in accordance with the BTD guidelines. The Proponent will provide 10 outdoor bicycle spaces (one per five units) and 47 secure storage

spaces (one per unit). Bicycle racks, signs, and parking areas will conform to BTD standards and be sited in safe, secure locations.

- The Proponent will work with the City to provide safe pedestrian access to the Project from the surrounding area.

3.7 Parking

Vehicular access to the Project will be through a site driveway off of Bromley Street, away from traffic at the rotary. The surface parking lot, at the back of the building, will provide 20 parking spaces, including one handicap parking space, dedicated to residents of the building. The Project's parking ratio is 0.43 spaces per unit (20 spaces for 47 units).

The supply of on-site parking proposed as part of the Project was developed to meet the following criteria:

- Minimize Project parking demands on surrounding study area.
- Provide sufficient on-site parking to accommodate for the anticipated residential demand.
- Encourage the use of public transportation and bicycle facilities.

Through field observations, it has been determined that there are segments of unrestricted parking surrounding the Project. Residents or visitors may take advantage of this available unregulated parking during times when the on-site parking is occupied. The surrounding on-street parking for the study area is illustrated in Figure 3.11.

3.8 Traffic Operations Analysis

Consistent with BTD Guidelines, Synchro 8 software was used to model level of service (LOS) operations at the study area intersections. LOS is a qualitative measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection.

LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS D is considered acceptable. LOS E indicates vehicles experience significant delay while LOS F suggests unacceptable delay for the average vehicle. LOS thresholds differ for signalized and unsignalized intersections. Longer delays at signalized intersections than at unsignalized intersections are perceived as acceptable.

Table 3.7 below presents the level of service delay threshold criteria as defined in the 2000 Highway Capacity Manual (HCM).

TABLE 3.7 LEVEL OF SERVICE CRITERIA

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

Source: 2000 Highway Capacity Manual (HCM)

Adjustments were made to the Synchro model to include characteristics of the study area such as heavy vehicles, bus operations, parking activity, and pedestrian crossings. The capacity analysis results are summarized in the following sections.

Signalized Capacity Analysis

The LOS results of the signalized capacity analyses are summarized in Table 3.8 and Table 3.9 for the 2015 Existing, 2020 No-Build, and 2020 Build Condition peak hours. Detailed Synchro results are presented in the Appendix B.

TABLE 3.8 SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS) SUMMARY – MORNING PEAK HOUR

	2015 Existing Condition			2020 No-Build Condition			2020 Build Condition		
Location	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Heath Street/Columbus Avenue/ Centre Street	**0.88**	**33.4**	**C**	**35.5**	**0.91**	**D**	**0.91**	**35.7**	**D**
Heath Street EB Thru	0.96	70.9	E	0.97	74.4	E	0.97	74.4	E
Centre Street WB Thru	0.75	60.2	E	0.81	73.3	E	0.81	73.3	E
Columbus Avenue NB Left	0.49	16.3	B	0.51	17.1	B	0.51	17.1	B
Columbus Avenue NB Thru	0.85	25.4	C	0.88	27.4	C	0.88	27.4	C
Columbus Avenue SB Thru	0.37	19.6	B	0.38	20.1	C	0.38	20.1	C

1 volume to capacity ratio
2 delay in seconds
3 level of service

TABLE 3.9 SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS) SUMMARY – EVENING PEAK HOUR

	2015 Existing Condition			2020 No-Build Condition			2020 Build Condition		
Location	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Heath Street/Columbus Avenue/ Centre Street	**0.89**	**42.7**	**D**	**0.91**	**45.4**	**D**	**0.92**	**45.7**	**D**
Heath Street EB Thru	0.94	66.7	E	0.97	73.0	E	0.97	74.8	E
Centre Street WB Thru	0.98	73.1	E	1.01	81.5	F	1.01	81.5	F
Columbus Avenue NB Left	0.86	96.7	F	0.88	100.3	F	0.88	100.3	F
Columbus Avenue NB Thru	0.67	26.0	C	0.70	26.9	C	0.70	26.9	C
Columbus Avenue SB Thru	0.80	37.7	D	0.83	39.3	D	0.83	39.5	D

1 volume to capacity ratio
2 delay in seconds
3 level of service

Overall, the intersection LOS for the Heath Street/Columbus Avenue/Centre intersection will not noticeable change with the proposed Project in place. Overall morning and evening peak LOS delay is expected to be minimal. The Project will have minimal impacts on this signalized intersection.

Unsignalized Capacity Analysis

The LOS results of the unsignalized capacity analyses are summarized in Table 3.10 and Table 3.11 for the 2015 Existing, 2020 No-Build, and 2020 Build Condition peak hours. Detailed Synchro results are presented in Appendix B.

TABLE 3.10 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS) SUMMARY – MORNING PEAK HOUR

	2015 Existing Condition			2020 No-Build Condition			2020 Build Condition		
Location	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Heath Street at New Heath Street/Parker Street/Wensley Street	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Heath Street EB Thru	0.95	-	-	0.99	-	-	0.99	-	-
Heath Street NB Thru	0.78	-	-	0.81	-	-	0.81	-	-
New Heath Street WB Thru	0.36	-	-	0.37	-	-	0.38	-	-
Parker Street SWB Thru	0.79	-	-	0.82	-	-	0.83	-	-
Wensley Street SB Thru	0.27	-	-	0.29	-	-	0.29	-	-
Heath Street at Bromley Street	**-**	**1.1**	**A**	**-**	**1.1**	**A**	**-**	**1.3**	**A**
Heath Street SEB Thru	0.05	1.2	A	0.05	1.3	A	0.05	1.3	A
Heath Street NWB Thru	0.36	0.0	A	0.37	0.0	A	0.37	0.0	A
Bromley Street SB Left/Right	0.12	34.0	D	0.13	36.3	E	0.16	37.7	E
New Heath Street at Bromley Street	**-**	**1.4**	**A**	**-**	**1.4**	**A**	**-**	**1.5**	**A**
New Heath Street EB Thru	0.21	0.0	A	0.22	0.0	A	0.22	0.0	A
New Heath Street WB Thru	0.01	0.7	A	0.01	0.7	A	0.01	0.7	A
Bromley Street NB Left/Right	0.10	11.4	B	0.10	11.5	B	0.11	11.6	B

1 volume to capacity ratio
2 delay in seconds
3 level of service

TABLE 3.11 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS) SUMMARY – EVENING PEAK HOUR

	2015 Existing Condition			2020 No-Build Condition			2020 Build Condition		
Location	v/c[1]	Delay[2]	LOS[3]	v/c	Delay	LOS	v/c	Delay	LOS
Heath Street at New Heath Street/Parker Street/Wensley Street	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Heath Street EB Thru	0.79	-	-	0.82	-	-	0.82	-	-
Heath Street NB Thru	0.48	-	-	0.50	-	-	0.50	-	-
New Heath Street WB Thru	0.26	-	-	0.27	-	-	0.27	-	-
Parker Street SWB Thru	0.66	-	-	0.69	-	-	0.69	-	-
Wensley Street SB Thru	0.10	-	-	0.10	-	-	0.10	-	-
Heath Street at Bromley Street	**-**	**1.1**	**A**	**-**	**1.1**	**A**	**-**	**1.2**	**A**
Heath Street SEB Thru	0.01	0.3	A	0.01	0.3	A	0.01	0.3	A
Heath Street NWB Thru	0.26	0.0	A	0.27	0.0	A	0.27	0.0	A
Bromley Street SB Left/Right	0.19	24.5	C	0.21	25.9	D	0.23	26.7	D
New Heath Street at Bromley Street	**-**	**0.7**	**A**	**-**	**0.7**	**A**	**-**	**0.8**	**A**
New Heath Street EB Thru	0.19	0.0	A	0.20	0.0	A	0.20	0.0	A
New Heath Street WB Thru	0.01	0.5	A	0.01	0.5	A	0.01	0.5	A
Bromley Street NB Left/Right	0.04	10.9	B	0.05	11.0	B	0.06	11.2	B

1 volume to capacity ratio
2 delay in seconds
3 level of service

Similar to the signalized LOS analysis, the proposed Project is not expected to have a noticeable effect on unsignalized intersections in the study area. Changes in LOS were tabulated to in in tenths of seconds, with overall LOS unchanged with the Project in place.

3.9 Construction Management

The Proponent will develop a detailed evaluation of potential short-term construction-related transportation impacts including construction vehicle traffic, parking supply and demand, and pedestrian access. Detailed Construction Management Plans (CMP) will be developed and submitted to the BTD for their approval. These plans will detail construction vehicle routing and staging.

Construction vehicles will be necessary to move construction materials to and from the Project Site. Every effort will be made to reduce the noise, control fugitive dust, and minimize other disturbances associated with construction traffic. Truck staging and laydown areas for the project will be carefully planned. The need for street occupancy (lane closures) along roadways adjacent to the Project Site is not known at this time.

Contractors will be encouraged to devise access plans for their personnel that de-emphasize auto use (such as seeking off-site parking, provide transit subsidies, on-site lockers, etc.) Construction workers will also be encouraged to use public transportation to access the Project Site because no new parking will be provided for them. Because of the construction

workers early arrival/departure (typically 7:00 AM – 3:00 PM) schedule, a conflict for on-street parking is not anticipated.

During the construction period, pedestrian activity adjacent to the site may be impacted by sidewalk closures. A variety of measures will be considered and implemented to protect the safety of pedestrians. Temporary walkways, appropriate lighting, and new directional and informational signage to direct pedestrians around the construction site will be provided. After construction is complete, finished pedestrian sidewalks will be permanently reconstructed to meet ADA standards around the new facilities. Any damage as a result of construction vehicles or otherwise will be repaired per City standards.

3.10 Transportation Access Plan Agreement

A Transportation Access Plan Agreement (TAPA) will be entered into between the Proponent and BTD. The TAPA will codify the specific measures and agreements between the Proponent and the City of Boston.

4

Environmental Protection

This chapter presents information on the existing environmental conditions in the vicinity of the Project Site and the potential changes that may occur as a result of the Project. The goal of the Project is to better utilize the Project Site and build on/complement adjacent uses while avoiding or minimizing potential adverse environmental impacts to the project area to the greatest extent feasible.

As discussed in more detail below, any Project-related impacts will be mitigated by the substantial community benefits the Project will bring to the neighborhood, including new housing and an improved streetscape. The sections that follow identify impacts that have been avoided, minimized and/or mitigated through design and/or management while addressing local, state, and federal design requirements. Temporary construction-period impacts will be managed to minimize disruption to the surrounding neighborhood. Sustainability and climate resiliency have been addressed in Chapter 2- Urban Design and Sustainability.

4.1 Key Findings and Benefits

The key findings and benefits of the project related to environmental protection are list below.

- The Project will result in a limited amount of new shadows that are not likely to discourage the use of sidewalks or public areas in the vicinity of the Project Site.
- No significant impacts are expected related to solar glare, air quality, water quality, flood hazards, groundwater, or noise.
- The Project will result in a very small amount of increased skyplane obstruction.
- The Project will comply with the MassDEP Stormwater Management Policy Standards, and will not affect the quality of nearby waterbodies.
- A Phase II Environmental Site Assessment will include the results of soil and groundwater analytical testing to evaluate if the Recognized Environmental Contaminants have impacted the subsurface at the project site. BOTH/JPNDC is prepared to seek financial support to remediate the site in the event that environmental contamination is found.

- A plan to control construction-related impacts including erosion, sedimentation, and other pollutant sources during construction and any land disturbance activities will be developed and implemented.

4.2 Shadow

This section describes the anticipated changes to shadows in the project area as a result of the Project. See Figures 4.1a through 4.1d for Shadow Study diagrams.

4.2.1 Summary of Key Findings

As is to be expected when building on a previously vacant site, the Project will result in moderate increases in new shadow impacts within the surrounding area. New shadows are generally limited to roads, sidewalks, parking areas, and rooftops and will not significantly impact any public green space. The presence of these new shadows is consistent with the urban environment and planning objectives of the neighborhood, and when combined with the Proponent's proposed enhancements, are not likely to discourage the use of sidewalks or public areas in the vicinity of the Project Site.

4.2.2 Regulatory Context

The Proponent has completed a shadow study as part of this EPNF to ascertain the potential new shadow impacts resulting from the Project. The shadow impact study has been conducted in accordance with Section 80B-2 of the City of Boston Zoning Code with particular emphasis on sidewalks, public plazas, and other public open spaces as well as nearby buildings of historical importance.

4.2.3 Methodology

The following shadow study has been prepared using methodologies consistent with accepted practices for such studies completed under Article 80 review. The analysis provides a comparison of the No-Build and Build Conditions. This is accomplished by using a three-dimensional model of the project area using data provided by the BRA, updated to include nearby foreseeable projects. The analysis is based on the BRA's 3D massing model for the Mission Hill/Jamaica Plain neighborhood. The study was completed using standard sun altitude and azimuth data for each study date estimated to occur at latitude and longitude 42°21'11.2"N, 71°07'46.9"W. Times were adjusted for daylight savings time as appropriate. The conditions were compared for the spring and fall equinoxes, and the summer and winter solstices at 9:00 AM, 12:00 Noon and 3:00 PM. Additional shadows were estimated for summer solstice and the equinoxes at 6:00 PM.

4.2.4 Potential Effects

The results of the shadow studies are presented in Figures 4.1 a-d.

March 21

During the first period shadows are cast to the northwest of the Project Site onto New Heath Street and the Heath Square Rotary. During the second and third periods shadow is cast to the north onto New Heath Street. During the final period, shadows are cast to the east over Bromley Street and the roof of the building fronting that street.

June 21

During the first period, shadow is cast mainly on the roadway within the Heath Square Rotary. During the second period, a slight shadow is cast to the north, but remains on the subject Site. The third and fourth periods find shadow to the east, with a small portion cast on Bromley Street.

September 21

During the first period shadows are cast to the northwest of the Project Site onto New Heath Street and the Heath Square Rotary. During the second and third periods shadow is cast to the north onto New Heath Street. During the final period, shadows are cast to the east over Bromley Street and the roof of the building fronting that street, stretching over the railroad tracks and onto a narrow stretch of the Southwest Corridor Park.

December 21

During the first period shadows are cast to the northwest of the Project Site onto New Heath Street and the Heath Square Rotary, reaching to the corner of Parker and Wensley Streets. During the second and third periods shadow is cast to the north/northwest onto New Heath Street, extending onto the property to the north.

4.3 Daylight

The following section describes the anticipated effect on daylight coverage at the Project Site as a result of the Project. An analysis of the percentage of skydome obstructed under the Build and No-Build conditions is a requirement of the Article 80 Large Project Review as part of the Environmental Protection component (Section 80B-2(c) of the City of Boston Zoning Code). The daylight analysis was prepared using the BRA's Daylight Analysis Program (BRADA) and has been completed in accordance with the requirements of Article 80 of the City of Boston Zoning Code. The results of the analysis are presented in Figure 4.2 a-b.

4.3.1 Methodology

The Project was analyzed using the BRADA and by comparing the Existing/No-Build Condition and Build Condition. This section provides a description of the methodology used for the analysis.

BRADA Software

The BRADA program was developed in 1985 by the Massachusetts Institute of Technology to estimate the pedestrian's view of the skydome taking into account the massing and building materials used. The software approximates a pedestrian's view of a site based on input parameters such as: location of viewpoint, length and height of buildings and the relative reflectivity of the building facades. The model typically uses the midpoint of an adjacent right-of-way or sidewalk as the analysis viewpoint. Based on these data, the model calculates the perceived skydome obstruction and provides a graphic depicting the analysis conditions.

The model inputs used for the study presented in this PNF were taken from a combination of the BRA City model, an existing conditions survey prepared by VHB, Inc., and schematic design plans prepared by PCA Architects. As described above, the BRADA software considers the relative reflectivity of building facades when calculating perceived daylight obstruction. Highly reflective materials are thought to reduce the perceived skydome obstruction when compared to non-reflective materials. For the purposes of this daylight analysis, the building facades are considered non-reflective, resulting in a conservative estimate of daylight obstruction.

Viewpoints

The following viewpoints were used for this daylight analysis:

- Center of Heath Street
- Center of Parker Street
- Center of New Heath Street
- Center of Bromley Street

4.3.2 Daylight Existing/No-Build Conditions

Under the Existing Condition, there are no skyplane obstructions from any of the viewpoints, because the Site is currently vacant.

4.3.3 Daylight Build Conditions

The Project-related daylight impacts for the viewpoints from Heath Street and Parker Street are presented in Figure 4.2a. The Project-related daylight impacts for the viewpoints from New Heath Street and Bromley Street are presented in Figure 4.2b. Under the Build Condition, all viewpoints are expected to experience an increase in skyplane obstruction (63.7 percent obstruction along Heath Street, 55.6 percent along Parker Street, 63.6 percent along New Heath Street, and 10.5 percent obstruction along Bromley Street) due to the increased height of the proposed building. This effect is to be expected and cannot be avoided when replacing a vacant site with a building.

4.4 Solar Glare

The impacts of solar glare on neighbors and adjacent roadways are not anticipated due to the proposed building design. The design does not include large areas of reflective glass or other materials that would result in solar impacts.

4.5 Air Quality

The 1990 Clean Air Act Amendments (CAAA) resulted in states being categorized as attainment and non-attainment areas, based upon the severity of their air quality problems. The Project is located in an area that has been designated as a Carbon Monoxide Maintenance area. The U.S. Environmental Protection Agency (EPA) has established the NAAQS for carbon monoxide to protect the public health. The Commonwealth of Massachusetts has adopted the same standards as those set by the EPA, and HUD applies these NAAQS when evaluating impacts.

The predominant source of air pollution anticipated from the Project is emissions from Project-related motor vehicle traffic, which directly emit carbon monoxide. Article 80 may require an evaluation of impacts on air quality from any significant stationary or mobile sources associated with the Project. The Proponent is prepared to address this requirement if necessary with a microscale analysis in accordance with the protocol/modeling procedures typically required by the BRA to determine conformance with the National Ambient Air Quality Standards (NAAQS), however given the limited motor vehicle trip generation, it is anticipated that the project will have limited impact. Through the implementation of transportation demand management as discussed in Chapter 3, impacts will be minimized to the extent feasible.

4.6 Water Quality

The Project will comply with the MassDEP Stormwater Management Policy Standards. These standards are discussed in detail in section 5.3.3. The Project will provide treatment for Total Suspended Solids (TSS) and phosphorous prior to discharge to the BWSC system. Rainfall from the building roof will be piped internally to roof drains which will connect to a closed drainage system onsite. Surface runoff from the Project will be directed to a closed drainage system consisting of deep sump catch basins, water quality treatment structures and infiltration systems. Phosphorous treatment will likely be accomplished through a subsurface infiltration system sized for the one-inch volume over the impervious site area.

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 inlets will be protected with filter fabric, straw wattles 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.

4.7 Flood Hazards & Wetland Resources

The Proponent has considered the Project's vulnerability to flooding from construction and operational standpoints. The Project is not within a FEMA-designated 100-year or 500-year flood zones, the nearest of which are located approximately 0.65 miles from the Site and are associated with Leverett Pond in Olmstead Park. The Proponent will be required to obtain Site Plan approval from the Boston Water and Sewer Commission. This process includes a comprehensive design review of project demands and existing system capacity. At this time, there is no indication that the Site would be susceptible to inland flooding from surcharged infrastructure. Refer to Chapter 2- Urban Design and Sustainability for an assessment flooding susceptibility due to future extreme weather events.

No wetland resource areas have been located on the Site.

4.8 Geotechnical

It is anticipated that the Site is covered by a miscellaneous granular fill material extending to depths of approximately 7 to 12 feet below existing ground surface, which is underlain by a natural deposit of compact to dense glacial outwash extending to depths of 27 feet or more below existing ground surface overlying bedrock. Groundwater is anticipated to be encountered at depths of 15 to 20 feet below ground surface.

Based upon the proposed scope of development and the anticipated subsurface conditions, preliminary foundation design of the proposed structure is anticipated to consist of spread footings bearing on compacted structural fill placed on the surface of the natural glacial outwash after complete removal of the existing fill from beneath the new foundations or on spread footings bearing on existing site soils improved by ground improvement technologies such as aggregate piers. The lowest level slab will consist of a soil-supported slab-on-grade. Given that the new structure will contain no below-grade space, a perimeter and underslab drainage system is not considered necessary. It is anticipated that excavation for the building foundations may require dewatering of the excavation. Handling of groundwater and/or surface water that may be encountered during construction is anticipated to be controlled through localized use of sump pumps. Pumped groundwater will be recharged on-site.

4.9 Groundwater

The Project Site is not located within the Groundwater Conservation Overlay District (GCOD) as outlined in Article 32 of the City of Boston Zoning Code. The proposed building is not planned to contain any occupied below-grade space. Therefore, construction of the Project is not expected to have adverse short or long-term impact on groundwater conditions.

4.10 Solid and Hazardous Waste

BOTH/NDC engaged McPhail Associates to perform a Phase I Environmental Site Assessment for the subject Site. The December 8, 2014 report identified two recognized environmental conditions: a) an apparently man-made mound of soil of unknown origin; and 2) the former Express Automotive site at 848 Parker Street which is an MADEP release site under Release Tracking Number (RTN) 3-11071.

McPhail is in the process of completing a Phase II Environmental Site Assessment that will include the results of soil and groundwater analytical testing to evaluate if the RECs have impacted the subsurface at the Project Site. BOTH/JPNDC is prepared to seek financial support to remediate the Site in the event that environmental contamination is found.

4.11 Noise

This section presents a qualitative noise evaluation of the Project. The noise evaluation discusses sound levels under future conditions based upon mechanical equipment, motor vehicle traffic, building operations, and emergency/back-up generators.

4.11.1 Noise Impact Criteria

The City of Boston and the DEP have developed noise impact criteria that establish noise thresholds deemed to result in adverse impacts.

The City of Boston has established regulations evaluating sound levels from proposed developments. These regulations establish maximum allowable sound levels based upon the land use of the proposed development. If the proposed development is located in a residential/industrial zoning district, the maximum noise level affecting residential uses shall not exceed the Residential-Industrial Noise Standard. The Residential-Industrial land use noise standard is 65 dBA for Daytime conditions (7:00 a.m. to 6:00 p.m.) and 55 dBA for Nighttime conditions (6:00 p.m. to 7:00 a.m.). The Business land use noise standard is 65 dBA for both Daytime and Nighttime conditions. These criteria are applicable to building facility noise sources, such as mechanical equipment, and do not apply to operation of any motor vehicle on any public way.

DEP has established a policy (DEP Policy 90-001) for implementing its noise regulations (310 CMR 7.10). This policy states that a source of sound will be considered in violation of the Department's noise regulation under the following conditions:

- If the source increases the broad band sound level by more than 10 dBA above ambient (normally defined as L90 or the noise level exceeded 90 percent of the time during the hours of noise source operations), or
- If the source produces a "pure tone" condition.

4.11.2 Project Impacts

The Project will be designed to adhere to state and local noise ordinances. The primary noise sources will likely be the mechanical and HVAC equipment necessary to maintain environmental controls during normal building operation. The design of the building and location of equipment will ensure that the sound levels generated by the Project meet both the City of Boston and DEP noise criteria and will have no adverse impact on the surrounding area. The following summarizes and evaluates each noise source and its potential sound level contribution to the surrounding area.

Mechanical Equipment

The Project will include some rooftop mechanical equipment. To the extent feasible, equipment will be located to take advantage of the buildings varied height and geometry which create a noise barrier blocking the rooftop mechanical noise from adjacent neighbors.

Building Operations

Trash/recycling drop-off rooms will be located on each floor. Management will then transfer waste to the designated outdoor trash storage area within the surface parking lot. Resident training with regard to trash and recycling practices will be provided by the owner/ management team.

4.11.3 Conclusion

The Project will comply with the City of Boston and DEP noise criteria because it will not generate sound levels that:

- Exceed the applicable land use criteria, or
- Significantly increase sound levels over existing levels, or
- Generate "pure tone" conditions because of the characteristics of traffic noise are varied.

Construction impacts are temporary in nature and are typically related to air (dust), noise, and runoff. The following sections describe the potential temporary impacts due to construction activities and proposed mitigation measures to reduce these impacts. Construction of the Project will be completed in a single phase. Construction of the building and site improvements are schedule to begin in December 2017. The Project is anticipated to be fully constructed and in operation by May 2019.

4.12 Site Preparation and Construction Staging

The Proponent will continue to work and coordinate with the utility companies to assure compliance and integrity of the Project. A plan to control construction-related impacts

including erosion, sedimentation, and other pollutant sources during construction and any land disturbance activities shall be developed and implemented.

4.12.1 Construction Air Quality

Retrofitted diesel construction vehicles, or vehicles that use alternate fuels, will be used. The Project will implement an outdoor construction management plan that includes provisions for wheel washing, site vacuuming, and truck covers. The Commonwealth of Massachusetts anti-idling law will be enforced during the construction phase of the Project with the installation of on-site anti-idling signage.

The Project will comply with the requirements of the Clean Construction Equipment Initiative aimed at reducing air emissions from diesel-powered construction equipment. Oxidation catalysts and catalyzed particulate filters will be utilized on all construction vehicles and equipment to reduce air quality degradation caused by emissions from heavy-duty, diesel-powered construction equipment. All pre-2007 diesel construction vehicles working on the Project will be retrofitted using retrofit technologies approved by the United States Environmental Protection Agency (EPA). Additionally, ultra-low-sulfur diesel (ULSD) fuel (15 parts per million) will be used for all off-road diesel equipment.

4.12.2 Construction Noise

The construction activity associated with the Project may temporarily increase nearby sound levels due to the use of heavy machinery. Heavy machinery is expected to be used intermittently throughout the Project's construction phases, typically during daytime periods. The construction phases that will generate the highest sound levels include the demolition of existing buildings, site excavation and grading, and construction of the foundations for the proposed buildings. The City of Boston Regulations for the Control of Noise considers construction sound levels to be an impact to residential land uses if the L10 is in excess of 75 dB(A) or the Lmax is in excess of 86 dB(A). A construction management program will be developed with the City of Boston to ensure that the City of Boston noise regulation related to construction noise is met.

The Project is subject to construction-hour restrictions and the residential sound limits established under the Regulations for the Control of Noise in the City of Boston. Residential and commercial neighbors will be provided with contact names and telephone numbers for comments/complaints regarding these and other construction-related issues.

4.12.3 Construction Traffic and Parking

Construction workers and construction trucks will be properly managed to minimize significant impacts on traffic conditions on surrounding streets during construction. The Project Site offers adequate space for on-site construction staging and parking. The Proponent will work with the BTD to develop a site-specific Construction Management Plan (CMP).

The following elements are typically addressed in the CMP:

- Designation of truck routes for deliveries
- Protection of pedestrian walkways
- Location and sizing of staging areas for on-site storage of construction materials
- Definition of worker parking parameters and measures to maximize related use of public transportation
- Identification of truck waiting areas
- Police officer traffic management
- Construction graphics program
- Interim traffic operation improvements
- Definition of street and sidewalk occupancies
- Definition of work hours

4.12.4 Construction Trip Generation and Worker Parking

The number of workers required during the construction will vary daily. Because the workforce will arrive and depart prior to peak commuter traffic periods, these trips are not expected to have a large impact on the area's transportation system. Workers will be required to take public transport or park in area lots. The Proponent will work to reduce construction employee vehicle trips through TDM measures, such as:

- Provide secure, on-site storage so that workers do not have to transport tools and equipment each day;
- Post transit schedules in prominent area; and/or
- Hire local workers.

4.12.5 Construction Truck Routes and Volumes

The construction work is not anticipated to generate a high volume during peak hours. Police details may be assigned to all active gate locations to ensure that vehicles are not impacting traffic operations as necessary.

4.12.6 Construction Hazardous Materials and Solid Waste

All solid waste generated will be recycled off-site or disposed of in accordance with federal, state, and city regulations. The Construction Manager will implement a waste management plan that will seek to divert at least 75 percent and up to 95% of construction and demolition waste material removed from the Site from landfills through recycling and salvaging.

4.12.7 Rodent Control During Construction

The City of Boston has declared that the infestation of rodents in the city as a serious problem. In order to control this infestation, the City enforces the requirements established under the Massachusetts State Sanitary Code, Chapter 211, 105 CMR 410.550 and the State Building

Code, Section 108.6. Policy Number 87-4 (City of Boston) established that preparation of a program for the extermination of rodents shall be required for issuance of permits for demolition, excavation, foundation, and basement rehabilitation. The Proponent will prepare and adhere to a rodent control program prior to demolition and on a regular basis throughout the duration of construction.

4.12.8 Public Safety During Construction

The entire perimeter of the construction site limits will be protected with a 6-foot high temporary chain link construction fence. Vehicular gates will be provided for construction traffic on perimeter roads to allow safe entrance and exiting for construction vehicles and personnel. Additionally, signage will be posted on fencing and construction trailers to alert all personnel to the safety requirements.

Larger deliveries of construction materials may require the use of police details to assist in managing vehicular and pedestrian traffic. Coordination with the Boston Police Department will be essential in providing safe travel routes for pedestrians during peak construction periods.

4.13 Rodent Control Post-Construction

Trash and solid waste removal will be handled by the building maintenance staff. The Proponent will maintain a service contract with a professional pest control firm to address rodent/pest control during the operational phase of the Project. In addition, no open top dumpsters will be allowed as an additional precaution to deter infestation.

5 Infrastructure

This chapter describes the existing infrastructure systems surrounding the Project Site, and discusses utility aspects of the Project and potential utility impacts. The following utilities are discussed: wastewater, water, stormwater management, natural gas, electricity, and telecommunications. Chapter 4, Environmental Protection, discusses energy conservation measures being considered as part of the Project.

The Project is expected to connect to existing city and utility company systems in the adjacent public streets. Based on coordination with the appropriate utilities and available utility drawings, it is expected that the increase in demand associated with the development and operation of the Project can be accommodated with existing infrastructure. Detailed design of the Project's utility systems will proceed in conjunction with the design of the building and interior mechanical systems.

The systems discussed herein include those owned or managed by the Boston Water and Sewer Commission (BWSC) and private utility companies. There will be further coordination among these entities and with the project engineers and architects as the project design develops and during the construction process for the Project.

5.1 Key Findings and Benefits

The key impact assessment findings related to infrastructure systems include:

- The existing city and utility infrastructure systems are expected to be adequately sized to accept the demand associated with the development and operation of the Project.
- The Project is estimated to generate approximately 11,070 gallons per day (net new) of sanitary sewage and will require approximately 12,177 gallons of water per day (net new).

Key Project-related mitigation and/or benefits associated with the infrastructure systems include:

- Construction of the Project will incorporate on-site stormwater management and treatment systems that are expected to improve water quality, reduce runoff volume, and control peak rates of runoff in comparison to existing conditions.
- The Project will not result in the introduction of any increased peak flows, pollutants, or sediments that would potentially impact the local drainage systems.

5.2 Regulatory Context

The following discusses the regulatory framework of utility connection reviews and standards. A complete list of the state and local permits anticipated associated with project-related infrastructure is included in Chapter 1, General Information and Regulatory Context. For the Project:

- BWSC approval will be required for all water, sewer and stormwater systems.
- The Boston Fire Department will review the Project with respect to fire protection measures such as siamese connections, hydrants, and standpipes.
- Design of the site access, hydrant locations, and energy systems (gas and electric) will also be coordinated with the respective system owners.

All improvements and connections to BWSC infrastructure will be reviewed by BWSC as part of the BWSC site plan review process. This process includes a comprehensive design review of the proposed service connections, assessment of system demands and capacity, and establishment of service accounts.

5.3 Stormwater Management

The following section describes the drainage utility infrastructure surrounding the Project Site and explain how these systems will service the Project.

5.3.1 Existing Drainage Conditions

There are existing Boston Water and Sewer (BWSC) storm drains in Parker Street, Heath Street and Bromley Street adjacent to the Project Site (see Figure 5.1):

- A 48-inch storm drain in Heath Street. This storm drain connects to a 78-inch storm drain which passes beneath the Southwest Corridor and connects to the 208-inch x 186-inch Stony Brook Conduit combined sewer in Columbus Avenue. This combined sewer ultimately flows to the Deer Island Waste Water Treatment Plant.
- A 12-inch storm drain in Bromley Street. This storm drain connects to the 48-inch storm drain described above.
- A 24-inch storm drain in Parker Street. This storm drain connects to the 48-inch storm drain described above.

Although storm drainage from the Site currently flows to the Deer Island Waste Water Treatment Plant, if the system is separated in the future, stormwater would flow to the Charles River.

5.3.2 Proposed Drainage Conditions

The Project is within the Charles River watershed. As a result, BWSC requires that stormwater runoff from impervious areas of the Site be treated for phosphorous prior to being discharged to the BWSC system.

The Project will provide phosphorous treatment on-site prior to discharge to the BWSC system. Rainfall from the building roof will be piped internally to roof drains which will connect to a closed drainage system on-site. Surface runoff from the Project will be directed to a closed drainage system consisting of deep sump catch basins, water quality treatment structures and infiltration systems. Phosphorous treatment will likely be accomplished through a subsurface infiltration system sized for the one-inch volume over the impervious site area.

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 inlets will be protected with filter fabric, straw wattles 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. See Below for additional information.

5.3.3 DEP Stormwater Management Policy Standards

In March 1997, the Department of Environmental Protection DEP adopted a new Stormwater Management Policy to address non-point source pollution. In 1997, the Massachusetts DEP 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 comply with this standard to the maximum extent practicable.

Standard #4: For new development, stormwater management systems must be designed to remove 80% of the average 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 management 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, parking and pedestrian areas. Any paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded catch basins and conveyed through water quality units and/or recharge systems 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 314 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 will comply with the Stormwater Management Standards as applicable to the development.

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

Compliance: The Project will comply with this standard. Sedimentation and erosion controls will be incorporated as part of the design of these projects and employed during construction.

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.

5.4 Sanitary Sewage

The following section describes the sanitary sewerage utility infrastructure surrounding the Project Site and explain how these systems will service the Project.

5.4.1 Existing Sewer System

There are existing BWSC sanitary sewers and combined sewers in Parker Street, Heath Street and Bromley Street adjacent to the Project Site (See Figure 5.1):

- An 18-inch sanitary sewer in Heath Street that flows to the 36-inch Southwest Corridor Interceptor. This sanitary sewer ultimately flows to the Deer Island Waste Water Treatment Plant.
- A 36-inch x 38-inch combined sewer in Heath Street that flows to the 208-inch x 186-inch combined sewer in Columbus Avenue.
- A 10-inch sanitary sewer at the south end of Bromley Street that flows to the 18-inch sanitary sewer described above.
- A 24-inch sanitary sewer in Parker Street that flows to the 36-inch x 38-inch combined sewer described above.

5.4.2 Proposed Sewage Flow and Connection

The Project's sewerage generation rates were estimated using the Massachusetts Department of Environmental Protection 310 CMR 15.00 Title 5 regulations. 310 CMR 15.00 lists typical generation values for the sources listed in Table 5.1 for the Project. Typical generation values are generally conservative values for estimating the sewage flows from new construction. Table 5.1 describes the proposed sewage generation due to the Project. Based on these estimates, the Project is expected to increase the total effluent sewage discharge from the Project Site by 11,070 gallons per day (gpd).

TABLE 5.1 EXISTING AND FUTURE SEWER GENERATION

Program Type	Units	Generation Rate	Sewer Generation (GPD)
Existing Sewer Flows			
Undeveloped	0	0	0
TOTAL	0	0	0
Proposed Sewer Flows			
Bedroom	97 bedrooms	110 gpd/bedroom	10,670
Office	111 sf	75 gpd/1,000 sf	200
Retail	895 sf	50 gpd/ 1,000 sf	200
TOTAL			11,070
NET NEW			11,070

Note: Based on DEP 314 CMR 7.15 flow calculation factors. Minimum 200 gpd for Office and retail uses.

The Project will likely connect to the 24-inch sanitary sewer in Parker Street. The Project will require site plan approval from BWSC, and all new connections to the BWSC sewer system will be reviewed and coordinated with BWSC to determine the most appropriate connections. In accordance with BWSC requirements, the Project's sewage and stormwater flows will be maintained separately and will be connected to the appropriate respective mains.

5.4.3 Sanitary Sewer System Capacity Analysis

The Proponent has analyzed the existing sanitary sewer main in Parker Street to determine whether it is of sufficient capacity to accommodate the Project (Table 5.2). Pipe sizes and inverts were obtained from BWSC record documents obtained at the Engineering Customer Service Desk. Flow capacity was analyzed using Manning's equation.

Based on available information, the 24-inch sanitary sewer main between manholes 23 and 24 has a capacity of 32.25 million gallons per day (mgd). The Project is estimated to contribute an additional 0.011 mgd to the main. Based on the peak flow estimate, the Project will not significantly burden the existing sewage system.

TABLE 5.2 EXISTING SEWER HYDRAULIC CAPACITY ANALYSIS

Manhole (BWSC#)	Size (inch)	Slope	Manning's Roughness Coefficient	Existing Capacity (mgd)	Proposed Peak Flow to Main (mgd)
24 to 23	24	0.049	0.013	32.25	0.011

5.5 Domestic Water and Fire Protection

The following section describes the water utility infrastructure surrounding the Project Site and explain how these systems will service the Project.

5.5.1 Existing Water Supply System

There are existing BWSC water mains in New Heath Street, Parker Street, Heath Street and Bromley Street adjacent to the Project Site (see Figure 5.2):

- A 12-inch Southern High main in New Heath Street.
- A 36-inch Southern High main in New Heath Street.
- A 16-inch Southern High main in Parker Street.
- A 36-inch Southern High main in Parker Street.
- A 16-inch Southern High main in Heath Street.
- A 36-inch Southern High main in Heath Street.
- An eight-inch Southern High main in Bromley Street.

Two existing hydrants are located adjacent to the Project Site, H62 and H94. There is also another existing hydrant on New Heath Street closer to the Southwest Corridor. Nitsch Engineering has requested hydrant flow test results from BWSC for these hydrants, but no

information has been received to date. As hydrant flow test data needs to be less than one year old to be used for design, new hydrant flow tests will be requested by Nitsch Engineering during the design phase of the Project.

It appears that there are no existing water services to the Project Site.

5.5.2 Proposed Water Demand and Connection

The Project's potable water demand is estimated as 110% of the sewage generation, or 12,177 gpd. The domestic water and fire protection services will likely connect to the 16-inch main in Parker Street, the 16-inch main in Heath Street or the 12-inch main in New Heath Street. Water connections will be reviewed and coordinated with BWSC to determine the most appropriate connections. If any existing water connections not used by the Project are discovered, they will be cut and capped at the main.

5.6 Other Utilities

5.6.1 Natural Gas Service

Natural gas service will be coordinated with the utility company. The gas will be utilized for heating of the building and production of domestic hot water.

5.6.2 Electrical Service

Electrical service will be coordinated with the utility company. The service will be 120/208/3 Phases, 4-wire.

5.6.3 Telephone and Telecommunications

Telephone and telecommunications services will be provided. Closets will be located on each level.

5.6.4 Protection of Utilities

To be discussed with utility companies.

6

Community/Public Process

On October 2, 2014, the City issued a Request for Proposals for disposition of the ten parcels comprising the General Heath Square Site. On December 22, 2014, BOTH/JPNDC submitted a complete proposal to the City. BOTH/JPNDC was the only organization to submit a proposal. The City held a community meeting on March 5, 2015 to present the BOTH/JPNDC proposal. On May 6, 2015, the City's Public Facilities Commission tentatively designated JPNDC (representing the BOTH/JPNDC partnership) as developer of the Site. Throughout this time period, the Project team has met with residents, neighborhood groups, community leaders, business owners, elected officials, City of Boston officials, and other stakeholders to seek input and feedback as they developed the Project. Below is a detailed description of this community/public process. Evidence of meeting activity (flyers, sign-in sheets, notes) is available upon request.

6.1 November – December 2014

In preparation for submission of the proposal to the Boston Department of Neighborhood Development (DND) on December 22, 2014, BOTH/NDC, led by the JPNDC Community Organizing Department, conducted extensive community engagement. Highlights include two well-publicized and well-attended public meetings, and a collection of many support letters and petitions in support of the BOTH/NDC proposal. Community meeting engagement activities were as follows:

6.1.1 Community Meeting #1: November 12, 2014

- 11/3/14: Email invitations sent (all JPNDC contacts, neighborhood groups, local news).
- 11/3/14 to 11/12/14: Meeting flyer distributed door by door in Bromley Heath, Center Street, Jackson Square, Hyde Jackson, and Back of the Hill /Mission Hill.
- 11/3/14 to 11/7/14: Meeting invitation placed at the Jamaica Plain News, JP Gazette, JP-Patch; posted flyer at local organizations: Bromley Heath Management office, ABCD, Nurtury, Martha Ellioth Health Center, Family Service of Greater Boston.
- 11/4/14: Distributed flyers at poling locations in JP during Election Day.
- 11/4/14: Visited and delivered flyers to businesses within 5 blocks of the Project Site.

- 11/5/14: Facebook posting; re-posted 11/11/14.
- 11/5/14: Attended Jamaica Plain Neighborhood Council meeting and invited members to attend Community Meeting #1.
- 11/7/14: Paid advertisement placed in JP Gazette.
- 11/11/14: Attended Egleston Square Main Street Board of Directors meeting and invited members to attend Community Meeting #1.

6.1.2 Community Meeting #2: December 2, 2014

- 11/13/14: Facebook posting; re-posted 11/24/14.
- 11/19/14: Email invitations sent (all JPNDC contacts, JPNC H&D Committee, other neighborhood groups, local news) for community meeting #2.
- 11/19/14 to 12/2/14: Meeting flyer distributed door by door in Bromley Heath, Center Street, Jackson Square, Hyde Jackson, and Back of the Hill /Mission Hill.
- 11/18/14 to 11/20/14: Meeting invitation placed at the Jamaica Plain News, JP Gazette, JP-Patch.
- 11/21/14: PRESS ARTICLE- JP Gazette Article reporting on community meeting #2 and publicizing community meeting #2.
- 11/24/14: Direct outreach performed to Bromley-Heath tenants (100+) at their Thanksgiving event.
- 12/1/14: Reminder email invitations sent (all JPNDC contacts, neighborhood groups, local news) for community meeting #2.

6.1.3 Letters of Support and Petitions

The following is a list of support letters and petitions received:

- Bromley-Heath Tenant Organization (2 letters)
- City Councilor Flaherty
- City Councilor Murphy
- City Councilor O'Malley
- City Councilor Pressley
- City Councilor Wu
- City Councilor Zakim
- State Representative Jeffrey Sanchez
- Julia Martin House Tenant Association
- New England Baptist Hospital
- Nurtury (Early Education Center at Bromley-Heath)
- Winn Management (for Oliver Lofts on Terrace Street)
- Placetailor (office tenant at 51 Heath Street)
- Ugi's Pizza (Site neighbor)
- Jamaica Plain Coalition: Tree of Life/Vida de Arbol (local social service agency)
- Support Petitions

6.1.4 Discussions Initiated

BOTH/NDC also initiated discussions with the following:

- CLQ Realty Group (property owner at 51 Heath Street)
- Family Services of Greater Boston
- Jamaica Plain Neighborhood Council
- Martha Elliot Health Center
- Mass DCR Southwest Corridor Park
- Southwest Corridor Park Conservancy
- Other elected officials

6.2 January – June 2015

During this time period, the team focused on progressing the development program. Highlights include presentations at community meetings of the initial proposal and a revised proposal created via a collaborative process among JPNDC/BOTH, Boston DND and the Boston Redevelopment Authority.

6.2.1 Community Meeting #3: March 5, 2015

- 1/15/15: Flyer distributed and email sent all JPNDC contacts, abutters, neighbors, Bromley Heath buildings, merchants on Centre Street and Heath Street for DND's sponsored community meeting to present proposals submitted to for the RFP on 1/28/15. This meeting was cancelled due to inclement weather.
- 2/28/15: Flyer distributed to abutters, neighbors, Bromley Heath buildings, merchants on Centre Street and Heath Street for DND's sponsored community meeting to present proposals submitted to for the RFP on 3/5/15.
- 3/03/15: Email invitations sent (all JPNDC contacts, JP/ Housing and Development Committee, neighborhood groups, local news) for DND sponsored community meeting to present proposals submitted to for the RFP on 3/5/15.

6.2.2 Community Meeting #4: June 23, 2015

- 6/08/15: Flyer distributed to abutters, neighbors, Bromley Heath buildings, merchants on Centre Street and Heath Street for community sponsored by DND/JPNCD and Back of the Hill CDC on 6/23/15.
- 6/19/15: Email invitations sent (all JPNDC contacts, JP/ Housing and Development Committee, neighborhood groups, local news) for community sponsored by DND/JPNCD and Back of the Hill CDC.

6.3 August – December 2015

In August 2015, JPNDC/BOTH renewed public process activity in light of upcoming regulatory processes (BRA Article 80 Large Project Review and Zoning Board of Appeals). Moving forward, community outreach efforts will be focused around these processes.

6.3.1 Jamaica Plain Neighborhood Council

JPNC has a formal committee structure and approvals proceed accordingly:

- Housing and Development Committee
  - The Project was formally presented to this committee on 9/15/15. Approximately 15 people attended. The committee voted unanimously to support the Project.
- Zoning Committee (Scheduled for 10/7/15)
- Full JPNC (Pending)

6.3.2 Other Organizations and Elected Officials

JPNDC/BOTH is requesting updated support letters from all previous supporters, as well as from other organizations and elected officials that have not yet formally supported GHS.

6.4 Conclusion

As a result of the robust engagement process described above, the Proponent is confident in the level of community/public support for the Project, and expects this support to play a vital role in the Project's ultimate success.

7

Project Certification

This expanded Project Notification Form has been submitted to the Boston Redevelopment Authority, as required by Article 80B of the Zoning Code, on the 7th of October, 2015.

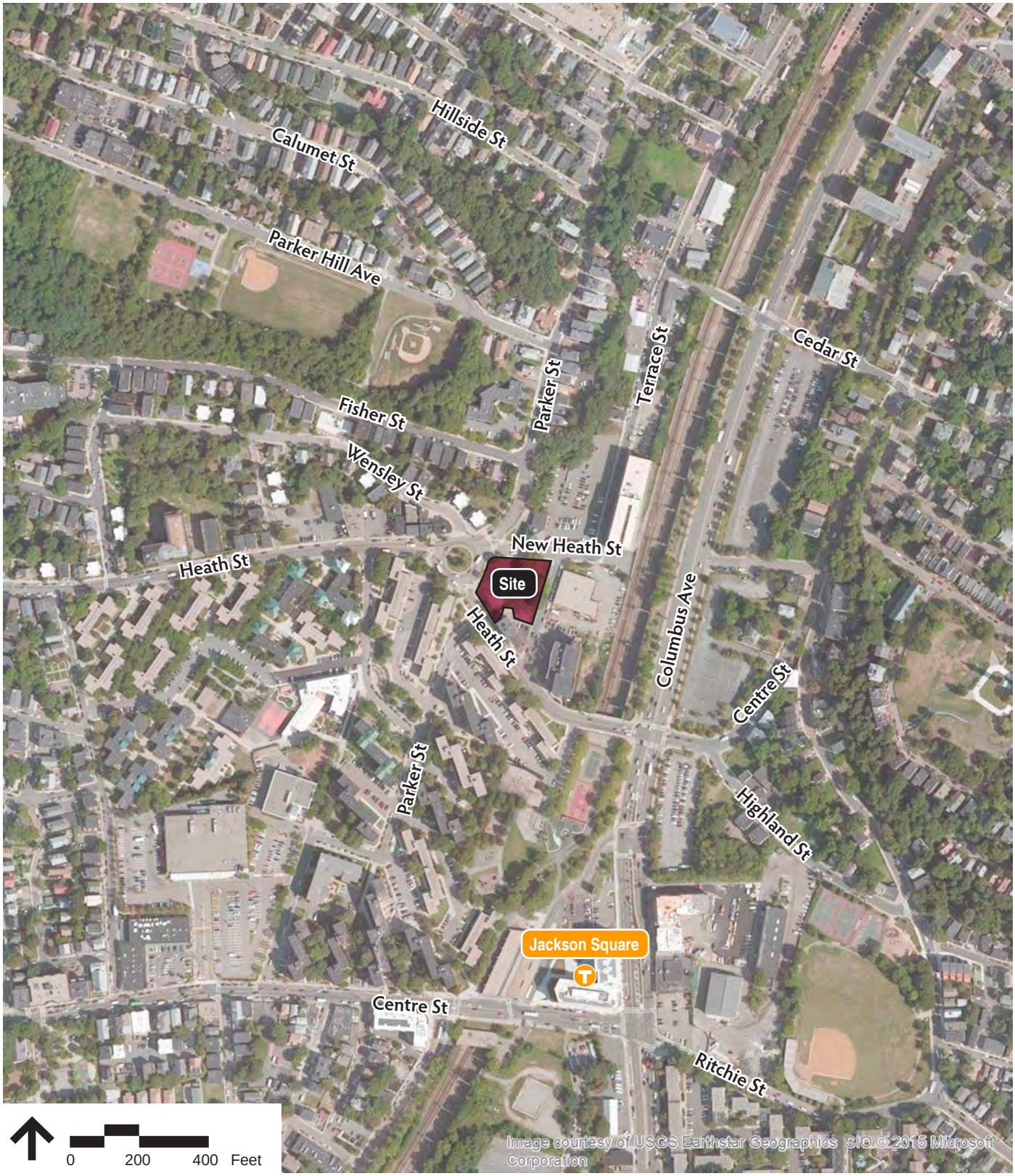
Proponent
BOTH/NDC Community Initiative, LLC

Richard Thal
Executive Director
Jamaica Plain Neighborhood Development Corporation

Preparer
Vanasse Hangen Brustlin, Inc.

Stephanie Kruel, ENV SP
Senior Environmental Planner

FIGURES



Source: ArcGIS Bing Aerial

Figure 1.1

Site Location Map

General Heath Square Apartments
Boston, MA

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Figure 1.2
Existing Site Conditions

Figure 1.3
Existing Site Photos

General Heath Square Apartments
Boston, MA

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Figure 1.4
Project Site Context

0 5 10 20 FEET

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Figure 1.5
Proposed Site Plan

General Heath Square Apartments
Boston, MA

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Figure 1.6a
Aerial Axonometric

General Heath Square Apartments
Boston, MA

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.6b
Aerial Axonometric

General Heath Square Apartments
Boston, MA

Figure 1.7a
Ground Floor Plan

General Heath Square Apartments
Boston, MA

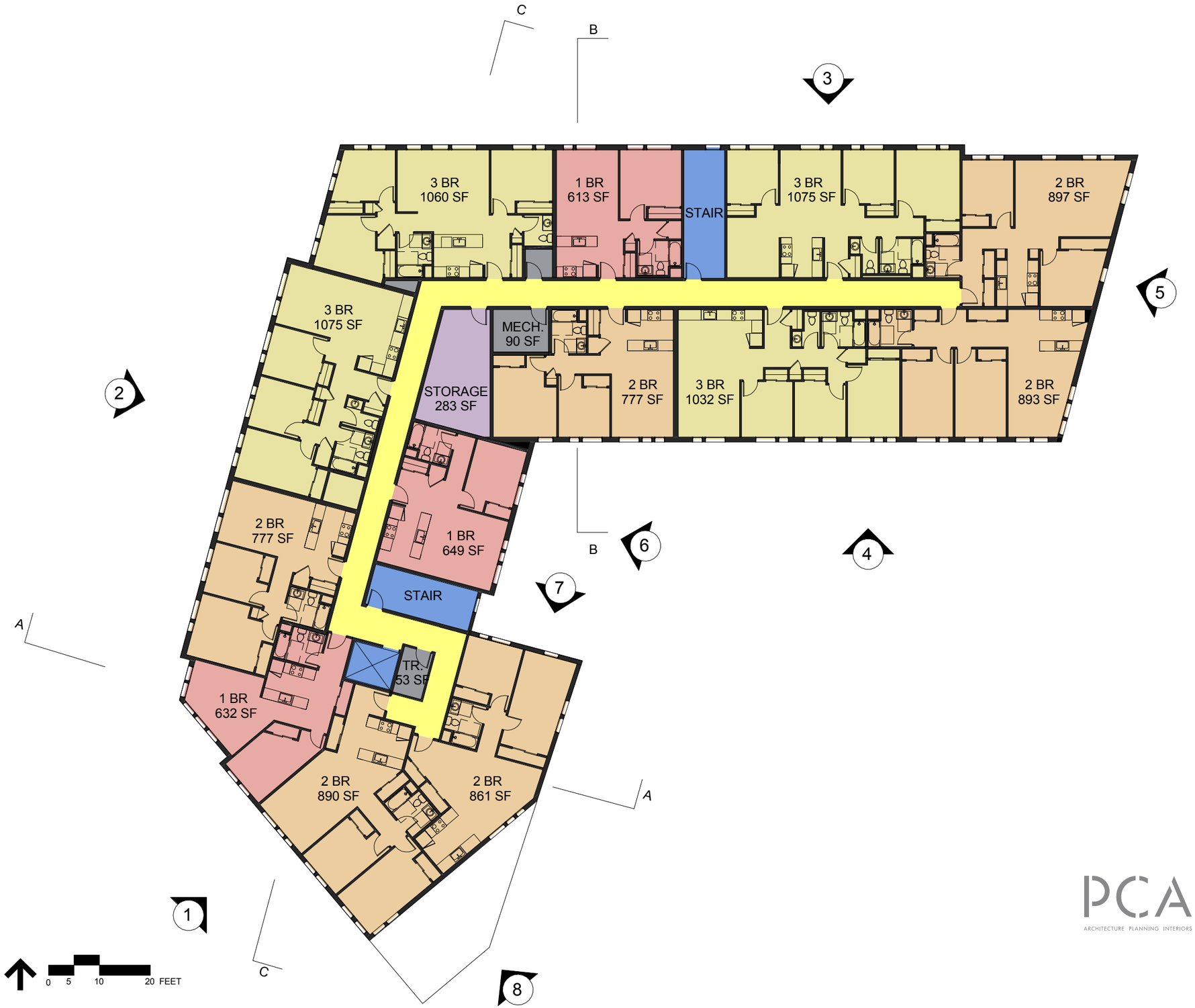

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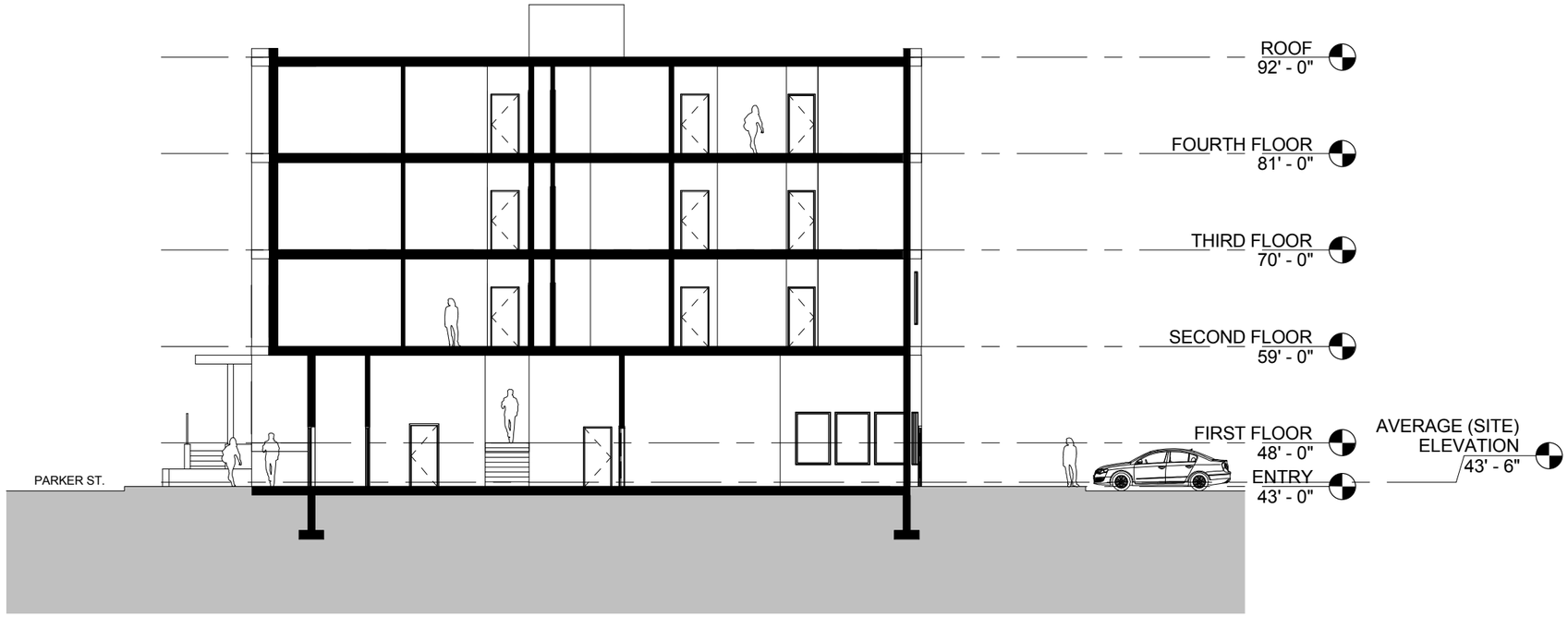
Figure 1.7b
Second-Fourth Floor Plan

General Heath Square Apartments
Boston, MA



PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.8a
Section A-A

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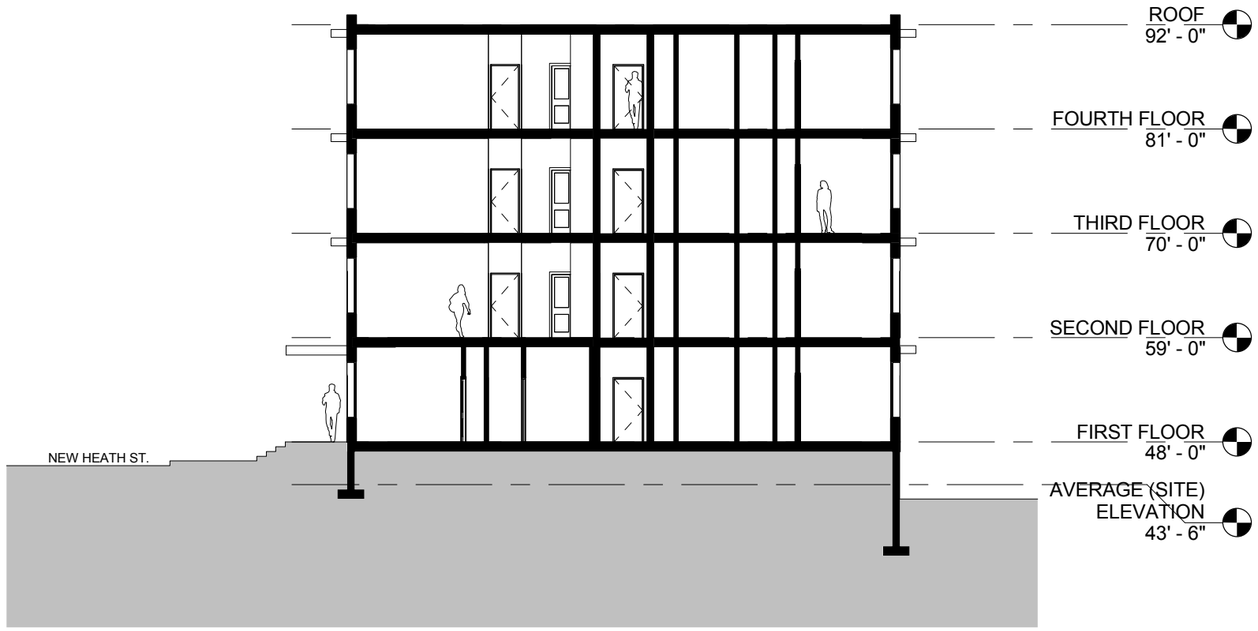
General Heath Square Apartments
Boston, MA



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PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.8b
Section B-B

General Heath Square Apartments
Boston, MA

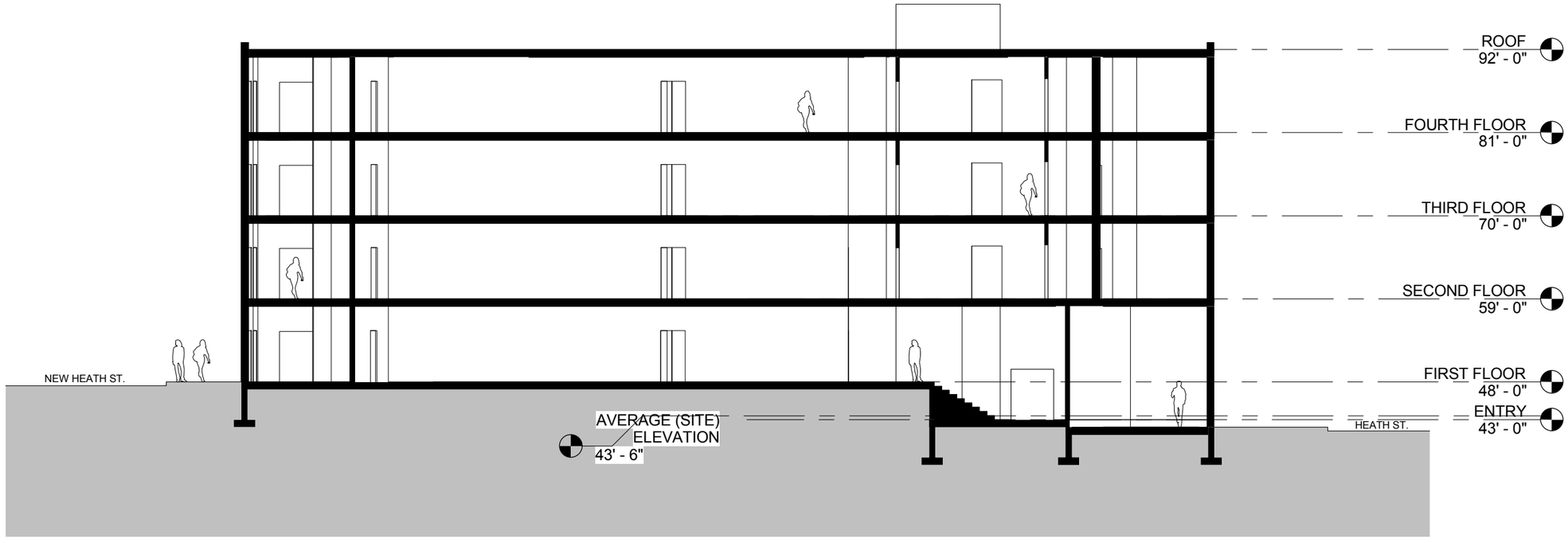

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Figure 1.8c
Section C-C

0 5 10 20 FEET

General Heath Square Apartments
Boston, MA

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.9a
View From Heath St. Looking West

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.9b
View from Bromley St. Looking East

General Heath Square Apartments
Boston, MA

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.9c
View From New Heath St. Looking East

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.9d
View From Heath St.

General Heath Square Apartments
Boston, MA

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.9e
View From Wensley St.

General Heath Square Apartments
Boston, MA

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Figure 1.9f
View on Parker St.

0 5 10 20 FEET

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Figure 1.10a
1 - Heath St. Elevation
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA

0 5 10 20 FEET

PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.10b
2 - Parker St. Elevation
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA

0 5 10 20 FEET

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Figure 1.10c
3 - New Heath St. Elevation
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA

0 5 10 20 FEET

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Figure 1.10d
4 - Rear Elevation - New Heath St.
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA

0 5 10 20 FEET

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Figure 1.10e
5 - Bromley St. Elevation
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA

0 5 10 20 FEET

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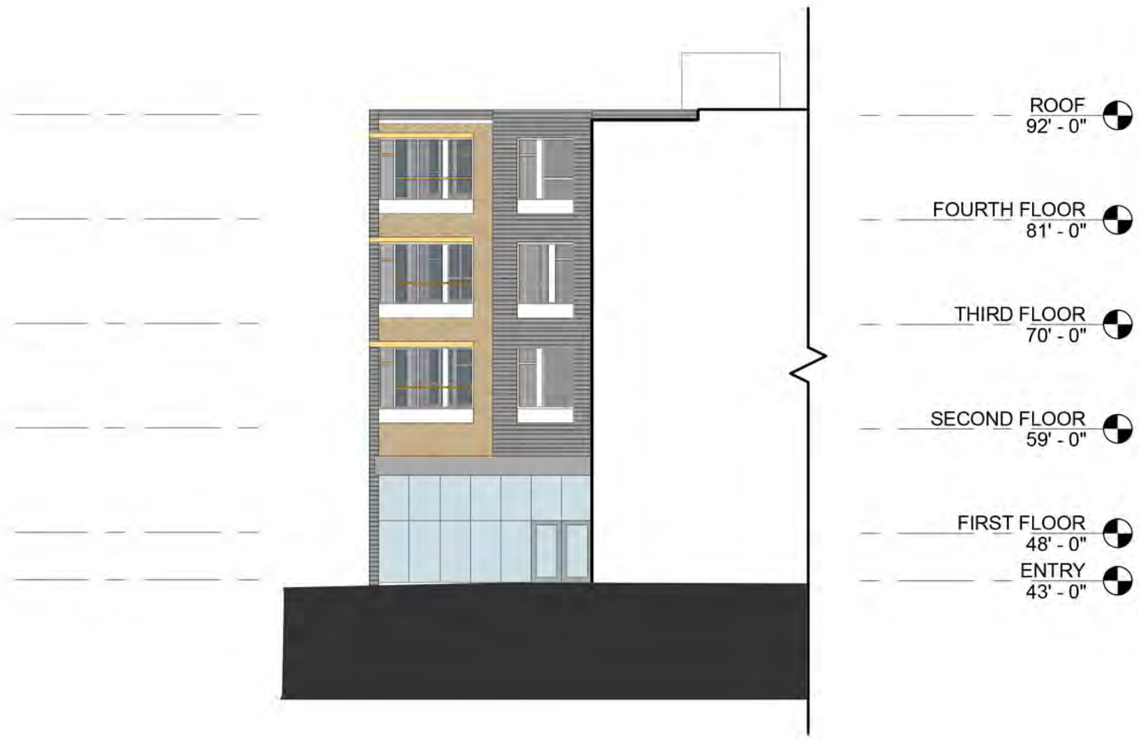
Figure 1.10f
6 - Rear Elevation - Parker St.
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA



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PCA ARCHITECTURE PLANNING INTERIORS

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Figure 1.10g
7 - Rear Elevation - Courtyard
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA

0 5 10 20 FEET

PCA ARCHITECTURE PLANNING INTERIORS

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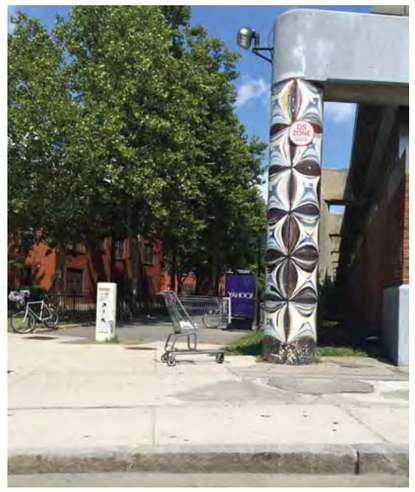
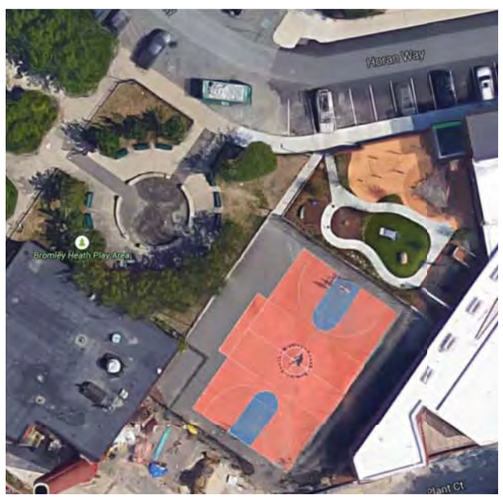
Figure 1.10h
8 - Side Elevation - Heath St.
1/16" = 1'-0"

General Heath Square Apartments
Boston, MA





Row 1: Heath Square rotary

Row 2: Southwest Corridor Park

Row 3: Bromley Heath Play Area

CO/la

vhb

Figure 2.1a
Nearby Open Spaces

General Heath Square Apartments
Boston, MA

Row 1: McLaughlin Playgroound

Row 2: Kevin Fitzgerald Park

Row 3: Mission Hill Community Garden

CO/la

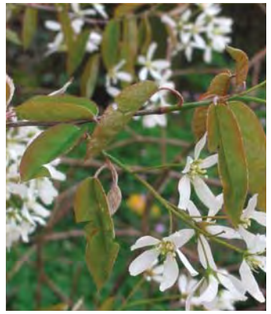
vhb

Figure 2.2b
Nearby Open Spaces

General Heath Square Apartments
Boston, MA














Ideas for Shade Trees:

Row 1: Quercus rubra/ Red Oak, Acer sacharum/ Sugar maple

Ideas for Ornamental/Understory Trees:

Row 2: Amelanchier canadensis/ Amelanchier Cornus mas/ Cornelian Cherry

Ideas for Shrubs:

Row 3: Rosa rugosa/ Rugosa Rose

Row 4: Vaccinium angustifolium/ Highbush Blueberry

CO/la

vhb

Figure 2.2a
Ornamental and Edible Plants

General Heath Square Apartments
Boston, MA








Ideas for Perennials:

Row 1: Lavendula angustifolia/ Lavender, Mentha piperita/ Peppermint

Row 2: Perovskia atriplicifolia/ Russian Sage, Rheum rhabarbarum/ Rhubarb

Vines:

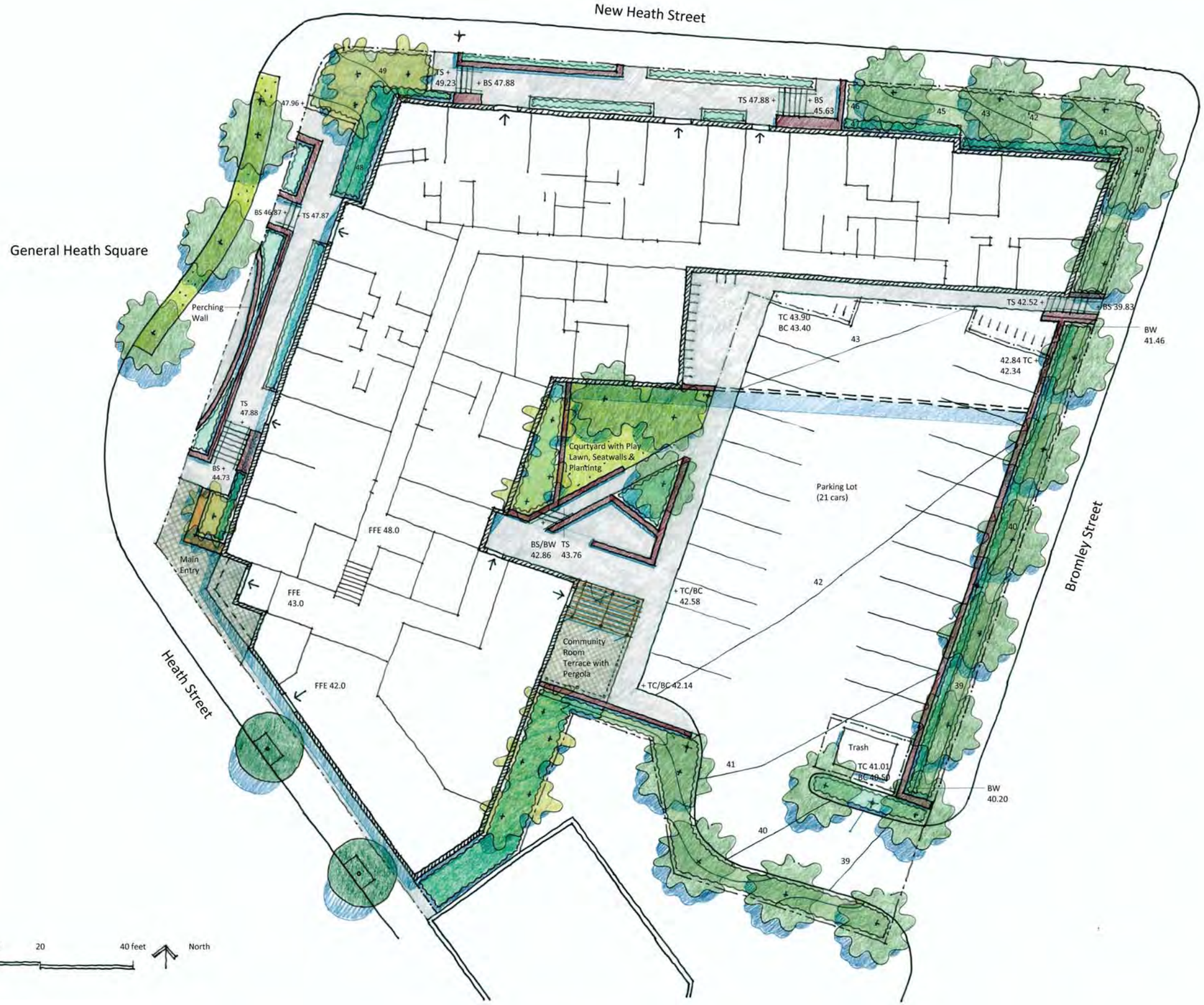
Row 3: Vitis sp./ Grape, Perthenocisus quinquifolia/ Virginia Creeper

CO/la

vhb

Figure 2.2b
Ornamental and Edible Plants

General Heath Square Apartments
Boston, MA



Legend

- Property line
- Existing tree to remain
- Proposed shade tree
- Proposed ornamental/understo
- Shrubs
- Perennial planting/Groundcove
- Lawn
- Cast-in-place concrete paving
- Special paving
- Fence or green screen
- Site wall- sitting or retaining
- Bench
- Bike racks- surface or wall mou
- Proposed contour line
- (+37.86) Existing spot elevation
- + 38.36 Proposed spot elevation
- + TC 42.31 / BC 41.81 Top of curb elevation / Bottom of curb elevation
- +TS 49.23 / BS 47.88 Top of step elevation / Bottom of stepelevation
- +TW 42.48 Top of wall elevation
- +BW 40.48 Bottom of wall elevation
- Building entry
- Proposed or existing light pole

CO/la

vhb

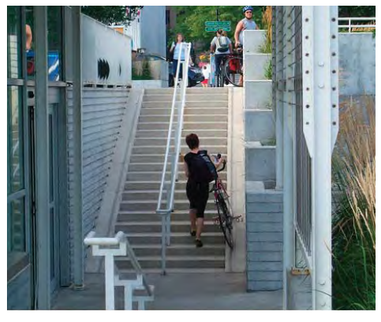
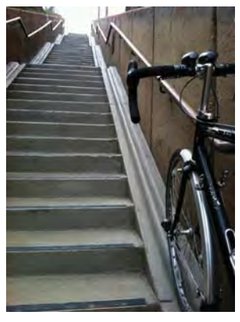
Figure 2.3
Preliminary Landscape Option

General Heath Square Apartments
Boston, MA











Furnishings:

Row 1: SEATING and WALLS

-Ideas for wood bench on stone frame facing Heath Square (David Faber, Bailey ArtForm)

-Ideas for Perching Bench facing Heath Square

Row 2: PERGOLA, GREEN WALL, FENCE

-Ideas for Shade Stucture at Commons (Original Vision Limited, Correa Pegola)

- Ideas for green wall and vine planting

-Ideas for perimter fence and gates in perforated metal (NY Botanical Garden)

Row 3: BICYCLE PARKING

-Ideas for wall mounted bike racks (Park-ABike

-Ideas for surface mounted bike racks (BikeParking)

-Ideas for accomodating bikes and steps (Steven Vance, Reconnecting America, PlanItMetro)

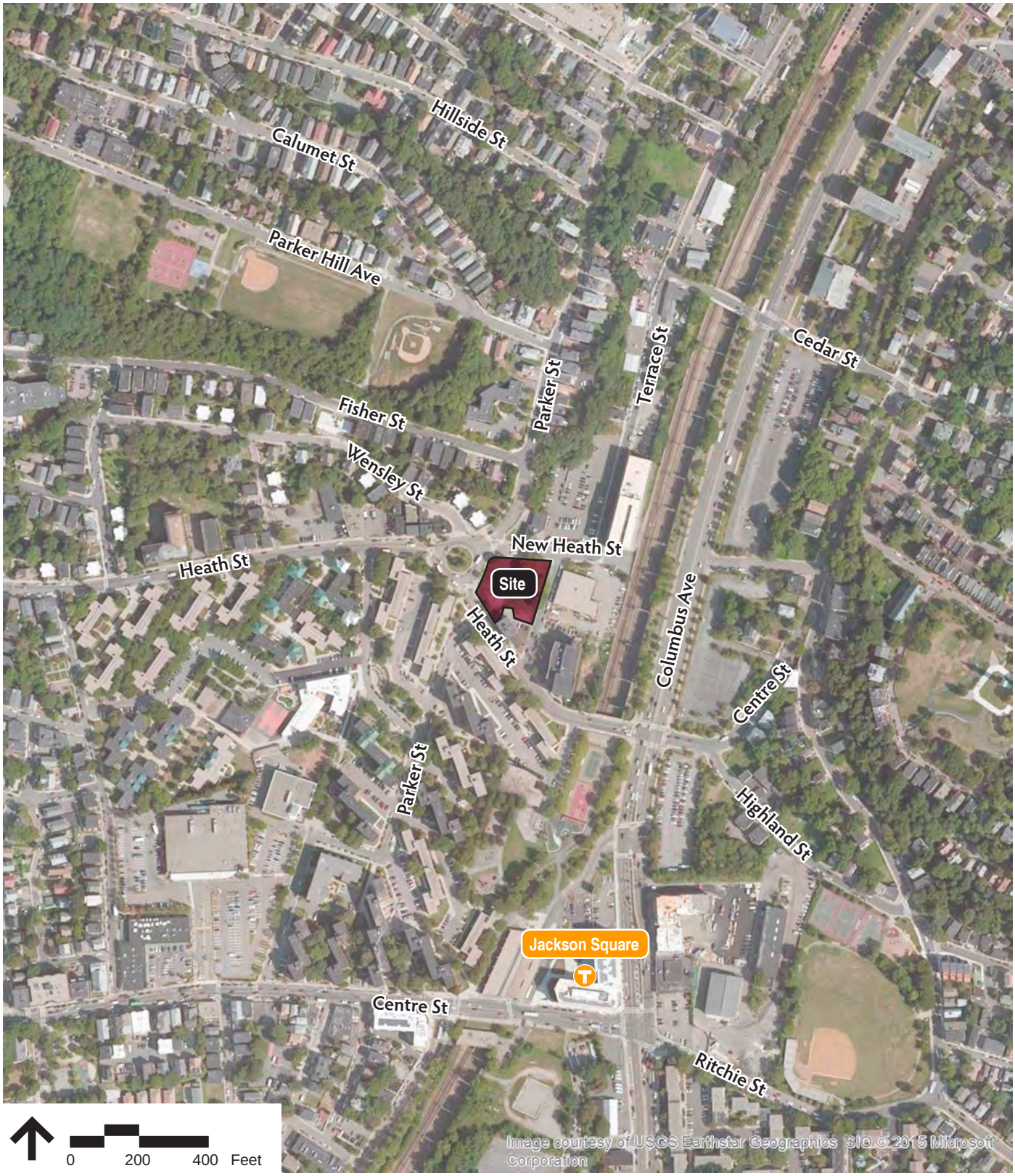
Row 4: PRODUCTIVE LANDSCAPE

-Ideas for mingling edible and perennial planting (Edible Arlington-Oranchak, The Year Of Living Fabulously)

CO/la

vhb

Figure 2.4
Precedent Images



Source: ArcGIS Bing Aerial

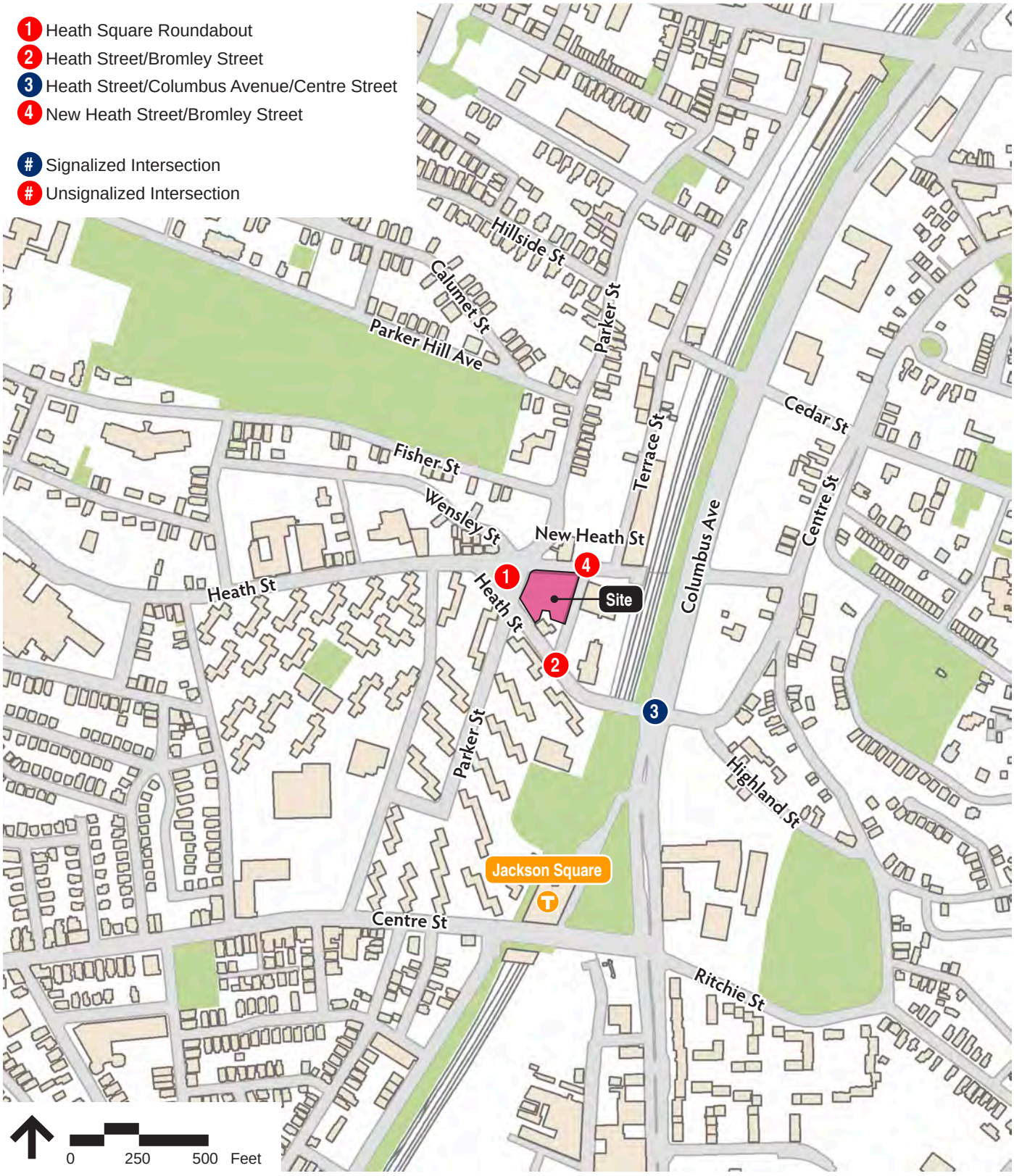
Figure 3.1
Site Location Map

General Heath Square Apartments
Boston, MA

Source: PCA

Figure 3.2
Site Location Map

General Heath Square Apartments
Boston, MA



Source: BWSC GIS datalayers

Figure 3.3
Study Area Intersections

General Heath Square Apartments
Boston, MA

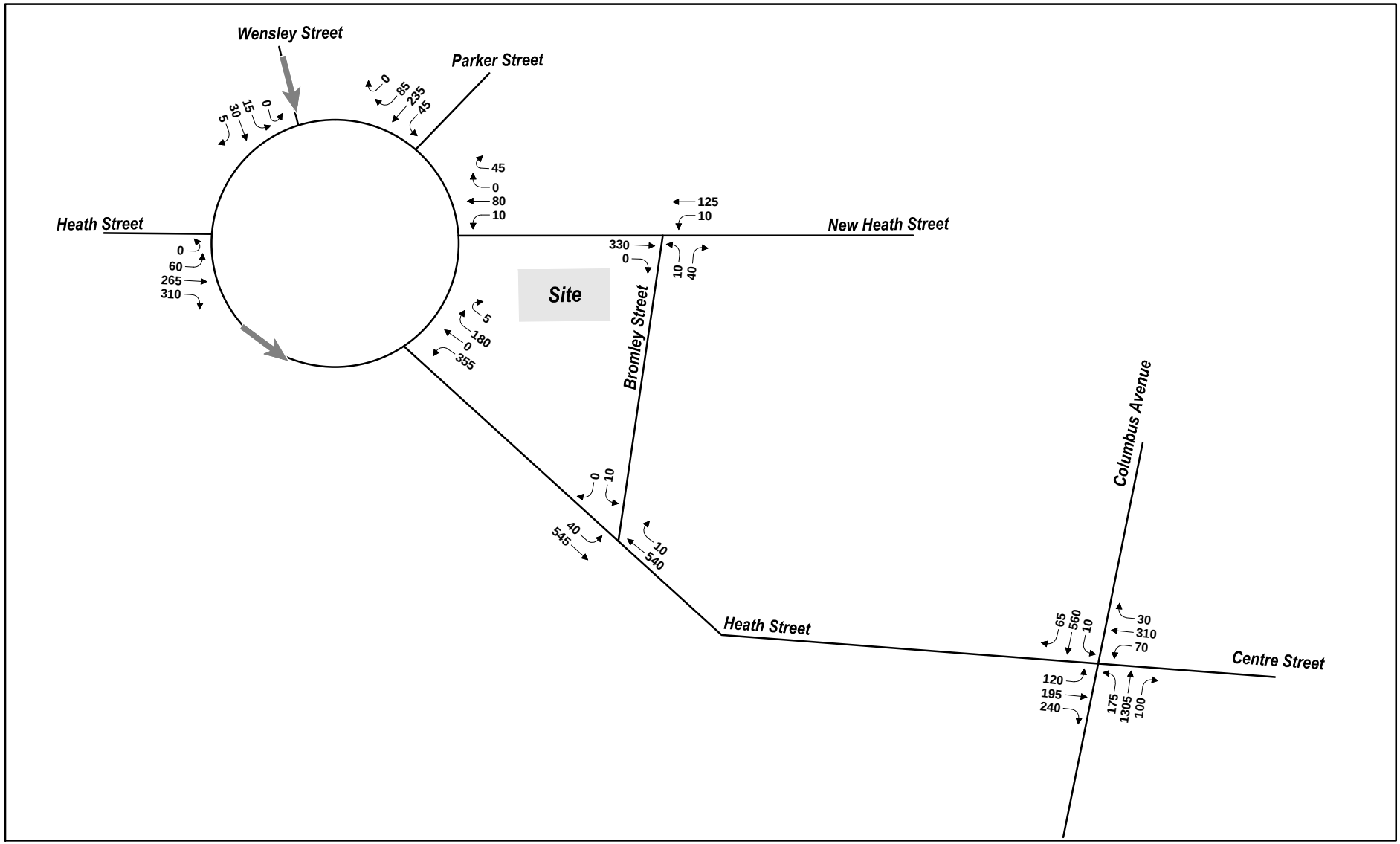


Figure 3.4
2015 Existing Condition Traffic Volumes
AM Peak Hour

General Heath Square Apartments
Boston, MA

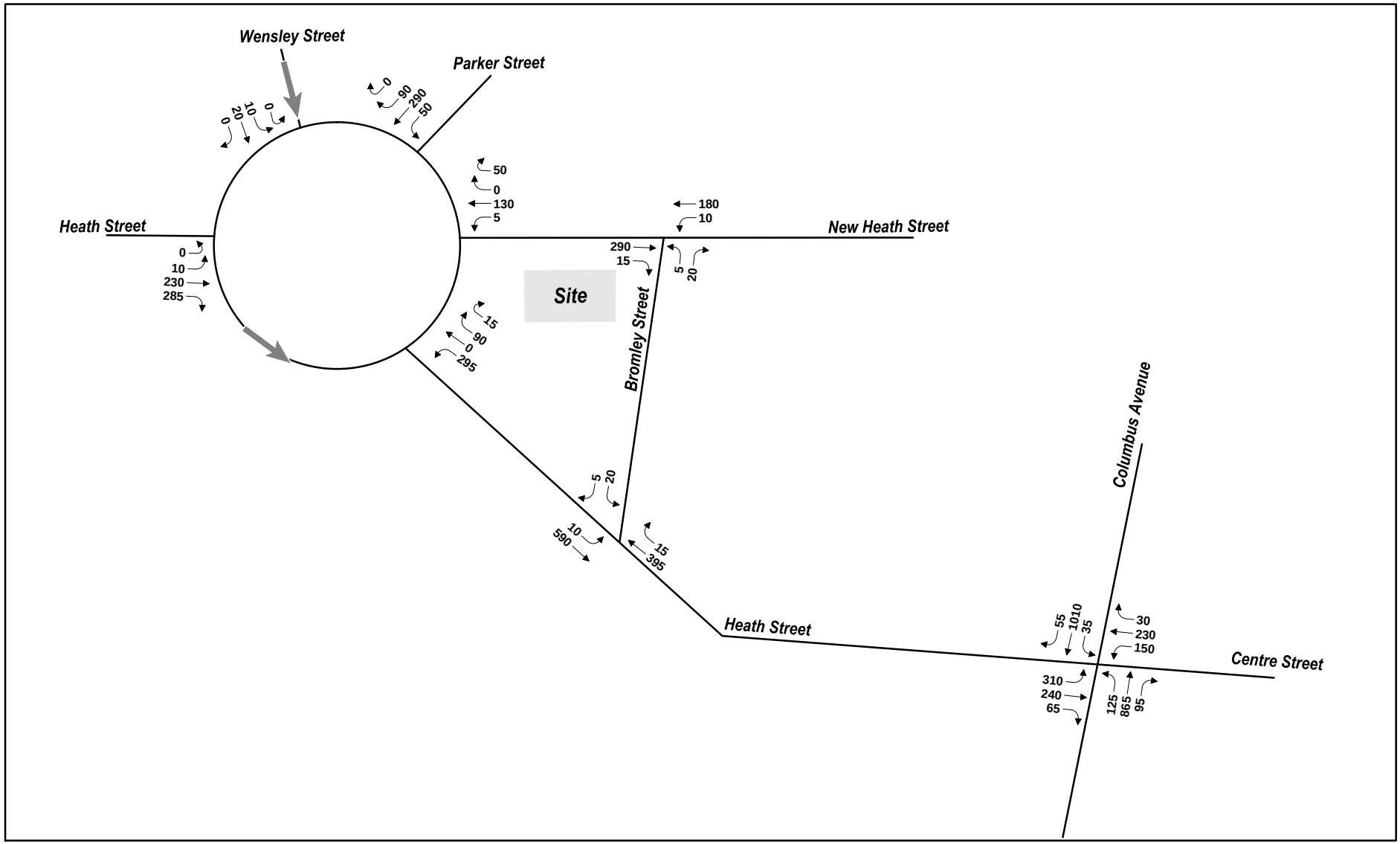


Figure 3.5
2015 Existing Condition Traffic Volumes
PM Peak Hour

General Heath Square Apartments
Boston, MA

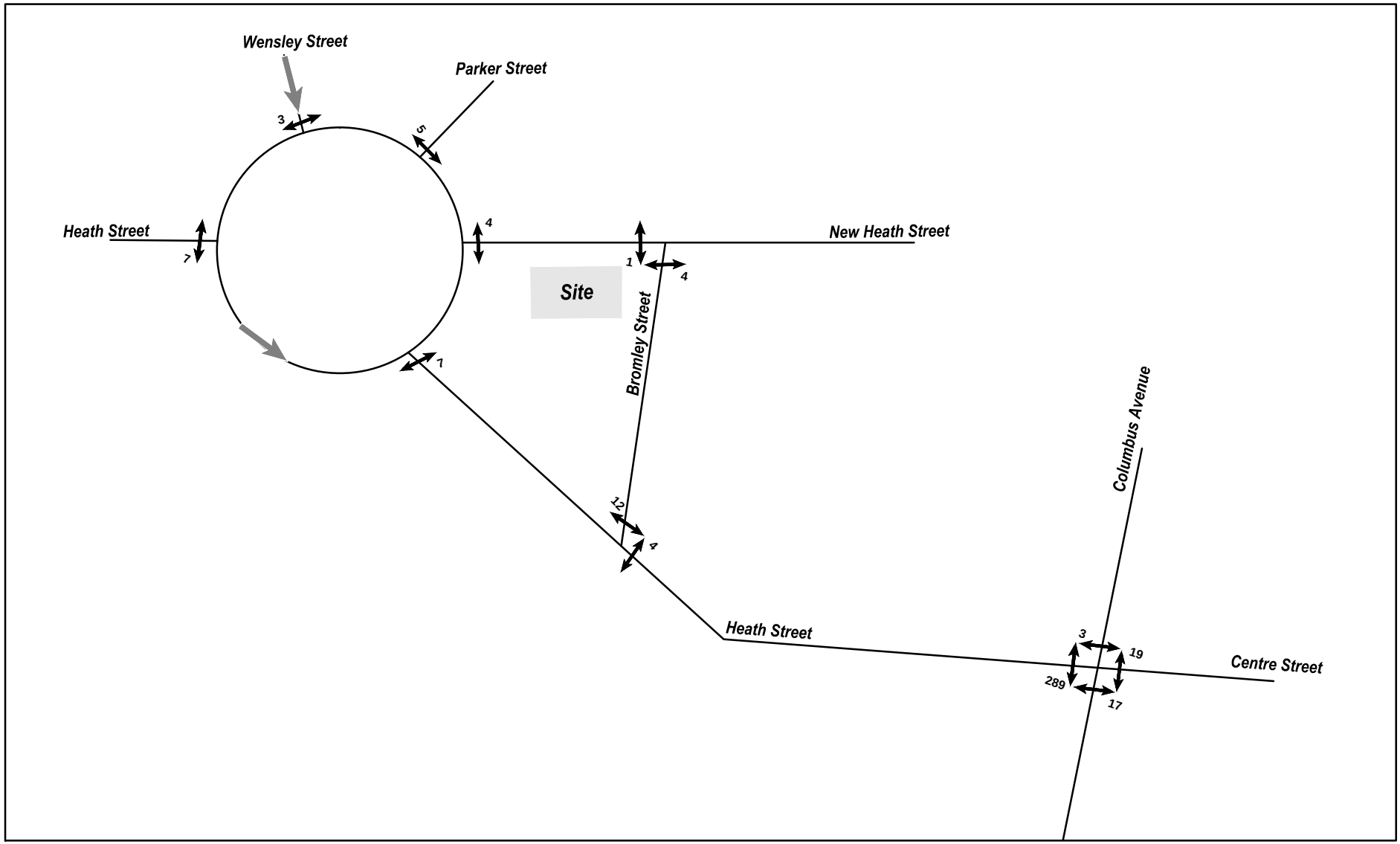


Figure 3.6
2015 Existing Condition Pedestrian Volumes
AM Peak Hour

General Heath Square Apartments
Boston, MA

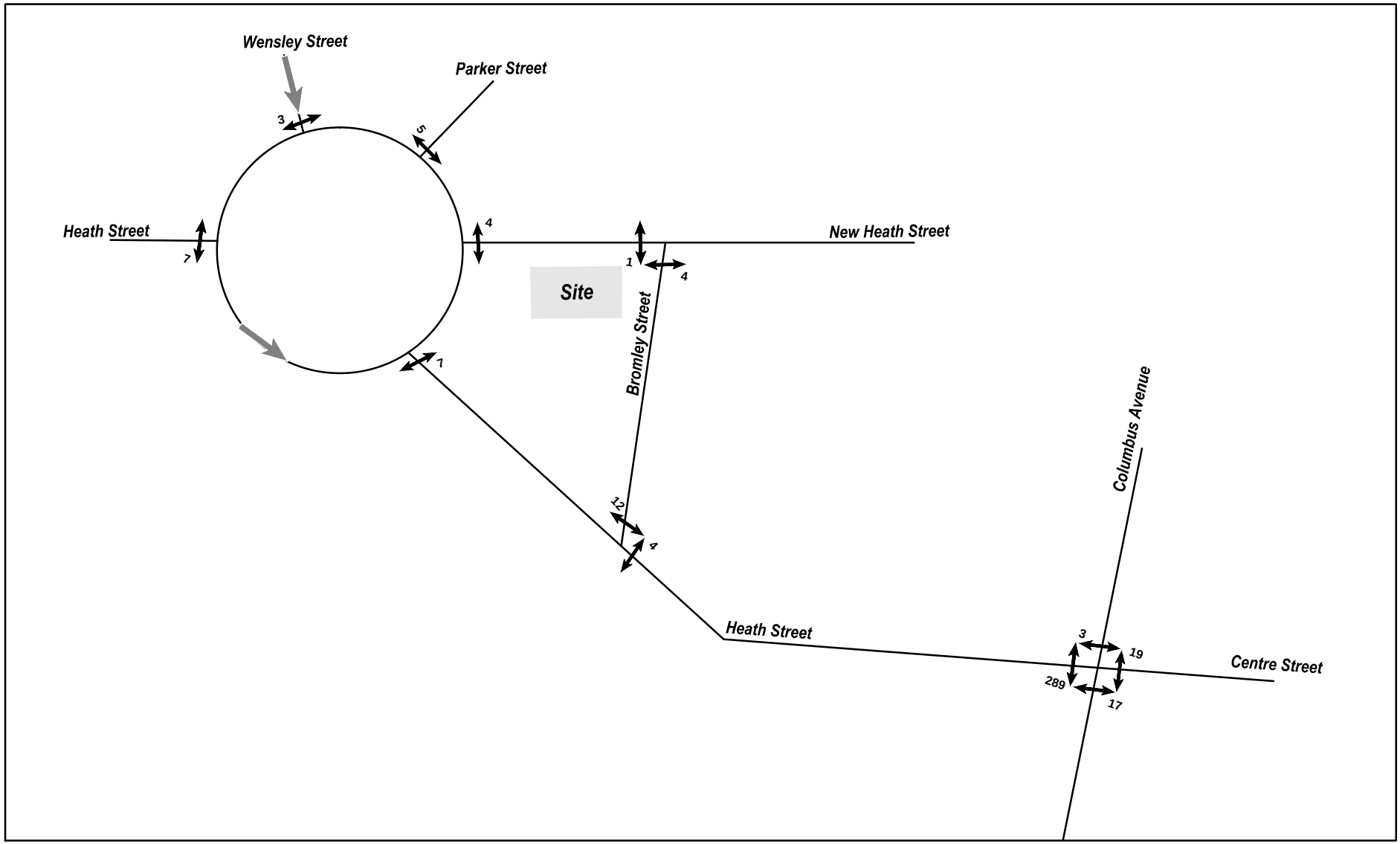


Figure 3.7
2015 Existing Condition Pedestrian Volumes
PM Peak Hour

General Heath Square Apartments
Boston, MA

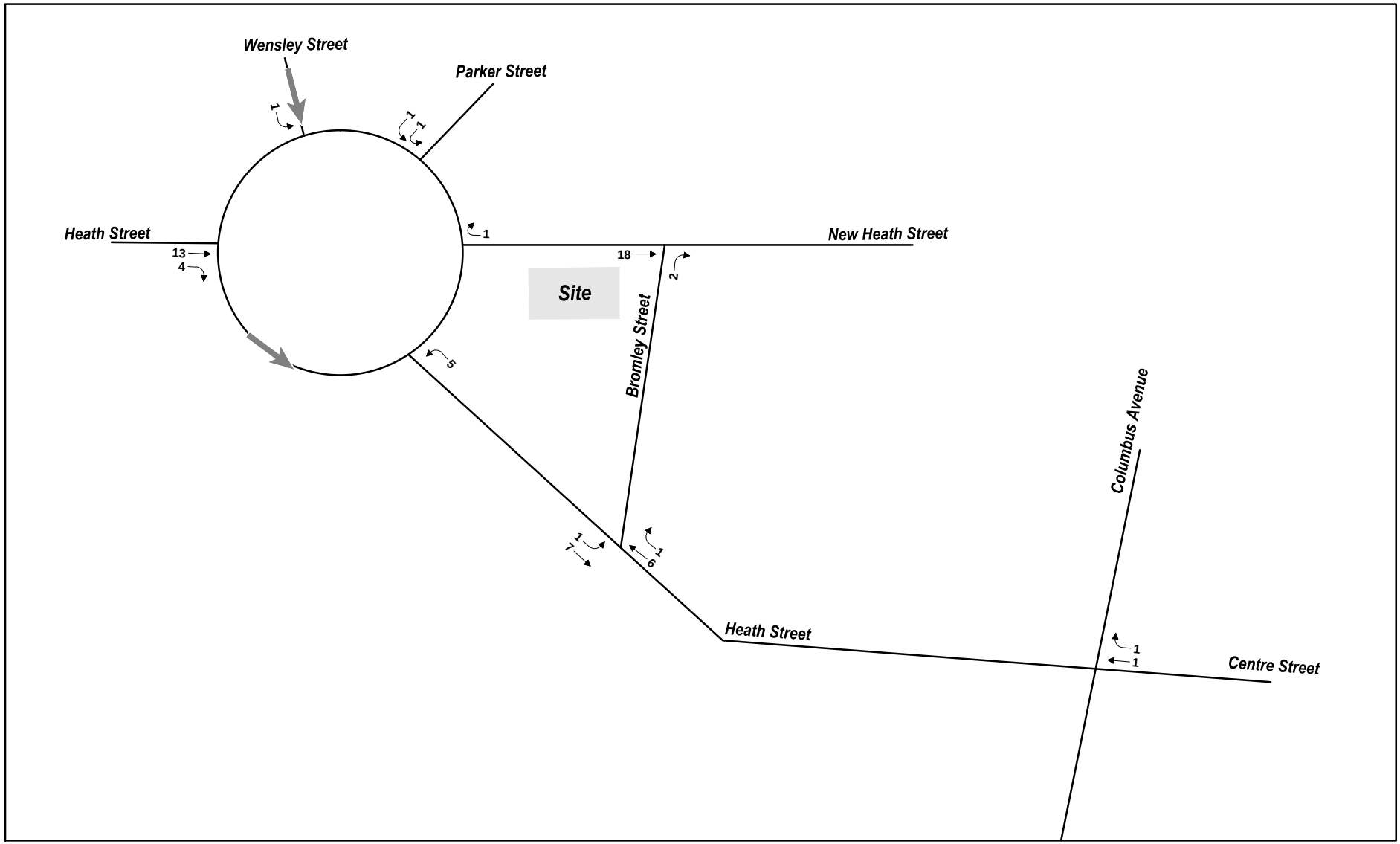


Figure 3.8
2015 Existing Condition Bicycle Volumes
AM Peak Hour

General Heath Square Apartments
Boston, MA

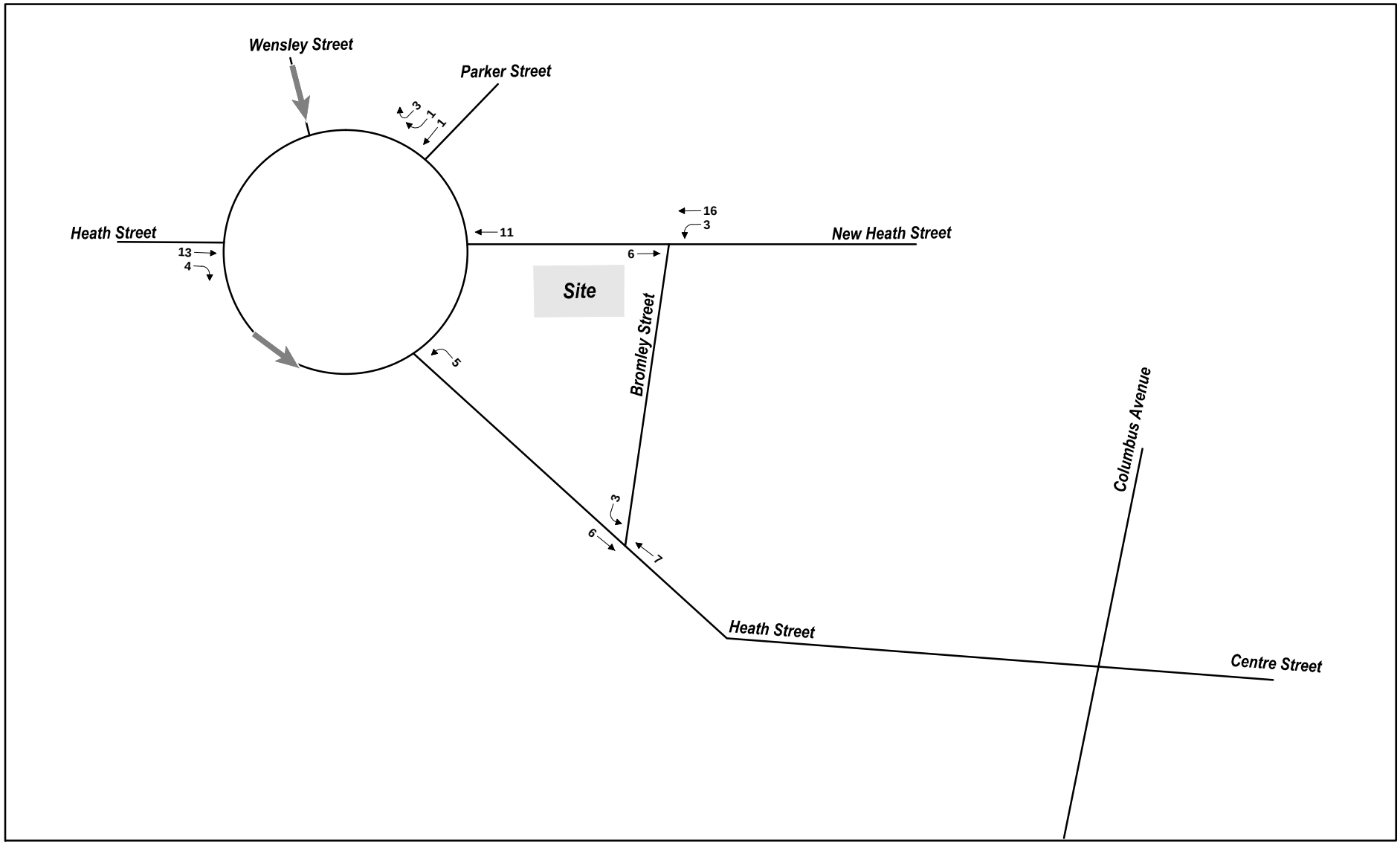
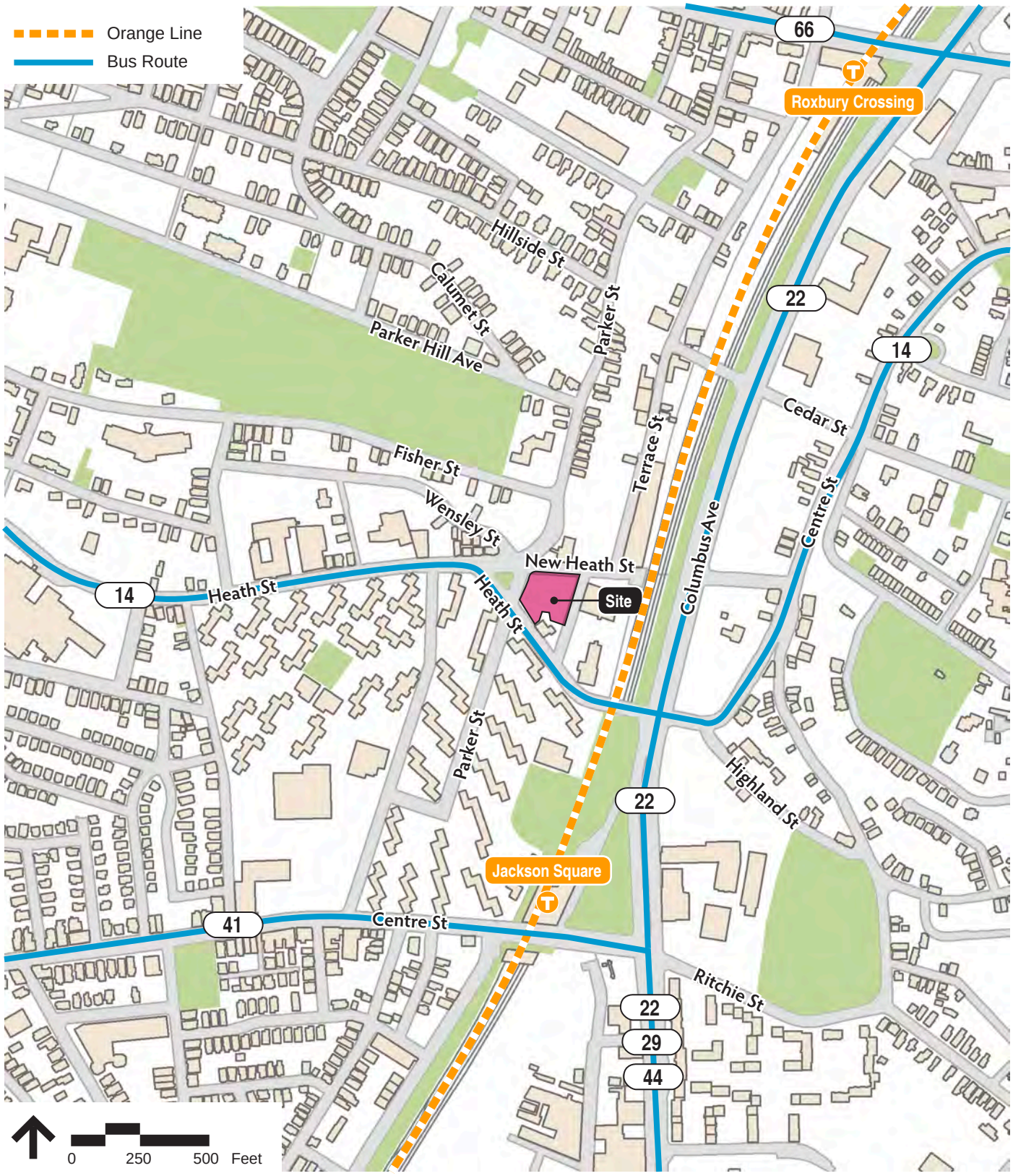


Figure 3.9
2015 Existing Condition Bicycle Volumes
PM Peak Hour

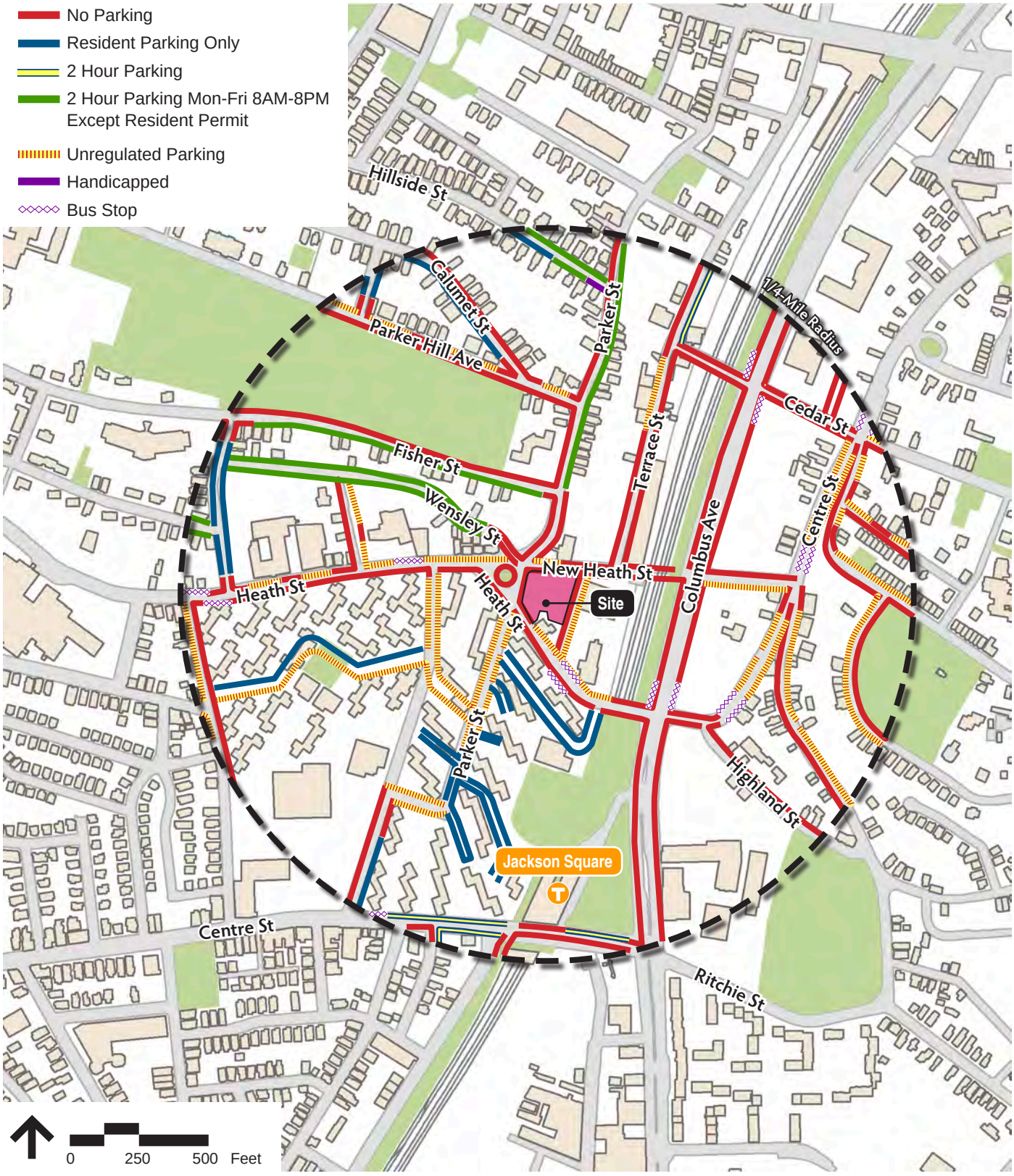
General Heath Square Apartments
Boston, MA



Source: BWSC GIS datalayers

Figure 3.10
Public Transportation

General Heath Square Apartments
Boston, MA



Source: BWSC GIS datalayers

Figure 3.11
Existing On-Street Parking

General Heath Square Apartments
Boston, MA

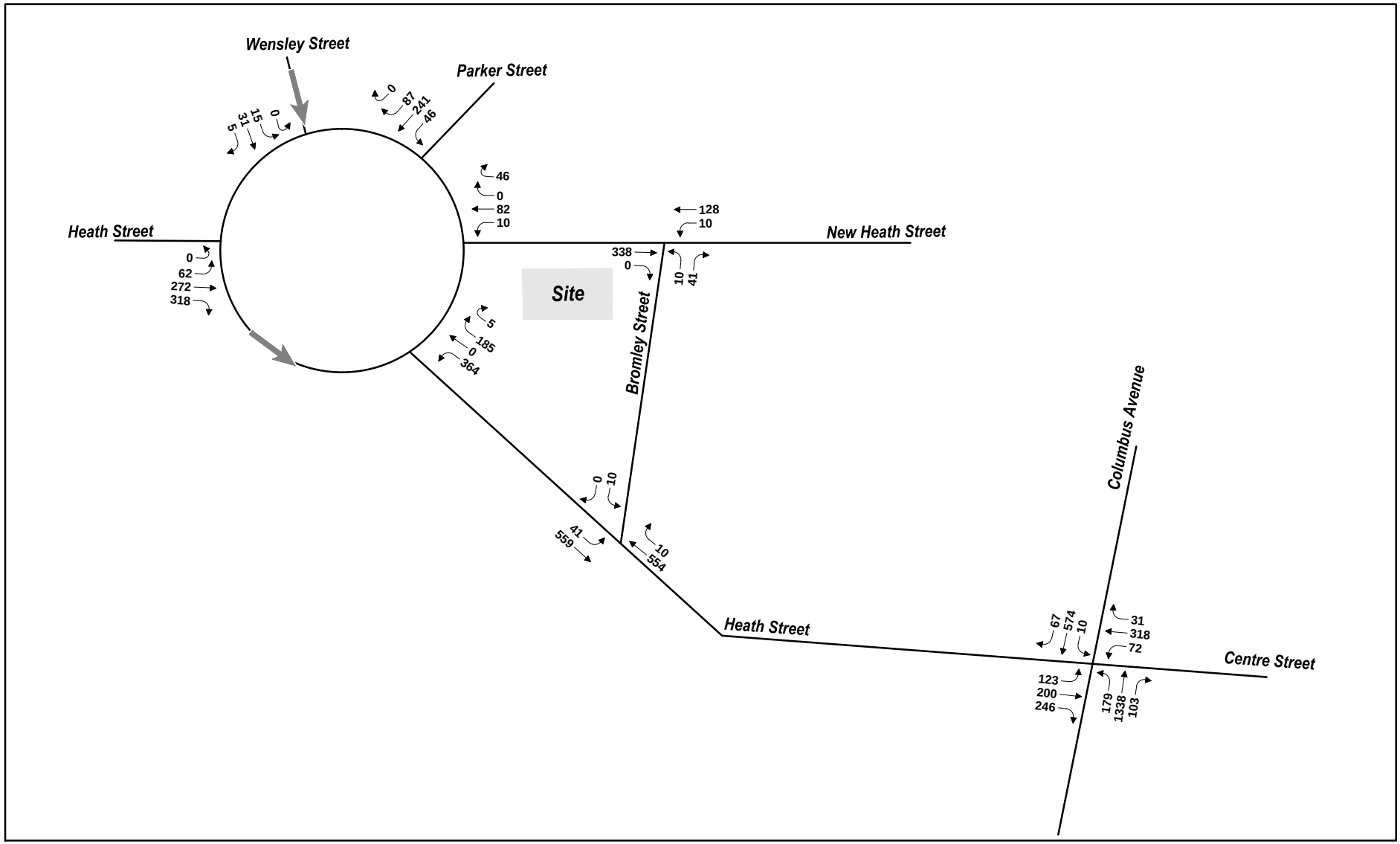


Figure 3.12
2020 No Build Traffic Volumes
AM Peak Hour

General Heath Square Apartments
Boston, MA

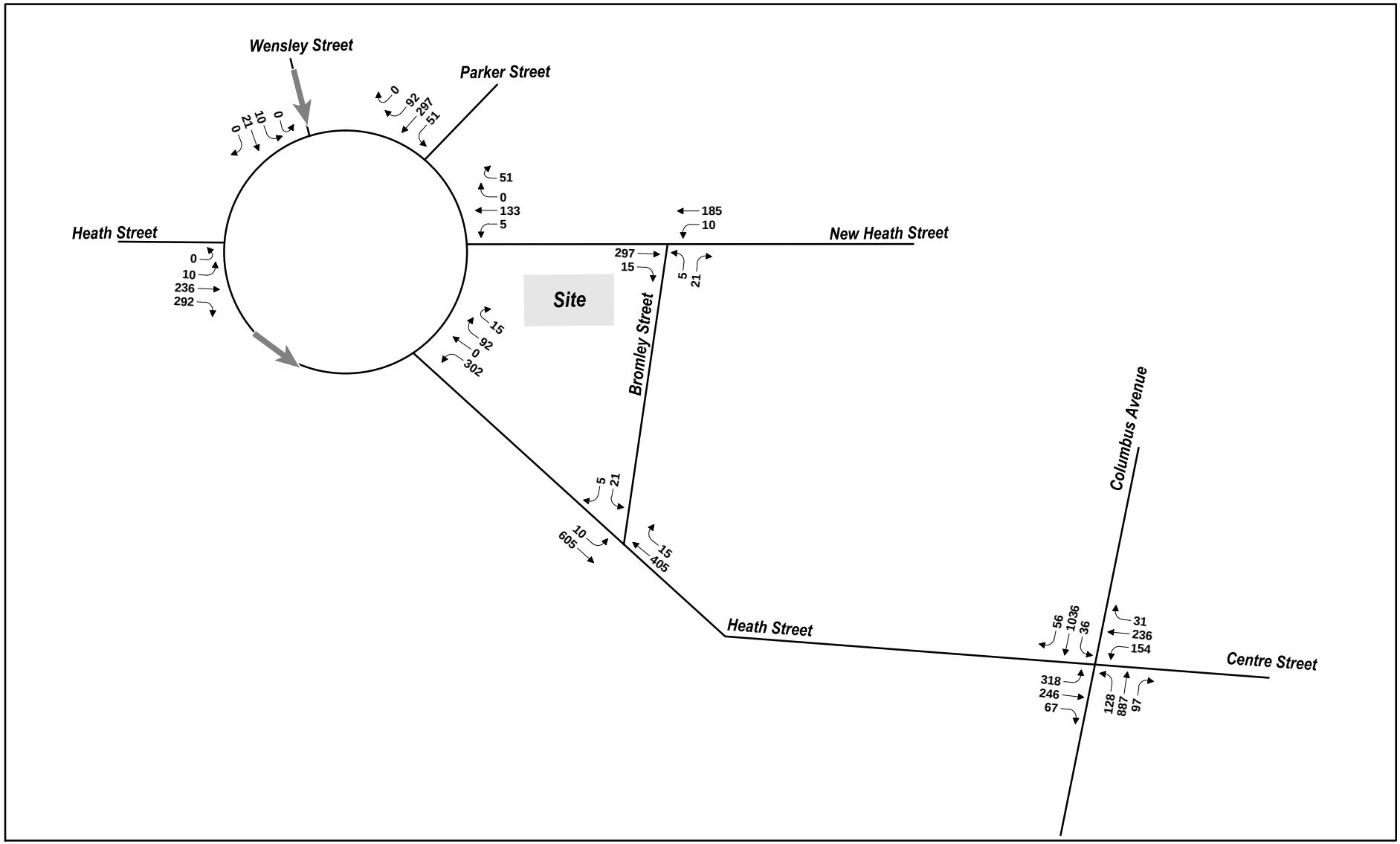
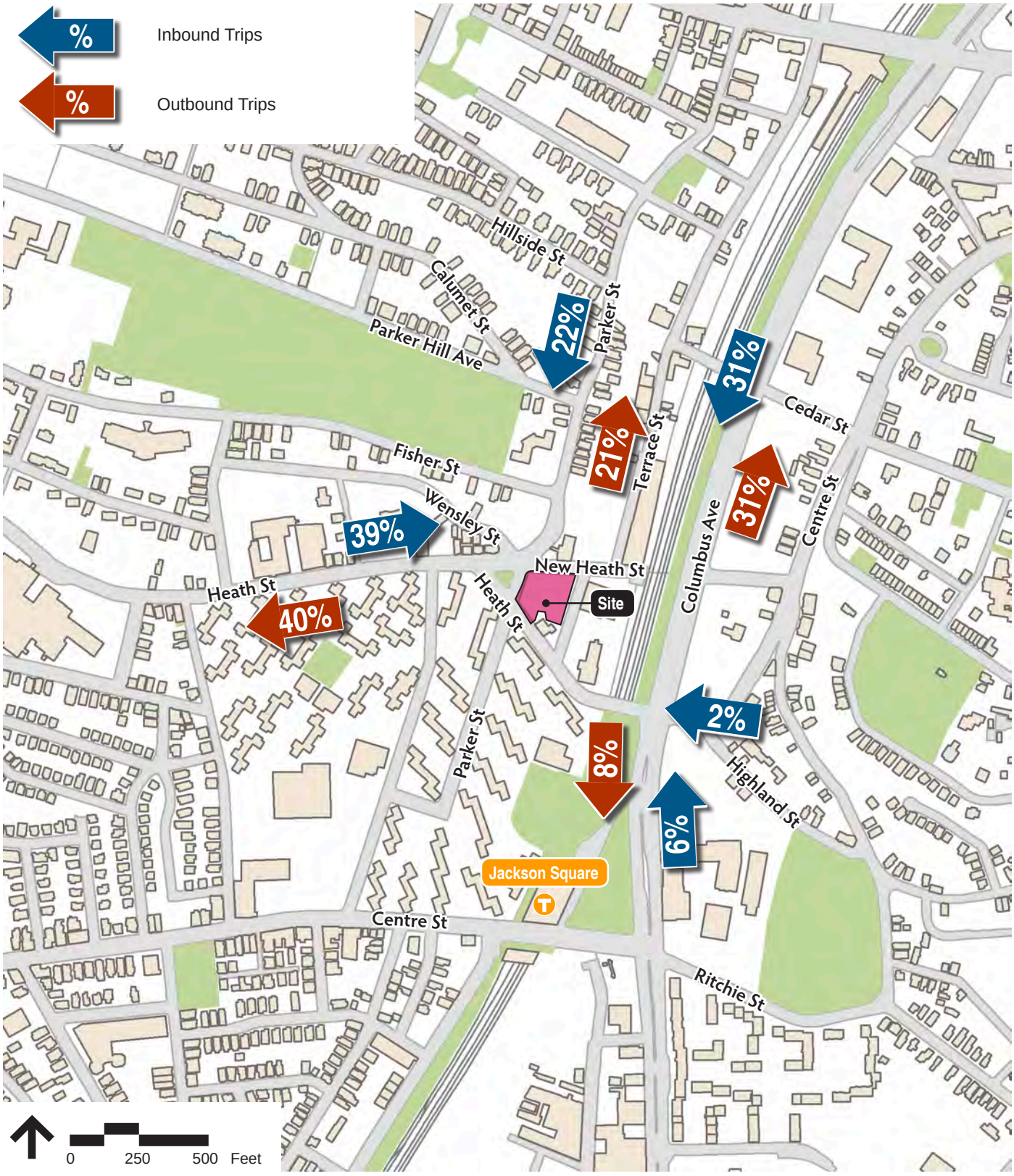


Figure 3.13
2020 No Build Traffic Volumes
PM Peak Hour

General Heath Square Apartments
Boston, MA



Source: BWSC GIS datalayers

Figure 3.14
Trip Distribution

General Heath Square Apartments
Boston, MA

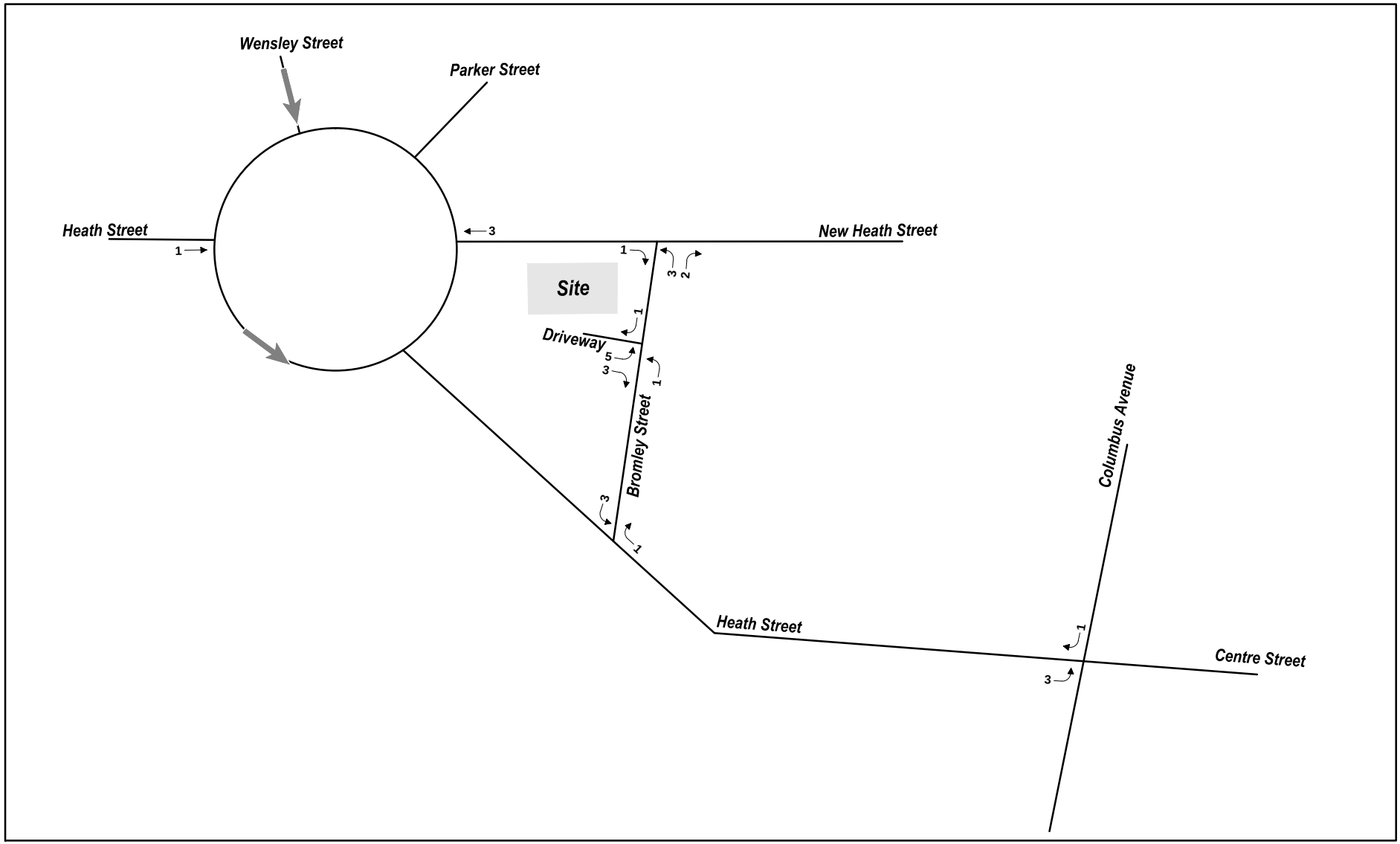


Figure 3.15
Project Generated Trips
AM Peak Hour

General Heath Square Apartments
Boston, MA

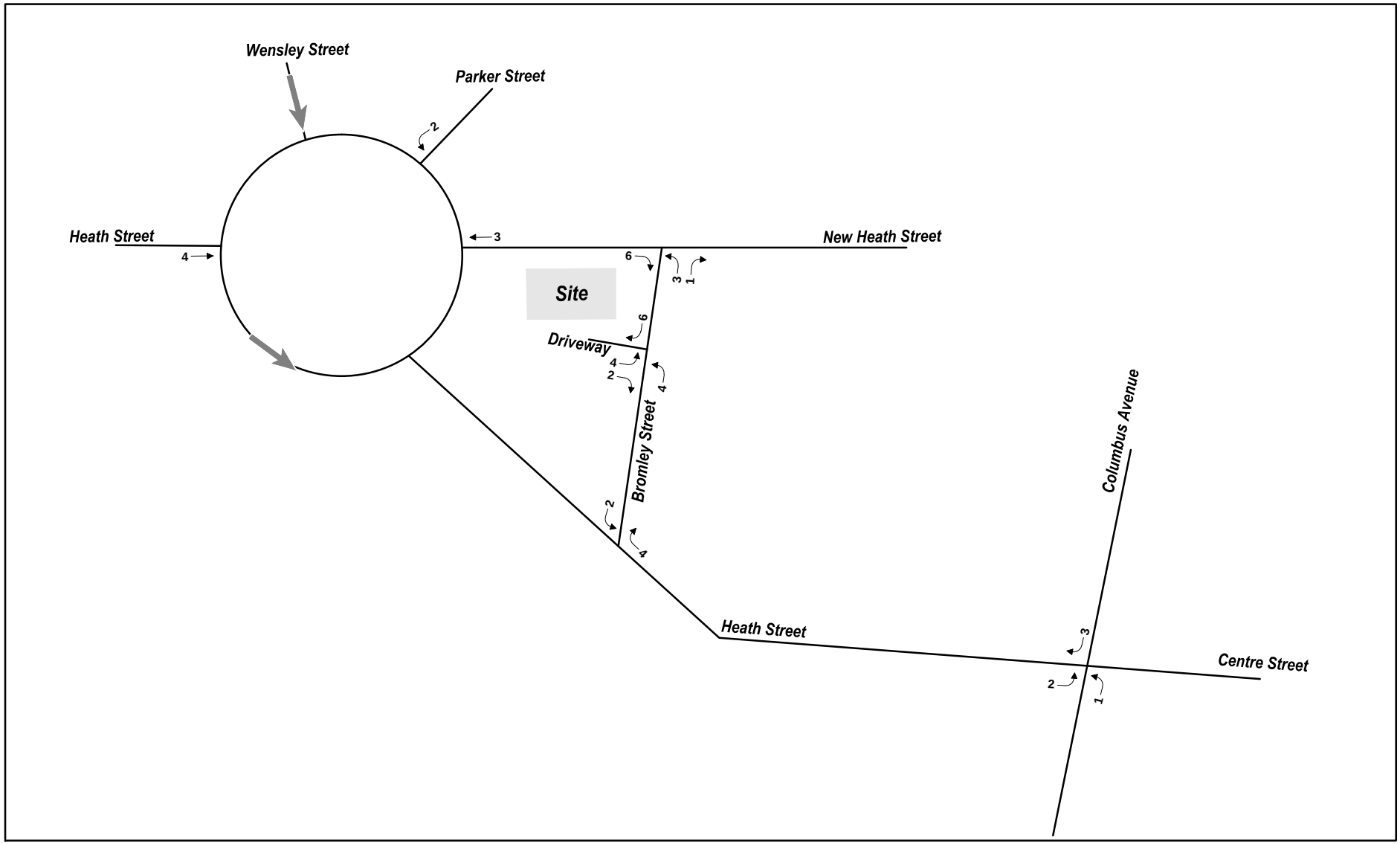


Figure 3.16
Project Generated Trips
PM Peak Hour

General Heath Square Apartments
Boston, MA

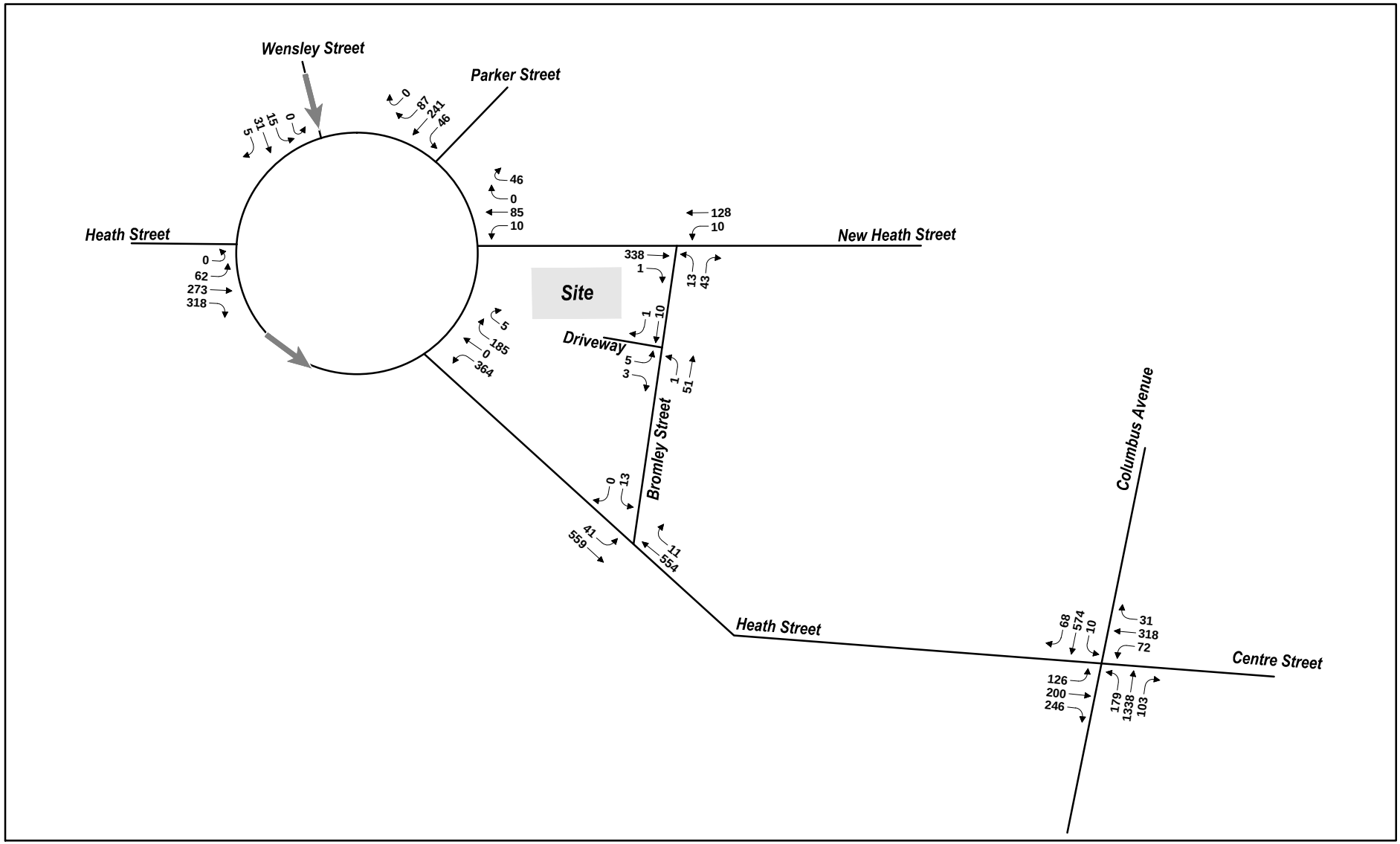


Figure 3.17
2020 Build Condition Traffic Volumes
AM Peak Hour

General Heath Square Apartments
Boston, MA

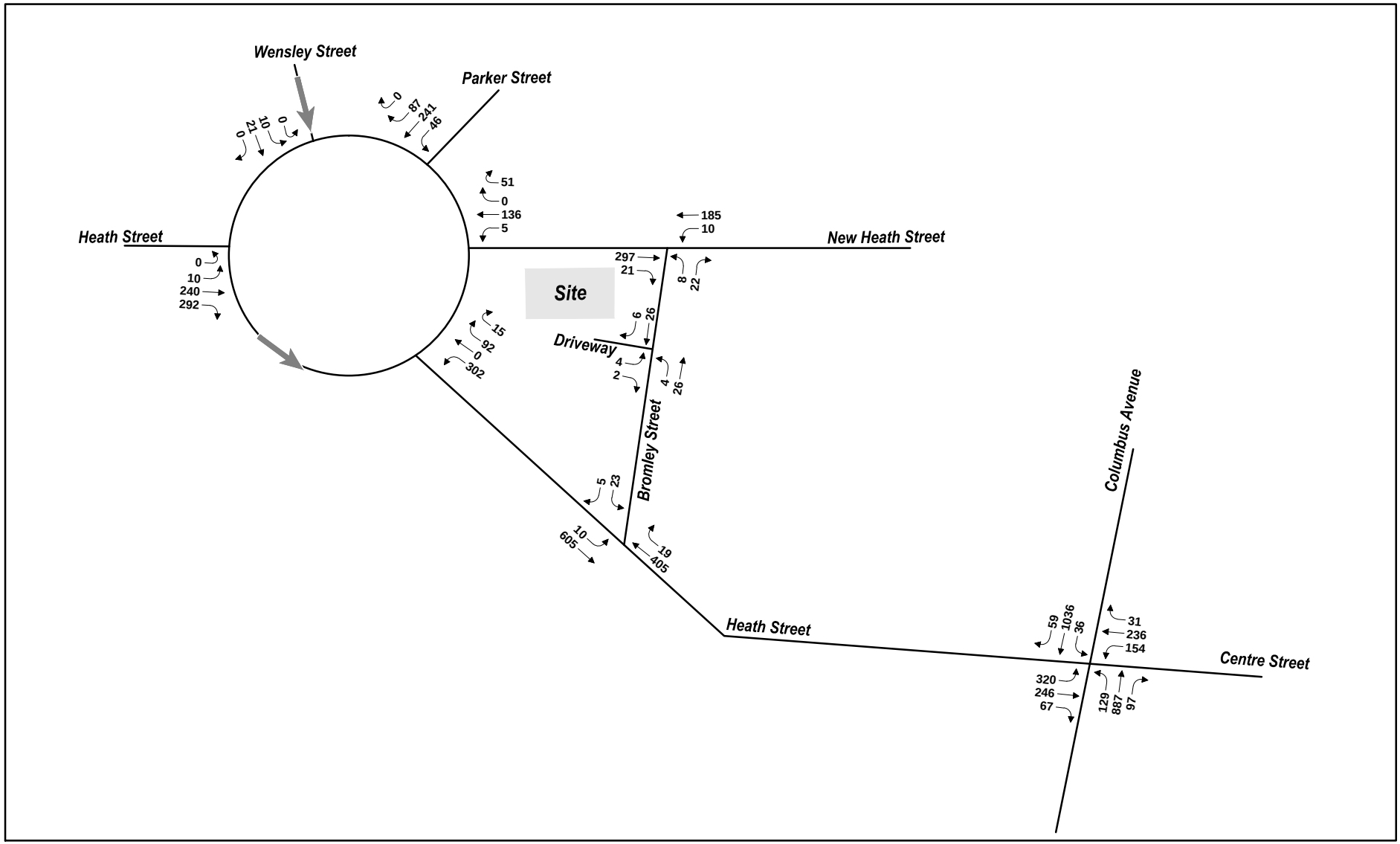
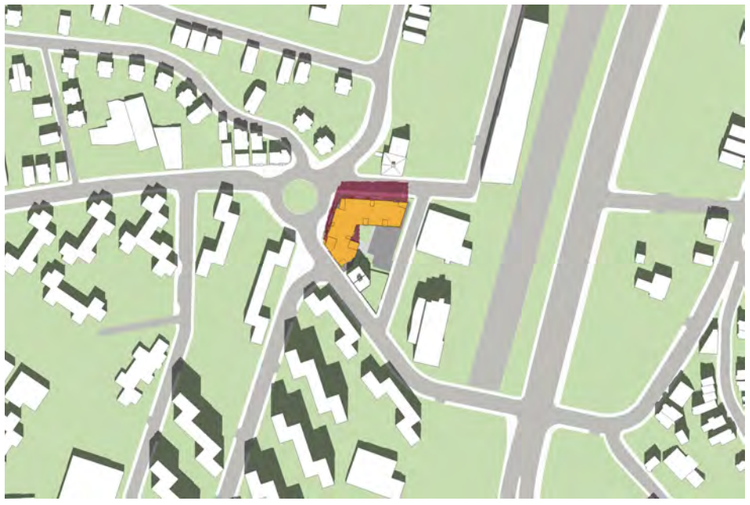


Figure 3.18
2020 Build Condition Traffic Volumes
PM Peak Hour

General Heath Square Apartments
Boston, MA

9 AM 3/21



12 PM 3/21

3 PM 3/21

6 PM 3/21

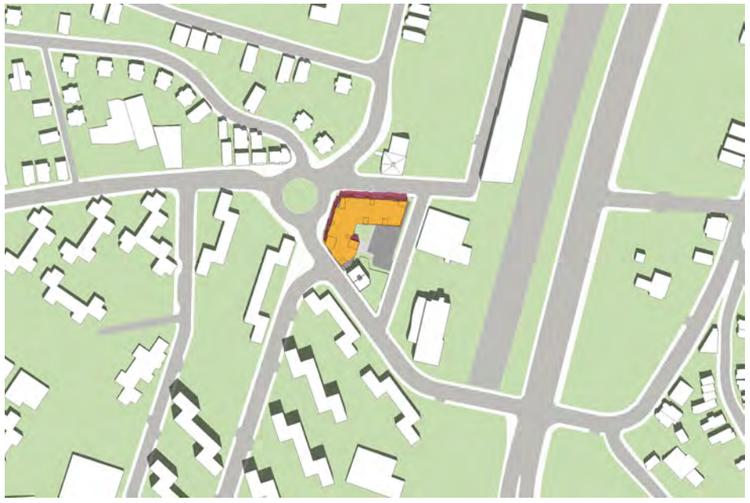
PCA ARCHITECTURE PLANNING INTERIORS

vhb

Figure 4.1a
Shadow Studies

General Heath Square Apartments
Boston, MA

9 AM 6/21



12 PM 6/21

3 PM 6/21

6 PM 6/21

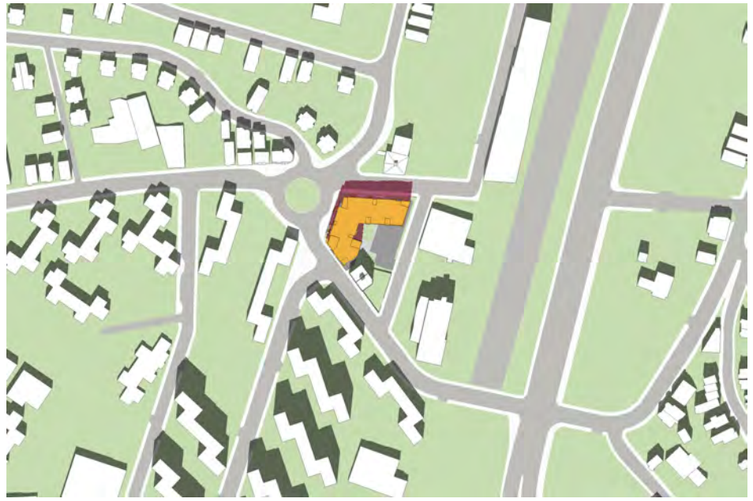
PCA ARCHITECTURE PLANNING INTERIORS

vhb

Figure 4.1b
Shadow Studies

General Heath Square Apartments
Boston, MA

9 AM 9/21



12 PM 9/21

3 PM 9/21

6 PM 9/21

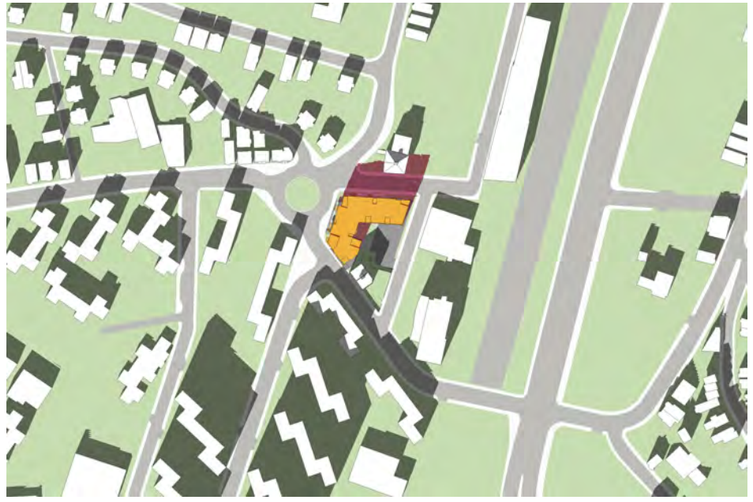
PCA
ARCHITECTURE PLANNING INTERIORS

vhb

Figure 4.1c
Shadow Studies

General Heath Square Apartments
Boston, MA

9 AM 12/21



12 PM 9/21

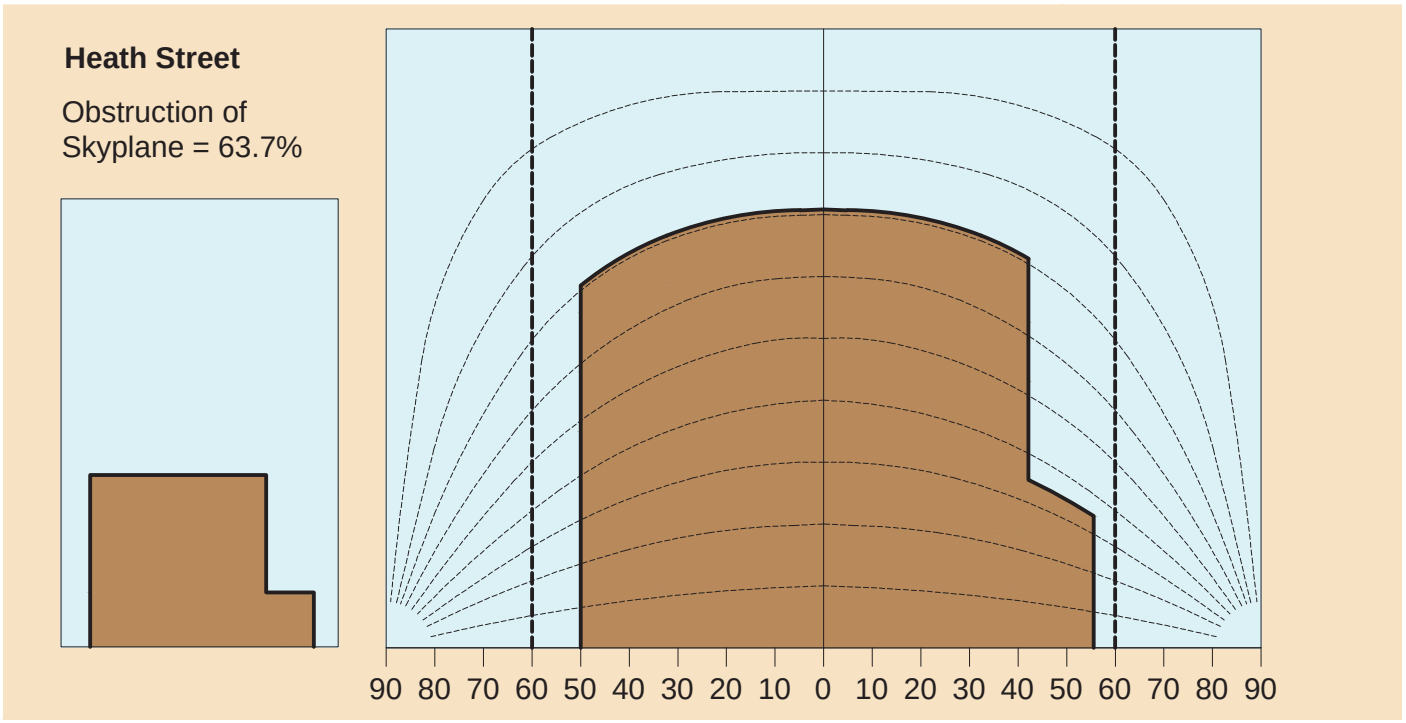
3 PM 9/21

PCA ARCHITECTURE PLANNING INTERIORS

vhb

Figure 4.1d
Shadow Studies

General Heath Square Apartments
Boston, MA



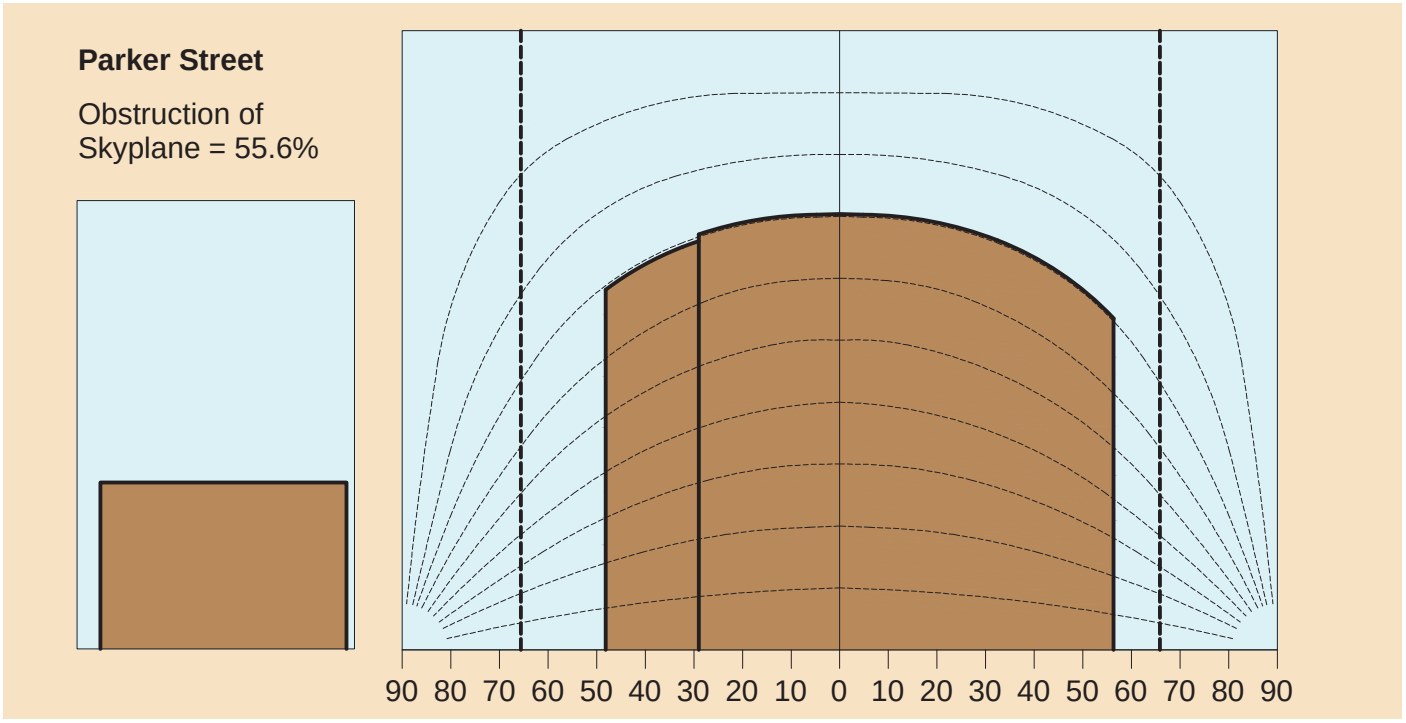
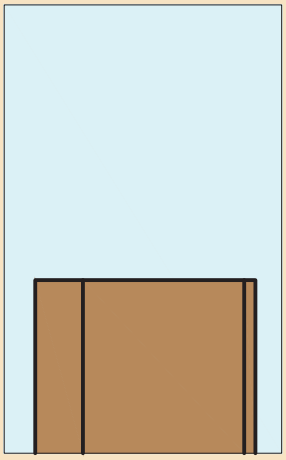


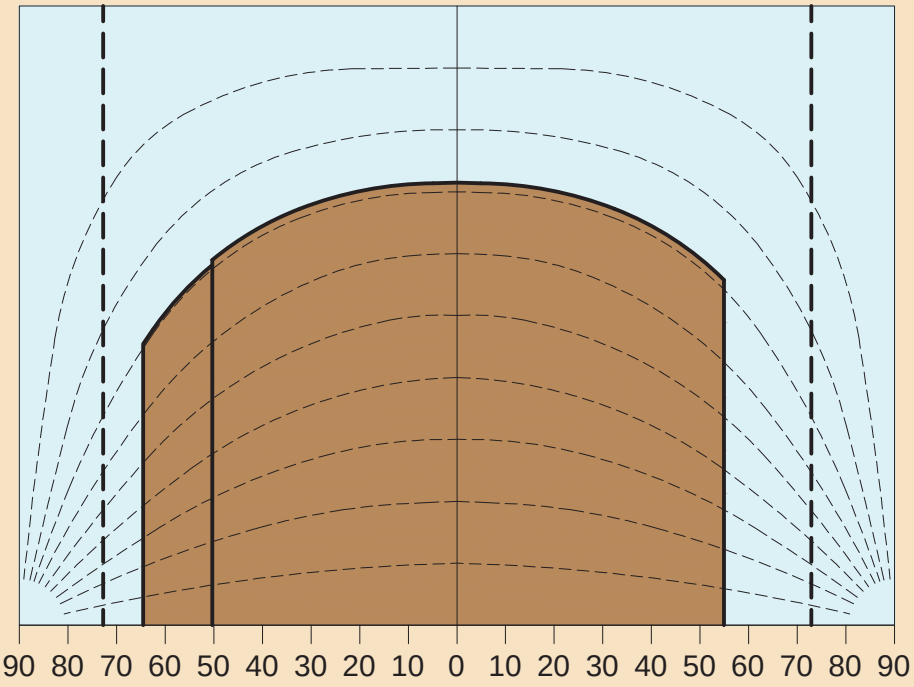
Figure 4.2a
Daylight Analysis

General Heath Square Apartments
Boston, MA

New Heath Street

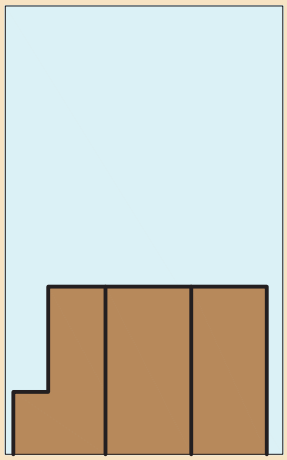
Obstruction of
Skyplane = 63.6%





Bromley Street

Obstruction of
Skyplane = 10.5%



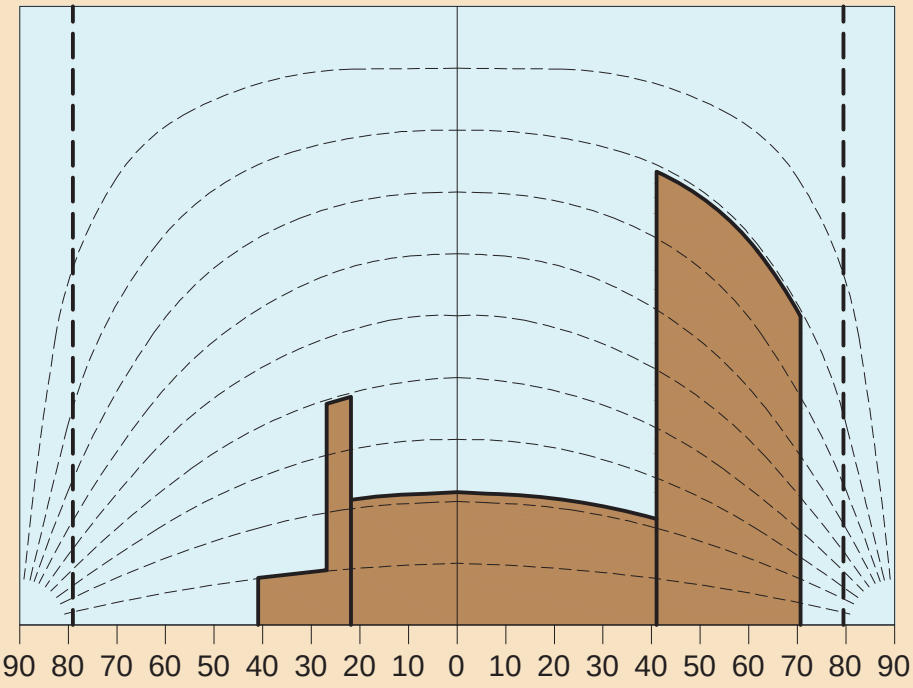


Figure 4.2b
Daylight Analysis

General Heath Square Apartments
Boston, MA

APPENDIX A: Letter of Intent

July 31, 2015

Brian Golden, Director
Boston Redevelopment Authority
Boston City Hall, 9th floor
Boston, MA 02201

RE: Letter of Intent to file an Expanded Project Notification Form
General Heath Square Apartments
(Boston DND owned site at Bromley St. / New Heath St. / Parker St., Jamaica Plain / Mission Hill)

Dear Director Golden:

Please accept this Letter of Intent, from Jamaica Plain Neighborhood Development Corporation (JPNDC) and our partner Back of the Hill Community Development Corporation, to file an Expanded Project Notification Form with respect to the development of the Boston Department of Neighborhood Development owned site known as Bromley St. / New Heath St. / Parker St. The currently vacant site is located on the Jamaica Plain / Mission Hill border near Jackson Square. JPNDC's tentative project name is General Heath Square Apartments ("GHS"). GHS will be a new construction affordable housing real estate development, which will transform a vacant underutilized lot into a thriving residential community which will complement the fabric of land uses in the area and will contribute to the affordable housing production goals of the City and the Commonwealth.

Highlights of the project include:

- Provision of 47 new affordable housing units, in an environment in which the demand for affordable housing production is high.
- Development of a currently underutilized vacant lot which borders or is near active land uses such as the Bromley-Heath Housing Development, Family Services of Greater Boston, the Southwest Corridor Park maintenance facility, and a New England Baptist Hospital satellite maintenance and parking facility.
- Transit-Oriented Development: the site is approximately 0.1 miles from the MBTA Jackson Square Orange Line Station.
- Bold design by award-winning architects Prellwitz Chilinski Associates.
- Environmentally friendly design and construction (adhering to LEED and Energy Star standards).
- Resident services for tenants, including services for special needs populations as appropriate.
- Workforce development and diversity: the project will generate construction employment for local residents. BOTH/JPNDC is committed to meeting or exceeding all City minority- and women-owned business procurement and local resident, female and minority hiring goals.

City Disposition Process

On October 2, 2014, the City issued a Request for Proposals for disposition of the ten contiguous vacant City of Boston owned parcels that comprise the site. On December 22, 2014, JPNDC submitted a complete proposal to the City. JPNDC was the only proposer. The City held a community meeting on

March 5, 2015 in order to present the JPNDC proposal. On May 6, 2015, the City's Public Facilities Commission formally designated JPNDC (representing the BOTH/JPNDC partnership) as developer of the site.

Development Program Planning

From January to April 2015, JPNDC and the development team engaged in a thorough and productive planning process with Boston Department of Neighborhood Development personnel and with Boston Redevelopment Authority personnel including Phil Cohen and Michael Cannizzo. The resulting development program and architectural design is a product of those collaborative efforts, in addition to public participation at multiple community meetings.

Development Program Summary Data

Site Area:	28,872 sq.ft.
Proposed GSF:	56,290 sq.ft.
Proposed Stories:	4
Affordability:	10 units ≤ 30% AMI; 30 units ≤ 60% AMI; 7 units ≤ 80% AMI
TDC estimate:	$16.4 million; $343K per unit

Article 80 Large Project Review

At approximately 56,000 square feet, GHS is subject to Article 80 Large Project Review. JPNDC, with the assistance of consultant Vanasse Hangen Brustlin, will submit an Expanded Project Notification Form to the BRA in late September or early October. We look forward to working with you, your staff, Boston DND, other City agencies, elected officials, and the public, to undertake the review of GHS.

Please contact JPNDC Senior Project Manager Matt Henzy (617-522-2424 x260 or mhenzy@jpndc.org) or VHB Senior Planner Stephanie Kruel (617-607-2972 or skruel@VHB.com) with any questions or comments.

Sincerely,

Richard Thal, JPNDC Executive Director

electronic copy
Phil Cohen, BRA
David West and John Feuerbach, DND
Stephanie Kruel and Sean Manning, VHB
Mark Eclipse and Alex Bushkoff, PCA
Maggie Cohn and Richard Giordano, BOTH CDC

APPENDIX B: Transportation Supporting Documentation

Observed Traffic Volume Data

- Turning Movement Counts (TMCs)

Synchro Level of Service (LOS)

- 2015 Existing Conditions
- 2020 No-Build Conditions
- 2020 Build Conditions

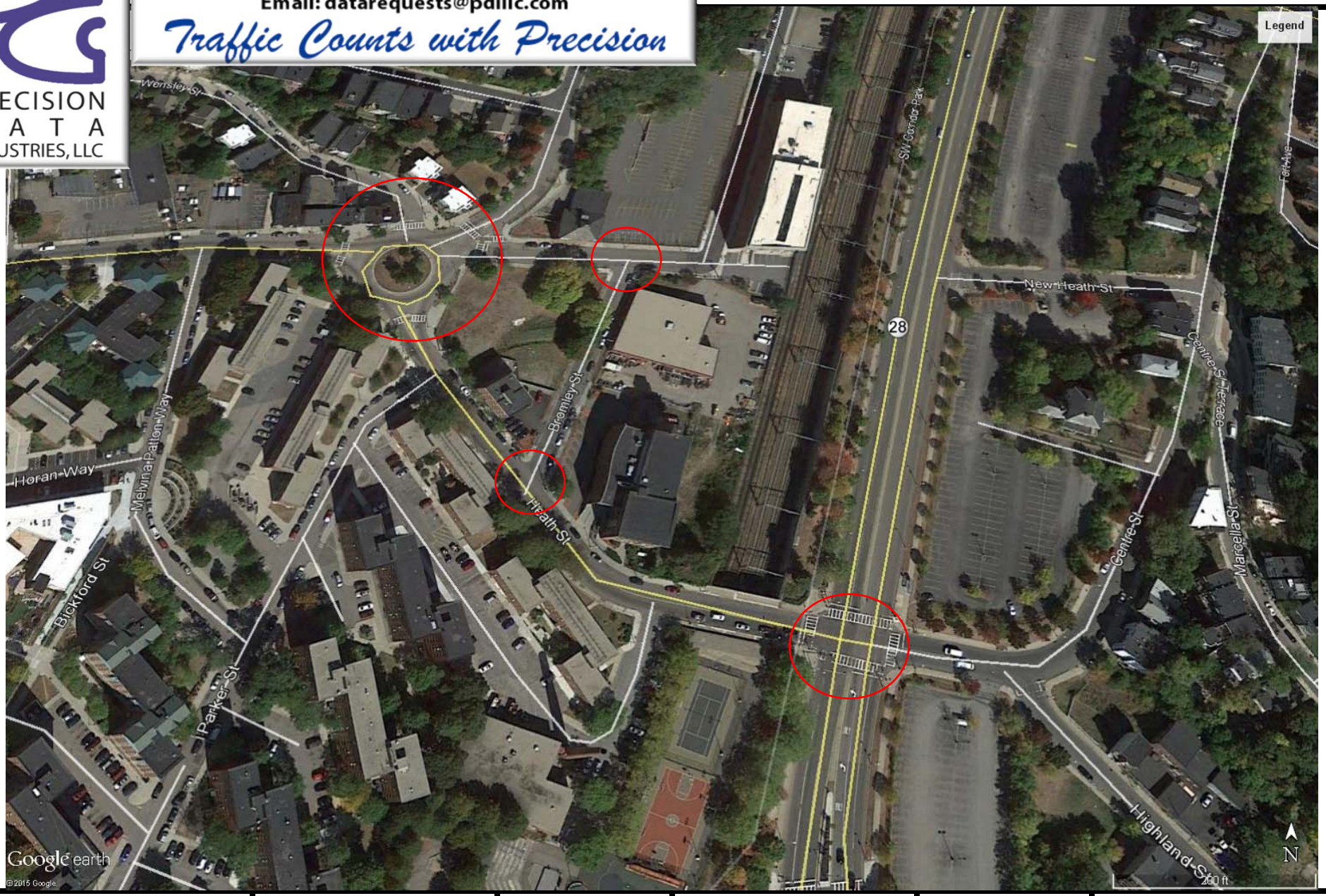
ITE Trip Generation

- Crash/Accident Analysis
- Vehicular Crash Summary (2010-2013)

Turning Movement Counts (TMCs)

PRECISION DATA INDUSTRIES, LLC
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Traffic Counts with Precision



Client:	Engineer:	Site Code:	Date:	PDI Job Number:	City, State:
VHB	R. White	13208.00	Tuesday 9/15/15	154599	Boston, MA

N/S/NE:Wensley St/ Heath St/Park St
E/W: New Heath Street/ Heath Street
City, State: Boston, MA
Client: VHB/ R. White

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 154599 A
Site Code : 13208.00
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Int. Total
07:00 AM	1	14	4	0	0	0	10	24	10	0	7	0	22	4	0	5	36	0	61	0	57	62	11	0	0	328
07:15 AM	2	13	9	0	0	0	6	31	8	0	13	0	18	1	0	2	41	0	93	0	55	76	16	0	0	384
07:30 AM	2	4	3	0	0	0	22	38	8	0	7	0	23	3	0	1	40	0	84	0	48	54	19	0	0	356
07:45 AM	0	2	3	0	0	0	20	27	9	0	9	0	17	3	0	0	53	0	99	0	60	75	13	0	0	390
Total	5	33	19	0	0	0	58	120	35	0	36	0	80	11	0	8	170	0	337	0	220	267	59	0	0	1458
08:00 AM	0	3	1	0	0	0	38	39	18	0	15	0	22	2	0	2	40	0	79	0	47	61	13	0	0	380
08:15 AM	2	1	2	0	0	0	7	29	4	0	17	0	20	4	0	7	35	0	76	0	72	97	2	0	0	375
08:30 AM	0	5	3	0	0	0	18	28	5	0	10	0	25	3	0	8	27	0	79	0	72	89	7	0	0	379
08:45 AM	1	1	1	0	0	0	15	25	6	0	6	0	20	1	0	7	23	0	64	0	76	76	5	0	0	327
Total	3	10	7	0	0	0	78	121	33	0	48	0	87	10	0	24	125	0	298	0	267	323	27	0	0	1461
Grand Total	8	43	26	0	0	0	136	241	68	0	84	0	167	21	0	32	295	0	635	0	487	590	86	0	0	2919
Apprch %	10.4	55.8	33.8	0	0	0	30.6	54.2	15.3	0	30.9	0	61.4	7.7	0	3.3	30.7	0	66	0	41.9	50.7	7.4	0	0	
Total %	0.3	1.5	0.9	0	0	0	4.7	8.3	2.3	0	2.9	0	5.7	0.7	0	1.1	10.1	0	21.8	0	16.7	20.2	2.9	0	0	
Cars	8	43	26	0	0	0	126	214	57	0	75	0	157	20	0	32	274	0	577	0	443	582	82	0	0	2716
% Cars	100	100	100	0	0	0	92.6	88.8	83.8	0	89.3	0	94	95.2	0	100	92.9	0	90.9	0	91	98.6	95.3	0	0	93
Heavy Vehicles	0	0	0	0	0	0	10	27	11	0	9	0	10	1	0	0	21	0	58	0	44	8	4	0	0	203
% Heavy Vehicles	0	0	0	0	0	0	7.4	11.2	16.2	0	10.7	0	6	4.8	0	0	7.1	0	9.1	0	9	1.4	4.7	0	0	7

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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	2	3	0	0	5	0	20	27	9	0	56	9	0	17	3	0	29	0	53	0	99	0	152	60	75	13	0	0	148	390
08:00 AM	0	3	1	0	0	4	0	38	39	18	0	95	15	0	22	2	0	39	2	40	0	79	0	121	47	61	13	0	0	121	380
08:15 AM	2	1	2	0	0	5	0	7	29	4	0	40	17	0	20	4	0	41	7	35	0	76	0	118	72	97	2	0	0	171	375
08:30 AM	0	5	3	0	0	8	0	18	28	5	0	51	10	0	25	3	0	38	8	27	0	79	0	114	72	89	7	0	0	168	379
Total Volume	2	11	9	0	0	22	0	83	123	36	0	242	51	0	84	12	0	147	17	155	0	333	0	505	251	322	35	0	0	608	1524
% App. Total	9.1	50	40.9	0	0		0	34.3	50.8	14.9	0		34.7	0	57.1	8.2	0		3.4	30.7	0	65.9	0		41.3	53	5.8	0	0		
PHF	.250	.550	.750	.000	.000	.688	.000	.546	.788	.500	.000	.637	.750	.000	.840	.750	.000	.896	.531	.731	.000	.841	.000	.831	.872	.830	.673	.000	.000	.889	.977
Cars	2	11	9	0	0	22	0	80	109	30	0	219	45	0	78	12	0	135	17	143	0	310	0	470	223	316	35	0	0	574	1420
% Cars	100	100	100	0	0	100	0	96.4	88.6	83.3	0	90.5	88.2	0	92.9	100	0	91.8	100	92.3	0	93.1	0	93.1	88.8	98.1	100	0	0	94.4	93.2
Heavy Vehicles	0	0	0	0	0	0	0	3	14	6	0	23	6	0	6	0	0	12	0	12	0	23	0	35	28	6	0	0	0	34	104
% Heavy Vehicles	0	0	0	0	0	0	0	3.6	11.4	16.7	0	9.5	11.8	0	7.1	0	0	8.2	0	7.7	0	6.9	0	6.9	11.2	1.9	0	0	0	5.6	6.8

N/S/NE:Wensley St/ Heath St/Park St
E/W: New Heath Street/ Heath Street
City, State: Boston, MA
Client: VHB/ R. White

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Site Code : 13208.00
Start Date : 9/15/2015
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Groups Printed- Cars

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Int. Total
07:00 AM	1	14	4	0	0	0	10	22	9	0	6	0	21	3	0	5	34	0	49	0	52	62	10	0	0	302
07:15 AM	2	13	9	0	0	0	4	27	5	0	12	0	17	1	0	2	38	0	85	0	55	75	15	0	0	360
07:30 AM	2	4	3	0	0	0	18	35	7	0	7	0	21	3	0	1	38	0	77	0	40	53	17	0	0	326
07:45 AM	0	2	3	0	0	0	19	25	8	0	8	0	16	3	0	0	49	0	94	0	50	75	13	0	0	365
Total	5	33	19	0	0	0	51	109	29	0	33	0	75	10	0	8	159	0	305	0	197	265	55	0	0	1353
08:00 AM	0	3	1	0	0	0	38	34	17	0	14	0	20	2	0	2	37	0	72	0	43	59	13	0	0	355
08:15 AM	2	1	2	0	0	0	6	24	2	0	15	0	18	4	0	7	31	0	72	0	64	95	2	0	0	345
08:30 AM	0	5	3	0	0	0	17	26	3	0	8	0	24	3	0	8	26	0	72	0	66	87	7	0	0	355
08:45 AM	1	1	1	0	0	0	14	21	6	0	5	0	20	1	0	7	21	0	56	0	73	76	5	0	0	308
Total	3	10	7	0	0	0	75	105	28	0	42	0	82	10	0	24	115	0	272	0	246	317	27	0	0	1363
Grand Total	8	43	26	0	0	0	126	214	57	0	75	0	157	20	0	32	274	0	577	0	443	582	82	0	0	2716
Apprch %	10.4	55.8	33.8	0	0	0	31.7	53.9	14.4	0	29.8	0	62.3	7.9	0	3.6	31	0	65.3	0	40	52.6	7.4	0	0	
Total %	0.3	1.6	1	0	0	0	4.6	7.9	2.1	0	2.8	0	5.8	0.7	0	1.2	10.1	0	21.2	0	16.3	21.4	3	0	0	

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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	2	3	0	0	5	0	19	25	8	0	52	8	0	16	3	0	27	0	49	0	94	0	143	50	75	13	0	0	138	365
08:00 AM	0	3	1	0	0	4	0	38	34	17	0	89	14	0	20	2	0	36	2	37	0	72	0	111	43	59	13	0	0	115	355
08:15 AM	2	1	2	0	0	5	0	6	24	2	0	32	15	0	18	4	0	37	7	31	0	72	0	110	64	95	2	0	0	161	345
08:30 AM	0	5	3	0	0	8	0	17	26	3	0	46	8	0	24	3	0	35	8	26	0	72	0	106	66	87	7	0	0	160	355
Total Volume	2	11	9	0	0	22	0	80	109	30	0	219	45	0	78	12	0	135	17	143	0	310	0	470	223	316	35	0	0	574	1420
% App. Total	9.1	50	40.9	0	0		0	36.5	49.8	13.7	0		33.3	0	57.8	8.9	0		3.6	30.4	0	66	0		38.9	55.1	6.1	0	0		
PHF	.250	.550	.750	.000	.000	.688	.000	.526	.801	.441	.000	.615	.750	.000	.813	.750	.000	.912	.531	.730	.000	.824	.000	.822	.845	.832	.673	.000	.000	.891	.973

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Groups Printed- Heavy Vehicles

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	0	0	2	1	0	1	0	1	1	0	0	2	0	12	0	5	0	1	0	0	26
07:15 AM	0	0	0	0	0	0	2	4	3	0	1	0	1	0	0	0	3	0	8	0	0	1	1	0	0	24
07:30 AM	0	0	0	0	0	0	4	3	1	0	0	0	2	0	0	0	2	0	7	0	8	1	2	0	0	30
07:45 AM	0	0	0	0	0	0	1	2	1	0	1	0	1	0	0	0	4	0	5	0	10	0	0	0	0	25
Total	0	0	0	0	0	0	7	11	6	0	3	0	5	1	0	0	11	0	32	0	23	2	4	0	0	105
08:00 AM	0	0	0	0	0	0	0	5	1	0	1	0	2	0	0	0	3	0	7	0	4	2	0	0	0	25
08:15 AM	0	0	0	0	0	0	1	5	2	0	2	0	2	0	0	0	4	0	4	0	8	2	0	0	0	30
08:30 AM	0	0	0	0	0	0	1	2	2	0	2	0	1	0	0	0	1	0	7	0	6	2	0	0	0	24
08:45 AM	0	0	0	0	0	0	1	4	0	0	1	0	0	0	0	0	2	0	8	0	3	0	0	0	0	19
Total	0	0	0	0	0	0	3	16	5	0	6	0	5	0	0	0	10	0	26	0	21	6	0	0	0	98
Grand Total	0	0	0	0	0	0	10	27	11	0	9	0	10	1	0	0	21	0	58	0	44	8	4	0	0	203
Apprch %	0	0	0	0	0	0	20.8	56.2	22.9	0	45	0	50	5	0	0	26.6	0	73.4	0	78.6	14.3	7.1	0	0	
Total %	0	0	0	0	0	0	4.9	13.3	5.4	0	4.4	0	4.9	0.5	0	0	10.3	0	28.6	0	21.7	3.9	2	0	0	

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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 07:30 AM																															
07:30 AM	0	0	0	0	0	0	0	4	3	1	0	8	0	0	2	0	0	2	0	2	0	7	0	9	8	1	2	0	0	11	30
07:45 AM	0	0	0	0	0	0	0	1	2	1	0	4	1	0	1	0	0	2	0	4	0	5	0	9	10	0	0	0	0	10	25
08:00 AM	0	0	0	0	0	0	0	0	5	1	0	6	1	0	2	0	0	3	0	3	0	7	0	10	4	2	0	0	0	6	25
08:15 AM	0	0	0	0	0	0	0	1	5	2	0	8	2	0	2	0	0	4	0	4	0	4	0	8	8	2	0	0	0	10	30
Total Volume	0	0	0	0	0	0	0	6	15	5	0	26	4	0	7	0	0	11	0	13	0	23	0	36	30	5	2	0	0	37	110
% App. Total	0	0	0	0	0		0	23.1	57.7	19.2	0		36.4	0	63.6	0	0		0	36.1	0	63.9	0		81.1	13.5	5.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.375	.750	.625	.000	.813	.500	.000	.875	.000	.000	.688	.000	.813	.000	.821	.000	.900	.750	.625	.250	.000	.000	.841	.917

N/S/NE:Wensley St/ Heath St/Park St
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Site Code : 13208.00
Start Date : 9/15/2015
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Groups Printed- Peds and Bikes

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Int. Total
07:00 AM	0	0	0	0	2	0	0	0	3	2	0	0	1	1	2	0	0	0	1	4	0	0	0	0	3	19
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	3	0	0	1	7
07:30 AM	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	3	0	5	0	0	0	13
07:45 AM	0	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	1	2	1	1	0	0	5	14
Total	0	0	1	0	4	0	0	1	4	4	1	0	1	1	4	0	0	0	3	10	1	9	0	0	9	53
08:00 AM	0	0	0	0	1	0	0	0	0	3	0	0	0	0	2	0	0	0	3	1	3	4	0	0	1	18
08:15 AM	0	2	0	0	1	0	0	0	0	3	0	0	0	0	4	0	0	0	0	4	1	8	0	0	2	25
08:30 AM	0	0	0	0	3	0	0	1	0	5	0	0	0	0	4	0	1	0	0	4	1	4	0	0	4	27
08:45 AM	0	0	0	0	4	0	0	0	0	4	0	0	0	0	5	0	0	0	0	7	0	5	0	0	4	29
Total	0	2	0	0	9	0	0	1	0	15	0	0	0	0	15	0	1	0	3	16	5	21	0	0	11	99
Grand Total	0	2	1	0	13	0	0	2	4	19	1	0	1	1	19	0	1	0	6	26	6	30	0	0	20	152
Apprch %	0	12.5	6.2	0	81.2	0	0	8	16	76	4.5	0	4.5	4.5	86.4	0	3	0	18.2	78.8	10.7	53.6	0	0	35.7	
Total %	0	1.3	0.7	0	8.6	0	0	1.3	2.6	12.5	0.7	0	0.7	0.7	12.5	0	0.7	0	3.9	17.1	3.9	19.7	0	0	13.2	

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	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	0	0	0	1	1	0	0	0	0	3	3	0	0	0	0	2	2	0	0	0	3	1	4	3	4	0	0	1	8	18
08:15 AM	0	2	0	0	1	3	0	0	0	0	3	3	0	0	0	0	4	4	0	0	0	0	4	4	1	8	0	0	2	11	25
08:30 AM	0	0	0	0	3	3	0	0	1	0	5	6	0	0	0	0	4	4	0	1	0	0	4	5	1	4	0	0	4	9	27
08:45 AM	0	0	0	0	4	4	0	0	0	0	4	4	0	0	0	0	5	5	0	0	0	0	7	7	0	5	0	0	4	9	29
Total Volume	0	2	0	0	9	11	0	0	1	0	15	16	0	0	0	0	15	15	0	1	0	3	16	20	5	21	0	0	11	37	99
% App. Total	0	18.2	0	0	81.8		0	0	6.2	0	93.8		0	0	0	0	100		0	5	0	15	80		13.5	56.8	0	0	29.7		
PHF	.000	.250	.000	.000	.563	.688	.000	.000	.250	.000	.750	.667	.000	.000	.000	.000	.750	.750	.000	.250	.000	.250	.571	.714	.417	.656	.000	.000	.688	.841	.853

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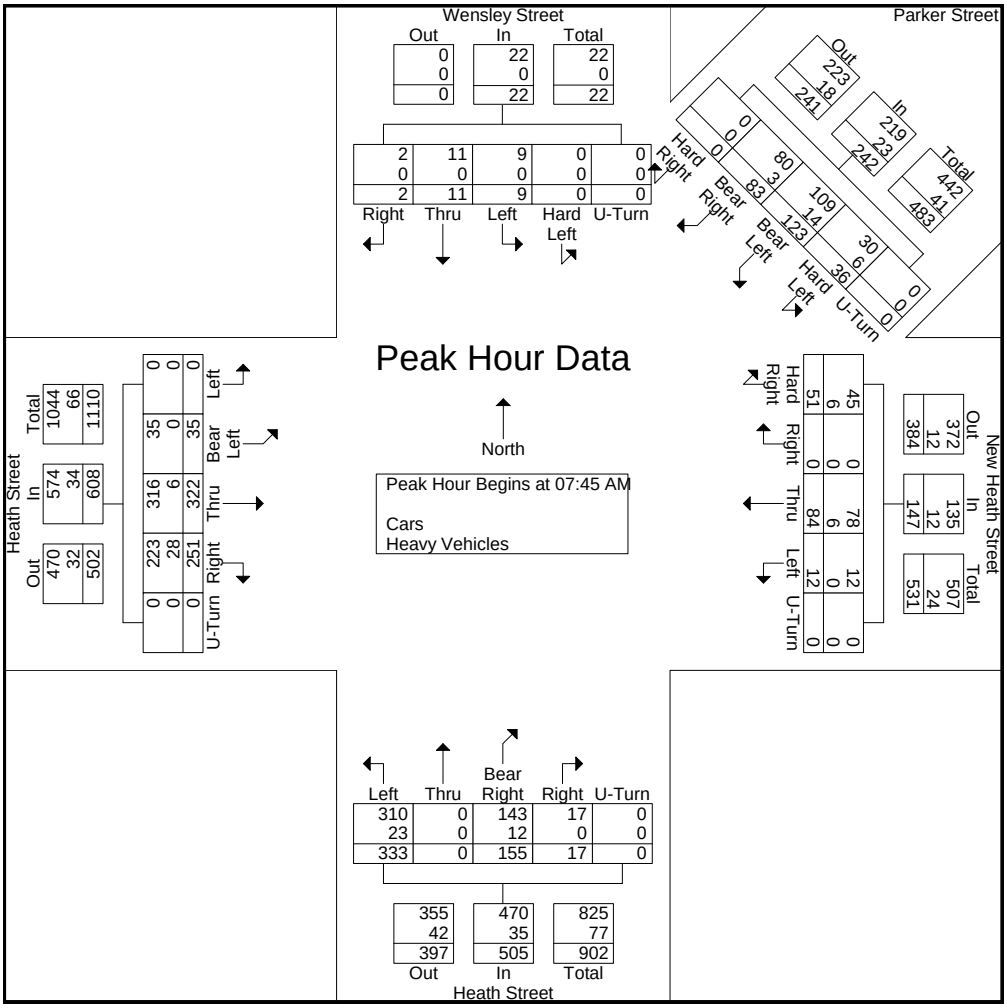
	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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	2	3	0	0	5	0	20	27	9	0	56	9	0	17	3	0	29	0	53	0	99	0	152	60	75	13	0	0	148	390
08:00 AM	0	3	1	0	0	4	0	38	39	18	0	95	15	0	22	2	0	39	2	40	0	79	0	121	47	61	13	0	0	121	380
08:15 AM	2	1	2	0	0	5	0	7	29	4	0	40	17	0	20	4	0	41	7	35	0	76	0	118	72	97	2	0	0	171	375
08:30 AM	0	5	3	0	0	8	0	18	28	5	0	51	10	0	25	3	0	38	8	27	0	79	0	114	72	89	7	0	0	168	379
Total Volume	2	11	9	0	0	22	0	83	123	36	0	242	51	0	84	12	0	147	17	155	0	333	0	505	251	322	35	0	0	608	1524
% App. Total	9.1	50	40.9	0	0		0	34.3	50.8	14.9	0		34.7	0	57.1	8.2	0		3.4	30.7	0	65.9	0		41.3	53	5.8	0	0		
PHF	.250	.550	.750	.000	.000	.688	.000	.546	.788	.500	.000	.637	.750	.000	.840	.750	.000	.896	.531	.731	.000	.841	.000	.831	.872	.830	.673	.000	.000	.889	.977
Cars	2	11	9	0	0	22	0	80	109	30	0	219	45	0	78	12	0	135	17	143	0	310	0	470	223	316	35	0	0	574	1420
% Cars	100	100	100	0	0	100	0	96.4	88.6	83.3	0	90.5	88.2	0	92.9	100	0	91.8	100	92.3	0	93.1	0	93.1	88.8	98.1	100	0	0	94.4	93.2
Heavy Vehicles	0	0	0	0	0	0	0	3	14	6	0	23	6	0	6	0	0	12	0	12	0	23	0	35	28	6	0	0	0	34	104
% Heavy Vehicles	0	0	0	0	0	0	0	3.6	11.4	16.7	0	9.5	11.8	0	7.1	0	0	8.2	0	7.7	0	6.9	0	6.9	11.2	1.9	0	0	0	5.6	6.8



N/S/NE:Wensley St/ Heath St/Park St
E/W: New Heath Street/ Heath Street
City, State: Boston, MA
Client: VHB/ R. White

PRECISION DATA INDUSTRIES, LLC
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File Name : 154599 AA
Site Code : 13208.00
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Int. Total
04:00 PM	3	15	1	0	0	0	37	69	25	0	13	0	29	4	0	5	20	0	50	0	56	34	0	0	0	361
04:15 PM	2	8	2	0	0	0	36	56	7	0	5	0	41	8	0	3	28	0	60	0	85	85	1	0	0	427
04:30 PM	0	2	1	0	0	0	34	76	8	0	7	0	33	2	0	2	27	0	54	0	88	49	1	0	0	384
04:45 PM	0	1	0	0	0	0	13	76	10	0	10	0	30	1	0	2	30	0	67	0	51	39	1	0	0	331
Total	5	26	4	0	0	0	120	277	50	0	35	0	133	15	0	12	105	0	231	0	280	207	3	0	0	1503
05:00 PM	0	5	0	1	0	0	37	68	12	0	12	0	31	2	0	4	19	0	67	0	56	61	1	0	0	376
05:15 PM	0	4	1	1	0	0	22	68	12	0	15	0	31	2	0	6	21	0	78	0	93	55	2	0	0	411
05:30 PM	0	4	0	0	0	0	24	89	9	0	16	0	42	0	0	2	21	0	76	0	71	46	2	0	0	402
05:45 PM	2	6	2	0	0	0	9	65	11	0	8	0	35	1	0	2	27	0	73	0	67	47	5	0	0	360
Total	2	19	3	2	0	0	92	290	44	0	51	0	139	5	0	14	88	0	294	0	287	209	10	0	0	1549
Grand Total	7	45	7	2	0	0	212	567	94	0	86	0	272	20	0	26	193	0	525	0	567	416	13	0	0	3052
Apprch %	11.5	73.8	11.5	3.3	0	0	24.3	64.9	10.8	0	22.8	0	72	5.3	0	3.5	25.9	0	70.6	0	56.9	41.8	1.3	0	0	
Total %	0.2	1.5	0.2	0.1	0	0	6.9	18.6	3.1	0	2.8	0	8.9	0.7	0	0.9	6.3	0	17.2	0	18.6	13.6	0.4	0	0	
Cars	7	44	6	1	0	0	206	544	75	0	73	0	272	19	0	25	178	0	497	0	544	400	13	0	0	2904
% Cars	100	97.8	85.7	50	0	0	97.2	95.9	79.8	0	84.9	0	100	95	0	96.2	92.2	0	94.7	0	95.9	96.2	100	0	0	95.2
Heavy Vehicles	0	1	1	1	0	0	6	23	19	0	13	0	0	1	0	1	15	0	28	0	23	16	0	0	0	148
% Heavy Vehicles	0	2.2	14.3	50	0	0	2.8	4.1	20.2	0	15.1	0	0	5	0	3.8	7.8	0	5.3	0	4.1	3.8	0	0	0	4.8

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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	0	5	0	1	0	6	0	37	68	12	0	117	12	0	31	2	0	45	4	19	0	67	0	90	56	61	1	0	0	118	376
05:15 PM	0	4	1	1	0	6	0	22	68	12	0	102	15	0	31	2	0	48	6	21	0	78	0	105	93	55	2	0	0	150	411
05:30 PM	0	4	0	0	0	4	0	24	89	9	0	122	16	0	42	0	0	58	2	21	0	76	0	99	71	46	2	0	0	119	402
05:45 PM	2	6	2	0	0	10	0	9	65	11	0	85	8	0	35	1	0	44	2	27	0	73	0	102	67	47	5	0	0	119	360
Total Volume	2	19	3	2	0	26	0	92	290	44	0	426	51	0	139	5	0	195	14	88	0	294	0	396	287	209	10	0	0	506	1549
% App. Total	7.7	73.1	11.5	7.7	0		0	21.6	68.1	10.3	0		26.2	0	71.3	2.6	0		3.5	22.2	0	74.2	0		56.7	41.3	2	0	0		
PHF	.250	.792	.375	.500	.000	.650	.000	.622	.815	.917	.000	.873	.797	.000	.827	.625	.000	.841	.583	.815	.000	.942	.000	.943	.772	.857	.500	.000	.000	.843	.942
Cars	2	19	2	1	0	24	0	89	281	35	0	405	45	0	139	5	0	189	14	80	0	282	0	376	274	201	10	0	0	485	1479
% Cars	100	100	66.7	50.0	0	92.3	0	96.7	96.9	79.5	0	95.1	88.2	0	100	100	0	96.9	100	90.9	0	95.9	0	94.9	95.5	96.2	100	0	0	95.8	95.5
Heavy Vehicles	0	0	1	1	0	2	0	3	9	9	0	21	6	0	0	0	0	6	0	8	0	12	0	20	13	8	0	0	0	21	70
% Heavy Vehicles	0	0	33.3	50.0	0	7.7	0	3.3	3.1	20.5	0	4.9	11.8	0	0	0	0	3.1	0	9.1	0	4.1	0	5.1	4.5	3.8	0	0	0	4.2	4.5

N/S/NE:Wensley St/ Heath St/Park St
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Page No : 1

Groups Printed- Cars

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Int. Total
04:00 PM	3	15	1	0	0	0	36	65	23	0	11	0	29	4	0	5	18	0	48	0	54	32	0	0	0	344
04:15 PM	2	7	2	0	0	0	35	52	3	0	3	0	41	7	0	3	25	0	55	0	81	81	1	0	0	398
04:30 PM	0	2	1	0	0	0	34	71	6	0	5	0	33	2	0	2	26	0	50	0	87	49	1	0	0	369
04:45 PM	0	1	0	0	0	0	12	75	8	0	9	0	30	1	0	1	29	0	62	0	48	37	1	0	0	314
Total	5	25	4	0	0	0	117	263	40	0	28	0	133	14	0	11	98	0	215	0	270	199	3	0	0	1425
05:00 PM	0	5	0	1	0	0	36	65	10	0	11	0	31	2	0	4	17	0	63	0	51	59	1	0	0	356
05:15 PM	0	4	1	0	0	0	21	65	11	0	13	0	31	2	0	6	19	0	77	0	90	52	2	0	0	394
05:30 PM	0	4	0	0	0	0	24	86	7	0	14	0	42	0	0	2	18	0	71	0	70	44	2	0	0	384
05:45 PM	2	6	1	0	0	0	8	65	7	0	7	0	35	1	0	2	26	0	71	0	63	46	5	0	0	345
Total	2	19	2	1	0	0	89	281	35	0	45	0	139	5	0	14	80	0	282	0	274	201	10	0	0	1479
Grand Total	7	44	6	1	0	0	206	544	75	0	73	0	272	19	0	25	178	0	497	0	544	400	13	0	0	2904
Apprch %	12.1	75.9	10.3	1.7	0	0	25	65.9	9.1	0	20.1	0	74.7	5.2	0	3.6	25.4	0	71	0	56.8	41.8	1.4	0	0	
Total %	0.2	1.5	0.2	0	0	0	7.1	18.7	2.6	0	2.5	0	9.4	0.7	0	0.9	6.1	0	17.1	0	18.7	13.8	0.4	0	0	

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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	0	5	0	1	0	6	0	36	65	10	0	111	11	0	31	2	0	44	4	17	0	63	0	84	51	59	1	0	0	111	356
05:15 PM	0	4	1	0	0	5	0	21	65	11	0	97	13	0	31	2	0	46	6	19	0	77	0	102	90	52	2	0	0	144	394
05:30 PM	0	4	0	0	0	4	0	24	86	7	0	117	14	0	42	0	0	56	2	18	0	71	0	91	70	44	2	0	0	116	384
05:45 PM	2	6	1	0	0	9	0	8	65	7	0	80	7	0	35	1	0	43	2	26	0	71	0	99	63	46	5	0	0	114	345
Total Volume	2	19	2	1	0	24	0	89	281	35	0	405	45	0	139	5	0	189	14	80	0	282	0	376	274	201	10	0	0	485	1479
% App. Total	8.3	79.2	8.3	4.2	0		0	22	69.4	8.6	0		23.8	0	73.5	2.6	0		3.7	21.3	0	75	0		56.5	41.4	2.1	0	0		
PHF	.250	.792	.500	.250	.000	.667	.000	.618	.817	.795	.000	.865	.804	.000	.827	.625	.000	.844	.583	.769	.000	.916	.000	.922	.761	.852	.500	.000	.000	.842	.938

N/S/NE:Wensley St/ Heath St/Park St
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Start Date : 9/15/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Hard Right	Right	Thru	Left	U-Turn	Right	Bear Right	Thru	Left	U-Turn	Right	Thru	Bear Left	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	0	0	1	4	2	0	2	0	0	0	0	0	2	0	2	0	2	2	0	0	0	17
04:15 PM	0	1	0	0	0	0	1	4	4	0	2	0	0	1	0	0	3	0	5	0	4	4	0	0	0	29
04:30 PM	0	0	0	0	0	0	0	5	2	0	2	0	0	0	0	0	1	0	4	0	1	0	0	0	0	15
04:45 PM	0	0	0	0	0	0	1	1	2	0	1	0	0	0	0	1	1	0	5	0	3	2	0	0	0	17
Total	0	1	0	0	0	0	3	14	10	0	7	0	0	1	0	1	7	0	16	0	10	8	0	0	0	78
05:00 PM	0	0	0	0	0	0	1	3	2	0	1	0	0	0	0	0	2	0	4	0	5	2	0	0	0	20
05:15 PM	0	0	0	1	0	0	1	3	1	0	2	0	0	0	0	0	2	0	1	0	3	3	0	0	0	17
05:30 PM	0	0	0	0	0	0	0	3	2	0	2	0	0	0	0	0	3	0	5	0	1	2	0	0	0	18
05:45 PM	0	0	1	0	0	0	1	0	4	0	1	0	0	0	0	0	1	0	2	0	4	1	0	0	0	15
Total	0	0	1	1	0	0	3	9	9	0	6	0	0	0	0	0	8	0	12	0	13	8	0	0	0	70
Grand Total	0	1	1	1	0	0	6	23	19	0	13	0	0	1	0	1	15	0	28	0	23	16	0	0	0	148
Apprch %	0	33.3	33.3	33.3	0	0	12.5	47.9	39.6	0	92.9	0	0	7.1	0	2.3	34.1	0	63.6	0	59	41	0	0	0	
Total %	0	0.7	0.7	0.7	0	0	4.1	15.5	12.8	0	8.8	0	0	0.7	0	0.7	10.1	0	18.9	0	15.5	10.8	0	0	0	

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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 04:15 PM																															
04:15 PM	0	1	0	0	0	1	0	1	4	4	0	9	2	0	0	1	0	3	0	3	0	5	0	8	4	4	0	0	0	8	29
04:30 PM	0	0	0	0	0	0	0	0	5	2	0	7	2	0	0	0	0	2	0	1	0	4	0	5	1	0	0	0	0	1	15
04:45 PM	0	0	0	0	0	0	0	1	1	2	0	4	1	0	0	0	0	1	1	1	0	5	0	7	3	2	0	0	0	5	17
05:00 PM	0	0	0	0	0	0	0	1	3	2	0	6	1	0	0	0	0	1	0	2	0	4	0	6	5	2	0	0	0	7	20
Total Volume	0	1	0	0	0	1	0	3	13	10	0	26	6	0	0	1	0	7	1	7	0	18	0	26	13	8	0	0	0	21	81
% App. Total	0	100	0	0	0		0	11.5	50	38.5	0		85.7	0	0	14.3	0		3.8	26.9	0	69.2	0		61.9	38.1	0	0	0		
PHF	.000	.250	.000	.000	.000	.250	.000	.750	.650	.625	.000	.722	.750	.000	.000	.250	.000	.583	.250	.583	.000	.900	.000	.813	.650	.500	.000	.000	.000	.656	.698

N/S/NE:Wensley St/ Heath St/Park St
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Groups Printed- Peds and Bikes

	Wensley Street From North					Parker Street From Northeast					New Heath Street From East					Heath Street From South					Heath Street From West					
Start Time	Right	Thru	Left	Hard Left	Peds	Hard Right	Bear Right	Bear Left	Hard Left	Peds	Hard Right	Right	Thru	Left	Peds	Right	Bear Right	Thru	Left	Peds	Right	Thru	Bear Left	Left	Peds	Int. Total
04:00 PM	0	0	0	0	1	0	0	1	0	4	0	0	0	0	2	0	0	0	0	3	0	0	0	0	25	36
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	10	14
04:30 PM	0	0	0	0	1	0	0	0	0	4	1	0	3	0	3	0	0	0	2	5	0	2	0	0	5	26
04:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	3	0	3	0	0	0	5	7	0	2	0	0	1	23
Total	0	0	0	0	2	0	0	1	0	10	1	0	7	0	8	0	0	0	8	17	0	4	0	0	41	99
05:00 PM	0	0	0	0	0	0	0	0	0	3	0	0	2	0	2	0	0	0	1	7	0	0	0	0	2	17
05:15 PM	0	0	0	0	1	2	0	0	0	1	0	0	2	0	1	0	0	0	3	1	0	2	0	0	3	16
05:30 PM	0	0	0	0	0	1	0	0	0	7	0	0	4	0	4	0	0	0	0	4	0	0	0	0	0	20
05:45 PM	0	0	0	0	0	0	1	1	0	10	0	0	3	0	6	0	0	0	1	2	0	0	0	0	3	27
Total	0	0	0	0	1	3	1	1	0	21	0	0	11	0	13	0	0	0	5	14	0	2	0	0	8	80
Grand Total	0	0	0	0	3	3	1	2	0	31	1	0	18	0	21	0	0	0	13	31	0	6	0	0	49	179
Apprch %	0	0	0	0	100	8.1	2.7	5.4	0	83.8	2.5	0	45	0	52.5	0	0	0	29.5	70.5	0	10.9	0	0	89.1	
Total %	0	0	0	0	1.7	1.7	0.6	1.1	0	17.3	0.6	0	10.1	0	11.7	0	0	0	7.3	17.3	0	3.4	0	0	27.4	

	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	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	1	1	0	0	1	0	4	5	0	0	0	0	2	2	0	0	0	0	3	3	0	0	0	0	25	25	36
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	2	3	0	0	0	0	10	10	14
04:30 PM	0	0	0	0	1	1	0	0	0	0	4	4	1	0	3	0	3	7	0	0	0	2	5	7	0	2	0	0	5	7	26
04:45 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	3	0	3	6	0	0	0	5	7	12	0	2	0	0	1	3	23
Total Volume	0	0	0	0	2	2	0	0	1	0	10	11	1	0	7	0	8	16	0	0	0	8	17	25	0	4	0	0	41	45	99
% App. Total	0	0	0	0	100		0	0	9.1	0	90.9		6.2	0	43.8	0	50		0	0	0	32	68		0	8.9	0	0	91.1		
PHF	.000	.000	.000	.000	.500	.500	.000	.000	.250	.000	.625	.550	.250	.000	.583	.000	.667	.571	.000	.000	.000	.400	.607	.521	.000	.500	.000	.000	.410	.450	.688

N/S/NE:Wensley St/ Heath St/Park St
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Start Date : 9/15/2015
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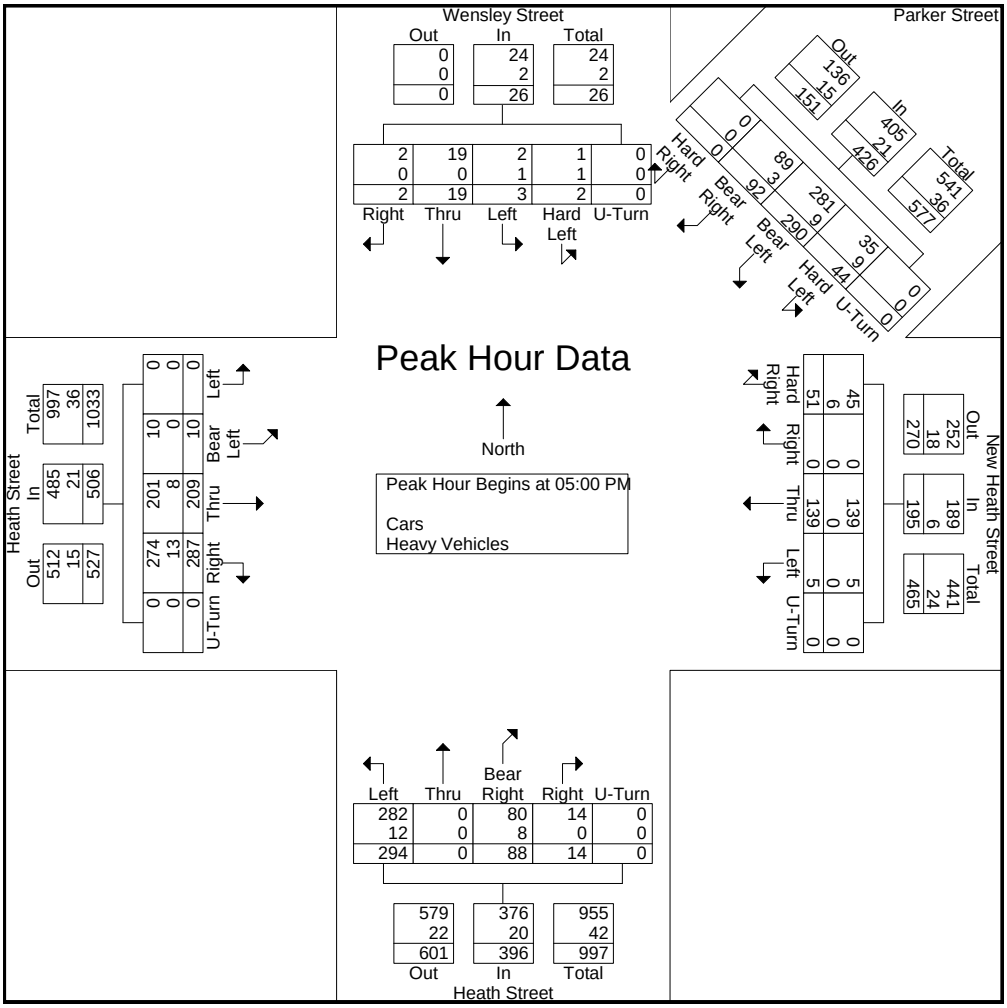
	Wensley Street From North						Parker Street From Northeast						New Heath Street From East						Heath Street From South						Heath Street From West						
Start Time	Right	Thru	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	Left	U-Turn	App. Total	Right	Bear Right	Thru	Left	U-Turn	App. Total	Right	Thru	Bear Left	Left	U-Turn	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	0	5	0	1	0	6	0	37	68	12	0	117	12	0	31	2	0	45	4	19	0	67	0	90	56	61	1	0	0	118	376
05:15 PM	0	4	1	1	0	6	0	22	68	12	0	102	15	0	31	2	0	48	6	21	0	78	0	105	93	55	2	0	0	150	411
05:30 PM	0	4	0	0	0	4	0	24	89	9	0	122	16	0	42	0	0	58	2	21	0	76	0	99	71	46	2	0	0	119	402
05:45 PM	2	6	2	0	0	10	0	9	65	11	0	85	8	0	35	1	0	44	2	27	0	73	0	102	67	47	5	0	0	119	360
Total Volume	2	19	3	2	0	26	0	92	290	44	0	426	51	0	139	5	0	195	14	88	0	294	0	396	287	209	10	0	0	506	1549
% App. Total	7.7	73.1	11.5	7.7	0		0	21.6	68.1	10.3	0		26.2	0	71.3	2.6	0		3.5	22.2	0	74.2	0		56.7	41.3	2	0	0		
PHF	.250	.792	.375	.500	.000	.650	.000	.622	.815	.917	.000	.873	.797	.000	.827	.625	.000	.841	.583	.815	.000	.942	.000	.943	.772	.857	.500	.000	.000	.843	.942
Cars	2	19	2	1	0	24	0	89	281	35	0	405	45	0	139	5	0	189	14	80	0	282	0	376	274	201	10	0	0	485	1479
% Cars	100	100	66.7	50.0	0	92.3	0	96.7	96.9	79.5	0	95.1	88.2	0	100	100	0	96.9	100	90.9	0	95.9	0	94.9	95.5	96.2	100	0	0	95.8	95.5
Heavy Vehicles	0	0	1	1	0	2	0	3	9	9	0	21	6	0	0	0	0	6	0	8	0	12	0	20	13	8	0	0	0	21	70
% Heavy Vehicles	0	0	33.3	50.0	0	7.7	0	3.3	3.1	20.5	0	4.9	11.8	0	0	0	0	3.1	0	9.1	0	4.1	0	5.1	4.5	3.8	0	0	0	4.2	4.5



N: Bromley Street
E/W: Heath Street
City, State: Boston, MA
Client: VHB/ R. White

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File Name : 154599 B
Site Code : 13208.00
Start Date : 9/15/2015
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Groups Printed- Cars - Heavy Vehicles

	Bromley Street From North			Heath Street From East			Heath Street From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
07:00 AM	1	1	0	10	108	0	111	3	0	234
07:15 AM	0	2	0	8	141	0	104	3	1	259
07:30 AM	0	1	0	7	141	0	106	3	0	258
07:45 AM	0	4	0	12	158	0	105	2	0	281
Total	1	8	0	37	548	0	426	11	1	1032
08:00 AM	1	4	0	13	135	0	97	2	0	252
08:15 AM	1	3	0	14	121	0	99	2	0	240
08:30 AM	1	5	0	12	114	0	111	2	0	245
08:45 AM	0	0	0	10	95	0	114	2	1	222
Total	3	12	0	49	465	0	421	8	1	959
Grand Total	4	20	0	86	1013	0	847	19	2	1991
Apprch %	16.7	83.3	0	7.8	92.2	0	97.6	2.2	0.2	
Total %	0.2	1	0	4.3	50.9	0	42.5	1	0.1	
Cars	4	19	0	82	939	0	770	19	2	1835
% Cars	100	95	0	95.3	92.7	0	90.9	100	100	92.2
Heavy Vehicles	0	1	0	4	74	0	77	0	0	156
% Heavy Vehicles	0	5	0	4.7	7.3	0	9.1	0	0	7.8

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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	0	2	0	2	8	141	0	149	104	3	1	108	259
07:30 AM	0	1	0	1	7	141	0	148	106	3	0	109	258
07:45 AM	0	4	0	4	12	158	0	170	105	2	0	107	281
08:00 AM	1	4	0	5	13	135	0	148	97	2	0	99	252
Total Volume	1	11	0	12	40	575	0	615	412	10	1	423	1050
% App. Total	8.3	91.7	0		6.5	93.5	0		97.4	2.4	0.2		
PHF	.250	.688	.000	.600	.769	.910	.000	.904	.972	.833	.250	.970	.934
Cars	1	10	0	11	37	538	0	575	370	10	1	381	967
% Cars	100	90.9	0	91.7	92.5	93.6	0	93.5	89.8	100	100	90.1	92.1
Heavy Vehicles	0	1	0	1	3	37	0	40	42	0	0	42	83
% Heavy Vehicles	0	9.1	0	8.3	7.5	6.4	0	6.5	10.2	0	0	9.9	7.9

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Groups Printed- Cars

	Bromley Street From North			Heath Street From East			Heath Street From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
07:00 AM	1	1	0	10	93	0	101	3	0	209
07:15 AM	0	2	0	8	130	0	97	3	1	241
07:30 AM	0	0	0	6	132	0	94	3	0	235
07:45 AM	0	4	0	11	149	0	91	2	0	257
Total	1	7	0	35	504	0	383	11	1	942
08:00 AM	1	4	0	12	127	0	88	2	0	234
08:15 AM	1	3	0	14	113	0	88	2	0	221
08:30 AM	1	5	0	12	108	0	106	2	0	234
08:45 AM	0	0	0	9	87	0	105	2	1	204
Total	3	12	0	47	435	0	387	8	1	893
Grand Total	4	19	0	82	939	0	770	19	2	1835
Apprch %	17.4	82.6	0	8	92	0	97.3	2.4	0.3	
Total %	0.2	1	0	4.5	51.2	0	42	1	0.1	

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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	0	2	0	2	8	130	0	138	97	3	1	101	241
07:30 AM	0	0	0	0	6	132	0	138	94	3	0	97	235
07:45 AM	0	4	0	4	11	149	0	160	91	2	0	93	257
08:00 AM	1	4	0	5	12	127	0	139	88	2	0	90	234
Total Volume	1	10	0	11	37	538	0	575	370	10	1	381	967
% App. Total	9.1	90.9	0		6.4	93.6	0		97.1	2.6	0.3		
PHF	.250	.625	.000	.550	.771	.903	.000	.898	.954	.833	.250	.943	.941

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Groups Printed- Heavy Vehicles

	Bromley Street From North			Heath Street From East			Heath Street From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	15	0	10	0	0	25
07:15 AM	0	0	0	0	11	0	7	0	0	18
07:30 AM	0	1	0	1	9	0	12	0	0	23
07:45 AM	0	0	0	1	9	0	14	0	0	24
Total	0	1	0	2	44	0	43	0	0	90
08:00 AM	0	0	0	1	8	0	9	0	0	18
08:15 AM	0	0	0	0	8	0	11	0	0	19
08:30 AM	0	0	0	0	6	0	5	0	0	11
08:45 AM	0	0	0	1	8	0	9	0	0	18
Total	0	0	0	2	30	0	34	0	0	66
Grand Total	0	1	0	4	74	0	77	0	0	156
Apprch %	0	100	0	5.1	94.9	0	100	0	0	
Total %	0	0.6	0	2.6	47.4	0	49.4	0	0	

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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	15	0	15	10	0	0	10	25
07:15 AM	0	0	0	0	0	11	0	11	7	0	0	7	18
07:30 AM	0	1	0	1	1	9	0	10	12	0	0	12	23
07:45 AM	0	0	0	0	1	9	0	10	14	0	0	14	24
Total Volume	0	1	0	1	2	44	0	46	43	0	0	43	90
% App. Total	0	100	0		4.3	95.7	0		100	0	0		
PHF	.000	.250	.000	.250	.500	.733	.000	.767	.768	.000	.000	.768	.900

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Groups Printed- Peds and Bikes

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	Peds EB	Peds WB	Right	Thru	Peds SB	Peds NB	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	1	1	1	0	1	1	0	2	0	0	0	7
07:15 AM	0	0	5	2	0	0	0	0	1	0	0	0	8
07:30 AM	0	0	2	1	0	2	0	1	0	1	0	0	7
07:45 AM	0	0	1	0	0	1	0	0	1	0	0	0	3
Total	0	1	9	4	0	4	1	1	4	1	0	0	25
08:00 AM	0	0	1	0	1	3	2	1	5	0	0	0	13
08:15 AM	0	0	2	0	0	1	1	1	3	0	0	0	8
08:30 AM	0	0	1	0	0	0	0	1	1	0	0	0	3
08:45 AM	0	0	5	0	5	0	2	3	2	0	0	0	17
Total	0	0	9	0	6	4	5	6	11	0	0	0	41
Grand Total	0	1	18	4	6	8	6	7	15	1	0	0	66
Apprch %	0	4.3	78.3	17.4	22.2	29.6	22.2	25.9	93.8	6.2	0	0	
Total %	0	1.5	27.3	6.1	9.1	12.1	9.1	10.6	22.7	1.5	0	0	

	Bromley Street From North					Heath Street From East					Heath Street From West					
Start Time	Right	Left	Peds EB	Peds WB	App. Total	Right	Thru	Peds SB	Peds NB	App. Total	Thru	Left	Peds NB	Peds SB	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	0	1	0	1	1	3	2	1	7	5	0	0	0	5	13
08:15 AM	0	0	2	0	2	0	1	1	1	3	3	0	0	0	3	8
08:30 AM	0	0	1	0	1	0	0	0	1	1	1	0	0	0	1	3
08:45 AM	0	0	5	0	5	5	0	2	3	10	2	0	0	0	2	17
Total Volume	0	0	9	0	9	6	4	5	6	21	11	0	0	0	11	41
% App. Total	0	0	100	0		28.6	19	23.8	28.6		100	0	0	0		
PHF	.000	.000	.450	.000	.450	.300	.333	.625	.500	.525	.550	.000	.000	.000	.550	.603

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City, State: Boston, MA
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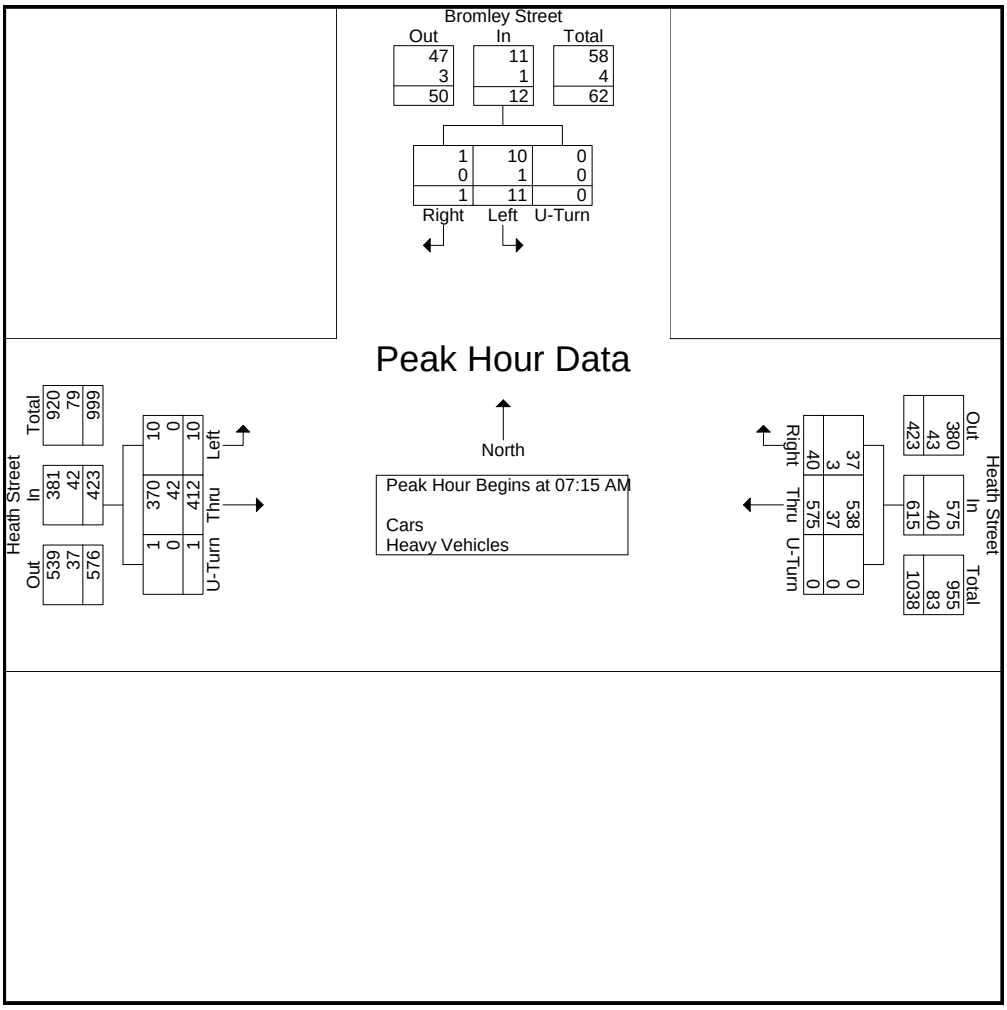
Page No : 1

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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	0	2	0	2	8	141	0	149	104	3	1	108	259
07:30 AM	0	1	0	1	7	141	0	148	106	3	0	109	258
07:45 AM	0	4	0	4	12	158	0	170	105	2	0	107	281
08:00 AM	1	4	0	5	13	135	0	148	97	2	0	99	252
Total Volume	1	11	0	12	40	575	0	615	412	10	1	423	1050
% App. Total	8.3	91.7	0		6.5	93.5	0		97.4	2.4	0.2		
PHF	.250	.688	.000	.600	.769	.910	.000	.904	.972	.833	.250	.970	.934
Cars	1	10	0	11	37	538	0	575	370	10	1	381	967
% Cars	100	90.9	0	91.7	92.5	93.6	0	93.5	89.8	100	100	90.1	92.1
Heavy Vehicles	0	1	0	1	3	37	0	40	42	0	0	42	83
% Heavy Vehicles	0	9.1	0	8.3	7.5	6.4	0	6.5	10.2	0	0	9.9	7.9



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Groups Printed- Cars - Heavy Vehicles

	Bromley Street From North			Heath Street From East			Heath Street From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
04:00 PM	1	6	0	2	78	0	149	0	0	236
04:15 PM	1	8	0	4	86	0	154	3	0	256
04:30 PM	0	3	0	4	86	0	161	1	0	255
04:45 PM	0	4	0	13	99	0	133	3	0	252
Total	2	21	0	23	349	0	597	7	0	999
05:00 PM	1	4	0	3	89	0	142	1	0	240
05:15 PM	1	8	0	1	101	0	168	1	0	280
05:30 PM	0	4	0	2	107	0	147	2	0	262
05:45 PM	1	2	0	4	98	0	144	1	0	250
Total	3	18	0	10	395	0	601	5	0	1032
Grand Total	5	39	0	33	744	0	1198	12	0	2031
Apprch %	11.4	88.6	0	4.2	95.8	0	99	1	0	
Total %	0.2	1.9	0	1.6	36.6	0	59	0.6	0	
Cars	5	37	0	33	705	0	1140	12	0	1932
% Cars	100	94.9	0	100	94.8	0	95.2	100	0	95.1
Heavy Vehicles	0	2	0	0	39	0	58	0	0	99
% Heavy Vehicles	0	5.1	0	0	5.2	0	4.8	0	0	4.9

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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	0	4	0	4	13	99	0	112	133	3	0	136	252
05:00 PM	1	4	0	5	3	89	0	92	142	1	0	143	240
05:15 PM	1	8	0	9	1	101	0	102	168	1	0	169	280
05:30 PM	0	4	0	4	2	107	0	109	147	2	0	149	262
Total Volume	2	20	0	22	19	396	0	415	590	7	0	597	1034
% App. Total	9.1	90.9	0		4.6	95.4	0		98.8	1.2	0		
PHF	.500	.625	.000	.611	.365	.925	.000	.926	.878	.583	.000	.883	.923
Cars	2	19	0	21	19	375	0	394	562	7	0	569	984
% Cars	100	95.0	0	95.5	100	94.7	0	94.9	95.3	100	0	95.3	95.2
Heavy Vehicles	0	1	0	1	0	21	0	21	28	0	0	28	50
% Heavy Vehicles	0	5.0	0	4.5	0	5.3	0	5.1	4.7	0	0	4.7	4.8

N: Bromley Street
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Groups Printed- Cars

	Bromley Street From North			Heath Street From East			Heath Street From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
04:00 PM	1	5	0	2	75	0	142	0	0	225
04:15 PM	1	8	0	4	79	0	145	3	0	240
04:30 PM	0	3	0	4	81	0	155	1	0	244
04:45 PM	0	4	0	13	92	0	123	3	0	235
Total	2	20	0	23	327	0	565	7	0	944
05:00 PM	1	4	0	3	85	0	133	1	0	227
05:15 PM	1	7	0	1	98	0	163	1	0	271
05:30 PM	0	4	0	2	100	0	143	2	0	251
05:45 PM	1	2	0	4	95	0	136	1	0	239
Total	3	17	0	10	378	0	575	5	0	988
Grand Total	5	37	0	33	705	0	1140	12	0	1932
Apprch %	11.9	88.1	0	4.5	95.5	0	99	1	0	
Total %	0.3	1.9	0	1.7	36.5	0	59	0.6	0	

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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	1	4	0	5	3	85	0	88	133	1	0	134	227
05:15 PM	1	7	0	8	1	98	0	99	163	1	0	164	271
05:30 PM	0	4	0	4	2	100	0	102	143	2	0	145	251
05:45 PM	1	2	0	3	4	95	0	99	136	1	0	137	239
Total Volume	3	17	0	20	10	378	0	388	575	5	0	580	988
% App. Total	15	85	0		2.6	97.4	0		99.1	0.9	0		
PHF	.750	.607	.000	.625	.625	.945	.000	.951	.882	.625	.000	.884	.911

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Site Code : 13208.00
Start Date : 9/15/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Bromley Street From North			Heath Street From East			Heath Street From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
04:00 PM	0	1	0	0	3	0	7	0	0	11
04:15 PM	0	0	0	0	7	0	9	0	0	16
04:30 PM	0	0	0	0	5	0	6	0	0	11
04:45 PM	0	0	0	0	7	0	10	0	0	17
Total	0	1	0	0	22	0	32	0	0	55
05:00 PM	0	0	0	0	4	0	9	0	0	13
05:15 PM	0	1	0	0	3	0	5	0	0	9
05:30 PM	0	0	0	0	7	0	4	0	0	11
05:45 PM	0	0	0	0	3	0	8	0	0	11
Total	0	1	0	0	17	0	26	0	0	44
Grand Total	0	2	0	0	39	0	58	0	0	99
Apprch %	0	100	0	0	100	0	100	0	0	
Total %	0	2	0	0	39.4	0	58.6	0	0	

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	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 04:15 PM													
04:15 PM	0	0	0	0	0	7	0	7	9	0	0	9	16
04:30 PM	0	0	0	0	0	5	0	5	6	0	0	6	11
04:45 PM	0	0	0	0	0	7	0	7	10	0	0	10	17
05:00 PM	0	0	0	0	0	4	0	4	9	0	0	9	13
Total Volume	0	0	0	0	0	23	0	23	34	0	0	34	57
% App. Total	0	0	0		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.821	.000	.821	.850	.000	.000	.850	.838

N: Bromley Street
E/W: Heath Street
City, State: Boston, MA
Client: VHB/ R. White

PRECISION
D A T A
INDUSTRIES, LLC
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Groups Printed- Peds and Bikes

	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	Peds EB	Peds WB	Right	Thru	Peds SB	Peds NB	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	2	0	2	0	1	0	1	0	0	6
04:15 PM	0	0	0	2	0	0	0	1	0	0	0	0	3
04:30 PM	0	0	2	3	0	2	0	2	0	0	0	1	10
04:45 PM	0	0	2	3	0	5	6	0	1	0	0	0	17
Total	0	0	4	10	0	9	6	4	1	1	0	1	36
05:00 PM	0	1	2	4	0	2	0	1	2	0	0	0	12
05:15 PM	0	0	2	3	0	3	0	3	2	0	0	0	13
05:30 PM	0	2	2	2	0	0	0	0	2	0	0	1	9
05:45 PM	0	0	3	2	0	2	0	0	0	0	1	0	8
Total	0	3	9	11	0	7	0	4	6	0	1	1	42
Grand Total	0	3	13	21	0	16	6	8	7	1	1	2	78
Apprch %	0	8.1	35.1	56.8	0	53.3	20	26.7	63.6	9.1	9.1	18.2	
Total %	0	3.8	16.7	26.9	0	20.5	7.7	10.3	9	1.3	1.3	2.6	

	Bromley Street From North					Heath Street From East					Heath Street From West					
Start Time	Right	Left	Peds EB	Peds WB	App. Total	Right	Thru	Peds SB	Peds NB	App. Total	Thru	Left	Peds NB	Peds SB	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	0	2	3	5	0	2	0	2	4	0	0	0	1	1	10
04:45 PM	0	0	2	3	5	0	5	6	0	11	1	0	0	0	1	17
05:00 PM	0	1	2	4	7	0	2	0	1	3	2	0	0	0	2	12
05:15 PM	0	0	2	3	5	0	3	0	3	6	2	0	0	0	2	13
Total Volume	0	1	8	13	22	0	12	6	6	24	5	0	0	1	6	52
% App. Total	0	4.5	36.4	59.1		0	50	25	25		83.3	0	0	16.7		
PHF	.000	.250	1.00	.813	.786	.000	.600	.250	.500	.545	.625	.000	.000	.250	.750	.765

N: Bromley Street
E/W: Heath Street
City, State: Boston, MA
Client: VHB/ R. White

PRECISION DATA INDUSTRIES, LLC
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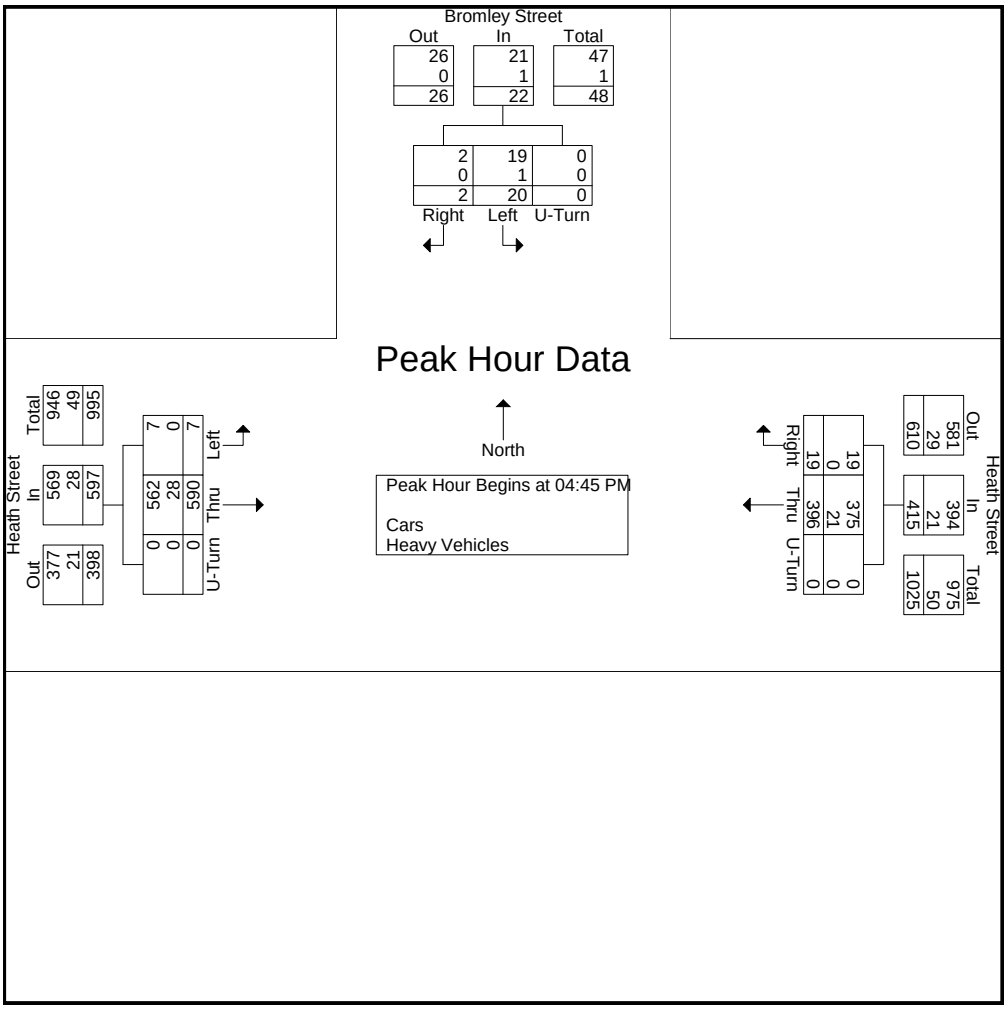
	Bromley Street From North				Heath Street From East				Heath Street From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	4	0	4	13	99	0	112	133	3	0	136	252
05:00 PM	1	4	0	5	3	89	0	92	142	1	0	143	240
05:15 PM	1	8	0	9	1	101	0	102	168	1	0	169	280
05:30 PM	0	4	0	4	2	107	0	109	147	2	0	149	262
Total Volume	2	20	0	22	19	396	0	415	590	7	0	597	1034
% App. Total	9.1	90.9	0		4.6	95.4	0		98.8	1.2	0		
PHF	.500	.625	.000	.611	.365	.925	.000	.926	.878	.583	.000	.883	.923
Cars	2	19	0	21	19	375	0	394	562	7	0	569	984
% Cars	100	95.0	0	95.5	100	94.7	0	94.9	95.3	100	0	95.3	95.2
Heavy Vehicles	0	1	0	1	0	21	0	21	28	0	0	28	50
% Heavy Vehicles	0	5.0	0	4.5	0	5.3	0	5.1	4.7	0	0	4.7	4.8



N/S: Columbus Avenue (Route 28)
E/W: Centre Street/ Heath Street
City, State: Boston, MA
Client: VHB/ R. White

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File Name : 154599 C
Site Code : 13208.00
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Columbus Avenue (Route 28) From North				Centre Street From East				Columbus Avenue (Route 28) From South				Heath Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	12	127	4	0	12	71	19	0	26	346	40	0	45	47	23	0	772
07:15 AM	17	143	4	0	10	75	17	0	21	362	51	0	47	38	20	0	805
07:30 AM	19	147	2	0	7	90	22	0	25	344	45	0	45	44	21	0	811
07:45 AM	24	135	1	0	4	92	18	0	27	313	49	0	49	28	24	0	764
Total	72	552	11	0	33	328	76	0	99	1365	185	0	186	157	88	0	3152
08:00 AM	17	137	4	0	10	76	14	0	28	288	50	0	47	37	17	0	725
08:15 AM	21	124	8	0	8	69	16	0	33	295	50	0	36	36	24	0	720
08:30 AM	16	134	3	0	5	59	24	0	33	273	49	0	52	40	30	0	718
08:45 AM	12	122	3	0	16	53	18	0	23	324	41	0	49	36	25	0	722
Total	66	517	18	0	39	257	72	0	117	1180	190	0	184	149	96	0	2885
Grand Total	138	1069	29	0	72	585	148	0	216	2545	375	0	370	306	184	0	6037
Apprch %	11.2	86.5	2.3	0	8.9	72.7	18.4	0	6.9	81.2	12	0	43	35.6	21.4	0	
Total %	2.3	17.7	0.5	0	1.2	9.7	2.5	0	3.6	42.2	6.2	0	6.1	5.1	3	0	
Cars	124	1001	28	0	69	555	133	0	189	2438	350	0	325	294	174	0	5680
% Cars	89.9	93.6	96.6	0	95.8	94.9	89.9	0	87.5	95.8	93.3	0	87.8	96.1	94.6	0	94.1
Heavy Vehicles	14	68	1	0	3	30	15	0	27	107	25	0	45	12	10	0	357
% Heavy Vehicles	10.1	6.4	3.4	0	4.2	5.1	10.1	0	12.5	4.2	6.7	0	12.2	3.9	5.4	0	5.9

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	12	127	4	0	143	12	71	19	0	102	26	346	40	0	412	45	47	23	0	115	772
07:15 AM	17	143	4	0	164	10	75	17	0	102	21	362	51	0	434	47	38	20	0	105	805
07:30 AM	19	147	2	0	168	7	90	22	0	119	25	344	45	0	414	45	44	21	0	110	811
07:45 AM	24	135	1	0	160	4	92	18	0	114	27	313	49	0	389	49	28	24	0	101	764
Total Volume	72	552	11	0	635	33	328	76	0	437	99	1365	185	0	1649	186	157	88	0	431	3152
% App. Total	11.3	86.9	1.7	0		7.6	75.1	17.4	0		6	82.8	11.2	0		43.2	36.4	20.4	0		
PHF	.750	.939	.688	.000	.945	.688	.891	.864	.000	.918	.917	.943	.907	.000	.950	.949	.835	.917	.000	.937	.972
Cars	62	517	10	0	589	33	310	70	0	413	86	1307	170	0	1563	164	151	81	0	396	2961
% Cars	86.1	93.7	90.9	0	92.8	100	94.5	92.1	0	94.5	86.9	95.8	91.9	0	94.8	88.2	96.2	92.0	0	91.9	93.9
Heavy Vehicles	10	35	1	0	46	0	18	6	0	24	13	58	15	0	86	22	6	7	0	35	191
% Heavy Vehicles	13.9	6.3	9.1	0	7.2	0	5.5	7.9	0	5.5	13.1	4.2	8.1	0	5.2	11.8	3.8	8.0	0	8.1	6.1

N/S: Columbus Avenue (Route 28)
E/W: Centre Street/ Heath Street
City, State: Boston, MA
Client: VHB/ R. White

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Start Date : 9/15/2015
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Groups Printed- Cars

	Columbus Avenue (Route 28) From North				Centre Street From East				Columbus Avenue (Route 28) From South				Heath Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	9	120	4	0	12	64	18	0	22	331	35	0	40	46	22	0	723
07:15 AM	15	136	3	0	10	73	15	0	19	351	47	0	44	37	18	0	768
07:30 AM	16	138	2	0	7	86	20	0	21	329	42	0	37	43	19	0	760
07:45 AM	22	123	1	0	4	87	17	0	24	296	46	0	43	25	22	0	710
Total	62	517	10	0	33	310	70	0	86	1307	170	0	164	151	81	0	2961
08:00 AM	15	131	4	0	10	74	11	0	26	273	47	0	40	37	16	0	684
08:15 AM	20	114	8	0	6	66	15	0	29	286	48	0	31	32	24	0	679
08:30 AM	15	123	3	0	5	57	22	0	27	258	48	0	48	39	29	0	674
08:45 AM	12	116	3	0	15	48	15	0	21	314	37	0	42	35	24	0	682
Total	62	484	18	0	36	245	63	0	103	1131	180	0	161	143	93	0	2719
Grand Total	124	1001	28	0	69	555	133	0	189	2438	350	0	325	294	174	0	5680
Apprch %	10.8	86.8	2.4	0	9.1	73.3	17.6	0	6.3	81.9	11.8	0	41	37.1	21.9	0	
Total %	2.2	17.6	0.5	0	1.2	9.8	2.3	0	3.3	42.9	6.2	0	5.7	5.2	3.1	0	

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	9	120	4	0	133	12	64	18	0	94	22	331	35	0	388	40	46	22	0	108	723
07:15 AM	15	136	3	0	154	10	73	15	0	98	19	351	47	0	417	44	37	18	0	99	768
07:30 AM	16	138	2	0	156	7	86	20	0	113	21	329	42	0	392	37	43	19	0	99	760
07:45 AM	22	123	1	0	146	4	87	17	0	108	24	296	46	0	366	43	25	22	0	90	710
Total Volume	62	517	10	0	589	33	310	70	0	413	86	1307	170	0	1563	164	151	81	0	396	2961
% App. Total	10.5	87.8	1.7	0		8	75.1	16.9	0		5.5	83.6	10.9	0		41.4	38.1	20.5	0		
PHF	.705	.937	.625	.000	.944	.688	.891	.875	.000	.914	.896	.931	.904	.000	.937	.932	.821	.920	.000	.917	.964

N/S: Columbus Avenue (Route 28)
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Groups Printed- Heavy Vehicles

	Columbus Avenue (Route 28) From North				Centre Street From East				Columbus Avenue (Route 28) From South				Heath Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	3	7	0	0	0	7	1	0	4	15	5	0	5	1	1	0	49
07:15 AM	2	7	1	0	0	2	2	0	2	11	4	0	3	1	2	0	37
07:30 AM	3	9	0	0	0	4	2	0	4	15	3	0	8	1	2	0	51
07:45 AM	2	12	0	0	0	5	1	0	3	17	3	0	6	3	2	0	54
Total	10	35	1	0	0	18	6	0	13	58	15	0	22	6	7	0	191
08:00 AM	2	6	0	0	0	2	3	0	2	15	3	0	7	0	1	0	41
08:15 AM	1	10	0	0	2	3	1	0	4	9	2	0	5	4	0	0	41
08:30 AM	1	11	0	0	0	2	2	0	6	15	1	0	4	1	1	0	44
08:45 AM	0	6	0	0	1	5	3	0	2	10	4	0	7	1	1	0	40
Total	4	33	0	0	3	12	9	0	14	49	10	0	23	6	3	0	166
Grand Total	14	68	1	0	3	30	15	0	27	107	25	0	45	12	10	0	357
Apprch %	16.9	81.9	1.2	0	6.2	62.5	31.2	0	17	67.3	15.7	0	67.2	17.9	14.9	0	
Total %	3.9	19	0.3	0	0.8	8.4	4.2	0	7.6	30	7	0	12.6	3.4	2.8	0	

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	3	7	0	0	10	0	7	1	0	8	4	15	5	0	24	5	1	1	0	7	49
07:15 AM	2	7	1	0	10	0	2	2	0	4	2	11	4	0	17	3	1	2	0	6	37
07:30 AM	3	9	0	0	12	0	4	2	0	6	4	15	3	0	22	8	1	2	0	11	51
07:45 AM	2	12	0	0	14	0	5	1	0	6	3	17	3	0	23	6	3	2	0	11	54
Total Volume	10	35	1	0	46	0	18	6	0	24	13	58	15	0	86	22	6	7	0	35	191
% App. Total	21.7	76.1	2.2	0		0	75	25	0		15.1	67.4	17.4	0		62.9	17.1	20	0		
PHF	.833	.729	.250	.000	.821	.000	.643	.750	.000	.750	.813	.853	.750	.000	.896	.688	.500	.875	.000	.795	.884

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Groups Printed- Peds and Bikes

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	1	0	1	0	2	1	0	0	0	3	2	0	0	0	28	5	43
07:15 AM	0	0	0	1	0	0	0	0	2	2	0	0	0	5	1	0	0	0	35	11	57
07:30 AM	0	0	0	0	0	0	0	0	4	3	0	0	0	8	2	0	0	0	57	3	77
07:45 AM	0	0	0	1	0	0	1	1	0	4	0	0	0	2	2	0	0	0	100	10	121
Total	0	0	0	2	1	0	2	1	8	10	0	0	0	18	7	0	0	0	220	29	298
08:00 AM	0	0	0	0	1	0	0	0	2	2	0	0	0	2	1	0	0	0	72	1	81
08:15 AM	0	0	0	1	0	0	0	0	1	1	0	2	0	2	0	0	0	0	94	2	103
08:30 AM	0	0	0	1	1	0	0	0	2	3	0	1	0	1	1	0	0	0	117	7	134
08:45 AM	0	0	0	0	0	0	0	0	1	4	0	1	0	3	0	0	0	0	108	3	120
Total	0	0	0	2	2	0	0	0	6	10	0	4	0	8	2	0	0	0	391	13	438
Grand Total	0	0	0	4	3	0	2	1	14	20	0	4	0	26	9	0	0	0	611	42	736
Apprch %	0	0	0	57.1	42.9	0	5.4	2.7	37.8	54.1	0	10.3	0	66.7	23.1	0	0	0	93.6	6.4	
Total %	0	0	0	0.5	0.4	0	0.3	0.1	1.9	2.7	0	0.5	0	3.5	1.2	0	0	0	83	5.7	

	Columbus Avenue (Route 28) From North						Centre Street From East						Columbus Avenue (Route 28) From South						Heath Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	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	0	0	1	0	1	0	1	1	0	4	6	0	0	0	2	2	4	0	0	0	100	10	110	121
08:00 AM	0	0	0	0	1	1	0	0	0	2	2	4	0	0	0	2	1	3	0	0	0	72	1	73	81
08:15 AM	0	0	0	1	0	1	0	0	0	1	1	2	0	2	0	2	0	4	0	0	0	94	2	96	103
08:30 AM	0	0	0	1	1	2	0	0	0	2	3	5	0	1	0	1	1	3	0	0	0	117	7	124	134
Total Volume	0	0	0	3	2	5	0	1	1	5	10	17	0	3	0	7	4	14	0	0	0	383	20	403	439
% App. Total	0	0	0	60	40		0	5.9	5.9	29.4	58.8		0	21.4	0	50	28.6		0	0	0	95	5		
PHF	.000	.000	.000	.750	.500	.625	.000	.250	.250	.625	.625	.708	.000	.375	.000	.875	.500	.875	.000	.000	.000	.818	.500	.813	.819

N/S: Columbus Avenue (Route 28)
E/W: Centre Street/ Heath Street
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Client: VHB/ R. White

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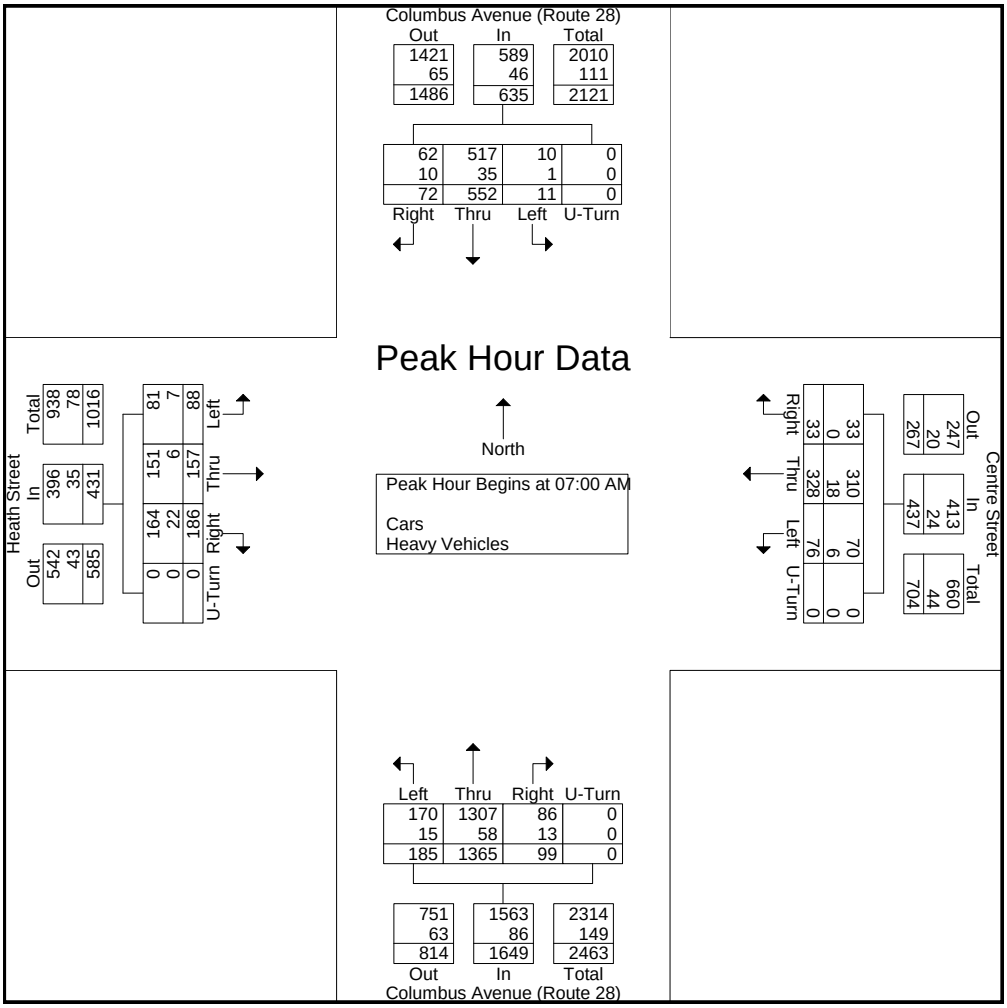
	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak 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	12	127	4	0	143	12	71	19	0	102	26	346	40	0	412	45	47	23	0	115	772
07:15 AM	17	143	4	0	164	10	75	17	0	102	21	362	51	0	434	47	38	20	0	105	805
07:30 AM	19	147	2	0	168	7	90	22	0	119	25	344	45	0	414	45	44	21	0	110	811
07:45 AM	24	135	1	0	160	4	92	18	0	114	27	313	49	0	389	49	28	24	0	101	764
Total Volume	72	552	11	0	635	33	328	76	0	437	99	1365	185	0	1649	186	157	88	0	431	3152
% App. Total	11.3	86.9	1.7	0		7.6	75.1	17.4	0		6	82.8	11.2	0		43.2	36.4	20.4	0		
PHF	.750	.939	.688	.000	.945	.688	.891	.864	.000	.918	.917	.943	.907	.000	.950	.949	.835	.917	.000	.937	.972
Cars	62	517	10	0	589	33	310	70	0	413	86	1307	170	0	1563	164	151	81	0	396	2961
% Cars	86.1	93.7	90.9	0	92.8	100	94.5	92.1	0	94.5	86.9	95.8	91.9	0	94.8	88.2	96.2	92.0	0	91.9	93.9
Heavy Vehicles	10	35	1	0	46	0	18	6	0	24	13	58	15	0	86	22	6	7	0	35	191
% Heavy Vehicles	13.9	6.3	9.1	0	7.2	0	5.5	7.9	0	5.5	13.1	4.2	8.1	0	5.2	11.8	3.8	8.0	0	8.1	6.1



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Groups Printed- Cars - Heavy Vehicles

	Columbus Avenue (Route 28) From North				Centre Street From East				Columbus Avenue (Route 28) From South				Heath Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	3	182	7	0	6	47	44	0	13	179	28	0	79	67	22	0	677
04:15 PM	7	260	5	0	9	46	39	0	22	234	36	0	72	62	23	0	815
04:30 PM	5	242	5	0	4	53	49	0	14	202	31	0	78	75	16	0	774
04:45 PM	16	254	15	0	9	52	47	0	23	215	43	0	73	50	11	0	808
Total	31	938	32	0	28	198	179	0	72	830	138	0	302	254	72	0	3074
05:00 PM	9	227	7	0	9	52	46	0	16	218	31	0	73	56	24	0	768
05:15 PM	10	265	9	0	9	56	26	0	21	229	34	0	86	54	17	0	816
05:30 PM	13	265	10	0	4	63	38	0	30	204	33	0	82	76	13	0	831
05:45 PM	22	252	11	0	9	46	39	0	30	212	27	0	78	57	11	0	794
Total	54	1009	37	0	31	217	149	0	97	863	125	0	319	243	65	0	3209
Grand Total	85	1947	69	0	59	415	328	0	169	1693	263	0	621	497	137	0	6283
Apprch %	4	92.7	3.3	0	7.4	51.7	40.9	0	8	79.7	12.4	0	49.5	39.6	10.9	0	
Total %	1.4	31	1.1	0	0.9	6.6	5.2	0	2.7	26.9	4.2	0	9.9	7.9	2.2	0	
Cars	83	1908	67	0	58	393	316	0	146	1634	246	0	594	478	130	0	6053
% Cars	97.6	98	97.1	0	98.3	94.7	96.3	0	86.4	96.5	93.5	0	95.7	96.2	94.9	0	96.3
Heavy Vehicles	2	39	2	0	1	22	12	0	23	59	17	0	27	19	7	0	230
% Heavy Vehicles	2.4	2	2.9	0	1.7	5.3	3.7	0	13.6	3.5	6.5	0	4.3	3.8	5.1	0	3.7

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	16	254	15	0	285	9	52	47	0	108	23	215	43	0	281	73	50	11	0	134	808
05:00 PM	9	227	7	0	243	9	52	46	0	107	16	218	31	0	265	73	56	24	0	153	768
05:15 PM	10	265	9	0	284	9	56	26	0	91	21	229	34	0	284	86	54	17	0	157	816
05:30 PM	13	265	10	0	288	4	63	38	0	105	30	204	33	0	267	82	76	13	0	171	831
Total Volume	48	1011	41	0	1100	31	223	157	0	411	90	866	141	0	1097	314	236	65	0	615	3223
% App. Total	4.4	91.9	3.7	0		7.5	54.3	38.2	0		8.2	78.9	12.9	0		51.1	38.4	10.6	0		
PHF	.750	.954	.683	.000	.955	.861	.885	.835	.000	.951	.750	.945	.820	.000	.966	.913	.776	.677	.000	.899	.970
Cars	48	995	40	0	1083	30	212	152	0	394	78	830	130	0	1038	303	226	61	0	590	3105
% Cars	100	98.4	97.6	0	98.5	96.8	95.1	96.8	0	95.9	86.7	95.8	92.2	0	94.6	96.5	95.8	93.8	0	95.9	96.3
Heavy Vehicles	0	16	1	0	17	1	11	5	0	17	12	36	11	0	59	11	10	4	0	25	118
% Heavy Vehicles	0	1.6	2.4	0	1.5	3.2	4.9	3.2	0	4.1	13.3	4.2	7.8	0	5.4	3.5	4.2	6.2	0	4.1	3.7

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Groups Printed- Cars

	Columbus Avenue (Route 28) From North				Centre Street From East				Columbus Avenue (Route 28) From South				Heath Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	3	175	7	0	6	44	43	0	11	170	28	0	75	66	21	0	649
04:15 PM	6	255	4	0	9	43	37	0	19	230	33	0	69	60	22	0	787
04:30 PM	5	239	5	0	4	50	47	0	11	194	29	0	72	73	15	0	744
04:45 PM	16	250	14	0	9	49	46	0	17	208	39	0	70	47	11	0	776
Total	30	919	30	0	28	186	173	0	58	802	129	0	286	246	69	0	2956
05:00 PM	9	223	7	0	9	50	44	0	15	209	28	0	70	53	21	0	738
05:15 PM	10	261	9	0	8	54	26	0	18	216	33	0	83	52	17	0	787
05:30 PM	13	261	10	0	4	59	36	0	28	197	30	0	80	74	12	0	804
05:45 PM	21	244	11	0	9	44	37	0	27	210	26	0	75	53	11	0	768
Total	53	989	37	0	30	207	143	0	88	832	117	0	308	232	61	0	3097
Grand Total	83	1908	67	0	58	393	316	0	146	1634	246	0	594	478	130	0	6053
Apprch %	4	92.7	3.3	0	7.6	51.2	41.2	0	7.2	80.7	12.1	0	49.4	39.8	10.8	0	
Total %	1.4	31.5	1.1	0	1	6.5	5.2	0	2.4	27	4.1	0	9.8	7.9	2.1	0	

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	16	250	14	0	280	9	49	46	0	104	17	208	39	0	264	70	47	11	0	128	776
05:00 PM	9	223	7	0	239	9	50	44	0	103	15	209	28	0	252	70	53	21	0	144	738
05:15 PM	10	261	9	0	280	8	54	26	0	88	18	216	33	0	267	83	52	17	0	152	787
05:30 PM	13	261	10	0	284	4	59	36	0	99	28	197	30	0	255	80	74	12	0	166	804
Total Volume	48	995	40	0	1083	30	212	152	0	394	78	830	130	0	1038	303	226	61	0	590	3105
% App. Total	4.4	91.9	3.7	0		7.6	53.8	38.6	0		7.5	80	12.5	0		51.4	38.3	10.3	0		
PHF	.750	.953	.714	.000	.953	.833	.898	.826	.000	.947	.696	.961	.833	.000	.972	.913	.764	.726	.000	.889	.965

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Groups Printed- Heavy Vehicles

	Columbus Avenue (Route 28) From North				Centre Street From East				Columbus Avenue (Route 28) From South				Heath Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	7	0	0	0	3	1	0	2	9	0	0	4	1	1	0	28
04:15 PM	1	5	1	0	0	3	2	0	3	4	3	0	3	2	1	0	28
04:30 PM	0	3	0	0	0	3	2	0	3	8	2	0	6	2	1	0	30
04:45 PM	0	4	1	0	0	3	1	0	6	7	4	0	3	3	0	0	32
Total	1	19	2	0	0	12	6	0	14	28	9	0	16	8	3	0	118
05:00 PM	0	4	0	0	0	2	2	0	1	9	3	0	3	3	3	0	30
05:15 PM	0	4	0	0	1	2	0	0	3	13	1	0	3	2	0	0	29
05:30 PM	0	4	0	0	0	4	2	0	2	7	3	0	2	2	1	0	27
05:45 PM	1	8	0	0	0	2	2	0	3	2	1	0	3	4	0	0	26
Total	1	20	0	0	1	10	6	0	9	31	8	0	11	11	4	0	112
Grand Total	2	39	2	0	1	22	12	0	23	59	17	0	27	19	7	0	230
Apprch %	4.7	90.7	4.7	0	2.9	62.9	34.3	0	23.2	59.6	17.2	0	50.9	35.8	13.2	0	
Total %	0.9	17	0.9	0	0.4	9.6	5.2	0	10	25.7	7.4	0	11.7	8.3	3	0	

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	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	3	0	0	3	0	3	2	0	5	3	8	2	0	13	6	2	1	0	9	30
04:45 PM	0	4	1	0	5	0	3	1	0	4	6	7	4	0	17	3	3	0	0	6	32
05:00 PM	0	4	0	0	4	0	2	2	0	4	1	9	3	0	13	3	3	3	0	9	30
05:15 PM	0	4	0	0	4	1	2	0	0	3	3	13	1	0	17	3	2	0	0	5	29
Total Volume	0	15	1	0	16	1	10	5	0	16	13	37	10	0	60	15	10	4	0	29	121
% App. Total	0	93.8	6.2	0		6.2	62.5	31.2	0		21.7	61.7	16.7	0		51.7	34.5	13.8	0		
PHF	.000	.938	.250	.000	.800	.250	.833	.625	.000	.800	.542	.712	.625	.000	.882	.625	.833	.333	.000	.806	.945

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Groups Printed- Peds and Bikes

	Columbus Avenue (Route 28) From North					Centre Street From East					Columbus Avenue (Route 28) From South					Heath Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	1	1	5	0	0	0	2	2	0	0	0	0	4	6	0	0	0	7	27	55
04:15 PM	0	0	0	1	2	0	0	0	2	1	0	0	0	2	2	0	0	0	7	38	55
04:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	0	0	0	13	45	63
04:45 PM	0	0	0	3	3	0	3	0	1	0	0	0	0	2	1	0	0	0	12	46	71
Total	0	1	1	9	5	0	4	2	5	1	0	0	0	9	12	0	0	0	39	156	244
05:00 PM	0	0	0	0	1	0	0	0	0	1	0	0	0	15	2	0	0	0	7	15	41
05:15 PM	0	0	0	1	0	0	0	0	1	3	0	0	0	6	4	0	0	0	3	7	25
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	2	4	0	0	0	2	9	18
05:45 PM	0	0	0	5	0	0	0	0	3	2	0	0	0	1	1	0	0	0	6	7	25
Total	0	0	0	6	1	0	0	0	5	6	0	0	0	24	11	0	0	0	18	38	109
Grand Total	0	1	1	15	6	0	4	2	10	7	0	0	0	33	23	0	0	0	57	194	353
Apprch %	0	4.3	4.3	65.2	26.1	0	17.4	8.7	43.5	30.4	0	0	0	58.9	41.1	0	0	0	22.7	77.3	
Total %	0	0.3	0.3	4.2	1.7	0	1.1	0.6	2.8	2	0	0	0	9.3	6.5	0	0	0	16.1	55	

	Columbus Avenue (Route 28) From North						Centre Street From East						Columbus Avenue (Route 28) From South						Heath Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	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	1	1	5	0	7	0	0	2	2	0	4	0	0	0	4	6	10	0	0	0	7	27	34	55
04:15 PM	0	0	0	1	2	3	0	0	0	2	1	3	0	0	0	2	2	4	0	0	0	7	38	45	55
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	3	4	0	0	0	13	45	58	63
04:45 PM	0	0	0	3	3	6	0	3	0	1	0	4	0	0	0	2	1	3	0	0	0	12	46	58	71
Total Volume	0	1	1	9	5	16	0	4	2	5	1	12	0	0	0	9	12	21	0	0	0	39	156	195	244
% App. Total	0	6.2	6.2	56.2	31.2		0	33.3	16.7	41.7	8.3		0	0	0	42.9	57.1		0	0	0	20	80		
PHF	.000	.250	.250	.450	.417	.571	.000	.333	.250	.625	.250	.750	.000	.000	.000	.563	.500	.525	.000	.000	.000	.750	.848	.841	.859

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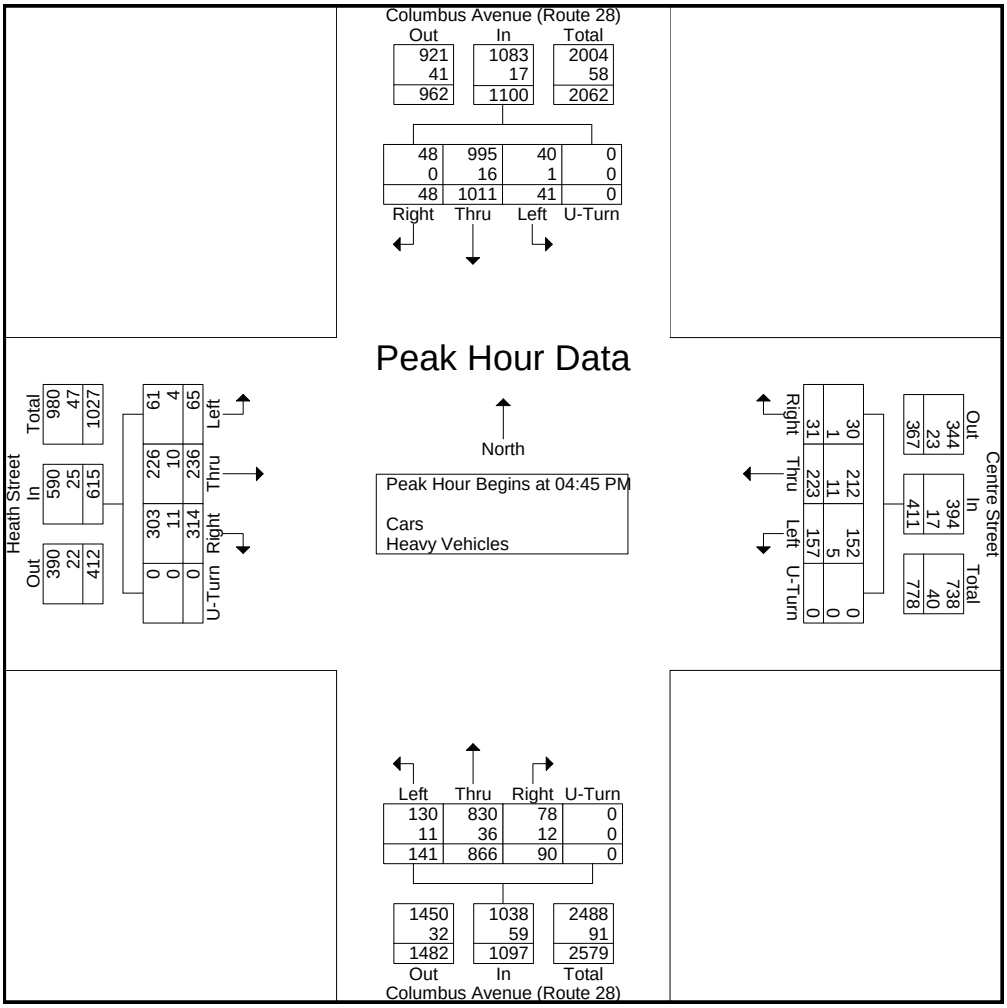
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	16	254	15	0	285	9	52	47	0	108	23	215	43	0	281	73	50	11	0	134	808
05:00 PM	9	227	7	0	243	9	52	46	0	107	16	218	31	0	265	73	56	24	0	153	768
05:15 PM	10	265	9	0	284	9	56	26	0	91	21	229	34	0	284	86	54	17	0	157	816
05:30 PM	13	265	10	0	288	4	63	38	0	105	30	204	33	0	267	82	76	13	0	171	831
Total Volume	48	1011	41	0	1100	31	223	157	0	411	90	866	141	0	1097	314	236	65	0	615	3223
% App. Total	4.4	91.9	3.7	0		7.5	54.3	38.2	0		8.2	78.9	12.9	0		51.1	38.4	10.6	0		
PHF	.750	.954	.683	.000	.955	.861	.885	.835	.000	.951	.750	.945	.820	.000	.966	.913	.776	.677	.000	.899	.970
Cars	48	995	40	0	1083	30	212	152	0	394	78	830	130	0	1038	303	226	61	0	590	3105
% Cars	100	98.4	97.6	0	98.5	96.8	95.1	96.8	0	95.9	86.7	95.8	92.2	0	94.6	96.5	95.8	93.8	0	95.9	96.3
Heavy Vehicles	0	16	1	0	17	1	11	5	0	17	12	36	11	0	59	11	10	4	0	25	118
% Heavy Vehicles	0	1.6	2.4	0	1.5	3.2	4.9	3.2	0	4.1	13.3	4.2	7.8	0	5.4	3.5	4.2	6.2	0	4.1	3.7



S: Bromley Street
E/W: New Heath Street
City, State: Boston, MA
Client: VHB/ R. White

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File Name : 154599 D
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Groups Printed- Cars - Heavy Vehicles

	New Heath Street From East			Bromley Street From South			New Heath Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	42	1	0	9	3	0	1	82	0	138
07:15 AM	36	2	0	10	1	0	1	96	0	146
07:30 AM	31	0	0	7	2	0	0	76	1	117
07:45 AM	32	5	0	11	3	0	0	100	0	151
Total	141	8	0	37	9	0	2	354	1	552
08:00 AM	35	4	0	10	5	0	0	88	5	147
08:15 AM	40	4	0	16	1	0	1	114	1	177
08:30 AM	30	3	0	10	5	0	1	107	3	159
08:45 AM	27	0	0	9	4	0	0	98	0	138
Total	132	11	0	45	15	0	2	407	9	621
Grand Total	273	19	0	82	24	0	4	761	10	1173
Apprch %	93.5	6.5	0	77.4	22.6	0	0.5	98.2	1.3	
Total %	23.3	1.6	0	7	2	0	0.3	64.9	0.9	
Cars	264	19	0	80	22	0	3	750	4	1142
% Cars	96.7	100	0	97.6	91.7	0	75	98.6	40	97.4
Heavy Vehicles	9	0	0	2	2	0	1	11	6	31
% Heavy Vehicles	3.3	0	0	2.4	8.3	0	25	1.4	60	2.6

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	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	32	5	0	37	11	3	0	14	0	100	0	100	151
08:00 AM	35	4	0	39	10	5	0	15	0	88	5	93	147
08:15 AM	40	4	0	44	16	1	0	17	1	114	1	116	177
08:30 AM	30	3	0	33	10	5	0	15	1	107	3	111	159
Total Volume	137	16	0	153	47	14	0	61	2	409	9	420	634
% App. Total	89.5	10.5	0		77	23	0		0.5	97.4	2.1		
PHF	.856	.800	.000	.869	.734	.700	.000	.897	.500	.897	.450	.905	.895
Cars	133	16	0	149	46	13	0	59	2	402	4	408	616
% Cars	97.1	100	0	97.4	97.9	92.9	0	96.7	100	98.3	44.4	97.1	97.2
Heavy Vehicles	4	0	0	4	1	1	0	2	0	7	5	12	18
% Heavy Vehicles	2.9	0	0	2.6	2.1	7.1	0	3.3	0	1.7	55.6	2.9	2.8

S: Bromley Street
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Page No : 1

Groups Printed- Cars

	New Heath Street From East			Bromley Street From South			New Heath Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	39	1	0	9	3	0	1	82	0	135
07:15 AM	35	2	0	10	1	0	0	95	0	143
07:30 AM	30	0	0	6	2	0	0	73	0	111
07:45 AM	32	5	0	11	3	0	0	99	0	150
Total	136	8	0	36	9	0	1	349	0	539
08:00 AM	33	4	0	9	5	0	0	86	3	140
08:15 AM	38	4	0	16	1	0	1	111	0	171
08:30 AM	30	3	0	10	4	0	1	106	1	155
08:45 AM	27	0	0	9	3	0	0	98	0	137
Total	128	11	0	44	13	0	2	401	4	603
Grand Total	264	19	0	80	22	0	3	750	4	1142
Apprch %	93.3	6.7	0	78.4	21.6	0	0.4	99.1	0.5	
Total %	23.1	1.7	0	7	1.9	0	0.3	65.7	0.4	

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	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	32	5	0	37	11	3	0	14	0	99	0	99	150
08:00 AM	33	4	0	37	9	5	0	14	0	86	3	89	140
08:15 AM	38	4	0	42	16	1	0	17	1	111	0	112	171
08:30 AM	30	3	0	33	10	4	0	14	1	106	1	108	155
Total Volume	133	16	0	149	46	13	0	59	2	402	4	408	616
% App. Total	89.3	10.7	0		78	22	0		0.5	98.5	1		
PHF	.875	.800	.000	.887	.719	.650	.000	.868	.500	.905	.333	.911	.901

S: Bromley Street
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Groups Printed- Heavy Vehicles

	New Heath Street From East			Bromley Street From South			New Heath Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	3	0	0	0	0	0	0	0	0	3
07:15 AM	1	0	0	0	0	0	1	1	0	3
07:30 AM	1	0	0	1	0	0	0	3	1	6
07:45 AM	0	0	0	0	0	0	0	1	0	1
Total	5	0	0	1	0	0	1	5	1	13
08:00 AM	2	0	0	1	0	0	0	2	2	7
08:15 AM	2	0	0	0	0	0	0	3	1	6
08:30 AM	0	0	0	0	1	0	0	1	2	4
08:45 AM	0	0	0	0	1	0	0	0	0	1
Total	4	0	0	1	2	0	0	6	5	18
Grand Total	9	0	0	2	2	0	1	11	6	31
Apprch %	100	0	0	50	50	0	5.6	61.1	33.3	
Total %	29	0	0	6.5	6.5	0	3.2	35.5	19.4	

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	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 07:30 AM													
07:30 AM	1	0	0	1	1	0	0	1	0	3	1	4	6
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
08:00 AM	2	0	0	2	1	0	0	1	0	2	2	4	7
08:15 AM	2	0	0	2	0	0	0	0	0	3	1	4	6
Total Volume	5	0	0	5	2	0	0	2	0	9	4	13	20
% App. Total	100	0	0		100	0	0		0	69.2	30.8		
PHF	.625	.000	.000	.625	.500	.000	.000	.500	.000	.750	.500	.813	.714

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Groups Printed- Peds and Bikes

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	Peds SB	Peds NB	Right	Left	Peds WB	Peds EB	Right	Thru	Peds NB	Peds SB	Int. Total
07:00 AM	0	1	0	0	0	0	0	1	0	1	0	1	4
07:15 AM	0	0	0	0	0	0	1	0	0	4	0	0	5
07:30 AM	0	0	0	0	2	0	0	2	0	7	0	0	11
07:45 AM	0	0	0	0	0	0	0	0	0	3	1	0	4
Total	0	1	0	0	2	0	1	3	0	15	1	1	24
08:00 AM	0	0	0	0	0	0	0	1	0	4	0	0	5
08:15 AM	0	0	0	0	0	0	2	0	0	11	0	1	14
08:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	4
08:45 AM	1	0	0	0	4	0	1	1	0	6	1	0	14
Total	1	0	0	0	4	0	3	2	0	25	1	1	37
Grand Total	1	1	0	0	6	0	4	5	0	40	2	2	61
Apprch %	50	50	0	0	40	0	26.7	33.3	0	90.9	4.5	4.5	
Total %	1.6	1.6	0	0	9.8	0	6.6	8.2	0	65.6	3.3	3.3	

	New Heath Street From East					Bromley Street From South					New Heath Street From West					
Start Time	Thru	Left	Peds SB	Peds NB	App. Total	Right	Left	Peds WB	Peds EB	App. Total	Right	Thru	Peds NB	Peds SB	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	0	0	0	0	0	0	0	1	1	0	4	0	0	4	5
08:15 AM	0	0	0	0	0	0	0	2	0	2	0	11	0	1	12	14
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
08:45 AM	1	0	0	0	1	4	0	1	1	6	0	6	1	0	7	14
Total Volume	1	0	0	0	1	4	0	3	2	9	0	25	1	1	27	37
% App. Total	100	0	0	0		44.4	0	33.3	22.2		0	92.6	3.7	3.7		
PHF	.250	.000	.000	.000	.250	.250	.000	.375	.500	.375	.000	.568	.250	.250	.563	.661

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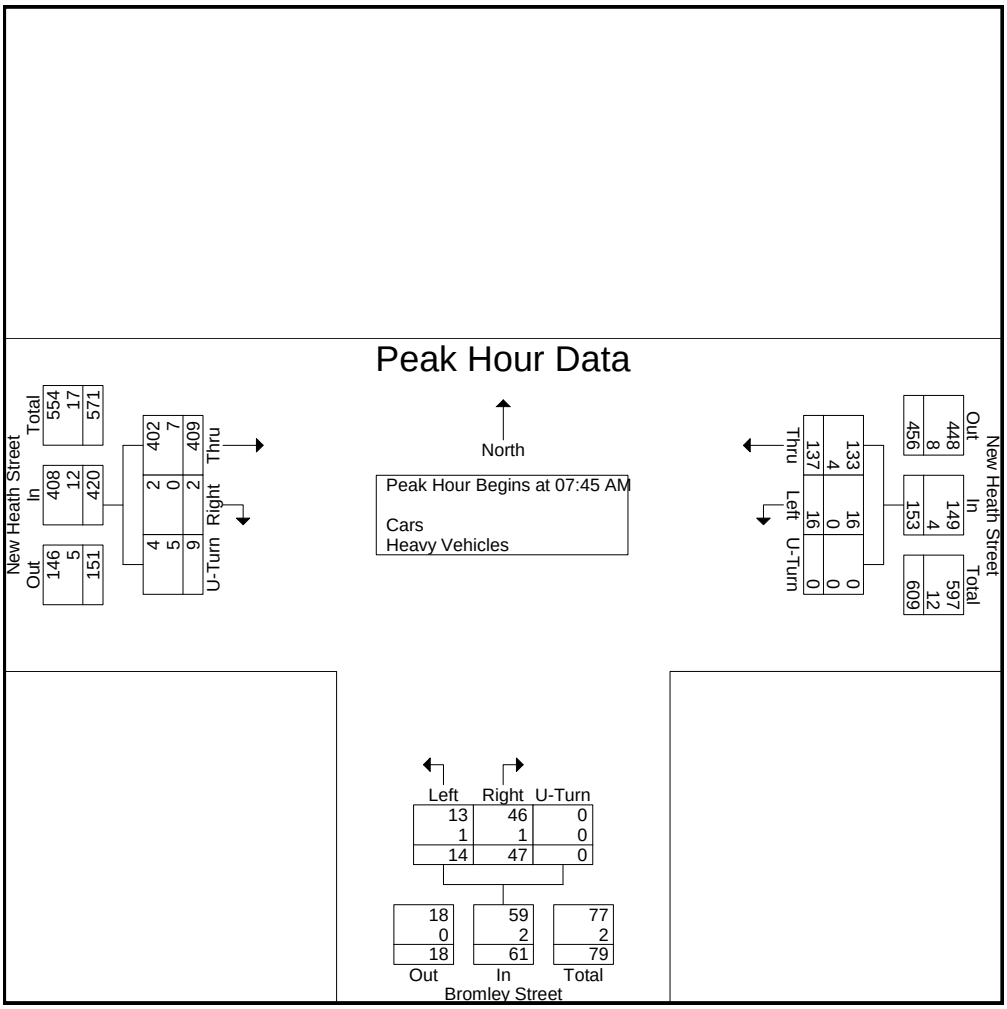
	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	32	5	0	37	11	3	0	14	0	100	0	100	151
08:00 AM	35	4	0	39	10	5	0	15	0	88	5	93	147
08:15 AM	40	4	0	44	16	1	0	17	1	114	1	116	177
08:30 AM	30	3	0	33	10	5	0	15	1	107	3	111	159
Total Volume	137	16	0	153	47	14	0	61	2	409	9	420	634
% App. Total	89.5	10.5	0		77	23	0		0.5	97.4	2.1		
PHF	.856	.800	.000	.869	.734	.700	.000	.897	.500	.897	.450	.905	.895
Cars	133	16	0	149	46	13	0	59	2	402	4	408	616
% Cars	97.1	100	0	97.4	97.9	92.9	0	96.7	100	98.3	44.4	97.1	97.2
Heavy Vehicles	4	0	0	4	1	1	0	2	0	7	5	12	18
% Heavy Vehicles	2.9	0	0	2.6	2.1	7.1	0	3.3	0	1.7	55.6	2.9	2.8



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Site Code : 13208.00
Start Date : 9/15/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	New Heath Street From East			Bromley Street From South			New Heath Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	37	3	0	1	3	0	4	85	1	134
04:15 PM	48	4	0	7	1	0	5	106	2	173
04:30 PM	37	3	0	5	3	0	0	73	2	123
04:45 PM	36	2	0	13	2	0	2	69	1	125
Total	158	12	0	26	9	0	11	333	6	555
05:00 PM	44	2	0	7	0	0	1	87	1	142
05:15 PM	39	5	0	1	3	0	4	83	2	137
05:30 PM	47	2	0	7	0	0	3	75	2	136
05:45 PM	38	1	0	7	0	0	1	76	1	124
Total	168	10	0	22	3	0	9	321	6	539
Grand Total	326	22	0	48	12	0	20	654	12	1094
Apprch %	93.7	6.3	0	80	20	0	2.9	95.3	1.7	
Total %	29.8	2	0	4.4	1.1	0	1.8	59.8	1.1	
Cars	324	20	0	48	12	0	20	635	0	1059
% Cars	99.4	90.9	0	100	100	0	100	97.1	0	96.8
Heavy Vehicles	2	2	0	0	0	0	0	19	12	35
% Heavy Vehicles	0.6	9.1	0	0	0	0	0	2.9	100	3.2

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	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 04:15 PM													
04:15 PM	48	4	0	52	7	1	0	8	5	106	2	113	173
04:30 PM	37	3	0	40	5	3	0	8	0	73	2	75	123
04:45 PM	36	2	0	38	13	2	0	15	2	69	1	72	125
05:00 PM	44	2	0	46	7	0	0	7	1	87	1	89	142
Total Volume	165	11	0	176	32	6	0	38	8	335	6	349	563
% App. Total	93.8	6.2	0		84.2	15.8	0		2.3	96	1.7		
PHF	.859	.688	.000	.846	.615	.500	.000	.633	.400	.790	.750	.772	.814
Cars	164	11	0	175	32	6	0	38	8	325	0	333	546
% Cars	99.4	100	0	99.4	100	100	0	100	100	97.0	0	95.4	97.0
Heavy Vehicles	1	0	0	1	0	0	0	0	0	10	6	16	17
% Heavy Vehicles	0.6	0	0	0.6	0	0	0	0	0	3.0	100	4.6	3.0

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Site Code : 13208.00
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Page No : 1

Groups Printed- Cars

	New Heath Street From East			Bromley Street From South			New Heath Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	37	2	0	1	3	0	4	83	0	130
04:15 PM	47	4	0	7	1	0	5	101	0	165
04:30 PM	37	3	0	5	3	0	0	73	0	121
04:45 PM	36	2	0	13	2	0	2	66	0	121
Total	157	11	0	26	9	0	11	323	0	537
05:00 PM	44	2	0	7	0	0	1	85	0	139
05:15 PM	39	4	0	1	3	0	4	79	0	130
05:30 PM	46	2	0	7	0	0	3	74	0	132
05:45 PM	38	1	0	7	0	0	1	74	0	121
Total	167	9	0	22	3	0	9	312	0	522
Grand Total	324	20	0	48	12	0	20	635	0	1059
Apprch %	94.2	5.8	0	80	20	0	3.1	96.9	0	
Total %	30.6	1.9	0	4.5	1.1	0	1.9	60	0	

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	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 04:15 PM													
04:15 PM	47	4	0	51	7	1	0	8	5	101	0	106	165
04:30 PM	37	3	0	40	5	3	0	8	0	73	0	73	121
04:45 PM	36	2	0	38	13	2	0	15	2	66	0	68	121
05:00 PM	44	2	0	46	7	0	0	7	1	85	0	86	139
Total Volume	164	11	0	175	32	6	0	38	8	325	0	333	546
% App. Total	93.7	6.3	0		84.2	15.8	0		2.4	97.6	0		
PHF	.872	.688	.000	.858	.615	.500	.000	.633	.400	.804	.000	.785	.827

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Groups Printed- Heavy Vehicles

	New Heath Street From East			Bromley Street From South			New Heath Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	0	1	0	0	0	0	0	2	1	4
04:15 PM	1	0	0	0	0	0	0	5	2	8
04:30 PM	0	0	0	0	0	0	0	0	2	2
04:45 PM	0	0	0	0	0	0	0	3	1	4
Total	1	1	0	0	0	0	0	10	6	18
05:00 PM	0	0	0	0	0	0	0	2	1	3
05:15 PM	0	1	0	0	0	0	0	4	2	7
05:30 PM	1	0	0	0	0	0	0	1	2	4
05:45 PM	0	0	0	0	0	0	0	2	1	3
Total	1	1	0	0	0	0	0	9	6	17
Grand Total	2	2	0	0	0	0	0	19	12	35
Apprch %	50	50	0	0	0	0	0	61.3	38.7	
Total %	5.7	5.7	0	0	0	0	0	54.3	34.3	

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	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	1	0	1	0	0	0	0	0	2	1	3	4
04:15 PM	1	0	0	1	0	0	0	0	0	5	2	7	8
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	2	2
04:45 PM	0	0	0	0	0	0	0	0	0	3	1	4	4
Total Volume	1	1	0	2	0	0	0	0	0	10	6	16	18
% App. Total	50	50	0		0	0	0		0	62.5	37.5		
PHF	.250	.250	.000	.500	.000	.000	.000	.000	.000	.500	.750	.571	.563

S: Bromley Street
E/W: New Heath Street
City, State: Boston, MA
Client: VHB/ R. White

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 154599 DD
Site Code : 13208.00
Start Date : 9/15/2015
Page No : 1

Groups Printed- Peds and Bikes

	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	Peds SB	Peds NB	Right	Left	Peds WB	Peds EB	Right	Thru	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	1	0	1	0	0	2	0	2	6
04:15 PM	1	0	0	0	0	0	0	1	0	1	0	5	8
04:30 PM	4	1	0	1	0	0	1	0	0	2	0	3	12
04:45 PM	3	0	0	0	0	0	0	0	0	2	0	0	5
Total	8	1	0	1	1	0	2	1	0	7	0	10	31
05:00 PM	3	1	0	1	0	0	2	1	0	0	0	0	8
05:15 PM	3	0	0	0	0	0	0	0	0	2	0	1	6
05:30 PM	4	2	0	0	0	0	0	1	0	3	0	2	12
05:45 PM	6	0	1	0	0	0	1	0	0	1	0	0	9
Total	16	3	1	1	0	0	3	2	0	6	0	3	35
Grand Total	24	4	1	2	1	0	5	3	0	13	0	13	66
Apprch %	77.4	12.9	3.2	6.5	11.1	0	55.6	33.3	0	50	0	50	
Total %	36.4	6.1	1.5	3	1.5	0	7.6	4.5	0	19.7	0	19.7	

	New Heath Street From East					Bromley Street From South					New Heath Street From West					
Start Time	Thru	Left	Peds SB	Peds NB	App. Total	Right	Left	Peds WB	Peds EB	App. Total	Right	Thru	Peds NB	Peds SB	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	3	1	0	1	5	0	0	2	1	3	0	0	0	0	0	8
05:15 PM	3	0	0	0	3	0	0	0	0	0	0	2	0	1	3	6
05:30 PM	4	2	0	0	6	0	0	0	1	1	0	3	0	2	5	12
05:45 PM	6	0	1	0	7	0	0	1	0	1	0	1	0	0	1	9
Total Volume	16	3	1	1	21	0	0	3	2	5	0	6	0	3	9	35
% App. Total	76.2	14.3	4.8	4.8		0	0	60	40		0	66.7	0	33.3		
PHF	.667	.375	.250	.250	.750	.000	.000	.375	.500	.417	.000	.500	.000	.375	.450	.729

S: Bromley Street
E/W: New Heath Street
City, State: Boston, MA
Client: VHB/ R. White

PRECISION DATA INDUSTRIES, LLC
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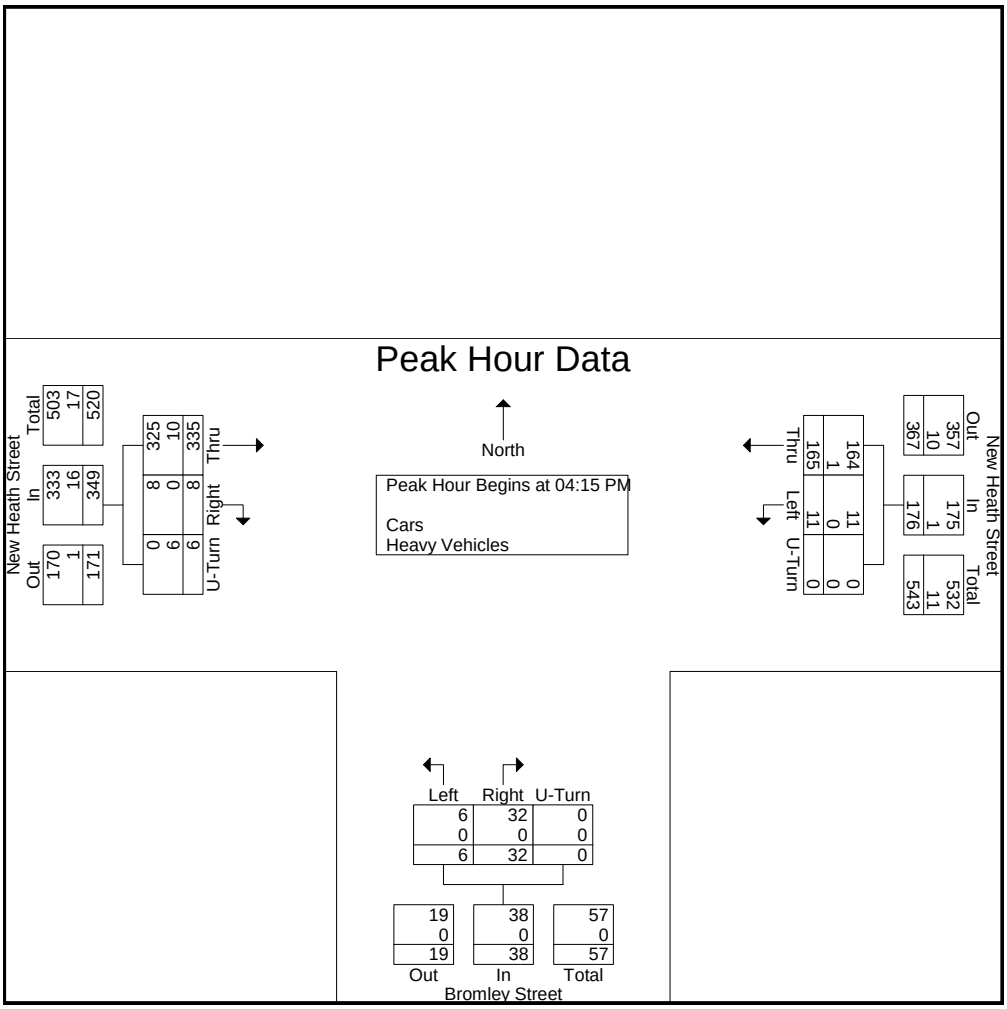
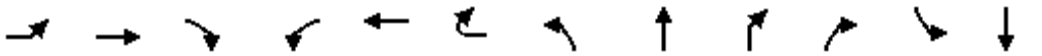
	New Heath Street From East				Bromley Street From South				New Heath Street From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	48	4	0	52	7	1	0	8	5	106	2	113	173
04:30 PM	37	3	0	40	5	3	0	8	0	73	2	75	123
04:45 PM	36	2	0	38	13	2	0	15	2	69	1	72	125
05:00 PM	44	2	0	46	7	0	0	7	1	87	1	89	142
Total Volume	165	11	0	176	32	6	0	38	8	335	6	349	563
% App. Total	93.8	6.2	0		84.2	15.8	0		2.3	96	1.7		
PHF	.859	.688	.000	.846	.615	.500	.000	.633	.400	.790	.750	.772	.814
Cars	164	11	0	175	32	6	0	38	8	325	0	333	546
% Cars	99.4	100	0	99.4	100	100	0	100	100	97.0	0	95.4	97.0
Heavy Vehicles	1	0	0	1	0	0	0	0	0	10	6	16	17
% Heavy Vehicles	0.6	0	0	0.6	0	0	0	0	0	3.0	100	4.6	3.0



Synchro Level of Service (LOS)

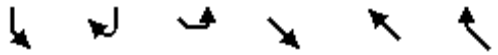


Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Right Turn Channelized						Yes						
Volume (veh/h)	60	265	310	10	80	45	355	0	180	5	15	30
Peak Hour Factor	0.91	0.91	0.91	0.39	0.39	0.39	0.88	0.88	0.88	0.88	0.44	0.44
Hourly flow rate (vph)	66	291	341	26	205	115	403	0	205	6	34	68
Approach Volume (veh/h)		698			231			614				114
Crossing Volume (veh/h)		534			674			456				1163
High Capacity (veh/h)		909			812			966				544
High v/c (veh/h)		0.77			0.28			0.63				0.21
Low Capacity (veh/h)		732			647			784				416
Low v/c (veh/h)		0.95			0.36			0.78				0.27

Intersection Summary					
Maximum v/c High		0.77			
Maximum v/c Low		0.95			
Intersection Capacity Utilization		128.9%	ICU Level of Service		H

Movement	SBR	SWL2	SWL	SWR
Right Turn Channelized				
Volume (veh/h)	5	45	235	85
Peak Hour Factor	0.44	0.69	0.69	0.69
Hourly flow rate (vph)	11	65	341	123
Approach Volume (veh/h)			529	
Crossing Volume (veh/h)			634	
High Capacity (veh/h)			838	
High v/c (veh/h)			0.63	
Low Capacity (veh/h)			670	
Low v/c (veh/h)			0.79	

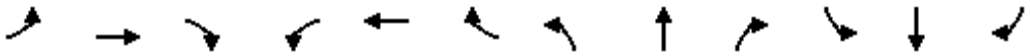
Intersection Summary



Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	10	0	40	545	540	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.97	0.97	0.90	0.90
Hourly flow rate (vph)	17	0	41	562	600	11
Pedestrians	12			12	16	
Lane Width (ft)	10.0			16.0	11.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					443	
pX, platoon unblocked	0.77	0.77	0.77			
vC, conflicting volume	1278	630	623			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1212	372	363			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	88	100	95			
cM capacity (veh/h)	141	499	882			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	17	603	611
Volume Left	17	41	0
Volume Right	0	0	11
cSH	141	882	1700
Volume to Capacity	0.12	0.05	0.36
Queue Length 95th (ft)	10	4	0
Control Delay (s)	34.0	1.2	0.0
Lane LOS	D	A	
Approach Delay (s)	34.0	1.2	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	195	240	70	310	30	175	1305	100	10	560	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	10	12	10
Total Lost time (s)	6.0	6.0		6.0	6.0		2.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	0.99			0.94	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.93	1.00			1.00	
Frt	1.00	0.92		1.00	0.99		1.00	0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1686	1589		1736	1819		1343	3042			4023	
Flt Permitted	0.30	1.00		0.19	1.00		0.36	1.00			0.90	
Satd. Flow (perm)	535	1589		343	1819		513	3042			3642	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	126	205	253	77	341	33	190	1418	109	10	577	67
RTOR Reduction (vph)	0	0	0	0	3	0	0	5	0	0	0	0
Lane Group Flow (vph)	126	458	0	77	371	0	190	1522	0	0	654	0
Confl. Peds. (#/hr)	3		23	23		3	289		19	19		289
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	5%	5%	5%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	6	0	0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)	36.2	36.2		36.2	36.2		70.8	72.8			58.8	
Effective Green, g (s)	36.2	36.2		36.2	36.2		70.8	70.8			58.8	
Actuated g/C Ratio	0.30	0.30		0.30	0.30		0.59	0.59			0.49	
Clearance Time (s)	6.0	6.0		6.0	6.0		2.0				5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0				2.0	
Lane Grp Cap (vph)	161	479		103	548		385	1794			1784	
v/s Ratio Prot		c0.29			0.20		0.05	c0.50				
v/s Ratio Perm	0.24			0.22			0.24				0.18	
v/c Ratio	0.78	0.96		0.75	0.68		0.49	0.85			0.37	
Uniform Delay, d1	38.3	41.1		37.8	36.8		11.9	20.2			19.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	20.0	29.7		22.5	2.6		4.5	5.2			0.6	
Delay (s)	58.3	70.9		60.2	39.4		16.3	25.4			19.6	
Level of Service	E	E		E	D		B	C			B	
Approach Delay (s)		68.2			43.0			24.4			19.6	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	112.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	330	0	10	125	10	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.82	0.82
Hourly flow rate (vph)	359	0	11	134	12	49
Pedestrians	5			4	5	
Lane Width (ft)	16.0			16.0	10.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			364		525	368
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			364		525	368
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	93
cM capacity (veh/h)			1185		501	668

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	359	145	61
Volume Left	0	11	12
Volume Right	0	0	49
cSH	1700	1185	626
Volume to Capacity	0.21	0.01	0.10
Queue Length 95th (ft)	0	1	8
Control Delay (s)	0.0	0.7	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	11.4
Approach LOS			B

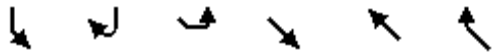
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Right Turn Channelized						Yes						
Volume (veh/h)	10	230	285	5	130	50	295	0	90	15	10	20
Peak Hour Factor	0.84	0.84	0.84	0.64	0.64	0.64	0.97	0.97	0.97	0.97	0.65	0.65
Hourly flow rate (vph)	12	274	339	8	203	78	304	0	93	15	15	31
Approach Volume (veh/h)		625			211			412				46
Crossing Volume (veh/h)		445			409			359				1009
High Capacity (veh/h)		975			1004			1045				618
High v/c (veh/h)		0.64			0.21			0.39				0.07
Low Capacity (veh/h)		792			817			854				479
Low v/c (veh/h)		0.79			0.26			0.48				0.10

Intersection Summary					
Maximum v/c High		0.64			
Maximum v/c Low		0.79			
Intersection Capacity Utilization		109.7%	ICU Level of Service		H

Movement	SWL2	SWL	SWR
Right Turn Channelized			
Volume (veh/h)	50	290	90
Peak Hour Factor	0.87	0.87	0.87
Hourly flow rate (vph)	57	333	103
Approach Volume (veh/h)		494	
Crossing Volume (veh/h)		515	
High Capacity (veh/h)		922	
High v/c (veh/h)		0.54	
Low Capacity (veh/h)		745	
Low v/c (veh/h)		0.66	

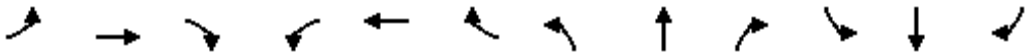
Intersection Summary



Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	20	5	10	590	395	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.90	0.90	0.93	0.93
Hourly flow rate (vph)	34	9	11	656	425	16
Pedestrians	24			22	24	
Lane Width (ft)	10.0			16.0	11.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	2			2	2	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					443	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1159	479	465			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1135	410	395			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	98	99			
cM capacity (veh/h)	197	571	1062			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	43	667	441
Volume Left	34	11	0
Volume Right	9	0	16
cSH	227	1062	1700
Volume to Capacity	0.19	0.01	0.26
Queue Length 95th (ft)	17	1	0
Control Delay (s)	24.5	0.3	0.0
Lane LOS	C	A	
Approach Delay (s)	24.5	0.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		



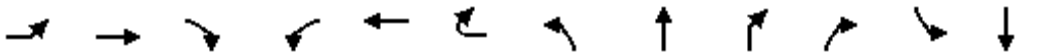
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	310	240	65	150	230	30	125	865	95	35	1010	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	10	12	10
Total Lost time (s)	5.0	5.0			5.0		2.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.99			1.00		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00			1.00	
Frt	1.00	0.97			0.99		1.00	0.99			0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	
Satd. Flow (prot)	1764	1779			1792		1516	3023			4487	
Flt Permitted	0.47	1.00			0.58		0.95	1.00			0.82	
Satd. Flow (perm)	865	1779			1058		1516	3023			3685	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	337	261	71	158	242	32	130	901	99	36	1052	57
RTOR Reduction (vph)	0	0	0	0	2	0	0	7	0	0	0	0
Lane Group Flow (vph)	337	332	0	0	430	0	130	993	0	0	1145	0
Confl. Peds. (#/hr)	7		35	35		7			11	11		56
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	4%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	6	6	0	0	0
Turn Type	Perm	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2			2			3			1		
Actuated Green, G (s)	49.6	49.6			49.6		12.0	60.4			46.4	
Effective Green, g (s)	49.6	49.6			49.6		12.0	58.4			46.4	
Actuated g/C Ratio	0.41	0.41			0.41		0.10	0.49			0.39	
Clearance Time (s)	5.0	5.0			5.0		2.0				5.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0				2.0	
Lane Grp Cap (vph)	357	735			437		151	1471			1424	
v/s Ratio Prot		0.19					c0.09	0.33				
v/s Ratio Perm	0.39				c0.41						c0.31	
v/c Ratio	0.94	0.45			0.98		0.86	0.67			0.80	
Uniform Delay, d1	33.9	25.4			34.8		53.2	23.5			32.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	32.9	0.2			38.3		43.5	2.5			4.9	
Delay (s)	66.7	25.6			73.1		96.7	26.0			37.7	
Level of Service	E	C			E		F	C			D	
Approach Delay (s)		46.3			73.1			34.2			37.7	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	115.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	290	15	10	180	5	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.89	0.89
Hourly flow rate (vph)	309	16	11	198	6	22
Pedestrians	13			7	13	
Lane Width (ft)	16.0			16.0	10.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			337		562	336
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			337		562	336
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	97
cM capacity (veh/h)			1216		476	698

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	324	209	28
Volume Left	0	11	6
Volume Right	16	0	22
cSH	1700	1216	638
Volume to Capacity	0.19	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.5	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.9
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

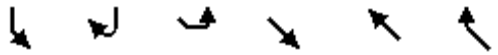


Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Right Turn Channelized						Yes						
Volume (veh/h)	62	272	318	10	82	46	364	0	185	5	15	31
Peak Hour Factor	0.91	0.91	0.91	0.39	0.39	0.39	0.88	0.88	0.88	0.88	0.44	0.44
Hourly flow rate (vph)	68	299	349	26	210	118	414	0	210	6	34	70
Approach Volume (veh/h)		716			236			630				116
Crossing Volume (veh/h)		546			692			468				1192
High Capacity (veh/h)		900			800			958				532
High v/c (veh/h)		0.80			0.29			0.66				0.22
Low Capacity (veh/h)		724			637			776				405
Low v/c (veh/h)		0.99			0.37			0.81				0.29

Intersection Summary				
Maximum v/c High		0.80		
Maximum v/c Low		0.99		
Intersection Capacity Utilization		131.6%	ICU Level of Service	H

Movement	SBR	SWL2	SWL	SWR
Right Turn Channelized				
Volume (veh/h)	5	46	241	87
Peak Hour Factor	0.44	0.69	0.69	0.69
Hourly flow rate (vph)	11	67	349	126
Approach Volume (veh/h)			542	
Crossing Volume (veh/h)			650	
High Capacity (veh/h)			828	
High v/c (veh/h)			0.65	
Low Capacity (veh/h)			661	
Low v/c (veh/h)			0.82	

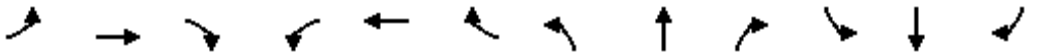
Intersection Summary



Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	10	0	41	559	554	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.97	0.97	0.90	0.90
Hourly flow rate (vph)	17	0	42	576	616	11
Pedestrians	12			12	16	
Lane Width (ft)	10.0			16.0	11.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					443	
pX, platoon unblocked	0.76	0.76	0.76			
vC, conflicting volume	1310	645	639			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1251	380	372			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	87	100	95			
cM capacity (veh/h)	132	488	866			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	17	619	627
Volume Left	17	42	0
Volume Right	0	0	11
cSH	132	866	1700
Volume to Capacity	0.13	0.05	0.37
Queue Length 95th (ft)	11	4	0
Control Delay (s)	36.3	1.3	0.0
Lane LOS	E	A	
Approach Delay (s)	36.3	1.3	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	123	200	246	72	318	31	179	1338	103	10	574	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	10	12	10
Total Lost time (s)	6.0	6.0		6.0	6.0		2.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	0.99			0.94	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.93	1.00			1.00	
Frt	1.00	0.92		1.00	0.99		1.00	0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1686	1590		1737	1818		1349	3042			4022	
Flt Permitted	0.29	1.00		0.18	1.00		0.35	1.00			0.89	
Satd. Flow (perm)	520	1590		324	1818		503	3042			3595	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	129	211	259	79	349	34	195	1454	112	10	592	69
RTOR Reduction (vph)	0	0	0	0	3	0	0	5	0	0	0	0
Lane Group Flow (vph)	129	470	0	79	380	0	195	1561	0	0	671	0
Confl. Peds. (#/hr)	3		23	23		3	289		19	19		289
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	5%	5%	5%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	6	0	0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)	36.6	36.6		36.6	36.6		70.4	72.4			58.4	
Effective Green, g (s)	36.6	36.6		36.6	36.6		70.4	70.4			58.4	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.59	0.59			0.49	
Clearance Time (s)	6.0	6.0		6.0	6.0		2.0				5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0				2.0	
Lane Grp Cap (vph)	158	484		98	554		379	1784			1749	
v/s Ratio Prot		c0.30			0.21		0.05	c0.51				
v/s Ratio Perm	0.25			0.24			0.25				0.19	
v/c Ratio	0.82	0.97		0.81	0.69		0.51	0.88			0.38	
Uniform Delay, d1	38.6	41.2		38.4	36.7		12.1	21.1			19.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	25.5	33.2		34.9	2.8		4.9	6.3			0.6	
Delay (s)	64.1	74.4		73.3	39.5		17.1	27.4			20.1	
Level of Service	E	E		E	D		B	C			C	
Approach Delay (s)		72.2			45.3			26.3			20.1	
Approach LOS		E			D			C			C	

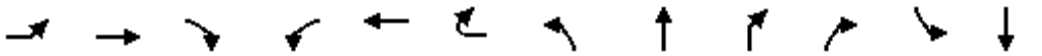
Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	114.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	338	0	10	128	10	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.82	0.82
Hourly flow rate (vph)	367	0	11	138	12	49
Pedestrians	5			4	5	
Lane Width (ft)	16.0			16.0	10.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			372		537	376
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			372		537	376
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	93
cM capacity (veh/h)			1177		493	660

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	367	148	61
Volume Left	0	11	12
Volume Right	0	0	49
cSH	1700	1177	618
Volume to Capacity	0.22	0.01	0.10
Queue Length 95th (ft)	0	1	8
Control Delay (s)	0.0	0.7	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	11.5
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

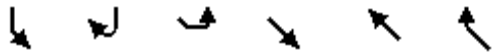


Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Right Turn Channelized						Yes						
Volume (veh/h)	10	236	292	5	133	51	302	0	92	15	10	21
Peak Hour Factor	0.84	0.84	0.84	0.64	0.64	0.64	0.97	0.97	0.97	0.97	0.65	0.65
Hourly flow rate (vph)	12	281	348	8	208	80	311	0	95	15	15	32
Approach Volume (veh/h)		640			216			422				48
Crossing Volume (veh/h)		456			418			367				1033
High Capacity (veh/h)		967			996			1038				606
High v/c (veh/h)		0.66			0.22			0.41				0.08
Low Capacity (veh/h)		784			811			848				469
Low v/c (veh/h)		0.82			0.27			0.50				0.10

Intersection Summary					
Maximum v/c High		0.66			
Maximum v/c Low		0.82			
Intersection Capacity Utilization		111.7%	ICU Level of Service		H

Movement	SWL2	SWL	SWR
Right Turn Channelized			
Volume (veh/h)	51	297	92
Peak Hour Factor	0.87	0.87	0.87
Hourly flow rate (vph)	59	341	106
Approach Volume (veh/h)		506	
Crossing Volume (veh/h)		527	
High Capacity (veh/h)		914	
High v/c (veh/h)		0.55	
Low Capacity (veh/h)		737	
Low v/c (veh/h)		0.69	

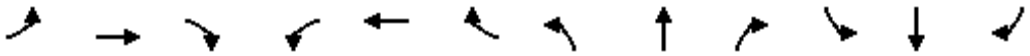
Intersection Summary



Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	21	5	10	605	405	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.90	0.90	0.93	0.93
Hourly flow rate (vph)	36	9	11	672	435	16
Pedestrians	24			22	24	
Lane Width (ft)	10.0			16.0	11.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	2			2	2	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					443	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1186	490	476			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1163	417	402			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	98	99			
cM capacity (veh/h)	189	563	1051			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	45	683	452
Volume Left	36	11	0
Volume Right	9	0	16
cSH	217	1051	1700
Volume to Capacity	0.21	0.01	0.27
Queue Length 95th (ft)	19	1	0
Control Delay (s)	25.9	0.3	0.0
Lane LOS	D	A	
Approach Delay (s)	25.9	0.3	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		



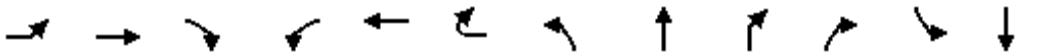
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	318	246	67	154	236	31	128	887	97	36	1010	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	10	12	10
Total Lost time (s)	5.0	5.0			5.0		2.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.99			1.00		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00			1.00	
Frt	1.00	0.97			0.99		1.00	0.99			0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	
Satd. Flow (prot)	1764	1779			1792		1516	3024			4486	
Flt Permitted	0.46	1.00			0.57		0.95	1.00			0.80	
Satd. Flow (perm)	858	1779			1046		1516	3024			3611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	346	267	73	162	248	33	133	924	101	38	1052	58
RTOR Reduction (vph)	0	0	0	0	2	0	0	7	0	0	0	0
Lane Group Flow (vph)	346	340	0	0	441	0	133	1018	0	0	1148	0
Confl. Peds. (#/hr)	7		35	35		7			11	11		56
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	4%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	6	6	0	0	0
Turn Type	Perm	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2			2			3			1		
Actuated Green, G (s)	50.0	50.0			50.0		12.0	60.0			46.0	
Effective Green, g (s)	50.0	50.0			50.0		12.0	58.0			46.0	
Actuated g/C Ratio	0.42	0.42			0.42		0.10	0.48			0.38	
Clearance Time (s)	5.0	5.0			5.0		2.0				5.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0				2.0	
Lane Grp Cap (vph)	357	741			435		151	1461			1384	
v/s Ratio Prot		0.19					c0.09	0.34				
v/s Ratio Perm	0.40				c0.42						c0.32	
v/c Ratio	0.97	0.46			1.01		0.88	0.70			0.83	
Uniform Delay, d1	34.2	25.2			35.0		53.3	24.1			33.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	38.8	0.2			46.5		47.0	2.8			5.9	
Delay (s)	73.0	25.4			81.5		100.3	26.9			39.3	
Level of Service	E	C			F		F	C			D	
Approach Delay (s)		49.4			81.5			35.3			39.3	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	116.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	297	15	10	185	5	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.89	0.89
Hourly flow rate (vph)	316	16	11	203	6	24
Pedestrians	13			7	13	
Lane Width (ft)	16.0			16.0	10.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			345		575	344
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			345		575	344
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	97
cM capacity (veh/h)			1209		467	692

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	332	214	29
Volume Left	0	11	6
Volume Right	16	0	24
cSH	1700	1209	633
Volume to Capacity	0.20	0.01	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.5	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.0
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

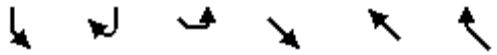


Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Right Turn Channelized						Yes						
Volume (veh/h)	62	273	318	10	85	46	364	0	185	5	15	31
Peak Hour Factor	0.91	0.91	0.91	0.39	0.39	0.39	0.88	0.88	0.88	0.88	0.44	0.44
Hourly flow rate (vph)	68	300	349	26	218	118	414	0	210	6	34	70
Approach Volume (veh/h)		718			244			630				116
Crossing Volume (veh/h)		546			692			469				1199
High Capacity (veh/h)		900			800			957				528
High v/c (veh/h)		0.80			0.30			0.66				0.22
Low Capacity (veh/h)		724			637			775				402
Low v/c (veh/h)		0.99			0.38			0.81				0.29

Intersection Summary					
Maximum v/c High		0.80			
Maximum v/c Low		0.99			
Intersection Capacity Utilization		131.8%	ICU Level of Service		H

Movement	SBR	SWL2	SWL	SWR
Right Turn Channelized				
Volume (veh/h)	5	46	241	87
Peak Hour Factor	0.44	0.69	0.69	0.69
Hourly flow rate (vph)	11	67	349	126
Approach Volume (veh/h)			542	
Crossing Volume (veh/h)			657	
High Capacity (veh/h)			823	
High v/c (veh/h)			0.66	
Low Capacity (veh/h)			657	
Low v/c (veh/h)			0.83	

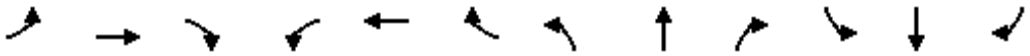
Intersection Summary



Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	13	0	41	559	554	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.60	0.60	0.97	0.97	0.90	0.90
Hourly flow rate (vph)	22	0	42	576	616	12
Pedestrians	12			12	16	
Lane Width (ft)	10.0			16.0	11.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					443	
pX, platoon unblocked	0.76	0.76	0.76			
vC, conflicting volume	1310	646	640			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1252	381	373			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	84	100	95			
cM capacity (veh/h)	132	488	865			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	22	619	628
Volume Left	22	42	0
Volume Right	0	0	12
cSH	132	865	1700
Volume to Capacity	0.16	0.05	0.37
Queue Length 95th (ft)	14	4	0
Control Delay (s)	37.7	1.3	0.0
Lane LOS	E	A	
Approach Delay (s)	37.7	1.3	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	126	200	246	72	318	31	179	1338	103	10	574	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	10	12	10
Total Lost time (s)	6.0	6.0		6.0	6.0		2.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	0.99			0.94	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.93	1.00			1.00	
Frt	1.00	0.92		1.00	0.99		1.00	0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1686	1590		1737	1818		1350	3042			4018	
Flt Permitted	0.29	1.00		0.18	1.00		0.35	1.00			0.89	
Satd. Flow (perm)	520	1590		324	1818		502	3042			3592	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	133	211	259	79	349	34	195	1454	112	10	592	70
RTOR Reduction (vph)	0	0	0	0	3	0	0	5	0	0	0	0
Lane Group Flow (vph)	133	470	0	79	380	0	195	1561	0	0	672	0
Confl. Peds. (#/hr)	3		23	23		3	289		19	19		289
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	5%	5%	5%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	6	0	0	0
Turn Type	Perm	NA		Perm	NA		D.P+P	NA		Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)	36.6	36.6		36.6	36.6		70.4	72.4			58.4	
Effective Green, g (s)	36.6	36.6		36.6	36.6		70.4	70.4			58.4	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.59	0.59			0.49	
Clearance Time (s)	6.0	6.0		6.0	6.0		2.0				5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0				2.0	
Lane Grp Cap (vph)	158	484		98	554		379	1784			1748	
v/s Ratio Prot		c0.30			0.21		0.05	c0.51				
v/s Ratio Perm	0.26			0.24			0.25				0.19	
v/c Ratio	0.84	0.97		0.81	0.69		0.51	0.88			0.38	
Uniform Delay, d1	39.0	41.2		38.4	36.7		12.1	21.1			19.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	30.3	33.2		34.9	2.8		4.9	6.3			0.6	
Delay (s)	69.3	74.4		73.3	39.5		17.1	27.4			20.1	
Level of Service	E	E		E	D		B	C			C	
Approach Delay (s)		73.3			45.3			26.3			20.1	
Approach LOS		E			D			C			C	

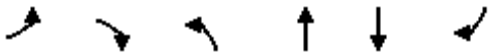
Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	114.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	338	1	10	128	13	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.93	0.93	0.82	0.82
Hourly flow rate (vph)	367	1	11	138	16	52
Pedestrians	5			4	5	
Lane Width (ft)	16.0			16.0	10.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			373		537	377
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			373		537	377
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	92
cM capacity (veh/h)			1175		492	660

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	368	148	68
Volume Left	0	11	16
Volume Right	1	0	52
cSH	1700	1175	612
Volume to Capacity	0.22	0.01	0.11
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.7	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	11.6
Approach LOS			B

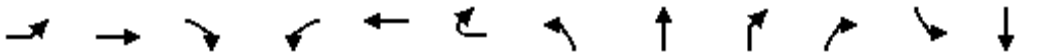
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	3	1	51	10	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	3	1	55	11	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	69	11	12			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	69	11	12			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	935	1069	1607			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	9	57	12
Volume Left	5	1	0
Volume Right	3	0	1
cSH	981	1607	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.7	0.1	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	0.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

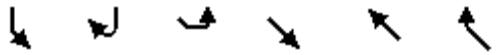


Movement	EBL	EBT	EBR	WBL	WBT	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Right Turn Channelized						Yes						
Volume (veh/h)	10	240	292	5	136	51	302	0	92	15	10	21
Peak Hour Factor	0.84	0.84	0.84	0.64	0.64	0.64	0.97	0.97	0.97	0.97	0.65	0.65
Hourly flow rate (vph)	12	286	348	8	213	80	311	0	95	15	15	32
Approach Volume (veh/h)		645			220			422				48
Crossing Volume (veh/h)		458			418			374				1040
High Capacity (veh/h)		965			996			1032				603
High v/c (veh/h)		0.67			0.22			0.41				0.08
Low Capacity (veh/h)		783			811			842				466
Low v/c (veh/h)		0.82			0.27			0.50				0.10

Intersection Summary					
Maximum v/c High		0.67			
Maximum v/c Low		0.82			
Intersection Capacity Utilization		112.1%	ICU Level of Service	H	

Movement	SWL2	SWL	SWR
Right Turn Channelized			
Volume (veh/h)	53	297	92
Peak Hour Factor	0.87	0.87	0.87
Hourly flow rate (vph)	61	341	106
Approach Volume (veh/h)		508	
Crossing Volume (veh/h)		532	
High Capacity (veh/h)		910	
High v/c (veh/h)		0.56	
Low Capacity (veh/h)		734	
Low v/c (veh/h)		0.69	

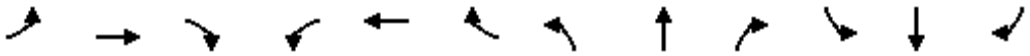
Intersection Summary



Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	23	5	10	605	405	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.90	0.90	0.93	0.93
Hourly flow rate (vph)	40	9	11	672	435	20
Pedestrians	24			22	24	
Lane Width (ft)	10.0			16.0	11.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	2			2	2	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					443	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1188	492	480			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1166	420	407			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	98	99			
cM capacity (veh/h)	188	562	1047			

Direction, Lane #	SB 1	SE 1	NW 1
Volume Total	48	683	456
Volume Left	40	11	0
Volume Right	9	0	20
cSH	214	1047	1700
Volume to Capacity	0.23	0.01	0.27
Queue Length 95th (ft)	21	1	0
Control Delay (s)	26.7	0.3	0.0
Lane LOS	D	A	
Approach Delay (s)	26.7	0.3	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		



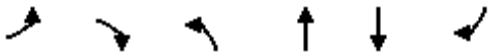
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	246	67	154	236	31	128	887	97	36	1010	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	16	16	16	10	12	12	10	12	10
Total Lost time (s)	5.0	5.0			5.0		2.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.91	
Frpb, ped/bikes	1.00	0.99			1.00		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00			0.99		1.00	1.00			1.00	
Frt	1.00	0.97			0.99		1.00	0.99			0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00			1.00	
Satd. Flow (prot)	1764	1779			1792		1516	3024			4482	
Flt Permitted	0.46	1.00			0.57		0.95	1.00			0.80	
Satd. Flow (perm)	858	1779			1046		1516	3024			3608	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	348	267	73	162	248	33	133	924	101	38	1052	61
RTOR Reduction (vph)	0	0	0	0	2	0	0	7	0	0	0	0
Lane Group Flow (vph)	348	340	0	0	441	0	133	1018	0	0	1151	0
Confl. Peds. (#/hr)	7		35	35		7			11	11		56
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	4%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	6	6	0	0	0
Turn Type	Perm	NA		Perm	NA		custom	NA		Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2			2			3			1		
Actuated Green, G (s)	50.0	50.0			50.0		12.0	60.0			46.0	
Effective Green, g (s)	50.0	50.0			50.0		12.0	58.0			46.0	
Actuated g/C Ratio	0.42	0.42			0.42		0.10	0.48			0.38	
Clearance Time (s)	5.0	5.0			5.0		2.0				5.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0				2.0	
Lane Grp Cap (vph)	357	741			435		151	1461			1383	
v/s Ratio Prot		0.19					c0.09	0.34				
v/s Ratio Perm	0.41				c0.42						c0.32	
v/c Ratio	0.97	0.46			1.01		0.88	0.70			0.83	
Uniform Delay, d1	34.4	25.2			35.0		53.3	24.1			33.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	40.4	0.2			46.5		47.0	2.8			6.0	
Delay (s)	74.8	25.4			81.5		100.3	26.9			39.5	
Level of Service	E	C			F		F	C			D	
Approach Delay (s)		50.4			81.5			35.3			39.5	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	117.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	297	21	10	185	8	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.89	0.89
Hourly flow rate (vph)	316	22	11	203	9	25
Pedestrians	13			7	13	
Lane Width (ft)	16.0			16.0	10.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			351		578	347
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			351		578	347
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	96
cM capacity (veh/h)			1202		465	689

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	338	214	34
Volume Left	0	11	9
Volume Right	22	0	25
cSH	1700	1202	611
Volume to Capacity	0.20	0.01	0.06
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.5	11.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	11.2
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	4	2	4	26	26	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.95			1.00	0.97	
Flt Protected	0.97			0.99	1.00	
Satd. Flow (prot)	1722			1851	1812	
Flt Permitted	0.97			0.98	1.00	
Satd. Flow (perm)	1722			1828	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	2	4	28	28	7
RTOR Reduction (vph)	1	0	0	0	4	0
Lane Group Flow (vph)	5	0	0	32	31	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	16.0			16.0	16.0	
Effective Green, g (s)	16.0			16.0	16.0	
Actuated g/C Ratio	0.40			0.40	0.40	
Clearance Time (s)	4.0			4.0	4.0	
Lane Grp Cap (vph)	688			731	724	
v/s Ratio Prot	c0.00				0.02	
v/s Ratio Perm				c0.02		
v/c Ratio	0.01			0.04	0.04	
Uniform Delay, d1	7.2			7.3	7.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.0			0.1	0.1	
Delay (s)	7.2			7.4	7.4	
Level of Service	A			A	A	
Approach Delay (s)	7.2			7.4	7.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.03		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	14.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

ITE Trip Generation

Heath Square Apartments
Trip Generation Estimate
September 2015

Heath Square - Residential Trip Generation

	Size	Trip Rate	Unadjusted Vehicle Trips	VOR	Person Trips	Vehicle Share	Transit Share	Walk/Other Share	Local VOR	Adjusted Vehicle Trips	Transit Trips	Walk/Other Trips
Daily Residential		8.68	408		681					188	110	258
In	47	4.34	204	1.67	341	46%	16%	38%	1.67	94	55	129
Out	units	4.34	204	1.67	341	46%	16%	38%	1.67	94	55	129
Total Daily			**408**		**681**					**188**	**110**	**258**
In			**204**		**341**					**94**	**55**	**129**
Out			**204**		**341**					**94**	**55**	**129**
AM Residential		0.55	26		43					10	8	20
In	47	0.11	5	1.67	8	37%	18%	45%	1.67	2	2	4
Out	units	0.45	21	1.67	35	37%	18%	45%	1.67	8	6	16
Total AM Peak Hour			**26**		**43**					**10**	**8**	**20**
In			**5**		**8**					**2**	**2**	**4**
Out			**21**		**35**					**8**	**6**	**16**
PM Residential		0.91	43		72					16	13	32
In	47	0.60	28	1.67	47	37%	18%	45%	1.67	10	8	21
Out	units	0.32	15	1.67	25	37%	18%	45%	1.67	6	5	11
Total PM Peak Hour			**43**		**72**					**16**	**13**	**32**
In			**28**		**47**					**10**	**8**	**21**
Out			**15**		**25**					**6**	**5**	**11**

Notes:
Trip Generation based on *ITE Trip Generation Manual* , 9th Edition, using LUC 220 - Apartment
Mode shares based on BTD Area 5 (Home)
VOR stands for Vehicle Occupancy Rate from 2009 NHTS

ITE TRIP GENERATION WORKSHEET
(9th Edition, Updated 2012)

LANDUSE: Apartment
LANDUSE CODE: 220

Independent Variable --- Number of Units

JOB NAME: **Heath Square**
JOB NUMBER: **13208**

Size 47 units

WEEKDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	88	0.87	6.65	1.27	12.50	210	0	1,000	50%	50%
AM PEAK (ADJACENT ST)	78	0.83	0.51	0.10	1.02	235	0	1,100	20%	80%
PM PEAK (ADJACENT ST)	90	0.77	0.62	0.10	1.64	233	0	1,100	65%	35%

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	313	156	156	408	204	204
AM PEAK (ADJACENT ST)	24	5	19	27	5	21
PM PEAK (ADJACENT ST)	29	19	10	44	28	15

SATURDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	15	0.85	6.39	2.84	8.40	175	65	360	50%	50%
PEAK OF GENERATOR	14	0.56	0.52	0.26	1.05	178	65	360	*Peak Distribution Not Availble*	

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	300	150	150	113	56	56
PEAK OF GENERATOR	24	NA	NA	39	NA	NA

SUNDAY

RATES:

	# Studies	R^2	Total Trip Ends			Independent Variable Range			Directional Distribution	
			Average	Low	High	Average	Low	High	Enter	Exit
DAILY	14	0.82	5.86	3.21	7.53	182	90	360	50%	50%
PEAK OF GENERATOR	13	--	0.51	0.26	1.43	186	90	360	*Peak Distribution Not Availble*	

TRIPS:

	BY AVERAGE			BY REGRESSION		
	Total	Enter	Exit	Total	Enter	Exit
DAILY	275	150	150	201	100	100
PEAK OF GENERATOR	24	NA	NA	NA	NA	NA

Crash/Accident Analysis

CRASH RATE WORKSHEET

CITY/TOWN : Boston

COUNT DATE :

DISTRICT : 6

UNSIGNALIZED :

SIGNALIZED : X

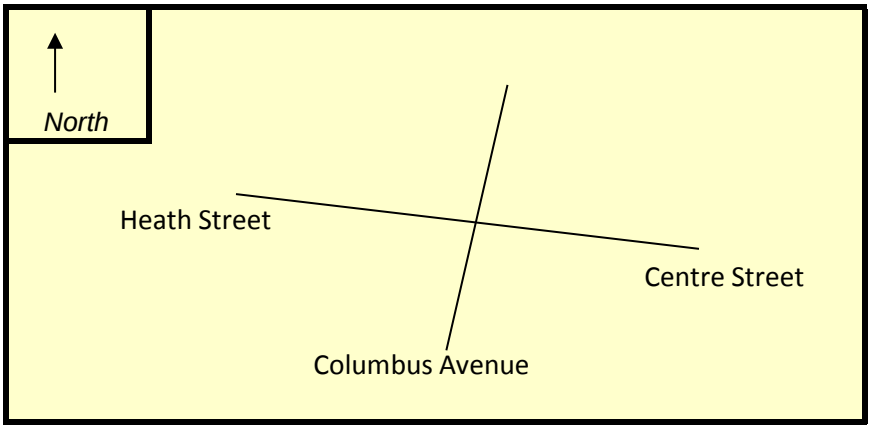
~ INTERSECTION DATA ~

MAJOR STREET : Columbus Avenue

MINOR STREET(S) : Heath Street

Centre Street

INTERSECTION DIAGRAM
(Label Approaches)



Peak Hour Volumes

APPROACH :	1	2	3	4	5	6
DIRECTION :	NB	SB	EB	WB		
VOLUMES (PM) :						

" K " FACTOR : 0.09

APPROACH ADT : 0

ADT = TOTAL VOL/"K" FACT.

TOTAL # OF ACCIDENTS : 5

OF YEARS : 3

AVERAGE # OF ACCIDENTS (**A**) : 1.67

CRASH RATE CALCULATION : #DIV/0!

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(ADT * 365)}$$

Source (optional): Volumes from Existing Condition PM Peak

Comments:

Sub Group	Crash ID	Town	Year	Crash Date	Crash Time	Crash Severity	Total Vehicles	Total Injured	Total Fatals	Collision manner	Road Surface	Lighting	Weather	Street	Intersection	Distance From Nearest Intersection	Vehicles Travel Directions	Most Harmful Events	Vehicle Action Prior to Crash	Vehicle Configuration	X Coordinate	Y Coordinate	Crash Data Id
NO GROUP	2763880	BOSTON	2011	7/21/2011	9:13 AM	Non-fatal injury	2	2	0	Rear-end	Dry	Daylight	Clear	COLUMBUS AVENUE / HEATH STREET	COLUMBUS AVENUE / HEATH STREET		V1:Southbound / V2:Southbound	V2: Collision with motor vehicle in traffic	V1: Slowing or stopped in traffic	V1: Light truck/van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car	233335.8312	897238.0964	3586672
NO GROUP	3316364	BOSTON (JAMAICA PLAIN)	2012	3/29/2012	5:34 PM	Non-fatal injury	3	2	0	Single vehicle crash	Dry	Dark - lighted roadway	Clear	COLUMBUS AVENUE / HEATH STREET	COLUMBUS AVENUE / HEATH STREET		V1:Not reported / V2: Not reported / V3: Unknown	V1: Not reported / V2:Not reported / V3:Not reported	V1: Not reported / V2:Not reported / V3:Travelling straight ahead	V1: Passenger car / V2:Passenger car / V3:Motorcycle	233335.8312	897238.0964	3713419
NO GROUP	3316050	BOSTON (ROXBURY)	2012	8/19/2012	11:05 AM	Property damage only (none injured)	2	0	0	Angle	Dry	Daylight	Clear	COLUMBUS AVENUE / HEATH STREET	COLUMBUS AVENUE / HEATH STREET		V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Travelling straight ahead / V2:Turning left	V1: Passenger car / V2:Passenger car	233335.8312	897238.0964	3712471
NO GROUP	3316172	BOSTON	2012	8/14/2012	9:22 AM	Non-fatal injury	3	4	0	Angle	Dry	Dawn	Clear	COLUMBUS AVENUE / HEATH STREET	COLUMBUS AVENUE / HEATH STREET		V1:Not reported / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Passenger car / V2:Passenger car	233335.8312	897238.0964	3712186
NO GROUP	3510233	BOSTON	2013	5/23/2013	1:27 AM	Non-fatal injury	3	3	0	Sideswipe, opposite direction	Dry	Dark - lighted roadway	Clear	COLUMBUS AVENUE / HEATH STREET	COLUMBUS AVENUE / HEATH STREET		V1:Not reported / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Travelling straight ahead / V2:Travelling straight ahead	V1: Passenger car / V2:Passenger car	233335.8312	897238.0964	3829640

APPENDIX C: BRA Checklists

Accessibility Checklist & Accessible Route Connections Figure

Climate Change Preparedness and Resiliency Checklist

LEED v4 Midrise Checklist

Multifamily Home Size Adjuster

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

In 2009, a nine-member Advisory Board was appointed to the Commission for Persons with Disabilities in an effort to reduce architectural, procedural, attitudinal, and communication barriers affecting persons with disabilities in the City of Boston. These efforts were instituted to work toward creating universal access in the built environment.

In line with these priorities, the Accessibility Checklist aims to support the inclusion of people with disabilities. In order to complete the Checklist, you must provide specific detail, including descriptions, diagrams and data, of the universal access elements that will ensure all individuals have an equal experience that includes full participation in the built environment throughout the proposed buildings and open space.

In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding the following:

- improvements for pedestrian and vehicular circulation and access;
- encourage new buildings and public spaces to be designed to enhance and preserve Boston's system of parks, squares, walkways, and active shopping streets;
- ensure that persons with disabilities have full access to buildings open to the public;
- afford such persons the educational, employment, and recreational opportunities available to all citizens; and
- preserve and increase the supply of living space accessible to persons with disabilities.

We would like to thank you in advance for your time and effort in advancing best practices and progressive approaches to expand accessibility throughout Boston's built environment.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
    a. http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
    a. http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Boston Complete Street Guidelines
    a. http://bostoncompletestreets.org/
4. City of Boston Mayors Commission for Persons with Disabilities Advisory Board
    a. http://www.cityofboston.gov/Disability
5. City of Boston – Public Works Sidewalk Reconstruction Policy
    a. http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
6. Massachusetts Office On Disability Accessible Parking Requirements
    a. www.mass.gov/anf/docs/mod/hp-parking-regulations-mod.doc
7. MBTA Fixed Route Accessible Transit Stations
    a. http://www.mbta.com/about_the_mbta/accessibility/

Article 80 | ACCESSIBILTY CHECKLIST

Project Information

Project Name:	General Heath Square Apartments
Project Address Primary:	61 Heath Street
Project Address Additional:	N/A
Project Contact (name / Title / Company / email / phone):	Matthew Henzy/ Senior Project Manager/ JPNDC mhenzy@jpndc.org / 617-522-2424 X260

Team Description

Owner / Developer:	BOTH/NDC Community Initiative LLC
Architect:	Prellwitz Chilinski Associates, Inc.
Engineer (building systems):	Wozny/Barbar & Associates, Inc.
Sustainability / LEED:	Conservation Services Group
Permitting:	VHB
Construction Management:	TBD

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

Article 80 | ACCESSIBILTY CHECKLIST

Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One to Three Unit	**Residential - Multi-unit, Four +**	Institutional	Education
Commercial	Office	Retail	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other

First Floor Uses (List): *Primary building entry, building office, mechanical, laundry, residential community space, residential (apartments), potential commercial/other tenant.*

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	***28,872 SF***	Building Area:	***56,290 SF***
Building Height:	***48 Ft.***	Number of Stories:	***4 Flrs.***
First Floor Elevation:	***43'/48' Elev.***	Are there below grade spaces:	*Yes / **No***

Assessment of Existing Infrastructure for Accessibility:

This section explores the proximity to accessible transit lines and proximate institutions such as, but not limited to hospitals, elderly and disabled housing, and general neighborhood information. The proponent should identify how the area surrounding the development is accessible for people with mobility impairments and should analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports.

Provide a description of the development neighborhood and identifying characteristics.	The Project will be located on ten contiguous vacant City of Boston-owned parcels bordered by New Heath St., Bromley St., Heath St., and the General Heath Sq. rotary/Parker St. Each street has sloping topography. There is one adjacent property on Heath St., the remainder of the block is vacant. The Project will be neighbored by the Bromley Heath Housing Development on Heath St., multi-family residential buildings around the rotary, a disused ice house on New Heath St., and Family Services of Greater Boston and the Southwest Corridor Park Headquarters on Bromley St.

	Existing sidewalks range in width from a maximum of approximately 20 feet for a portion of the rotary frontage to a minimum of approximately 6 feet on Bromley St.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	MBTA bus route 14 runs along Heath St. and stops directly in front of the site. Jackson Square T station is approximately ¼ mile away, with Orange Line trains and local bus connections to routes 14, 22, 29, 41 and 44.
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Bromley Heath Housing Development sits directly across Heath St. Roxbury Prep Charter School and The Hennigan School are located between ¼ and ½ mile away.
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	The Family Service Center of Greater Boston sits across Bromley St. Southwest Corridor park is less than a ¼ mile away. McLaughlin Playground, Marcella Playground and the Bromley Heath Play area are all approximately ½ mile away.

Surrounding Site Conditions – Existing:

This section identifies the current condition of the sidewalks and pedestrian ramps around the development site.

Are there sidewalks and pedestrian ramps existing at the development site?	Yes.
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	Heath, New Heath and Parker Streets have existing concrete sidewalks with pedestrian curb cuts. Bromley St. has an asphalt sidewalk. Condition varies from good, at Parker and Heath Streets, to poor at Bromley St.
Are the sidewalks and pedestrian ramps existing-to-remain? **If yes,** have the sidewalks and pedestrian ramps been verified as compliant? **If yes,** please provide surveyors report.	All sidewalks are to be replaced with new, compliant, concrete walks. Tactile warning material to be provided at all pedestrian curb cuts.

Is the development site within a historic district? If yes, please identify.	No.

Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps in and around the development site. The width of the sidewalk contributes to the degree of comfort and enjoyment of walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Typically, a five foot wide Pedestrian Zone supports two people walking side by side or two wheelchairs passing each other. An eight foot wide Pedestrian Zone allows two pairs of people to comfortable pass each other, and a ten foot or wider Pedestrian Zone can support high volumes of pedestrians.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	Yes.
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Neighborhood Residential
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	Heath St. sidewalk is approximately 9'-6" wide. Parker St. sidewalk varies between approximately 9'-6" and 20' wide. New Heath St. sidewalk is approximately 8' wide. Bromley St. Sidewalk is approximately 6' wide.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	New sidewalks will be concrete. Materials will be on private property, and consist of plantings, site seating (benches) and low, stone retaining walls and stairs; all located on Parker and New Heath Streets.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	N/A

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	N/A
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	N/A

Proposed Accessible Parking:

See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability Handicap Parking Regulations.

What is the total number of parking spaces provided at the development site parking lot or garage?	20 proposed
What is the total number of accessible spaces provided at the development site?	1 proposed
Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	No.
Where is accessible visitor parking located?	The 1 proposed accessible space will be located in the parking lot behind the building, near the residential entrance at grade.
Has a drop-off area been identified? **If yes,** will it be accessible?	No.
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	Proposed accessible spot will be accessible from adjacent sidewalks at the rear entry of the building. Distance to rear residential entry is approximately 45’.

Circulation and Accessible Routes:

The primary objective in designing smooth and continuous paths of travel is to accommodate persons of all abilities that allow for universal access to entryways, common spaces and the visit-ability* of neighbors.

**Visit-ability – Neighbors ability to access and visit with neighbors without architectural barrier limitations*

Provide a diagram of the accessible route connections through the site.	See attached.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Flush condition at primary entry/elevator lobby (Heath and Parker Streets). Flush conditions at street entries to 4 units on Parker and New Heath Streets. Flush condition at secondary entry (New Heath St.) Flush condition at rear entry from parking lot.
Are the accessible entrance and the standard entrance integrated?	Yes.
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes.
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	No.

Accessible Units: (If applicable)

In order to facilitate access to housing opportunities this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing choice.

What is the total number of proposed units for the development?	47
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	Rental, all.
How many accessible units are being proposed?	Three units Will be Group 2 as defined by MAAB regulations (521 MA CMR): one 1-bedroom, one 2-bedroom and one 3-bedroom. The remaining 44 units will be Group 1 as defined by MAAB regulations.

Article 80 | ACCESSIBILTY CHECKLIST

Please provide plan and diagram of the accessible units.	Unit plans are not yet available.
How many accessible units will also be affordable? If none, please describe reason.	3
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason.	No.
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	No.
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	N/A

Thank you for completing the Accessibility Checklist!

For questions or comments about this checklist or accessibility practices, please contact:

kathryn.quigley@boston.gov | Mayors Commission for Persons with Disabilities

PCA ARCHITECTURE PLANNING INTERIORS

vhb

ACCESSIBLE ROUTE CONNECTIONS

1" = 20'

General Heath Square
Boston, MA

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

A.1 - Project Information

Project Name:	**General Heath Square Apartments**
Project Address Primary:	**61 Heath Street**
Project Address Additional:	**N/A**
Project Contact (name / Title / Company / email / phone):	**Matthew Henzy/ Senior Project Manager/ JPNDC** **mhenzy@jpndc.org / 617-522-2424 X260**

A.2 - Team Description

Owner / Developer:	**BOTH/NDC Community Initiative LLC**
Architect:	**Prellwitz Chilinski Associates, Inc.**
Engineer (building systems):	**Wozny/Barbar & Associates, Inc.**
Sustainability / LEED:	**Conservation Services Group**
Permitting:	**VHB**
Construction Management:	**TBD**
Climate Change Expert:	**Conservation Services Group/VHB**

A.3 - Project Permitting and Phase

At what phase is the project – most recent completed submission at the time of this response?

PNF / Expanded PNF Submission	Draft / Final Project Impact Report Submission	BRA Board Approved	Notice of Project Change
Planned Development Area	BRA Final Design Approved	Under Construction	Construction just completed:

A.4 - Building Classification and Description

List the principal Building Uses:	**47 Unit Residential Construction.**
List the First Floor Uses:	**Primary entry/lobby, community space, residences, mechanical, laundry room, commercial/other.**

What is the principal Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	***28,872 SF***	Building Area:	***56,290 SF***
Building Height:	***48 Ft.***	Number of Stories:	***4***
First Floor Elevation (reference Boston City Base):	***43' Elev.***	Are there below grade spaces/levels, if yes how many:	***No_/ Number of Levels***

A.5 - Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)?

Select by Primary Use:	New Construction	Core & Shell	Healthcare	Schools
	Retail	**Homes Midrise**	Homes	Other
Select LEED Outcome:	**Certified**	Silver	Gold	Platinum

Will the project be USGBC Registered and / or USGBC Certified?

Registered:	*Yes / **No***	Certified:	***No***

A.6 - Building Energy

What are the base and peak operating energy loads for the building?

Electric:	***460(kW)***	Heating:	***9.4(MMBtu/hr)***
What is the planned building Energy Use Intensity:	***TBD** (kbut/SF or kWh/SF)*	Cooling:	***100(Tons/hr)***

What are the peak energy demands of your critical systems in the event of a service interruption?

Electric:	***TBD**(kW)*	Heating:	***TBD**(MMBtu/hr)*
		Cooling:	***TBD**(Tons/hr)*

What is nature and source of your back-up / emergency generators?

Electrical Generation:	***TBD**(kW)*		Fuel Source:	
System Type and Number of Units:	Combustion Engine	Gas Turbine	Combine Heat and Power	*(Units)*

B - Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	50 Years	**75 Years**

What is the full expected operational life of key building systems (e.g. heating, cooling, ventilation)?

Select most appropriate:	10 Years	**25 Years**	50 Years	75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	**50 Years**	75 Years

Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

90.6/8.1	*Deg.*

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

95 *Deg.*	*5* *Days*	*2* *Events / yr.*

What Drought characteristics will be used for project planning – Duration and Frequency?

5 *Days*	*2* *Events / yr.*

What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

41.51 *Inches / yr.*	*4.9* *Inches*	*127* *Events / yr.*

What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

Peak Wind	*Hours*	*Events / yr.*

B.2 - Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Building energy use below code:	*20* %	**As required by current Stretch Energy Code.**
How is performance determined:	**A building energy model will be conducted as design advances and as required for a future Building Permit.**	

What specific measures will the project employ to reduce building energy consumption?

Select all appropriate:	**High performance building envelop**	**High performance lighting & controls**	**Building day lighting**	**EnergyStar equip. / appliances**
	High performance HVAC equipment	**Energy recovery ventilation**	No active cooling	No active heating
Describe any added measures:				

What are the insulation (R) values for building envelop elements?

Roof:	*R = 36 continuous/45-50 cavity*	Walls / Curtain Wall Assembly:	*R = 12 continuous/+12 cavity*
Foundation:	*R = N/A*	Basement / Slab:	*R =21*
Windows:	*R =3.57 / U =0.28*	Doors:	*R = TBD / U =0.80*

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

	On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
	On-site Solar PV	On-site Solar Thermal	Wind power	None
Describe any added measures:	**Participate in the Energy Star program, install LED lighting.**			

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate:	Connected to local distributed electrical	Building will be Smart Grid ready	Connected to distributed steam, hot, chilled water	Distributed thermal energy ready

Will the building remain operable without utility power for an extended period?

*Yes / **No***	If yes, for how long:	*Days*
If Yes, is building "Islandable?		
If Yes, describe strategies:		

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	**External shading devices**	Tuned glazing,
	Building cool zones	**Operable windows**	**Natural ventilation**	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	**High Performance Building Envelope**
Describe any added measures:				

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	High reflective paving materials	**Shade trees & shrubs**	**High reflective roof materials**	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:	On-site retention systems & ponds	**Infiltration galleries & areas**	vegetated water capture systems	Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	Hardened building structure & elements	**Buried utilities & hardened infrastructure**	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

*Yes / **No***

Describe site conditions?

Site Elevation – Low/High Points:	*Boston City Base* ***39' – 48'***
Building Proximity to Water:	***3,600 Ft.***

Is the site or building located in any of the following?

Coastal Zone:	*Yes / **No***	Velocity Zone:	*Yes / **No***
Flood Zone:	*Yes / **No***	Area Prone to Flooding:	*Yes / **No***

Will the 2013 Preliminary FEMA Flood Insurance Rate Maps or future floodplain delineation updates due to Climate Change result in a change of the classification of the site or building location?

2013 FEMA Prelim. FIRMs:	*Yes / **No***	Future floodplain delineation updates:	*Yes / **No***

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

3,500 Ft.

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. ***Otherwise you have completed the questionnaire; thank you!***

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*Ft.*	Frequency of storms:	*per year*

C.3 - Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

What will be the Building Flood Proof Elevation and First Floor Elevation:

Flood Proof Elevation:	*Boston City Base Elev.(Ft.)*	First Floor Elevation:	*Boston City Base Elev. (Ft.)*

Will the project employ temporary measures to prevent building flooding (e.g. barricades, flood gates):

	Yes / No	If Yes, to what elevation	*Boston City Base Elev. (Ft.)*
If Yes, describe:			

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1st Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention

Were the differing effects of fresh water and salt water flooding considered:

Yes / No

Will the project site / building(s) be accessible during periods of inundation or limited access to transportation:

Yes / No	If yes, to what height above 100 Year Floodplain:	*Boston City Base Elev. (Ft.)*

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

Yes / No

If Yes, describe:

Will the building remain occupiable without utility power during an extended period of inundation:

Yes / No	If Yes, for how long:	*days*

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

C.4 - Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:	*Yes / No*	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction

Can the site and building be reasonably modified to increase Building Flood Proof Elevation?

Select appropriate:	*Yes / No*	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	*Yes / No*	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel
Describe any specific or additional strategies:				

Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness best practices, please contact: John.Dalzell.BRA@cityofboston.gov

General Heath Square Apartments Scorecard

Note: The information on this tab is READ-ONLY. To edit this information, see the Credit Category tabs.

Integrative Process	**Attempted**	Y	0 of 2	M	*0*	**Verified**	0
IPc	**Integrative Process**		Not Attempted		*0*		
Location and Transportation	**Attempted**	Y	15 of 15	M	*0*	**Verified**	0
LTp	Floodplain Avoidance		Required				Not Verified
Performance Path							
LTc	LEED for Neighborhood Development		Not Attempted		*0*		
Prescriptive Path							
LTc	Site Selection		8 of 8		*0*		
LTc	Compact Development		3 of 3		*0*		
LTc	Community Resources		2 of 2		*0*		
LTc	Access to Transit		2 of 2		*0*		
Sustainable Sites	**Attempted**	Y	7 of 7	M	*0*	**Verified**	0
SSp	Construction Activity Pollution Prevention		Required				Not Verified
SSp	No Invasive Plants		Required				Not Verified
SSc	Heat Island Reduction		2 of 2		*0*		
SSc	Rainwater Management		3 of 3		*0*		
SSc	Nontoxic Pest Control		2 of 2		*0*		
Water Efficiency	**Attempted**	Y	9 of 12	M	*0*	**Verified**	0
WEp	Water Metering		Required				Not Verified
Performance Path							
WEc	Total Water Use		9 of 12		*0*		
Prescriptive Path							
WEc	Indoor Water Use		Not Attempted		*0*		
WEc	Outdoor Water Use		2 of 4		*0*		
Energy and Atmosphere	**Attempted**	Y	24 of 37	M	*0*	**Verified**	0
EAp	Minimum Energy Performance		Required				Not Verified
EAp	Energy Metering		Required				Not Verified
EAp	Education of the Homeowner, Tenant or Building Manager		Required				Not Verified
EAc	Annual Energy Use		18 of 30		*0*		
EAc	Efficient Hot Water Distribution System		5 of 5		*0*		
EAc	Advanced Utility Tracking		1 of 2		*0*		
Materials and Resources	**Attempted**	Y	6 of 9	M	*0*	**Verified**	0
MRp	Certified Tropical Wood		Required				Not Verified
MRp	Durability Management		Required				Not Verified
MRc	Durability Management Verification		Not Attempted		*0*		
MRc	Environmentally Preferable Products		3.5 of 5		*0*		
MRc	Construction Waste Management		2.5 of 3		*0*		
Indoor Environmental Quality	**Attempted**	Y	7.5 of 18	M	*0*	**Verified**	0
EQp	Ventilation		Required				Not Verified
EQp	Combustion Venting		Required				Not Verified
EQp	Garage Pollutant Protection		Required				Not Verified
EQp	Radon-Resistant Construction		Required				Not Verified
EQp	Air Filtering		Required				Not Verified
EQp	Environmental Tobacco Smoke		Required				Not Verified
EQp	Compartmentalization		Required				Not Verified
EQc	Enhanced Ventilation		Not Attempted		*0*		
EQc	Contaminant Control		0.5 of 2		*0*		
EQc	Balancing of Heating and Cooling Distribution Systems		2 of 3		*0*		
EQc	Enhanced Compartmentalization		Not Attempted		*0*		
EQc	Combustion Venting		2 of 2		*0*		
EQc	Enhanced Garage Pollutant Protection		1 of 1		*0*		
EQc	Low-Emitting Products		2 of 3		*0*		
EQc	No Environmental Tobacco Smoke		Not Attempted		*0*		
Innovation	**Attempted**	Y	2.5 of 6	M	*0*	**Verified**	0
INp	Preliminary Rating		Required				Not Verified
INc	Innovation		2.5 of 5		*0*		
INc	LEED Accredited Professional		Not Attempted		*0*		
Regional Priority	**Attempted**	Y	2 of 4	M	*0*	**Verified**	0
RPc	Regional Priority		2 of 4		*0*		

Point Floors	
The project earned at least 8 points total in Location and Transportation and Energy and Atmosphere	Yes
The project earned at least 3 points in Water Efficiency	Yes
The project earned at least 3 points in Indoor Environmental Quality	Yes

Total	**Attempted**	Y	73 of 110	M	0	**Verified**	0

Certification Thresholds Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110

Multifamily Home Size Adjuster

This approach can be used to determine an overall home size adjuster for for multifamily buildings, but it cannot be used to determine an overall home size adjuster for a complex with multiple multifamily buildings. If a project includes multiple multifamily buildings, each building must have its own home size adjustment. This weighted approach cannot be used for multiple single family homes.

Complete the table for each building in the project. Input the number of units and the average square footage for units with the corresponding bedroom number. For example, if the building has three 2-bedroom units that are 1300 sq ft, 1400 sq ft, and 1500 sq ft, insert "3" in cell G9 and "1400" in cell H9. Please leave zeros or blanks where appropriate.

Building ID	0 Bedrooms		1 Bedroom		2 Bedrooms		3 Bedrooms		4 Bedrooms		5 Bedrooms		6 Bedrooms	
	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)
			11	650.00	22	875.00	14	1,150.00						
Unit adjustment	0.0		-8.5		-10.0		-10.0		0.0		0.0		0.0	

Total number of units	47
Average number of bedrooms per unit	2.1
Average floor area per unit (sq ft)	904.26
Average adjustment	-9.6
Overall average adjustment	-9.5