Project Notification Form

112 Shawmut Avenue

Submitted to:
Boston Planning & Development Agency
One City Hall Square
Boston, MA 02201

Prepared by:
Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

Submitted by:
DIV Shawmut, LLC
an affiliate of
The Davis Companies
125 High Street, Suite 2111
Boston, MA 02110

In Association with:
The Architectural Team, Inc.
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
Howard Stein Hudson

August 29, 2017

Epsilon
ASSOCIATES INC.

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Chapter 1

Project Description / General Information

1.0 PROJECT DESCRIPTION/GENERAL INFORMATION

1.1 Introduction

DIV Shawmut, LLC, an affiliate of The Davis Companies (the Proponent), proposes a new 13-story residential building with ground floor retail/café use (the Project) at 112 Shawmut Avenue, on the southeast corner of the Shawmut Avenue/Herald Street intersection (the Project Site). The Project will result in the adaptive reuse of a former industrial building and the creation of new housing at a transit-accessible location.

The ground floor will activate the corner with a new retail/café space, and areas adjacent to the corner with the residential entry located along Shawmut Avenue and residential amenity spaces that will look out onto Herald Street. Public realm improvements, including new paving, street trees and new plant materials, will be provided one the Shawmut Avenue and Herald Street sidewalks to accentuate a walkable edge in accordance with the City of Boston Complete Streets guidelines. The Project will generate jobs and property tax revenues, and feature sustainable design features targeting LEED Silver that minimize environmental impacts and provide for climate resiliency.

This expanded Project Notification Form (EPNF) is being submitted to the Boston Redevelopment Authority doing business as the Boston Planning & Development Agency (herein, the BPDA) to initiate review of the Project under Article 80B, Large Project Review, of the Boston Zoning Code.

1.2 Project Description

1.2.1 Project Site

The Project Site is an approximately 28,378 square foot (sf), approximately 0.65-acre, parcel of land located within the South End Neighborhood District and the South End Landmark Protection Area of Boston (see Figure 1-1). The Project Site is bounded by Shawmut Avenue to the west, Herald Street to the north, and privately-owned parcels of land to the south and east. Currently, the Project Site includes an existing six story concrete frame/brick façade former warehouse building formerly used as offices and ground floor day care space, with approximately 44 surface parking spaces, and minimal open space. The Project Site is located within walking distance of several Massachusetts Bay Transportation Authority (MBTA) bus routes and a Silver Line station, as well as the Tufts Medical Center station of the Orange Line and the Boylston Street stop of the Green Line.

1.2.2 Area Context

The Project Site is located on what was a narrow strip of land called "The Neck" during colonial times, where present day Washington Street and Shawmut Avenue run. The majority of the land area in the South End was created through landfill projects in the 19th and 20th centuries. The South End neighborhood today consists of historic residential blocks, public parks, and main thoroughfares lined with commercial, residential, industrial, and institutional buildings. See Figures 1-2 and 1-3 for a context map and photographs of the surrounding area.

In the 20th century, commercial, industrial, and institutional uses became popular along the main streets in the South End. Newly built and adapted existing structures included hotels, churches, and business and entertainment uses. Many residential structures in the area, particularly those along major thoroughfares, include storefronts at the ground level.

To the south of the Project Site is a parcel of land owned by the Boston Chinese Evangelical Church (BCEC) that is currently occupied by a three-story former nursing home facility and surface parking spaces. It is currently used for religious, educational and other charitable purposes. To the east of the Project Site is a parcel of land owned by the Chinese Consolidated Benevolent Association of New England which currently consists of a single-story supermarket and associated surface parking spaces.

1.2.3 Proposed Project

The Project includes the construction of an approximately 192,568 sf, 13-story building consisting of approximately 143 residential units and residential amenity space, and approximately 980 sf of ground floor retail/café space. The building will include three levels of parking, one of which will be below-grade, to accommodate approximately 124 vehicles. The Project will have a maximum Building Height (as defined in the Boston Zoning Code) of approximately 150 feet[1]. The roof of the building will include a rooftop deck and amenity space for residents' use, as well as enclosed mechanical space. See Figures 1-4 to 1-9 for proposed site plans, building perspectives, elevations and sections. Figure 1-11 includes an aerial perspective of the Project. Floor plans are included in Appendix A.

The existing building on the Project Site will be partially demolished, with the exception of the street-facing facades which will be incorporated into the Project design (see Figure 1-12). The new construction component of the Project will expand to the east and above the existing building. The ground floor will contain residential amenity spaces along Herald Street that will activate the streetfront, as well as a residential entry located along Shawmut Avenue. The garage will be accessed by an entrance/exit ramp on Herald Street and an entrance/exit ramp on Shawmut Avenue; because of the site geometry, the two parking areas in the garage will be independent of each other and not connected; this is designed to optimize the amount of open space at the Project. The loading bay at the Project will also be accessed from Shawmut Avenue. Bicycle racks for residents and visitors will be located near the entrances to the building, and there will also be bicycle racks for residents within the parking garage.

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[1] All capitalized terms used in this EPNF but not defined are as defined in the Boston Zoning Code, as amended.

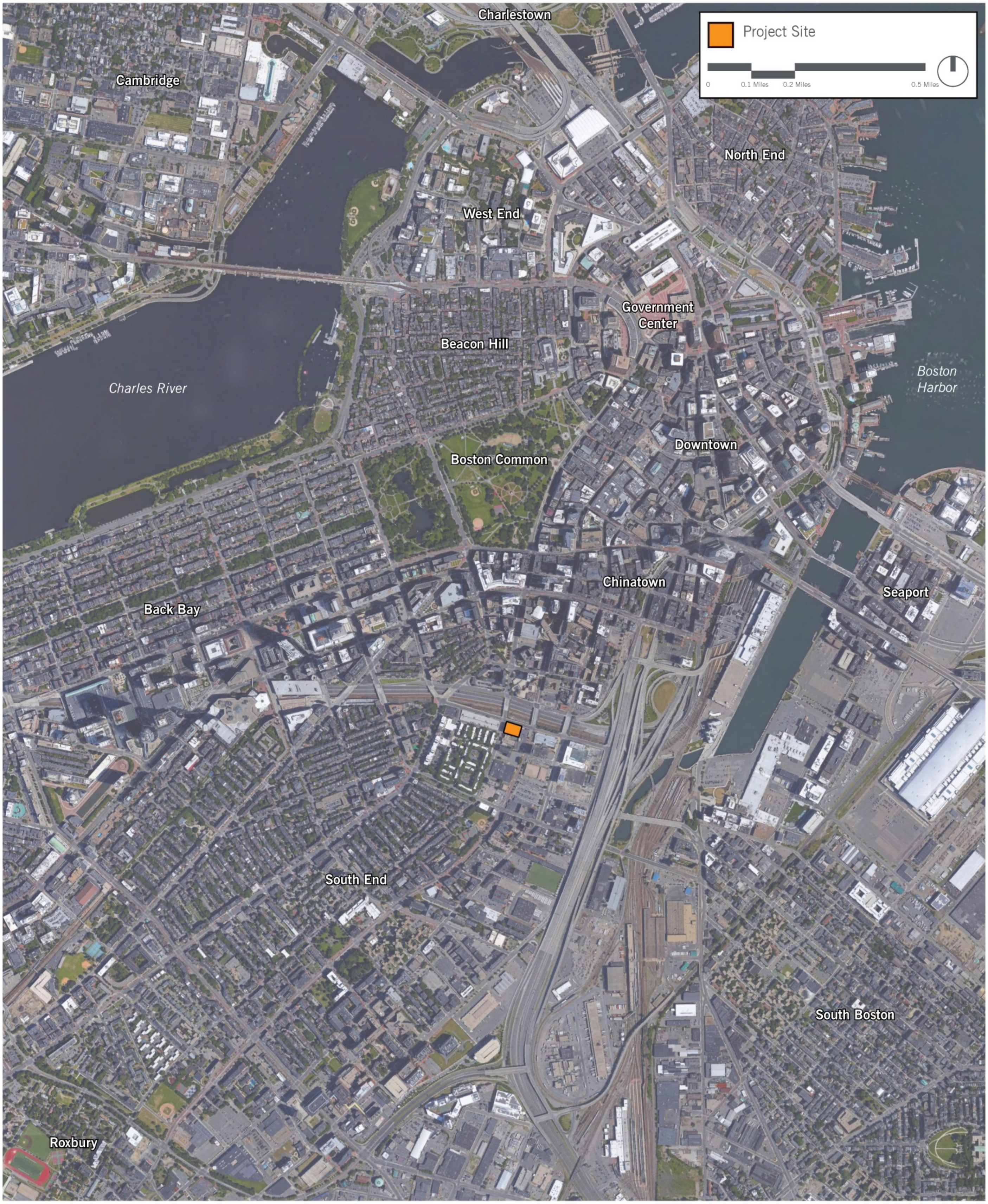
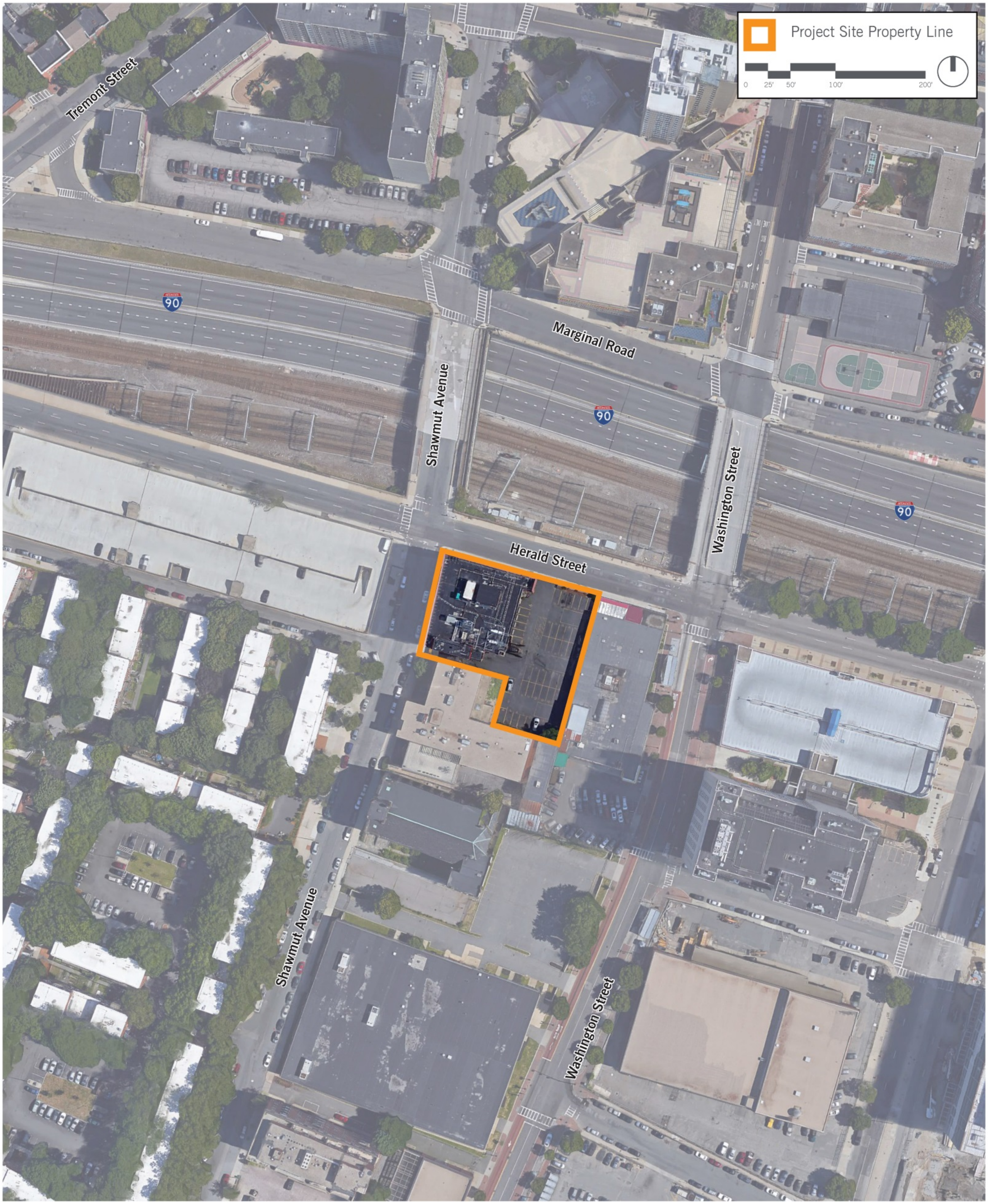


Figure 1-1
Aerial Locus Map



112 Shawmut Avenue Boston, Massachusetts

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Figure 1-2
Existing Conditions

Figure 1-3

Existing Conditions Area Photographs

112 Shawmut Avenue Boston, Massachusetts

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Figure 1-4
Proposed Conditions

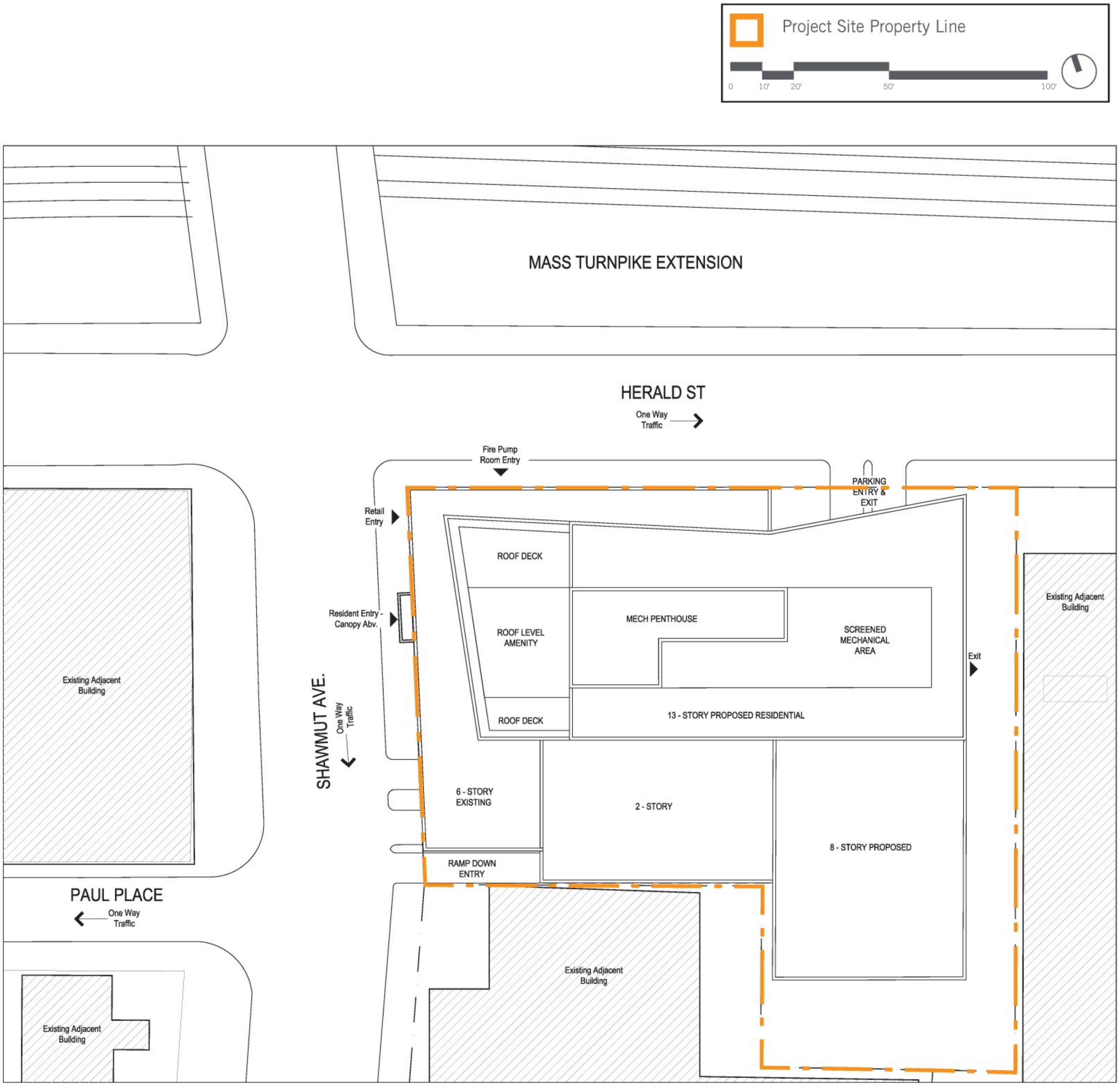


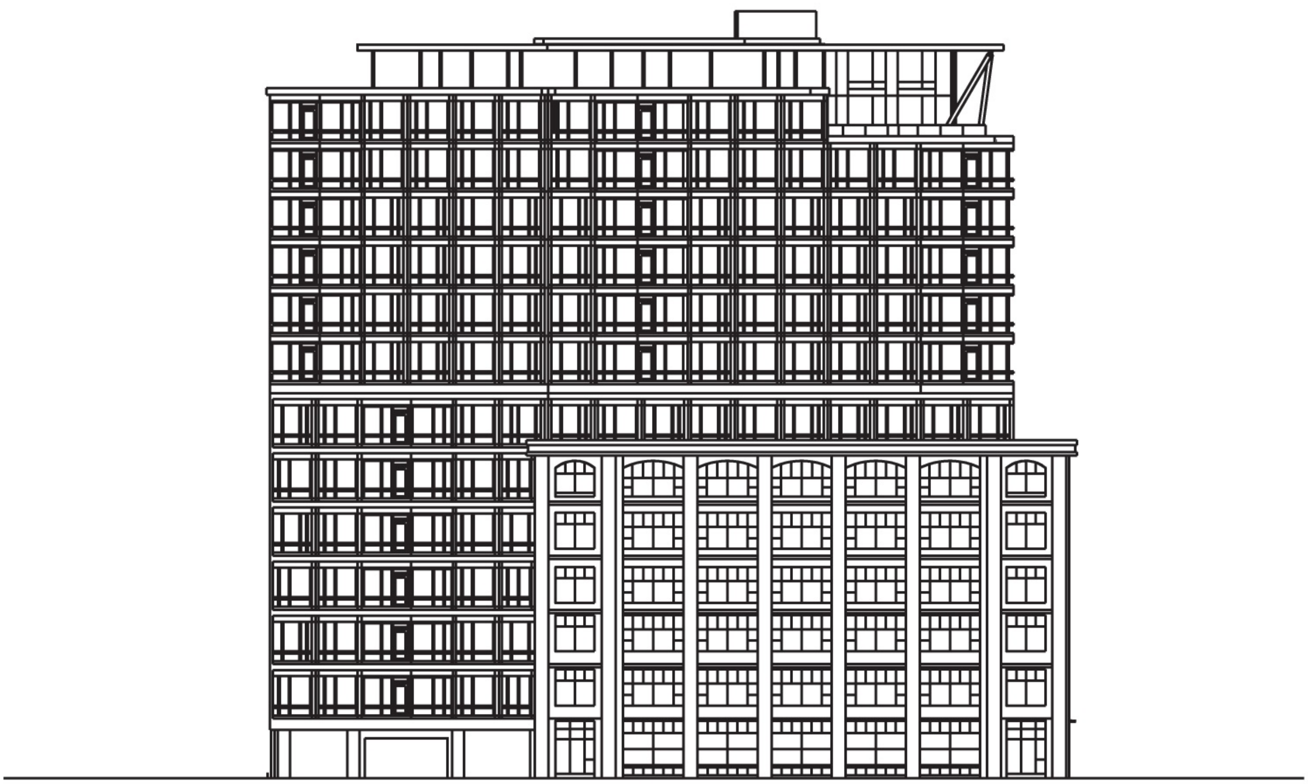
Figure 1-5

Proposed Site Plan

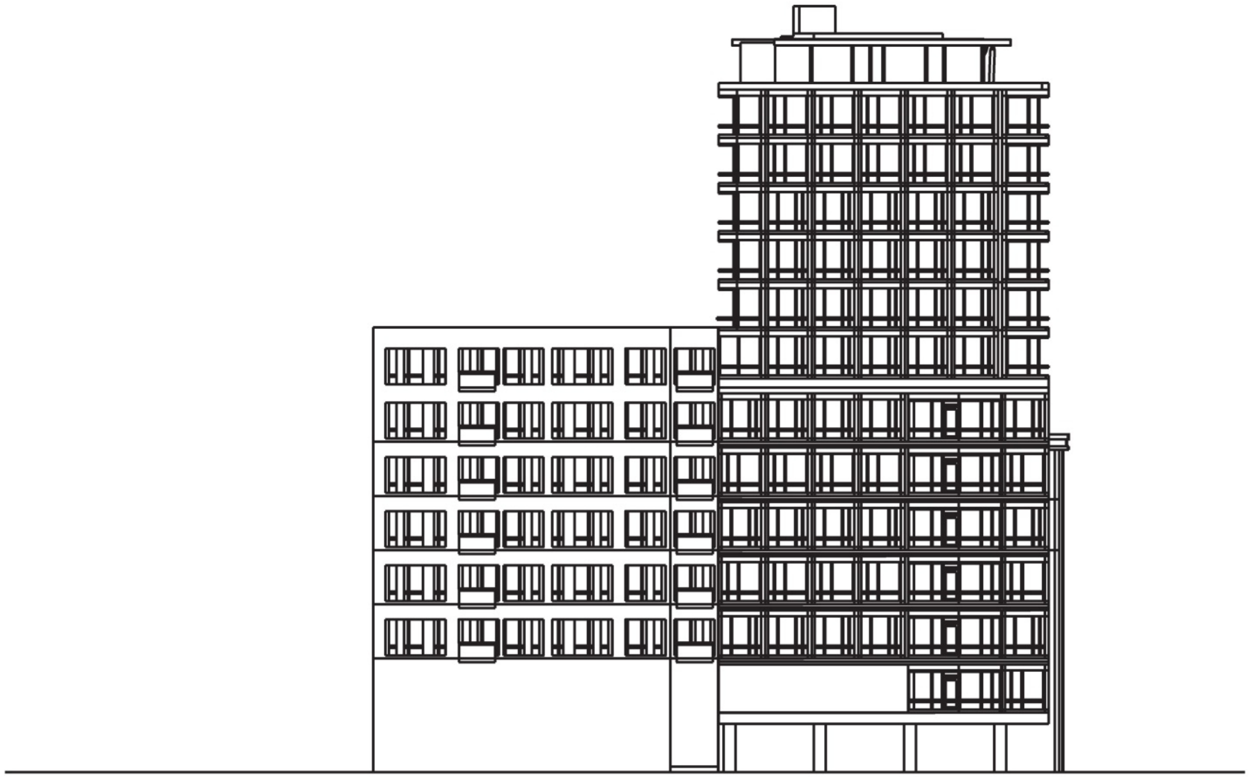
Figure 1-6

Rendered Perspectives

West Elevation

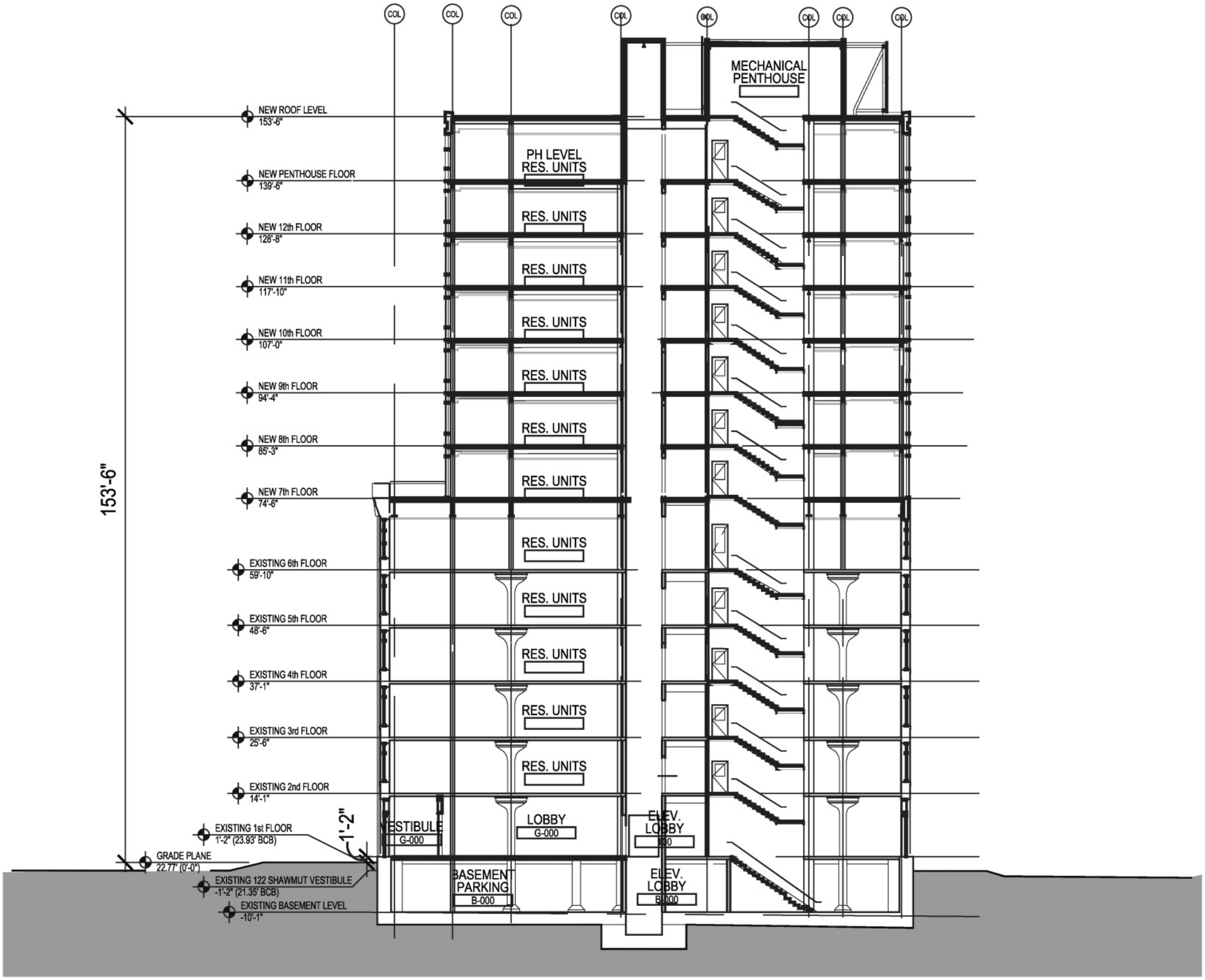


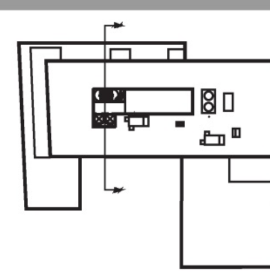
North Elevation



East Elevation

South Elevation





112 Shawmut Avenue   Boston, Massachusetts

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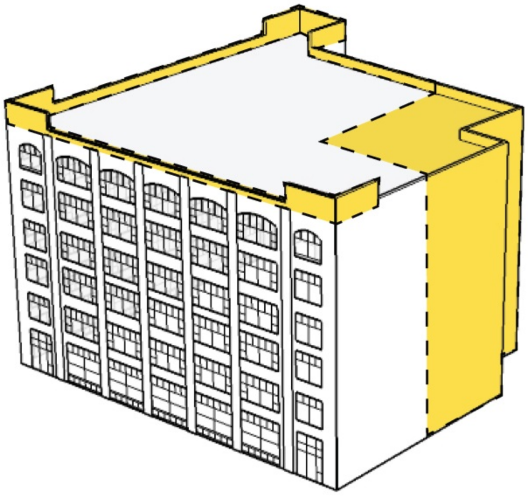
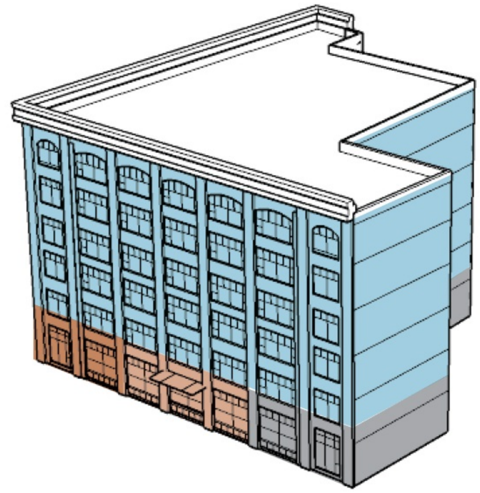
Figure 1-10

Building Section

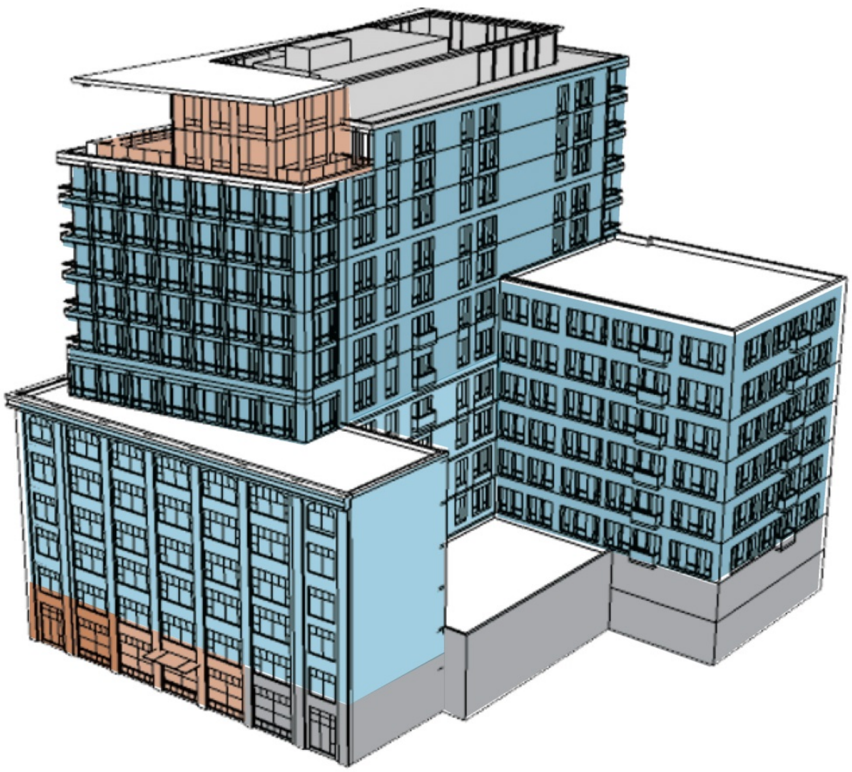
Figure 1-11
Aerial Perspective



Existing Building Selective Demolition



Existing Building Remaining



Proposed Building

Public realm improvements, including new paving, street trees and new plant materials will be provided along Shawmut Avenue and Herald Street to create a more pedestrian-friendly experience in accordance with the City of Boston Complete Streets guidelines. Figures 1-13 to 1-14 include landscape and circulation plans. A south and west-facing roof terrace on the 13th floor and a rooftop terrace at the 9th level will offer views of the Boston skyline, while also providing access to outdoor space for residents. Private balconies and rooftop terraces on the 7th floor will also provide outdoor space for specific units.

Table 1-1 Project Program

Project Element	Approximate Dimension
Residential	191,588 ± sf / 143 ± units
Retail	980 ± sf
Total Square Footage	**192,568 ± sf**
Building Height	150 ± feet
Parking	124 ± spaces

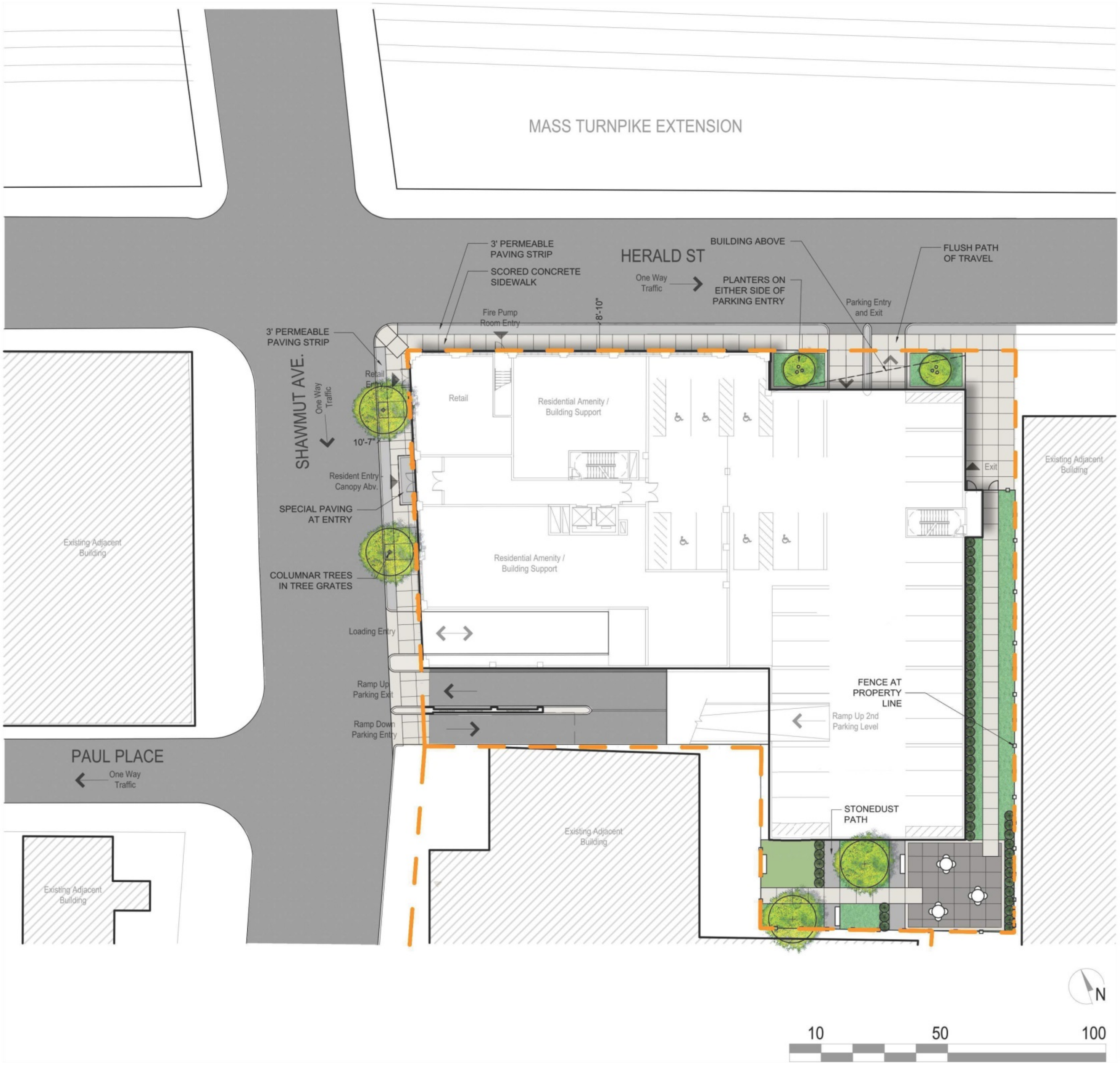
1.2.4 Consistency with the Harrison Albany Corridor Strategic Plan

The Project is located on the far northwest corner of the area addressed in the Harrison Albany Corridor Strategic Plan, which was adopted by the BPDA in 2011. That planning area comprises four distinct sub-areas, with the Project Site located within the New York Streets sub-area. The Strategic Plan describes the vision for this sub-area as follows:

> *"The New York Streets sub-area should emphasize its location as the vital physical and economic link between the City's downtown, Chinatown, and South End neighborhoods with convenient access to South Boston and the regional roadway system. Future development should provide exciting new 18-hour uses within a pedestrian-friendly public realm that includes a finer grain of city blocks that allow for enhanced transportation access and circulation. Non-residential uses should provide new jobs for Boston residents."*

The Project is consistent with the goals stated in the Plan as follows:

- Promoting pedestrian activity in the area from the proposed residential condo owners. These residents will walk to nearby restaurants, businesses and transit at all hours of the day.
- Using density effectively with a residential use to connect the area to Downtown and Chinatown.


MASS TURNPIKE EXTENSION
HERALD ST
One Way Traffic
3' PERMEABLE PAVING STRIP
SCORED CONCRETE SIDEWALK
BUILDING ABOVE
PLANTERS ON EITHER SIDE OF PARKING ENTRY
FLUSH PATH OF TRAVEL
Parking Entry and Exit
Fire Pump Room Entry
8'-10"
3' PERMEABLE PAVING STRIP
SHAWMUT AVE.
One Way Traffic
Retail Entry
10'-7"
Resident Entry - Canopy Abv.
SPECIAL PAVING AT ENTRY
COLUMNAR TREES IN TREE GRATES
Loading Entry
Ramp Up Parking Exit
Ramp Down Parking Entry
Retail
Residential Amenity / Building Support
Residential Amenity / Building Support
Exit
FENCE AT PROPERTY LINE
Ramp Up 2nd Parking Level
STONEDUST PATH
Existing Adjacent Building
Existing Adjacent Building
Existing Adjacent Building
Existing Adjacent Building
PAUL PLACE
One Way Traffic
N
10
50
100

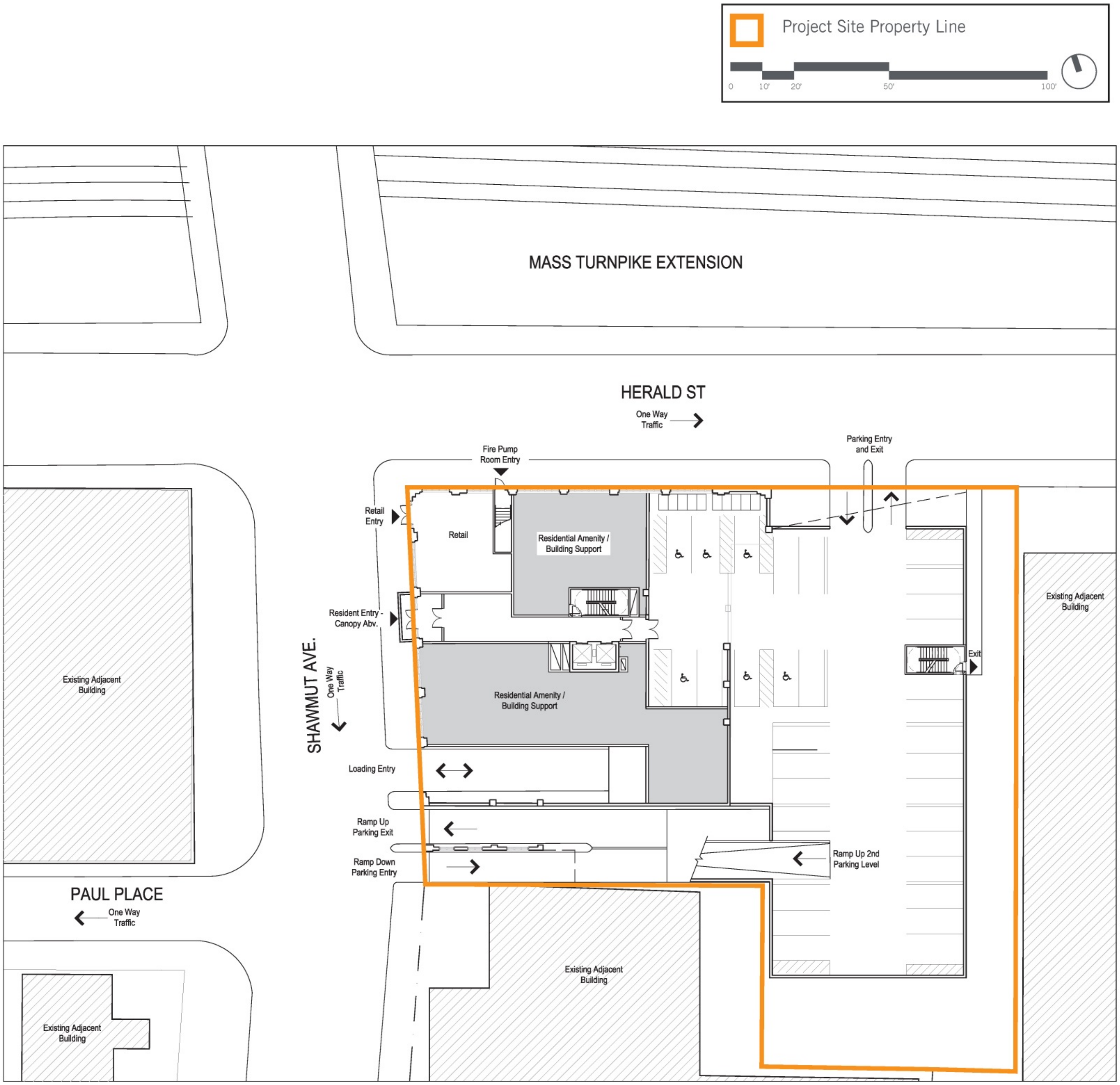


Figure 1-14
Circulation Plan

- Maintaining the existing building's architecture style through adaptive reuse and enhancing it with an architecturally contemporary addition to provide a transformative effect for the neighborhood.

- Creating a pedestrian-friendly streetscape and strong street edge, including a public pedestrian node at the residential building main entrance while integrating adequate service facilities for parking and loading and maintaining vehicular access on the surrounding streets.

- Encouraging the use of alternative methods of transportation, including providing bicycle racks on-site and minimizing on-site parking.

- Enhancing the public realm through landscape design and streetscape improvements along the perimeter streets, Shawmut Avenue and Herald Street, including new landscaped sidewalks with increased width and streetscape improvements.

1.2.5 Evolution of Design

The Project team explored a multitude of massing options for the Project Site, and multiple site factors were considered in developing each of these options: the existing brick building and its vertically oriented façade were determined to be important to maintain and integrate into the design; the location of the Project at the edge of the South End neighborhood adjacent to Herald Street and Interstate 90; and efficient utilization of the deep corner block site.

The Project team began by studying site utilization. Simple additions to the top of the building in conjunction with massing filling the existing surface parking areas yielded a conglomeration of distinct building elements throughout the Project Site, but failed to create a unified site strategy. The removal of some of the existing structure facing the interior of the Project Site was studied to allow for more efficient use of the site, and to open the rear courtyard to a more pleasing proportion. The increased openness at the interior of the Project Site allowed for the creation of a simplified L-shaped addition that both creates a new identity for the Project and reinforces the character of the brick of the existing façade building, allowing it to control the street presence at the corner of the block. The entire new added mass was then pulled back from the plane of the existing building to reinforce this Project concept.

Along the street facades, early schemes also considered multiple distinct masses added to the existing building. These included a vertically oriented bar attached to the east of the existing building in a rhythm similar to that of the existing building extending to the full allowable height; the Project team also considered aligning with the existing building with a contemporary capping mass finishing out the full height. While interesting, these concepts failed to create the differentiation between existing and new that provides a strong reinforcement of the historic building character on the corner of the Project Site, with the new addition serving as a foil.

At the pedestrian level, the Project design is intended to ease pedestrian travel between the South End neighborhood and Downtown, which tends to utilize the Shawmut Avenue bridge over Interstate 90, by locating curb cuts and access to parking, loading, and service areas away from the Shawmut Avenue/Herald Street corner. Studying the vehicular and pedestrian access started with the single parking and loading entry located on the Herald Street side of the Project Site. As the design developed, the design moved to diffuse the vehicular traffic between both sides of this corner site and thus lessening the intensity of vehicle traffic at both streets, and pushing the vehicle access points toward the lot lines which will free the corner for comfortable pedestrian travel.

1.3 Public Benefits

The Project will generate many public benefits for the surrounding neighborhood and the City of Boston as a whole, both during construction and on an ongoing basis upon its completion.

Smart Growth/Transit-Oriented Development

The Project is consistent with smart-growth and transit-oriented development principles. The Project Site is well served by existing public transportation, including nearby rapid transit and bus lines that provide easy access to the Project Site from the Greater Boston region. The Project Site is also located in an area with essential services and amenities for its future residential occupants within easy walking distance.

Affordable Housing

The Project will comply with the City's Inclusionary Development Policy (IDP) by providing a monetary contribution to the City's IDP fund for the development of nearby affordable housing.

Improved Street and Pedestrian Environment

The Project will activate an underutilized site with enhanced streetscapes on both Shawmut Avenue and Herald Street that will include landscaped sidewalks and street trees.

Sustainable Design/Green Building

The Proponent is committed to building a LEED certifiable project with a target of the Silver level, incorporating sustainable design features to minimize energy use, reduce the Project's impact on greenhouse gas emissions, and provide a high-quality environment for residents and the surrounding area and provide for climate resiliency.

Increased Employment

The Project will create approximately 160 construction jobs and permanent jobs related to maintenance, management and operations of the building, including the retail/café space.

New Property Tax

The Project will generate significant property tax revenues and expand the City's tax base substantially from what is presently generated.

1.4 Legal Information

1.4.1 Legal Judgments Adverse to the Proposed Project

To the Proponent's knowledge, there are no legal judgments or actions pending concerning the Project or the Project Site.

1.4.2 History of Tax Arrears on Property

The Proponent owns only the Project Site, and there are no overdue taxes owed the City of Boston with respect to the same.

1.4.3 Site Control/Public Easements

The Proponent acquired the Project Site in July 2015 pursuant to a deed recorded in the Suffolk County Registry of Deeds. There are no public easements which traverse or affect any portion of the Project Site.

1.5 Zoning

1.5.1 Existing Zoning

The Project Site is located within the South End Neighborhood District, which is shown on Map 1P of the Boston Zoning Map. The South End Neighborhood District is governed by Article 64 of the Zoning Code, and the dimensional requirements applicable to the Project Site are as follows:

- Maximum Building Height: 150 feet
- Maximum Floor Area Ratio: 6.5 provided that if the Project is subject to a Planned Development Area Development Plan, the FAR would be 8.0
- Lot Coverage Not more than 80% (for Projects located in Planned Development Areas)

The proposed multi-family dwellings are permitted as of right under the Zoning Code, as would be any potential small ground floor café or retail space. The off-street parking and loading requirements for the Project will be determined through the Article 80B Large Project Review process, consistent with Section 64-36 of the Zoning Code.

1.5.2 Proposed Zoning

In 2016, the Proponent initiated conversations with the owners of the properties adjacent to the Project Site about the possibility of coordinated planning for their respective three parcels of land. The adjacent property owners are the Boston Chinese Evangelical Church (BCEC), which owns the property known as 120 Shawmut Avenue (the BCEC Property), and the Chinese Consolidated Benevolent Association of New England, Inc. (CCBA), which owns the property known as 50 Herald Street (the CCBA Property).

The BCEC Property contains a three-story building that was built as and operated as a nursing home, and which now houses religious uses and uses ancillary thereto, including religious educational and social service programs. The CCBA Property contains a single story building that currently houses a supermarket, and related surface parking. Both the BCEC Property and the CCBA Property are underutilized, and the BCEC Property as currently developed does not meet the growing space needs of BCEC and its congregants.

The Proponent, BCEC and CCBA have discussed a coordinated approach to future development of the three properties that would yield compatible development on each property, as well coordinated streetscape improvements such as street trees, street furniture (benches, bicycle racks) and improved street lighting in this area, which lacks the pedestrian-friendly character that is so characteristic of the South End neighborhood (see Figure 1-12). An important new public amenity associated with the development of the three new projects could be a new east-west pedestrian connection that could be established at the southern boundaries of the CCBA and BCEC properties to provide through-block pedestrian connectivity between Washington Street and Shawmut Street, as well as a private way that can provide service, loading and parking access to the CCBA Property. This new through-block connection could provide a route that connects residents living west of the PDA Area to streets and commercial establishments located to the east. Overall, the three projects would occupy approximately 74% of the total lot area included within the PDA area.

As a result, the three parties—the Proponent, BCEC and CCBA—are collaborating to propound and submit to the BPDA, in accordance with Section 3-1A(a), Section 64-28 and Article 80C of the Code, a Development Plan for a new Planned Development Area that would encompass the three properties and create use, height and density requirements for each of the properties. The proposed Planned Development Area would contain approximately 82,557 sf and each property would have its discrete use, density and height requirements, although the height of each of the buildings would be consistent with the 150-foot height limit prescribed by Article 64 of the Zoning Code.

The currently anticipated projects on the BCEC and CCBA sites are as follows (see also Table 1-2):

- The improvements to be constructed at the BCEC Property are anticipated to consist of either reuse of a portion of the existing former nursing home facility, with a vertical addition thereto, or the construction of a new 11 story structure of approximately 150 feet in Building Height to house two religious sanctuaries, a gymnasium, fitness rooms, office, classroom and meeting space for religious educational, recreational and social services uses, a small (approximately 2,000 sf) ground floor commercial space, and approximately 72 residential units. The building, which is currently estimated to contain 145,000 sf of Gross Floor Area, may also include underground parking for approximately 30 vehicles.

- The improvements to be constructed at the CCBA Property are anticipated to consist of a new building that is 9 stories high at the corner of Herald and Washington Streets, rising to 14 stories further south along Washington Street. The building will be approximately 150 feet in Building Height and contain approximately 302 residential units, together with approximately 14,200 sf of ground floor commercial, retail and/or community space along Washington Street. The building may also include an underground garage accommodating approximately 120 parking spaces.

Table 1-2 Planned Development Area Projects

	Height	Uses	Stories	Gross Square Feet	Residential Units	Parking
112 Shawmut Avenue (Davis Companies)	150'±	Residential; retail/café; accessory parking	13	192,568± sf	143±	124± spaces
50 Herald Street (CCBA)[1]	150'±	Residential; retail, community and/or commercial; accessory parking	9-14±	261,000± sf	302±	120± spaces
120 Shawmut Avenue (BCEC) (Assumes development of new building)[1]	150'±	Religious; religious educational, social services and office uses; residential; and accessory parking	11±	145,000± sf	72±	30± spaces

1 At this time, no formal filing with the BPDA under Article 80B of the Zoning Code has been made for either the proposed BCEC project or the proposed CCBA project; those project filings will be made by BCEC and CCBA, respectively, at such time when each such organization is prepared to move forward with their respective potential project.

In accordance with Section 3-1A(a), of the Code, the Development Plan would set forth information on the development of projects on each of the project sites, the BCEC Property and the CCBA Property, including the proposed location and appearance of structures, open spaces and landscaping, the proposed uses and densities of such structures, the proposed traffic circulation, the proposed parking and loading facilities, and access to public transportation.

The Development Plan would also provide information on the development of the proposed projects on the BCEC Property and the CCBA Property. The projects on the BCEC Property and the CCBA Property will undergo separate future Article 80B Large Project Review by the BPDA.

The Development Plan will be submitted to the BPDA for public agency and community review as determined by the three Co-Proponents and the BPDA. Following a public review process and the BPDA's approval of the Project pursuant to Article 80B of the Zoning Code, as well as the approval of the Development Plan by the BPDA, the Boston Zoning Commission and the Mayor pursuant to Article 80C of the Zoning Code, the final plans and specifications for the Project will be submitted to the BPDA for its review and approval as to consistency with the provisions of Development Plan applicable to the Project Site.

It should be noted that at this time, no formal filing with the BPDA under Article 80B of the Zoning Code has been made for either the proposed BCEC project or the proposed CCBA project; those project filings will be made by BCEC and CCBA, respectively, at such time when each such organization is prepared to move forward with their respective potential project.

1.6 Anticipated Permits and Approvals

Table 1-3 includes a preliminary list of local, state and federal permits and approvals that may be required for the Project. This list is based upon current information about the Project, and is subject to change as the design and program of the Project evolves. Some of the permits and approvals listed may not be required, while there may be others not listed that will be needed.

Table 1-3 Anticipated Permits and Approvals

Agency Name	Permit / Approval
Federal	
Federal Aviation Administration	Determination of No Hazard to Air Navigation (cranes)
U.S. Environmental Protection Agency	National Pollution Elimination Discharge System Notice of Intent

Table 1-3 Anticipated Permits and Approvals (Continued)

Agency Name	Permit / Approval
State	
Massachusetts Department of Environmental Protection	Construction Notice
Local	
Boston Planning & Development Agency	Article 80B Large Project Review; potential recommendation of Planned Development Area and related map amendment
Boston Civic Design Commission	Design Review
Boston Zoning Commission	Potential Planned Development Area Development Plan approval and related map amendment
Public Improvement Commission	Specific Repairs, Canopy License, Earth Retention System approvals
Boston Water & Sewer Commission	Site Plan Approval and related approvals
South End Landmark District Commission	Certificate of Design Approval (Protection Area)
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Committee on Licenses, Public Safety Commission	Garage Permit and Fuel Storage License
Inspectional Services Department	Building Permit Certificate of Occupancy

1.7 Public Participation

The Proponent and its Project team have met with elected officials, the City of Boston, abutters, neighborhood groups and other interested parties to discuss the Project. The Project team will continue to meet with the community and others as the Project moves forward in the Article 80B review process.

1.8 Schedule

Construction is anticipated to commence in the first quarter of 2018, with construction completion anticipated in the third quarter of 2019.

1.9 Project Identification and Team

Address/Location: 112 Shawmut Avenue, South End

Proponent:	DIV Shawmut, LLC, an affiliate of The Davis Companies 125 High Street, 21st Floor Boston, MA 02110 (617) 451-1300 Brian Fallon Dante Angelucci Jason Tilley
Architect:	The Architectural Team, Inc. 50 Commandant's Way at Admiral's Hill Chelsea, MA 02150 (617) 889-4402 Michael Liu Jason Gier
Legal Counsel:	Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. One Financial Center Boston, MA 02111 (617) 348-3009 Rebecca A. Lee, Esq.
Permitting and Historic Resources Consultants:	Epsilon Associates, Inc. 3 Mill & Main Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Cindy Schlessinger Geoff Starsiak
Transportation Consultant and Civil Engineer:	Howard Stein Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080 Brian Beisel Richard Latini

Chapter 2

Transportation

2.0 TRANSPORTATION

2.1 Introduction

Howard Stein Hudson (HSH) has conducted an evaluation of the transportation impacts of the proposed redevelopment of the Project Site. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and requirements of the Article 80 Large Project Review process. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, loading operations, transit services, and bicycle and pedestrian activity.

2.1.1 Project Description

The 112 Shawmut Avenue parcel consists of an approximately 70,000 sf, six-story building with an adjacent accessory parking lot.

The Project consists of the redevelopment and an addition to the existing structure to include approximately 143 residential units, approximately 124 parking spaces, and approximately 980 sf of ground floor commercial/retail space. The Project will include bicycle storage on site that will store approximately 143 bicycles. The Project will include a loading bay accessed from Shawmut Avenue to accommodate all loading, retail deliveries, and move-in/move-out activity at the Project.

2.1.2 Study Methodology

The Existing (2017) Condition analysis includes an inventory of the existing transportation conditions such as traffic characteristics, parking, curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site conditions. Existing counts for vehicles, bicycles, and pedestrians were collected at the study area intersections. A traffic data collection effort forms the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analyses evaluate potential transportation impacts associated with the Project. The long-term transportation impacts are evaluated for the year 2024, based on a seven-year horizon from the year of the filing of this traffic study.

The No-Build (2024) Condition analysis includes general background traffic growth, traffic growth associated with specific developments (not including this Project), and transportation improvements that are planned in the vicinity of the Project Site.

The Build (2024) Condition analysis includes a net increase in traffic volume due to the addition of Project-generated trip estimates to the traffic volumes developed as part of the No-Build (2024) Condition analysis. The transportation study identifies expected roadway, parking, transit, pedestrian, and bicycle accommodations, as well as loading capabilities and deficiencies.

The final part of the transportation study identifies measures to mitigate Project-related impacts and to address any traffic, pedestrian, bicycle, transit, safety, or construction related issues that are necessary to accommodate the Project.

An evaluation of short-term traffic impacts associated with construction activities is also provided.

2.1.3 Study Area

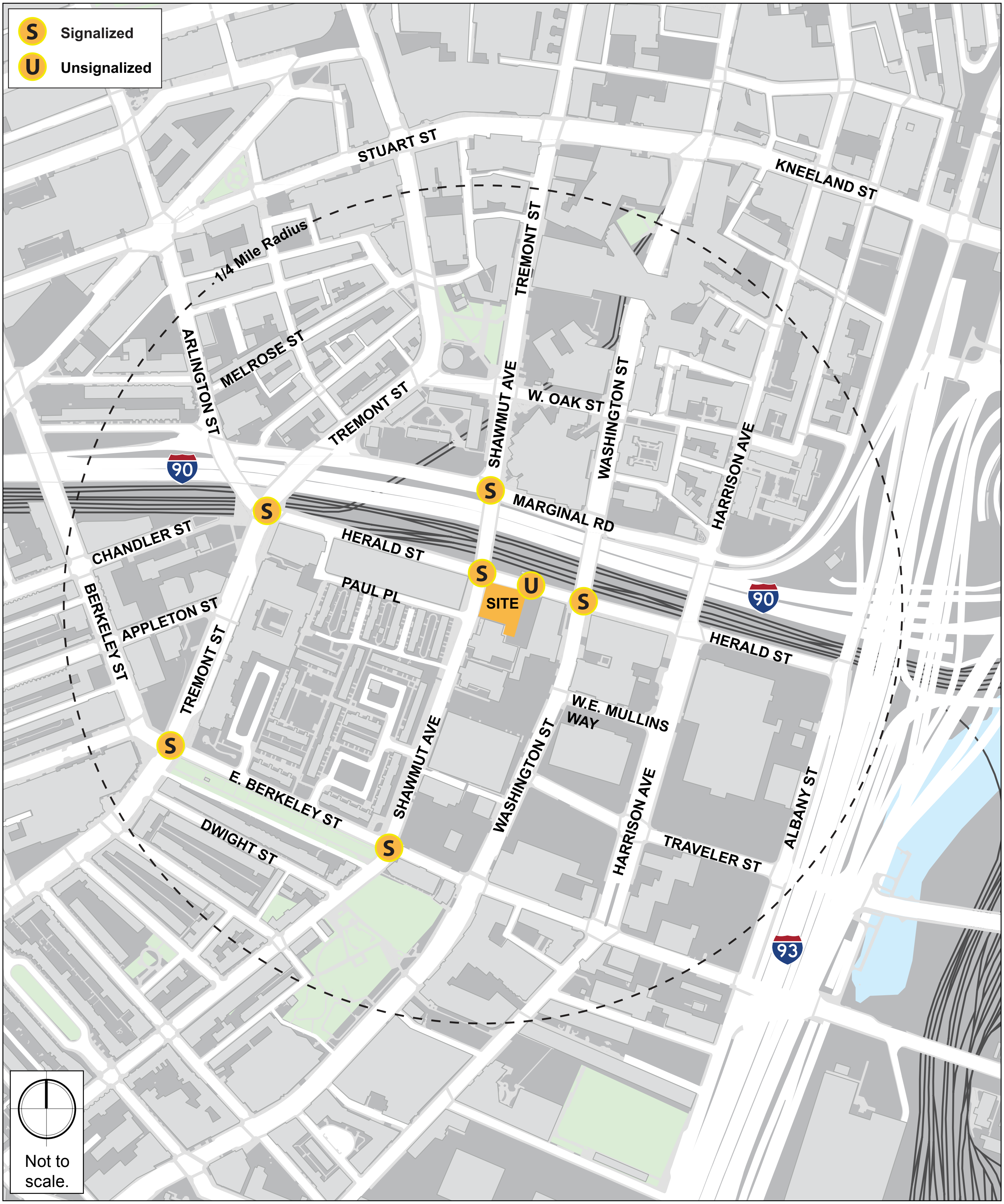
The transportation study area consists of Herald Street to the north, Washington Street to the east, East Berkeley Street to the south, and Tremont Street to the west, including the following seven intersections:

- Arlington Street/Herald Street/Tremont Street (signalized);
- Herald Street/Shawmut Avenue (signalized);
- Herald Street/Site Driveway (unsignalized);
- Herald Street/Washington Street (signalized);
- East Berkeley Street/Shawmut Avenue (signalized);
- Tremont Street/East Berkeley Street/Berkeley Street (signalized); and
- Shawmut Avenue/Marginal Road (signalized).

The study area is shown in Figure 2-1.

2.2 Existing (2017) Condition

This section includes descriptions of existing study area roadway geometries, intersection geometry and traffic control, parking and curbs usage, public transportation services, peak-hour traffic volumes for vehicles, bicycles, and pedestrians, and intersection traffic operations.



112 Shawmut Avenue Boston, Massachusetts

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Figure 2-1
Study Area Intersections

2.2.1 Existing Roadway Conditions

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

Arlington Street is a one-way southbound, three-lane roadway located west of the Project Site and runs in a north-south direction between Beacon Street to the north and Tremont Street to the south. Arlington Street is classified as an urban principal arterial roadway under BTD jurisdiction. In the vicinity of the Project Site, on-street parking is restricted on both sides of Arlington Street. Sidewalks are provided on both sides of the roadway.

Herald Street is a one-way eastbound, three-lane roadway adjacent to the north side of the Project Site. Herald Street generally runs in an east-west direction between Tremont Street to the west and Albany Street to the south. Herald Street is classified as an urban principal arterial roadway under BTD jurisdiction. In the vicinity of the Project Site, on-street parking is restricted on both sides of the roadway. Sidewalks are provided on both sides of the roadway; however, the sidewalk on the northern side is only approximately three feet wide.

Tremont Street is a two-way, four lane roadway located to the west of the Project Site. Tremont Street generally runs in a north-south direction between Government Center to the north and Roxbury to the south. Tremont Street is classified as an urban principal arterial roadway in the vicinity of the Project Site and is under BTD jurisdiction. In the vicinity of the Project Site, metered on-street parking is provided on both sides of the roadway. Sidewalks are provided on both sides of Tremont Street.

Shawmut Avenue is a one-way southbound, two-lane roadway located adjacent to the west side of the Project Site. Shawmut Avenue generally runs in a north-south direction between Oak Street to the north and Malcolm X Boulevard to the south. Shawmut Avenue is classified as an urban minor arterial roadway under BTD jurisdiction. In the vicinity of the Project Site, two-hour parking is provided along both sides of the roadway. Sidewalks are provided on both sides of Shawmut Avenue.

Washington Street is a two-way, four lane roadway located to the east of the Project Site that generally runs in a north-south direction between downtown Boston to the north and the outer Boston neighborhoods to the south. Washington Street is classified as an urban principal arterial roadway under BTD jurisdiction. Washington Street has a dedicated bus lane in both the northbound and southbound directions. In the vicinity of the Project Site, there is one southbound bus only lane and three northbound lanes, one of which is a bus only lane. On-street parking is provided on the east side of the roadway. Sidewalks exist on both sides of the roadway.

East Berkeley Street is a one-way westbound, three lane roadway located south of the Project Site and generally runs in an east-west direction between the I-93 NB Frontage Road to the east and Tremont Street to the west. East Berkeley Street is classified as an urban principal roadway under BTD jurisdiction. In the vicinity of the Project Site, peak hour restricted on-street parking is provided along both sides of the roadway. Sidewalks are provided on both sides of the roadway.

Marginal Road is a one-way westbound, two lane roadway located to the north side of the Project Site and generally runs in an east-west direction between Harrison Avenue to the east and Arlington Street to the west. Marginal Road is classified as an urban minor arterial roadway under BTD jurisdiction. Metered on-street parking is provided on the south side of the roadway, and resident permit parking on the north side of the roadway. Sidewalks are provided on both sides of Marginal Road.

2.2.2 Existing Intersection Conditions

The existing study area intersections are described below. Intersection characteristics such as traffic control, lane usage, pedestrian facilities, pavement markings, and adjacent land use are described.

Arlington Street/ Herald Street/Tremont Street is a four-legged, signalized intersection with three approaches. The Arlington Street eastbound approach consists of an exclusive left-turn lane, two exclusive through lanes and a shared through/right-turn lane. The Tremont Street northbound approach consists of an exclusive through lane and a shared through/right-turn lane. The Tremont Street southbound approach consists of a shared left-turn/through lane and an exclusive through lane. Sidewalks are provided along all approaches. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

Herald Street/Shawmut Avenue is a four-legged, signalized intersection with two approaches. The Herald Street eastbound approach consists of two exclusive through lanes and a shared through/right-turn lane. The Shawmut Avenue southbound approach consists of a shared left-turn/through lane and an exclusive through lane. Sidewalks are provided along all approaches. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

Herald Street/Site Driveway is a two-legged, unsignalized intersection with two approaches. The Herald Street eastbound approach consists of two through lanes and a shared through/right-turn lane. The Site Driveway northbound approach consists of a right-turn only lane. Sidewalks are provided along all approaches. Crosswalks and wheelchair ramps are not provided across any of the approaches to the intersection.

Herald Street/Washington Street is a four-legged, signalized intersection with three approaches. The Herald Street eastbound approach consists of a left-turn/through lane, and two through lanes. The Washington Street northbound approach consists of two through lanes and a right-turn lane. The Washington Street southbound approach consists of a bus-only lane. Sidewalks are provided along all approaches. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

East Berkeley Street/Shawmut Avenue is a four-legged, signalized intersection with three approaches. The East Berkeley Street westbound approach consists of three through lanes. The Shawmut Avenue northbound approach consists of a left-turn only lane. The Shawmut Avenue southbound approach consists of a right-turn only lane. Sidewalks are provided along all approaches. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

Tremont Street/East Berkeley Street/Berkeley Street is a four-legged, signalized intersection with four approaches. The Berkeley Street eastbound approach consists of a left-turn lane and a right-turn lane. The East Berkeley Street westbound approach consists of a left-turn lane, a through lane, and a shared through/right-turn lane. The Tremont Street northbound approach consists of a shared left-turn/through lane and a through lane. The Tremont Street southbound approach consists of a through lane and a shared through/right-turn lane. Sidewalks are provided along all approaches. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

Shawmut Avenue/Marginal Road is a four-legged, signalized intersection with two approaches. The Marginal Road westbound approach consists of a shared left-turn/through lane and an exclusive through lane. The Shawmut Avenue southbound approach consists of an exclusive through lane and a shared through/right-turn lane. Sidewalks are provided along all approaches. Crosswalk, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

2.2.3 Existing Parking and Curb Use

On-street parking surrounding the Project Site generally consists of residential, metered, and commercial parking. The on-street parking regulations within the study area are shown in Figure 2-2.

2.2.4 Car and Bicycle Sharing Services

Car sharing services enable easy access to short-term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to one of the service's designated locations. Pick-up/drop-off locations are typically in existing parking lots or other parking areas throughout neighborhoods as a convenience to users of the services. Nearby car sharing services provide an important transportation option and reduce the need for private vehicle ownership.

One major car sharing service with vehicle locations near the Project Site is Zipcar. There are currently three Zipcar locations within a quarter-mile walk of the Project Site. The nearest car sharing location to the Project Site is at the Ink Block (300 Harrison Avenue) located one block to the east of the Project Site.

The Project Site is also located in proximity to a bicycle sharing station provided by Hubway. Hubway is the Boston area's bicycle sharing service, which was launched in 2011 and currently consists of more than 1,600 shared bicycles at more than 160 stations throughout Boston, Brookline, Cambridge, and Somerville. The nearest Hubway station to the Project Site is located at the intersection of Harrison Avenue/Herald Street at Ink Block. The nearby car and bicycle sharing locations within a quarter-mile of the Project Site are shown in Figure 2-3.

2.2.5 Existing Bicycle Conditions

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project Site is conveniently located in close proximity to several bicycle facilities. The City of Boston's 2013 "Bike Routes of Boston" map designates Arlington Street and Herald Street as advanced routes, suitable for experienced and traffic-confident cyclists. Neither street has bicycle markings on the roadway.

Washington Street, Tremont Street, and East Berkeley Street are designated as intermediate routes, suitable for riders with some on-road experience, and the roadway is marked with bicycle sharrows. Shawmut Avenue is designated as beginner route, suitable for newer riders with limited on-road experience.

Bicycle counts were conducted concurrent with the vehicular turning movement counts (TMCs) and are presented in Figure 2-4.

2.2.6 Existing Pedestrian Conditions

Sidewalks are provided along all roadways in the study area, and are generally in good condition. Crosswalks and pedestrian signal equipment are provided at all study area intersections.

To determine the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersections and are presented in Figure 2-5.

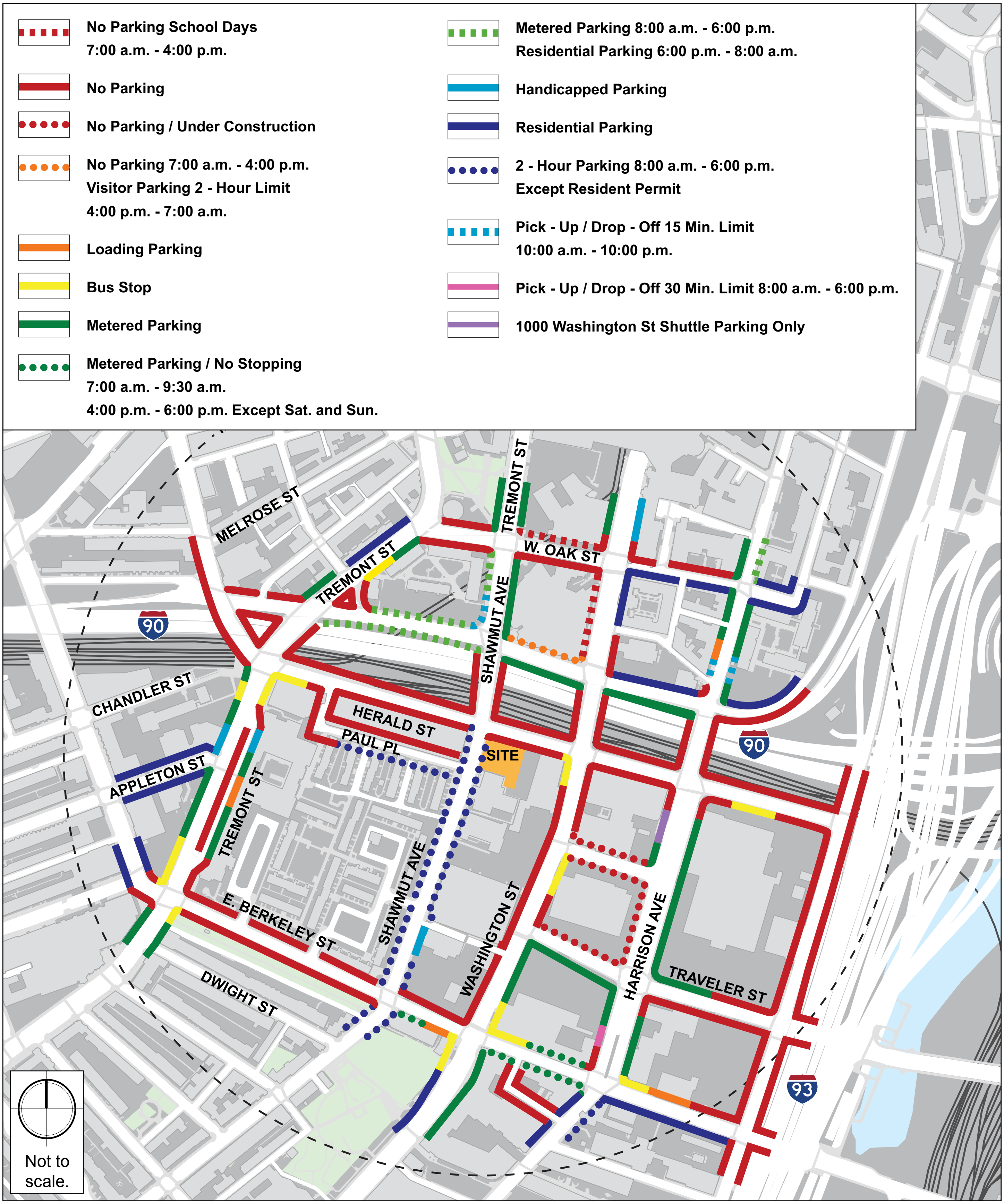

Figure 2-2
On-Street Parking

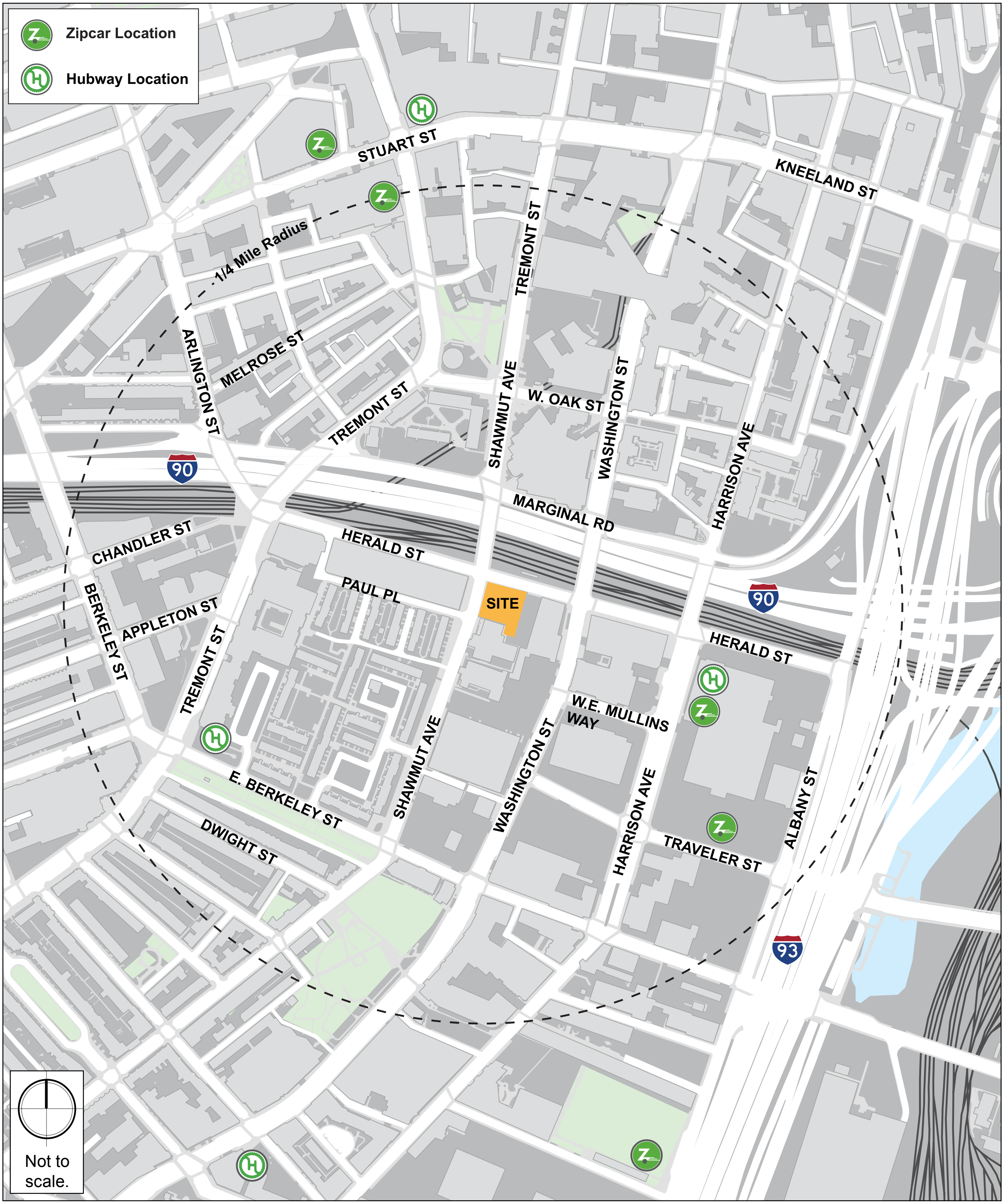

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Figure 2-3
Car and Bicycles Sharing Services

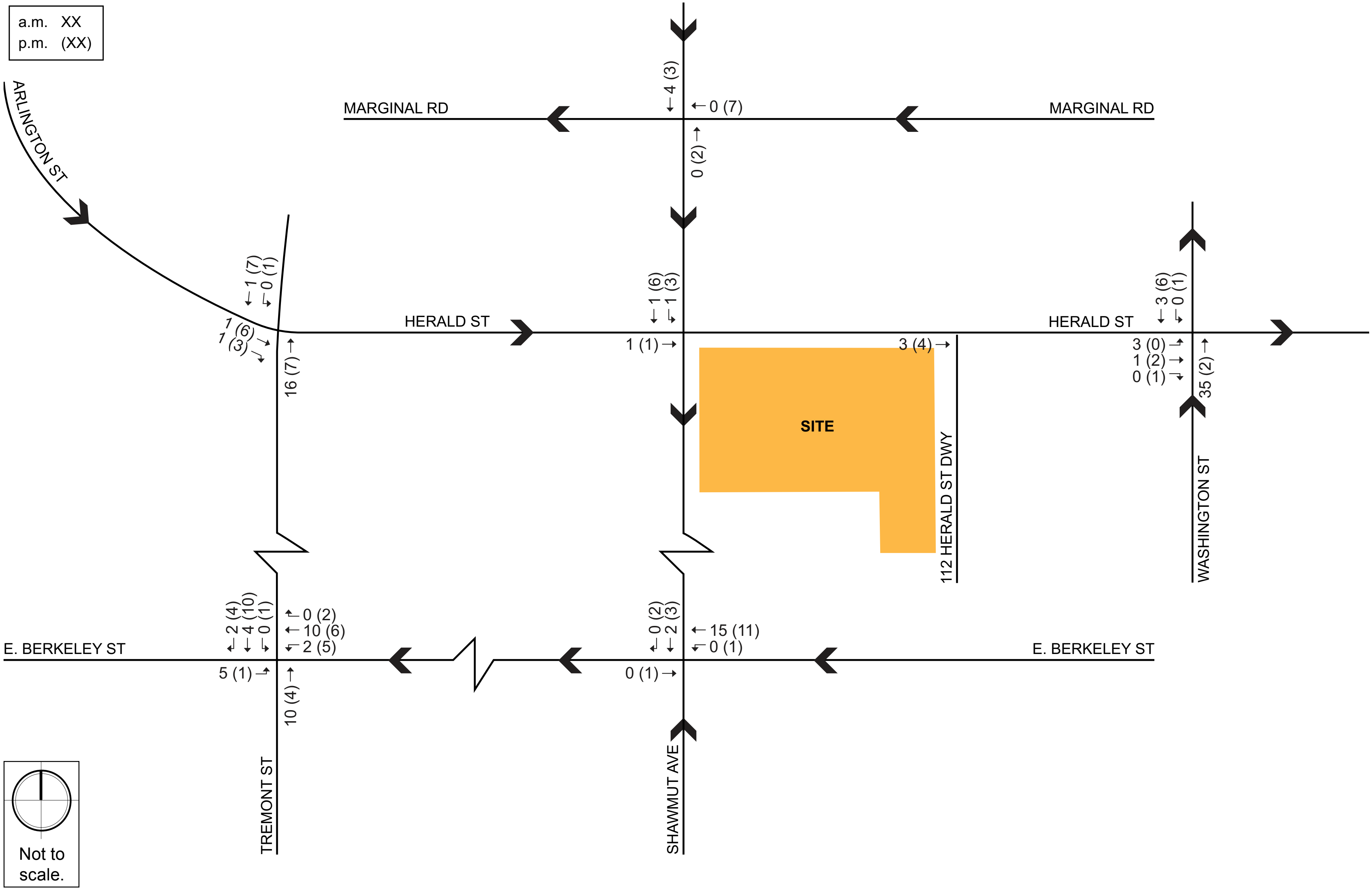

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Figure 2-4

Existing (2017) Condition Bicycles Volumes, Weekday a.m. and p.m. Peak Hours

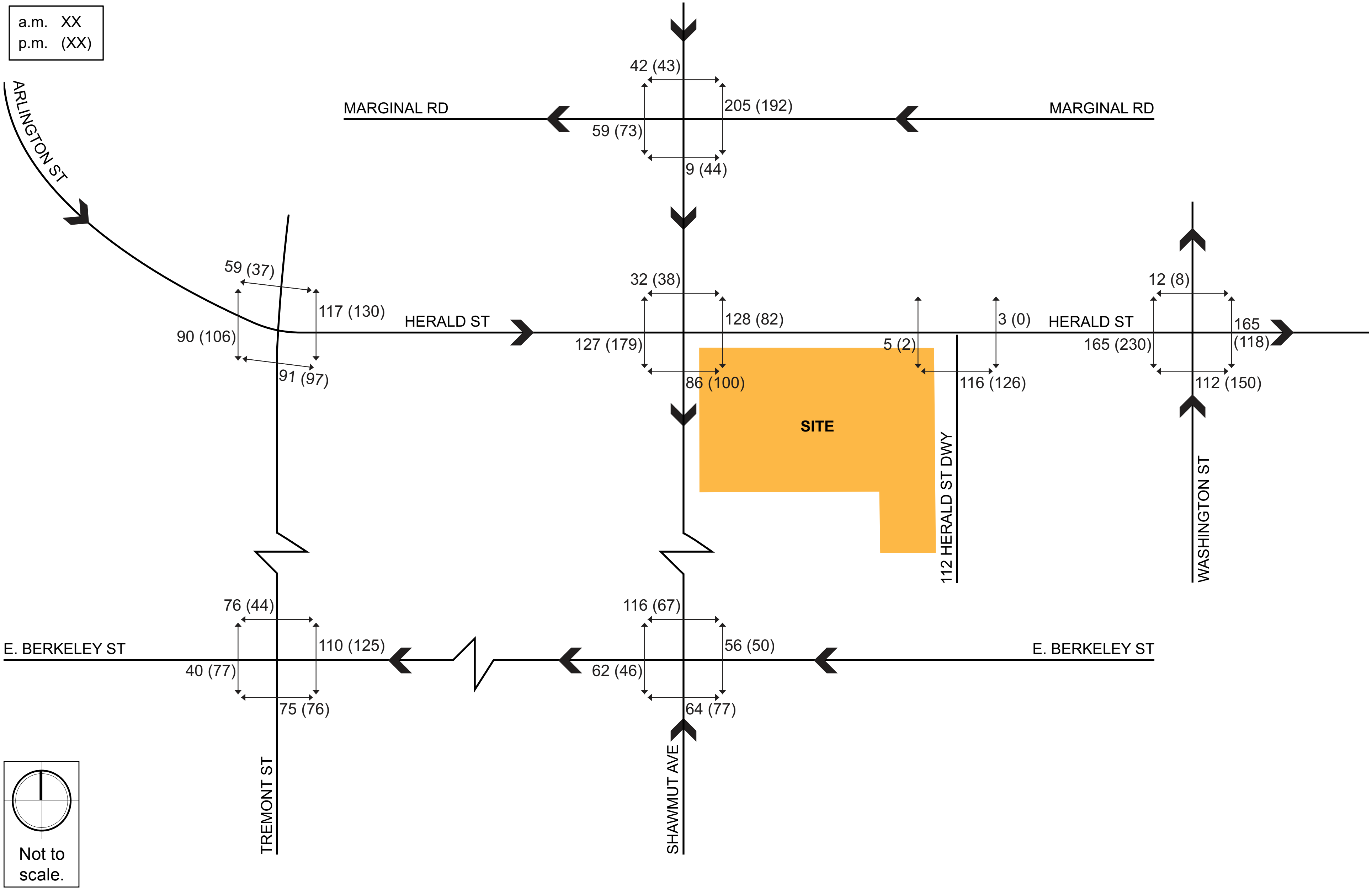

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Figure 2-5

Existing (2017) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hours

2.2.7 Existing Public Transportation

The area around the Project Site is well-served by public transportation. The MBTA's Silver Line, Green Line, Orange Line and several bus lines are located in proximity to the Site and provide access throughout the city. The closest Green Line station, Boylston Street, is 0.4 miles away and serves all of the Green Line's branches. The closest Orange Line stations, Tufts Medical Center and Chinatown, are less than 0.25 miles away. The Orange Line runs between Oak Grove Station in Malden to Forest Hills Station in Jamaica Plain. The closest Silver Line station is located just east of the Project Site at the intersection of Washington Street/Herald Street, providing easy access to downtown, South Station, and the South Boston Waterfront.

The MBTA Route 9 bus travels along Arlington Street and Herald Street with bus stops located at the intersections of Arlington Street/Herald Street/Tremont Street and Herald Street/Harrison Avenue. The MBTA Route 11 bus travels along Washington Street to the east of the Project Site with a bus stop located at the intersection of Washington Street/Herald Street. The MBTA Route 43 bus travels along Charles Street and Tremont Street to the west of the Project Site with a bus stop located at the intersection of Tremont Street/Appleton Street and to the east of the intersection of Tremont Street/Marginal Road. The nearby public transit services are shown in Figure 2-6 and summarized in Table 2-1.

Table 2-1 Existing Public Transportation

Transit Service	Description	Peak-Hour Headway (minutes)[1]
	Subway Lines	
Green Line	B Line – Government Center Station – Boston College Station C Line – North Station – Cleveland Circle Station D Line – Government Center Station – Riverside Station E Line – Lechmere Station – Heath Street Station	6
Orange Line	Oak Grove Station – Forest Hills Station	6
	Bus Routes	
Silver Line	Dudley Station – South Station (SL4) or Downtown Crossing (SL5)	5
9	City Point – Copley Square via Broadway Station	4-6
11	City Point – Downtown via Broadway Station	6
43	Ruggles Station – Park Street & Tremont Street via Tremont Street	18-20

1 Headway is the scheduled time between trains or buses. Headways are approximate.
Source: www.mbta.com, January 2017.

2.2.8 Existing Traffic Conditions

2.2.8.1 Turning Movement Counts

Traffic volume data was collected at the study area intersections on January 5, 2017. Traffic TMCs and vehicle classification counts were conducted during the weekday a.m. and weekday p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively). The traffic classification counts included car, heavy vehicle, pedestrian, and bicycle movements. Detailed traffic counts are provided in Appendix B.

2.2.8.2 Seasonal Adjustment

In order to account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the January 2017 TMCs. The seasonal adjustment factor for roadways similar to the study area indicates that average monthly traffic volumes are approximately three percent higher than the traffic volumes that were collected. Therefore, the traffic counts were increased by three percent to reflect average month conditions.

Existing traffic volumes were collected to develop the 2017 Existing Condition vehicular traffic volumes. The Existing (2017) Condition weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown in Figure 2-7 and Figure 2-8, respectively.

The heaviest traffic movements occur along Herald Street eastbound and East Berkeley Street westbound during the peak hours. Both roadways provide access to the regional highway system and are used as primary routes between I-93 and Back Bay, the South End, and other neighborhoods throughout Boston.

2.2.9 Traffic Operations Analysis

Trafficware's Synchro (version 9) software package was used to calculate average delay and associated level of service (LOS) at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. Table 2-2 indicates the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition, with significant traffic delay. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

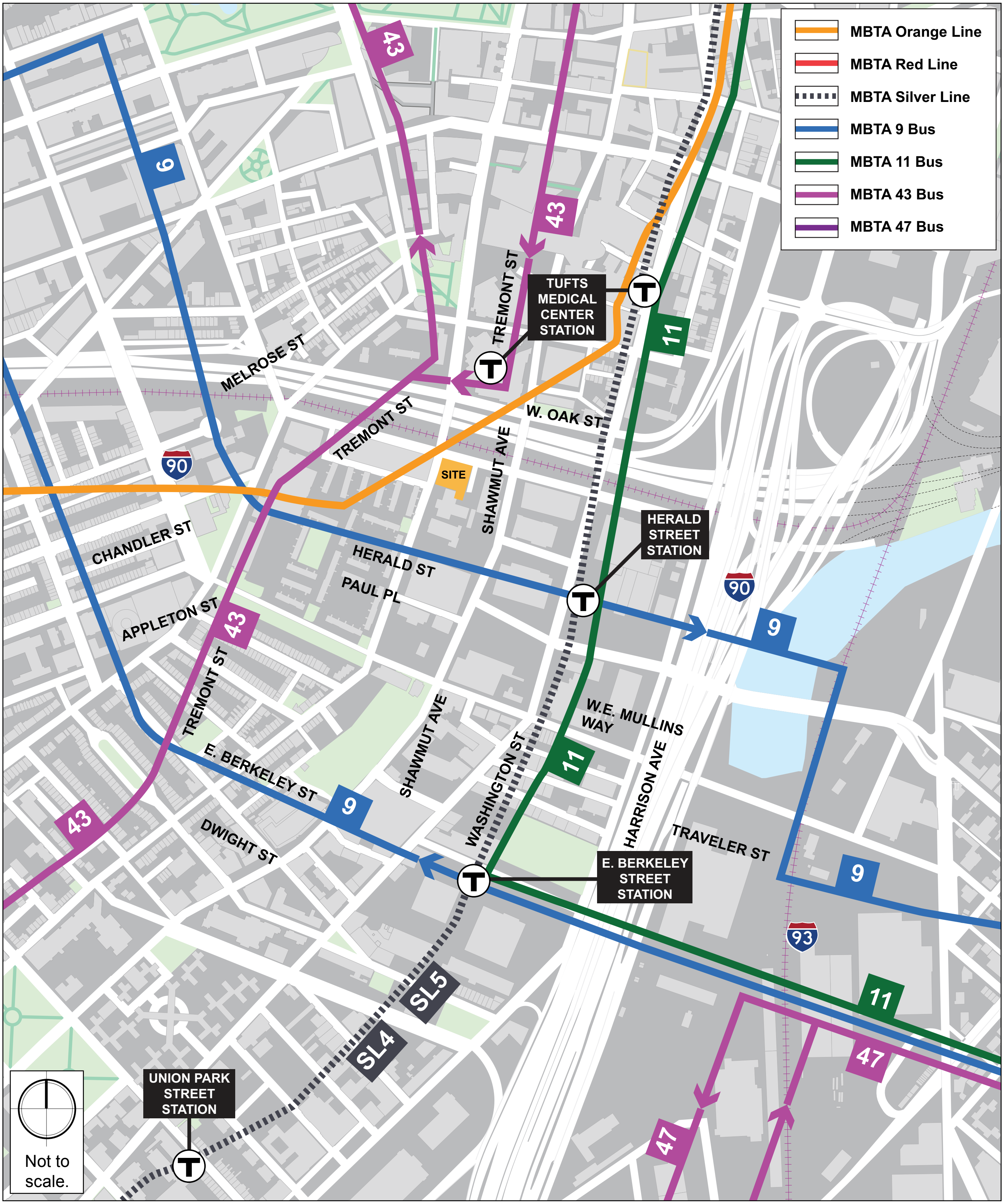

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Figure 2-6
Public Transportation

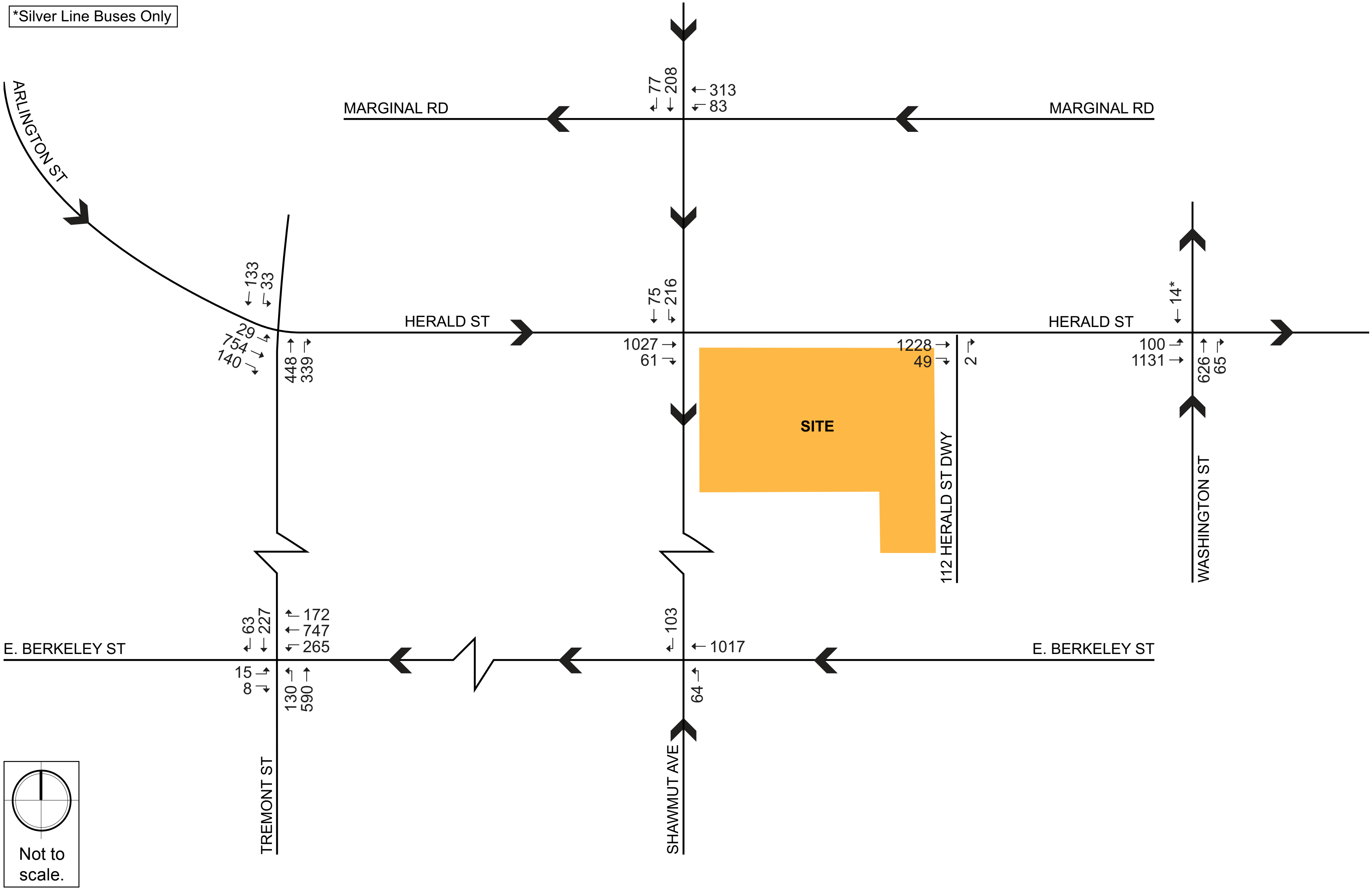

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Figure 2-7

Existing (2017) Condition Traffic Volumes, Weekday a.m. Peak Hour

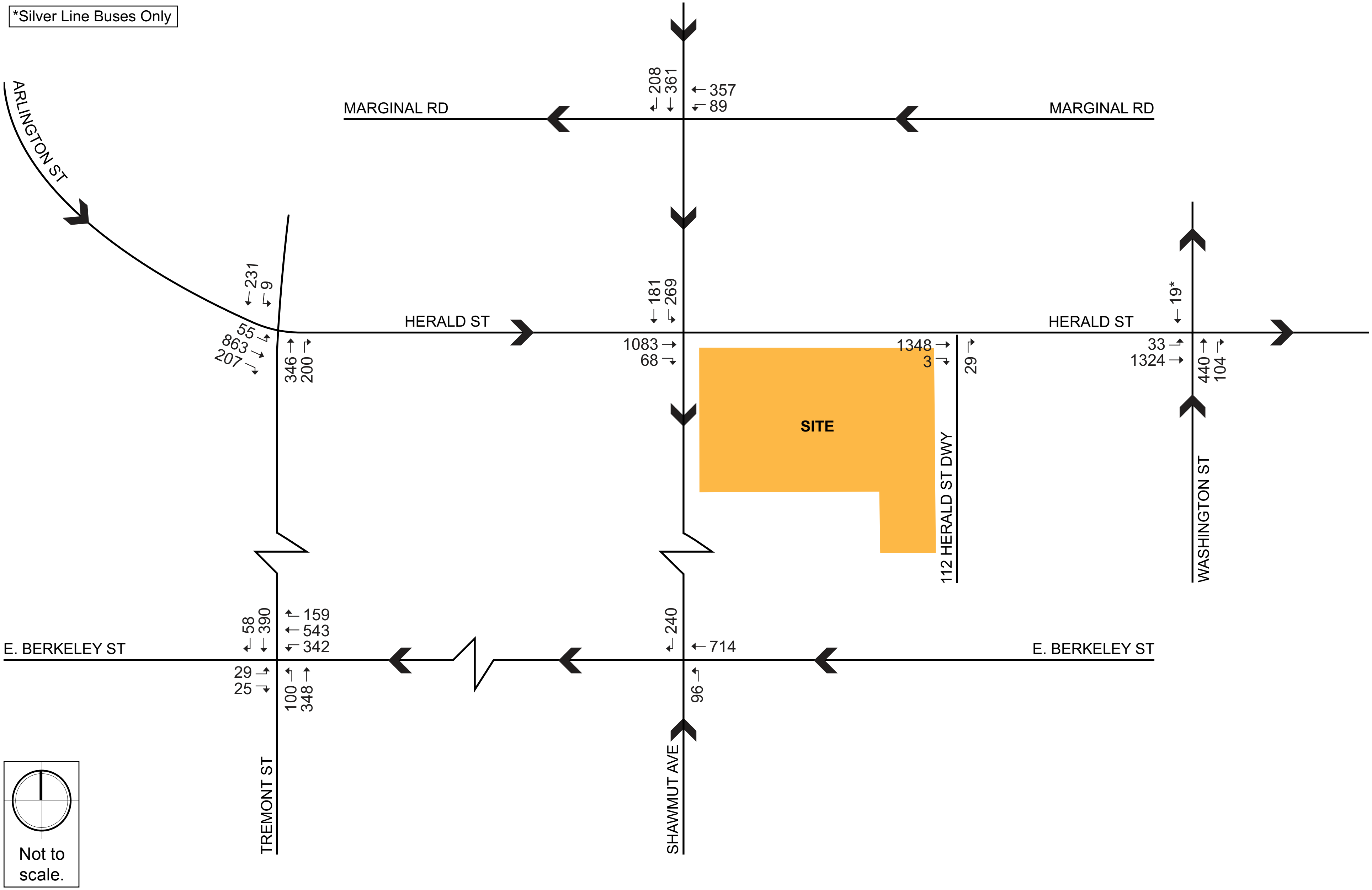

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Figure 2-8
Existing (2017) Condition Traffic Volumes, Weekday p.m. Peak Hour

Table 2-2 Vehicle Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

In addition to delay and LOS, the operational capacity and vehicular queues are calculated and used to further quantify traffic operations at intersections. The following describes these other calculated measures.

The volume-to-capacity (v/c) ratio is a measure of congestion at an intersection approach. A v/c ratio below one indicates that the intersection approach has adequate capacity to process the arriving traffic volumes over the course of an hour. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity.

The 50th percentile queue length, measured in feet, represents the maximum queue length during a cycle of the traffic signal with typical (or median) entering traffic volumes.

The 95th percentile queue length, measured in feet, represents the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line during five percent of all signal cycles. The 95th percentile queue will not be seen during each cycle. The queue would be this long only five percent of the time and would typically not occur during off-peak hours. Since volumes fluctuate throughout the hour, the 95th percentile queue represents what can be considered a “worst case” scenario. Queues at the intersection are generally below the 95th percentile queue throughout the course of the peak hour. It is also unlikely that the 95th percentile queues for each approach to the intersection will occur simultaneously.

2.2.10 Existing (2017) Condition Traffic Operations Analysis

Table 2-3 and Table 2-4 summarize the Existing (2017) Condition capacity analysis for the study area intersection during the weekday a.m. Peak Hour and the weekday p.m. Peak Hour. The detailed analysis sheets are provided in Appendix B.

Table 2-3 Existing (2017) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized					
Arlington Street/Herald Street/Tremont Street	**B**	**18.9**	-	-	-
Arlington Street EB left/thru | thru | thru| thru/right	C	23.9	0.45	129	161
Tremont Street NB thru | thru/right	B	11.5	0.71	140	m138
Tremont Street SB left/thru | thru	C	25.0	0.26	49	70
Herald Street/Shawmut Avenue	**A**	**8.8**	-	-	-
Herald Street EB thru | thru | thru/right	A	8.7	0.51	106	106
Shawmut Avenue SB left | left	A	5.9	0.23	0	0
Shawmut Avenue SB thru | thru	B	18.1	0.08	21	36
Herald Street/Washington Street	**B**	**16.2**	-	-	-
Herald Street EB left/thru | thru | thru	B	13.0	0.69	160	187
Washington Street NB thru | thru	C	22.3	0.56	174	217
Washington Street NB right	B	11.6	0.19	15	42
Washington Street SB thru (Silver Line buses only)	B	16.0	0.05	7	17
East Berkeley Street/Shawmut Avenue	**B**	**10.7**	-	-	-
E Berkeley Street WB thru | thru | thru	B	11.5	0.44	134	163
Shawmut Avenue NB left	A	1.0	0.18	0	0
Shawmut Avenue SB right	A	8.9	0.38	0	0
Tremont Street/East Berkeley Street/Berkeley Street	**E**	**61.7**	-	-	-
Berkeley Street EB left	D	38.1	0.26	9	28
Berkeley Street EB right	A	0.1	0.02	0	0
E Berkeley Street WB left	D	36.2	0.59	174	277
E Berkeley Street WB thru | thru/right	E	79.3	1.06	~369	#500
Tremont Street NB left/thru | thru	E	58.9	0.98	218	#350
Tremont Street SB thru | thru/right	D	41.5	0.51	111	148
Shawmut Avenue/Marginal Road	**B**	**19.6**	-	-	-
Marginal Road WB left/thru | thru	C	20.2	0.33	95	129
Shawmut Avenue SB thru | thru | thru/right	B	18.7	0.20	36	59
Unsignalized					
Herald Street/112 Shawmut Avenue Driveway	-	-	-	-	-
Herald Street EB thru | thru | thru/right	-	0.0	0.30	-	0
112 Shawmut Avenue Driveway NB right	A	9.3	0.01	-	1

\# 95th percentile volume exceeds capacity.
~ 50th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
m = Queue is metered from upstream signal.
Grey shading indicates LOS E or F.

Table 2-4 Existing (2017) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized					
Arlington Street/Herald Street/Tremont Street	**C**	**23.9**	-	-	-
Arlington Street EB left/thru | thru | thru| thru/right	C	22.4	0.49	154	188
Tremont Street NB thru | thru/right	C	25.4	0.57	135	192
Tremont Street SB left/thru | thru	C	27.0	0.28	68	100
Herald Street/Shawmut Avenue	**A**	**7.4**	-	-	-
Herald Street EB thru | thru | thru/right	A	6.7	0.53	76	86
Shawmut Avenue SB left | left	A	1.5	0.30	2	4
Shawmut Avenue SB thru | thru	B	19.9	0.25	30	38
Herald Street/Washington Street	**B**	**11.0**	-	-	-
Herald Street EB left/thru | thru | thru	A	5.6	0.66	59	69
Washington Street NB thru | thru	C	25.6	0.45	119	166
Washington Street NB right	B	18.7	0.32	35	81
Washington Street SB thru (Silver Line buses only)	C	21.2	0.07	10	24
East Berkeley Street/Shawmut Avenue	**A**	**7.8**	-	-	-
E Berkeley Street WB thru | thru | thru	A	8.4	0.67	85	103
Shawmut Avenue NB left	A	1.8	0.29	0	0
Shawmut Avenue SB right	A	8.8	0.63	0	21
Tremont Street/East Berkeley Street/Berkeley Street	**D**	**39.1**	-	-	-
Berkeley Street EB left	E	61.2	0.53	24	51
Berkeley Street EB right	A	0.2	0.06	0	0
E Berkeley Street WB left	D	48.0	0.81	277	388
E Berkeley Street WB thru | thru/right	D	42.6	0.85	292	362
Tremont Street NB left/thru | thru	C	30.2	0.60	147	191
Tremont Street SB thru | thru/right	D	36.8	0.56	183	223
Shawmut Avenue/Marginal Road	**C**	**21.4**	-	-	-
Marginal Road WB left/thru | thru	C	22.3	0.38	112	154
Shawmut Avenue SB thru | thru | thru/right	C	20.7	0.42	93	114
Unsignalized					
Herald Street/112 Shawmut Avenue Driveway	-	-	-	-	-
Herald Street EB thru | thru | thru/right	-	0.0	0.35	-	0
112 Shawmut Avenue Driveway NB right	A	9.0	0.04	-	3

Grey shading indicates LOS E or F.

The signalized intersection of **Tremont Street/East Berkeley Street/Berkeley Street** currently operates at LOS E during the weekday a.m. peak hour and LOS D during the weekday p.m. peak hour. During the a.m. peak hour, the East Berkeley Street westbound through/

through/right lanes and Tremont Street northbound approach operate at LOS E. During the p.m. peak hour, the Berkeley Street eastbound left lane operates at LOS E. All other movements at the intersection operate at LOS D or better.

All movements at the other study area intersections operate under capacity with acceptable levels of service.

2.3 No-Build (2024) Condition

The No-Build (2024) Condition reflects a future scenario that incorporates anticipated traffic volume changes associated with background traffic growth independent of any specific project, traffic associated with other planned specific developments, and planned infrastructure improvements that will affect travel patterns throughout the study area. The No-Build (2024) Condition does not include the Project-related impacts. These infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements.

2.3.1 Background Traffic Growth

The methodology to account for future background traffic growth, independent of large development projects, may be affected by changes in demographics, smaller scale development projects, or projects unforeseen at this time. Based on a review of recent traffic studies conducted for nearby projects and historic traffic data, to account for any additional unforeseen traffic growth a one-half percent per year annual traffic growth rate was used.

2.3.2 Specific Development Traffic Growth

Traffic volumes associated with known, larger or adjacent development projects can affect traffic patterns throughout the study area within the future analysis time horizon. Nearby development projects were identified in the vicinity of the Project and are shown in Figure 2-9. Traffic volumes associated with the following projects were directly incorporated into the future conditions traffic volumes:

- **370-380 Harrison Avenue** – This project, located to the southeast of the Project Site, calls for the construction of a mixed-use building with approximately 314 residential units, 8,500 sf of commercial space, and 180 off-street parking spaces. This project has been approved by the BPDA Board.

- **80 East Berkeley Street** – This project, located to the south of the Project Site, consists of the construction of a 308,000 sf, 11-story building with ground floor retail and 200 parking spaces. This project has been approved by the BPDA Board.

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Figure 2-9
Area Developement Projects

- **321 Harrison Avenue** – This project, located to the east of the Project Site, calls for the construction of 230,000 gross square feet of office space, a new lobby, and pedestrian realm improvements. This project is currently under construction.

- **345 Harrison Avenue** – This project, located to the southeast of the Project Site, calls for the construction of two residential buildings with approximately 585 rental units and 40,000 sf of ground floor retail. This project is currently under construction.

- The Project Site is part of a larger Planned Development Area contemplated to be created. It is envisioned that two additional buildings would be constructed within the proposed Planned Development Area: one proposed building, which would be constructed by CCBA, would consist of approximately 302 residential units, approximately 14,200 sf of retail, commercial and/or community space, and approximately 120 underground parking spaces with access via a new private alley off of Washington Street. The second proposed building, which would be constructed by BCEC, may be either the renovation/addition of the existing structure and/or a new building to consist of approximately 72 residential units, approximately 2,000 sf of ground floor commercial retail space, and a church/community center of approximately 72,846 sf with access via Shawmut Avenue, and approximately 30 underground parking spaces. The BCEC and CCBA projects are described in this EPNF only for illustrative purposes; no formal filings with the BPDA have been made for either project.

Traffic volumes for all other nearby development projects, listed in Table 2-5, are included in the general background traffic growth.

Table 2-5 Other Development Projects in the Project Vicinity

Project	Program Description	Status
Quincy Tower	Unit renovations to the existing 162 residential units; common area and accessibility upgrades	Board Approved
Parcel P-7A	Construction of 23-story, 125,000 sf, 346 room micro hotel	Board Approved
136 Shawmut Avenue	Renovation of former Holy Trinity German Church, 8-story building with 33 residential units and 57,904 sf of residential space	Under Construction
AC Hotel South End	Construction of European-style “select-service” hotel with 200 rooms	Under Construction
Ink Block – Phase III	Construction of last of five buildings at Ink Block, consisting of 76 condominium units and 75 parking spaces	Under Construction
Parcel 24	312 unit/mixed income residential units	Construction Complete

2.3.3 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. Based on this review, the nearby infrastructure projects are listed below.

Harrison Albany Corridor Strategic Plan – The Project Site is located within the Harrison Albany Corridor, which was the focus of a comprehensive planning study adopted by the BPDA in 2011. The Harrison Albany Corridor Strategic Plan includes proposed reconfiguration and improvements to several roadways by the City in the vicinity of the Project Site. These improvements are intended to enhance pedestrian facilities, eliminate some of the one-way roadways in the area, and to provide easier and more efficient vehicular circulation throughout the area. The proposed reconfiguration includes the following changes:

- ♦ Washington Street currently has four travel lanes - two northbound lanes for vehicular travel, one northbound lane designated for bicycles and buses, and one southbound lane designated for bicycles and buses. The City of Boston has plans to reassign the lanes to provide a single lane for vehicles in each direction. The two bus-only lanes will remain and continue to accommodate right turning vehicles.
- ♦ Harrison Avenue is currently being redesigned with a reduced cross section to provide bicycle lanes and turning lanes at driveways and intersections. These modifications will be implemented between Herald Street and East Berkeley Street.
- ♦ Traveler Street will be reconfigured to allow two-way travel between Harrison Avenue and Washington Street. This will require new signal equipment and signal phasing at the intersection of Harrison Avenue/Traveler Street.

These roadway modifications were incorporated into the future conditions traffic analysis.

2.3.4 No-Build (2024) Condition Traffic Volumes

The one percent per year annual growth rate was applied to the Existing (2017) Condition traffic volumes, then the traffic volumes associated with the background development projects listed above were added to develop the No-Build (2024) Condition traffic volumes. The No-Build (2024) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on Figure 2-10 and Figure 2-11, respectively.

2.3.5 No-Build (2024) Condition Traffic Operations Analysis

The No-Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis. Table 2-6 and Table 2-7 present the No-Build (2024) Condition capacity analysis for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in Appendix B. The No-Build conditions incorporate the planned roadway and circulation modifications to Washington Street, Harrison Avenue, and Traveler Street. Information related to the future roadway conditions, including expected traffic patterns, traffic signal timings, and changes in lane usage were provided by the BPDA and BTD.

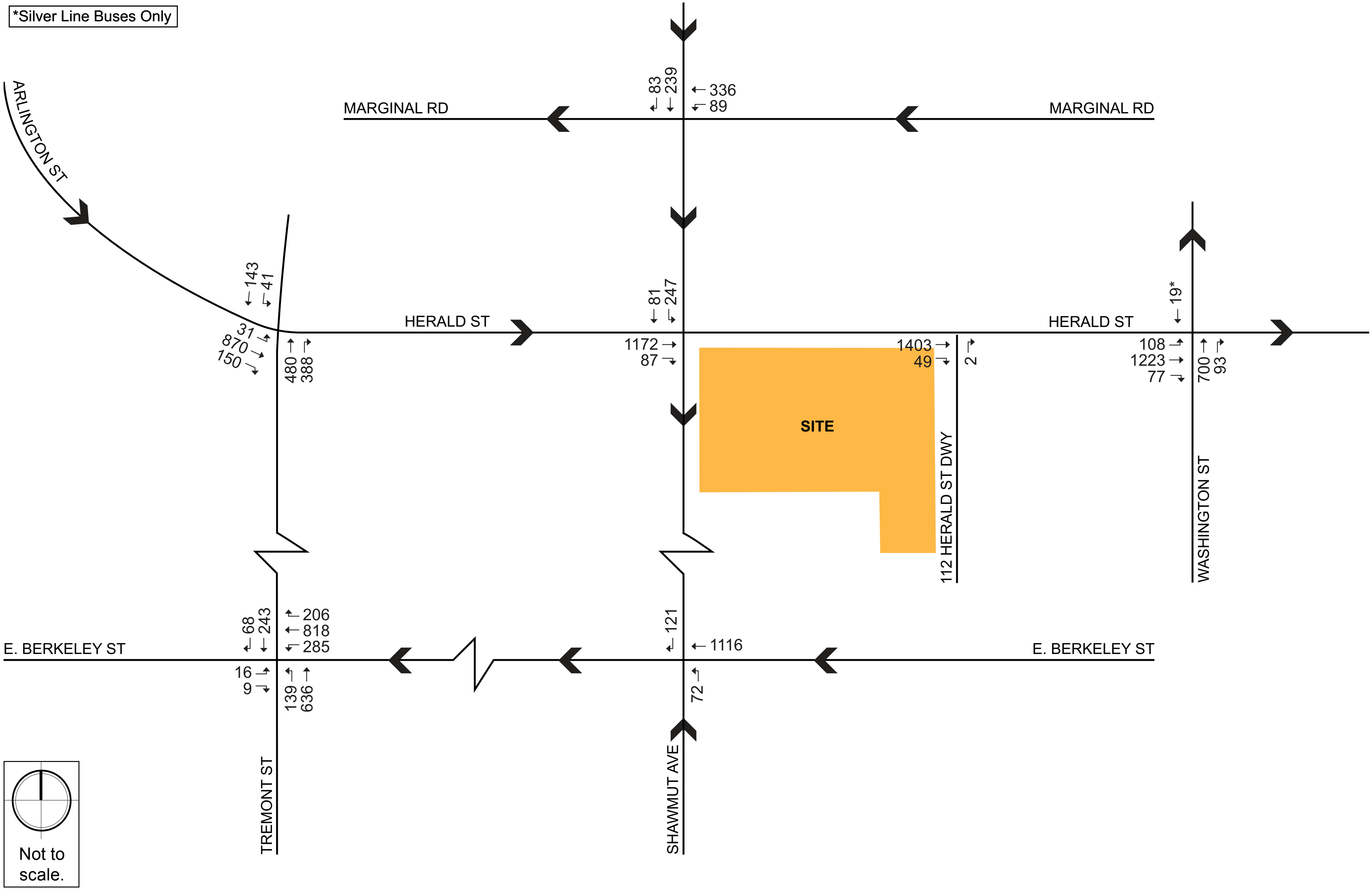

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Figure 2-10
No-Build (2024) Condition Traffic Volumes, a.m. Peak hour

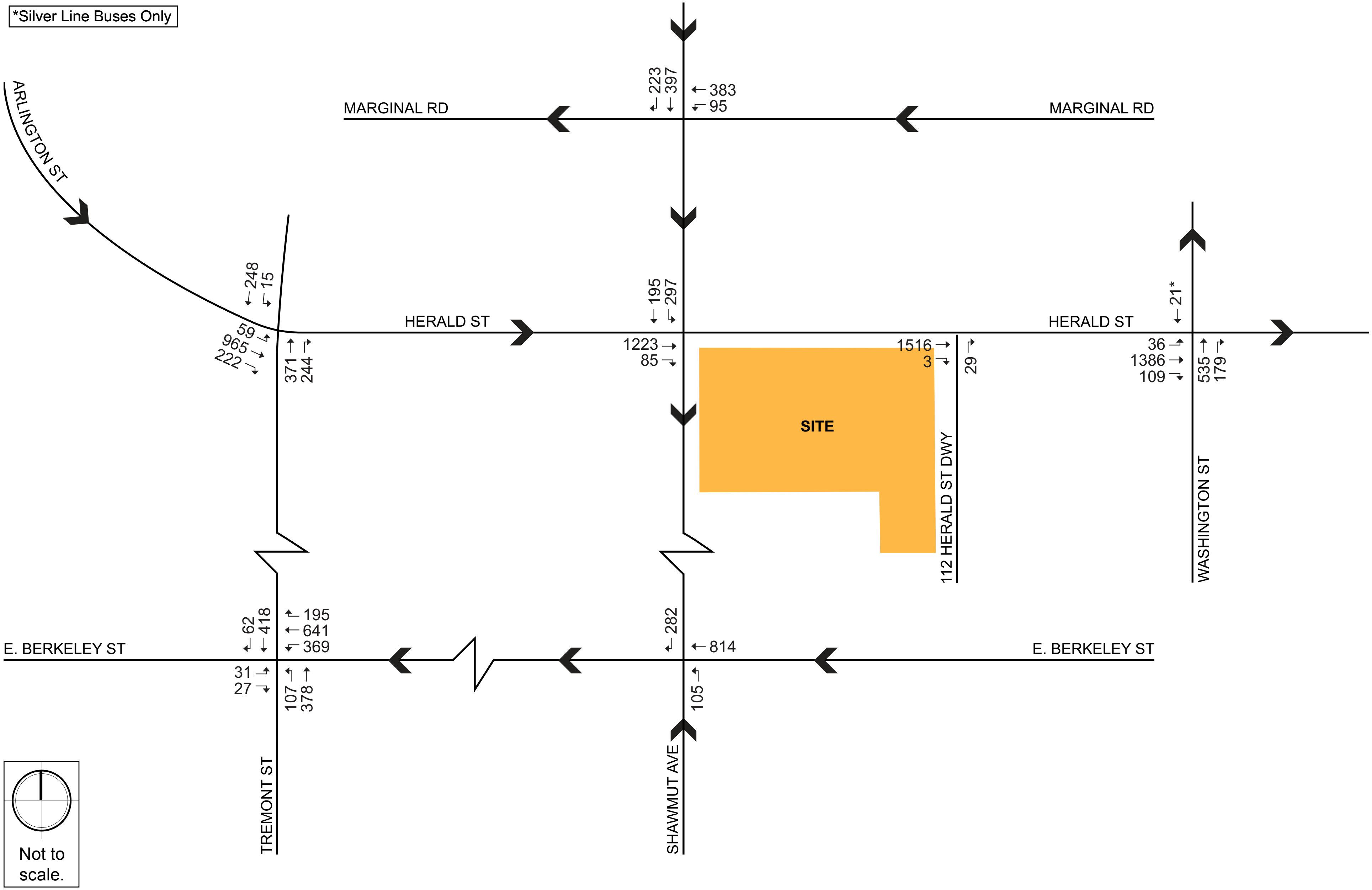

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Figure 2-11
No-Build (2024) Condition Traffic Volumes, p.m. Peak hour

Table 2-6 No-Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized					
Arlington Street/Herald Street/Tremont Street	**C**	**24.0**	-	-	-
Arlington Street EB left/thru | thru | thru| thru/right	C	24.9	0.51	153	187
Tremont Street NB thru | thru/right	C	22.3	0.78	291	m131
Tremont Street SB left/thru | thru	C	26.0	0.32	56	78
Herald Street/Shawmut Avenue	**A**	**9.0**	-	-	-
Herald Street EB thru | thru | thru/right	A	8.9	0.59	121	115
Shawmut Avenue SB left | left	A	6.6	0.26	0	13
Shawmut Avenue SB thru | thru	B	17.9	0.09	23	39
Herald Street/Washington Street	**D**	**49.7**	-	-	-
Herald Street left/thru | thru | thru/right	B	15.6	0.78	337	400
Washington Street NB thru	F	>80.0	>1.00	~620	#793
Washington Street NB right	B	14.3	0.23	31	64
Washington Street SB thru (Silver Line buses only)	B	15.6	0.06	9	20
East Berkeley Street/Shawmut Avenue	**B**	**11.2**	-	-	-
E Berkeley Street WB thru | thru | thru	B	12.1	0.48	153	184
Shawmut Avenue NB left	A	1.2	0.21	0	0
Shawmut Avenue SB right	A	9.9	0.45	1	1
Tremont Street/East Berkeley Street/Berkeley Street	**F**	**>80.0**	-	-	-
Berkeley Street EB left	D	39.0	0.28	9	29
Berkeley Street EB right	A	0.1	0.02	0	0
E Berkeley Street WB left	C	28.1	0.64	169	264
E Berkeley Street WB thru | thru/right	F	>80.0	>1.00	~438	#572
Tremont Street NB left/thru | thru	F	>80.0	>1.00	~296	#450
Tremont Street SB thru | thru/right	C	30.6	0.54	113	149
Shawmut Avenue/Marginal Road	**C**	**20.1**	-	-	-
Marginal Road WB left/thru | thru	C	20.6	0.36	104	139
Shawmut Avenue SB thru | thru | thru/right	B	19.3	0.23	42	66
Unsignalized					
Herald Street/112 Shawmut Avenue Driveway	-	-	-	-	-
Herald Street EB thru | thru | thru/right	-	0.0	0.34	-	0
112 Shawmut Avenue Driveway NB right	A	9.5	0.01	-	1

\# 95th percentile volume exceeds capacity.
~ 50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
Grey shading indicates a decrease to LOS E or F from Existing (2017) Condition.

Table 2-7 No-Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized					
Arlington Street/Herald Street/Tremont Street	**C**	**24.5**	-	-	-
Arlington Street EB left/thru | thru | thru| thru/right	C	23.4	0.55	177	213
Tremont Street NB thru | thru/right	C	25.3	0.63	149	212
Tremont Street SB left/thru | thru	C	27.4	0.31	76	110
Herald Street/Shawmut Avenue	**A**	**9.0**	-	-	-
Herald Street EB thru | thru | thru/right	A	9.2	0.60	91	103
Shawmut Avenue SB left | left	A	1.4	0.33	2	3
Shawmut Avenue SB thru | thru	B	19.4	0.27	32	39
Herald Street/Washington Street	**D**	**40.4**	-	-	-
Herald Street left/thru | thru | thru/right	D	49.8	>1.00	~434	#531
Washington Street NB thru	C	23.5	0.72	264	403
Washington Street NB right	B	12.5	0.30	56	102
Washington Street SB thru (Silver Line buses only)	B	11.4	0.05	8	18
East Berkeley Street/Shawmut Avenue	**B**	**10.7**	-	-	-
E Berkeley Street WB thru | thru | thru	A	9.8	0.31	100	147
Shawmut Avenue NB left	A	2.1	0.32	0	0
Shawmut Avenue SB right	B	17.5	0.75	0	80
Tremont Street/East Berkeley Street/Berkeley Street	**D**	**44.4**	-	-	-
Berkeley Street EB left	F	>80.0	0.72	28	#73
Berkeley Street EB right	A	0.2	0.07	0	0
E Berkeley Street WB left	D	46.1	0.80	304	#429
E Berkeley Street WB thru | thru/right	D	50.5	0.94	373	#479
Tremont Street NB left/thru | thru	D	35.8	0.72	165	208
Tremont Street SB thru | thru/right	D	40.6	0.65	203	241
Shawmut Avenue/Marginal Road	**C**	**22.2**	-	-	-
Marginal Road WB left/thru | thru	C	22.8	0.40	122	166
Shawmut Avenue SB thru | thru | thru/right	C	21.7	0.46	107	128
Unsignalized					
Herald Street/112 Shawmut Avenue Driveway	**-**	**-**	-	-	-
Herald Street EB thru | thru | thru/right	-	0.0	0.39	-	0
112 Shawmut Avenue Driveway NB right	A	9.4	0.05	-	4

95th percentile volume exceeds capacity.
~ 50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
Grey shading indicates a decrease to LOS E or F from Existing (2017) Condition.

The signalized intersection of **Herald Street/Washington Street** continues to operate at an acceptable LOS during both the weekday peak hours under the No-Build (2024) Condition. During the a.m. peak hour, the Washington Street northbound through lane LOS worsens from LOS C to LOS F. All other movements at the intersection continue to operate at LOS D or better.

The signalized intersection of **Tremont Street/East Berkeley Street/Berkeley Street** decreases from LOS E to LOS F during the a.m. peak hour, and continues to operate at LOS D during the p.m. peak hour under the No-Build (2024) Condition. During the a.m. peak hour, the East Berkeley Street westbound through and shared through/right lanes as well as the Tremont Street northbound left decreases from LOS E to LOS F. During the p.m. peak hour, the Berkeley Street eastbound left-turn lane decreases from LOS E to LOS F. All other movements at the intersection continue to operate at LOS D or better.

As previously stated, the traffic operations analysis was based on the expected changes to traffic patterns, future traffic signal timings, and proposed lane usage modifications. It is expected that during the development of the roadway projects, traffic signal operations will be adjusted accordingly to respond to the changes in actual traffic patterns, which will have the potential to improve overall traffic operations in the area.

2.4 Build (2024) Condition

As previously summarized, the Project Site is located at 112 Shawmut Avenue in Boston's South End neighborhood. The Project consists of the redevelopment of the existing structure to a 13-floor building containing approximately 143 residential units, with approximately 980 sf of commercial space located on the ground floor. Vehicular parking will be provided on-site, with approximately 124 spaces. The Project will include secure, covered on-site storage for approximately 143 bicycles.

2.4.1 Site Access and Vehicle Circulation

Vehicular access to the Project Site will be provided via two entrances: one entrance located on Shawmut Avenue, providing access to approximately 63 parking spaces at basement level, and one entrance located on Herald Street, providing access to approximately 61 parking spaces combined at ground and second level. The entrances/exits to the parking garage components are located as far away from the corner of Herald Street and Shawmut Avenue as feasible to eliminate congestion at the corner making it more pedestrian friendly. The site geometry constraints limit the ability to connect the garage components while providing sufficient parking. The Proponent considered alternative garage designs that would enable, for example, the two discrete parking areas within the Project to be connected; however, that would result in a substantial loss of open space on the Project Site and be inconsistent with the lot coverage goals set forth in Article 64 of the Code.

All loading activity will occur on-site within a loading dock located with a driveway on Shawmut Avenue, adjacent to the basement level parking garage entrance/exit. The loading dock will accommodate all loading services, trash pick-up, and move-in/move-out activity.

Primary pedestrian access to the Project Site will be from Shawmut Avenue. The site plan is shown in Figure 2-12.

2.4.2 Parking

The parking goals developed by the BTD for this section of the South End are a maximum of 0.75 to 1.00 parking spaces per residential unit. The Project is proposing to construct a total of approximately 124 parking spaces in a structured garage for a parking ratio of 0.87 spaces per residential unit. Due to site constraints, access to the ground and second floor levels of the garage are provided from Herald Street with access to the lower/basement level of the parking garage provided from Shawmut Avenue. Parking for the small commercial/retail space can be served by on-street spaces in the area.

2.4.3 Loading and Service Accommodations

Loading and service operations for the Project will occur on the Project Site and will accommodate up to an SU-36 box truck, which is expected to be the largest vehicle traveling to the Project Site. Trash pick-up can also occur on the Project Site without impacting pedestrian and vehicular movements along Shawmut Avenue.

Delivery estimates for the residential element of the Project are based on data provided in the Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area report[2] (the "CTPS report"). Deliveries to the Project Site will likely be SU-36 trucks and smaller delivery vehicles. Residential units primarily generate delivery trips related to small packages and prepared food. Based on the CTPS report, the Project is expected to generate three light truck trips per day to the Project Site.

2.4.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and short-term bicycle racks for visitors. Based on BTD guidelines, the Project will supply a minimum of 143 secure bicycle parking/storage spaces within the Project Site.

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[2] Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area; Central Transportation Planning Staff; September 1993.

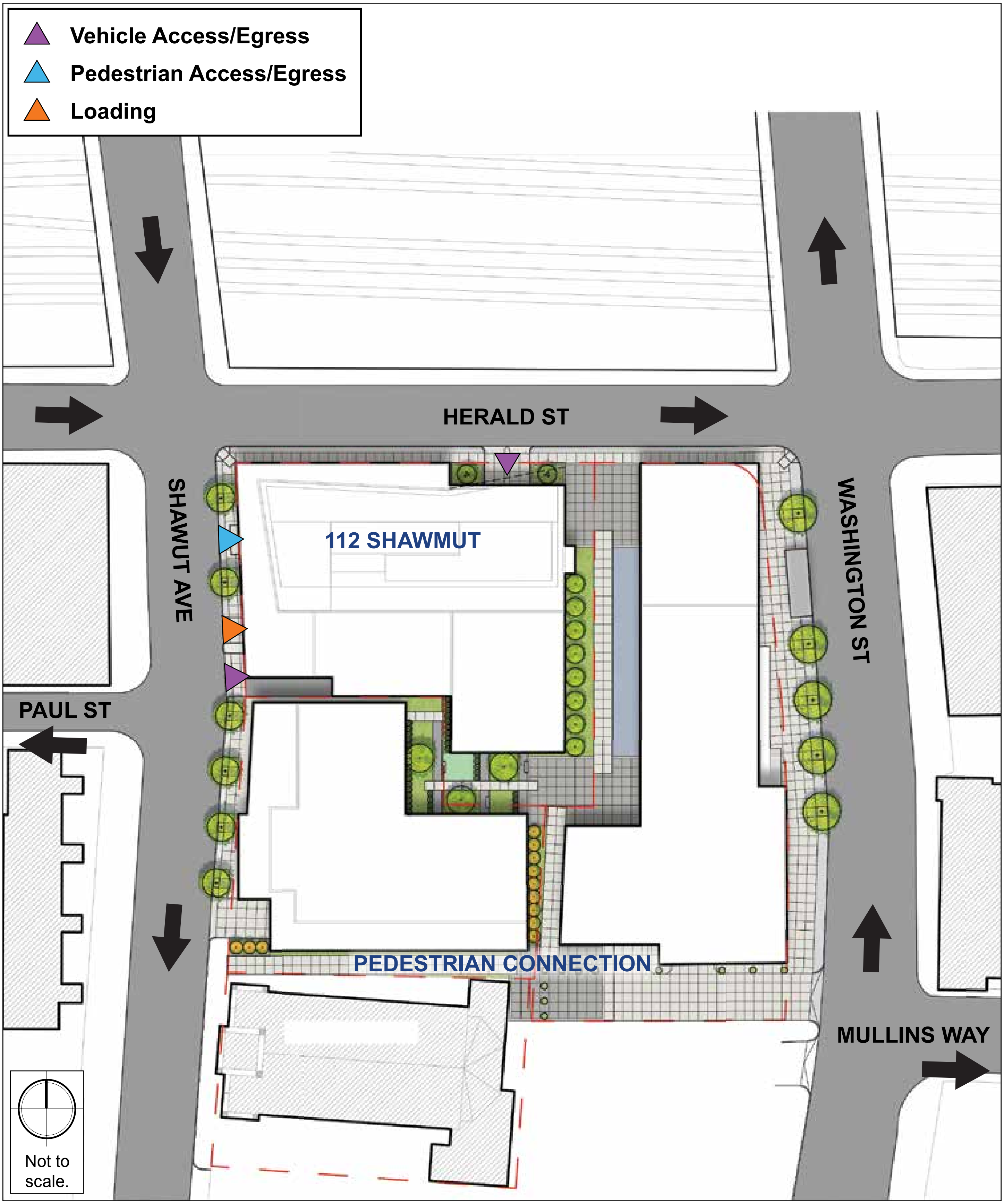

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Figure 2-12
Site Plan

2.4.5 Trip Generation Methodology

Determining the future trip generation of a project is a complex, multi-step process that produces an estimate of vehicle trips, transit trips, walk trips, and bicycle trips associated with a proposed development and a specific land use program. A project's location and proximity to different travel modes determines how people will travel to and from a project site.

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[3] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

To estimate the trip generation for the Project, the following ITE land use code (LUCs) were used:

Land Use Code 220 – Apartment. This land use code refers to dwelling units located within the same building with at least three other dwelling units. Trip generation estimates are based on ITE's average rate per dwelling unit.

Land Use Code 820 – Shopping Center. This land use code refers to an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Trip generation estimates are based on ITE's average rate per 1,000 sf.

2.4.6 Mode Share

BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. The Project is located within designated Area 3 – South Core, Park Plaza. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[4]. The person trips were then distributed to different modes according to the mode shares shown in Table 2-8.

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3 Trip Generation Manual, 9th Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

4 *Summary of Travel Trends: 2009 National Household Travel Survey*; FHWA; Washington, D.C.; June 2011.

Table 2-8 Travel Mode Shares

Time Period		Land Use	Vehicle Occupancy Rate[1]	Walk/Bike Share[2]	Transit Share[2]	Vehicle Share[2]
Daily	In	Residential	1.13	48%	17%	35%
	Out		1.13	48%	17%	35%
	In	Retail	1.78	43%	17%	40%
	Out		1.78	43%	17%	40%
a.m. Peak Hour	In	Residential	1.13	38%	17%	45%
	Out		1.13	65%	13%	22%
	In	Retail	1.78	33%	16%	51%
	Out		1.78	79%	7%	14%
p.m. Peak Hour	In	Residential	1.13	65%	13%	22%
	Out		1.13	38%	17%	45%
	In	Retail	1.78	79%	7%	14%
	Out		1.78	33%	16%	51%

1. 2009 National Household Travel Survey.
2. Based on rates published by the Boston Transportation Department for Area 3.

2.4.7 Existing Trip Generation

The existing Project Site contains office space and an associated parking lot. The office space will be vacated prior to commencement of Project construction. For the Build (2024) Condition, the trips associated with the existing office space have been subtracted from the study area's roadway network.

2.4.8 Project Trip Generation

The mode share percentages shown in Table 2-8 were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The trip generation for the Project by mode is shown in Table 2-9. The detailed trip generation information is provided in Appendix B.

Table 2-9 Project Trip Generation

Time Period		Walk/Bike Trips	Transit Trips	Primary Vehicle Trips
Daily				
Apartment [1]		566	200	366
Retail [2]		32	12	16
Total Daily Trips		**598**	**212**	**382**
a.m. Peak Hour				
Apartment [1]	In	7	3	7
	Out	47	9	14
	Total	54	12	21
Retail [2]	In	1	0	1
	Out	0	0	0
	Total	1	0	1
Total a.m. Peak Hour Trips		**55**	**12**	**22**
p.m. Peak Hour				
Apartment [1]	In	46	9	14
	Out	14	6	16
	Total	60	15	30
Retail [2]	In	3	0	1
	Out	1	1	1
	Total	4	1	2
Total p.m. Peak Hour Trips		**64**	**16**	**32**

1. Based on ITE LUC 220 – 157 Apartment units, average rate. Although the Project now consists of 143 apartment units, the trip generation is based on a previously contemplated larger building program which would generate more trips than the currently proposed building program.
2. Based on ITE LUC 820 – 980 sf Shopping Center, average rate.

The net peak-hour vehicle trip generation for the Project was determined by adjusting the Project-generated vehicle trips to account for the removal of the trips associated with the existing office space on the Project Site. The existing trips were determined based on ITE for 70,000 sf of office space. The net vehicle trip generation for the Project during the weekday a.m. and p.m. peak hours is shown in Table 2-10.

Table 2-10 Net Vehicle Trip Generation

Direction	Project-Generated Trips[1]	Existing Trips[1]	New Vehicle Trips[2]
a.m. Peak Hour			
In	8	49	**-41**
Out	14	2	**+12**
Total	**22**	**51**	**-29**

Table 2-10 Net Vehicle Trip Generation (Continued)

Direction	Project-Generated Trips[1]	Existing Trips[1]	New Vehicle Trips[2]
p.m. Peak Hour			
In	15	3	**+12**
Out	17	44	**-27**
Total	**32**	**47**	**-15**

1. Based on ITE Trip Generation.
2. Net new vehicle trips on study area roadway network.

As shown in Table 2-10, the Project is expected to generate approximately 29 fewer vehicle trips during the weekday a.m. peak hour and 15 fewer vehicle trips during the weekday p.m. peak hour. Even without the reduction of existing trips, the level of traffic volume increase associated with the proposed Project is minimal when compared to the existing traffic volumes within the study area.

2.4.9 Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project Site. Trip distribution patterns for the Project were based on BTD's origin-destination data and trip distribution patterns presented in traffic studies for nearby projects. The vehicle trips associated with the Project were assigned to the proposed parking garage on site. The trip distribution patterns for the Project are illustrated in Figures 2-13 and 2-14.

2.4.10 Build (2024) Traffic Volumes

The vehicle trips were distributed through the study area. The Project-generated trips for the weekday a.m. Peak Hour and weekday p.m. Peak Hour are shown in Figure 2-15 and Figure 2-16, respectively. The existing trips currently accessing the existing uses on the Project Site were subtracted from the volumes, as they will be eliminated with the redevelopment. The trip assignments were added to the No-Build (2024) Condition vehicular traffic volumes to develop the Build (2024) Condition vehicular traffic volumes. The Build (2024) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on Figure 2-17 and Figure 2-18, respectively.

2.4.11 Build (2024) Condition Traffic Operations Analysis

The Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis and the No-Build (2024) Condition capacity analysis. Table 2-11 and Table 2-12 present the Build (2024) Condition capacity analysis for the weekday a.m. Peak Hour and weekday p.m. Peak Hour, respectively. The detailed analysis sheets are provided in Appendix B.

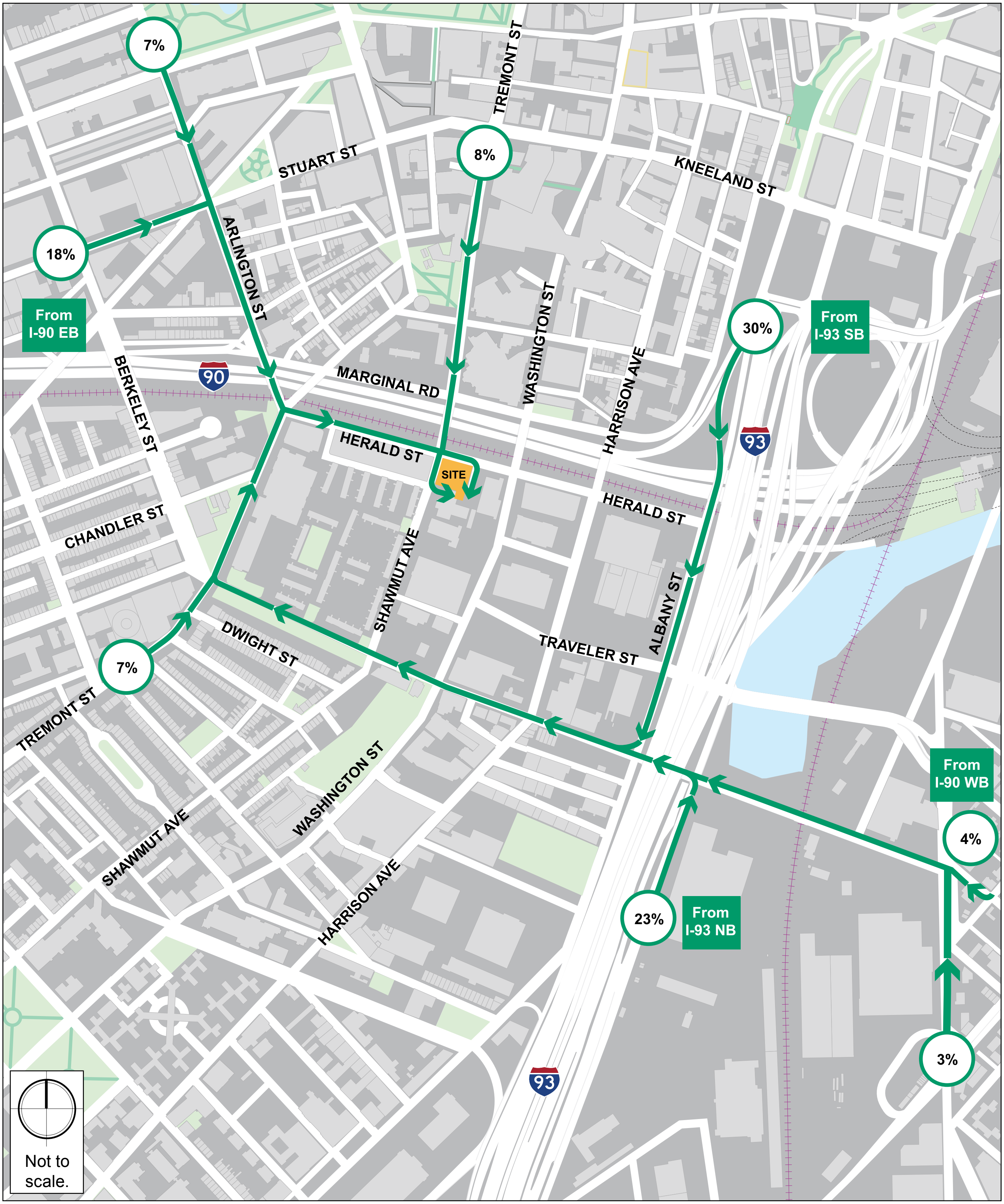

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Figure 2-13
Vehicle Trip Distribution - Entering

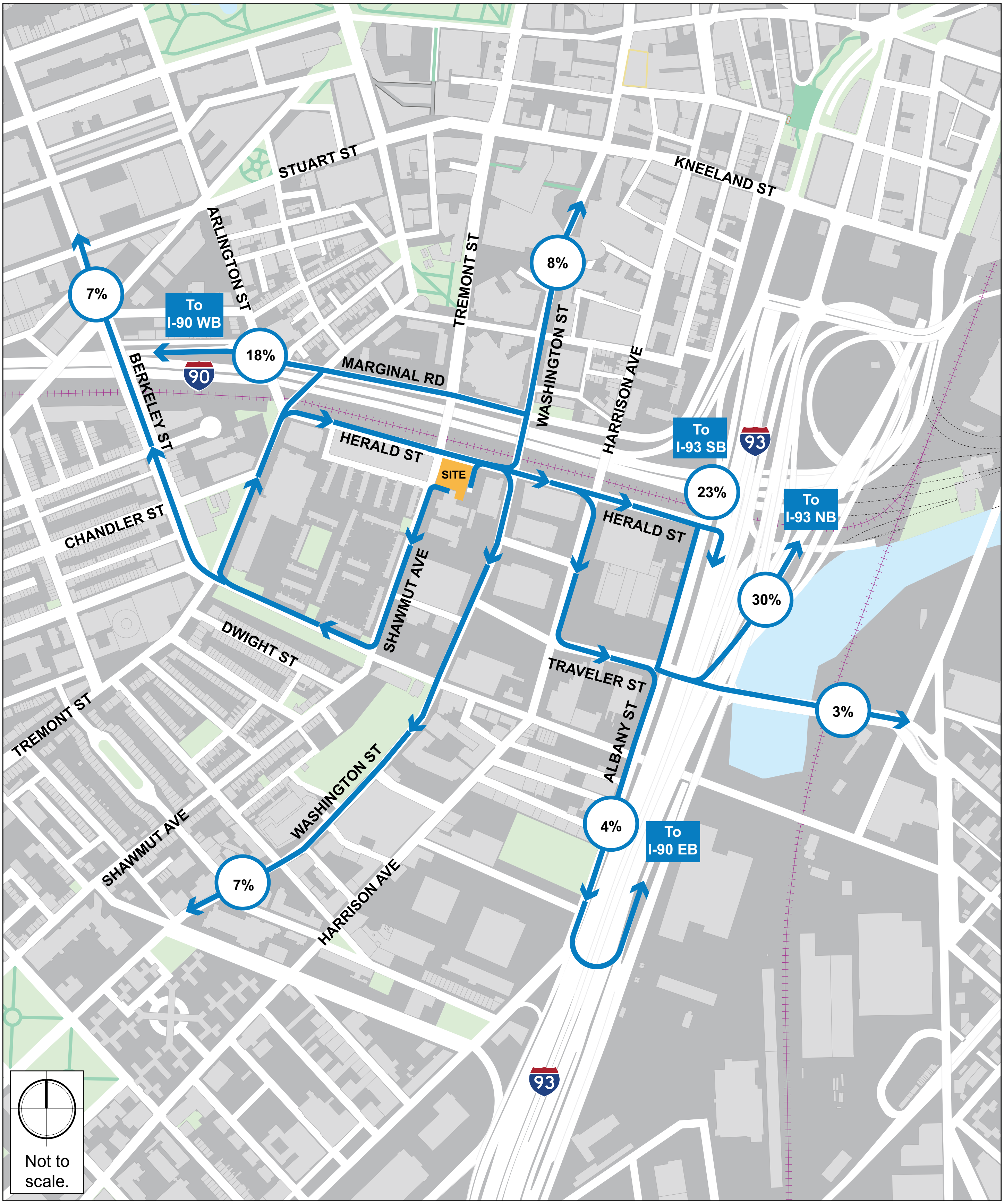

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Figure 2-14
Vehicle Trip Distribution - Exiting

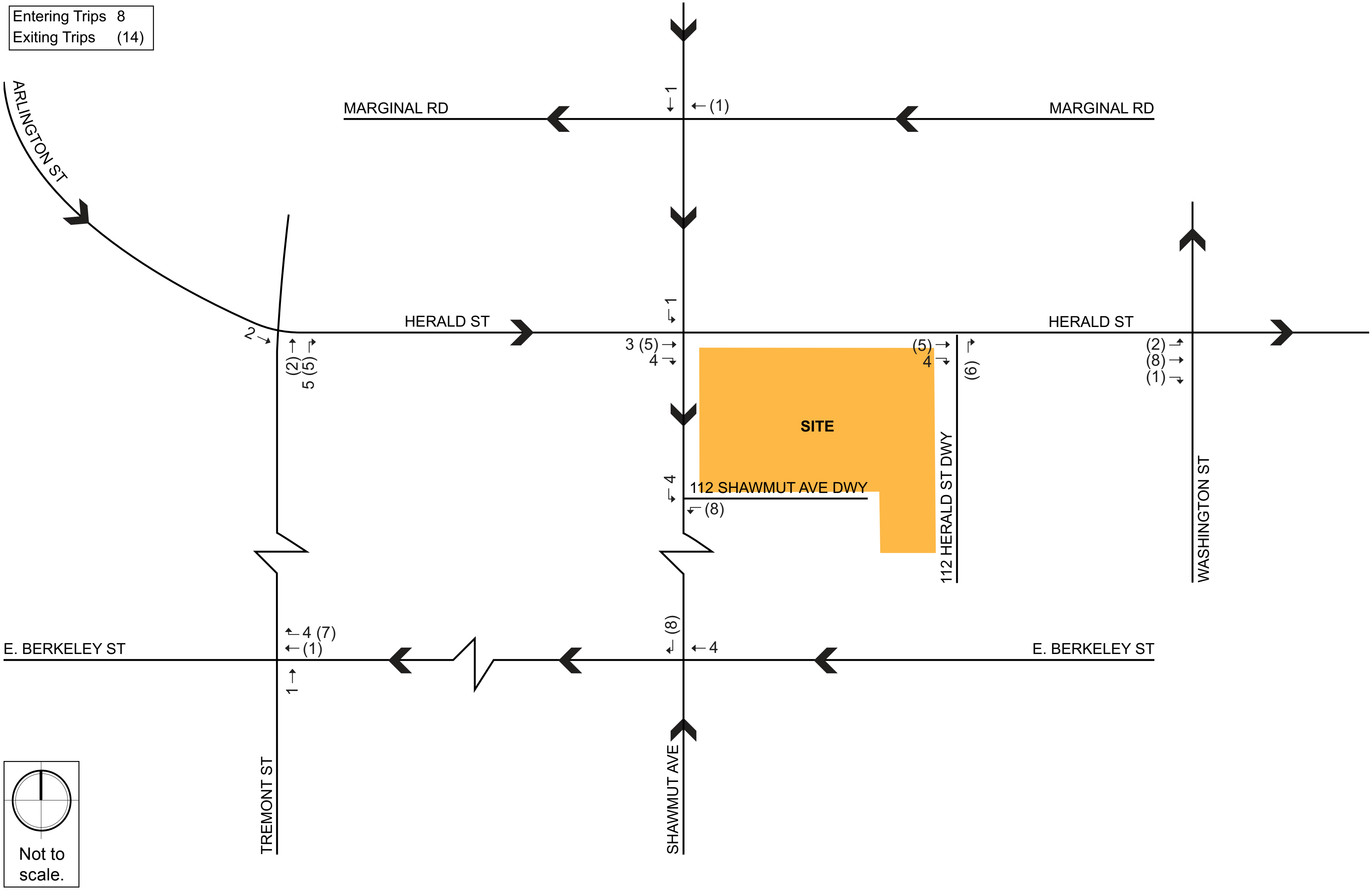

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Figure 2-15
Net Vehicle Trip Assignment, a.m. Peak Hour

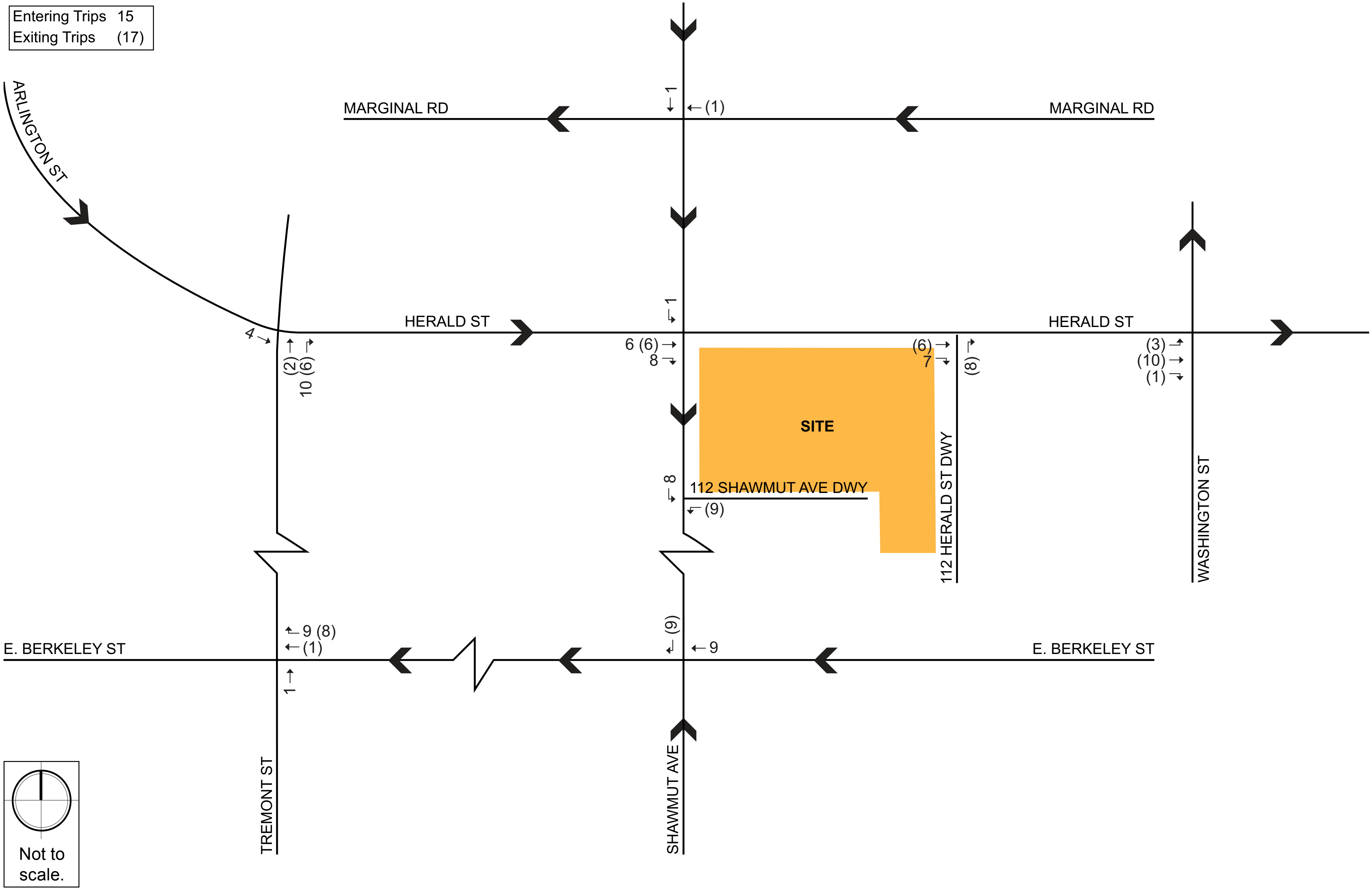

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Figure 2-16
Net Vehicle Trip Assignment, p.m. Peak Hour

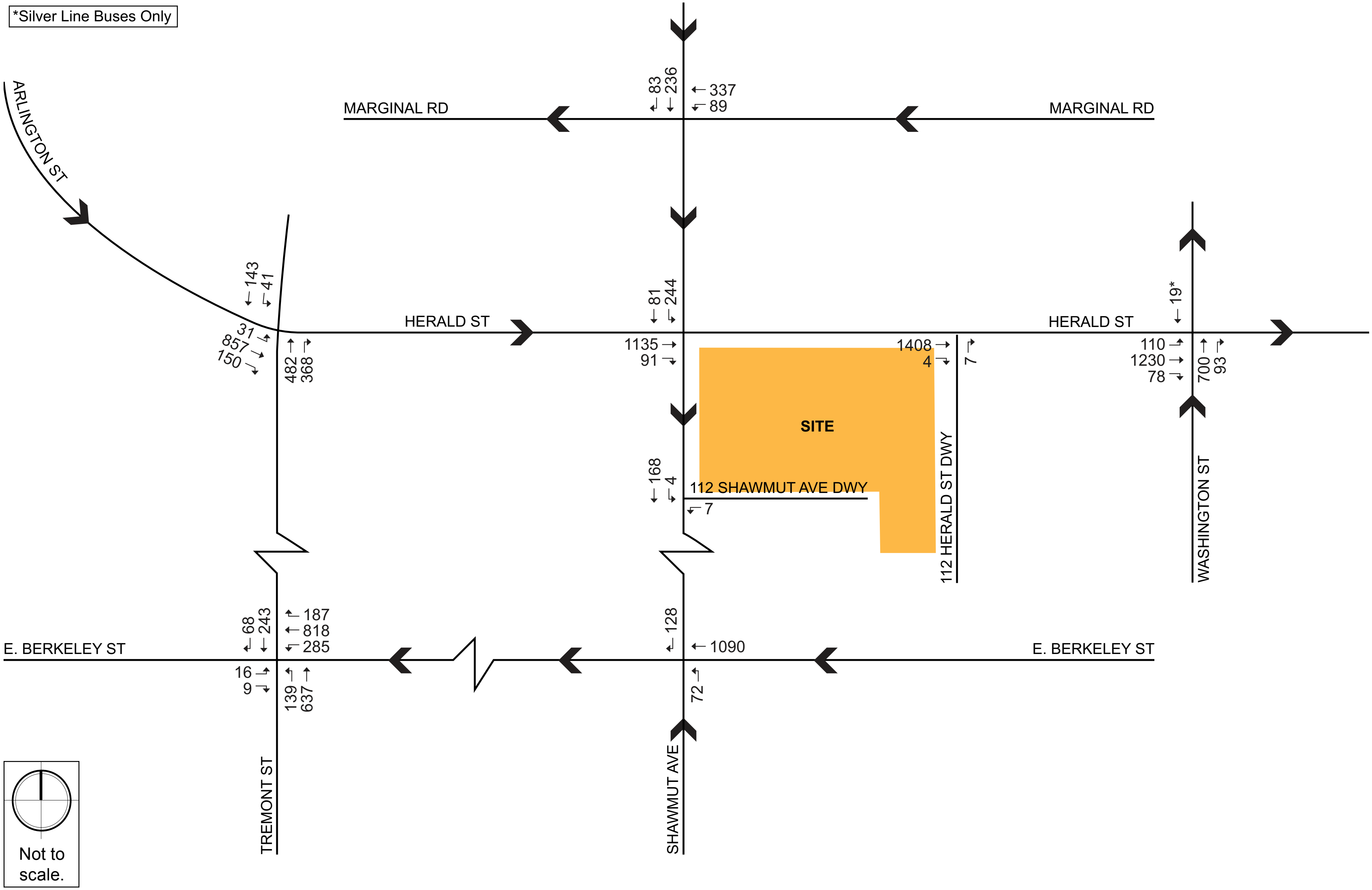

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Figure 2-17
Build (2024) Condition Traffic Volumes, a.m. Peak hour

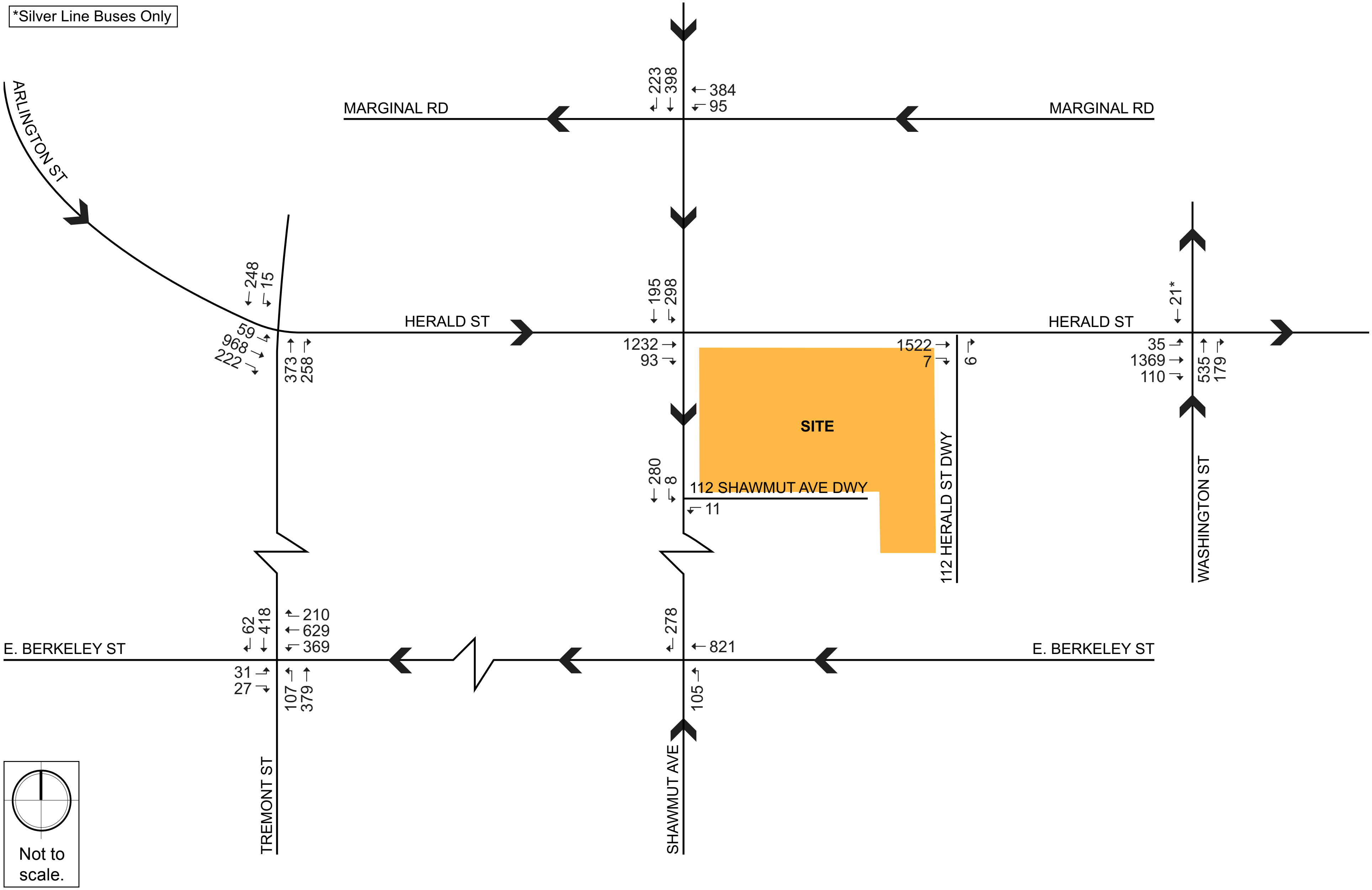

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Figure 2-18

Build (2024) Condition Traffic Volumes, p.m. Peak hour

Table 2-11 Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized					
Arlington Street/Herald Street/Tremont Street	**C**	**23.7**	**-**	**-**	**-**
Arlington Street EB left/thru | thru | thru| thru/right	C	24.8	0.51	152	184
Tremont Street NB thru | thru/right	C	21.7	0.76	168	m120
Tremont Street SB left/thru | thru	C	25.9	0.32	56	77
Herald Street/Shawmut Avenue	**A**	**8.8**	**-**	**-**	**-**
Herald Street EB thru | thru | thru/right	A	8.7	0.58	116	111
Shawmut Avenue SB left | left	A	6.1	0.25	0	10
Shawmut Avenue SB thru | thru	B	18.0	0.09	23	39
Herald Street/Washington Street	**D**	**49.8**	**-**	**-**	**-**
Herald Street left/thru | thru | thru/right	B	16.1	0.79	339	403
Washington Street NB thru	F	>80.0	>1.00	~620	#793
Washington Street NB right	B	14.3	0.23	31	64
Washington Street SB thru (Silver Line buses only)	B	15.6	0.06	9	20
East Berkeley Street/Shawmut Avenue	**B**	**11.1**	**-**	**-**	**-**
E Berkeley Street WB thru | thru | thru	B	11.9	0.47	147	178
Shawmut Avenue NB left	A	1.2	0.21	0	0
Shawmut Avenue SB right	B	10.2	0.48	2	2
Tremont Street/East Berkeley Street/Berkeley Street	**F**	**>80.0**	**-**	**-**	**-**
Berkeley Street EB left	D	39.0	0.28	9	29
Berkeley Street EB right	A	0.1	0.02	0	0
E Berkeley Street WB left	C	28.4	0.64	169	264
E Berkeley Street WB thru | thru/right	F	>80.0	>1.00	~425	#558
Tremont Street NB left/thru | thru	F	>80.0	>1.00	~297	#451
Tremont Street SB thru | thru/right	C	30.6	0.54	113	149
Shawmut Avenue/Marginal Road	**C**	**20.1**	**-**	**-**	**-**
Marginal Road WB left/thru | thru	C	20.7	0.36	104	140
Shawmut Avenue SB thru | thru | thru/right	B	19.2	0.23	42	65
Unsignalized					
Herald Street/112 Shawmut Avenue Driveway	**-**	**-**	**-**	**-**	**-**
Herald Street EB thru | thru | thru/right	A	0.0	0.35	-	0
112 Shawmut Avenue Driveway NB right	A	9.6	0.02	-	2
Shawmut Avenue/112 Shawmut Avenue Driveway	**-**	**-**	**-**	**-**	**-**
112 Shawmut Avenue Driveway WB left	A	9.5	0.01	-	1
Shawmut Avenue SB left/thru	A	0.2	0.00	-	0

95th percentile volume exceeds capacity.
~50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Table 2-12 Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized					
Arlington Street/Herald Street/Tremont Street	**C**	**24.3**	-	-	-
Arlington Street EB left/thru | thru | thru| thru/right	C	23.4	0.55	178	213
Tremont Street NB thru | thru/right	C	24.7	0.64	148	212
Tremont Street SB left/thru | thru	C	27.5	0.31	76	110
Herald Street/Shawmut Avenue	**A**	**9.2**	-	-	-
Herald Street EB thru | thru | thru/right	A	9.5	0.61	94	106
Shawmut Avenue SB left | left	A	1.4	0.33	2	3
Shawmut Avenue SB thru | thru	B	19.3	0.27	31	39
Herald Street/Washington Street	**D**	**37.5**	-	-	-
Herald Street left/thru | thru | thru/right	D	45.6	>1.00	~424	#523
Washington Street NB thru	C	23.5	0.72	264	403
Washington Street NB right	B	12.5	0.30	56	102
Washington Street SB thru (Silver Line buses only)	B	11.4	0.05	8	18
East Berkeley Street/Shawmut Avenue	**B**	**10.6**	-	-	-
E Berkeley Street WB thru | thru | thru	B	9.8	0.32	101	148
Shawmut Avenue NB left	A	2.1	0.32	0	0
Shawmut Avenue SB right	B	17.2	0.74	0	78
Tremont Street/East Berkeley Street/Berkeley Street	**D**	**44.6**	-	-	-
Berkeley Street EB left	F	>80.0	0.72	28	#73
Berkeley Street EB right	A	0.2	0.07	0	0
E Berkeley Street WB left	D	46.0	0.80	304	#428
E Berkeley Street WB thru | thru/right	D	50.8	0.94	374	#482
Tremont Street NB left/thru | thru	D	35.9	0.73	166	209
Tremont Street SB thru | thru/right	D	40.6	0.65	203	241
Shawmut Avenue/Marginal Road	**C**	**22.2**	-	-	-
Marginal Road WB left/thru | thru	C	22.8	0.40	122	166
Shawmut Avenue SB thru | thru | thru/right	C	21.8	0.46	108	128
Unsignalized					
Herald Street/112 Shawmut Avenue Driveway	-	-	-	-	-
Herald Street EB thru | thru | thru/right	A	0.0	0.39	-	0
112 Shawmut Avenue Driveway NB right	A	9.2	0.01	-	1
Shawmut Avenue/112 Shawmut Avenue Driveway	-	-	-	-	-
112 Shawmut Avenue Driveway WB left	B	10.3	0.02	-	1
Shawmut Avenue SB left/thru	A	0.3	0.01	-	0

95th percentile volume exceeds capacity.
~50th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.

Based on Table 2-6 and Table 2-7, all the intersections and movements continue to operate at the same LOS as the No-Build (2024) Condition. The Project is expected to generate minimal new trips throughout the study area when compared to the existing uses, and will not have a material impact on traffic operations at the study area intersections.

2.5 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to minimize automobile usage and Project-related traffic impacts. TDM will be facilitated by the nature of the Project (which does not generate significant peak hour trips) and its proximity to numerous public transit alternatives for its residents.

On-site management will keep a supply of transit information (schedules, maps, and fare information) to be made available to the residents and patrons of the Project Site. The Proponent will work with the City to develop a TDM program appropriate to the Project and consistent with its level of impact.

The Proponent is prepared to take advantage of good transit access in marketing the Project to future residents by working with them to implement the following TDM measures to encourage the use of non-vehicular modes of travel.

The TDM measures for the Project may include, but are not limited, to the following:

- The Proponent will designate a transportation coordinator from the property management team to oversee transportation issues, including parking, service and loading, and deliveries, and will work with the commercial tenant as they move in to the retail/commercial space to raise awareness of public transportation, bicycling, and walking opportunities;

- The Proponent will provide orientation packets to new tenants containing information on available transportation choices, including transit routes/schedules and nearby vehicle sharing and bicycle sharing locations. The property manager will work with residents and the commercial tenant as they move in to help facilitate transportation for new arrivals;

- The Proponent will provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options;

- The Proponent will provide electric vehicle charging stations to accommodate five percent of the parking spaces in the garage; and

- The Proponent will provide information on travel alternatives for residents, employees, and visitors via the Project website and in the building lobby.

2.6 Transportation Mitigation Measures

The Proponent will continue to work with the City of Boston so that the Project efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use.

The Proponent is responsible for preparation of the Transportation Access Plan Agreement (TAPA), a formal legal agreement between the Proponent and the BTD. The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, TDM measures, and any other responsibilities that are agreed to by both the Proponent and the BTD. Because the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed. The proposed measures listed above and any additional transportation improvements to be undertaken as part of this Project will be defined and documented in the TAPA.

The Proponent's contractor for the Project will also produce a Construction Management Plan (CMP) for review and approval by BTD. The CMP will detail the schedule, staging, parking, delivery, and other associated impacts of the construction of the Project.

Chapter 3

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW COMPONENT

3.1 Wind

3.1.1 Introduction

Rowan Williams Davies & Irwin Inc. (RWDI) was retained to assess the pedestrian level wind impact of the proposed Project. The qualitative assessment is based on the following:

- a review of the regional long-term meteorological data from Boston Logan International Airport;
- design drawings and documents received from the Project team on June 6 and 8, 2017;
- wind-tunnel studies undertaken by RWDI for similar projects in the Boston area, including projects on adjacent blocks;
- RWDI's engineering judgment, experience and expert knowledge of wind flows around buildings[5,6,7]; and
- use of software developed by RWDI (Windestimator[2]) for estimating the potential wind conditions around generalized building forms.

This qualitative approach provides a screening-level estimation of potential wind conditions.

3.1.2 Site and Building Information

The Project Site is currently occupied a single six stories in height and surrounded by parking lots, multi-lane roadways and buildings ranging from five to 20 stories in height in the immediate vicinity. The downtown core of Boston, with high-rise developments is to the northeast. The terrain to the north through west to southwest comprise dense arrays of three to five-story residential and commercial buildings. To the south through east, the surroundings are slightly less dense, consisting of residential and industrial development, with Dorchester Bay and the Inner Harbor about two miles to the east.

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

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

7 H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", Journal of Wind Engineering and Industrial Aerodynamics, vol.104-106, pp.397-407.

Several new buildings are under construction or approved in the adjacent lots. Most of these projects are proposed to be 10-stories in height or taller, and are likely to be completed before the proposed Project. The Project will be similar in height to other mid-rise buildings in the surrounding area, including proposed buildings currently under construction in the vicinity.

Major pedestrian areas on and around the Project Site include a main entrance on Shawmut Avenue, sidewalks on all neighboring streets and terraces on Levels 7, 9 and 13.

3.1.3 Meteorological Data

Wind statistics at Boston Logan International Airport between 1990 and 2015 were analyzed and Figure 3.1-1 graphically depicts the distributions of wind frequency and directionality for the four seasons and for the annual period. When all winds are considered (regardless of speed), winds from the northwest and southwest quadrants are predominant. Northeasterly winds are also relatively frequent in the spring.

Strong winds with mean speeds greater than 20 miles per hour (mph)--red bands in the wind roses--are prevalent from the west-northwest direction throughout the year, while the strong winds from the southwest and northeast are also common. These are critical wind directions focused on in the following discussions.

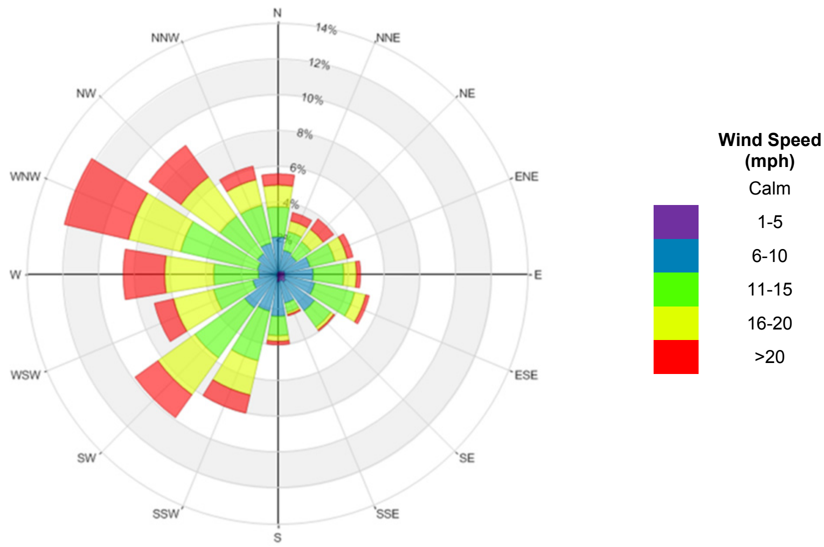
3.1.4 Pedestrian Wind Criteria

The BPDA has adopted two standards for assessing the relative wind comfort of pedestrians.

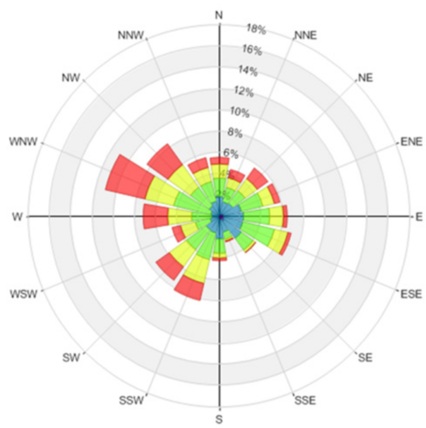
First, the BPDA wind design guidance criterion states that an effective gust velocity (hourly-mean wind speed + 1.5 times the root mean square wind speed) of 31 mph should not be exceeded more than one percent (1%) of the time. This criterion is hereby referred to as the gust criterion.

The second set of criteria used by the BPDA to determine the acceptability of specific locations is based on the work of Melbourne[8]. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing and walking. The criteria are expressed in terms of benchmarks for the one-hour mean wind speed exceeded one percent of the time (i.e., the 99-percentile mean wind speed), as provided in Table 3.1-1.

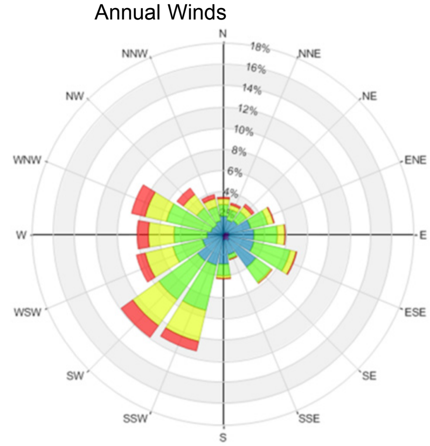
8 Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions", Journal of Industrial Aerodynamics, 3 (1978) 241-249.



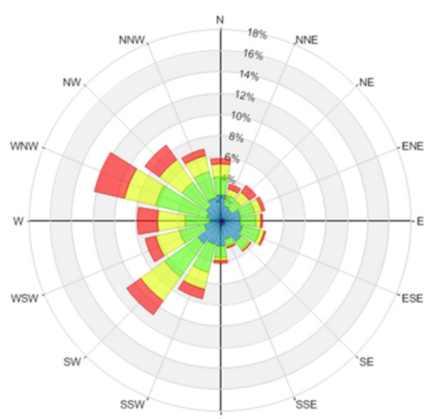
Annual Winds



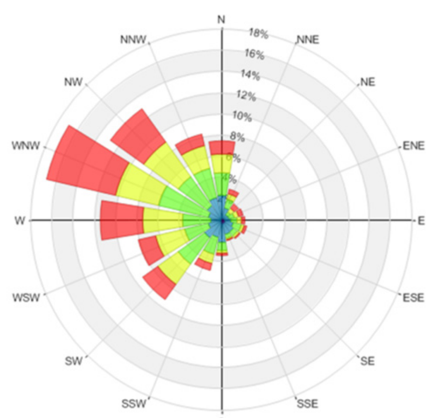
Spring (March to May)



Summer (June to August)



Fall (September to November)



Winter (December to February)

Table 3.1-1 BPDA Mean Wind Criteria*

Level of Comfort	Wind Speed
Dangerous	> 27 mph
Uncomfortable for Walking	>19 and ≤27 mph
Comfortable for Walking	>15 and ≤19 mph
Comfortable for Standing	>12 and ≤15 mph
Comfortable for Sitting	<12 mph

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

Pedestrians on sidewalks will be active and wind speeds comfortable for walking are appropriate at these locations. Lower wind speeds comfortable for standing are desired for building entrances where people are apt to linger. For any outdoor amenity at and above grade, low wind speeds comfortable for sitting or standing are desired in the summer months when such amenity spaces are typically in use. Wind speeds rated "Uncomfortable for Walking" and/or "Dangerous" are higher than desirable for any pedestrian activity.

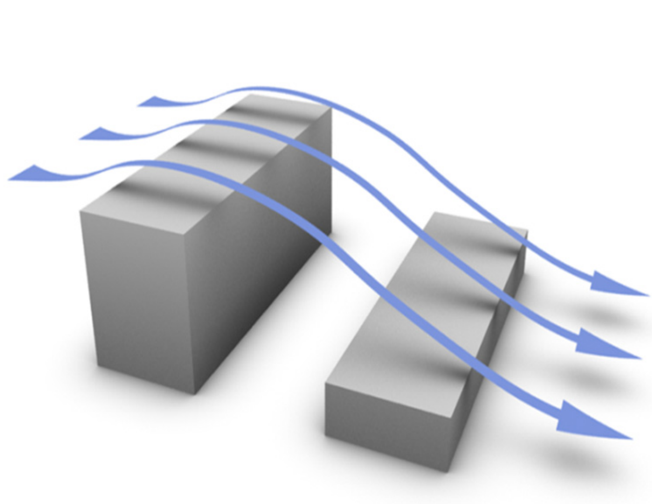
The following discussions on pedestrian wind conditions is based on the annual wind climate. Typically the summer and fall winds tend to be more comfortable than the annual winds while the winter and spring winds are less comfortable than the annual winds.

3.1.5 Pedestrian Wind Conditions

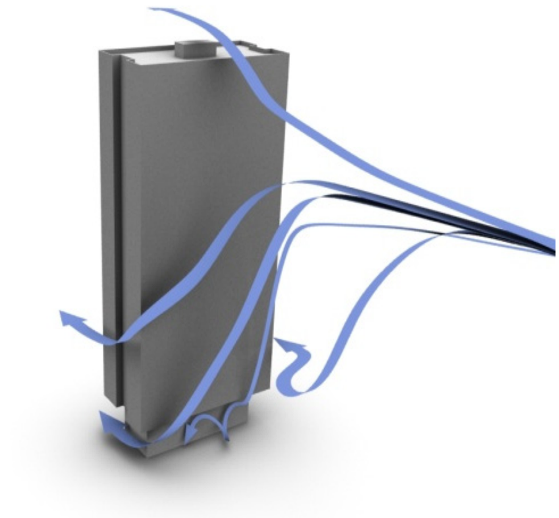
3.1.5.1 Background

Predicting wind speeds and frequencies of occurrence is complicated. It involves the assessment of building geometry, orientation, position and height of surrounding buildings, upwind terrain and the local wind climate. Over the years, RWDI has conducted thousands of wind tunnel model studies on pedestrian wind conditions around buildings, yielding a broad knowledge base. This knowledge has been incorporated into RWDI's proprietary software that allows, in many situations, for a screening-level qualitative estimation of pedestrian wind conditions without wind tunnel testing.

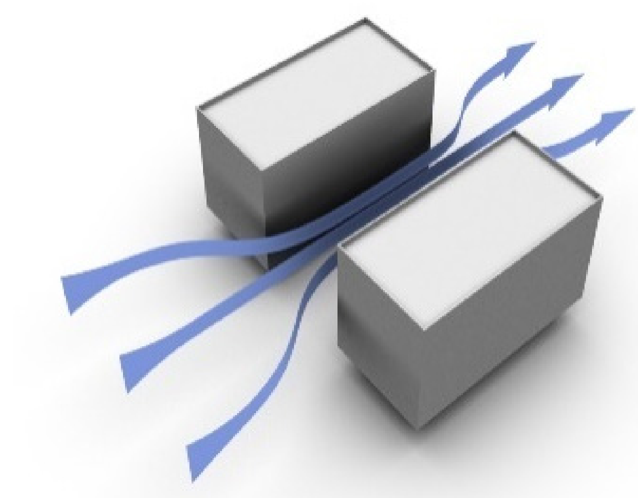
Wind generally tends to flow over dense arrays of buildings of even height (Figure 3.1-2, Image a). Buildings taller than their surroundings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. Such a Downwashing Flow (Figure 3.1-2, Image b) is the main cause for increased wind activity around buildings at the pedestrian level. These Downwashed winds subsequently channel along street canyons make those areas windy (Figure 3.1-2, Image c). If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and uncomfortable conditions.



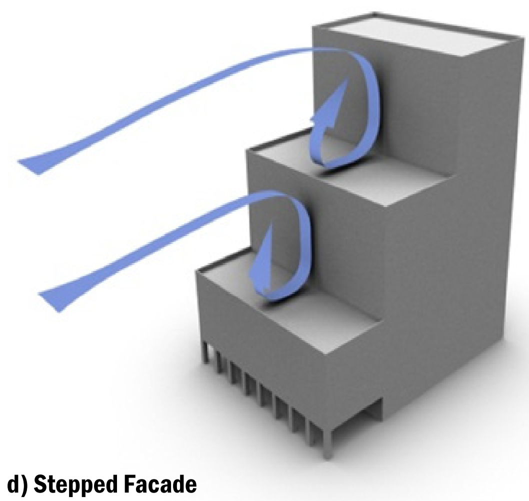
a) Wind Flow over Low-rise Buildings



b) Downwashing Flow



c) Channeling Effect



d) Stepped Facade

Figure 3.1-2

General Wind Flow Phenomena Around Buildings

Stepping the windward façade (Figure 3.1-2, Image d) is a positive design strategy that is often used for wind control. However, increased wind activity will be created on the lower windward roofs or terraces where low wind speeds are typically desired for amenity use.

3.1.5.2 No Build: Effective Gust

Wind conditions on the existing Project Site are expected to be in compliance with the effective gust criterion, due to the low heights of the on-site buildings.

Off-site, existing tall buildings and approved and under construction buildings that are likely to be completed before the Project are expected to result in wind speeds that exceed the gust criterion on the sidewalks close to them, particularly near their western corners on Washington Street. These high wind conditions can be attributed to building-wind interactions as discussed in Section 3.1.5.1.

3.1.5.3 No-Build: Mean Speed

On an annual basis, wind conditions at most areas around the Project Site perimeter are currently predicted to be rated comfortable for sitting, standing or walking and therefore, suitable for pedestrian activities. This is largely due to the uniform height of surrounding buildings in the westerly and northeast directions that prevent the redirection of winds to street level (Figure 3.1-2, Image a).

Wind conditions north of Herald Street on Shawmut Avenue and Washington Street are expected to be around the upper threshold for the walking category and could potentially be uncomfortable for walking from time to time due to exposure to the prevailing winds.

Wind conditions at the intersections of these streets at Herald Street are also expected to be potentially uncomfortable due to wind acceleration around existing buildings at these intersections. Similar conditions are expected along Washington Street, south of Herald Street, close to the existing taller buildings due to the building-wind interactions discussed in Section 3.1.5.1.

3.1.5.4 Build: Project Features and Wind Flow

The proposed building will be similar in height to mid-rise buildings that exist in the vicinity, and those that are under construction or approved in the neighboring area. The building will be taller than the majority of the area to the west and southwest, predominantly consisting of low-rise buildings and roads, and therefore, exposed to winds from those directions. Although strong winds from the northeast are frequent, especially in the spring, the downtown core and taller buildings in that direction aid in lowering the impact of these winds on the Project.

The Project design includes large terraces formed by stepping the massing back at upper levels. These massing setbacks are positive in that they capture downwashing flow and reduce wind impacts at grade level. The exposure of the building on its west and north side, however, subjects the building to wind accelerations at the exposed building corners, which could potentially result in high and even severe wind conditions on the sidewalks near the corners of the building. Canopies and other potential measures will be evaluated to mitigate these conditions.

The main entrance is on Shawmut Avenue on the west side and is designed with an overhead canopy and a closed vestibule, which could serve as a waiting area for patrons on windy days.

3.1.5.5 Build – Grade Level: Effective Gust

With the addition of the Project to the existing surroundings, wind conditions at most areas around the Project Site are expected to meet the effective gust criterion. The potential exception to this is at the northwest and southwest corners of the building, due to exposure and corner acceleration as discussed in Section 3.1.5.4. Apart from localized impacts close to the building, the proposed Project is expected to have no significant impact on wind conditions in the extended surroundings.

The Project will afford shelter to the portion of Washington Street between Herald Street and William E. Mullins Way, from the prevailing westerly winds. Therefore, it is anticipated that high wind activity expected in this street section under the No-Build scenario will be reduced, and wind conditions near the existing building in that section will meet the gust criterion.

Conditions in the surrounding area away from the Project Site are anticipated to be the same as the No-Build condition.

3.1.5.6 Build – Grade Level: Mean Speed

Sidewalks

Wind speeds around the Project are anticipated to be comfortable for walking or better at most areas. Winds near the western building corners are anticipated to be rated uncomfortable for walking. The Project team will continue to evaluate measures to improve wind conditions at these locations as the design progresses. The sheltering effect of the Project is expected to reduce wind speeds on Washington Street, south of Herald Street. Conditions at other areas are generally expected to remain similar to those noted for the No-Build scenario in Section 3.1.5.3.

Main Entrance

The canopy above the main entrance on Shawmut Avenue will protect the entrance from winds downwashing off the west façade. However, winds accelerating at the western building corners will flow towards the entrance. The Project team is evaluating measures to mitigate these winds. The proposed closed vestibule at this entrance would serve as a protected waiting area for pedestrians.

3.1.5.7 Build – Terraces

The proposed Project includes large terraces on Level 7 (north and west sides), Level 9 (southeast) and Level 13 (Penthouse, northwest and southwest).

Wind speed increases with elevation; the large terraces are more exposed to winds due to the presence of very few tall buildings in the immediate vicinity in the windward directions. Wind speeds on the terraces are expected to be higher than desirable for passive activities. Wind speeds on the southeast terrace on Level 9 and the northwest terrace on Level 13 would be relatively lower than on the other terraces due to their location farthest from the windward (west) side (Level 9) and recessed location at a re-entrant corner under a large canopy (Level 13). However, conditions are expected to be windy from time to time. As the design progresses, the Project team will continue to evaluate measures to ensure comfortable wind conditions at the times when the terraces will be most in use.

3.1.6 Summary

Based on the Project height and its surroundings, local wind data, and RWDI's experience with similar projects, it is predicted that wind speeds at most areas around the Project will be suitable for pedestrian activity and similar to conditions that exist currently. However, the exposure of the Project to the west-northwest and southwest winds, and the interaction of winds with the proposed building and the new surrounding buildings anticipated to be completed before the proposed Project, will result in higher than desired wind conditions around the western corners. The main entrance and terraces are expected to be windy for the intended use due to their exposure to the prevailing winds. The Project team will continue to evaluate measures to mitigate wind impacts at the corners, main entrance and terraces as the design progresses.

Wind speeds that exceed the effective gust criterion are expected in the existing surroundings prior to the addition of the Project and would remain after the Project is constructed. The addition of the Project is expected to result in similar high gust conditions near its western corners. Mean wind speeds at the aforementioned areas are expected to be rated uncomfortable for walking. Wind conditions at most other areas are expected to remain largely unchanged compared to the existing conditions and be in the range comfortable for walking or standing. As mentioned above, the Project team will continue to evaluate measures to mitigate these potential gust conditions.

The proposed Project is expected to have little to no impact on wind conditions in the extended surroundings.

3.2 Shadow

3.2.1 Introduction and Methodology

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

The shadow analysis presents the existing shadow and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. The analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project Site. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 3.2-1 to 3.2-14 at the end of this section.

The results of the analysis show that new shadow from the Project will generally be limited to nearby streets and sidewalks. During one time period (December 21 at 3:00 p.m.), new shadow will be cast onto the Quincy Upper School playground, the closest open space to the Project Site. No new shadow will be cast onto nearby bus stops during the 14 time periods studied.

3.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow from the Project will be cast to the northwest. Minimal new shadow will be cast onto small portions of Herald Street, Shawmut Avenue and its sidewalks, and Paul Place and its northern sidewalk. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 12:00 p.m., new shadow from the Project will be cast to the north. New shadow will be cast onto small portions of Herald Street and Shawmut Avenue, as well as their sidewalks. New shadow will also be cast onto the commuter rail tracks to the north. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 3:00 p.m., new shadow from the Project will be cast to the northeast. New shadow will be cast across a portion of Herald Street and its sidewalks, as well as portions of the train tracks to the north and the Massachusetts Turnpike. No new shadow will be cast onto nearby bus stops or existing public open spaces.

3.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow from the Project will be cast to the west onto a minor portion of the Paul Place northern sidewalk. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 12:00 p.m., new shadow will be cast to the northwest onto a small portion of Herald Street and its southern sidewalk, as well as a small portion of Shawmut Avenue. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 3:00 p.m., new shadow will be cast to the northeast over a portion of Herald Street and its sidewalks. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 6:00 p.m., new shadow will be cast to the east onto portions of Herald Street and its southern sidewalk, and Washington Street and its sidewalks. No new shadow will be cast onto nearby bus stops or existing public open spaces.

3.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, new shadow from the Project will be cast to the northwest. New shadow will be cast onto minor portions of Herald Street and Shawmut Avenue and its sidewalks. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 12:00 p.m., new shadow from the Project will be cast to the north. New shadow will be cast onto small portions of Herald Street and Shawmut Avenue, as well as their sidewalks. New shadow will also be cast onto the commuter rail tracks and the Massachusetts Turnpike to the north. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 3:00 p.m., new shadow from the Project will be cast to the northeast. New shadow will be cast across a small portion of Herald Street and its sidewalks, as well as portions of the commuter rail tracks and the Massachusetts Turnpike to the north. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 6:00 p.m., new shadow will be cast to the east across a minimal portion of Herald Street, a portion of Harrison Avenue and its sidewalks, Marginal Road and its sidewalks, and Hudson Street and its sidewalks. No new shadow will be cast onto nearby bus stops or existing public open spaces.

3.2.5 Winter Solstice (December 21)

At 9:00 a.m. during the winter solstice, new shadow from the Project will be cast to the northwest across a minor portion of Shawmut Avenue and its sidewalks, Marginal Road and its sidewalks, and the commuter rail tracks and Massachusetts Turnpike to the north. No new shadow will be cast onto nearby bus stops or existing public open spaces.

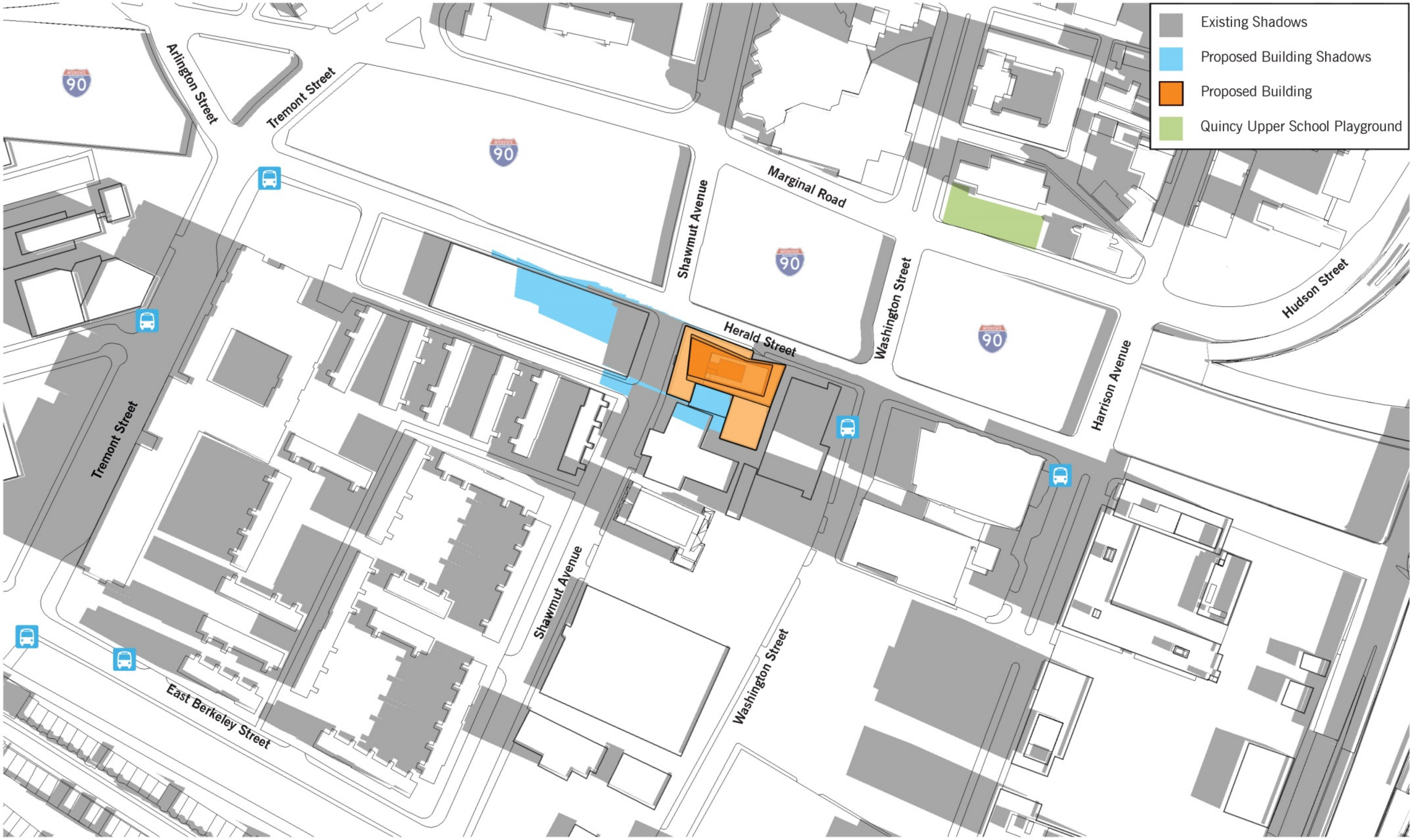
At 12:00 p.m., new shadow will be cast to the north across a minor portion of Herald Street and its sidewalks, a small portion of Marginal Road and its sidewalks, a minor portion of Shawmut Avenue and its eastern sidewalk, as well as the commuter rail tracks and

Massachusetts Turnpike to the north. No new shadow will be cast onto nearby bus stops or existing public open spaces.

At 3:00 p.m., new shadow will be cast to the northwest across small portions of Washington Street and its eastern sidewalk, Marginal Road, the commuter rail tracks and Massachusetts Turnpike to the north, and a portion of the Quincy Upper School playground. No new shadow will be cast onto nearby bus stops or other existing public open spaces.

3.2.6 Conclusions

The shadow analysis examines the impact of new shadow from the Project on the surrounding area during 14 time periods. New shadow will mainly be cast onto nearby streets and sidewalks. During one time period (December 21 at 3:00 p.m.), new shadow will be cast onto the Quincy Upper School playground. No new shadow will be cast onto nearby existing public open spaces during any of the other time periods studied. No new shadow will be cast onto nearby bus stops during the 14 time periods studied.



112 Shawmut Avenue Boston, Massachusetts

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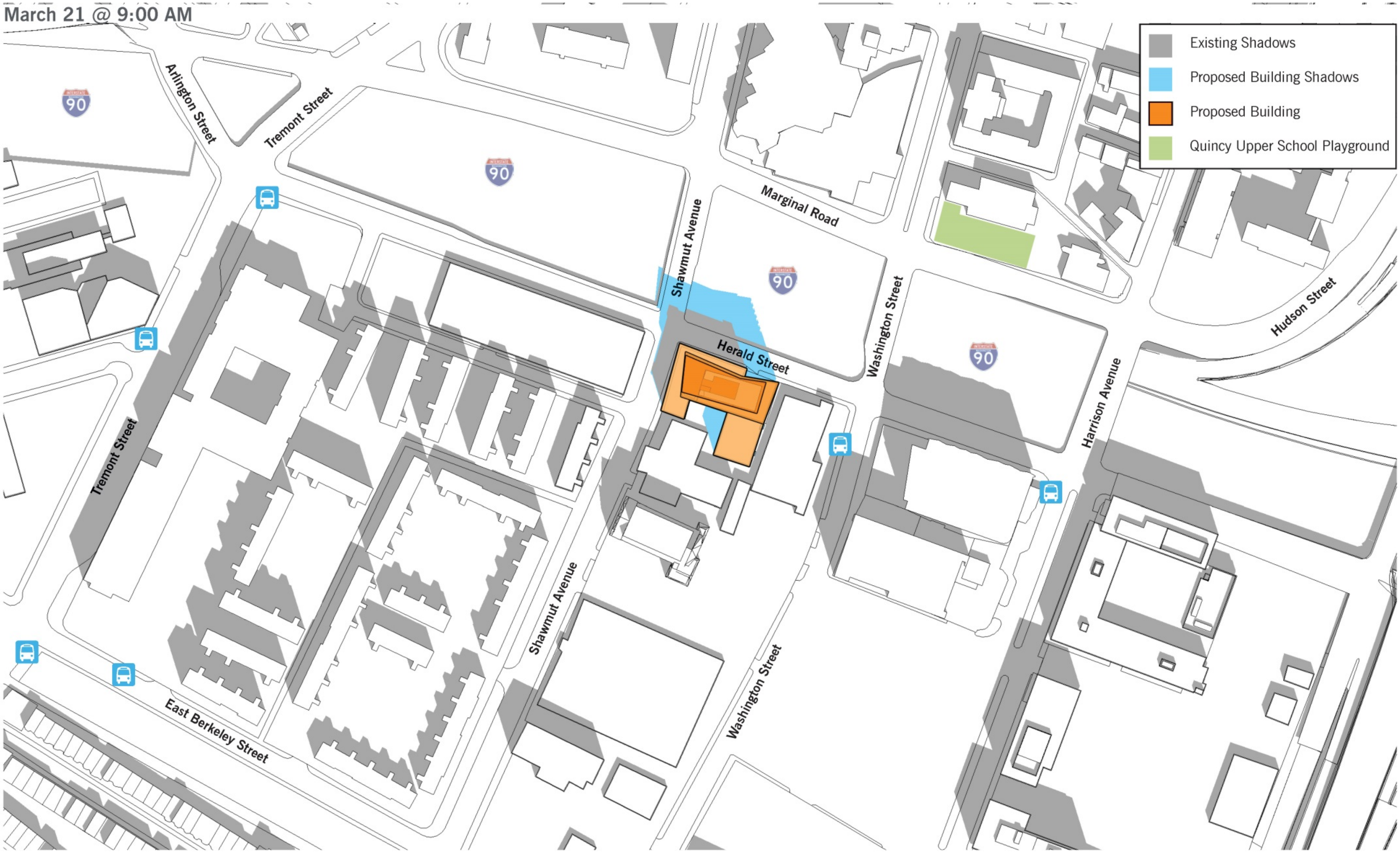
Figure 3.2-1

Shadow Study, March 21 9:00 a.m.



112 Shawmut Avenue   Boston, Massachusetts

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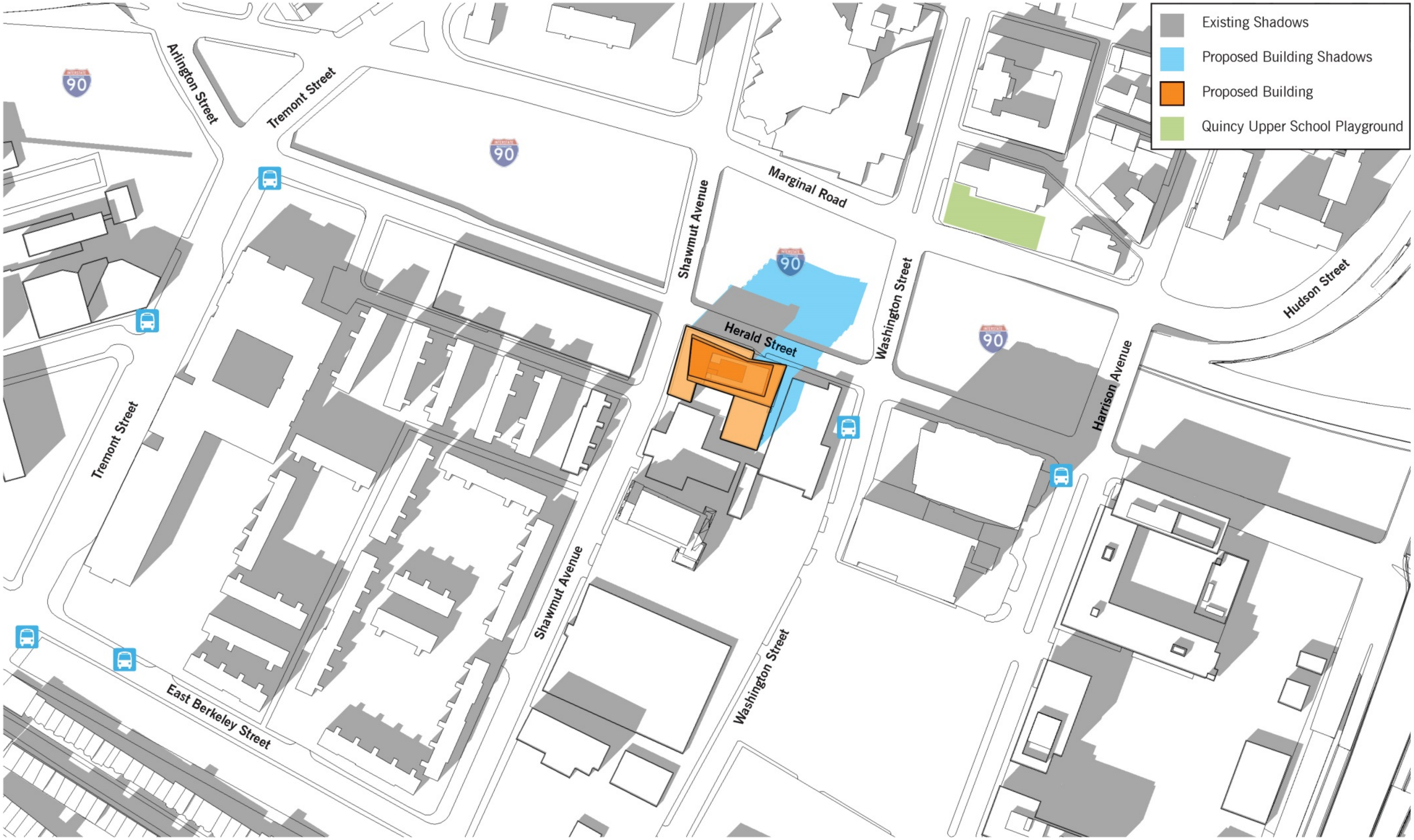
Figure 3.2-2

Shadow Study, March 21 12:00 p.m.



112 Shawmut Avenue   Boston, Massachusetts

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Figure 3.2-3

Shadow Study, March 21 3:00 p.m.

112 Shawmut Avenue   Boston, Massachusetts

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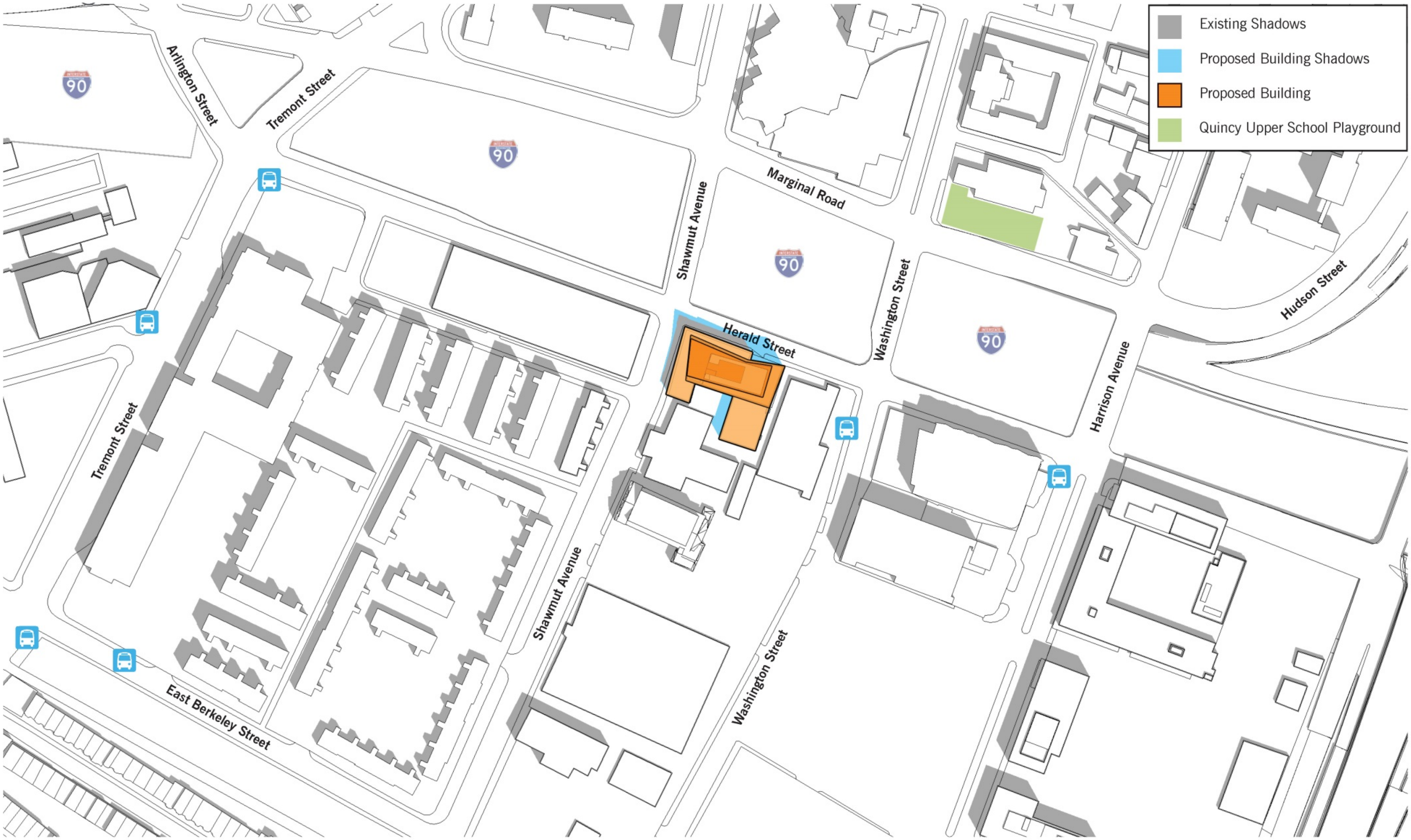
Figure 3.2-4

Shadow Study, June 21 9:00 a.m.



112 Shawmut Avenue   Boston, Massachusetts

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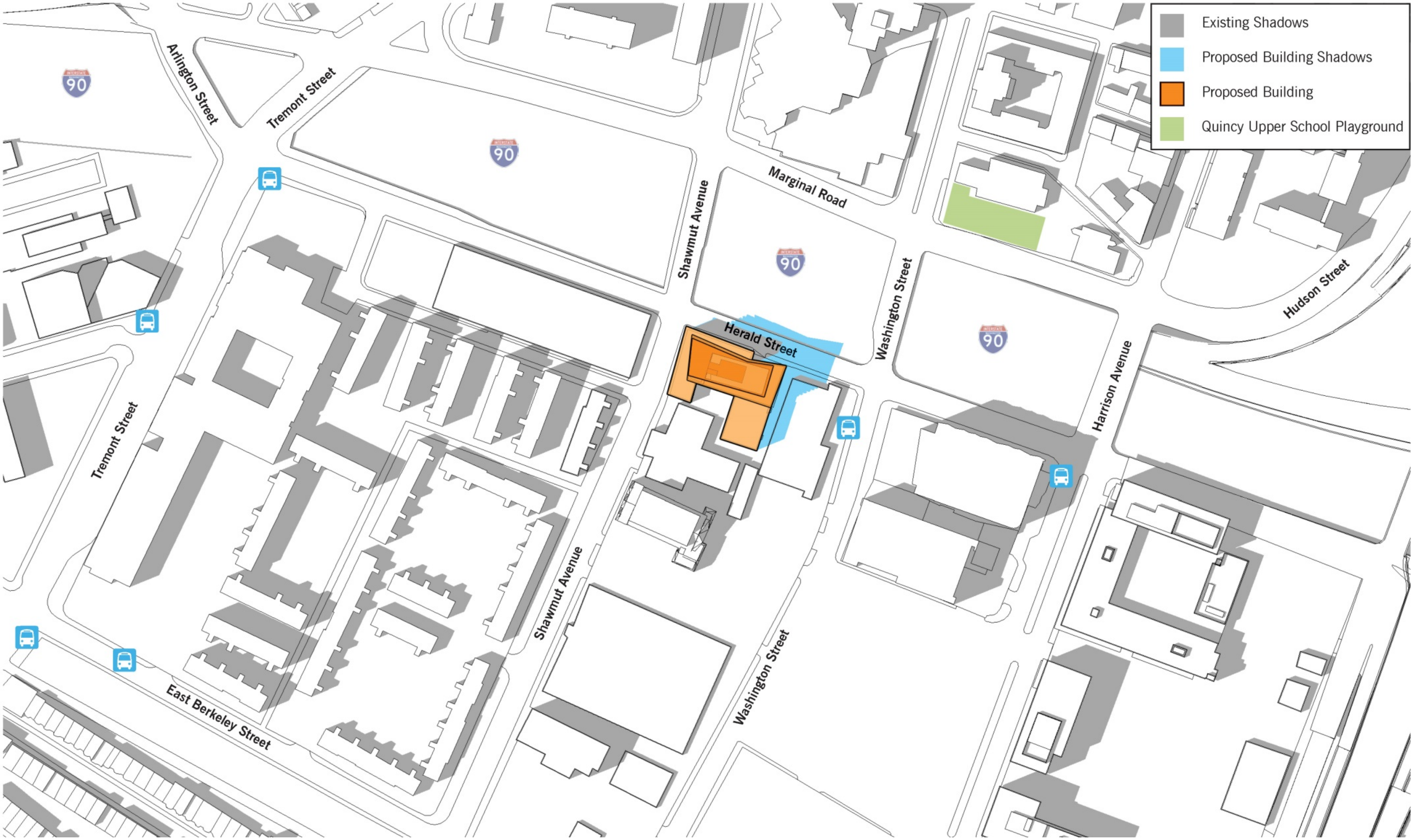
Figure 3.2-5

Shadow Study, June 21 12:00 p.m.



112 Shawmut Avenue   Boston, Massachusetts

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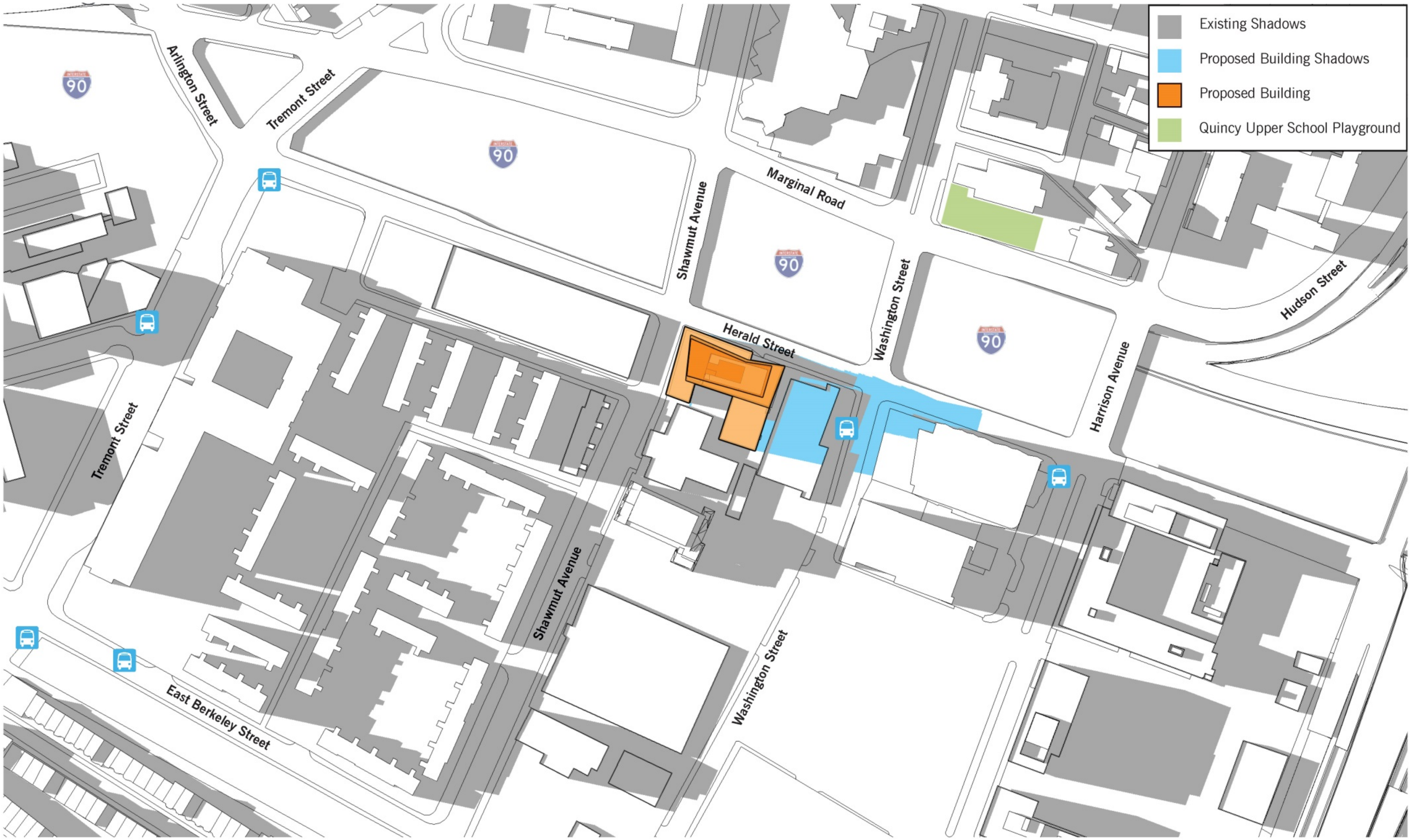
Figure 3.2-6

Shadow Study, June 21 3:00 p.m.



112 Shawmut Avenue Boston, Massachusetts

Figure 3.2-7

Shadow Study, June 21 6:00 p.m.

112 Shawmut Avenue   Boston, Massachusetts

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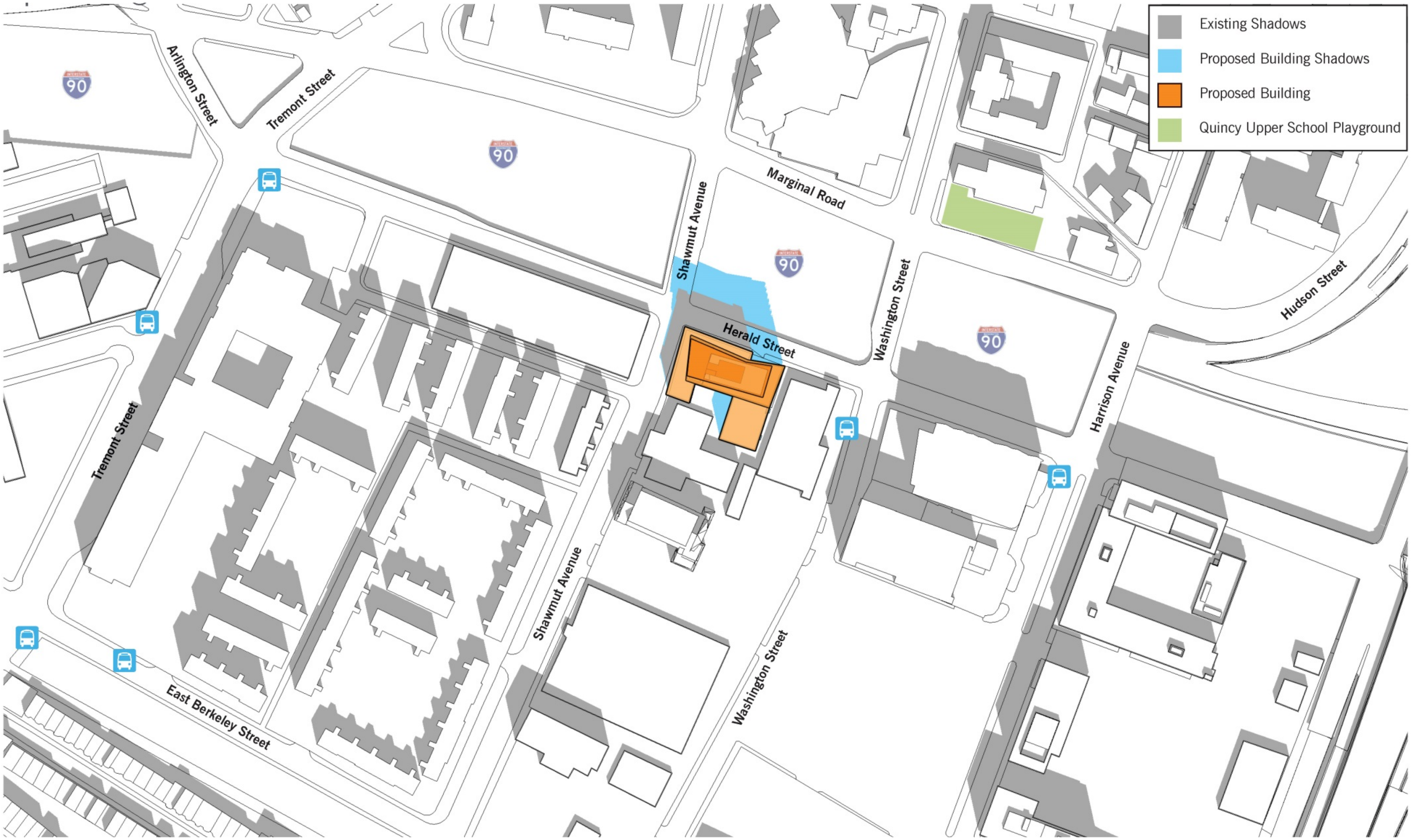
Figure 3.2-8

Shadow Study, September 21 9:00 a.m.



112 Shawmut Avenue Boston, Massachusetts

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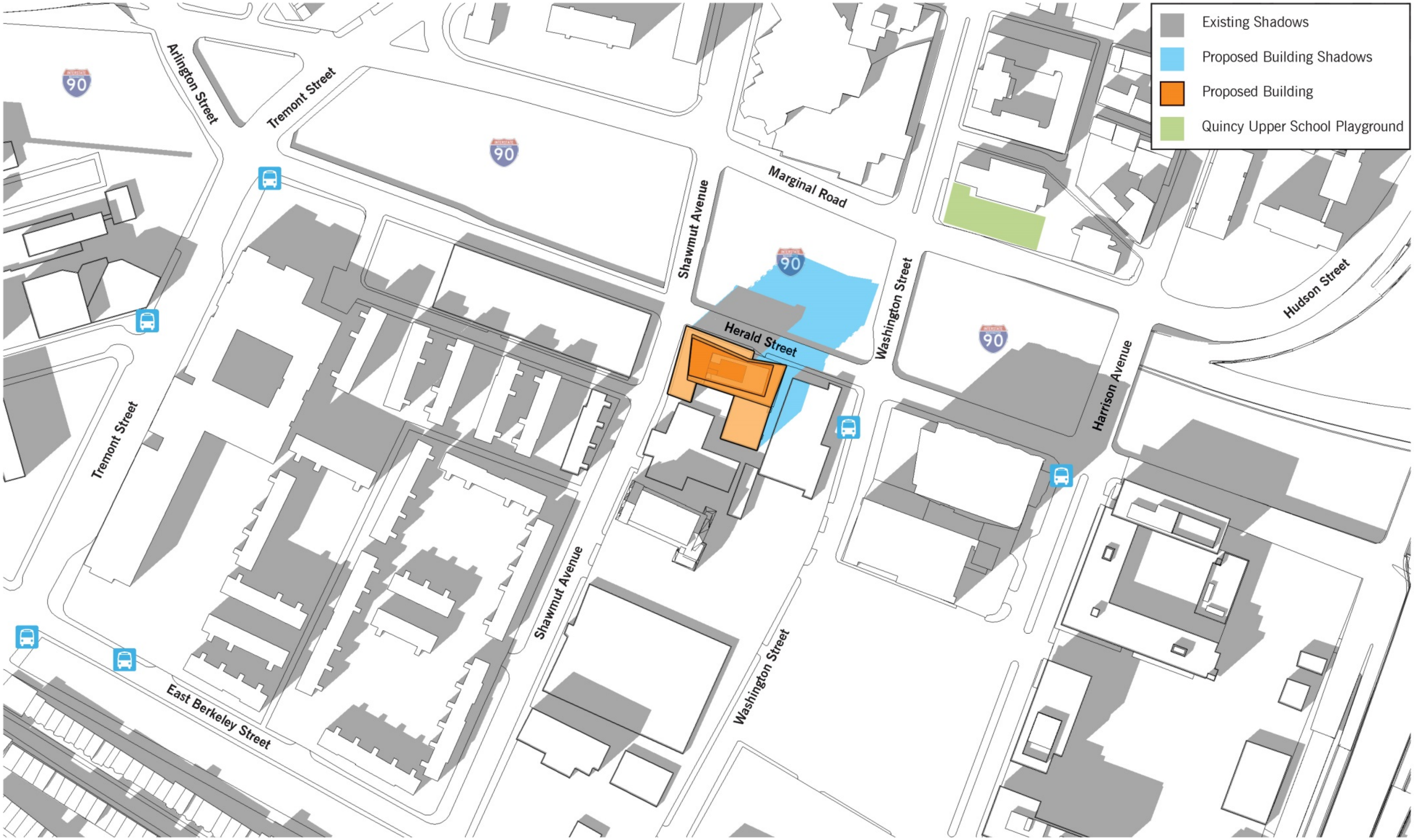
Figure 3.2-9

Shadow Study, September 21 12:00 p.m.



112 Shawmut Avenue   Boston, Massachusetts

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Figure 3.2-10

Shadow Study, September 21 3:00 p.m.

112 Shawmut Avenue **Boston, Massachusetts**

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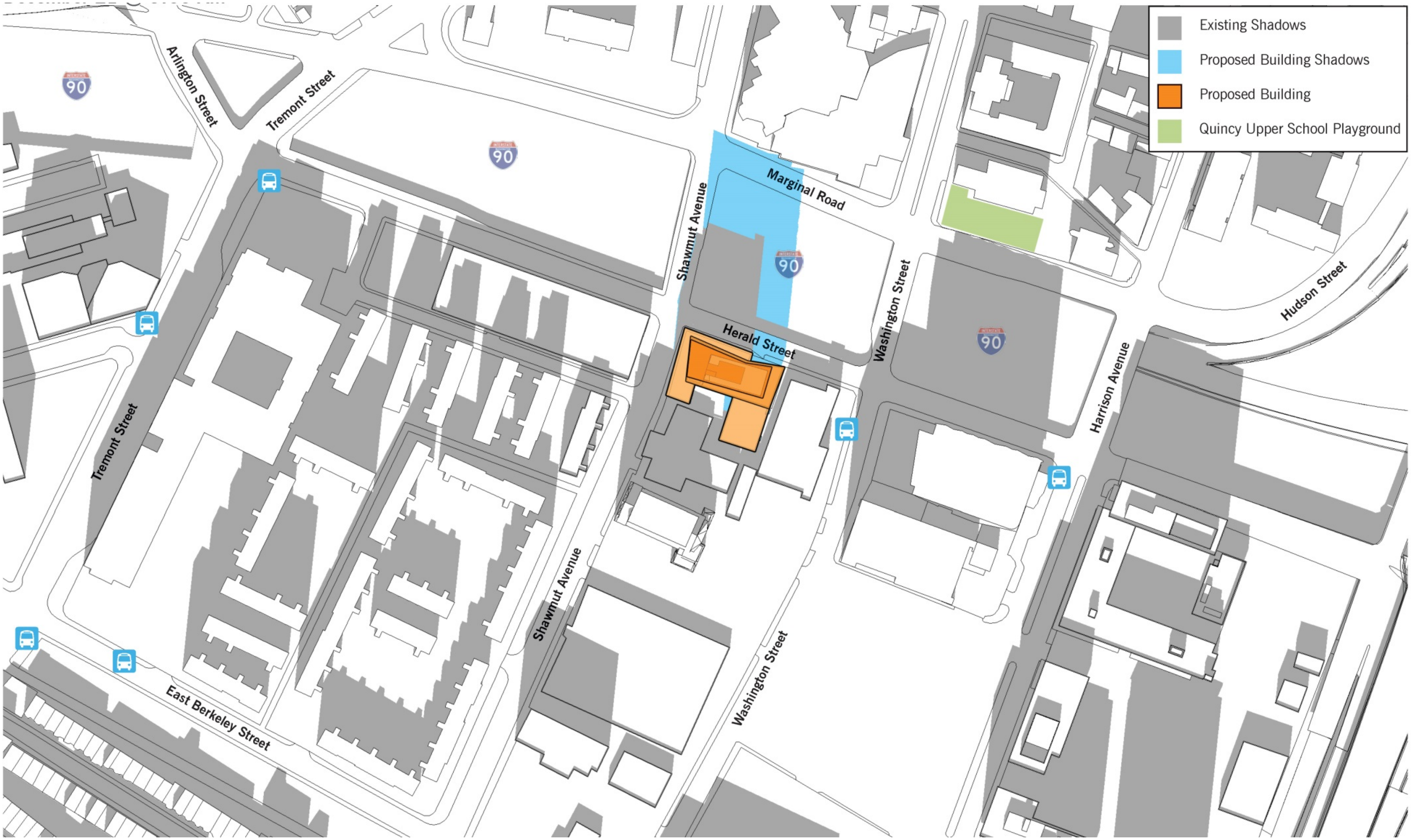
Figure 3.2-11

Shadow Study, September 21 6:00 p.m.

Figure 3.2-12

Shadow Study, December 21 9:00 a.m.



112 Shawmut Avenue   Boston, Massachusetts

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Figure 3.2-13

Shadow Study, December 21 12:00 p.m.

112 Shawmut Avenue Boston, Massachusetts

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Figure 3.2-14

Shadow Study, December 21 3:00 p.m.

3.3 Daylight Analysis

3.3.1 Introduction

The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and sidewalks in the immediate vicinity of a project site.

The results of the analysis performed for the Project indicate that while the Project will result in increased daylight obstruction over existing conditions, the resulting conditions will be similar to the daylight obstruction values within the surrounding area and are typical of densely built urban areas.

3.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program[9]. This program measures the percentage of sky dome that is obstructed by a project, and is considered a useful tool for evaluating the net change in obstruction from existing to build conditions at a specific site.

Using BRADA, a silhouette view of the building is taken at ground level from the middle of the adjacent city streets or pedestrian ways centered on the proposed building. The façade of the building facing the viewpoint, including heights, setbacks, corners and other features, is plotted onto a base map using lateral and elevation angles. The two-dimensional base map generated by BRADA represents a figure of the building in the "sky dome" from the selected viewpoint. Based on the width of the view, the distance between the viewpoint and the building, and the massing and setbacks incorporated into the design of the building, the BRADA program calculates the percentage of daylight that will be obstructed on a scale of 0 to 100 percent; the lower the number, the lower the percentage of obstruction of daylight from any given viewpoint.

The analysis compares three conditions: Existing Conditions, Proposed Conditions, and the context of the area.

Two viewpoints were chosen to evaluate daylight obstruction for the Existing and Proposed Conditions. Three area context viewpoints were selected to provide a basis of comparison to existing conditions in the surrounding area. The viewpoint and area context viewpoints were taken in the following locations and are shown in Figure 3.3-1.

- **Viewpoint 1:** View from the center of Herald Street facing south toward the Project Site.

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

- **Viewpoint 2:** View from the center of Shawmut Avenue facing east toward the Project Site.

- **Area Context Viewpoint AC1:** View from the center of Herald Street facing south toward 1000 Washington Street.

- **Area Context Viewpoint AC2:** View from the center of Shawmut Avenue facing east toward 120 Shawmut Avenue.

- **Area Context Viewpoint AC3:** View from the center of Washington Street facing east toward 345 Harrison Avenue.

3.3.3 Results

The daylight obstruction for each viewpoint is shown in Table 3.3-1. Figures 3.3-2 through 3.3-3 illustrate the BRADA results for each analysis.

Table 3.3-1 Daylight Results

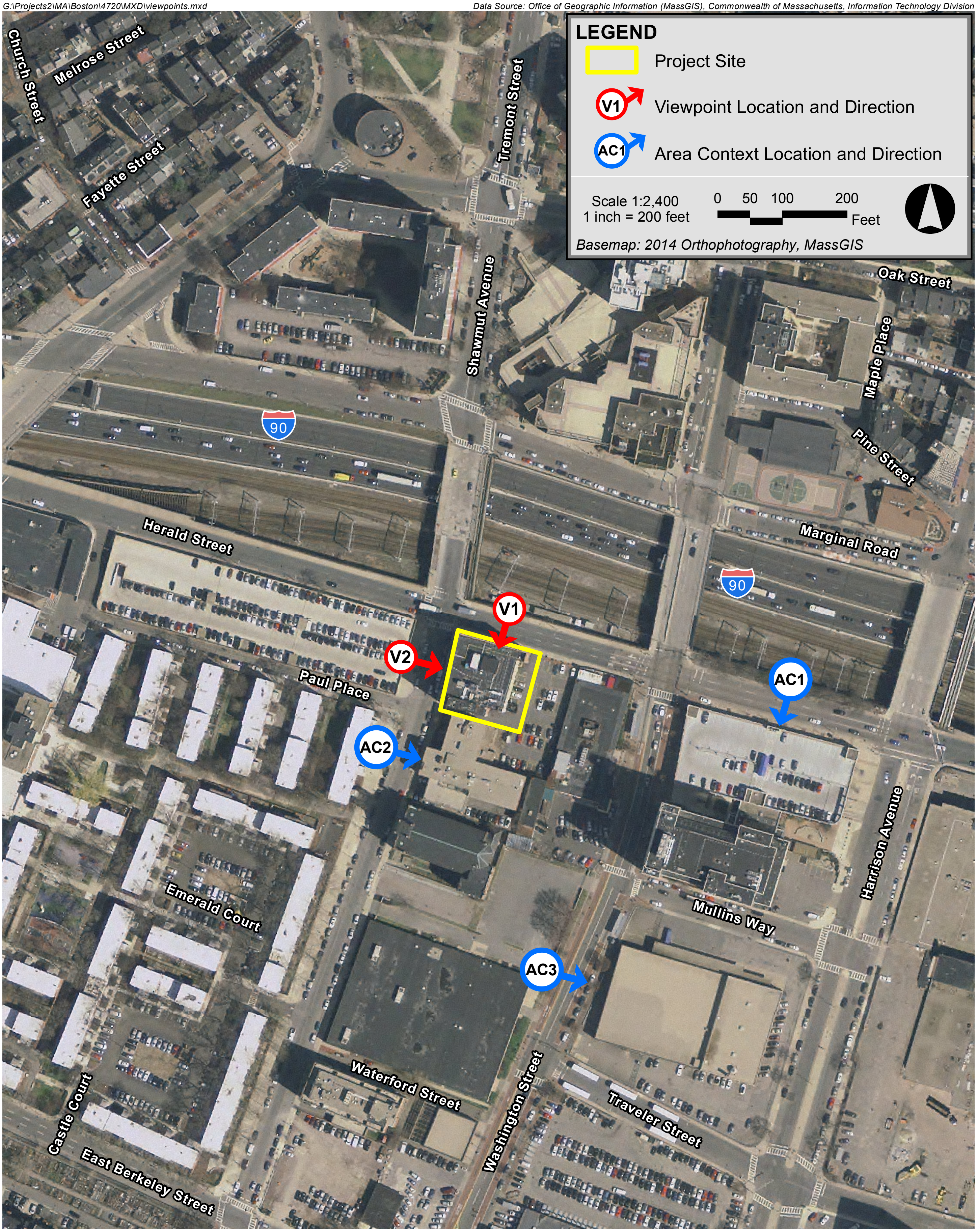
Viewpoint Locations		Daylight Obstruction (Percent) Existing Conditions	Proposed Conditions
Viewpoint 1	View from the center of Herald Street facing south toward the Project Site	58.5%	77.8%
Viewpoint 2	View from the center of Shawmut Avenue facing east toward the Project Site	73.9%	75.9%
Area Context Points			
AC1	View from the center of Herald Street facing the building approved at 1000 Washington Street	80.8%	N/A
AC2	View from the center of Harrison Avenue facing the building approved at 345 Harrison Avenue	70.8%	N/A
AC3	View from the center of Shawmut Street facing the existing building at	40.5%	N/A

Herald Street - Viewpoint 1

Herald Street runs along the northern edge of the Project Site. Viewpoint 1 was taken from the center of Herald Street facing south toward the Project Site. This portion of the Project Site has an existing daylight obstruction of 58.5%. The development of the Project will increase the daylight obstruction value to 77.8%. The daylight obstruction value is comparable to the daylight obstruction value of other buildings in the area, including the Area Context buildings.

G:\Projects2\MA\Boston\4720\MXD\viewpoints.mxd

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division



112 Shawmut Avenue Boston, Massachusetts

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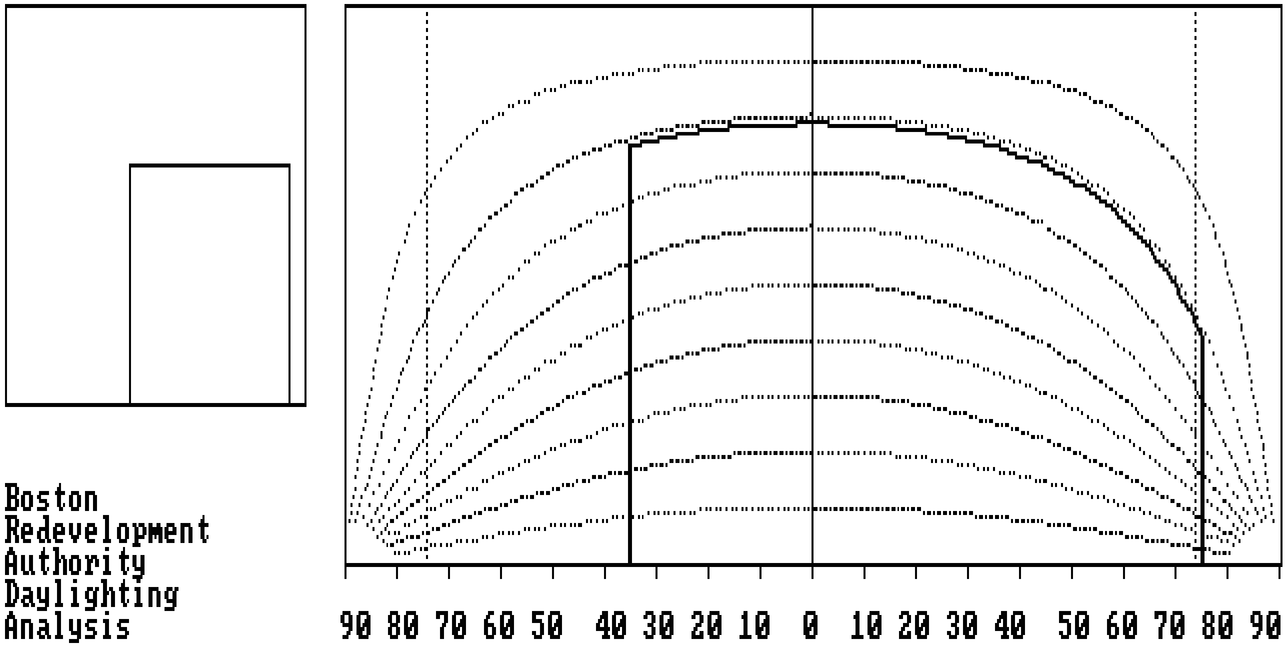
Figure 3.3-1

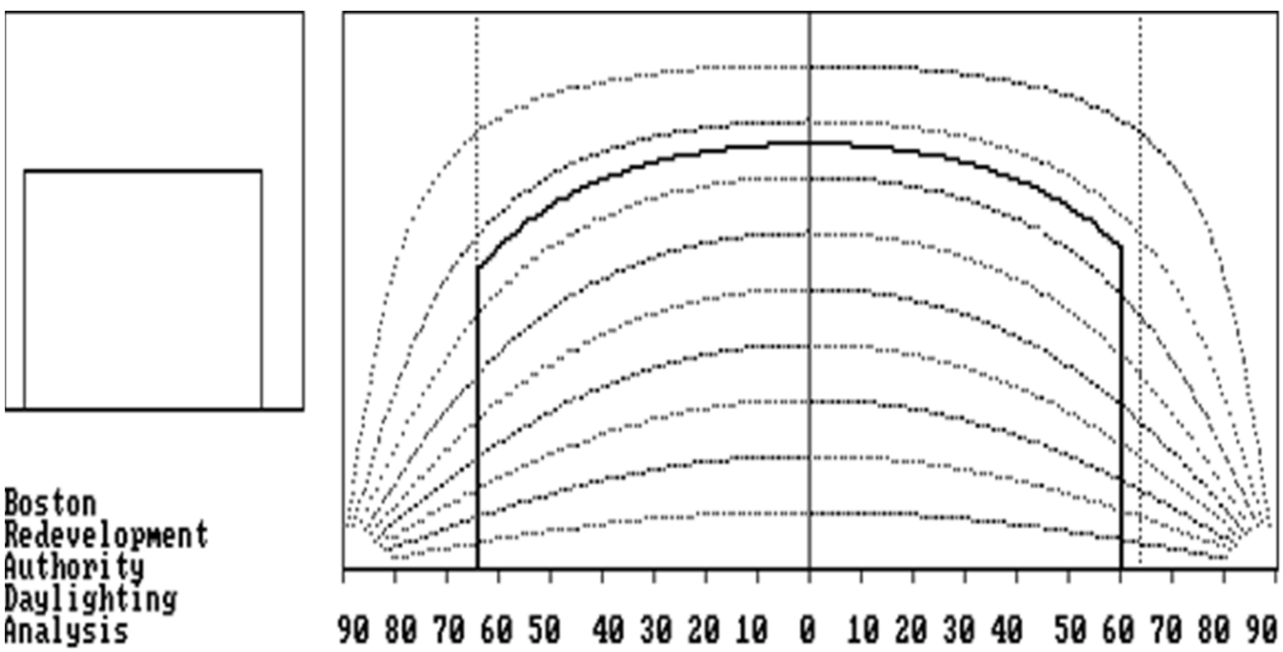
Viewpoint and Area Context Locations

Viewpoint 1: View from Herald Street facing south toward the Project Site:



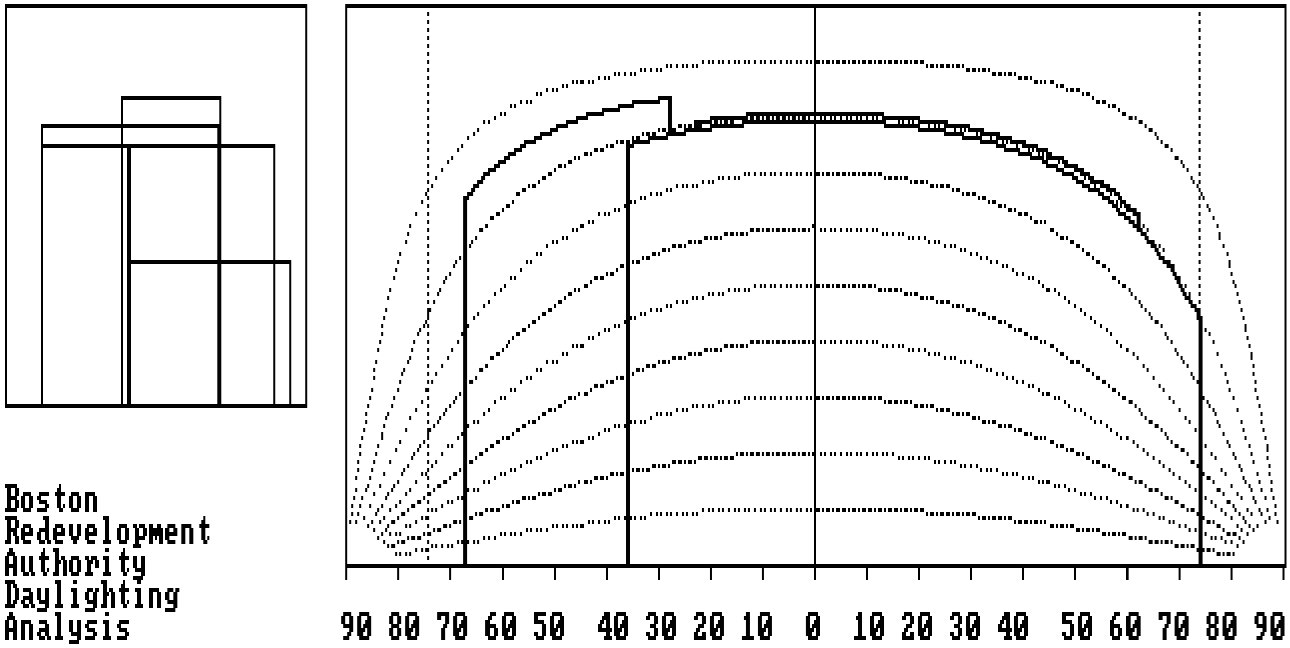
Obstruction of daylight by the building is 58.5 %

Viewpoint 2: View from Shawmut Avenue facing east toward Project Site:



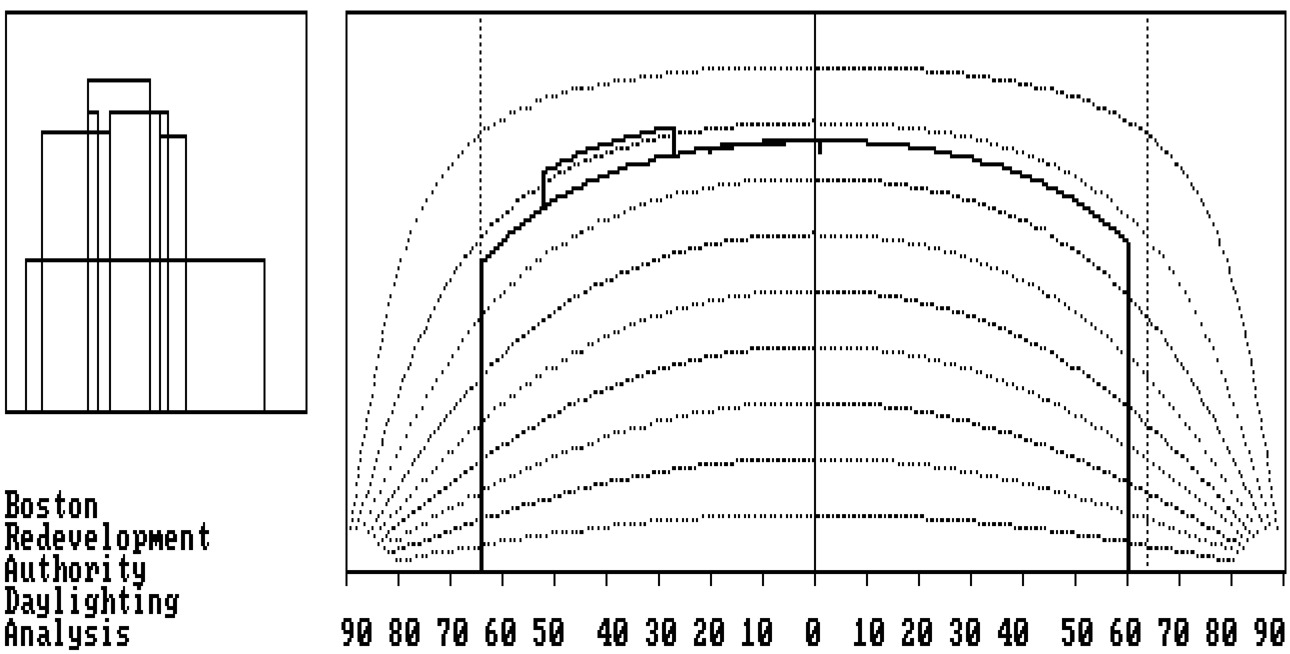
Obstruction of daylight by the building is 73.9 %

Viewpoint 1: View from Herald Street facing south toward the Project Site:



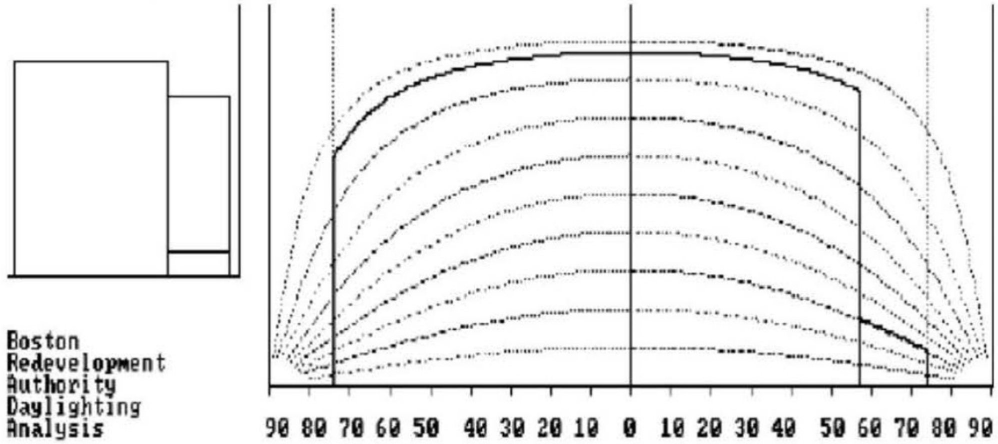
Obstruction of daylight by the building is 77.8 %

Viewpoint 2: View from Shawmut Avenue facing east toward Project Site:



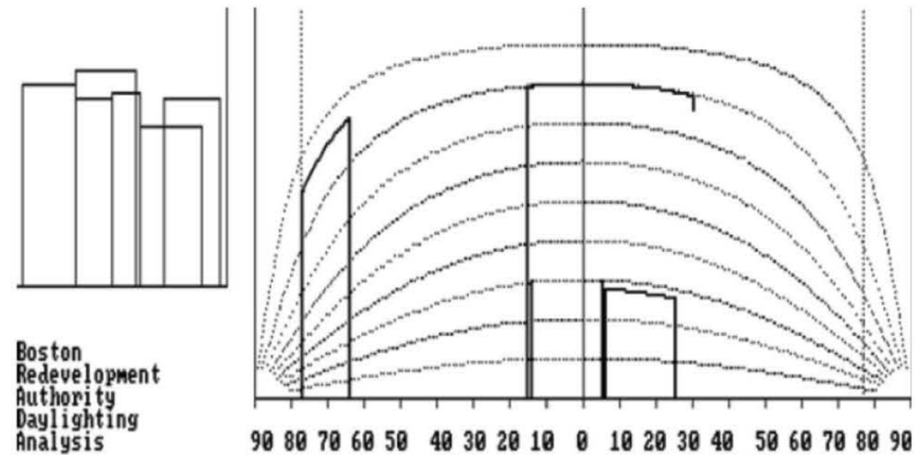
Obstruction of daylight by the building is 75.9 %

Area Context Viewpoint AC1: View from Herald Street facing south toward 1000 Washington Street.



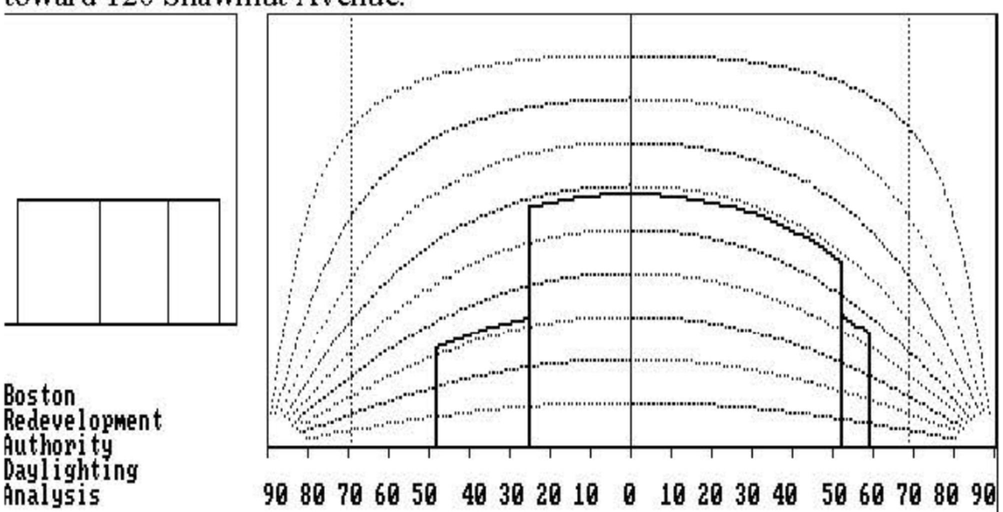
Obstruction of daylight by the building is 80.8 %

Area Context Viewpoint AC2: View from Harrison Avenue facing east toward 345 Harrison Avenue.



Obstruction of daylight by the building is 70.8 %

Area Context Viewpoint AC3: View from Shawmut Avenue facing east toward 120 Shawmut Avenue.



Obstruction of daylight by the building is 40.5 %

Shawmut Avenue – Viewpoint 2

Shawmut runs along the western edge of the Project Site. Viewpoint 2 was taken from the center of Shawmut Avenue facing east toward the Project Site. This portion of the Project Site has an existing daylight obstruction of 73.9%. The development of the Project will minimally increase the daylight obstruction value to 75.9%. The daylight obstruction value is similar to the daylight obstruction value of the existing conditions and of other buildings in the area, including the Area Context buildings.

Area Context Viewpoints

The Project Site is located in an area with a mix of relatively medium- to high-density residential and commercial uses. To provide a larger context for comparison of daylight conditions, obstruction values were calculated for the three Area Context Viewpoints described above and shown on Figure 3.3-4. The daylight obstruction values ranged from 40.5% for AC3, an older low rise commercial structure; to 80.8% for AC1, a recently approved mid-rise residential structure representative of new construction in the neighborhood. Daylight obstruction values for the proposed Project are largely consistent with or less than the Area Context values.

3.3.4 Conclusion

The daylight analysis conducted for the Project describes existing and proposed daylight obstruction conditions at the Project Site and in the surrounding area. The results of the BRADA analysis indicate that while the development of the Project will result in a modest increase in daylight obstruction over existing conditions, the resulting conditions will be similar to or less than the daylight obstruction values within the surrounding area. The design includes setbacks from the streets, space between buildings, and a variety of heights that allow for views of the sky.

3.4 Solar Glare

It is not anticipated that the Project will include the use of highly reflective glass or other reflective materials on the building facades that would result in adverse impacts from reflected solar glare from the Project.

3.5 Air Quality

3.5.1 Introduction

The BPDA requires that proposed projects evaluate the air quality in the local area, and that proponents assess any adverse air quality impacts attributable to a project.

The Project does not generate enough traffic to require a mesoscale vehicle emissions quantification analysis. However, the Project creates new trips through local intersections operating at LOS D or worse. Therefore, a microscale analysis of carbon monoxide has been completed to provide information on the Project's impact to air quality from mobile sources.

Any new stationary sources will be reviewed by the Massachusetts Department of Environmental Protection (MassDEP) during permitting under the Environmental Results Program, as required. It is expected that all stationary sources will be small, and any impacts from stationary sources would be minimal.

3.5.2 National Ambient Air Quality Standards and Background Concentrations

Background air quality concentrations and federal air quality standards were utilized to conduct the above air quality impact analyses. Federal National Ambient Air Quality Standards (NAAQS) were developed by the U.S. Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety. The modeling methodologies were developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[10] The following sections outline the NAAQS standards and detail the sources of background air quality data.

3.5.2.1 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, EPA promulgated NAAQS for the following criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM-10 and PM-2.5), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in Table 3.5-1. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS (differences are highlighted in **bold** in Table 3.5-1).

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

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

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[10] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005.

Table 3.5-1 National (NAAQS) and Massachusetts (MAAQS) Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$) Primary	NAAQS ($\mu g/m^3$) Secondary	MAAQS ($\mu g/m^3$) Primary	MAAQS ($\mu g/m^3$) Secondary
NO_2	Annual (1)	100	Same	100	Same
	1-hour (2)	**188**	None	**None**	None
SO_2	Annual (1)(9)	80	None	80	None
	24-hour (3)(9)	365	None	365	None
	3-hour (3)	None	1300	None	1300
	1-hour (4)	**196**	None	**None**	None
PM-2.5	Annual (1)	**12**	**15**	**None**	**None**
	24-hour (5)	**35**	**Same**	**None**	**None**
PM-10	Annual (1)(6)	**None**	None	**50**	Same
	24-hour (3)(7)	150	Same	150	Same
CO	8-hour (3)	10,000	Same	10,000	Same
	1-hour (3)	40,000	Same	40,000	Same
Ozone	8-hour (8)	**147**	Same	**235**	Same
Pb	3-month (1)	1.5	Same	1.5	Same

(1) Not to be exceeded.
(2) 98th percentile of one-hour daily maximum concentrations, averaged over three years.
(3) Not to be exceeded more than once per year.
(4) 99th percentile of one-hour daily maximum concentrations, averaged over three years.
(5) 98th percentile, averaged over three years.
(6) EPA revoked the annual PM-10 NAAQS in 2006.
(7) Not to be exceeded more than once per year on average over three years.
(8) Annual fourth-highest daily maximum eight-hour concentration, averaged over three years.
(9) EPA revoked the annual and 24-hour SO_2 NAAQS in 2010. However, they remain in effect until one year after the area's initial attainment designation, unless designated as "nonattainment".

Source: http://www.epa.gov/ttn/naaqs/criteria.html and 310 CMR 6.04

3.5.2.2 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP to EPA was obtained for 2013 to 2015. Data for the pollutant and averaging time combinations were obtained from the EPA's AirData website.

The Clean Air Act allows for one exceedance per year of the CO and SO_2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM-10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM-2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. For annual PM-2.5 averages, the average of the highest yearly observations was used as the background concentration. To attain the one-hour NO_2 standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$.

Background concentrations were determined from the closest available monitoring stations to the Project. All pollutants are not monitored at every station, so data from multiple locations are necessary. The closest monitor is at 174 North Street in Boston, roughly 1.25 miles north-northeast of the Project. This site samples for PM-2.5 only. The next closest site is at East First Street in South Boston, roughly 1.5 miles east-southeast of the Project location. However this site only samples for NO_2 and SO_2. Finally, the remaining pollutants are measured at Harrison Avenue in Boston, roughly 1.5 miles southwest of the Project Site. A summary of the background air quality concentrations are presented in Table 3.5-2.

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

Pollutant	Averaging Time	2013	2014	2015	Background Concentration ($\mu g/m^3$)	NAAQS	Percent of NAAQS
SO_2 (1)(6)(7)	1-Hour (5)	36.7	73.4	24.6	44.9	196.0	23%
	3-Hour	42.7	63.7	22.8	63.7	1300.0	5%
	24-Hour	17.0	21.2	11.3	21.2	365.0	6%
	Annual	4.0	4.6	2.1	4.6	80.0	6%
PM-10	24-Hour	34	61.0	28.0	61.0	150.0	41%
	Annual	15.1	13.9	12.4	15.1	50.0	30%
PM-2.5	24-Hour (5)	19.9	14.5	16.8	17.1	35.0	49%
	Annual (5)	8.8	7.1	7.4	7.8	12.0	65%
NO_2 (3)	1-Hour (5)	88.4	116.6	99.6	101.5	188.0	54%
	Annual	22.9	26.3	28.1	28.1	100.0	28%
CO (2)	1-Hour	2145.3	1963.1	1560.9	2145.3	40000.0	5%
	8-Hour	1375.2	1489.8	1031.4	1489.8	10000.0	15%
Ozone (4)	8-Hour	115.8	106.0	109.9	115.8	147.0	79%
Lead	Rolling 3-Month	0.006	0.014	0.016	0.016	0.15	10%

Notes:
From 2013-2015 EPA's AirData Website
(1) SO_2 reported ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2.62 $\mu g/m^3$.
(2) CO reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1146 $\mu g/m^3$.
(3) NO_2 reported in ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1.88 $\mu g/m^3$.
(4) O_3 reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1963 $\mu g/m^3$.
(5) Background level is the average concentration of the three years.
(6) The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.
(7) The E. 1st St. monitor was closed in 2014. Harrison Avenue data used for 2015 SO_2 and NO_2.

Air quality in the vicinity of the Project Site is generally good, with all local background concentrations found to be well below the NAAQS.

3.5.3 Mobile Sources

Mobile sources of air pollution include emissions from gasoline, diesel, and natural gas fueled vehicle traffic. Emissions from mobile sources have continually decreased as engine technology and efficiency have been improved.

3.5.3.1 Methodology

The BPDA requests an analysis of the effect on air quality of the increase in traffic generated by projects subject to Large Project Review. This "microscale" analysis is typically required for any intersection where 1) Project traffic would impact intersections or roadway links currently operating at LOS D, E, or F or would cause LOS to decline to D, E, or F; 2) Project traffic would increase traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour); or 3) the Project will generate 3,000 or more new average daily trips on roadways providing access to a single location. The microscale analysis involves modeling of CO emissions from vehicles idling at and traveling through signaled intersections. Predicted ambient concentrations of CO for the Build and No-Build cases are compared with federal (and state) ambient air quality standards for CO.

The microscale analysis typically examines ground-level CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. The NAAQS standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period, and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on current vehicles has reduced the occurrences of CO hotspots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The microscale analysis has been conducted using the latest versions of EPA's MOVES and CAL3QHC programs to estimate CO concentrations at sidewalk receptor locations. Baseline (2017) and future year (2024) emission factor data calculated from the MOVES model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections. The modeling methodology was developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[11]

Existing background values of CO at the nearest monitor location at Harrison Avenue were obtained from MassDEP. CAL3QHC results were then added to background CO values of 1.9 ppm (one-hour) and 1.3 ppm (eight-hour), as provided by MassDEP, to determine total

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[11] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005.

air quality impacts due to the Project. These values were compared to the NAAQS for CO of 35 ppm (one-hour) and 9 ppm (eight-hour).

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

Intersection Selection

Two signalized intersections included in the traffic study meet the above conditions described at the beginning of this section (see Chapter 2). The traffic volumes and LOS calculations provided in Chapter 3 form the basis of evaluating the traffic data versus the microscale thresholds. The intersections found to meet the criteria are:

- Washington Street and Herald Street, and
- Tremont Street, Berkeley Street, and East Berkeley Street.

Microscale modeling was performed for the intersections based on the aforementioned methodology. The 2017 Existing Condition and the 2024 No-Build and Build conditions were each evaluated for both morning (a.m.) and afternoon (p.m.) peak.

Emissions Calculations (MOVES)

The EPA MOVES computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOVES model are based on motor vehicle operations typical of daily periods. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the county specific vehicle age registration distribution, fleet mix, meteorology, and other inputs. The inputs for MOVES for the existing (2017) and future year (2024) are provided by MassDEP.

All link types for the modeled intersections were input into MOVES. Idle emission factors are obtained from factors for a link average speed of 0 miles per hour (mph). Moving emissions are calculated based on speeds at which free-flowing vehicles travel through the intersection as stated in traffic modeling (Synchro) reports. A speed of 25 mph is used for all free-flow traffic, consistent with the City of Boston speed limit. Speeds of 10 and 15 mph were used for right (and U-turns, if necessary) and left turns, respectively. Roadway emissions factors were obtained from MOVES using EPA guidance.[12]

Winter CO emission factors are typically higher than summer. Therefore, January weekday emission factors were conservatively used in the microscale analysis.

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[12] U.S. EPA, 2010. Using MOVES in Project-Level Carbon Monoxide Analyses. EPA-420-B-10-041.

Receptors & Meteorology Inputs

Sets of up to 200 receptors were placed in the vicinity of the modeled intersections. Receptors extended approximately 300 feet on the sidewalks along the roadways approaching the intersections. The roadway links and receptor locations of the modeled intersections are presented in Figures 3.5-1 and 3.5-2.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[13], a wind speed of one meter per second, stability class D (4), and a mixing height of 1,000 meters were used. To account for the intersection geometry, wind directions from 0° to 350°, every 10° were selected. A surface roughness length of 321 centimeters was selected.[14]

Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-links at signalized intersections, worst-case meteorological conditions, and traffic input data. The one-hour concentrations were scaled by a factor of 0.9 to estimate eight-hour concentrations.[15] The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling outputs.

For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 1.9 ppm (2,145 $\mu g/m^3$) for one-hour and 1.3 ppm (1,490 $\mu g/m^3$) for eight-hour CO.

3.5.4 Air Quality Results

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3.5-3 through 3.5-6 for the 2017 and 2024 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.9.[16]

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

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

15 U.S. EPA, AERSCREEN User's Guide; EPA-454/B-11-001, March 2011.

16 Ibid.

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Figure 3.5-1

Intersection of Washington Street and Herald Street.

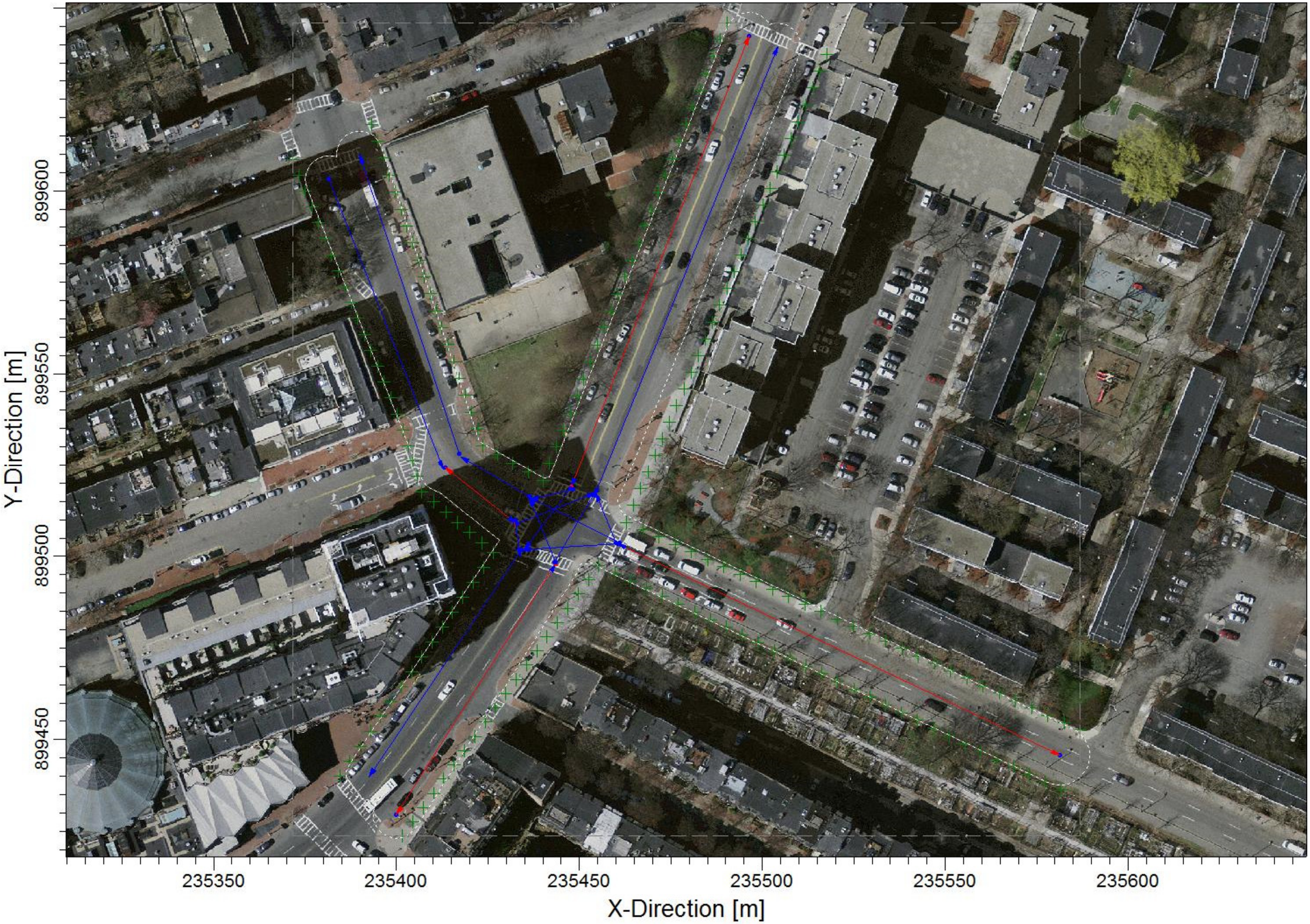

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Figure 3.5-2

Intersection of Tremont Street, Berkeley Street, and East Berkeley Street.

The results of the one-hour and eight-hour maximum modeled CO ground-level concentrations from CAL3QHC were added to EPA-supplied background levels for comparison to the NAAQS. These values represent the highest potential concentrations at the intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology. The highest one-hour traffic-related concentration predicted in the area of the Project for the modeled (Build) conditions (0.3 ppm) plus background (1.9 ppm) is 2.2 ppm. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled (Build) conditions (0.3 ppm) plus background (1.3 ppm) is 1.6 ppm. All concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

3.5.5 Conclusions

Results of the microscale analysis show that all predicted CO concentrations are well below one-hour and eight-hour NAAQS. Therefore, it can be concluded that there are no anticipated adverse air quality impacts resulting from increased traffic in the area.

Table 3.5-3 Summary of Microscale Modeling Analysis (Existing 2017)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Washington Street and Herald Street	AM	0.4	1.9	2.3	35
	PM	0.5	1.9	2.4	35
Tremont Street, Berkeley Street, and East Berkeley Street	AM	0.4	1.9	2.3	35
	PM	0.4	1.9	2.3	35
8-Hour					
Washington Street and Herald Street	AM	0.4	1.3	1.7	9
	PM	0.5	1.3	1.8	9
Tremont Street, Berkeley Street, and East Berkeley Street	AM	0.4	1.3	1.7	9
	PM	0.4	1.3	1.7	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

Table 3.5-4 Summary of Microscale Modeling Analysis (No-Build 2024)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Washington Street and Herald Street	AM	0.3	1.9	2.2	35
	PM	0.3	1.9	2.2	35
Tremont Street, Berkeley Street, and East Berkeley Street	AM	0.3	1.9	2.2	35
	PM	0.3	1.9	2.2	35
8-Hour					
Washington Street and Herald Street	AM	0.3	1.3	1.6	9
	PM	0.3	1.3	1.6	9
Tremont Street, Berkeley Street, and East Berkeley Street	AM	0.3	1.3	1.6	9
	PM	0.3	1.3	1.6	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

Table 3.5-5 Summary of Microscale Modeling Analysis (Build 2024)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Washington Street and Herald Street	AM	0.3	1.9	2.2	35
	PM	0.3	1.9	2.2	35
Tremont Street, Berkeley Street, and East Berkeley Street	AM	0.3	1.9	2.2	35
	PM	0.3	1.9	2.2	35
8-Hour					
Washington Street and Herald Street	AM	0.3	1.3	1.6	9
	PM	0.3	1.3	1.6	9
Tremont Street, Berkeley Street, and East Berkeley Street	AM	0.3	1.3	1.6	9
	PM	0.3	1.3	1.6	9

Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.

3.6 Stormwater/Water Quality

Please see Chapter 7 for information on stormwater and water quality.

3.7 Flood Hazard Zones / Wetlands

The most current version of the Federal Emergency Management Agency (FEMA) Floor Insurance Rate Map for this area (Community Panel Numbered 25025C0077J, effective March 16, 2016) shows that the Project Site is located outside the 500-year flood zone area. This is reflected in the Project Site survey included as Appendix D.

The Project Site does not contain wetlands.

3.8 Geotechnical Impacts

3.8.1 Introduction

This section addresses the below-grade construction activities anticipated for the Project. It discusses anticipated existing soil and groundwater conditions; anticipated foundation construction methods; and excavation work anticipated for the Project based on subsurface information obtained from other sites in the vicinity of the Project. The 112 Shawmut Avenue will be built in full compliance with local, state, and federal environmental regulations.

3.8.2 Subsurface Soil Conditions

Based on subsurface explorations completed at the Project Site, the existing ground surface is underlain by a 10.5 to 17-foot thickness of miscellaneous granular fill. Within a portion of the Project Site, a discontinuous organic deposit which was generally 1.5 to 4 feet thick was encountered. Below the fill and organic deposits, the Project Site is underlain by a very stiff to very soft marine clay deposit that extends to a depth of about 84 to 91 feet below the ground surface. The marine clay deposit was underlain by a dense to very dense glacial till deposit that was observed to be 3 to 8 feet thick. The surface of the bedrock deposit was encountered beneath the glacial till deposit at depths varying from 87 to 97 feet below ground surface. The bedrock was encountered within three borings and was observed to consist of argillite.

3.8.3 Groundwater Conditions

The stabilized groundwater level in observation wells located at the Project Site was observed to range from depths of about 8.5 to 12 feet below existing ground surface, corresponding to approximately Elevation +9.0 and Elevation +10.9 on the Boston City Base (BCB). Groundwater observations wells maintained by the Boston Groundwater Trust (BGwT) in the vicinity of the Project Site indicate stabilized groundwater levels ranging from Elevation +8.5 to Elevation +12.0 (BCB) between 2005 and 2017.

The Project Site is located within the Groundwater Conservation Overlay District (GCOD) as established by Article 32 of the Zoning Code. Because of the Project Site's location in the GCOD, the Proponent's civil engineer will certify that the Project will not negatively impact groundwater levels on the Project Site or on adjacent lots pursuant to the provisions of Article 32, Section 6. Pursuant to Section 32-6 of the Code, there are performance standards required of projects such as the Project to prevent adverse effects on area groundwater levels and on nearby properties. The Project will be designed to meet the groundwater recharge standards of Section 32-6 of the Code, such that the Project will not have any adverse effects on groundwater levels at the applicable Project Site or on nearby Lots. The Proponent will submit to the BPDA and the Boston Water and Sewer Commission (BWSC), a certification from the Project's registered civil engineer that as designed, its Project will include a groundwater recharge system to enable such Project to meet the groundwater recharge standards of Section 32-6 of the Code. The Proponent will also obtain from the BWSC, a certification that its Project will meet such performance standards. The Proponent will provide a copy of such BWSC determination and civil engineer's certification to the BPDA and to the Boston Groundwater Trust prior to the issuance of a Certification of Consistency for the Project under Article 80B of the Code.

The Project team will coordinate with the BGwT to protect groundwater levels in the area, and the Proponent will include monitoring of the existing BGwT wells' groundwater level before, during, and following construction.

The excavation to construct the below-grade level will require temporary dewatering to construct the proposed structure in-the-dry. The dewatering will be short-term, and the effluent will be discharged legally off-site. If the temporary dewatering is observed to have a negative impact on groundwater levels in the vicinity of the Project Site, a temporary groundwater recharge system would be installed which utilizes the water collected in the construction dewatering system to restore the groundwater condition by means of recharge wells located outside of the temporary earth support wall. Continuous pumping of groundwater for the permanent building condition will not be performed, and therefore the Project is not anticipated to have an adverse impact on the groundwater level within or adjacent to the Project Site.

The proposed lowest-level slab is planned to be at Elevation +12.6 (BCB). Based on the groundwater levels discussed above, perimeter and underslab drainage may be used to protect the basement level of the Project against groundwater intrusion during the possible short-term rises in the groundwater level resulting from events of heavy and/or prolonged precipitation. The foundation drainage system will tie into the existing BWSC storm drain system.

3.8.4 Solid and Hazardous Waste

To the extent that hazardous materials are found at the Project Site in reportable levels under the Massachusetts Contingency Plan (MCP), the Proponent will cause such materials to be excavated, transported and disposed of in accordance with the MCP and any other applicable laws or regulations.

3.9 Solid Waste and Recycling

The Project will generate solid waste typical of residential and retail/café uses. Solid waste is expected to include wastepaper, cardboard, glass bottles and food. Recyclable materials will be recycled through a program implemented by building management. The Project will generate approximately 167 tons of solid waste per year.

With the exception of household hazardous wastes typical of residential and retail/commercial developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials. Typical waste generated by the uses will be handled in compliance with all local, state and federal regulations.

The building will include areas for trash collection and recycling collection on each floor, and a trash room in close proximity to the loading dock. Recycling facilities will be provided on-site for paper, glass, plastic and metal.

3.10 Noise Impacts

3.10.1 Introduction

A sound level assessment was conducted that included a baseline sound monitoring program to measure existing sound levels in the vicinity of the Project, computer modeling to predict operational sound levels from proposed mechanical equipment, and a comparison of future Project sound levels to applicable City of Boston Zoning District Noise Standards.

This analysis, which is consistent with BPDA requirements for noise studies, indicates that with appropriate noise controls, predicted sound levels from the Project will comply with local noise regulations.

3.10.2 Noise Terminology

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

The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two or more separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3-dB increase (53 dB), which is equal to doubling in sound energy but not equal to a doubling in quantity (100 dB). Thus, every 3-dB change in sound level represents a doubling or halving of sound energy. Relative to this characteristic, a change in sound levels of less than 3 dB is imperceptible to the human ear.

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

A sound level meter (SLM) that is used to measure noise is a standardized instrument.[17] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various circumstances. The most commonly used weighting network is the A-weighting (there are also B-, C-, D-, and Z-weighting networks)

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[17] *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

because it most closely approximates how the human ear responds to sound at various frequencies, described in Hertz (Hz). The A-weighting network is the accepted scale used for community sound level measurements, and sounds are frequently reported as detected with a sound level meter with this weighting. A-weighted sound levels emphasize middle frequency sounds (i.e., middle pitched – around 1,000 Hz), and de-emphasize low and high frequency sounds. A-weighted sound levels are reported in decibels designated as "dBA".

Because the sounds in the environment vary with time, many different sound metrics may be used to quantify them. There are two typical methods used for describing variable sounds. These are exceedance levels and equivalent levels, both of which are derived from a large number of moment-to-moment A-weighted sound pressure level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated Ln, where "n" can have a value between 0 and 100 in terms of percentage. Equivalent levels are designated L_{eq} and quantify a hypothetical steady sound that would have the same energy as the actual fluctuating sound observed. The several sound level metrics that are commonly reported in community noise monitoring and are presented in this report are described below.

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

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

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

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

- L_{eq} is a sound pressure level commonly A-weighted and presented in dBA. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with time-averaged mean square sound pressure values, the L_{eq} is primarily controlled by loud noises if there are fluctuating sound levels.

In the design of noise controls, which do not function quite like the human ear, it is important to understand the frequency spectrum of the noise source of interest. The spectra of noises are usually stated in terms of octave-band sound pressure levels, in dB, with the frequency bands being those established by standard (American National Standards Institute [ANSI] S1.11, 1986). To facilitate the noise control design process, the estimates of noise levels in this analysis are also presented in terms of octave-band sound pressure levels. Octave-band measurements and modeling are used in assessing compliance with the City of Boston noise regulations.

3.10.3 Noise Regulations and Criteria

The City of Boston has both a noise ordinance and noise regulations. Chapter 16 §26 of the Boston Municipal Code sets the general standard for noise that is unreasonable or excessive: louder than 50 decibels between the hours of 11:00 p.m. and 7:00 a.m., or louder than 70 decibels at all other hours. The Boston Air Pollution Control Commission (BAPCC) has adopted regulations based on the city's ordinance - "Regulations for the Control of Noise in the City of Boston", which distinguish among residential, business, and industrial districts in the city. In particular, BAPCC Regulation 2 is applicable to the sounds from the Project and is considered in this noise study.

Table 3.10-1 below presents the "Zoning District Noise Standards" contained in Regulation 2.5 of the BAPCC "Regulations for the Control of Noise in the City of Boston," adopted December 17, 1976. These maximum allowable sound pressure levels apply at the property line of the receiving property. The "Residential Zoning District" limits apply to any lot located within a residential zoning district or to any residential use located in another zone except an Industrial Zoning District, according to Regulation 2.2. Similarly, per Regulation 2.3, business limits apply to any lot located within a business zoning district not in residential or institutional use.

Table 3.10-1 City Noise Standards, Maximum Allowable Sound Pressure Levels

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

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

3.10.4 Existing Conditions

A background noise level survey was conducted to characterize the existing "baseline" acoustical environment in the vicinity of the Project. Existing noise sources around the Project Site include: vehicular and truck traffic along local streets, construction activity and equipment, traffic from Interstate 90, idling vehicles, pedestrian foot traffic, trains, wind, birds, and the general city soundscape.

3.10.4.1 Noise Monitoring Methodology

Since noise impacts from the Project on the community will be highest when background noise levels are the lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Therefore, daytime measurements were scheduled to avoid peak traffic conditions. Sound level measurements were made on Monday, March 20, 2017 during the daytime (1:00 p.m. to 3:30 p.m.) and on Monday, March 20, 2017 and Tuesday March 21, 2017 during nighttime hours (11:30 p.m. to 2:00 a.m.). All measurements were 20 minutes in duration.

Sound levels were measured at publicly accessible locations at a height of five feet (1.5 meters) above ground level, under low wind conditions, and with dry roadway surfaces. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a

General Tools digital psychrometer. Unofficial observations about meteorology or land use in the community were made solely to characterize the existing sound levels in the area and to estimate the noise sensitivity at properties near the Project Site.

3.10.4.2 Noise Monitoring Locations

The selection of the noise monitoring locations was based upon a review of zoning and land use in the Project area. Four noise monitoring locations were selected as representative sites to obtain a sampling of the ambient baseline noise environment. These measurement locations are depicted on Figure 4.10-1 and described below.

- **Location 1** is located on the northeast corner of Washington Street and William E Mullins Way across from the parking lot of C-Mart Supermarket. This location is representative of the closest receptors to the east of the Project.

- **Location 2A (daytime only)** is located on the southwest corner of Shawmut Avenue and Paul Place, across from 112 Shawmut Avenue and 120 Shawmut Avenue. This location is representative of the closest residential receptors west of the Project (Castle Square Parks).

- **Location 2B (nighttime only)** is located along the southern sidewalk of Paul Place, approximately 100 feet to the west of Location 2A. This location was chosen as the nighttime sound as Location 2A was dominated by idling mechanical equipment from the construction site at The Lucas (136 Shawmut Avenue). This location is representative of the closest residential receptors west of the Project (Castle Square Parks).

- **Location 3** is located at the northwest corner of Washington Street and Marginal Road, outside of the Josiah Quincy School. This location represents the closest residential and institutional receptors north of the Project (Josiah Quincy School, Quincy Upper School, and Mass Pike Towers).

- **Location 4** is located along the western corner of Shawmut Avenue and Emerald Court, across from 180 Waterford Place. This location is representative of the residential receptors south of the Project (Castle Square Parks and the Waterford Place Apartments).

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

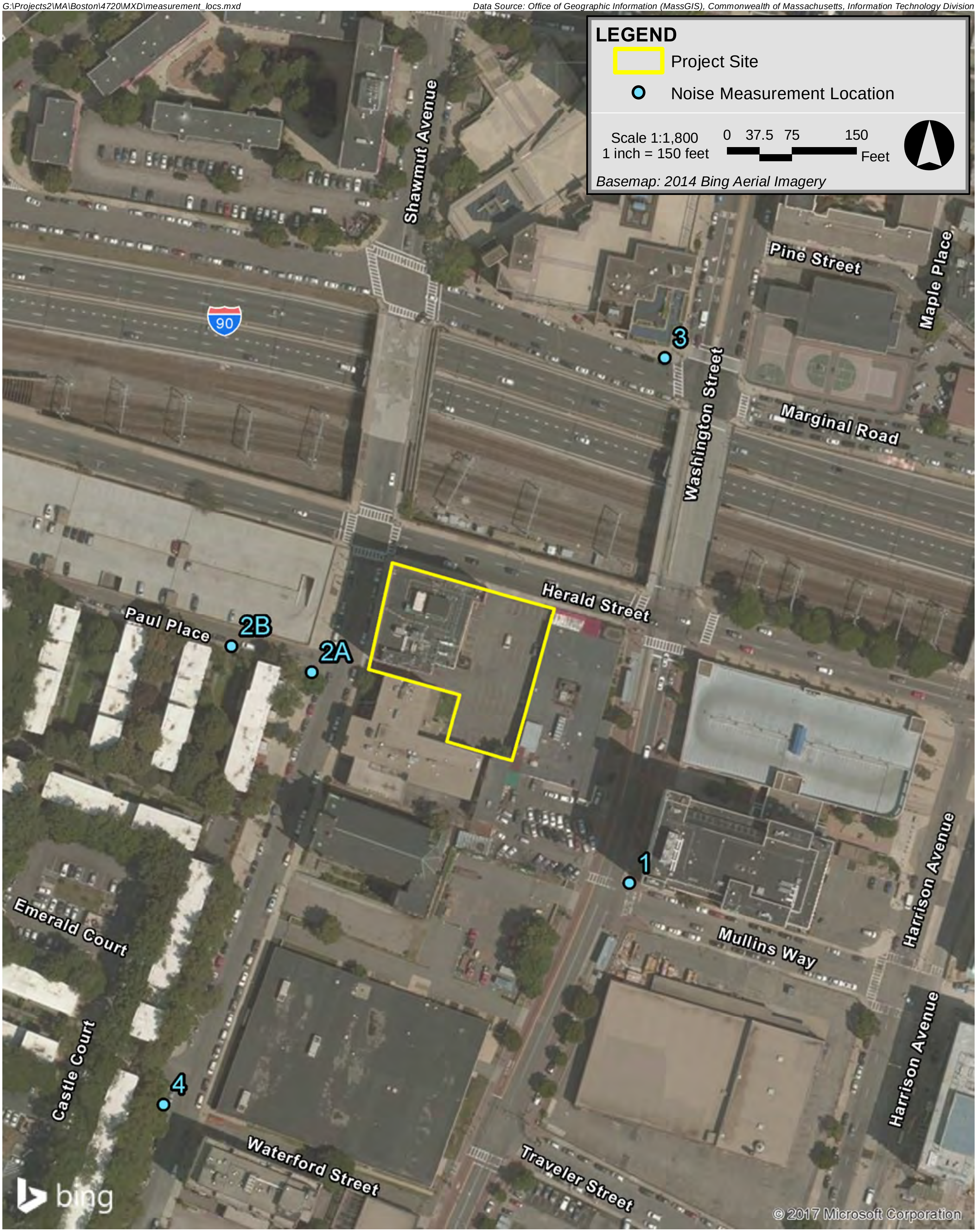

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Figure 3.10-1

Noise Measurement Locations

3.10.4.3 Noise Monitoring Equipment

A Larson Davis Model 831 sound level meter equipped with a PCB PRM831 preamplifier, a PCB 377B20 half-inch microphone, and manufacturer-provided windscreen was used to collect background sound pressure level data. This instrumentation meets the "Type 1 - Precision" requirements set forth in ANSI S1.4 for acoustical measuring devices. The measurement equipment was calibrated in the field before and after the surveys with a Larson Davis CAL200 acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. Statistical descriptors (e.g., L_{eq}, L_{90}, etc.) were measured for each 20-minute sampling period, with octave-band sound levels corresponding to the same data set processed for the broadband levels.

3.10.4.4 Measured Background Noise Levels

Baseline noise monitoring results are presented in Table 4.10-2 and summarized below:

- The daytime residual background (L90) measurements ranged from 56 to 64 dBA;
- The nighttime residual background (L90) measurements ranged from 48 to 56 dBA;
- The daytime equivalent level (Leq) measurements ranged from 65 to 82 dBA; and
- The nighttime equivalent level (Leq) measurements ranged from 51 to 64 dBA.

Table 3.10-2 Summary of Measured Background Noise Levels – March 20, 2017 (Daytime) & March 21, 2017 (Nighttime)

Location	Period	Start Time	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}	L_{90} Sound Pressure Level by Octave-Band Center Frequency (Hz)								
								31.5	63	125	250	500	1k	2k	4k	8k
			dBA	dBA	dBA	dBA	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
1	Day	2:45 PM	82	107	74	69	64	68	67	64	61	60	59	54	47	41
2A	Day	1:16 PM	69	89	71	64	60	65	69	66	59	56	56	50	44	36
3	Day	1:47 PM	67	80	69	65	62	71	68	64	59	57	59	53	41	33
4	Day	2:16 PM	65	79	69	60	56	64	67	63	54	54	52	47	36	26
1	Night	11:34 PM	64	82	67	56	53	60	61	57	53	51	49	41	30	27
2B	Night	1:17 AM	51	59	52	50	49	60	60	55	51	46	43	37	27	21
3	Night	12:00 AM	62	73	65	59	56	61	60	58	54	52	52	45	31	22
4	Night	12:52 AM	52	71	51	49	48	57	58	55	49	45	43	37	29	20

Note: Sound pressure levels are rounded to the nearest whole decibel.

Weather Conditions:

	Date	Temp	RH	Sky	Wind
Daytime	Monday, March 20, 2017	62 °F	9%	Clear	Calm
Nighttime	Tuesday, March 21, 2017	41 °F	30%	Clear	Calm

Monitoring Equipment Used:

	Manufacturer	Model	S/N
Sound Level Meter	Larson Davis	LD831	2155
Microphone	Larson Davis	377B20	112256
Preamp	Larson Davis	PRM831	16478
Calibrator	Larson Davis	Cal200	7146

3.10.5 Future Conditions

3.10.5.1 Overview of Potential Project Noise Sources

The primary sources of continuous sound exterior to the Project will consist of ventilation, heating, cooling, and emergency power noise sources. Multiple noise sources will be located within an enclosed rooftop mechanical area, and multiple sources (i.e., ventilation fans) will be located on the northern façade of the Project at the first floor.

Table 3.10-3 provides an anticipated list of the major sources of sound. Sound power levels used in the acoustical modeling of each piece of equipment are presented in Table 3.10-4. Sound power level data were provided by the respective manufacturer of each piece of equipment, except for the emergency generator for which sound pressure levels were provided. Sound power levels for the emergency generator were calculated using the sound pressure levels at the reference distance.

The Project includes select noise-control measures that are necessary to achieve compliance with the applicable noise regulations. As the design progresses, specifications for mechanical equipment may change; however, appropriate measures will be taken to ensure compliance with the City Noise Standards. A garage intake fan and transformer fan will each be attenuated through acoustical louvers. Sound levels from two energy recovery ventilators (ERV) will each be mitigated either through a sound mitigation package supplied by the vendor, or through the selection of quieter equipment from an alternate manufacturer. The emergency generator sound levels will be controlled using an enclosure and an exhaust silencer as part of the SA Canopy mitigation package. To further limit impacts from the standby generator, required periodic, routine testing will be conducted during daytime hours, when background sound levels are highest. A summary of the noise mitigation proposed for the Project is presented in Table 3.10-5.

Table 3.10-3 Modeled Noise Sources

Noise Source	Quantity	Approximate Location	Size/Capacity
Energy Recovery Ventilator (ERV)	2	Roof (137' tier)	13,000 CFM
Cooling Tower Cell	2	Roof (137' tier)	Unknown[1]
Emergency Generator	1	Roof (137' tier)	350 kW
Garage Exhaust Fan	1	Roof (137' tier)	11,500 CFM
Garage Intake Fan[2]	1	First level northern façade	11,500 CFM
Transformer Fan	1	First level northern façade	20,000 CFM

Notes:

1. No information provided.
2. No location for a garage intake fan was provided, however, a garage fan was identified to utilize an acoustical louver; therefore, a garage intake fan was assumed to be located on the northern façade of the Project at the first level.

Table 3.10-4 Modeled Sound Power Levels per Noise Source

Noise Source	Broad-band (dBA)	Sound Level (dB) per Octave-Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Energy Recovery Ventilator (ERV)[1]	98	89[6]	89	94	102	95	91	85	81	77
Cooling Tower Cell[2]	90	95[6]	95	93	89	88	84	81	76	68
Emergency Generator[3]	102	109[6]	109	105	105	98	94	92	87	92
Garage Exhaust Fan[4]	86	91[6]	91	88	83	83	81	79	76	72
Garage Intake Fan[4]	86	91[6]	91	88	83	83	81	79	76	72
Transformer Fan[5]	88	90[6]	90	91	87	86	82	78	74	70

Notes: Sound power levels do not include mitigation identified in Table 4.10-5.

1. Munters ClimaFlex, 13,000 CFM unit. Sound levels include inlet and outlet contribution.
2. Marley model NC8403NLN2 cooling tower. Levels are for a single cell.
3. CAT C15, 350kW unit including SA Canopy mitigation package.
4. Greenheck model SFB-25-75, 11,500 CFM fan.
5. Greenheck model SBE-2L42-30, 20,000 CFM fan.
6. No data provided by manufacturer. Octave-band sound level assumed to be equal to the 63 Hz band level.

Table 3.10-5 Attenuation Values Applied to Mitigate Each Noise Source

Noise Source	Form of Mitigation	Sound Level (dB) per Octave-Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
ERV's (each)	Alternative/Modified Unit[1]	0	1	3	6	6	6	7	5	4
Garage Intake Fan	Louver[2]	0	5	10	9	13	20	29	10	5
Transformer Fan	Louver[2]	0	5	10	9	13	20	29	10	5

Notes:

1. The Proponent will consult with the manufacturer to identify mitigation options to achieve the minimum attenuation values presented, or select a unit from an alternate manufacturer meeting the mitigated modeled sound levels.
2. Greenheck model AFJ-120 acoustical louver transmission loss.

3.10.5.2 Noise Modeling Methodology

The noise impacts associated with the Project were predicted at the nearest and most representative receptors using the CadnaA noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The CadnaA software allows for octave-band calculation of noise from multiple noise sources, as well as computation of diffraction around building edges.

3.10.5.3 Future Sound Levels – Nighttime

The analysis of sound levels at night considered all of the mechanical equipment without the emergency generator running to simulate typical nighttime operation conditions at nearby receptors. Eight modeling locations were included in the analysis. Modeling locations A through D are identical to measurement locations 1, 2A, 3, and 4, respectively, and modeling location B2 is identical to measurement location 2B. Three additional modeling locations, E through G, were added for more residential uses in the vicinity of the Project. The modeling receptors, which correspond to residential, institutional, and business uses in the community, are depicted in Figure 3.10-2. The predicted exterior Project-only sound levels range from 36 to 47 dBA at nearby receptors. The City of Boston Residential and Business limits have been applied to the appropriate locations. Predicted sound levels from Project-related equipment are within the broadband and octave-band nighttime limits under the City Noise Standards at the modeling locations. The evaluation is presented in Table 3.10-6.

Table 3.10-6 Comparison of Future Predicted Project-Only Nighttime Sound Levels to the City of Boston Limits

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave-Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Business	47	47	46	46	50	46	41	34	29	16
B	Residential	37	47	43	40	40	31	34	27	21	7
B2	Residential	37	45	42	41	43	34	27	18	12	0
C	Institutional	36	49	47	43	40	34	25	16	22	14
D	Residential	41	45	45	44	45	40	35	29	20	0
E	Residential	47	46	47	48	52	45	40	32	27	14
F	Residential	46	46	45	46	50	44	40	32	27	13
G	Residential	46	45	44	45	50	44	39	33	26	7
City of Boston Limits	**Residential**	**50**	**68**	**67**	**61**	**52**	**46**	**40**	**33**	**28**	**26**
	Business	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

3.10.5.4 Future Sound Levels – Daytime

As previously noted, the emergency generator will only operate during the day for brief, routine testing when the background sound levels are high, or during an interruption of power from the electrical grid. A second analysis combined noise from the Project's mechanical equipment and its emergency generator to reflect worst-case conditions during a period of equipment testing. The sound levels were calculated at the same receptors as in the nighttime analysis and then evaluated against daytime limits. The predicted exterior Project-only daytime sound levels range from 39 to 48 dBA at nearby receptors. Predicted sound levels from Project-related equipment are within the daytime broadband and octave-band limits under the City Noise Standards at each of the modeled locations. This evaluation is presented in Table 3.10-7.

Table 3.10-7 Comparison of Future Predicted Project-Only Daytime Sound Levels to City Noise Standards

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave-Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Business	48	55	54	49	51	46	41	34	29	16
B	Residential	40	54	51	44	43	33	36	31	23	15
B2	Residential	39	52	51	45	45	35	29	24	17	11
C	Institutional	40	53	53	47	45	36	28	20	22	14
D	Residential	44	49	50	48	48	42	37	33	23	7
E	Residential	48	54	55	51	53	45	40	33	27	15
F	Residential	47	53	53	50	52	45	41	34	28	14
G	Residential	47	50	51	48	51	46	41	35	27	12
City of Boston Limits	**Residential**	**60**	**76**	**75**	**69**	**62**	**56**	**50**	**45**	**40**	**38**
	Business	**65**	**79**	**78**	**73**	**68**	**62**	**56**	**51**	**47**	**44**

3.10.6 Conclusions

Baseline noise levels were measured in the vicinity of the Project during the day and at night. At these and additional locations, future Project-only sound levels were calculated based on information provided on the expected mechanical equipment. Project-only sound levels were compared to applicable limits.

Predicted mechanical equipment noise levels from the proposed Project at each receptor location, taking into account attenuation due to distance, structures, and noise-control measures, will be at or below the octave-band requirements of the City Noise Standards. The predicted sound levels from Project-related equipment, as modeled, are expected to remain below 50 dBA at nearby residences; (and therefore, within the nighttime residential zoning limits for the City of Boston at the nearest residential receptors). The results indicate that the Project can operate without significant impact on the existing acoustical environment.

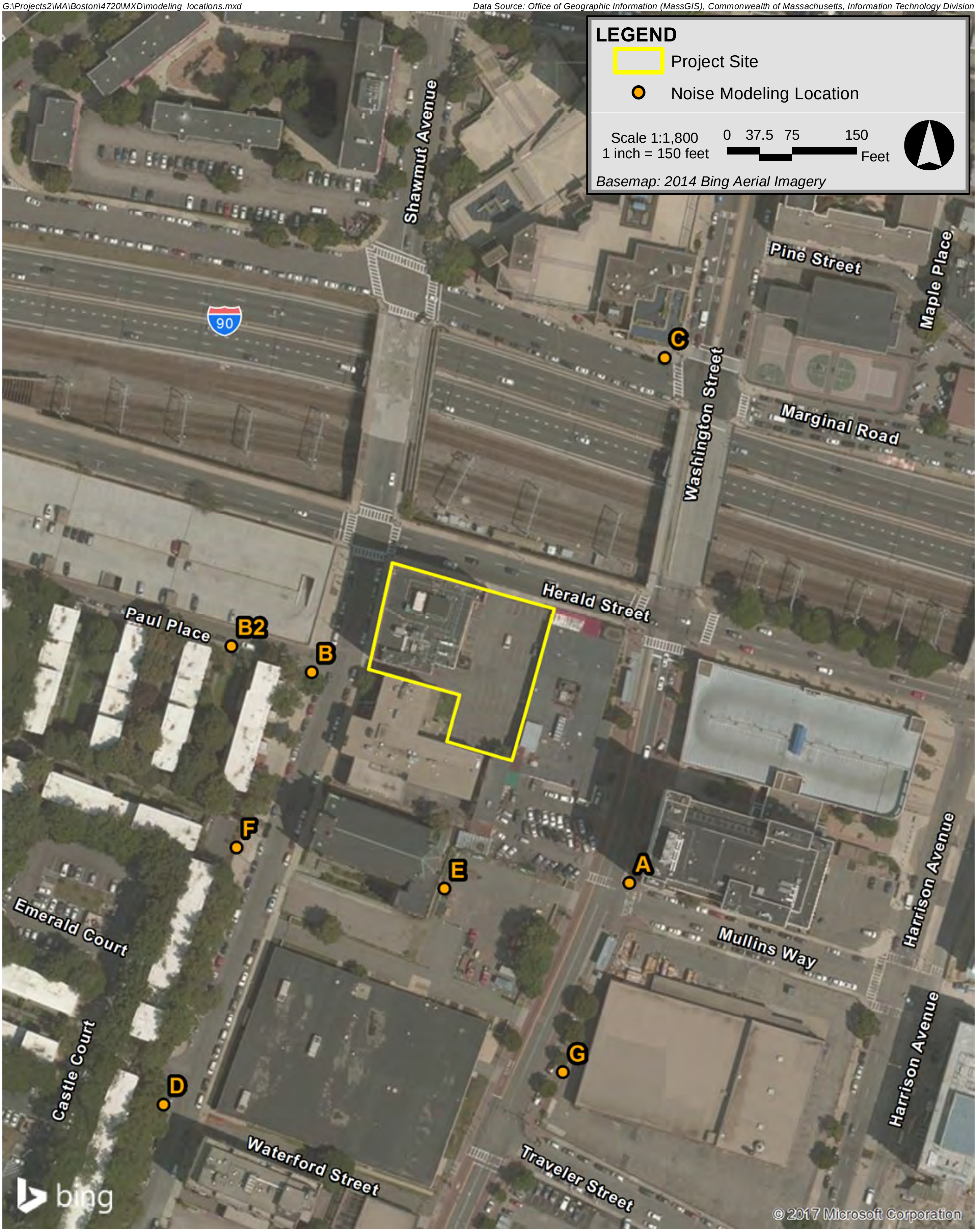

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Figure 3.10-2
Noise Modeling Locations

At this time, while the mechanical equipment and noise controls have been refined, they are still conceptual in nature. During the final design phase of the Project, mechanical equipment and noise controls will be specified and designed to meet the applicable broadband limit and the corresponding octave-band limits of the City Noise Standards.

3.11 Construction Impacts

3.11.1 Introduction

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

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

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

3.11.2 Construction Methodology / Public Safety

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

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

3.11.3 Construction Schedule

The Proponent anticipates that the Project will commence construction in the first quarter of 2018, with completion anticipated in the third quarter of 2019.

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

3.11.4 Construction Staging / Access

Access to the Project Site and construction staging areas will be as provided in the CMP approved by BTD.

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

3.11.5 Construction Mitigation

The Proponent will follow City of Boson and MassDEP guidelines which will direct the evaluation and mitigation of construction impacts.

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

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

3.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 160 construction jobs will be created over the length of the construction period. The Proponent will make reasonable good-faith efforts to have at least 51% of the total employee work hours be for Boston residents, at least 40% of total employee work hours be for minorities and at least 12% of the total employee work hours be for women. The Proponent will enter into a Boston Residents Construction Employment Plan with the BPDA with respect to the Project.

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

3.11.7 Construction Truck Routes and Deliveries

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

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

3.11.8 Construction Air Quality

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

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Minimizing spoils on the construction site;

- ♦ Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- ♦ Minimizing storage of debris on site; and
- ♦ Periodic street and sidewalk cleaning with water to minimize dust accumulations.

3.11.9 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the Project, as there is a nearby major residential development. Increased community sound levels, however, are an inherent consequence of construction activities. Construction work at the Project will comply with the requirements of the City of Boston Noise Ordinance, and reasonable efforts will be made to minimize the noise impact of all construction activities.

Mitigation measures are expected to include:

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

3.11.10 Construction Waste

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

3.11.11 Protection of Utilities

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

3.12 Rodent Control

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

3.13 Wildlife Habitat

The Project Site is in an established urban neighborhood. There are no wildlife habitats in or adjacent to the Project Site.

Chapter 4

Sustainable Design and Climate Change Resilience

4.0 SUSTAINABLE DESIGN AND CLIMATE CHANGE RESILIENCE

4.1 Green Building

The Project's approach is rooted in sustainable development and design, and the Project team anticipates incorporating many aspects of sustainability to ensure the longevity of the Project while reducing the overall ecological footprint of the building. Emphasis has been placed on urban connectivity, reduced carbon footprint, reduction of virgin material use, overall energy and water conservation, and occupant well-being, among other considerations. The Project is located in a dense urban area with access to public transportation and bicycle amenities. The design incorporates portions of the existing structure, and the new portions of the building will feature high-efficiency exterior wall assemblies and high-performance glazing, as well as a variety of sustainable materials, which will serve to increase efficiency and enhance the aesthetic design quality at the interior and exterior. This glazing systems coupled with generous interior ceiling heights will provide tenants with unique opportunities for daylight harvesting and views to the exterior.

The Project will use the LEED BD+C for New Construction v4 rating system to demonstrate the Project's sustainability goals and compliance with Article 37 of the Zoning Code. The LEED rating system tracks the sustainable features of the Project by assigning points in the following categories: Location and Transportation (LT); Sustainable Sites (SS); Water Efficiency (WE); Energy & Atmosphere (EA); Materials and Resources (MR); Indoor Environmental Quality (IEQ); Innovation & Design (ID); and Regional Priority (RP). Currently, the Project's preliminary evaluation has identified 57 possible points, meeting Silver level, that may be achievable, and will continue to evaluate these credits and the 16 additional credits that are identified as maybe achievable.

Location and Transportation

The Project team identified 13 points of the 16 possible points within Location and Transportation as potentially achievable. The Project is anticipated to achieve these credits based on its location in a dense neighborhood with access to a number of services and amenities, transit and bicycle facilities, as well as providing bicycle amenities on site and potentially providing preferred spaces and electric vehicle charging stations within the proposed parking garage.

Sustainable Sites

The Project team anticipates achieving up to two points for heat island reduction, by including high albedo roofing surfaces and green roofs, and light pollution reduction.

Water Efficiency

The Project team anticipates achieving up to seven points for water efficiency by integrating an efficient landscaping irrigation strategy supplementing collected rainwater for potable water irrigation. Additionally, reduced indoor water use and efficient cooling tower operation through design and specification is anticipated, as well as water meters.

Energy and Atmosphere

The Project team currently anticipates achieving up to 13 points out of the total 33 points available for the Energy and Atmosphere through the implementation of various energy-saving strategies such as high-efficiency building envelope systems and components, high efficiency unit owner HVAC systems delivered by a common, high efficiency heating and cooling plant, and an air to air heat recovery system for ventilation and exhaust air; as well as through commissioning measures above those required by the prerequisites, including potentially building envelope commissioning, and through the purchase of renewable energy certificates supporting the production of off-site renewable energy. The Project team will also evaluate the feasibility of including renewable energy on-site.

Materials and Resources

The Project team anticipates potentially achieving 11 points out of 13 possible points in the Materials and Resources category through life cycle impact analysis, the specific selection of building materials and products with a high amount of recycled content, materials that are additionally extracted/harvested and manufactured within 100 miles of the Project Site, and that subject themselves to environmental impact reviews.

The Project will also have a construction waste management plan to divert materials from landfills. The construction team will work with the waste management provider for the project to collect waste on-site that will meet the program requirements.

Indoor Environmental Quality

The Project team anticipates earning 8 out of a possible 16 points related to the implementation of indoor air quality measures, including but not limited to: monitoring outdoor air delivery to interior spaces to counter high concentrations of indoor air pollutants; increasing ventilation rates to spaces throughout the building; and managing indoor air quality during construction for the construction team as well as future occupants.

Residents of the building will be able to control lighting and heating and cooling. Additionally, acoustic performance of the demising and floor/ceiling assemblies will be completed, and the currently anticipated design will provide quality views throughout the occupied spaces.

Innovation and Design

The Project team will include at least one LEED AP. Additional points are anticipated to be achieved through exemplary performance. The Project team may also include a green education campaign for occupants and visitors and a green housekeeping policy for base building services.

Regional Priority Credits

The four points available in this category are contingent upon meeting certain thresholds for credits in other categories, as determined by the USGBC. Out of five possibilities considered based on the Project location, the Proponent anticipates that possibly up to four options may be achievable: energy performance, indoor water use reduction, rainwater management, and a high priority site.

4.2 Climate Change Resilience

The Proponent has analyzed the potential climate conditions approximately 50 years into the future in order to evaluate the potential impact to the Project from climate change. Climate change conditions considered include sea level rise, higher maximum and mean temperatures, more frequent and longer extreme heat events, more frequent and longer droughts, more severe rainfall events, and increased wind events. A copy of the completed checklist is included in Appendix E. Given the preliminary level of design, the responses are also preliminary and may be updated as the Project design progresses.

Increased Temperature

According to "Climate Ready Boston," the City of Boston can expect that the number of days with temperatures greater than 90°F will increase from the current 11 days annually experienced between 1971 and 2000, to between 25 and 90 days annually by 2070, depending on the extent of greenhouse gas emissions over the next several decades.[18] Extreme heat can have serious negative impacts on human health and infrastructure, both of which will affect quality of life. The Project design will incorporate a number of measures to minimize the impact of high temperature events, including:

- New street trees where possible; and
- High-albedo roofing and paving materials to minimize the heat island effect.

[18] Climate Ready Boston, December 7, 2016.

Sea Level Rise

According to "Climate Ready Boston," the sea level by 2030 may be as much as eight inches higher than it was in 2000, and could be as high as seven feet higher by 2100 under the high emissions scenario. As described in "Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery" by MassDOT (the "MassDOT Report"), "one of the challenges presented by the wide range of sea level rise (SLR) projections is the inability to assign likelihood to any particular [SLR] scenario."[19] To be conservative, in the year 2070, SLR could be as high as approximately four feet.

The MassDOT Report shows that a portion of the southeast corner of the Project Site may be impacted by a 1,000-year flood in 2070 with a depth of at least 2 inches. Given the timeframe and minimal expected impact, no specific measures are currently incorporated into the design. If the impacts to the Project Site are projected to be worse than currently anticipated, the Proponent will analyze measures to reduce the Project's vulnerability to flooding.

Rain Events

As a result of climate change, the Northeast is expected to experience more frequent and intense storms. To mitigate, the Proponent will take measures to minimize stormwater runoff and protect the Project's mechanical equipment. These measures include:

- Stormwater infiltration to the extent feasible;
- Water tight utility conduits; and
- Wastewater and stormwater back flow prevention.

Drought Conditions

Under the high emissions scenario, the occurrence of droughts lasting one to three months could go up by as much as 75% over existing conditions by the end of the century. To minimize the Project's susceptibility to drought conditions, the Project is anticipated to include aeration fixtures and appliances chosen for water conservation qualities, conserving potable water supplies.

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19 Massachusetts Department of Transportation, et al. "MassDOT-FHWA Pilot Project Report: Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery." November 2015.

4.3 Renewable Energy

The Project will have limited roof area suitable for a solar photovoltaic or solar thermal system. The Proponent will continue to evaluate the feasibility of incorporating renewable energy into the Project as the design progresses.

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name: 112 Shawmut Avenue, Boston, MA

Date: 7-Aug-17

Y	?	N			
1			Credit	Integrative Process	1

13	1	0		**Location and Transportation**	**16**
		0	Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
	1		Credit	High Priority Site	2
5			Credit	Surrounding Density and Diverse Uses	5
5			Credit	Access to Quality Transit	5
1			Credit	Bicycle Facilities	1
		0	Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

2	4	0		**Sustainable Sites**	**10**
Y			Prereq	Construction Activity Pollution Prevention	Required
	1		Credit	Site Assessment	1
		0	Credit	Site Development - Protect or Restore Habitat	2
		0	Credit	Open Space	1
	2		Credit	Rainwater Management	3
1	1		Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1

7	0	0		**Water Efficiency**	**11**
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
3			Credit	Indoor Water Use Reduction	6
1			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

13	5	0		**Energy and Atmosphere**	**33**
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
3	2		Credit	Enhanced Commissioning	6
8	2		Credit	Optimize Energy Performance	18
		0	Credit	Advanced Energy Metering	1
		0	Credit	Demand Response	2
	1		Credit	Renewable Energy Production	3
		0	Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

11	0	0		**Materials and Resources**	**13**
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
5			Credit	Building Life-Cycle Impact Reduction	5
1			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
1			Credit	Construction and Demolition Waste Management	2

8	2	0		**Indoor Environmental Quality**	**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1			Credit	Enhanced Indoor Air Quality Strategies	2
2			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
		0	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1			Credit	Interior Lighting	2
	2		Credit	Daylight	3
1			Credit	Quality Views	1
1			Credit	Acoustic Performance	1

2	0	0		**Innovation**	**6**
1			Credit	Innovation - Access to Quality Transit	5
1			Credit	LEED Accredited Professional	1

0	4	0		**Regional Priority**	**4**
	1		Credit	Regional Priority: Optimize Energy Performance Threshold 8	1
	1	0	Credit	Regional Priority: Rainwater Management	1
	1		Credit	Regional Priority: Renewable Energy Production	1
	1	0	Credit	Regional Priority: Indoor Water Use Reduction	1
	1	0		Regional Priority: High Priority Site	1
57	16	0		**TOTALS** Possible Points:	**110**

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

Prepared by BCS Building Consultation Services

Chapter 5

Urban Design

5.0 URBAN DESIGN

5.1 Introduction

The Project team considered several design options for the building and site layout to address program components, urban design constraints and opportunities, parking requirements, market viability and cost parameters, as well as anticipated development on nearby abutter properties (i.e., the property known as 50 Herald Street [the CCBA Property] and 120 Shawmut Avenue [the BCEC Property]), as discussed by the abutting property owners with the Project team. The following considerations were critical to the Project's design.

5.1.1 Site Constraints

The massing and form of the building volume respond to the site's development constraints. The corner site's geometry and deep 'L' shaped interior leg, as well as the unbuildable open space above the Massachusetts Turnpike extension to the north, contributed to positioning the building's largest and tallest massing to the northern portion of the site abutting Herald Street, which is a wide, three-lane road that flanks the Massachusetts Turnpike extension. A cohesive design strategy considering the street walls established by the existing building, and respecting the South End lot coverage requirements contained in Article 64 (South End Neighborhood District) of the Zoning Code informed the proposed bar building addition. The addition embraces the existing structure both below and adjacent to the addition while reinforcing the existing established geometry of this corner site. Parking is tucked back into the interior of the site with minimal presence on the street. Because of the site's geometry, the parking garage will have entrances/exits on both Herald Street and Shawmut Avenue; the two components of the three-level underground garage will be separate from each other, and there will be no internal access between the two components.

5.1.2 Urban Design Considerations

The Project Site is located within the South End Landmark District's Harrison/Albany Protection Area. This formerly industrial area contains a concentration of late nineteenth and early twentieth century brick industrial buildings and serves as a visual buffer to the South End Landmark District, to which it is adjacent. The Protection Area is generally characterized by large-scale industrial buildings which are different in scale and use from the historically residential portion of the South End which is typified by blocks of three- to five-story row houses built in the nineteenth century.

Maintaining the character of the existing structure at the corner of the Project Site and the existing industrial vernacular in the corner of this South End neighborhood was a critical consideration early in the design process.

In addition, the Proponent has engaged in collaborative discussions over the last 18 months with the non-profit owners of both the BCEC Property located directly to the south, and the CCBA Property located directly to the east. This coordinated planning has resulted in a coordinated site plan for the three properties (see Figure 1-12) that will include an east-west pedestrian way located on the BCEC and CCBA properties, that will establish the southern boundaries of the CCBA and BCEC properties, and provide through-block pedestrian connectivity between Washington Street and Shawmut Street, as well as a private way that can provide parking, service and loading access to the CCBA Project. This will encourage the kind of through-block pedestrian access called for in the Harrison-Albany Strategic Plan, and will provide a route that connects residents living west of the PDA Area to streets and commercial establishments located to the east. The CCBA Property is also planned to include a north-south pedestrian way that will connect to the new east-west pedestrian way to be established. The coordinated planning and development of the three properties is being voluntarily undertaken by the three parties and is expected to be memorialized in an area-wide Development Plan for a new PDA to which all three property owners will be co-proponents, as discussed in Section 1.5.2 of this EPNF.

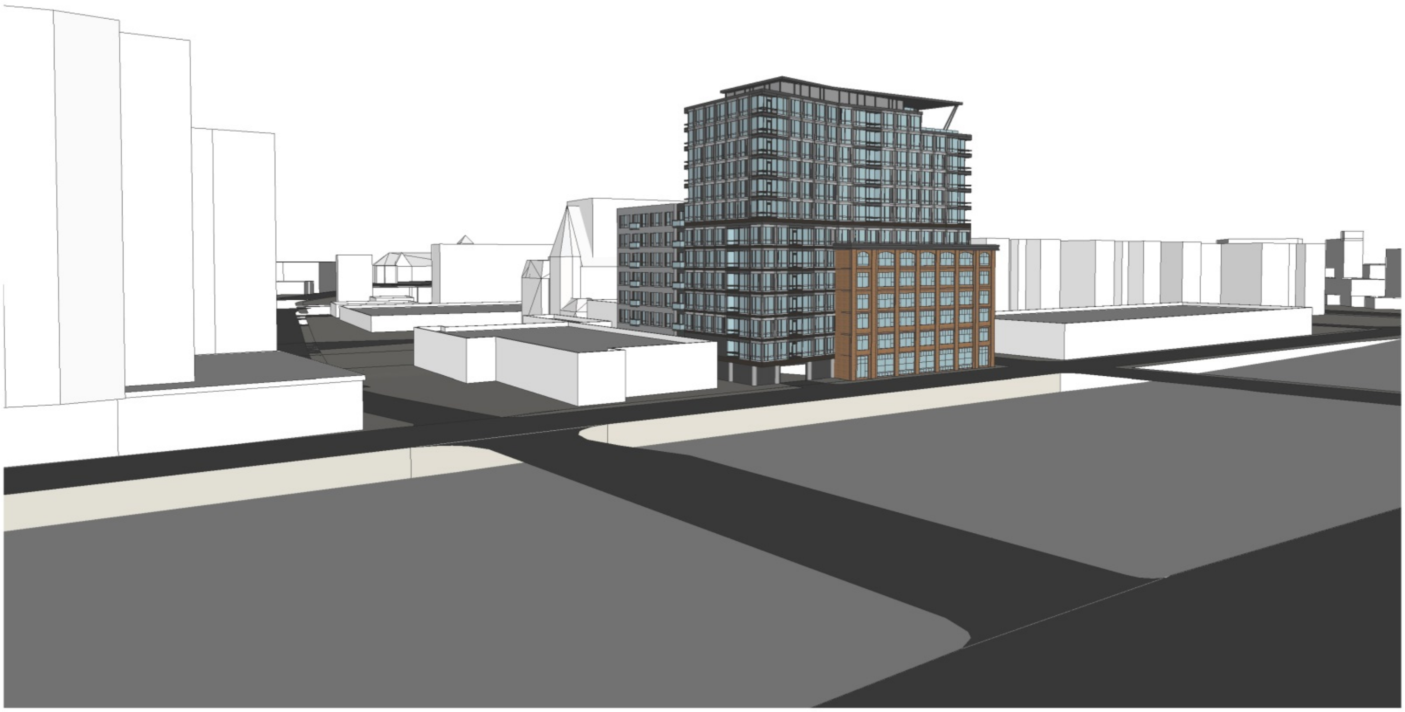
5.1.3 Building Materials

The Project Site is uniquely located visible to Downtown and the Massachusetts Turnpike forming the edge of the South End neighborhood. The existing early 1900's warehouse is organized by stepped brick piers that accentuate the vertical repetitive bays of the building while some additional understated detailing at the three street-facing building corners reinforces the feeling of heaviness expressed by the façade. The existing building is sited tight to the property line at Herald Street and Shawmut Avenue, and establishes a clear definition of the street corner of the Project Site.

Taking inspiration from this existing historic industrial architecture, the design team has created a façade which interprets the strongly vertical and gridded façade of the industrial warehouse and introduces a contemporary gridded façade appropriate to residential occupancy. The upper levels and adjacent areas of the façade will build on the existing repetitive strategy and introduce variation via opening pattern and balcony cuts into the fabric of the new façade. This new gridded and varied façade plane will serve as a foil to the stately existing brick warehouse promoting a nuanced understanding of each of the systems and their place in the history of the Neighborhood. See Figures 5-1 and 5-2 for views of the proposed building.

5.1.4 Streetscape/Landscape Improvements

As discussed in Section 5.1.2, this part of the South End was formerly characterized by industrial and other non-residential uses, and as a consequence, lacks the pedestrian charm so characteristic of the South End residential neighborhood. As a result, the Proponent intends to install new street trees on Shawmut Avenue and Herald Street, as well as other landscape elements and sidewalk improvements, in order to heighten the pedestrian appeal around the Project Site (see Figure 5-3).



View Looking Southwest

View Looking Southeast

View Looking East

View Looking South

Figure 5-2

Perspectives – Looking East and South

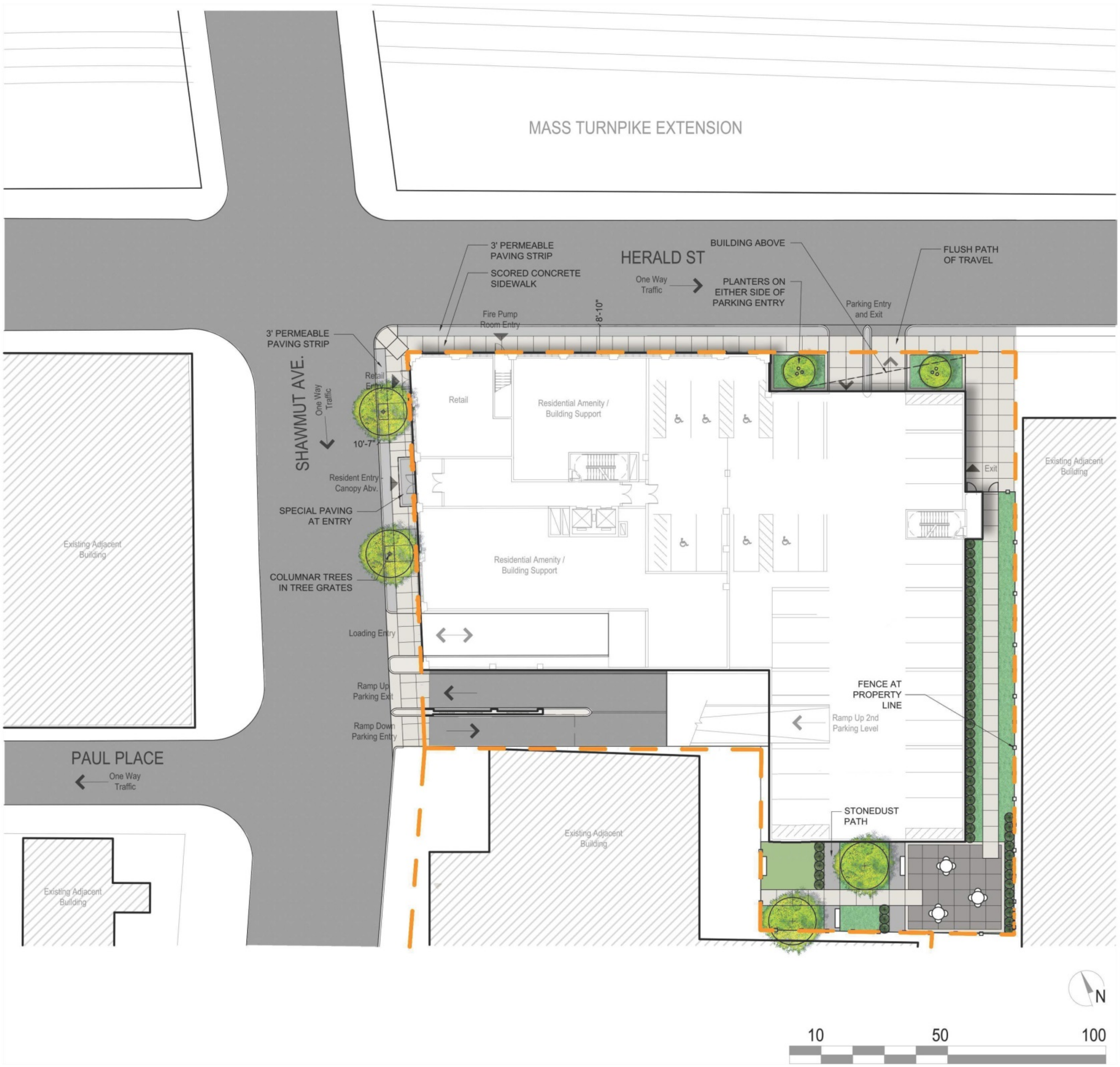


Figure 5-3
Landscape Plan

Chapter 6

Historic and Archaeological Resources

6.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

6.1 Introduction

This Historic and Archaeological Resources Chapter includes a description of the historic and archaeological resources within and in the vicinity of the Project Site. Reviews of the State and National Registers of Historic Places, as well as the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth (the Inventory), were undertaken to identify historic and archaeological resources.

6.2 Historic Resources in the Project Vicinity

6.2.1 Historic Resources on the Project Site

The Project Site is occupied by a concrete framed brick-veneered six-story warehouse building. Although no original permit to build has been located, other City of Boston records indicate that the building was completed in 1915 and designed by architect Frank Augustus Bourne (1873-1936).

Despite its slightly irregular footprint, the building appears cubic in massing owing to the consistent seven-bay width of its principal elevations facing Shawmut Avenue and Herald Street. A further Gothic note is added by the piers along the street elevations, whose slight projections suggest buttresses, and a cruciform masonry detail centered on each spandrel. Subdivided into individual fixed and operable lights, the window openings extend the full width of each bay, from pier to pier. The existing windows consist of aluminum replacements.

A Bangor native, Bourne was educated at the University of Maine and later studied architecture at the Massachusetts Institute of Technology under the French-born architect Constant-Desiré Despradelle.

Following a period of apprenticeship with the nationally influential firm of Shepley, Rutan & Coolidge, Bourne pursued an independent practice for the remainder of his career. In this role, he designed many churches and schools throughout New England, including Our Lady of the Snows in Dublin, N.H. and Dean Academy (now Dean College) in Franklin, Massachusetts. Bourne was also involved in the relocation and subsequent restoration of Asher Benjamin's Charles Street Meeting House (1807) when that thoroughfare was widened in 1920. Most notably, in relation to the Project, Bourne served from 1915 to 1924 as the architect for the Morgan Memorial philanthropic workshops. It was for this charitable organization, that 112 Shawmut Avenue was built.

The Project Site is located within the Harrison/Albany Protection Area of the South End Landmark District. This Protection Area acts as a visual buffer to the more architecturally significant portion of the South End that comprises the Landmark District proper. As described further below, design-review standards and criteria within the Harrison/Albany Protection Area are considerably less stringent than those applicable within the Landmark District proper; jurisdiction extends only to demolition, land coverage, the building's height, landscape, and topography.

The Project Site is also located within the South End Industrial Area, as surveyed by the Boston Landmarks Commission and included in the MHC Inventory. This is a concentration of late nineteenth and early twentieth century brick industrial buildings with related tenement and worker housing. Its boundaries are similar to those of the Protection Area, but unlike the Protection Area, it does not extend west of Washington Street (see Figure 6-1).

Although previously identified as potentially eligible for listing in the National Register of Places, neither the South End Industrial Area nor the South End Landmark District's Harrison/Albany Protection Area are included in the State or National Registers. The eastern periphery of the Protection Area was re-zoned into several contiguous sub-districts. Thus, under Appendix C of Article 64 of the Zoning Code, as adopted in 2012, the Project Site is located within Area 1, in which a height of 150 feet and an F.A.R. of 6.5 are identified as the allowable maximums (except as part of a Planned Development Area, where under certain circumstances, an FAR of 8.0 is permitted).

As a visual buffer to the South End Landmark District itself, to which it is immediately adjacent, the Protection Area is generally characterized by large-scale industrial buildings. Many of them are being replaced by residential developments. These are not only markedly different in scale and use from the historically residential portion of the South End, but they often lack historic and aesthetic significance as well.

Whereas the Landmark District is typified by blocks of three- to five-story rowhouses built in the nineteenth century, the Protection Area is dominated by architecturally undistinguished factories and warehouses, many of which date only from the postwar period. Most of its few earlier buildings have been altered beyond recognition. Nonetheless, while the Protection Area's built character is not generally significant in its own right, the South End Landmark District Standards and Criteria indicate that the Protection Area is important to the preservation of the Landmark District. Those Standards and Criteria indicate that the oversight of development in the Protection Area by the South End Landmark District Commission is designed to protect views of the District; ensure that new development is architecturally compatible in its massing, setback and height; and safeguard light and air circulation within the larger Landmark District.

Under the review authority of the South End Landmark District Commission, properties within the boundaries of the Landmark District are subject to standards of design and materials in order to protect and promote the historic aesthetic integrity of the area. By contrast, the Commission's regulatory authority within the Protection Area is more limited.

The demolition policy within the Protection Area states that "In general, the demolition of structures in the Protection Area may be allowed subject to prior approval by the Commission." The breadth of this statement has since been narrowed to outline the manner in which the South End Landmark District Commission will approach proposed demolitions, in a policy statement adopted by the District Commission in July 2013.

In the present instance, the Project will result in only partial demolition of the historic building and its principal street elevations will be retained as major design components of the Project.

6.2.2 Historic Resources in the Vicinity of the Project Site

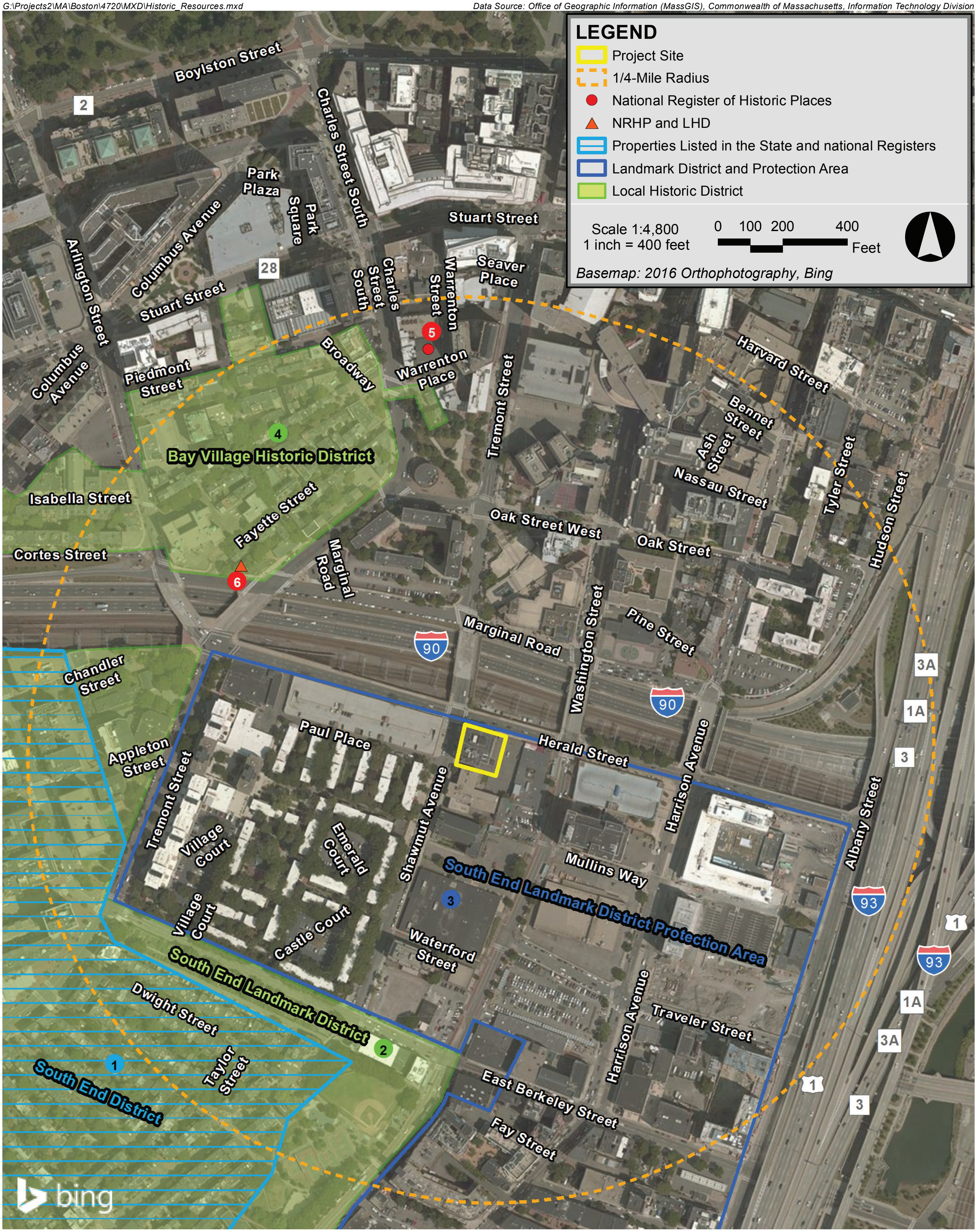
The South End Landmark District and the South End National Register Historic District are located south and west of the Project Site. The South End Harrison/Albany Protection Area and the South End Industrial Area have similar boundaries; however, the South End Industrial Area does not extend west of Washington Street, and thereby excludes Shawmut Avenue. Table 6-1 below and Figure 6-1 identify the State and National Register listed properties and historic districts located within a quarter mile radius of the Project Site.

Table 6-1 Historic Resources in the Vicinity of the Project Site

Map	State & National Register-listed Properties & Historic Districts	Address	Designation
1	South End National Register Historic District	Roughly bounded by Yarmouth Street, Columbus Avenue, Mass. Turnpike, Berkeley Street, Tremont Street, and Dwight Street	National Register Historic District
2	South End Landmark District	Roughly bounded by Claremont Street, Camden Street, Harrison Avenue, East Berkeley Street, and Mass. Turnpike	Local Historic District, State Register District
3	South End Harrison/Albany Protection Area	Roughly bounded by Mass. Turnpike, Rte. 93, Washington Street, Malden Street, Harrison Avenue, Albany Street, and Camden Street	Protection Area
4	Bay Village Historic District	Roughly bounded by Marginal Road, Cortes Street, Berkeley Street, Isabella Street, Arlington Street, Piedmont Street, Stuart Street, Broadway and Charles Street South	Local Historic District
5	Charles Street Playhouse	76-78 Warrenton Street	National Register Individual Designation
6	1 Bay Street	1 Bay Street at Fayette Street	National Register Individual Designation; Local Historic District

G:\Projects2\MA\Boston\4720\MXD\Historic_Resources.mxd

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division



112 Shawmut Avenue Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 6-1
Historic Resources

The Project Site is located to the northeast of the **South End National Register District**. Designated in 1973, the 600-acre district is among the largest Victorian-era urban neighborhoods in the United States. The South End of Boston was developed predominately between 1848 and 1930. The neighborhood's oldest thoroughfare, Washington Street, was laid out on the original "neck" connecting Boston's originally peninsular land mass with the Roxbury mainland. The City of Boston eventually filled the tidal marshes lining Washington Street and in 1848 began to auction off parcels to speculative developers. As a result of this initiative, the South End became one of the most fashionable residential neighborhoods of mid-nineteenth century Boston.

The Project Site is located immediately to the east and south of the locally designated **South End District Landmark District**. While its earliest buildings are conservative flat-fronted, gable-roofed Greek Revival rowhouses, the South End is better known for its harmonious blocks of speculator-built houses whose bow-fronted façades and mansard roofs reflect the later and more florid Italianate and Second Empire styles. Many of these line ornamental squares of varying proportions featuring cast-iron fences and fountains. In recognition of its significance, the area was designated a City of Boston landmark district in 1983.

The Project Site is located within the **South End/Harrison-Albany Protection Area**, and subject to its less stringent regulations, relative to those of the South End Landmark District proper. East of the South End's residential streets and adjacent to major rail lines, this industrial area dominated by warehouses and factory buildings was developed in the later nineteenth and early twentieth centuries. This area, which today sits within the angle formed by the Massachusetts Turnpike Extension and Interstate 93, is a designated sub-district known as the South End Protection Area.

The **Bay Village Historic District**, located to the northwest of the Project Site, was designated by the Boston Landmarks Commission in 1983. Located southwest of Downtown Boston, Bay Village was first constructed on landfill in the 1820s. Dating from the second quarter of the nineteenth century, the early dwellings of Bay Village exemplify the late Federal and Greek Revival styles, resembling smaller, more modestly ornamented versions of houses found on Beacon Hill. This phenomenon is explained by the fact that housewrights active in the development of Beacon Hill built their own homes in Bay Village in the prevailing architectural fashions of the day, though smaller in scale and simpler in detail.

As the nearby South End and Back Bay neighborhoods were developed in the years immediately before and after the Civil War, substantial brick houses and residential hotels went up along Cortes and Isabella Streets, in the area west of Arlington Street (which was known as Ferdinand Street until the turn of the twentieth century). Variously Second Empire, Ruskin Gothic or Queen Anne in style, these buildings mirror the visual character of those residential areas.

The Charles Playhouse at **76-78 Warrenton Street**, almost due north of the Project Site, has enjoyed a vivid history. Its pedimented red-brick façade dominated by a monumental pair of Ionic columns in antis suggests its origin as a house of worship. Erected in 1839 as a Universalist church designed by Asher Benjamin, the building was later used as a synagogue and a speakeasy before its conversion to a theater in 1958. It was included on the National Register in 1980.

The tiny brick house at **1 Bay Street** in the Bay Village Historic District occupies a footprint of only 650 square feet. Twenty feet wide and 2 ½ stories tall, its elliptical-arched entry recess identifies its ca. 1830, late Federal style. The residence was included in the National Register in 1994.

6.3 Archaeological Resources within the Project Site

The Project Site is a previously developed urban parcel. It is not believed that significant archaeological resources remain within the Project Site. No impacts to archaeological resources are anticipated as a result of the Project.

6.4 Impacts to Historic Resources

6.4.1 Urban Design

The proposed removal of the existing building's minor mid-block elevations presents an opportunity to devise a solution that is both visually exciting and functionally efficient. A complementary new structure of modern design will reinterpret and reinvigorate the historic building. Its regular bays will provide a vital cornerstone to the new construction, ensuring the Project's visual absorption into the urban context that has evolved around the Project Site. In functional terms, the retention of the original street façades will also facilitate a more effective utilization of this deep and programmatically demanding corner location.

Significantly, the two elements do not merely engage but literally integrate with each other; their two L shapes interlock to create a coherent and potent unit enclosing an open courtyard at the core of the Project Site.

As a function of its greater height, the heavily glazed residential tower will rise behind the brick-veneered street façades of the historic structure. Its dissimilar material expression is intended as an effective means of differentiating the new construction from the original building. At the same time, both components will reflect a strongly repetitive fenestration pattern, unifying the composition as a whole.

As a consequence of the new construction's greater height, the historic building may be said to share the skyline with the new construction. In this sense, the greater present visibility of the Project Site may be understood to invite the new construction's higher profile. At the street level, however, the old brick walls will remain the dominant design element. In this fashion these historic elevations will continue to dominate the prominent corner location.

This primacy is particularly evident along the sidewalks at the base of the Project. In order to improve the pedestrian experience in this area, vehicular access to the parking, loading and service areas has been shifted away from the historic Shawmut Avenue and Herald Street façades. Trees and other landscape elements will invite pedestrian circulation around the Project Site.

6.4.2 Shadow Impacts to Historic Resources

The Project will be similar in height to currently constructed and recently approved buildings in the area. Therefore, shadow impacts are anticipated to be similar to the impacts created by nearby buildings. The vicinity of the Project Site will continue to include a mix of heights and densities that will allow for views of the sky.

Shadow analyses were undertaken to demonstrate the anticipated impacts from the Project. These consisted of standard shadow studies done for the spring equinox, summer solstice, autumn equinox and winter solstice at 9:00 a.m., 12:00 p.m. (noon), and 3:00 p.m., as well as 6:00 p.m. for the summer solstice and autumn equinox.

These studies demonstrated that net new shadow is limited in both degree and duration. Modestly extending existing shadow, it is typically cast easterly from the Project Site on the Protection Area at 6:00 p.m. on the spring equinox and on 6:00 p.m. on the summer solstice. Minor new shadow falls to the west onto the edge of the Landmark District at 9:00 a.m. on both the spring and fall equinoxes. Otherwise, sporadic new shadow is cast onto the Massachusetts Turnpike, to the north of the Project Site. There are no other shadow impacts on any historic resources within a quarter-mile radius of the Project Site.

Chapter 7

Infrastructure

7.0 INFRASTRUCTURE

7.1 Introduction

The following sections describe the existing sewer, water, and drainage systems surrounding the Project Site, and explain how these systems will service the Project. The analysis also includes a description of anticipated Project-related impacts on the utilities and mitigation measures to address potential impacts. The Project is in the early design stages, and as a more definitive design evolves, the Proponent will coordinate with the various utility companies to ensure full services for the new Project.

A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application will be required for the proposed new water and sewer connections. In addition, a Stormwater Pollution Prevention Plan (SWPPP) will be submitted specifying best management practices (BMPs) for protecting the existing stormwater drainage system during construction.

7.2 Sanitary Sewer System

7.2.1 Existing Sanitary Sewer System

BWSC record drawings indicate that the sanitary sewer system in the Project area (see Figure 7-1 at the end of this chapter) is owned and maintained by BWSC. BWSC record drawings indicate an existing 12-inch sanitary sewer line runs southwest along Shawmut Avenue to the west of the Project Site, and an existing 12-inch sanitary sewer line runs east along Herald Street to the northeast of the Project Site.

7.2.2 Estimated Project Wastewater Generation

The Project consists of approximately 143 units with approximately 220 bedrooms. The building will also contain approximately 980 sf of retail/café space. The Project will generate an estimated 24,250 gallons per day (gpd) based on design sewer flows provided in 310 CMR 15.000-The State Environmental Code, Title 5: Standard Requirements for the Siting, Construction, Inspection, Upgrade and Expansion of On-Site Sewage Treatment and Disposal Systems and for the Transport and Disposal of Septage and the proposed building program as summarized in Table 7-1.

Based on the proposed estimated sanitary flow, which is greater than 15,000 gpd, BWSC will require the removal of infiltration/inflow (I/I) at a minimum 4:1 ratio of I/I removed to wastewater generated.

Table 7-1 Project Wastewater Generation

Use	Number	Sewage Generation Rate	Total gpd
Family Dwelling	220 beds	110 gpd/bedroom	24,200
Retail	980 sf	50 gpd/1,000 sf	50
Total Estimated Project Sewage Generation			**24,250**

7.2.3 Sanitary Sewer Connections

The proposed sanitary sewer line from the new building will likely connect to the BWSC's sewer line in Shawmut Avenue. Incidental runoff from the parking garage will flow through a gas and oil separator prior to being piped to the sanitary sewer service. Gas and oil separators will conform to BWSC and Massachusetts Water Resources Authority (MWRA) standards.

7.2.4 Wastewater Flow Mitigation

To help conserve water and reduce the amount of wastewater generated by the Project, the Proponent will investigate the use of water conservation devices such as low-flow toilets and urinal, flow-restricting faucets, and sensor operated sinks and toilets consistent with the Proponent's compliance at the LEED Certifiable threshold, and in compliance with all pertinent Code requirements.

7.3 Water Supply System

7.3.1 Existing Water Service

The water distribution system near the Project area is owned and maintained by BWSC (see Figure 7-2 at the end of this chapter). BWSC record drawings indicate there is an existing 12-inch pit cast iron (PCI) water main installed in Shawmut Avenue. There is also an existing 12-inch ductile iron cement-lined (DICL) water main installed in Herald Street. Both mains are part of BWSC's Southern Low distribution system.

Fire hydrants are located in Shawmut Avenue and Herald Street to the northwest, southwest, and east of the Project area. It appears that these hydrants will provide sufficient coverage for the Project. The Proponent will design appropriate domestic and fire protection lines, and the fire hydrant coverage for the Project with the consultation of BWSC and the Boston Fire Department (BFD) during the detailed design phase.

7.3.2 Proposed Water Service

It is anticipated that the Project will be serviced via the existing 12-inch PCI water main in Shawmut Avenue. Separate new domestic water and fire protection services will be required. The fire protection service will be provided with a backflow prevention device that will be approved though BWSC's Enforcement Section. The location of hydrants and siamese connections will be reviewed by BWSC and BFD during the design development phase of the Project. Water meters will be of a type approved by BWSC and tied into the BWSC's Automatic Meter Reading (AMR) System. Fixture counts and water meter sizing information will be provided, and services will be designed and coordinated with the BWSC as part of the Site Plan Review process and General Service Application.

7.3.3 Anticipated Water Consumption

The Project's estimated water consumption is based on the Project's estimated sewage generation, plus a factor to account for consumption, system losses, and other usages to estimate an average water demand. The total estimated water demand is 26,675 gpd. The water for the Project will be supplied by BWSC. More detailed water use and meter sizing calculations will be submitted to BWSC as part of the Site Plan Review process.

7.3.4 Water Supply Conservation and Mitigation

To help conserve water used by the Project, the Proponent will investigate the use of water conservation devices such as low-flow toilets and urinal, flow-restricting faucets, and sensor operated sinks and toilets consistent with the Proponent's compliance at the LEED Certifiable threshold, and in compliance with all pertinent Code requirements.

7.4 Storm Drainage System

7.4.1 Existing Stormwater Drainage System

The Project Site consists of the existing building and existing paved parking and walkway areas. The existing storm drainage system in Shawmut Avenue is owned and maintained by BWSC (see Figure 7-1).

7.4.2 Proposed Stormwater Drainage System

Stormwater runoff from the Project Site is expected to be conveyed to a subsurface infiltration system. Stormwater will be infiltrated in a volume equivalent to one inch times the impervious area of the Project Site at a minimum. Stormwater from pavement areas will be pretreated prior to discharging to the infiltration system. Overflows from the infiltration system are expected to piped to the BWSC storm drain in Shawmut Avenue.

7.4.3 Water Quality and Construction Stormwater Management

The Project will not impact the water quality of nearby water bodies. The Project proposes a stormwater management program, designed in compliance with MassDEP Stormwater Management Standards requirements for redevelopment, which will provide pretreatment and infiltration, if feasible, prior to discharging stormwater to the drainage system. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

A pollution prevention plan will be prepared for use during construction including during demolition activity. Stormwater pollution prevention measures will include good housekeeping such as properly storing materials, spill prevention and response plans, and proper storage and disposal of solid wastes. Erosion and sediment controls will be used during construction to protect adjacent properties, the storm drain system, and the nearby surface waters. The Project's construction contractor will be responsible for controlling dust using street sweeping and watering, if necessary.

7.4.4 City of Boston Groundwater Overlay District

The Project Site is located within the City of Boston Groundwater Conservation Overlay District (GCOD). Per the GCOD regulations, stormwater infiltration is required and must capture a minimum rainfall volume of one inch across the site area. In order to meet this regulation, a stormwater infiltration system will be designed that best fits the Project needs and the site constraints.

7.5 Electrical Systems

Eversource owns and maintains the electrical transmission system in the vicinity of the Project. The electrical power supply design and loads for the building will be coordinated with Eversource during the design phase. The Proponent is investigating energy conservation measures, including energy efficient lighting and heating and cooling systems for the Project.

7.6 Telephone and Cable Systems

Verizon, Comcast, and RCN provide cable and telephone services in the Project area. It is anticipated that if new cable service is provided to the proposed building, it will be provided underground from Shawmut Avenue.

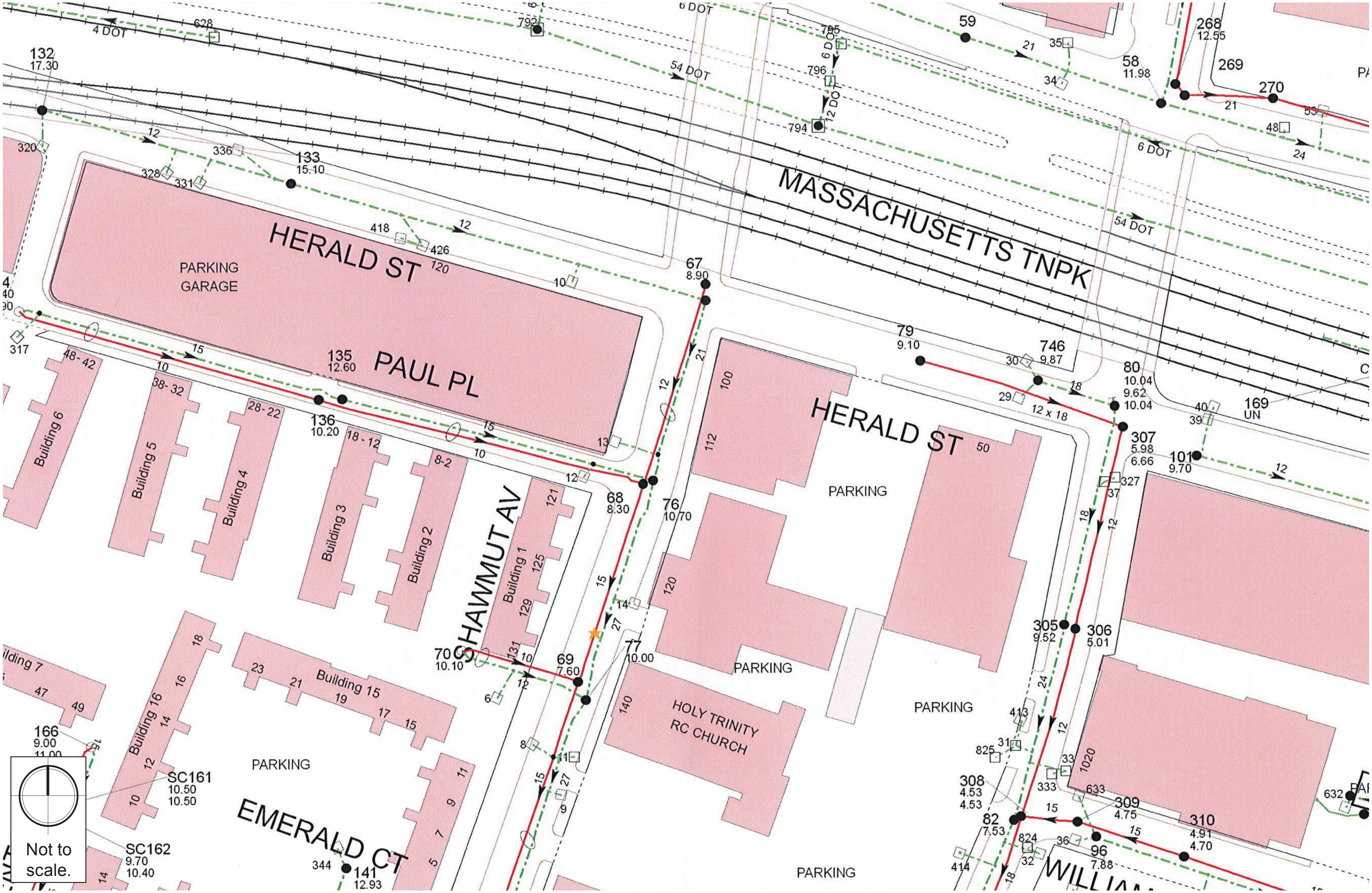
7.7 Natural Gas System

National Grid provides natural gas in the Project area. The actual size and location of the building services will be coordinated with National Grid.

7.8 Utility Protection During Construction

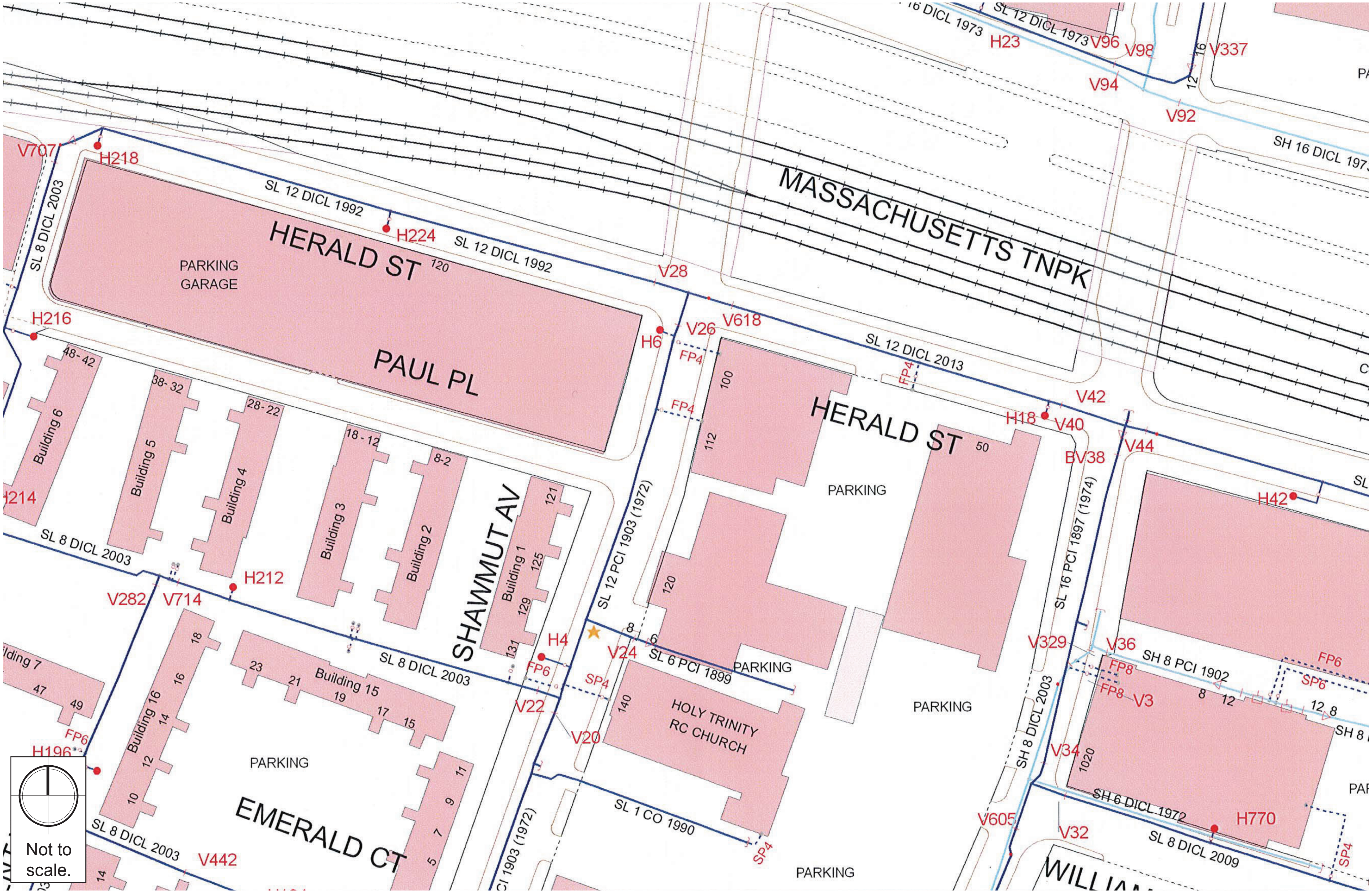
The Project's construction contractor will notify utility companies and call "Dig Safe" prior to excavation. During construction, infrastructure will be protected using sheeting and shoring, temporary relocations, and construction staging as required. The Project's construction contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of all utilities with the appropriate utility owners and/or agencies.

The Project's construction contractor will also be required to provide adequate notification to the utility owner prior to any work commencing on their utility. In addition, in the event a utility cannot be maintained in service during switch over to a temporary or permanent system, the Project's construction contractor will be required to coordinate the shutdown with the utility owners and Project abutters to minimize impacts and inconveniences.



112 Shawmut Avenue **Boston, Massachusetts**

Figure 7-1
Existing Sewer System



112 Shawmut Avenue Boston, Massachusetts

HOWARD STEIN HUDSON
Engineers + Planners

Figure 7-2
Existing Water System

Chapter 8

Coordination With Other Government Agencies

8.0 COORDINATION WITH OTHER GOVERNMENT AGENCIES

8.1 Architectural Access Board Requirements

The Project will comply with the requirements of the Architectural Access Board and the standards of the Americans with Disabilities Act. The Accessibility Checklist is included in Appendix F.

8.2 Massachusetts Environmental Policy Act

The Project is not anticipated to require review by the Massachusetts Environmental Policy Act (MEPA) Office of the Massachusetts Executive Office of Energy and Environmental Affairs. Current plans do not call for the Project to receive any state permits or state funding or involve any state land transfers.

8.3 Massachusetts Historical Commission

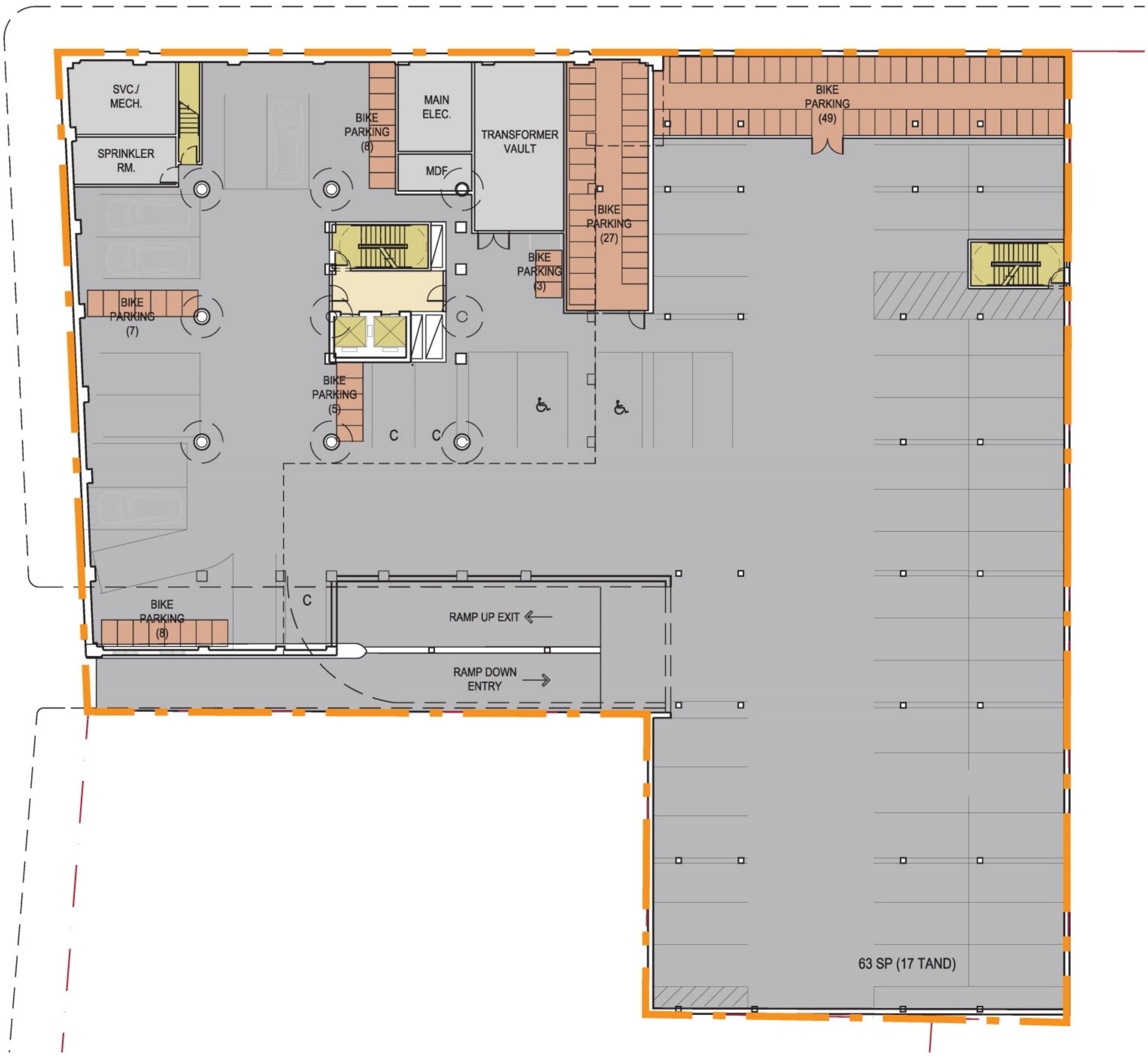
In the event that a state or federal action is identified as required for the Project, a Massachusetts Historical Commission Project Notification Form will be filed for the Project in compliance with State Register Review (950 CMR 71.00) and/or Section 106 of the National Historic Preservation Act (36 CFR 800).

8.4 South End Landmark District Commission

The Project Site is located within the South End Harrison/Albany Protection Area. Building demolitions, the height and setback of new construction, and changes to topography and landscaping within the Protection Area are subject to review by the SELD Commission. At the appropriate time the Proponent will file a Design Review application for the Project with the SELD Commission and will provide follow-up with the Boston Landmarks Commission staff.

Appendix A

Floor Plans



112 Shawmut Avenue Boston, Massachusetts

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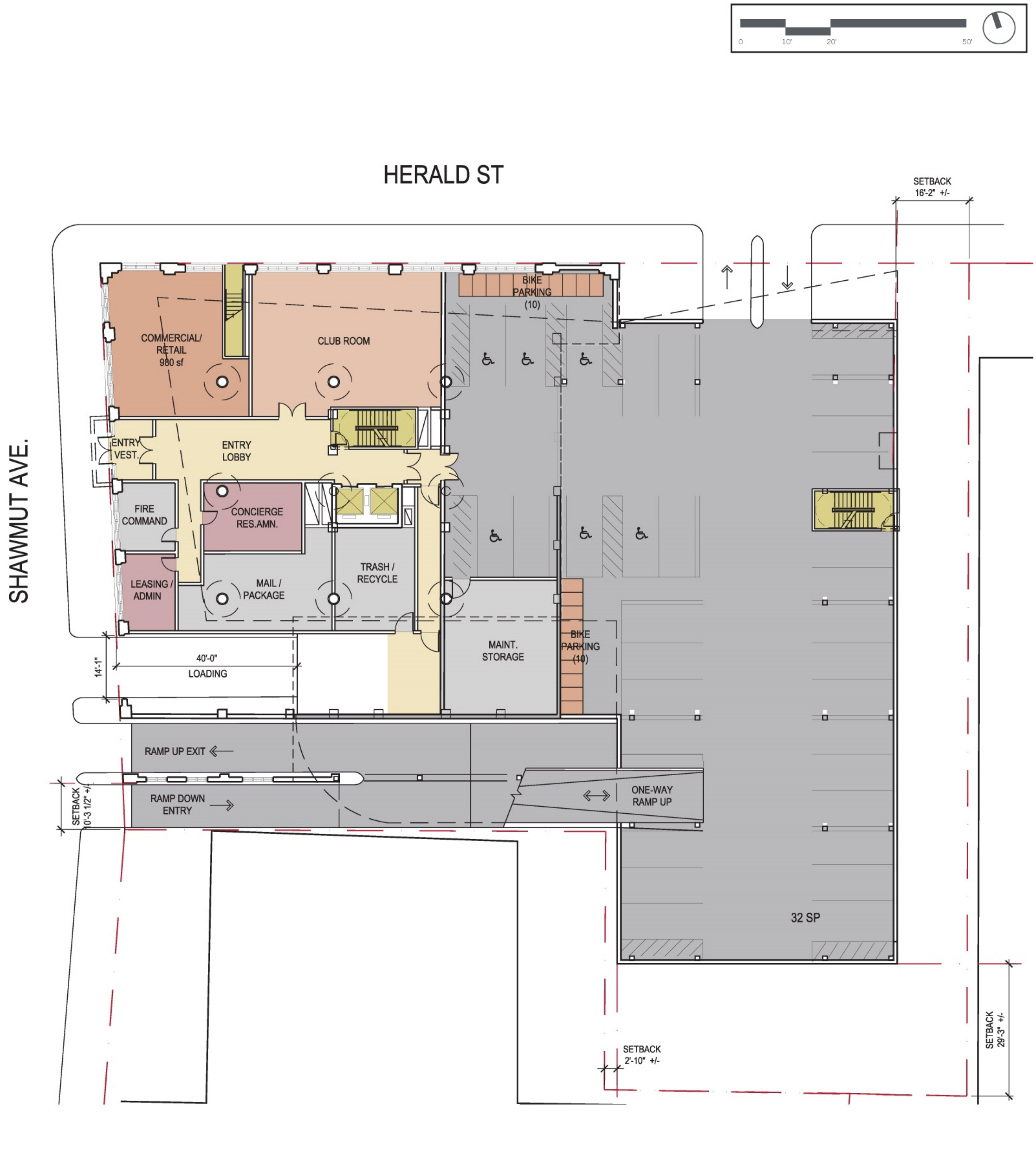
Basement Floor Plan


0
10'
20'
50'
HERALD ST
SETBACK
16'-2" +/-
BIKE PARKING (10)
COMMERCIAL/ RETAIL 980 sf
CLUB ROOM
ENTRY VEST.
ENTRY LOBBY
FIRE COMMAND
CONCIERGE RES.AMN.
TRASH / RECYCLE
LEASING / ADMIN
MAIL / PACKAGE
MAINT. STORAGE
BIKE PARKING (10)
SHAWMUT AVE.
14'-1"
40'-0"
LOADING
RAMP UP EXIT
RAMP DOWN ENTRY
SETBACK 0'-3 1/2" +/-
ONE-WAY RAMP UP
32 SP
SETBACK 2'-10" +/-
SETBACK 29'-3" +/-

0
10'
20'
50'
HERALD ST
SHAWMUT AVE.
Unit E
2-BR + Study
Unit F
1-BR +Study
Unit G
1-BR +Study
Unit H
1-BR + Study
Unit I
1-BR
Unit J
2-BR + Study
Unit D
ST
Unit C
ST
Unit B
1-BD
Unit A
2-BR
IDF
EME
ELEC
TR/RE
BIKE
PARKING
(7)
BIKE
PARKING
(9)
C
ONE-WAY
RAMP DN
29SP

0
10'
20'
50'
HERALD ST
SHAWMUT AVE.
Unit E
3-BR
Unit F
1-BR +Study
Unit G
1-BR + Study
Unit H
2-BR + Study
Unit J
3-BR
Unit C
1-BD
ELEC
TR/RE
T/D
EME
STO
Unit K
1-BD
Unit U
1 BD
Unit T
1 BD
Unit B
1-BD
Pvt Deck
3rd Floor
Balcony
4th-6th
Unit S
1 BD
Unit L
1 BD
Unit A
2-BR + Study
Balcony
4th-6th
Pvt Deck
3rd Floor
Unit R
1 BD
Unit M
ST
Unit N
ST
Unit Q
ST
Unit P
ST
Unit O
1 BD


0
10'
20'
50'
HERALD ST
SHAWMUT AVE.
Balcony 8th Floor
Pvt Deck 7th Floor
Balcony 8th Floor
Pvt Deck 7th Floor
Pvt Deck 7th Floor
Balcony 7th Floor
Balcony 8th Floor
Unit E 3-BR
Unit F 1 BD
Unit H 1-BD
Unit J 3-BD
Pvt Deck 7th Floor
ELEC
TR/RE
T/D EME
STO
Unit K 1-BD
Unit S 3-BD
Unit T 1 BD
Balcony 8th Floor
Balcony 8th Floor
Balcony 7th Floor
Balcony 7th Floor
Unit S 1 BD
Unit L 1 BD
Pvt Deck 7th Floor
Unit R 1 BD
Unit M ST
Unit N ST
Unit Q ST
Unit P ST
Unit O 1 BD


0
10'
20'
50'


HERALD ST
SHAWMUT AVE.
Unit E
3-BR
Unit F
2-BR + Study
Unit J
3-BR
ELEC
TR/RE
T/D
EME
Unit S
3-BD
Unit T
1 BD
STO
Fitness
Outdoor Fitness
COMMON ROOF
AREA


0
10'
20'
50'


Unit E
3-BR
Unit F
2-BR + Study
Unit J
3-BR
ELEC
TR/RE
T/D
EME
STO
Unit K
2-BR
Unit T
1 BD
Unit S
3-BD

112 Shawmut Avenue   Boston, Massachusetts

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Penthouse Level (Thirteenth) Floor Plan

Appendix B

Transportation

Appendix B – Transportation

Vehicle, Pedestrian, and Bicycle Counts
Trip Generation
Synchro Intersection Level of Service Reports

- Existing (2017) Condition
- No-Build (2024) Condition
- Build (2024) Condition

Vehicle, Pedestrian, and Bicycle Counts

N/S: Tremont Street
E/W: Herald Street/ Arlington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 A
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Tremont Street From North				**Herald Street From East**				**Tremont Street From South**				**Arlington 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	0	26	11	0	0	0	0	0	54	70	0	0	24	126	7	0	318
07:15 AM	0	28	16	0	0	0	0	0	73	88	0	0	29	149	7	0	390
07:30 AM	0	25	11	0	0	0	0	0	70	118	0	0	43	162	7	0	436
07:45 AM	0	23	9	0	0	0	0	0	82	121	0	0	22	202	5	0	464
Total	0	102	47	0	0	0	0	0	279	397	0	0	118	639	26	0	1608
08:00 AM	0	36	6	0	0	0	0	0	84	118	0	0	40	165	7	0	456
08:15 AM	0	31	6	0	0	0	0	0	85	80	0	0	31	180	5	0	418
08:30 AM	0	39	11	0	0	0	0	0	78	116	0	0	43	185	11	0	483
08:45 AM	0	36	9	0	0	0	0	0	73	102	0	0	33	184	12	0	449
Total	0	142	32	0	0	0	0	0	320	416	0	0	147	714	35	0	1806
Grand Total	0	244	79	0	0	0	0	0	599	813	0	0	265	1353	61	0	3414
Apprch %	0	75.5	24.5	0	0	0	0	0	42.4	57.6	0	0	15.8	80.6	3.6	0	
Total %	0	7.1	2.3	0	0	0	0	0	17.5	23.8	0	0	7.8	39.6	1.8	0	
Cars	0	226	78	0	0	0	0	0	589	761	0	0	250	1276	60	0	3240
% Cars	0	92.6	98.7	0	0	0	0	0	98.3	93.6	0	0	94.3	94.3	98.4	0	94.9
Heavy Vehicles	0	18	1	0	0	0	0	0	10	52	0	0	15	77	1	0	174
% Heavy Vehicles	0	7.4	1.3	0	0	0	0	0	1.7	6.4	0	0	5.7	5.7	1.6	0	5.1

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

	Tremont Street From North					**Herald Street From East**					**Tremont Street From South**					**Arlington 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
07:45 AM	0	23	9	0	32	0	0	0	0	0	82	121	0	0	203	22	202	5	0	229	464
08:00 AM	0	36	6	0	42	0	0	0	0	0	84	118	0	0	202	40	165	7	0	212	456
08:15 AM	0	31	6	0	37	0	0	0	0	0	85	80	0	0	165	31	180	5	0	216	418
08:30 AM	0	39	11	0	50	0	0	0	0	0	78	116	0	0	194	43	185	11	0	239	483
Total Volume	0	129	32	0	161	0	0	0	0	0	329	435	0	0	764	136	732	28	0	896	1821
% App. Total	0	80.1	19.9	0		0	0	0	0		43.1	56.9	0	0		15.2	81.7	3.1	0		
PHF	.000	.827	.727	.000	.805	.000	.000	.000	.000	.000	.968	.899	.000	.000	.941	.791	.906	.636	.000	.937	.943
Cars	0	118	31	0	149	0	0	0	0	0	323	410	0	0	733	127	698	27	0	852	1734
% Cars	0	91.5	96.9	0	92.5	0	0	0	0	0	98.2	94.3	0	0	95.9	93.4	95.4	96.4	0	95.1	95.2
Heavy Vehicles	0	11	1	0	12	0	0	0	0	0	6	25	0	0	31	9	34	1	0	44	87
% Heavy Vehicles	0	8.5	3.1	0	7.5	0	0	0	0	0	1.8	5.7	0	0	4.1	6.6	4.6	3.6	0	4.9	4.8

N/S: Tremont Street
E/W: Herald Street/ Arlington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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Email: datarequests@pdillc.com

File Name : 165421 A
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Peds and Bikes

	Tremont Street From North					Herald Street From East					Tremont Street From South					Arlington 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	0	0	3	6	0	1	0	4	3	0	0	0	7	2	27
07:15 AM	0	0	0	3	5	0	0	0	8	12	0	0	0	6	5	0	1	0	10	0	50
07:30 AM	0	0	0	8	17	0	0	0	6	22	0	1	0	17	11	0	0	0	18	4	104
07:45 AM	0	0	0	0	13	0	0	0	7	22	0	3	0	26	7	1	0	0	17	2	98
Total	0	0	0	11	36	0	0	0	24	62	0	5	0	53	26	1	1	0	52	8	279
08:00 AM	0	1	0	5	4	0	0	0	10	26	0	5	0	11	5	0	0	0	24	5	96
08:15 AM	0	0	0	10	2	0	0	0	10	14	0	7	0	10	4	0	1	0	16	4	78
08:30 AM	0	2	0	5	0	0	0	0	9	20	0	4	0	11	10	0	0	0	27	1	89
08:45 AM	0	0	0	1	1	0	0	0	9	24	0	4	0	11	8	2	0	0	11	4	75
Total	0	3	0	21	7	0	0	0	38	84	0	20	0	43	27	2	1	0	78	14	338
Grand Total	0	3	0	32	43	0	0	0	62	146	0	25	0	96	53	3	2	0	130	22	617
Apprch %	0	3.8	0	41	55.1	0	0	0	29.8	70.2	0	14.4	0	55.2	30.5	1.9	1.3	0	82.8	14	
Total %	0	0.5	0	5.2	7	0	0	0	10	23.7	0	4.1	0	15.6	8.6	0.5	0.3	0	21.1	3.6	

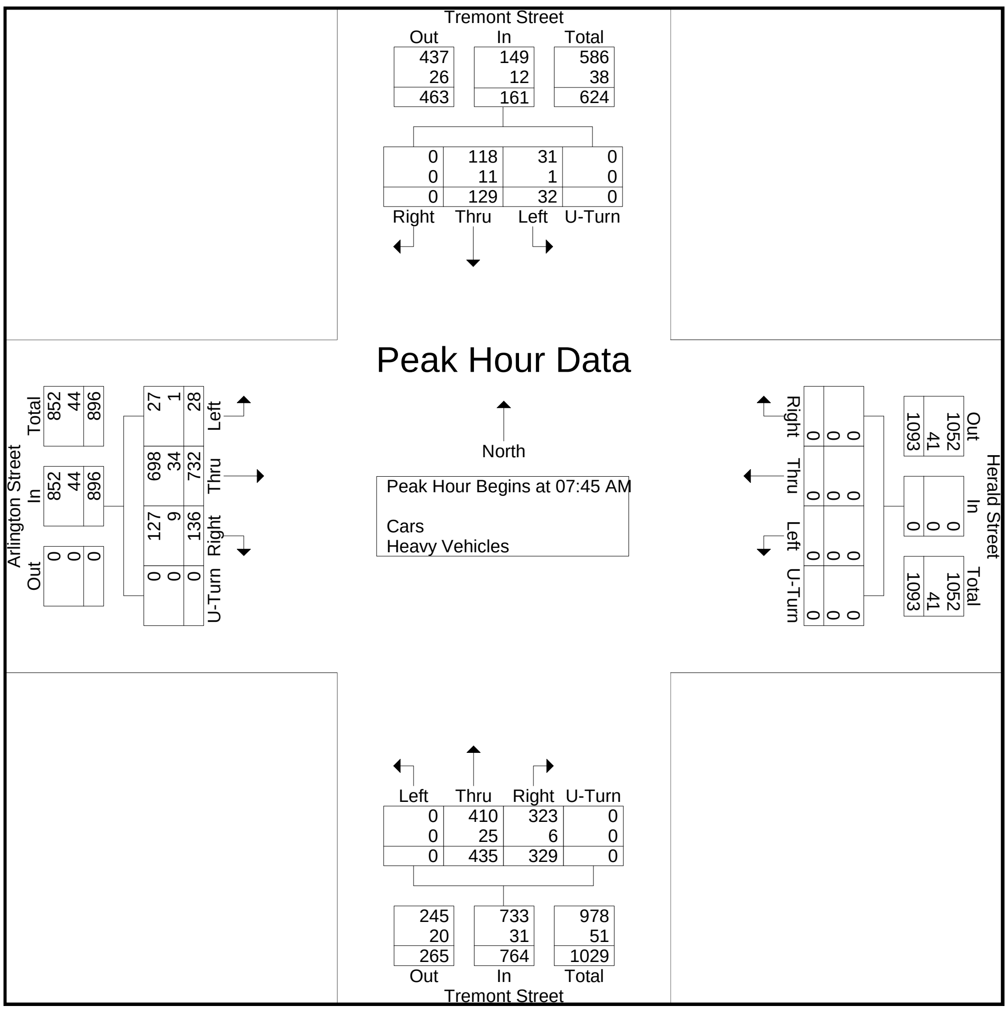
	Tremont Street From North						Herald Street From East						Tremont Street From South						Arlington Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. 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 07:30 AM																									
07:30 AM	0	0	0	8	17	25	0	0	0	6	22	28	0	1	0	17	11	29	0	0	0	18	4	22	104
07:45 AM	0	0	0	0	13	13	0	0	0	7	22	29	0	3	0	26	7	36	1	0	0	17	2	20	98
08:00 AM	0	1	0	5	4	10	0	0	0	10	26	36	0	5	0	11	5	21	0	0	0	24	5	29	96
08:15 AM	0	0	0	10	2	12	0	0	0	10	14	24	0	7	0	10	4	21	0	1	0	16	4	21	78
Total Volume	0	1	0	23	36	60	0	0	0	33	84	117	0	16	0	64	27	107	1	1	0	75	15	92	376
% App. Total	0	1.7	0	38.3	60		0	0	0	28.2	71.8		0	15	0	59.8	25.2		1.1	1.1	0	81.5	16.3		
PHF	.000	.250	.000	.575	.529	.600	.000	.000	.000	.825	.808	.813	.000	.571	.000	.615	.614	.743	.250	.250	.000	.781	.750	.793	.904

N/S: Tremont Street
E/W: Herald Street/ Arlington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 A
Site Code : TBA
Start Date : 1/5/2017

	Tremont Street From North					Herald Street From East					Tremont Street From South					Arlington 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 07:45 AM																					
07:45 AM	0	23	9	0	32	0	0	0	0	0	82	121	0	0	203	22	202	5	0	229	464
08:00 AM	0	36	6	0	42	0	0	0	0	0	84	118	0	0	202	40	165	7	0	212	456
08:15 AM	0	31	6	0	37	0	0	0	0	0	85	80	0	0	165	31	180	5	0	216	418
08:30 AM	0	39	11	0	50	0	0	0	0	0	78	116	0	0	194	43	185	11	0	239	483
Total Volume	0	129	32	0	161	0	0	0	0	0	329	435	0	0	764	136	732	28	0	896	1821
% App. Total	0	80.1	19.9	0		0	0	0	0		43.1	56.9	0	0		15.2	81.7	3.1	0		
PHF	.000	.827	.727	.000	.805	.000	.000	.000	.000	.000	.968	.899	.000	.000	.941	.791	.906	.636	.000	.937	.943
Cars	0	118	31	0	149	0	0	0	0	0	323	410	0	0	733	127	698	27	0	852	1734
% Cars	0	91.5	96.9	0	92.5	0	0	0	0	0	98.2	94.3	0	0	95.9	93.4	95.4	96.4	0	95.1	95.2
Heavy Vehicles	0	11	1	0	12	0	0	0	0	0	6	25	0	0	31	9	34	1	0	44	87
% Heavy Vehicles	0	8.5	3.1	0	7.5	0	0	0	0	0	1.8	5.7	0	0	4.1	6.6	4.6	3.6	0	4.9	4.8



N/S: Tremont Street
E/W: Herald Street/ Arlington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 AA
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Tremont Street From North				**Herald Street From East**				**Tremont Street From South**				**Arlington 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	48	0	0	0	0	0	0	40	75	0	0	46	139	8	0	356
04:15 PM	0	52	3	0	0	0	0	0	45	77	0	0	62	169	11	0	419
04:30 PM	0	60	4	0	0	0	0	0	44	78	0	0	59	189	11	0	445
04:45 PM	0	44	4	0	0	0	0	0	42	91	1	0	43	233	12	0	470
Total	0	204	11	0	0	0	0	0	171	321	1	0	210	730	42	0	1690
05:00 PM	0	50	1	0	0	0	0	0	52	76	0	0	45	219	12	0	455
05:15 PM	0	61	0	0	0	0	0	0	56	91	0	0	45	197	18	0	468
05:30 PM	0	59	0	0	0	0	0	0	42	79	0	0	55	187	22	0	444
05:45 PM	0	63	3	0	0	0	0	0	44	85	1	0	43	184	12	0	435
Total	0	233	4	0	0	0	0	0	194	331	1	0	188	787	64	0	1802
Grand Total	0	437	15	0	0	0	0	0	365	652	2	0	398	1517	106	0	3492
Apprch %	0	96.7	3.3	0	0	0	0	0	35.8	64	0.2	0	19.7	75.1	5.2	0	
Total %	0	12.5	0.4	0	0	0	0	0	10.5	18.7	0.1	0	11.4	43.4	3	0	
Cars	0	414	15	0	0	0	0	0	349	631	2	0	391	1480	102	0	3384
% Cars	0	94.7	100	0	0	0	0	0	95.6	96.8	100	0	98.2	97.6	96.2	0	96.9
Heavy Vehicles	0	23	0	0	0	0	0	0	16	21	0	0	7	37	4	0	108
% Heavy Vehicles	0	5.3	0	0	0	0	0	0	4.4	3.2	0	0	1.8	2.4	3.8	0	3.1

	Tremont Street From North					**Herald Street From East**					**Tremont Street From South**					**Arlington 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	60	4	0	64	0	0	0	0	0	44	78	0	0	122	59	189	11	0	259	445
04:45 PM	0	44	4	0	48	0	0	0	0	0	42	91	1	0	134	43	233	12	0	288	470
05:00 PM	0	50	1	0	51	0	0	0	0	0	52	76	0	0	128	45	219	12	0	276	455
05:15 PM	0	61	0	0	61	0	0	0	0	0	56	91	0	0	147	45	197	18	0	260	468
Total Volume	0	215	9	0	224	0	0	0	0	0	194	336	1	0	531	192	838	53	0	1083	1838
% App. Total	0	96	4	0		0	0	0	0		36.5	63.3	0.2	0		17.7	77.4	4.9	0		
PHF	.000	.881	.563	.000	.875	.000	.000	.000	.000	.000	.866	.923	.250	.000	.903	.814	.899	.736	.000	.940	.978
Cars	0	204	9	0	213	0	0	0	0	0	189	326	1	0	516	190	820	51	0	1061	1790
% Cars	0	94.9	100	0	95.1	0	0	0	0	0	97.4	97.0	100	0	97.2	99.0	97.9	96.2	0	98.0	97.4
Heavy Vehicles	0	11	0	0	11	0	0	0	0	0	5	10	0	0	15	2	18	2	0	22	48
% Heavy Vehicles	0	5.1	0	0	4.9	0	0	0	0	0	2.6	3.0	0	0	2.8	1.0	2.1	3.8	0	2.0	2.6

N/S: Tremont Street
E/W: Herald Street/ Arlington Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 AA
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Peds and Bikes

	Tremont Street From North					Herald Street From East					Tremont Street From South					Arlington 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	0	0	2	1	0	0	0	18	6	1	2	0	9	8	0	0	0	7	3	57
04:15 PM	0	1	0	2	0	0	0	0	14	12	0	0	0	5	10	0	0	0	4	6	54
04:30 PM	0	2	0	1	2	0	0	0	7	16	0	0	0	9	17	0	0	0	7	3	64
04:45 PM	0	0	0	5	0	0	0	1	21	12	0	0	0	7	9	0	0	0	8	7	70
Total	0	3	0	10	3	0	0	1	60	46	1	2	0	30	44	0	0	0	26	19	245
05:00 PM	0	3	0	15	6	0	0	0	21	14	0	2	0	15	20	0	0	0	28	9	133
05:15 PM	0	4	0	1	1	0	0	0	17	3	0	0	0	4	17	2	3	0	11	12	75
05:30 PM	0	5	0	4	4	0	0	0	31	12	0	4	0	10	14	0	2	0	8	21	115
05:45 PM	0	5	1	1	5	0	0	0	15	17	0	1	0	7	10	1	1	0	5	12	81
Total	0	17	1	21	16	0	0	0	84	46	0	7	0	36	61	3	6	0	52	54	404
Grand Total	0	20	1	31	19	0	0	1	144	92	1	9	0	66	105	3	6	0	78	73	649
Apprch %	0	28.2	1.4	43.7	26.8	0	0	0.4	60.8	38.8	0.6	5	0	36.5	58	1.9	3.8	0	48.8	45.6	
Total %	0	3.1	0.2	4.8	2.9	0	0	0.2	22.2	14.2	0.2	1.4	0	10.2	16.2	0.5	0.9	0	12	11.2	

	Tremont Street From North						Herald Street From East						Tremont Street From South						Arlington 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 05:00 PM																									
05:00 PM	0	3	0	15	6	24	0	0	0	21	14	35	0	2	0	15	20	37	0	0	0	28	9	37	133
05:15 PM	0	4	0	1	1	6	0	0	0	17	3	20	0	0	0	4	17	21	2	3	0	11	12	28	75
05:30 PM	0	5	0	4	4	13	0	0	0	31	12	43	0	4	0	10	14	28	0	2	0	8	21	31	115
05:45 PM	0	5	1	1	5	12	0	0	0	15	17	32	0	1	0	7	10	18	1	1	0	5	12	19	81
Total Volume	0	17	1	21	16	55	0	0	0	84	46	130	0	7	0	36	61	104	3	6	0	52	54	115	404
% App. Total	0	30.9	1.8	38.2	29.1		0	0	0	64.6	35.4		0	6.7	0	34.6	58.7		2.6	5.2	0	45.2	47		
PHF	.000	.850	.250	.350	.667	.573	.000	.000	.000	.677	.676	.756	.000	.438	.000	.600	.763	.703	.375	.500	.000	.464	.643	.777	.759

N/S: Tremont Street
E/W: Herald Street/ Arlington Street
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Client: Howard Stein-Hudson/ M. Santos

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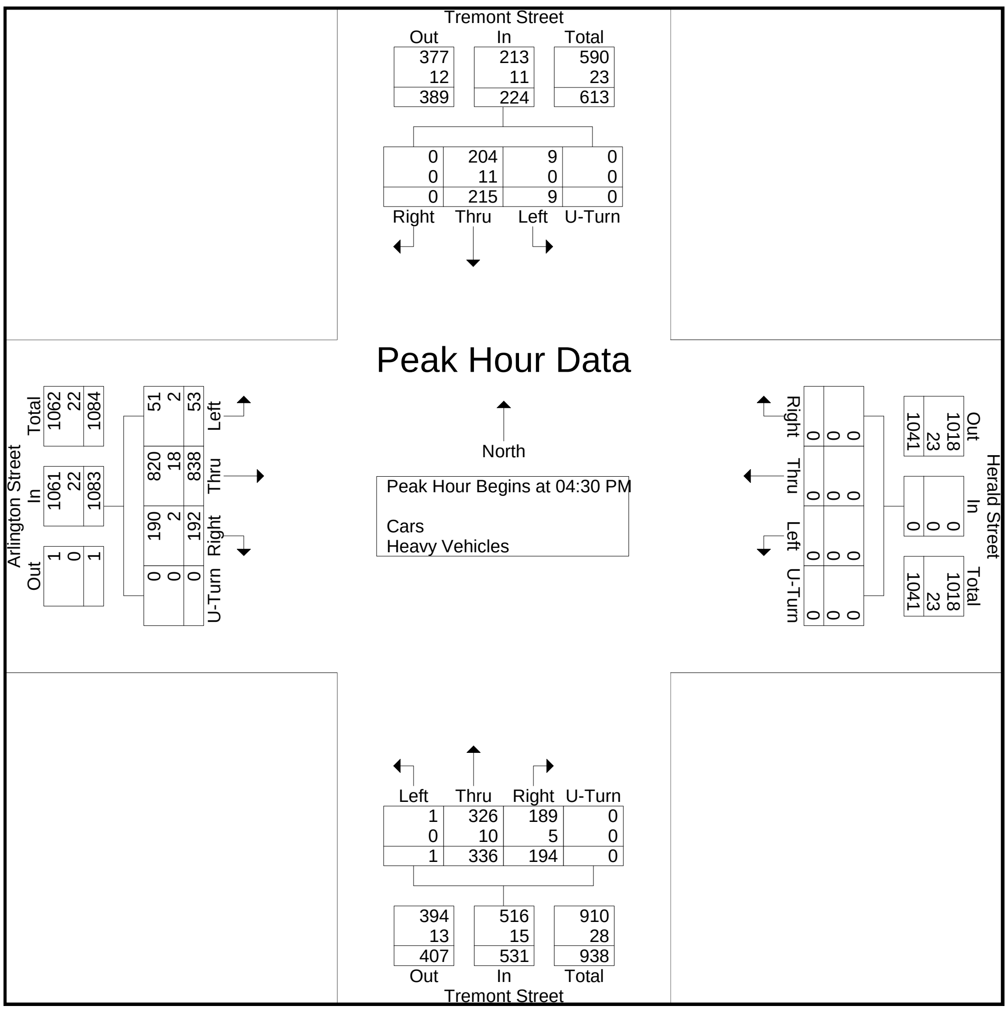
File Name : 165421 AA
Site Code : TBA
Start Date : 1/5/2017

	Tremont Street From North					Herald Street From East					Tremont Street From South					Arlington 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	60	4	0	64	0	0	0	0	0	44	78	0	0	122	59	189	11	0	259	445
04:45 PM	0	44	4	0	48	0	0	0	0	0	42	91	1	0	134	43	233	12	0	288	470
05:00 PM	0	50	1	0	51	0	0	0	0	0	52	76	0	0	128	45	219	12	0	276	455
05:15 PM	0	61	0	0	61	0	0	0	0	0	56	91	0	0	147	45	197	18	0	260	468
Total Volume	0	215	9	0	224	0	0	0	0	0	194	336	1	0	531	192	838	53	0	1083	1838
% App. Total	0	96	4	0		0	0	0	0		36.5	63.3	0.2	0		17.7	77.4	4.9	0		
PHF	.000	.881	.563	.000	.875	.000	.000	.000	.000	.000	.866	.923	.250	.000	.903	.814	.899	.736	.000	.940	.978
Cars	0	204	9	0	213	0	0	0	0	0	189	326	1	0	516	190	820	51	0	1061	1790
% Cars	0	94.9	100	0	95.1	0	0	0	0	0	97.4	97.0	100	0	97.2	99.0	97.9	96.2	0	98.0	97.4
Heavy Vehicles	0	11	0	0	11	0	0	0	0	0	5	10	0	0	15	2	18	2	0	22	48
% Heavy Vehicles	0	5.1	0	0	4.9	0	0	0	0	0	2.6	3.0	0	0	2.8	1.0	2.1	3.8	0	2.0	2.6



N/S: Shawmut Avenue
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 B
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Shawmut Avenue From North				Herald Street From East				Shawmut Avenue From South				Herald 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	0	10	21	0	0	0	0	0	0	0	0	0	2	169	0	0	202
07:15 AM	0	7	31	0	0	0	0	0	0	0	0	0	8	202	0	0	248
07:30 AM	0	10	62	0	0	0	0	0	0	0	0	0	10	261	0	0	343
07:45 AM	0	14	46	0	0	0	0	0	0	0	0	0	14	255	0	0	329
Total	0	41	160	0	0	0	0	0	0	0	0	0	34	887	0	0	1122
08:00 AM	0	14	51	0	0	0	0	0	0	0	0	0	12	245	0	0	322
08:15 AM	0	18	45	0	0	0	0	0	0	0	0	0	10	235	0	0	308
08:30 AM	0	27	56	0	0	0	0	0	0	0	0	0	23	256	0	0	362
08:45 AM	0	21	53	0	0	0	0	0	0	0	0	0	19	224	0	0	317
Total	0	80	205	0	0	0	0	0	0	0	0	0	64	960	0	0	1309
Grand Total	0	121	365	0	0	0	0	0	0	0	0	0	98	1847	0	0	2431
Apprch %	0	24.9	75.1	0	0	0	0	0	0	0	0	0	5	95	0	0	
Total %	0	5	15	0	0	0	0	0	0	0	0	0	4	76	0	0	
Cars	0	119	338	0	0	0	0	0	0	0	0	0	97	1760	0	0	2314
% Cars	0	98.3	92.6	0	0	0	0	0	0	0	0	0	99	95.3	0	0	95.2
Heavy Vehicles	0	2	27	0	0	0	0	0	0	0	0	0	1	87	0	0	117
% Heavy Vehicles	0	1.7	7.4	0	0	0	0	0	0	0	0	0	1	4.7	0	0	4.8

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

	Shawmut Avenue From North					Herald Street From East					Shawmut Avenue From South					Herald 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
07:45 AM	0	14	46	0	60	0	0	0	0	0	0	0	0	0	0	14	255	0	0	269	329
08:00 AM	0	14	51	0	65	0	0	0	0	0	0	0	0	0	0	12	245	0	0	257	322
08:15 AM	0	18	45	0	63	0	0	0	0	0	0	0	0	0	0	10	235	0	0	245	308
08:30 AM	0	27	56	0	83	0	0	0	0	0	0	0	0	0	0	23	256	0	0	279	362
Total Volume	0	73	198	0	271	0	0	0	0	0	0	0	0	0	0	59	991	0	0	1050	1321
% App. Total	0	26.9	73.1	0		0	0	0	0		0	0	0	0		5.6	94.4	0	0		
PHF	.000	.676	.884	.000	.816	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.641	.968	.000	.000	.941	.912
Cars	0	72	180	0	252	0	0	0	0	0	0	0	0	0	0	59	948	0	0	1007	1259
% Cars	0	98.6	90.9	0	93.0	0	0	0	0	0	0	0	0	0	0	100	95.7	0	0	95.9	95.3
Heavy Vehicles	0	1	18	0	19	0	0	0	0	0	0	0	0	0	0	0	43	0	0	43	62
% Heavy Vehicles	0	1.4	9.1	0	7.0	0	0	0	0	0	0	0	0	0	0	0	4.3	0	0	4.1	4.7

N/S: Shawmut Avenue
E/W: Herald Street
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Groups Printed- Peds and Bikes

	Shawmut Avenue From North					Herald Street From East					Shawmut Avenue From South					Herald 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	1	8	1	0	0	0	4	4	0	0	0	5	4	0	0	0	11	3	41
07:15 AM	0	0	0	10	2	0	0	0	2	8	0	0	0	2	9	0	1	0	17	8	59
07:30 AM	0	0	1	7	2	0	0	0	3	8	0	0	0	10	5	0	0	0	18	17	71
07:45 AM	0	0	0	3	3	0	0	0	3	9	0	0	0	9	9	0	0	0	14	15	65
Total	0	0	2	28	8	0	0	0	12	29	0	0	0	26	27	0	1	0	60	43	236
08:00 AM	0	0	0	7	0	0	0	0	7	7	0	0	0	7	6	0	1	0	21	7	63
08:15 AM	0	0	0	10	1	0	0	0	14	11	0	0	0	11	17	0	0	0	29	6	99
08:30 AM	0	0	1	2	0	0	0	0	14	18	0	0	0	9	14	0	0	0	20	4	82
08:45 AM	0	1	0	11	1	0	0	0	31	26	0	0	0	11	11	0	0	0	29	11	132
Total	0	1	1	30	2	0	0	0	66	62	0	0	0	38	48	0	1	0	99	28	376
Grand Total	0	1	3	58	10	0	0	0	78	91	0	0	0	64	75	0	2	0	159	71	612
Apprch %	0	1.4	4.2	80.6	13.9	0	0	0	46.2	53.8	0	0	0	46	54	0	0.9	0	68.5	30.6	
Total %	0	0.2	0.5	9.5	1.6	0	0	0	12.7	14.9	0	0	0	10.5	12.3	0	0.3	0	26	11.6	

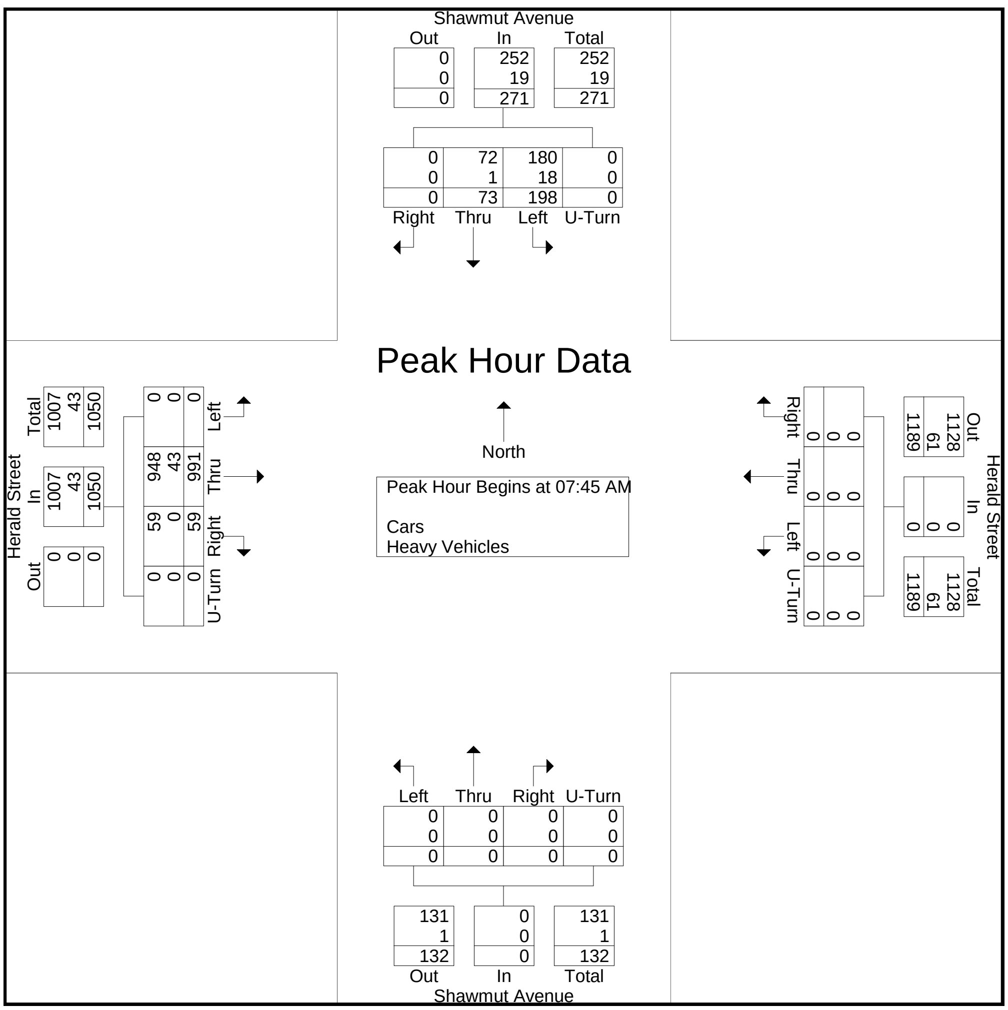
	Shawmut Avenue From North						Herald Street From East						Shawmut Avenue From South						Herald Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:00 AM																									
08:00 AM	0	0	0	7	0	7	0	0	0	7	7	14	0	0	0	7	6	13	0	1	0	21	7	29	63
08:15 AM	0	0	0	10	1	11	0	0	0	14	11	25	0	0	0	11	17	28	0	0	0	29	6	35	99
08:30 AM	0	0	1	2	0	3	0	0	0	14	18	32	0	0	0	9	14	23	0	0	0	20	4	24	82
08:45 AM	0	1	0	11	1	13	0	0	0	31	26	57	0	0	0	11	11	22	0	0	0	29	11	40	132
Total Volume	0	1	1	30	2	34	0	0	0	66	62	128	0	0	0	38	48	86	0	1	0	99	28	128	376
% App. Total	0	2.9	2.9	88.2	5.9		0	0	0	51.6	48.4		0	0	0	44.2	55.8		0	0.8	0	77.3	21.9		
PHF	.000	.250	.250	.682	.500	.654	.000	.000	.000	.532	.596	.561	.000	.000	.000	.864	.706	.768	.000	.250	.000	.853	.636	.800	.712

N/S: Shawmut Avenue
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 B
Site Code : TBA
Start Date : 1/5/2017

	Shawmut Avenue From North					Herald Street From East					Shawmut Avenue From South					Herald 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 07:45 AM																					
07:45 AM	0	14	46	0	60	0	0	0	0	0	0	0	0	0	0	14	255	0	0	269	329
08:00 AM	0	14	51	0	65	0	0	0	0	0	0	0	0	0	0	12	245	0	0	257	322
08:15 AM	0	18	45	0	63	0	0	0	0	0	0	0	0	0	0	10	235	0	0	245	308
08:30 AM	0	27	56	0	83	0	0	0	0	0	0	0	0	0	0	23	256	0	0	279	362
Total Volume	0	73	198	0	271	0	0	0	0	0	0	0	0	0	0	59	991	0	0	1050	1321
% App. Total	0	26.9	73.1	0		0	0	0	0		0	0	0	0		5.6	94.4	0	0		
PHF	.000	.676	.884	.000	.816	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.641	.968	.000	.000	.941	.912
Cars	0	72	180	0	252	0	0	0	0	0	0	0	0	0	0	59	948	0	0	1007	1259
% Cars	0	98.6	90.9	0	93.0	0	0	0	0	0	0	0	0	0	0	100	95.7	0	0	95.9	95.3
Heavy Vehicles	0	1	18	0	19	0	0	0	0	0	0	0	0	0	0	0	43	0	0	43	62
% Heavy Vehicles	0	1.4	9.1	0	7.0	0	0	0	0	0	0	0	0	0	0	0	4.3	0	0	4.1	4.7



N/S: Shawmut Avenue
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 BB
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Cars - Heavy Vehicles

	Shawmut Avenue From North				Herald Street From East				Shawmut Avenue From South				Herald 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	40	49	0	0	0	0	0	0	0	0	0	17	232	0	0	338
04:15 PM	0	44	67	0	0	0	0	0	0	0	0	0	19	207	0	0	337
04:30 PM	0	46	69	0	0	0	0	0	0	0	0	0	17	244	0	0	376
04:45 PM	0	43	49	0	0	0	0	0	0	0	0	0	12	267	0	0	371
Total	0	173	234	0	0	0	0	0	0	0	0	0	65	950	0	0	1422
05:00 PM	0	55	80	0	0	0	0	0	0	0	0	0	18	254	0	0	407
05:15 PM	0	42	62	0	0	0	0	0	0	0	0	0	16	232	0	0	352
05:30 PM	0	36	70	0	0	0	0	0	0	0	0	0	20	298	0	0	424
05:45 PM	0	27	50	0	0	0	0	0	0	0	0	0	17	247	0	0	341
Total	0	160	262	0	0	0	0	0	0	0	0	0	71	1031	0	0	1524
Grand Total	0	333	496	0	0	0	0	0	0	0	0	0	136	1981	0	0	2946
Apprch %	0	40.2	59.8	0	0	0	0	0	0	0	0	0	6.4	93.6	0	0	
Total %	0	11.3	16.8	0	0	0	0	0	0	0	0	0	4.6	67.2	0	0	
Cars	0	330	483	0	0	0	0	0	0	0	0	0	134	1930	0	0	2877
% Cars	0	99.1	97.4	0	0	0	0	0	0	0	0	0	98.5	97.4	0	0	97.7
Heavy Vehicles	0	3	13	0	0	0	0	0	0	0	0	0	2	51	0	0	69
% Heavy Vehicles	0	0.9	2.6	0	0	0	0	0	0	0	0	0	1.5	2.6	0	0	2.3

	Shawmut Avenue From North					Herald Street From East					Shawmut Avenue From South					Herald 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	0	43	49	0	92	0	0	0	0	0	0	0	0	0	0	12	267	0	0	279	371
05:00 PM	0	55	80	0	135	0	0	0	0	0	0	0	0	0	0	18	254	0	0	272	407
05:15 PM	0	42	62	0	104	0	0	0	0	0	0	0	0	0	0	16	232	0	0	248	352
05:30 PM	0	36	70	0	106	0	0	0	0	0	0	0	0	0	0	20	298	0	0	318	424
Total Volume	0	176	261	0	437	0	0	0	0	0	0	0	0	0	0	66	1051	0	0	1117	1554
% App. Total																					
PHF	.000	.800	.816	.000	.809	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.825	.882	.000	.000	.878	.916
Cars	0	174	251	0	425	0	0	0	0	0	0	0	0	0	0	66	1024	0	0	1090	1515
% Cars	0	98.9	96.2	0	97.3	0	0	0	0	0	0	0	0	0	0	100	97.4	0	0	97.6	97.5
Heavy Vehicles																					
% Heavy Vehicles	0	1.1	3.8	0	2.7	0	0	0	0	0	0	0	0	0	0	0	2.6	0	0	2.4	2.5

N/S: Shawmut Avenue
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 BB
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Peds and Bikes

	Shawmut Avenue From North					Herald Street From East					Shawmut Avenue From South					Herald 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	3	5	0	0	0	10	8	0	0	0	6	9	0	0	0	9	23	75
04:15 PM	0	0	0	2	2	0	0	0	12	5	0	0	0	7	4	0	0	0	13	26	71
04:30 PM	0	0	0	1	3	0	0	0	16	10	0	0	0	11	11	0	0	0	12	30	94
04:45 PM	0	0	1	4	4	0	0	0	12	8	0	0	0	10	4	0	0	0	12	38	93
Total	0	1	2	10	14	0	0	0	50	31	0	0	0	34	28	0	0	0	46	117	333
05:00 PM	0	1	1	1	4	0	0	0	14	9	0	0	0	13	18	0	0	0	11	35	107
05:15 PM	0	3	1	3	13	0	0	0	8	9	0	0	0	9	24	0	1	0	11	28	110
05:30 PM	0	2	0	2	7	0	0	0	9	13	0	0	0	7	15	0	0	0	7	37	99
05:45 PM	0	4	1	0	6	0	0	0	7	3	0	0	0	6	13	2	2	0	19	29	92
Total	0	10	3	6	30	0	0	0	38	34	0	0	0	35	70	2	3	0	48	129	408
Grand Total	0	11	5	16	44	0	0	0	88	65	0	0	0	69	98	2	3	0	94	246	741
Apprch %	0	14.5	6.6	21.1	57.9	0	0	0	57.5	42.5	0	0	0	41.3	58.7	0.6	0.9	0	27.2	71.3	
Total %	0	1.5	0.7	2.2	5.9	0	0	0	11.9	8.8	0	0	0	9.3	13.2	0.3	0.4	0	12.7	33.2	

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

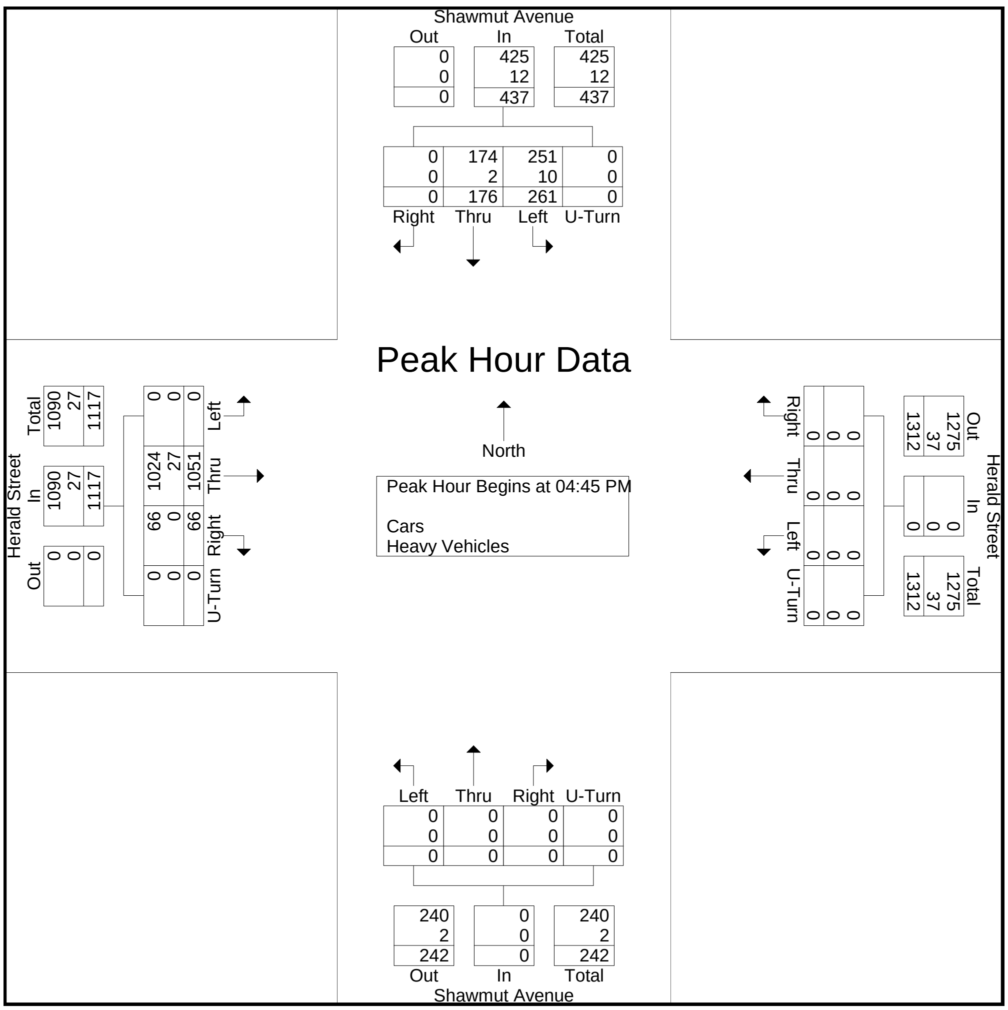
	Shawmut Avenue From North						Herald Street From East						Shawmut Avenue From South						Herald Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
04:45 PM	0	0	1	4	4	9	0	0	0	12	8	20	0	0	0	10	4	14	0	0	0	12	38	50	93
05:00 PM	0	1	1	1	4	7	0	0	0	14	9	23	0	0	0	13	18	31	0	0	0	11	35	46	107
05:15 PM	0	3	1	3	13	20	0	0	0	8	9	17	0	0	0	9	24	33	0	1	0	11	28	40	110
05:30 PM	0	2	0	2	7	11	0	0	0	9	13	22	0	0	0	7	15	22	0	0	0	7	37	44	99
Total Volume	0	6	3	10	28	47	0	0	0	43	39	82	0	0	0	39	61	100	0	1	0	41	138	180	409
% App. Total	0	12.8	6.4	21.3	59.6		0	0	0	52.4	47.6		0	0	0	39	61		0	0.6	0	22.8	76.7		
PHF	.000	.500	.750	.625	.538	.588	.000	.000	.000	.768	.750	.891	.000	.000	.000	.750	.635	.758	.000	.250	.000	.854	.908	.900	.930

N/S: Shawmut Avenue
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 BB
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

	Shawmut Avenue From North					Herald Street From East					Shawmut Avenue From South					Herald 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	0	43	49	0	92	0	0	0	0	0	0	0	0	0	0	12	267	0	0	279	371
05:00 PM	0	55	80	0	135	0	0	0	0	0	0	0	0	0	0	18	254	0	0	272	407
05:15 PM	0	42	62	0	104	0	0	0	0	0	0	0	0	0	0	16	232	0	0	248	352
05:30 PM	0	36	70	0	106	0	0	0	0	0	0	0	0	0	0	20	298	0	0	318	424
Total Volume	0	176	261	0	437	0	0	0	0	0	0	0	0	0	0	66	1051	0	0	1117	1554
% App. Total																					
PHF	.000	.800	.816	.000	.809	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.825	.882	.000	.000	.878	.916
Cars	0	174	251	0	425	0	0	0	0	0	0	0	0	0	0	66	1024	0	0	1090	1515
% Cars	0	98.9	96.2	0	97.3	0	0	0	0	0	0	0	0	0	0	100	97.4	0	0	97.6	97.5
Heavy Vehicles																					
% Heavy Vehicles	0	1.1	3.8	0	2.7	0	0	0	0	0	0	0	0	0	0	0	2.6	0	0	2.4	2.5



S: #112 Shawmut Ave Driveway
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 C
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Cars - Heavy Vehicles

	Herald Street From East			112 Shawmut Ave Driveway From South			Herald Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	0	2	188	0	190
07:15 AM	0	0	0	0	0	0	5	230	0	235
07:30 AM	0	0	0	0	0	0	2	313	0	315
07:45 AM	0	0	0	0	0	0	7	305	0	312
Total	0	0	0	0	0	0	16	1036	0	1052
08:00 AM	0	0	0	2	0	0	5	293	0	300
08:15 AM	0	0	0	1	0	0	1	281	0	283
08:30 AM	0	0	0	0	0	0	3	308	0	311
08:45 AM	0	0	0	0	0	0	6	276	0	282
Total	0	0	0	3	0	0	15	1158	0	1176
Grand Total	0	0	0	3	0	0	31	2194	0	2228
Apprch %	0	0	0	100	0	0	1.4	98.6	0	
Total %	0	0	0	0.1	0	0	1.4	98.5	0	
Cars	0	0	0	2	0	0	30	2083	0	2115
% Cars	0	0	0	66.7	0	0	96.8	94.9	0	94.9
Heavy Vehicles	0	0	0	1	0	0	1	111	0	113
% Heavy Vehicles	0	0	0	33.3	0	0	3.2	5.1	0	5.1

	Herald Street From East				112 Shawmut Ave Driveway From South				Herald 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	0	0	0	0	0	0	0	0	2	313	0	315	315
07:45 AM	0	0	0	0	0	0	0	0	7	305	0	312	312
08:00 AM	0	0	0	0	2	0	0	2	5	293	0	298	300
08:15 AM	0	0	0	0	1	0	0	1	1	281	0	282	283
Total Volume	0	0	0	0	3	0	0	3	15	1192	0	1207	1210
% App. Total	0	0	0		100	0	0		1.2	98.8	0		
PHF	.000	.000	.000	.000	.375	.000	.000	.375	.536	.952	.000	.958	.960
Cars	0	0	0	0	2	0	0	2	14	1137	0	1151	1153
% Cars	0	0	0	0	66.7	0	0	66.7	93.3	95.4	0	95.4	95.3
Heavy Vehicles	0	0	0	0	1	0	0	1	1	55	0	56	57
% Heavy Vehicles	0	0	0	0	33.3	0	0	33.3	6.7	4.6	0	4.6	4.7

S: #112 Shawmut Ave Driveway
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 C
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Peds and Bikes

	Herald Street From East				112 Shawmut Ave Driveway From South				Herald 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	0	0	1	0	0	4	4	0	1	0	0	10
07:15 AM	0	0	0	1	0	0	4	4	0	1	0	0	10
07:30 AM	0	0	0	0	0	0	13	5	0	1	1	0	20
07:45 AM	0	0	0	0	0	0	12	7	0	0	0	0	19
Total	0	0	0	2	0	0	33	20	0	3	1	0	59
08:00 AM	0	0	0	1	0	0	7	11	0	1	0	2	22
08:15 AM	0	0	0	2	0	0	13	16	0	1	0	0	32
08:30 AM	0	0	0	0	0	0	15	23	0	1	2	1	42
08:45 AM	0	0	0	0	0	0	18	13	0	0	0	0	31
Total	0	0	0	3	0	0	53	63	0	3	2	3	127
Grand Total	0	0	0	5	0	0	86	83	0	6	3	3	186
Apprch %	0	0	0	100	0	0	50.9	49.1	0	50	25	25	
Total %	0	0	0	2.7	0	0	46.2	44.6	0	3.2	1.6	1.6	

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

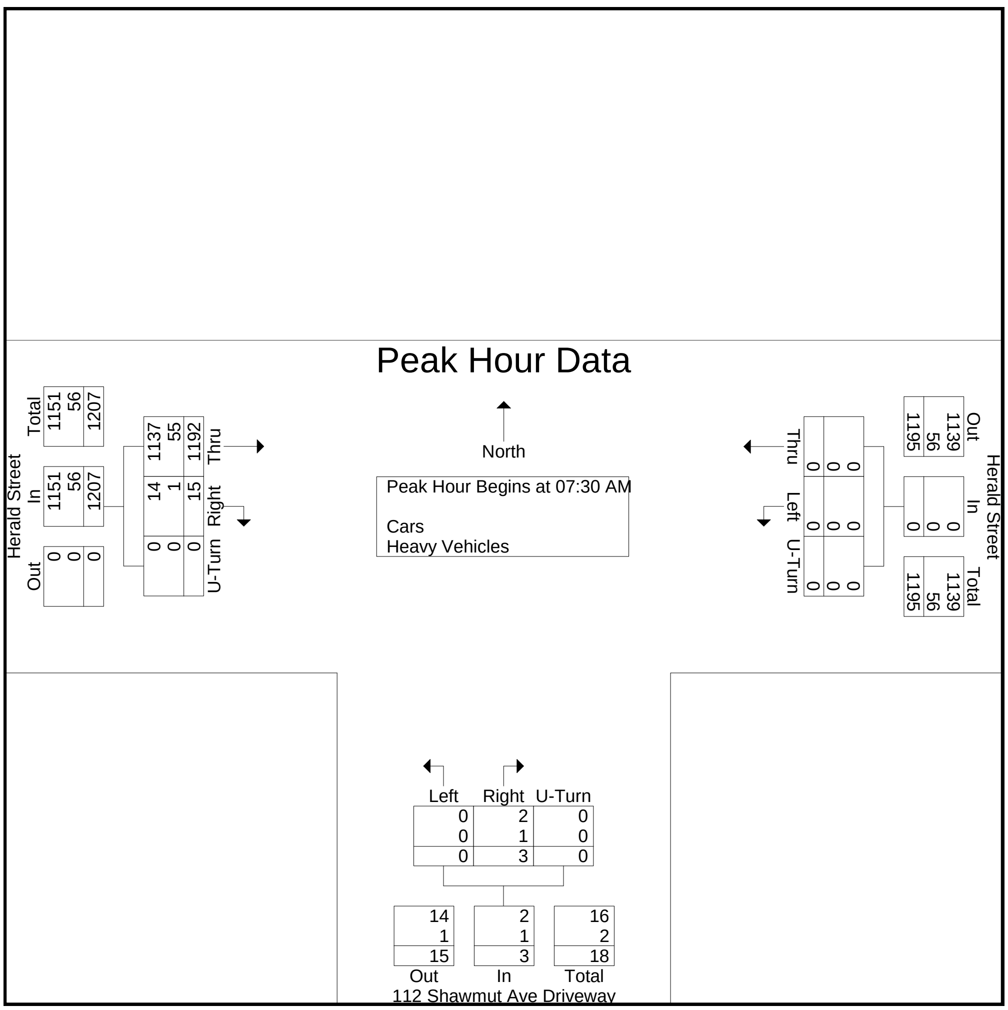
	Herald Street From East					112 Shawmut Ave Driveway From South					Herald Street From West					
Start Time	Thru	Left	Peds SB	Peds NB	App. Total	Right	Left	Peds WB	Peds EB	App. Total	Right	Thru	Peds NB	Peds SB	App. Total	Int. Total
08:00 AM	0	0	0	1	1	0	0	7	11	18	0	1	0	2	3	22
08:15 AM	0	0	0	2	2	0	0	13	16	29	0	1	0	0	1	32
08:30 AM	0	0	0	0	0	0	0	15	23	38	0	1	2	1	4	42
08:45 AM	0	0	0	0	0	0	0	18	13	31	0	0	0	0	0	31
Total Volume	0	0	0	3	3	0	0	53	63	116	0	3	2	3	8	127
% App. Total	0	0	0	100		0	0	45.7	54.3		0	37.5	25	37.5		
PHF	.000	.000	.000	.375	.375	.000	.000	.736	.685	.763	.000	.750	.250	.375	.500	.756

S: #112 Shawmut Ave Driveway
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 C
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

	Herald Street From East				112 Shawmut Ave Driveway From South				Herald 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	0	0	0	0	0	0	0	0	2	313	0	315	315
07:45 AM	0	0	0	0	0	0	0	0	7	305	0	312	312
08:00 AM	0	0	0	0	2	0	0	2	5	293	0	298	300
08:15 AM	0	0	0	0	1	0	0	1	1	281	0	282	283
Total Volume	0	0	0	0	3	0	0	3	15	1192	0	1207	1210
% App. Total	0	0	0		100	0	0		1.2	98.8	0		
PHF	.000	.000	.000	.000	.375	.000	.000	.375	.536	.952	.000	.958	.960
Cars	0	0	0	0	2	0	0	2	14	1137	0	1151	1153
% Cars	0	0	0	0	66.7	0	0	66.7	93.3	95.4	0	95.4	95.3
Heavy Vehicles	0	0	0	0	1	0	0	1	1	55	0	56	57
% Heavy Vehicles	0	0	0	0	33.3	0	0	33.3	6.7	4.6	0	4.6	4.7



S: #112 Shawmut Ave Driveway
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 CC
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Cars - Heavy Vehicles

	Herald Street From East			112 Shawmut Ave Driveway From South			Herald Street From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	0	0	0	5	0	0	1	280	0	286
04:15 PM	0	0	0	1	0	0	1	277	0	279
04:30 PM	0	0	0	3	0	0	0	313	0	316
04:45 PM	0	0	0	2	0	0	0	325	0	327
Total	0	0	0	11	0	0	2	1195	0	1208
05:00 PM	0	0	0	3	0	0	1	329	0	333
05:15 PM	0	0	0	2	0	0	2	291	0	295
05:30 PM	0	0	0	2	0	0	1	361	0	364
05:45 PM	0	0	0	1	0	0	0	308	0	309
Total	0	0	0	8	0	0	4	1289	0	1301
Grand Total	0	0	0	19	0	0	6	2484	0	2509
Apprch %	0	0	0	100	0	0	0.2	99.8	0	
Total %	0	0	0	0.8	0	0	0.2	99	0	
Cars	0	0	0	19	0	0	6	2420	0	2445
% Cars	0	0	0	100	0	0	100	97.4	0	97.4
Heavy Vehicles	0	0	0	0	0	0	0	64	0	64
% Heavy Vehicles	0	0	0	0	0	0	0	2.6	0	2.6

	Herald Street From East				112 Shawmut Ave Driveway From South				Herald 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 04:45 PM													
04:45 PM	0	0	0	0	2	0	0	2	0	325	0	325	327
05:00 PM	0	0	0	0	3	0	0	3	1	329	0	330	333
05:15 PM	0	0	0	0	2	0	0	2	2	291	0	293	295
05:30 PM	0	0	0	0	2	0	0	2	1	361	0	362	364
Total Volume	0	0	0	0	9	0	0	9	4	1306	0	1310	1319
% App. Total	0	0	0		100	0	0		0.3	99.7	0		
PHF	.000	.000	.000	.000	.750	.000	.000	.750	.500	.904	.000	.905	.906
Cars	0	0	0	0	9	0	0	9	4	1268	0	1272	1281
% Cars	0	0	0	0	100	0	0	100	100	97.1	0	97.1	97.1
Heavy Vehicles	0	0	0	0	0	0	0	0	0	38	0	38	38
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	2.9	0	2.9	2.9

S: #112 Shawmut Ave Driveway
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 CC
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Peds and Bikes

	Herald Street From East				112 Shawmut Ave Driveway From South				Herald 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	0	0	12	16	0	1	0	0	29
04:15 PM	0	0	0	0	0	0	13	9	0	0	0	0	22
04:30 PM	0	0	0	0	0	0	16	16	0	0	1	0	33
04:45 PM	0	0	0	0	0	0	16	9	0	1	0	1	27
Total	0	0	0	0	0	0	57	50	0	2	1	1	111
05:00 PM	0	0	0	0	0	0	12	18	0	0	0	0	30
05:15 PM	0	0	0	0	0	0	12	27	0	3	0	0	42
05:30 PM	0	0	0	0	0	0	6	15	0	0	0	0	21
05:45 PM	0	0	0	0	0	0	4	13	0	1	0	0	18
Total	0	0	0	0	0	0	34	73	0	4	0	0	111
Grand Total	0	0	0	0	0	0	91	123	0	6	1	1	222
Apprch %	0	0	0	0	0	0	42.5	57.5	0	75	12.5	12.5	
Total %	0	0	0	0	0	0	41	55.4	0	2.7	0.5	0.5	

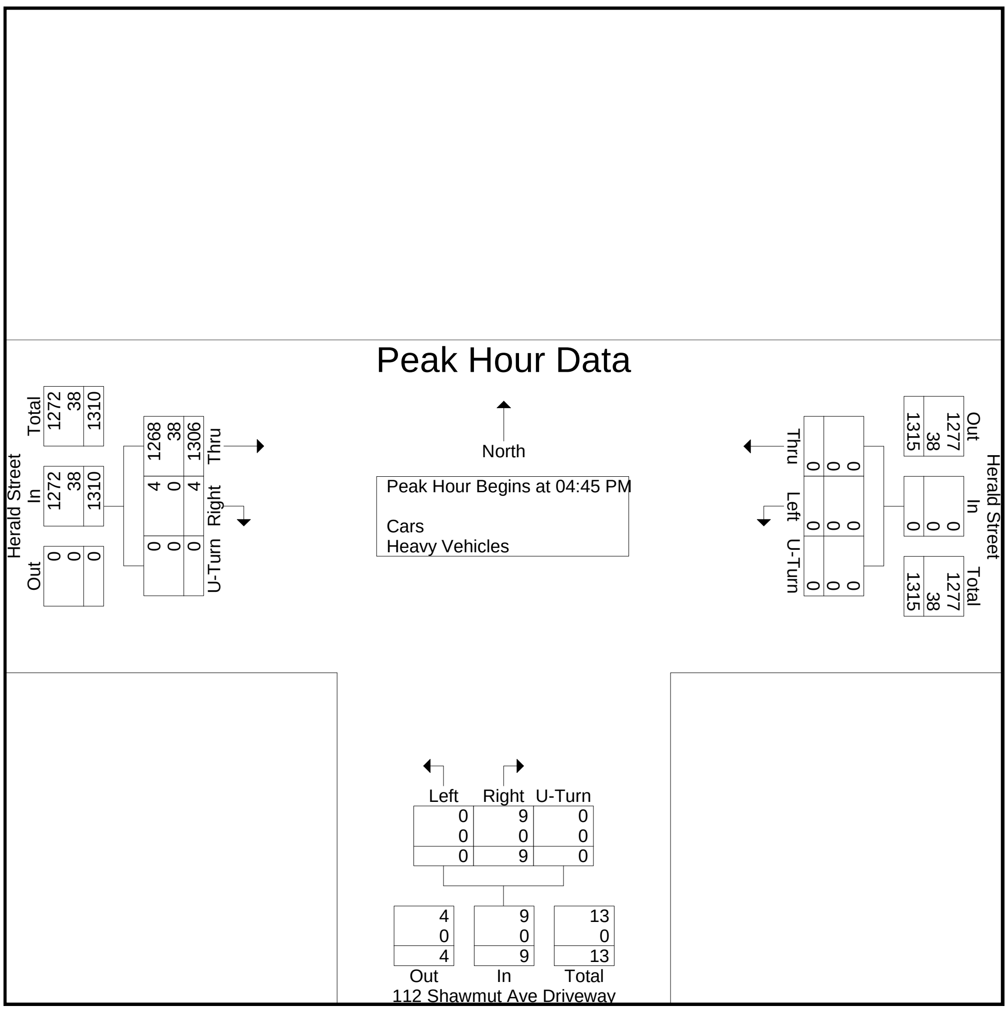
	Herald Street From East					112 Shawmut Ave Driveway From South					Herald Street From West					
Start Time	Thru	Left	Peds SB	Peds NB	App. Total	Right	Left	Peds WB	Peds EB	App. Total	Right	Thru	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:30 PM																
04:30 PM	0	0	0	0	0	0	0	16	16	32	0	0	1	0	1	33
04:45 PM	0	0	0	0	0	0	0	16	9	25	0	1	0	1	2	27
05:00 PM	0	0	0	0	0	0	0	12	18	30	0	0	0	0	0	30
05:15 PM	0	0	0	0	0	0	0	12	27	39	0	3	0	0	3	42
Total Volume	0	0	0	0	0	0	0	56	70	126	0	4	1	1	6	132
% App. Total	0	0	0	0		0	0	44.4	55.6		0	66.7	16.7	16.7		
PHF	.000	.000	.000	.000	.000	.000	.000	.875	.648	.808	.000	.333	.250	.250	.500	.786

S: #112 Shawmut Ave Driveway
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 CC
Site Code : TBA
Start Date : 1/5/2017

	Herald Street From East				112 Shawmut Ave Driveway From South				Herald 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 04:45 PM													
04:45 PM	0	0	0	0	2	0	0	2	0	325	0	325	327
05:00 PM	0	0	0	0	3	0	0	3	1	329	0	330	333
05:15 PM	0	0	0	0	2	0	0	2	2	291	0	293	295
05:30 PM	0	0	0	0	2	0	0	2	1	361	0	362	364
Total Volume	0	0	0	0	9	0	0	9	4	1306	0	1310	1319
% App. Total	0	0	0		100	0	0		0.3	99.7	0		
PHF	.000	.000	.000	.000	.750	.000	.000	.750	.500	.904	.000	.905	.906
Cars	0	0	0	0	9	0	0	9	4	1268	0	1272	1281
% Cars	0	0	0	0	100	0	0	100	100	97.1	0	97.1	97.1
Heavy Vehicles	0	0	0	0	0	0	0	0	0	38	0	38	38
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	2.9	0	2.9	2.9



N/S: Washington Street
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 D
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North				Herald Street From East				Washington Street From South				Herald 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	0	3	0	0	0	0	0	0	9	70	0	0	0	170	14	0	266
07:15 AM	0	3	0	0	0	0	0	0	11	82	0	0	0	211	11	0	318
07:30 AM	0	4	0	0	0	0	0	0	8	121	0	0	0	287	23	0	443
07:45 AM	0	5	1	0	0	0	0	0	13	113	0	0	0	280	19	0	431
Total	0	15	1	0	0	0	0	0	41	386	0	0	0	948	67	0	1458
08:00 AM	0	3	0	0	0	0	0	0	14	128	0	0	0	262	28	0	435
08:15 AM	0	4	0	0	0	0	0	0	13	152	0	0	0	258	22	0	449
08:30 AM	0	4	0	1	0	0	0	0	13	157	0	0	0	284	25	0	484
08:45 AM	0	3	0	0	0	0	0	0	23	171	0	0	0	265	17	0	479
Total	0	14	0	1	0	0	0	0	63	608	0	0	0	1069	92	0	1847
Grand Total	0	29	1	1	0	0	0	0	104	994	0	0	0	2017	159	0	3305
Apprch %	0	93.5	3.2	3.2	0	0	0	0	9.5	90.5	0	0	0	92.7	7.3	0	
Total %	0	0.9	0	0	0	0	0	0	3.1	30.1	0	0	0	61	4.8	0	
Cars	0	3	1	1	0	0	0	0	92	889	0	0	0	1909	152	0	3047
% Cars	0	10.3	100	100	0	0	0	0	88.5	89.4	0	0	0	94.6	95.6	0	92.2
Heavy Vehicles	0	26	0	0	0	0	0	0	12	105	0	0	0	108	7	0	258
% Heavy Vehicles	0	89.7	0	0	0	0	0	0	11.5	10.6	0	0	0	5.4	4.4	0	7.8

	Washington Street From North					Herald Street From East					Washington Street From South					Herald 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 08:00 AM																					
08:00 AM	0	3	0	0	3	0	0	0	0	0	14	128	0	0	142	0	262	28	0	290	435
08:15 AM	0	4	0	0	4	0	0	0	0	0	13	152	0	0	165	0	258	22	0	280	449
08:30 AM	0	4	0	1	5	0	0	0	0	0	13	157	0	0	170	0	284	25	0	309	484
08:45 AM	0	3	0	0	3	0	0	0	0	0	23	171	0	0	194	0	265	17	0	282	479
Total Volume	0	14	0	1	15	0	0	0	0	0	63	608	0	0	671	0	1069	92	0	1161	1847
% App. Total																					
PHF	.000	.875	.000	.250	.750	.000	.000	.000	.000	.000	.685	.889	.000	.000	.865	.000	.941	.821	.000	.939	.954
Cars	0	2	0	1	3	0	0	0	0	0	55	551	0	0	606	0	1006	86	0	1092	1701
% Cars	0	14.3	0	100	20.0	0	0	0	0	0	87.3	90.6	0	0	90.3	0	94.1	93.5	0	94.1	92.1
Heavy Vehicles																					
% Heavy Vehicles	0	85.7	0	0	80.0	0	0	0	0	0	12.7	9.4	0	0	9.7	0	5.9	6.5	0	5.9	7.9

N/S: Washington Street
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 D
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Peds and Bikes

	Washington Street From North					Herald Street From East					Washington Street From South					Herald 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	3	0	0	0	15	11	0	2	0	1	3	1	0	0	4	8	48
07:15 AM	0	2	0	2	1	0	0	0	11	12	0	3	0	3	6	0	1	0	10	5	56
07:30 AM	0	0	0	0	2	0	0	0	12	9	0	3	0	6	6	0	1	0	8	11	58
07:45 AM	0	0	0	0	2	0	0	0	13	16	0	8	0	12	8	0	0	0	16	16	91
Total	0	2	0	2	8	0	0	0	51	48	0	16	0	22	23	1	2	0	38	40	253
08:00 AM	0	1	0	0	1	0	0	0	15	14	0	7	0	7	10	0	0	1	19	7	82
08:15 AM	0	0	0	1	0	0	0	0	14	25	0	8	0	14	10	0	0	0	24	13	109
08:30 AM	0	1	0	1	6	0	0	0	14	40	0	12	0	14	23	0	1	2	22	26	162
08:45 AM	0	1	0	2	1	0	0	0	26	17	0	8	0	17	17	0	0	0	25	29	143
Total	0	3	0	4	8	0	0	0	69	96	0	35	0	52	60	0	1	3	90	75	496
Grand Total	0	5	0	6	16	0	0	0	120	144	0	51	0	74	83	1	3	3	128	115	749
Apprch %	0	18.5	0	22.2	59.3	0	0	0	45.5	54.5	0	24.5	0	35.6	39.9	0.4	1.2	1.2	51.2	46	
Total %	0	0.7	0	0.8	2.1	0	0	0	16	19.2	0	6.8	0	9.9	11.1	0.1	0.4	0.4	17.1	15.4	

	Washington Street From North						Herald Street From East						Washington Street From South						Herald 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 08:00 AM																									
08:00 AM	0	1	0	0	1	2	0	0	0	15	14	29	0	7	0	7	10	24	0	0	1	19	7	27	82
08:15 AM	0	0	0	1	0	1	0	0	0	14	25	39	0	8	0	14	10	32	0	0	0	24	13	37	109
08:30 AM	0	1	0	1	6	8	0	0	0	14	40	54	0	12	0	14	23	49	0	1	2	22	26	51	162
08:45 AM	0	1	0	2	1	4	0	0	0	26	17	43	0	8	0	17	17	42	0	0	0	25	29	54	143
Total Volume	0	3	0	4	8	15	0	0	0	69	96	165	0	35	0	52	60	147	0	1	3	90	75	169	496
% App. Total	0	20	0	26.7	53.3		0	0	0	41.8	58.2		0	23.8	0	35.4	40.8		0	0.6	1.8	53.3	44.4		
PHF	.000	.750	.000	.500	.333	.469	.000	.000	.000	.663	.600	.764	.000	.729	.000	.765	.652	.750	.000	.250	.375	.900	.647	.782	.765

N/S: Washington Street
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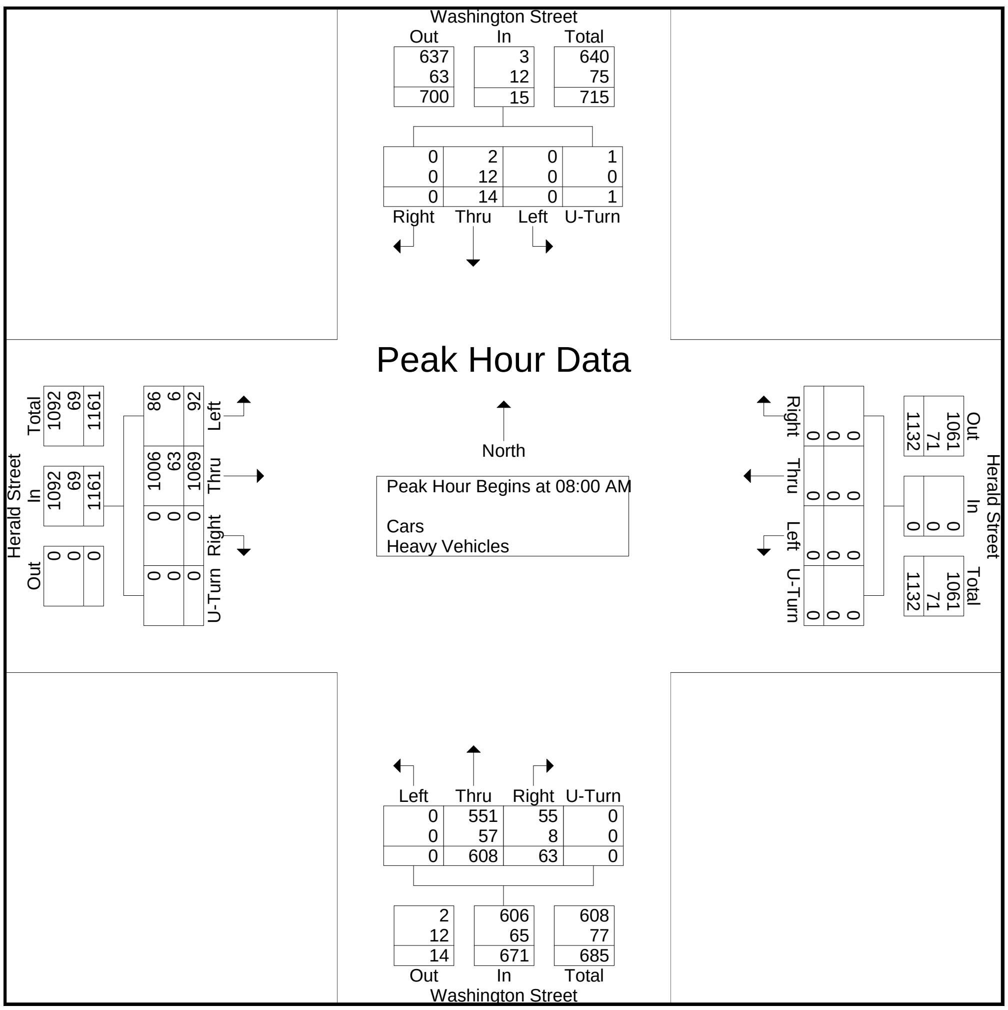
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 D
Site Code : TBA
Start Date : 1/5/2017

	Washington Street From North					Herald Street From East					Washington Street From South					Herald 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 08:00 AM																					
08:00 AM	0	3	0	0	3	0	0	0	0	0	14	128	0	0	142	0	262	28	0	290	435
08:15 AM	0	4	0	0	4	0	0	0	0	0	13	152	0	0	165	0	258	22	0	280	449
08:30 AM	0	4	0	1	5	0	0	0	0	0	13	157	0	0	170	0	284	25	0	309	484
08:45 AM	0	3	0	0	3	0	0	0	0	0	23	171	0	0	194	0	265	17	0	282	479
Total Volume	0	14	0	1	15	0	0	0	0	0	63	608	0	0	671	0	1069	92	0	1161	1847
% App. Total																					
PHF	.000	.875	.000	.250	.750	.000	.000	.000	.000	.000	.685	.889	.000	.000	.865	.000	.941	.821	.000	.939	.954
Cars	0	2	0	1	3	0	0	0	0	0	55	551	0	0	606	0	1006	86	0	1092	1701
% Cars	0	14.3	0	100	20.0	0	0	0	0	0	87.3	90.6	0	0	90.3	0	94.1	93.5	0	94.1	92.1
Heavy Vehicles																					
% Heavy Vehicles	0	85.7	0	0	80.0	0	0	0	0	0	12.7	9.4	0	0	9.7	0	5.9	6.5	0	5.9	7.9



N/S: Washington Street
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 DD
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Cars - Heavy Vehicles

	Washington Street From North				**Herald Street From East**				**Washington Street From South**				**Herald 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	4	2	1	0	0	0	0	20	116	0	0	0	284	11	0	438
04:15 PM	0	4	1	0	0	0	0	0	16	114	0	0	0	266	8	0	409
04:30 PM	0	2	1	0	0	0	0	0	16	111	0	4	0	303	14	0	451
04:45 PM	0	4	1	0	0	0	0	0	25	119	0	0	0	320	10	0	479
Total	0	14	5	1	0	0	0	0	77	460	0	4	0	1173	43	0	1777
05:00 PM	0	5	2	1	0	0	0	0	20	90	0	0	0	326	7	0	451
05:15 PM	0	6	2	0	0	0	0	0	28	114	0	0	0	284	5	0	439
05:30 PM	0	3	1	0	0	0	0	0	28	104	0	0	1	355	9	0	501
05:45 PM	0	4	0	0	0	0	0	0	14	128	0	0	0	301	14	0	461
Total	0	18	5	1	0	0	0	0	90	436	0	0	1	1266	35	0	1852
Grand Total	0	32	10	2	0	0	0	0	167	896	0	4	1	2439	78	0	3629
Apprch %	0	72.7	22.7	4.5	0	0	0	0	15.7	84	0	0.4	0	96.9	3.1	0	
Total %	0	0.9	0.3	0.1	0	0	0	0	4.6	24.7	0	0.1	0	67.2	2.1	0	
Cars	0	5	10	2	0	0	0	0	162	819	0	4	1	2373	78	0	3454
% Cars	0	15.6	100	100	0	0	0	0	97	91.4	0	100	100	97.3	100	0	95.2
Heavy Vehicles	0	27	0	0	0	0	0	0	5	77	0	0	0	66	0	0	175
% Heavy Vehicles	0	84.4	0	0	0	0	0	0	3	8.6	0	0	0	2.7	0	0	4.8

	Washington Street From North					**Herald Street From East**					**Washington Street From South**					**Herald 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	0	4	1	0	5	0	0	0	0	0	25	119	0	0	144	0	320	10	0	330	479
05:00 PM	0	5	2	1	8	0	0	0	0	0	20	90	0	0	110	0	326	7	0	333	451
05:15 PM	0	6	2	0	8	0	0	0	0	0	28	114	0	0	142	0	284	5	0	289	439
05:30 PM	0	3	1	0	4	0	0	0	0	0	28	104	0	0	132	1	355	9	0	365	501
Total Volume	0	18	6	1	25	0	0	0	0	0	101	427	0	0	528	1	1285	31	0	1317	1870
% App. Total																					
PHF	.000	.750	.750	.250	.781	.000	.000	.000	.000	.000	.902	.897	.000	.000	.917	.250	.905	.775	.000	.902	.933
Cars	0	3	6	1	10	0	0	0	0	0	98	386	0	0	484	1	1245	31	0	1277	1771
% Cars	0	16.7	100	100	40.0	0	0	0	0	0	97.0	90.4	0	0	91.7	100	96.9	100	0	97.0	94.7
Heavy Vehicles																					
% Heavy Vehicles	0	83.3	0	0	60.0	0	0	0	0	0	3.0	9.6	0	0	8.3	0	3.1	0	0	3.0	5.3

N/S: Washington Street
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 DD
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Peds and Bikes

	Washington Street From North					Herald Street From East					Washington Street From South					Herald 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	0	0	2	2	0	0	0	18	13	0	0	0	25	12	0	0	0	21	34	127
04:15 PM	0	2	0	1	6	0	0	0	14	18	0	0	0	9	14	0	0	0	17	28	109
04:30 PM	0	0	0	1	6	0	0	0	17	19	0	2	0	16	21	0	0	0	15	25	122
04:45 PM	0	1	1	1	1	0	0	0	15	14	0	0	0	26	11	1	0	0	20	22	113
Total	0	3	1	5	15	0	0	0	64	64	0	2	0	76	58	1	0	0	73	109	471
05:00 PM	0	2	0	0	1	0	0	0	11	14	0	0	0	20	19	0	0	0	33	40	140
05:15 PM	0	2	0	0	2	0	0	0	21	14	0	0	0	10	34	0	2	0	25	30	140
05:30 PM	0	1	0	2	1	0	0	0	14	15	0	2	0	10	20	0	0	0	19	41	125
05:45 PM	0	7	0	0	0	0	0	0	13	11	0	1	0	6	12	0	2	0	12	29	93
Total	0	12	0	2	4	0	0	0	59	54	0	3	0	46	85	0	4	0	89	140	498
Grand Total	0	15	1	7	19	0	0	0	123	118	0	5	0	122	143	1	4	0	162	249	969
Apprch %	0	35.7	2.4	16.7	45.2	0	0	0	51	49	0	1.9	0	45.2	53	0.2	1	0	38.9	59.9	
Total %	0	1.5	0.1	0.7	2	0	0	0	12.7	12.2	0	0.5	0	12.6	14.8	0.1	0.4	0	16.7	25.7	

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

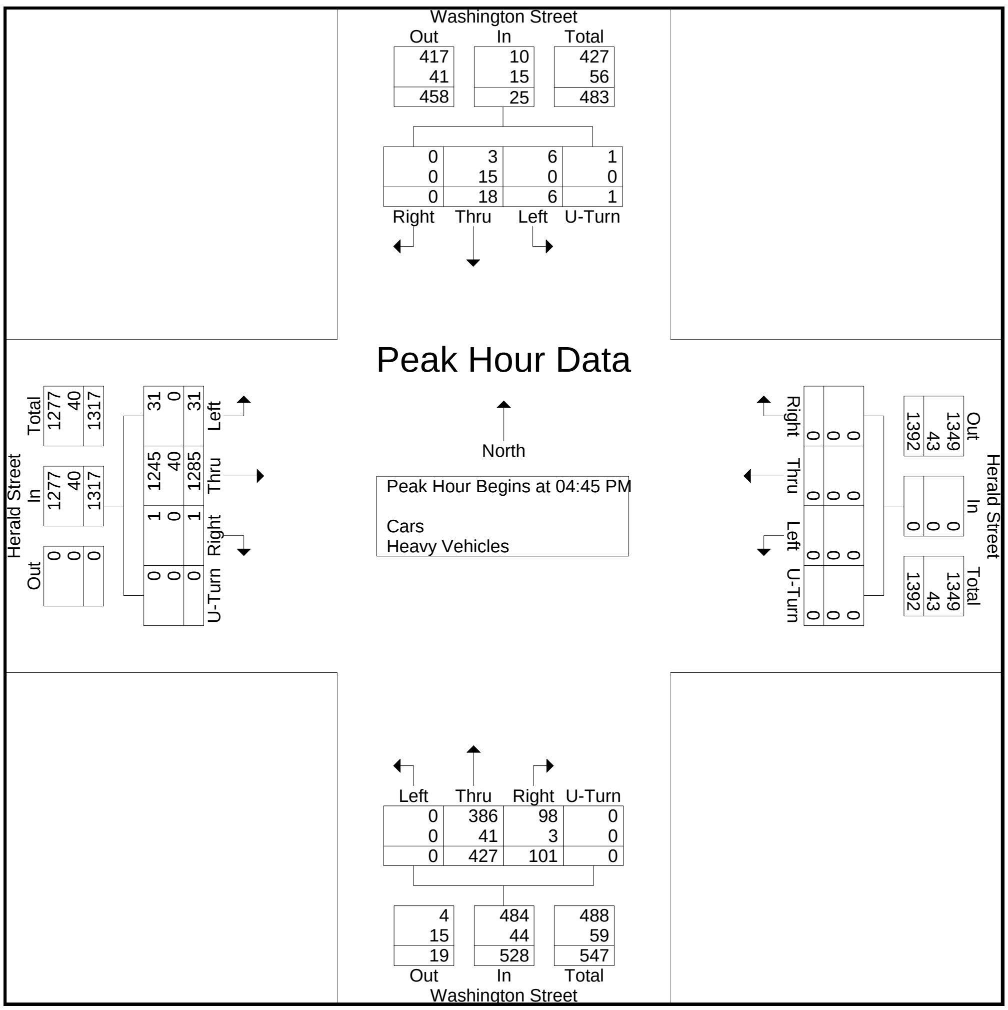
	Washington Street From North						Herald Street From East						Washington Street From South						Herald Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
04:45 PM	0	1	1	1	1	4	0	0	0	15	14	29	0	0	0	26	11	37	1	0	0	20	22	43	113
05:00 PM	0	2	0	0	1	3	0	0	0	11	14	25	0	0	0	20	19	39	0	0	0	33	40	73	140
05:15 PM	0	2	0	0	2	4	0	0	0	21	14	35	0	0	0	10	34	44	0	2	0	25	30	57	140
05:30 PM	0	1	0	2	1	4	0	0	0	14	15	29	0	2	0	10	20	32	0	0	0	19	41	60	125
Total Volume	0	6	1	3	5	15	0	0	0	61	57	118	0	2	0	66	84	152	1	2	0	97	133	233	518
% App. Total	0	40	6.7	20	33.3		0	0	0	51.7	48.3		0	1.3	0	43.4	55.3		0.4	0.9	0	41.6	57.1		
PHF	.000	.750	.250	.375	.625	.938	.000	.000	.000	.726	.950	.843	.000	.250	.000	.635	.618	.864	.250	.250	.000	.735	.811	.798	.925

N/S: Washington Street
E/W: Herald Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 DD
Site Code : TBA
Start Date : 1/5/2017

	Washington Street From North					Herald Street From East					Washington Street From South					Herald 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	0	4	1	0	5	0	0	0	0	0	25	119	0	0	144	0	320	10	0	330	479
05:00 PM	0	5	2	1	8	0	0	0	0	0	20	90	0	0	110	0	326	7	0	333	451
05:15 PM	0	6	2	0	8	0	0	0	0	0	28	114	0	0	142	0	284	5	0	289	439
05:30 PM	0	3	1	0	4	0	0	0	0	0	28	104	0	0	132	1	355	9	0	365	501
Total Volume	0	18	6	1	25	0	0	0	0	0	101	427	0	0	528	1	1285	31	0	1317	1870
% App. Total																					
PHF	.000	.750	.750	.250	.781	.000	.000	.000	.000	.000	.902	.897	.000	.000	.917	.250	.905	.775	.000	.902	.933
Cars	0	3	6	1	10	0	0	0	0	0	98	386	0	0	484	1	1245	31	0	1277	1771
% Cars	0	16.7	100	100	40.0	0	0	0	0	0	97.0	90.4	0	0	91.7	100	96.9	100	0	97.0	94.7
Heavy Vehicles																					
% Heavy Vehicles	0	83.3	0	0	60.0	0	0	0	0	0	3.0	9.6	0	0	8.3	0	3.1	0	0	3.0	5.3



N/S: Tremont Street
E/W: E.Berkeley Street/ Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 E
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Tremont Street From North				E. Berkeley Street From East				Tremont Street From South				Berkeley 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	7	44	0	0	36	149	66	0	0	79	24	0	2	0	0	0	407
07:15 AM	11	39	0	0	35	141	48	0	0	112	15	0	2	0	3	0	406
07:30 AM	7	66	0	0	46	180	75	0	0	125	32	1	2	0	8	0	542
07:45 AM	9	46	0	0	39	172	72	0	0	153	32	0	3	0	2	0	528
Total	34	195	0	0	156	642	261	0	0	469	103	1	9	0	13	0	1883
08:00 AM	12	66	0	0	37	176	62	0	0	137	30	0	1	0	4	0	525
08:15 AM	19	45	0	0	39	183	55	0	0	99	35	0	2	0	4	0	481
08:30 AM	21	63	0	0	43	194	68	0	0	146	29	0	2	0	2	0	568
08:45 AM	8	63	0	0	38	189	69	0	0	118	32	0	6	0	2	0	525
Total	60	237	0	0	157	742	254	0	0	500	126	0	11	0	12	0	2099
Grand Total	94	432	0	0	313	1384	515	0	0	969	229	1	20	0	25	0	3982
Apprch %	17.9	82.1	0	0	14.2	62.6	23.3	0	0	80.8	19.1	0.1	44.4	0	55.6	0	
Total %	2.4	10.8	0	0	7.9	34.8	12.9	0	0	24.3	5.8	0	0.5	0	0.6	0	
Cars	83	407	0	0	293	1279	491	0	0	928	222	1	16	0	24	0	3744
% Cars	88.3	94.2	0	0	93.6	92.4	95.3	0	0	95.8	96.9	100	80	0	96	0	94
Heavy Vehicles	11	25	0	0	20	105	24	0	0	41	7	0	4	0	1	0	238
% Heavy Vehicles	11.7	5.8	0	0	6.4	7.6	4.7	0	0	4.2	3.1	0	20	0	4	0	6

	Tremont Street From North					E. Berkeley Street From East					Tremont Street From South					Berkeley 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 07:45 AM																					
07:45 AM	9	46	0	0	55	39	172	72	0	283	0	153	32	0	185	3	0	2	0	5	528
08:00 AM	12	66	0	0	78	37	176	62	0	275	0	137	30	0	167	1	0	4	0	5	525
08:15 AM	19	45	0	0	64	39	183	55	0	277	0	99	35	0	134	2	0	4	0	6	481
08:30 AM	21	63	0	0	84	43	194	68	0	305	0	146	29	0	175	2	0	2	0	4	568
Total Volume	61	220	0	0	281	158	725	257	0	1140	0	535	126	0	661	8	0	12	0	20	2102
% App. Total	21.7	78.3	0	0		13.9	63.6	22.5	0		0	80.9	19.1	0		40	0	60	0		
PHF	.726	.833	.000	.000	.836	.919	.934	.892	.000	.934	.000	.874	.900	.000	.893	.667	.000	.750	.000	.833	.925
Cars	53	205	0	0	258	149	672	244	0	1065	0	516	120	0	636	6	0	12	0	18	1977
% Cars	86.9	93.2	0	0	91.8	94.3	92.7	94.9	0	93.4	0	96.4	95.2	0	96.2	75.0	0	100	0	90.0	94.1
Heavy Vehicles	8	15	0	0	23	9	53	13	0	75	0	19	6	0	25	2	0	0	0	2	125
% Heavy Vehicles	13.1	6.8	0	0	8.2	5.7	7.3	5.1	0	6.6	0	3.6	4.8	0	3.8	25.0	0	0	0	10.0	5.9

N/S: Tremont Street
E/W: E.Berkeley Street/ Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 E
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Peds and Bikes

	Tremont Street From North					E. Berkeley Street From East					Tremont Street From South					Berkeley 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	8	3	0	0	0	2	6	0	1	1	5	1	0	0	0	5	2	34
07:15 AM	0	0	0	3	4	1	2	0	1	11	0	0	0	9	5	0	0	0	4	1	41
07:30 AM	0	0	0	1	6	0	1	0	3	33	0	2	0	6	6	0	0	0	8	9	75
07:45 AM	0	0	0	0	16	0	2	0	6	20	0	0	0	12	3	0	0	1	8	3	71
Total	0	0	0	12	29	1	5	0	12	70	0	3	1	32	15	0	0	1	25	15	221
08:00 AM	1	0	0	1	13	0	1	1	9	26	0	2	0	12	2	0	0	1	5	4	78
08:15 AM	1	0	0	2	19	0	4	0	5	17	0	2	0	14	5	0	0	2	7	2	80
08:30 AM	0	2	0	2	15	0	2	0	8	18	0	2	0	14	2	0	0	1	9	3	78
08:45 AM	0	2	0	4	20	0	3	1	10	17	0	4	0	14	12	0	0	1	8	2	98
Total	2	4	0	9	67	0	10	2	32	78	0	10	0	54	21	0	0	5	29	11	334
Grand Total	2	4	0	21	96	1	15	2	44	148	0	13	1	86	36	0	0	6	54	26	555
Apprch %	1.6	3.3	0	17.1	78	0.5	7.1	1	21	70.5	0	9.6	0.7	63.2	26.5	0	0	7	62.8	30.2	
Total %	0.4	0.7	0	3.8	17.3	0.2	2.7	0.4	7.9	26.7	0	2.3	0.2	15.5	6.5	0	0	1.1	9.7	4.7	

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

	Tremont Street From North						E. Berkeley Street From East						Tremont Street From South						Berkeley 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
08:00 AM	1	0	0	1	13	15	0	1	1	9	26	37	0	2	0	12	2	16	0	0	1	5	4	10	78
08:15 AM	1	0	0	2	19	22	0	4	0	5	17	26	0	2	0	14	5	21	0	0	2	7	2	11	80
08:30 AM	0	2	0	2	15	19	0	2	0	8	18	28	0	2	0	14	2	18	0	0	1	9	3	13	78
08:45 AM	0	2	0	4	20	26	0	3	1	10	17	31	0	4	0	14	12	30	0	0	1	8	2	11	98
Total Volume	2	4	0	9	67	82	0	10	2	32	78	122	0	10	0	54	21	85	0	0	5	29	11	45	334
% App. Total	2.4	4.9	0	11	81.7		0	8.2	1.6	26.2	63.9		0	11.8	0	63.5	24.7		0	0	11.1	64.4	24.4		
PHF	.500	.500	.000	.563	.838	.788	.000	.625	.500	.800	.750	.824	.000	.625	.000	.964	.438	.708	.000	.000	.625	.806	.688	.865	.852

N/S: Tremont Street
E/W: E.Berkeley Street/ Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
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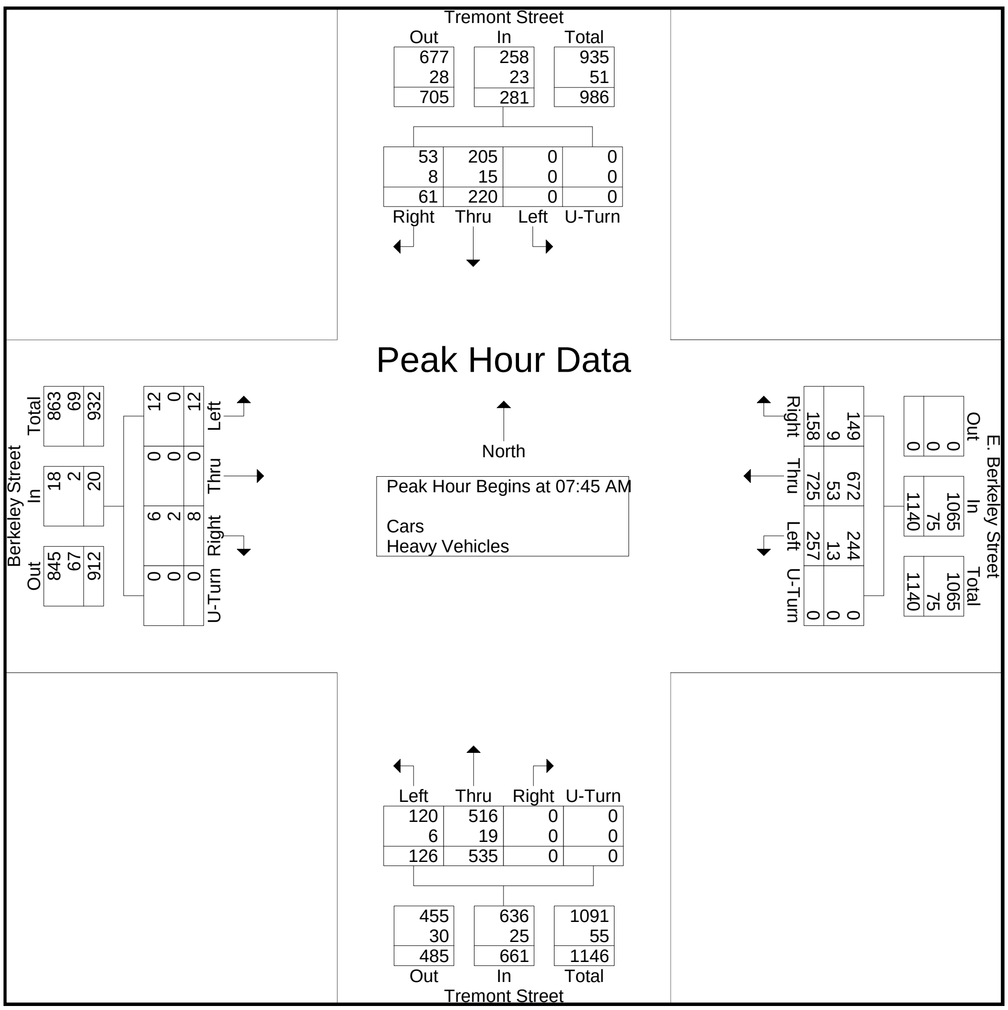
Email: datarequests@pdillc.com

File Name : 165421 E
Site Code : TBA
Start Date : 1/5/2017

	Tremont Street From North					E. Berkeley Street From East					Tremont Street From South					Berkeley 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 07:45 AM																					
07:45 AM	9	46	0	0	55	39	172	72	0	283	0	153	32	0	185	3	0	2	0	5	528
08:00 AM	12	66	0	0	78	37	176	62	0	275	0	137	30	0	167	1	0	4	0	5	525
08:15 AM	19	45	0	0	64	39	183	55	0	277	0	99	35	0	134	2	0	4	0	6	481
08:30 AM	21	63	0	0	84	43	194	68	0	305	0	146	29	0	175	2	0	2	0	4	568
Total Volume	61	220	0	0	281	158	725	257	0	1140	0	535	126	0	661	8	0	12	0	20	2102
% App. Total	21.7	78.3	0	0		13.9	63.6	22.5	0		0	80.9	19.1	0		40	0	60	0		
PHF	.726	.833	.000	.000	.836	.919	.934	.892	.000	.934	.000	.874	.900	.000	.893	.667	.000	.750	.000	.833	.925
Cars	53	205	0	0	258	149	672	244	0	1065	0	516	120	0	636	6	0	12	0	18	1977
% Cars	86.9	93.2	0	0	91.8	94.3	92.7	94.9	0	93.4	0	96.4	95.2	0	96.2	75.0	0	100	0	90.0	94.1
Heavy Vehicles	8	15	0	0	23	9	53	13	0	75	0	19	6	0	25	2	0	0	0	2	125
% Heavy Vehicles	13.1	6.8	0	0	8.2	5.7	7.3	5.1	0	6.6	0	3.6	4.8	0	3.8	25.0	0	0	0	10.0	5.9



N/S: Tremont Street
E/W: E.Berkeley Street/ Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 EE
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Cars - Heavy Vehicles

	Tremont Street From North				E. Berkeley Street From East				Tremont Street From South				Berkeley 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	16	90	0	0	35	113	64	0	0	76	26	0	8	0	2	0	430
04:15 PM	14	93	0	0	32	124	80	0	0	69	18	0	4	0	4	0	438
04:30 PM	17	114	0	0	33	104	75	0	0	80	21	0	14	0	3	0	461
04:45 PM	12	83	0	0	40	142	72	0	0	75	24	0	5	0	3	0	456
Total	59	380	0	0	140	483	291	0	0	300	89	0	31	0	12	0	1785
05:00 PM	16	84	0	0	35	122	82	0	0	95	24	0	4	0	4	0	466
05:15 PM	10	99	0	0	33	114	80	0	0	76	22	0	10	0	4	0	448
05:30 PM	18	113	0	0	37	149	98	0	0	72	27	0	5	0	7	0	526
05:45 PM	10	94	0	0	30	140	57	0	0	83	30	0	4	0	2	0	450
Total	54	390	0	0	135	525	317	0	0	326	103	0	23	0	17	0	1890
Grand Total	113	770	0	0	275	1008	608	0	0	626	192	0	54	0	29	0	3675
Apprch %	12.8	87.2	0	0	14.5	53.3	32.2	0	0	76.5	23.5	0	65.1	0	34.9	0	
Total %	3.1	21	0	0	7.5	27.4	16.5	0	0	17	5.2	0	1.5	0	0.8	0	
Cars	109	747	0	0	265	970	599	0	0	604	188	0	54	0	29	0	3565
% Cars	96.5	97	0	0	96.4	96.2	98.5	0	0	96.5	97.9	0	100	0	100	0	97
Heavy Vehicles	4	23	0	0	10	38	9	0	0	22	4	0	0	0	0	0	110
% Heavy Vehicles	3.5	3	0	0	3.6	3.8	1.5	0	0	3.5	2.1	0	0	0	0	0	3

	Tremont Street From North					E. Berkeley Street From East					Tremont Street From South					Berkeley 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	12	83	0	0	95	40	142	72	0	254	0	75	24	0	99	5	0	3	0	8	456
05:00 PM	16	84	0	0	100	35	122	82	0	239	0	95	24	0	119	4	0	4	0	8	466
05:15 PM	10	99	0	0	109	33	114	80	0	227	0	76	22	0	98	10	0	4	0	14	448
05:30 PM	18	113	0	0	131	37	149	98	0	284	0	72	27	0	99	5	0	7	0	12	526
Total Volume	56	379	0	0	435	145	527	332	0	1004	0	318	97	0	415	24	0	18	0	42	1896
% App. Total	12.9	87.1	0	0		14.4	52.5	33.1	0		0	76.6	23.4	0		57.1	0	42.9	0		
PHF	.778	.838	.000	.000	.830	.906	.884	.847	.000	.884	.000	.837	.898	.000	.872	.600	.000	.643	.000	.750	.901
Cars	54	368	0	0	422	139	511	327	0	977	0	308	95	0	403	24	0	18	0	42	1844
% Cars	96.4	97.1	0	0	97.0	95.9	97.0	98.5	0	97.3	0	96.9	97.9	0	97.1	100	0	100	0	100	97.3
Heavy Vehicles	2	11	0	0	13	6	16	5	0	27	0	10	2	0	12	0	0	0	0	0	52
% Heavy Vehicles	3.6	2.9	0	0	3.0	4.1	3.0	1.5	0	2.7	0	3.1	2.1	0	2.9	0	0	0	0	0	2.7

N/S: Tremont Street
E/W: E.Berkeley Street/ Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC

46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 EE
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Peds and Bikes

	Tremont Street From North					E. Berkeley Street From East					Tremont Street From South					Berkeley 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	0	0	5	4	0	1	1	7	9	0	1	0	3	5	0	0	0	3	7	46
04:15 PM	0	0	0	3	6	0	1	0	18	10	0	1	1	7	7	0	0	0	5	14	73
04:30 PM	0	1	0	10	8	0	2	1	12	12	0	0	0	7	3	0	0	0	6	8	70
04:45 PM	1	0	0	4	4	0	0	0	9	9	0	0	0	4	6	0	0	0	4	8	49
Total	1	1	0	22	22	0	4	2	46	40	0	2	1	21	21	0	0	0	18	37	238
05:00 PM	0	6	0	11	1	1	1	0	16	3	0	1	0	1	12	0	0	0	7	9	69
05:15 PM	2	1	0	13	1	0	1	3	14	12	0	0	0	9	12	0	0	0	9	17	94
05:30 PM	0	3	0	9	0	1	1	1	30	12	0	3	0	10	13	0	0	1	7	11	102
05:45 PM	2	0	1	7	2	0	3	1	25	13	0	0	0	8	11	0	0	0	5	12	90
Total	4	10	1	40	4	2	6	5	85	40	0	4	0	28	48	0	0	1	28	49	355
Grand Total	5	11	1	62	26	2	10	7	131	80	0	6	1	49	69	0	0	1	46	86	593
Apprch %	4.8	10.5	1	59	24.8	0.9	4.3	3	57	34.8	0	4.8	0.8	39.2	55.2	0	0	0.8	34.6	64.7	
Total %	0.8	1.9	0.2	10.5	4.4	0.3	1.7	1.2	22.1	13.5	0	1	0.2	8.3	11.6	0	0	0.2	7.8	14.5	

	Tremont Street From North						E. Berkeley Street From East						Tremont Street From South						Berkeley 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 05:00 PM

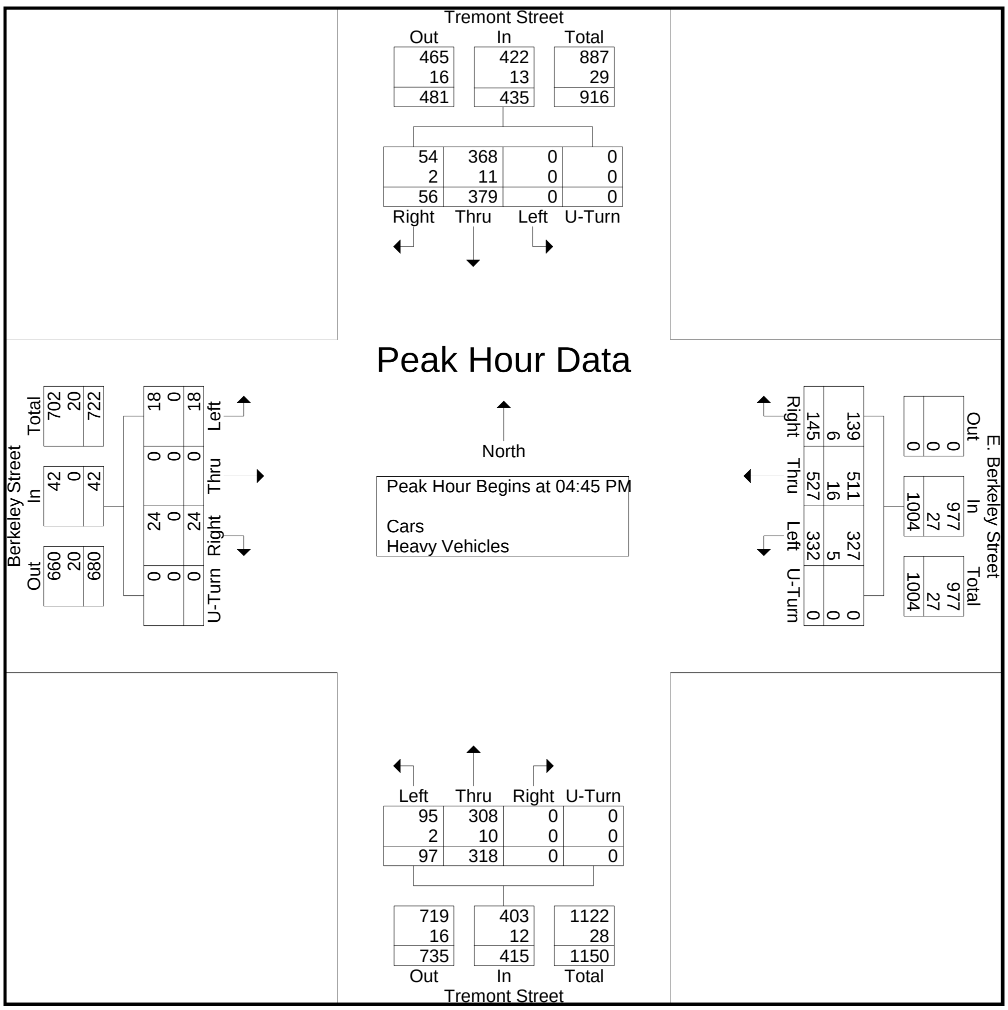
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
05:00 PM	0	6	0	11	1	18	1	1	0	16	3	21	0	1	0	1	12	14	0	0	0	7	9	16	69
05:15 PM	2	1	0	13	1	17	0	1	3	14	12	30	0	0	0	9	12	21	0	0	0	9	17	26	94
05:30 PM	0	3	0	9	0	12	1	1	1	30	12	45	0	3	0	10	13	26	0	0	1	7	11	19	102
05:45 PM	2	0	1	7	2	12	0	3	1	25	13	42	0	0	0	8	11	19	0	0	0	5	12	17	90
Total Volume	4	10	1	40	4	59	2	6	5	85	40	138	0	4	0	28	48	80	0	0	1	28	49	78	355
% App. Total	6.8	16.9	1.7	67.8	6.8		1.4	4.3	3.6	61.6	29		0	5	0	35	60		0	0	1.3	35.9	62.8		
PHF	.500	.417	.250	.769	.500	.819	.500	.500	.417	.708	.769	.767	.000	.333	.000	.700	.923	.769	.000	.000	.250	.778	.721	.750	.870

N/S: Tremont Street
E/W: E.Berkeley Street/ Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 EE
Site Code : TBA
Start Date : 1/5/2017

	Tremont Street From North					E. Berkeley Street From East					Tremont Street From South					Berkeley 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	12	83	0	0	95	40	142	72	0	254	0	75	24	0	99	5	0	3	0	8	456
05:00 PM	16	84	0	0	100	35	122	82	0	239	0	95	24	0	119	4	0	4	0	8	466
05:15 PM	10	99	0	0	109	33	114	80	0	227	0	76	22	0	98	10	0	4	0	14	448
05:30 PM	18	113	0	0	131	37	149	98	0	284	0	72	27	0	99	5	0	7	0	12	526
Total Volume	56	379	0	0	435	145	527	332	0	1004	0	318	97	0	415	24	0	18	0	42	1896
% App. Total	12.9	87.1	0	0		14.4	52.5	33.1	0		0	76.6	23.4	0		57.1	0	42.9	0		
PHF	.778	.838	.000	.000	.830	.906	.884	.847	.000	.884	.000	.837	.898	.000	.872	.600	.000	.643	.000	.750	.901
Cars	54	368	0	0	422	139	511	327	0	977	0	308	95	0	403	24	0	18	0	42	1844
% Cars	96.4	97.1	0	0	97.0	95.9	97.0	98.5	0	97.3	0	96.9	97.9	0	97.1	100	0	100	0	100	97.3
Heavy Vehicles	2	11	0	0	13	6	16	5	0	27	0	10	2	0	12	0	0	0	0	0	52
% Heavy Vehicles	3.6	2.9	0	0	3.0	4.1	3.0	1.5	0	2.7	0	3.1	2.1	0	2.9	0	0	0	0	0	2.7



N/S: Shawmut Avenue
E/W: E.Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 F
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Shawmut Avenue From North				E. Berkeley Street From East				Shawmut Avenue From South				E. Berkeley 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	13	0	0	0	0	216	0	0	0	0	17	0	0	0	0	0	246
07:15 AM	14	0	0	0	0	211	0	0	0	0	13	0	0	0	0	0	238
07:30 AM	15	0	0	0	0	266	0	0	0	0	20	0	0	0	0	0	301
07:45 AM	21	0	0	0	0	241	0	0	0	0	11	0	0	0	0	0	273
Total	63	0	0	0	0	934	0	0	0	0	61	0	0	0	0	0	1058
08:00 AM	18	0	0	0	0	246	0	0	0	0	15	0	0	0	0	0	279
08:15 AM	17	0	0	0	0	236	0	0	0	0	16	0	0	0	0	0	269
08:30 AM	29	0	0	0	0	277	0	0	0	0	13	0	0	0	0	0	319
08:45 AM	36	0	0	0	0	228	0	0	0	0	18	0	0	0	0	0	282
Total	100	0	0	0	0	987	0	0	0	0	62	0	0	0	0	0	1149
Grand Total	163	0	0	0	0	1921	0	0	0	0	123	0	0	0	0	0	2207
Apprch %	100	0	0	0	0	100	0	0	0	0	100	0	0	0	0	0	
Total %	7.4	0	0	0	0	87	0	0	0	0	5.6	0	0	0	0	0	
Cars	160	0	0	0	0	1774	0	0	0	0	120	0	0	0	0	0	2054
% Cars	98.2	0	0	0	0	92.3	0	0	0	0	97.6	0	0	0	0	0	93.1
Heavy Vehicles	3	0	0	0	0	147	0	0	0	0	3	0	0	0	0	0	153
% Heavy Vehicles	1.8	0	0	0	0	7.7	0	0	0	0	2.4	0	0	0	0	0	6.9

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

	Shawmut Avenue From North					E. Berkeley Street From East					Shawmut Avenue From South					E. Berkeley 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
08:00 AM	18	0	0	0	18	0	246	0	0	246	0	0	15	0	15	0	0	0	0	0	279
08:15 AM	17	0	0	0	17	0	236	0	0	236	0	0	16	0	16	0	0	0	0	0	269
08:30 AM	29	0	0	0	29	0	277	0	0	277	0	0	13	0	13	0	0	0	0	0	319
08:45 AM	36	0	0	0	36	0	228	0	0	228	0	0	18	0	18	0	0	0	0	0	282
Total Volume	100	0	0	0	100	0	987	0	0	987	0	0	62	0	62	0	0	0	0	0	1149
% App. Total	100	0	0	0		0	100	0	0		0	0	100	0		0	0	0	0		
PHF	.694	.000	.000	.000	.694	.000	.891	.000	.000	.891	.000	.000	.861	.000	.861	.000	.000	.000	.000	.000	.900
Cars	98	0	0	0	98	0	910	0	0	910	0	0	61	0	61	0	0	0	0	0	1069
% Cars	98.0	0	0	0	98.0	0	92.2	0	0	92.2	0	0	98.4	0	98.4	0	0	0	0	0	93.0
Heavy Vehicles	2	0	0	0	2	0	77	0	0	77	0	0	1	0	1	0	0	0	0	0	80
% Heavy Vehicles	2.0	0	0	0	2.0	0	7.8	0	0	7.8	0	0	1.6	0	1.6	0	0	0	0	0	7.0

N/S: Shawmut Avenue
E/W: E.Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 F
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Peds and Bikes

	Shawmut Avenue From North					E. Berkeley Street From East					Shawmut Avenue From South					E. Berkeley 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	3	4	0	0	0	1	3	0	0	0	8	1	0	0	0	4	1	25
07:15 AM	0	0	0	3	8	0	2	0	3	1	0	0	0	8	2	0	0	0	3	2	32
07:30 AM	0	0	0	6	16	0	1	0	3	9	0	0	0	13	9	0	0	0	13	0	70
07:45 AM	0	0	0	9	16	0	2	0	2	8	0	0	0	7	6	0	0	0	10	0	60
Total	0	0	0	21	44	0	5	0	9	21	0	0	0	36	18	0	0	0	30	3	187
08:00 AM	0	0	0	7	19	0	3	0	4	7	0	0	0	8	5	0	0	0	12	3	68
08:15 AM	0	0	0	5	17	0	4	0	3	7	0	0	0	11	2	0	0	0	13	6	68
08:30 AM	0	1	0	5	27	0	3	0	8	13	0	0	0	12	3	0	0	0	13	0	85
08:45 AM	0	1	0	11	25	0	5	0	6	8	0	0	0	12	11	0	0	0	14	1	94
Total	0	2	0	28	88	0	15	0	21	35	0	0	0	43	21	0	0	0	52	10	315
Grand Total	0	2	0	49	132	0	20	0	30	56	0	0	0	79	39	0	0	0	82	13	502
Apprch %	0	1.1	0	26.8	72.1	0	18.9	0	28.3	52.8	0	0	0	66.9	33.1	0	0	0	86.3	13.7	
Total %	0	0.4	0	9.8	26.3	0	4	0	6	11.2	0	0	0	15.7	7.8	0	0	0	16.3	2.6	

	Shawmut Avenue From North						E. Berkeley Street From East						Shawmut Avenue From South						E. Berkeley 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 08:00 AM																									
08:00 AM	0	0	0	7	19	26	0	3	0	4	7	14	0	0	0	8	5	13	0	0	0	12	3	15	68
08:15 AM	0	0	0	5	17	22	0	4	0	3	7	14	0	0	0	11	2	13	0	0	0	13	6	19	68
08:30 AM	0	1	0	5	27	33	0	3	0	8	13	24	0	0	0	12	3	15	0	0	0	13	0	13	85
08:45 AM	0	1	0	11	25	37	0	5	0	6	8	19	0	0	0	12	11	23	0	0	0	14	1	15	94
Total Volume	0	2	0	28	88	118	0	15	0	21	35	71	0	0	0	43	21	64	0	0	0	52	10	62	315
% App. Total	0	1.7	0	23.7	74.6		0	21.1	0	29.6	49.3		0	0	0	67.2	32.8		0	0	0	83.9	16.1		
PHF	.000	.500	.000	.636	.815	.797	.000	.750	.000	.656	.673	.740	.000	.000	.000	.896	.477	.696	.000	.000	.000	.929	.417	.816	.838

N/S: Shawmut Avenue
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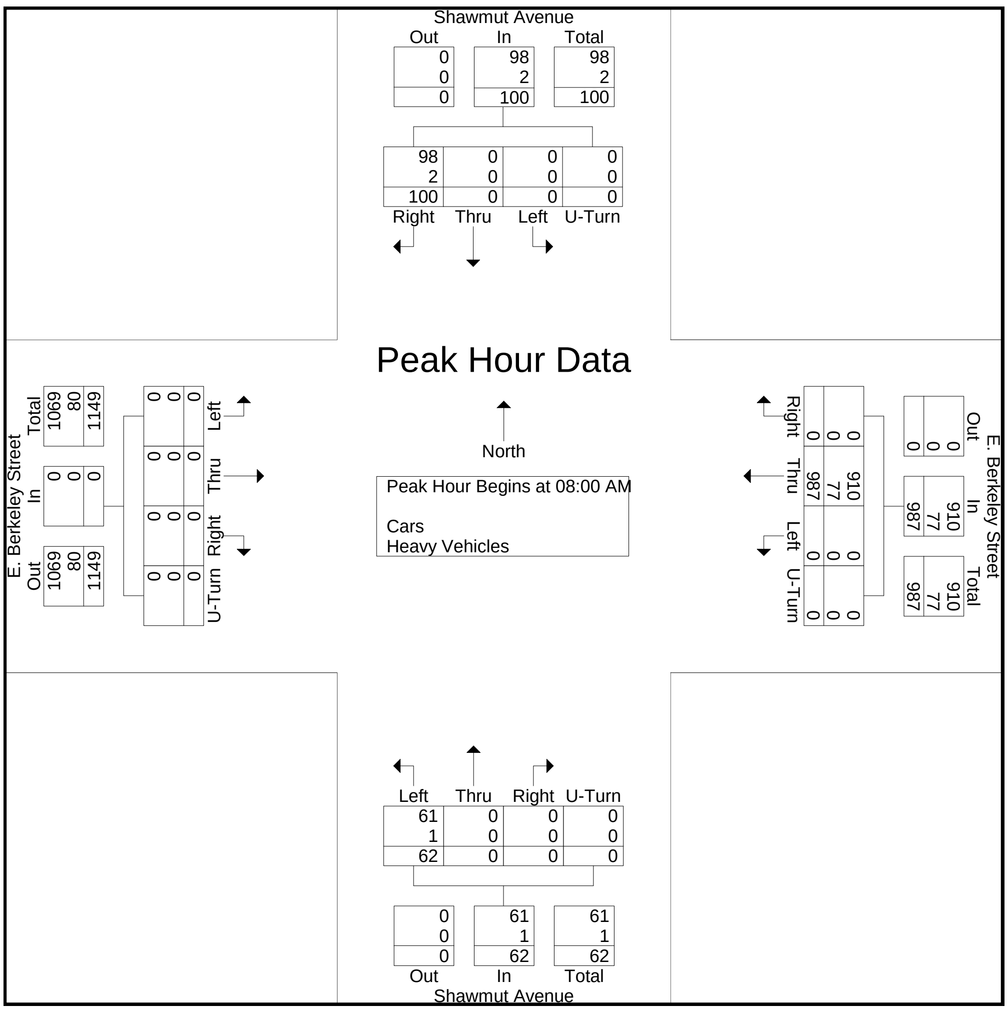
	Shawmut Avenue From North					E. Berkeley Street From East					Shawmut Avenue From South					E. Berkeley Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	18	0	0	0	18	0	246	0	0	246	0	0	15	0	15	0	0	0	0	0	279
08:15 AM	17	0	0	0	17	0	236	0	0	236	0	0	16	0	16	0	0	0	0	0	269
08:30 AM	29	0	0	0	29	0	277	0	0	277	0	0	13	0	13	0	0	0	0	0	319
08:45 AM	36	0	0	0	36	0	228	0	0	228	0	0	18	0	18	0	0	0	0	0	282
Total Volume	100	0	0	0	100	0	987	0	0	987	0	0	62	0	62	0	0	0	0	0	1149
% App. Total	100	0	0	0		0	100	0	0		0	0	100	0		0	0	0	0		
PHF	.694	.000	.000	.000	.694	.000	.891	.000	.000	.891	.000	.000	.861	.000	.861	.000	.000	.000	.000	.000	.900
Cars	98	0	0	0	98	0	910	0	0	910	0	0	61	0	61	0	0	0	0	0	1069
% Cars	98.0	0	0	0	98.0	0	92.2	0	0	92.2	0	0	98.4	0	98.4	0	0	0	0	0	93.0
Heavy Vehicles	2	0	0	0	2	0	77	0	0	77	0	0	1	0	1	0	0	0	0	0	80
% Heavy Vehicles	2.0	0	0	0	2.0	0	7.8	0	0	7.8	0	0	1.6	0	1.6	0	0	0	0	0	7.0



N/S: Shawmut Avenue
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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Shawmut Avenue From North				E. Berkeley Street From East				Shawmut Avenue From South				E. Berkeley 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	63	0	0	0	0	155	0	0	0	0	15	0	0	0	0	0	233
04:15 PM	57	0	0	0	0	152	0	0	0	0	18	0	0	0	0	0	227
04:30 PM	64	0	0	0	0	137	0	0	0	0	21	0	0	0	0	0	222
04:45 PM	58	0	0	0	0	177	0	0	0	0	18	0	0	0	0	0	253
Total	242	0	0	0	0	621	0	0	0	0	72	0	0	0	0	0	935
05:00 PM	61	0	0	0	0	160	0	0	0	0	19	0	0	0	0	0	240
05:15 PM	56	0	0	0	0	159	0	0	0	0	27	0	0	0	0	0	242
05:30 PM	58	0	0	0	0	197	0	0	0	0	29	0	0	0	0	0	284
05:45 PM	37	0	0	0	0	184	0	0	0	0	21	0	0	0	0	0	242
Total	212	0	0	0	0	700	0	0	0	0	96	0	0	0	0	0	1008
Grand Total	454	0	0	0	0	1321	0	0	0	0	168	0	0	0	0	0	1943
Apprch %	100	0	0	0	0	100	0	0	0	0	100	0	0	0	0	0	
Total %	23.4	0	0	0	0	68	0	0	0	0	8.6	0	0	0	0	0	
Cars	446	0	0	0	0	1271	0	0	0	0	164	0	0	0	0	0	1881
% Cars	98.2	0	0	0	0	96.2	0	0	0	0	97.6	0	0	0	0	0	96.8
Heavy Vehicles	8	0	0	0	0	50	0	0	0	0	4	0	0	0	0	0	62
% Heavy Vehicles	1.8	0	0	0	0	3.8	0	0	0	0	2.4	0	0	0	0	0	3.2

	Shawmut Avenue From North					E. Berkeley Street From East					Shawmut Avenue From South					E. Berkeley 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

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
04:45 PM	58	0	0	0	58	0	177	0	0	177	0	0	18	0	18	0	0	0	0	0	253
05:00 PM	61	0	0	0	61	0	160	0	0	160	0	0	19	0	19	0	0	0	0	0	240
05:15 PM	56	0	0	0	56	0	159	0	0	159	0	0	27	0	27	0	0	0	0	0	242
05:30 PM	58	0	0	0	58	0	197	0	0	197	0	0	29	0	29	0	0	0	0	0	284
Total Volume	233	0	0	0	233	0	693	0	0	693	0	0	93	0	93	0	0	0	0	0	1019
% App. Total	100	0	0	0		0	100	0	0		0	0	100	0		0	0	0	0		
PHF	.955	.000	.000	.000	.955	.000	.879	.000	.000	.879	.000	.000	.802	.000	.802	.000	.000	.000	.000	.000	.897
Cars	230	0	0	0	230	0	670	0	0	670	0	0	90	0	90	0	0	0	0	0	990
% Cars	98.7	0	0	0	98.7	0	96.7	0	0	96.7	0	0	96.8	0	96.8	0	0	0	0	0	97.2
Heavy Vehicles	3	0	0	0	3	0	23	0	0	23	0	0	3	0	3	0	0	0	0	0	29
% Heavy Vehicles	1.3	0	0	0	1.3	0	3.3	0	0	3.3	0	0	3.2	0	3.2	0	0	0	0	0	2.8

N/S: Shawmut Avenue
E/W: E.Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 FF
Site Code : TBA
Start Date : 1/5/2017

Groups Printed- Peds and Bikes

	Shawmut Avenue From North					E. Berkeley Street From East					Shawmut Avenue From South					E. Berkeley 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	1	0	0	3	8	0	3	0	3	6	0	0	0	8	4	0	0	0	5	5	46
04:15 PM	0	0	0	4	3	0	2	0	4	3	0	0	0	4	8	0	0	0	1	7	36
04:30 PM	0	0	0	4	6	0	3	0	4	3	0	0	0	6	4	0	0	0	7	8	45
04:45 PM	0	0	0	12	8	0	0	0	9	3	0	0	0	2	2	0	0	0	3	7	46
Total	1	0	0	23	25	0	8	0	20	15	0	0	0	20	18	0	0	0	16	27	173
05:00 PM	0	0	0	6	6	0	2	0	10	4	0	0	0	6	13	0	0	0	4	9	60
05:15 PM	1	1	0	15	8	0	2	0	8	4	0	0	0	6	10	0	0	0	4	6	65
05:30 PM	0	0	0	16	5	0	3	0	6	8	0	0	0	8	14	0	1	0	1	8	70
05:45 PM	1	2	0	9	2	0	4	1	6	4	0	0	0	9	11	0	0	0	5	9	63
Total	2	3	0	46	21	0	11	1	30	20	0	0	0	29	48	0	1	0	14	32	258
Grand Total	3	3	0	69	46	0	19	1	50	35	0	0	0	49	66	0	1	0	30	59	431
Apprch %	2.5	2.5	0	57	38	0	18.1	1	47.6	33.3	0	0	0	42.6	57.4	0	1.1	0	33.3	65.6	
Total %	0.7	0.7	0	16	10.7	0	4.4	0.2	11.6	8.1	0	0	0	11.4	15.3	0	0.2	0	7	13.7	

	Shawmut Avenue From North						E. Berkeley Street From East						Shawmut Avenue From South						E. Berkeley 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 05:00 PM																									
05:00 PM	0	0	0	6	6	12	0	2	0	10	4	16	0	0	0	6	13	19	0	0	0	4	9	13	60
05:15 PM	1	1	0	15	8	25	0	2	0	8	4	14	0	0	0	6	10	16	0	0	0	4	6	10	65
05:30 PM	0	0	0	16	5	21	0	3	0	6	8	17	0	0	0	8	14	22	0	1	0	1	8	10	70
05:45 PM	1	2	0	9	2	14	0	4	1	6	4	15	0	0	0	9	11	20	0	0	0	5	9	14	63
Total Volume	2	3	0	46	21	72	0	11	1	30	20	62	0	0	0	29	48	77	0	1	0	14	32	47	258
% App. Total	2.8	4.2	0	63.9	29.2		0	17.7	1.6	48.4	32.3		0	0	0	37.7	62.3		0	2.1	0	29.8	68.1		
PHF	.500	.375	.000	.719	.656	.720	.000	.688	.250	.750	.625	.912	.000	.000	.000	.806	.857	.875	.000	.250	.000	.700	.889	.839	.921

N/S: Shawmut Avenue
E/W: E.Berkeley Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

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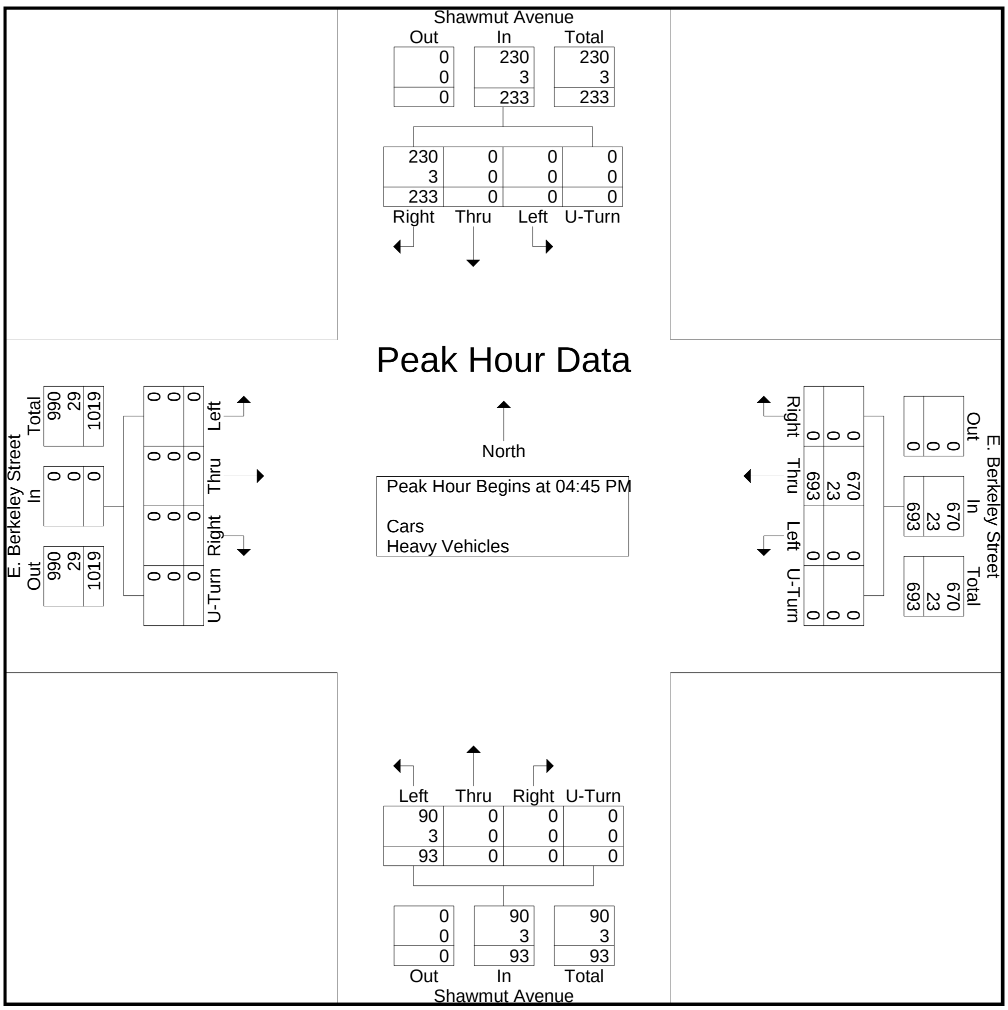
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 FF
Site Code : TBA
Start Date : 1/5/2017

	Shawmut Avenue From North					E. Berkeley Street From East					Shawmut Avenue From South					E. Berkeley 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	58	0	0	0	58	0	177	0	0	177	0	0	18	0	18	0	0	0	0	0	253
05:00 PM	61	0	0	0	61	0	160	0	0	160	0	0	19	0	19	0	0	0	0	0	240
05:15 PM	56	0	0	0	56	0	159	0	0	159	0	0	27	0	27	0	0	0	0	0	242
05:30 PM	58	0	0	0	58	0	197	0	0	197	0	0	29	0	29	0	0	0	0	0	284
Total Volume	233	0	0	0	233	0	693	0	0	693	0	0	93	0	93	0	0	0	0	0	1019
% App. Total	100	0	0	0		0	100	0	0		0	0	100	0		0	0	0	0		
PHF	.955	.000	.000	.000	.955	.000	.879	.000	.000	.879	.000	.000	.802	.000	.802	.000	.000	.000	.000	.000	.897
Cars	230	0	0	0	230	0	670	0	0	670	0	0	90	0	90	0	0	0	0	0	990
% Cars	98.7	0	0	0	98.7	0	96.7	0	0	96.7	0	0	96.8	0	96.8	0	0	0	0	0	97.2
Heavy Vehicles	3	0	0	0	3	0	23	0	0	23	0	0	3	0	3	0	0	0	0	0	29
% Heavy Vehicles	1.3	0	0	0	1.3	0	3.3	0	0	3.3	0	0	3.2	0	3.2	0	0	0	0	0	2.8



N/S: Shawmut Avenue
E/W: Marginal Road
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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Email: datarequests@pdillc.com

File Name : 165421 G
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Shawmut Avenue From North				Marginal Road From East				Shawmut Avenue From South				Marginal Road 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	16	24	0	0	0	36	7	0	0	0	0	0	0	0	0	0	83
07:15 AM	16	28	0	0	0	41	9	0	0	0	0	0	0	0	0	0	94
07:30 AM	19	62	0	0	0	60	7	0	0	0	0	0	0	0	0	0	148
07:45 AM	24	52	0	0	0	73	11	0	0	0	0	0	0	0	0	0	160
Total	75	166	0	0	0	210	34	0	0	0	0	0	0	0	0	0	485
08:00 AM	19	54	0	0	0	66	11	0	0	0	0	0	0	0	0	0	150
08:15 AM	22	49	0	0	0	82	14	0	0	0	0	0	0	0	0	0	167
08:30 AM	22	50	0	0	0	82	29	0	0	0	0	0	0	0	0	0	183
08:45 AM	12	49	0	0	0	74	27	0	0	0	0	0	0	0	0	0	162
Total	75	202	0	0	0	304	81	0	0	0	0	0	0	0	0	0	662
Grand Total	150	368	0	0	0	514	115	0	0	0	0	0	0	0	0	0	1147
Apprch %	29	71	0	0	0	81.7	18.3	0	0	0	0	0	0	0	0	0	
Total %	13.1	32.1	0	0	0	44.8	10	0	0	0	0	0	0	0	0	0	
Cars	144	342	0	0	0	493	111	0	0	0	0	0	0	0	0	0	1090
% Cars	96	92.9	0	0	0	95.9	96.5	0	0	0	0	0	0	0	0	0	95
Heavy Vehicles	6	26	0	0	0	21	4	0	0	0	0	0	0	0	0	0	57
% Heavy Vehicles	4	7.1	0	0	0	4.1	3.5	0	0	0	0	0	0	0	0	0	5

	Shawmut Avenue From North					Marginal Road From East					Shawmut Avenue From South					Marginal Road 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 08:00 AM																					
08:00 AM	19	54	0	0	73	0	66	11	0	77	0	0	0	0	0	0	0	0	0	0	150
08:15 AM	22	49	0	0	71	0	82	14	0	96	0	0	0	0	0	0	0	0	0	0	167
08:30 AM	22	50	0	0	72	0	82	29	0	111	0	0	0	0	0	0	0	0	0	0	183
08:45 AM	12	49	0	0	61	0	74	27	0	101	0	0	0	0	0	0	0	0	0	0	162
Total Volume	75	202	0	0	277	0	304	81	0	385	0	0	0	0	0	0	0	0	0	0	662
% App. Total	27.1	72.9	0	0		0	79	21	0		0	0	0	0		0	0	0	0		
PHF	.852	.935	.000	.000	.949	.000	.927	.698	.000	.867	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.904
Cars	73	185	0	0	258	0	295	77	0	372	0	0	0	0	0	0	0	0	0	0	630
% Cars	97.3	91.6	0	0	93.1	0	97.0	95.1	0	96.6	0	0	0	0	0	0	0	0	0	0	95.2
Heavy Vehicles	2	17	0	0	19	0	9	4	0	13	0	0	0	0	0	0	0	0	0	0	32
% Heavy Vehicles	2.7	8.4	0	0	6.9	0	3.0	4.9	0	3.4	0	0	0	0	0	0	0	0	0	0	4.8

N/S: Shawmut Avenue
E/W: Marginal Road
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
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File Name : 165421 G
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Groups Printed- Peds and Bikes

	Shawmut Avenue From North					Marginal Road From East					Shawmut Avenue From South					Marginal Road 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	1	0	0	0	0	0	0	6	19	0	0	0	3	1	0	0	0	2	0	32
07:15 AM	0	0	0	3	0	0	0	0	9	17	0	0	0	4	2	0	0	0	7	4	46
07:30 AM	0	0	0	2	11	0	0	0	15	18	0	0	0	10	3	0	0	0	5	4	68
07:45 AM	0	0	0	3	7	0	0	0	14	23	0	0	0	10	0	0	0	0	5	3	65
Total	0	1	0	8	18	0	0	0	44	77	0	0	0	27	6	0	0	0	19	11	211
08:00 AM	0	0	0	0	4	0	0	0	13	23	0	0	0	2	0	0	0	0	10	3	55
08:15 AM	0	0	0	11	5	0	0	0	19	25	0	0	0	1	0	0	0	0	13	4	78
08:30 AM	0	2	0	17	3	0	0	0	18	25	0	0	0	1	2	0	0	0	12	3	83
08:45 AM	0	2	0	1	1	0	0	0	39	43	0	0	0	3	0	0	0	0	11	3	103
Total	0	4	0	29	13	0	0	0	89	116	0	0	0	7	2	0	0	0	46	13	319
Grand Total	0	5	0	37	31	0	0	0	133	193	0	0	0	34	8	0	0	0	65	24	530
Apprch %	0	6.8	0	50.7	42.5	0	0	0	40.8	59.2	0	0	0	81	19	0	0	0	73	27	
Total %	0	0.9	0	7	5.8	0	0	0	25.1	36.4	0	0	0	6.4	1.5	0	0	0	12.3	4.5	

	Shawmut Avenue From North						Marginal Road From East						Shawmut Avenue From South						Marginal Road 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 08:00 AM																									
08:00 AM	0	0	0	0	4	4	0	0	0	13	23	36	0	0	0	2	0	2	0	0	0	10	3	13	55
08:15 AM	0	0	0	11	5	16	0	0	0	19	25	44	0	0	0	1	0	1	0	0	0	13	4	17	78
08:30 AM	0	2	0	17	3	22	0	0	0	18	25	43	0	0	0	1	2	3	0	0	0	12	3	15	83
08:45 AM	0	2	0	1	1	4	0	0	0	39	43	82	0	0	0	3	0	3	0	0	0	11	3	14	103
Total Volume	0	4	0	29	13	46	0	0	0	89	116	205	0	0	0	7	2	9	0	0	0	46	13	59	319
% App. Total	0	8.7	0	63	28.3		0	0	0	43.4	56.6		0	0	0	77.8	22.2		0	0	0	78	22		
PHF	.000	.500	.000	.426	.650	.523	.000	.000	.000	.571	.674	.625	.000	.000	.000	.583	.250	.750	.000	.000	.000	.885	.813	.868	.774

N/S: Shawmut Avenue
E/W: Marginal Road
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION
D A T A
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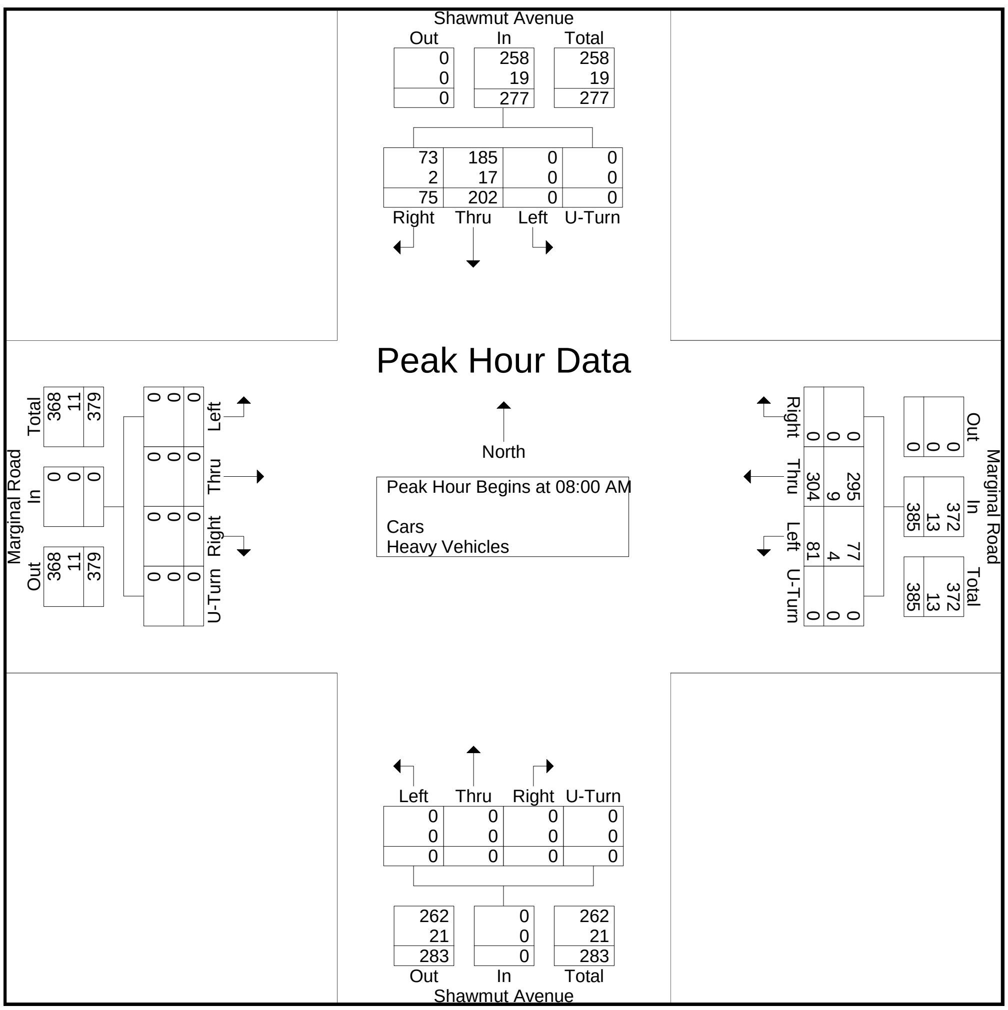
	Shawmut Avenue From North					Marginal Road From East					Shawmut Avenue From South					Marginal Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	19	54	0	0	73	0	66	11	0	77	0	0	0	0	0	0	0	0	0	0	150
08:15 AM	22	49	0	0	71	0	82	14	0	96	0	0	0	0	0	0	0	0	0	0	167
08:30 AM	22	50	0	0	72	0	82	29	0	111	0	0	0	0	0	0	0	0	0	0	183
08:45 AM	12	49	0	0	61	0	74	27	0	101	0	0	0	0	0	0	0	0	0	0	162
Total Volume	75	202	0	0	277	0	304	81	0	385	0	0	0	0	0	0	0	0	0	0	662
% App. Total	27.1	72.9	0	0		0	79	21	0		0	0	0	0		0	0	0	0		
PHF	.852	.935	.000	.000	.949	.000	.927	.698	.000	.867	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.904
Cars	73	185	0	0	258	0	295	77	0	372	0	0	0	0	0	0	0	0	0	0	630
% Cars	97.3	91.6	0	0	93.1	0	97.0	95.1	0	96.6	0	0	0	0	0	0	0	0	0	0	95.2
Heavy Vehicles	2	17	0	0	19	0	9	4	0	13	0	0	0	0	0	0	0	0	0	0	32
% Heavy Vehicles	2.7	8.4	0	0	6.9	0	3.0	4.9	0	3.4	0	0	0	0	0	0	0	0	0	0	4.8



N/S: Shawmut Avenue
E/W: Marginal Road
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Client: Howard Stein-Hudson/ M. Santos

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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Shawmut Avenue From North				Marginal Road From East				Shawmut Avenue From South				Marginal Road 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	44	79	0	0	0	77	10	0	0	0	0	0	0	0	0	0	210
04:15 PM	46	90	0	0	0	77	16	0	0	0	0	0	0	0	0	0	229
04:30 PM	40	95	0	0	0	74	19	0	0	0	0	0	0	0	0	0	228
04:45 PM	46	85	0	0	0	75	12	0	0	0	1	0	0	0	0	0	219
Total	176	349	0	0	0	303	57	0	0	0	1	0	0	0	0	0	886
05:00 PM	53	111	0	0	0	63	25	0	0	0	0	0	0	0	0	0	252
05:15 PM	60	80	0	0	1	81	19	0	0	0	0	0	0	0	0	0	241
05:30 PM	45	83	0	0	0	101	18	0	0	0	0	0	0	0	1	0	248
05:45 PM	44	67	0	0	0	102	14	0	0	0	0	0	0	0	0	0	227
Total	202	341	0	0	1	347	76	0	0	0	0	0	0	0	1	0	968
Grand Total	378	690	0	0	1	650	133	0	0	0	1	0	0	0	1	0	1854
Apprch %	35.4	64.6	0	0	0.1	82.9	17	0	0	0	100	0	0	0	100	0	
Total %	20.4	37.2	0	0	0.1	35.1	7.2	0	0	0	0.1	0	0	0	0.1	0	
Cars	366	679	0	0	1	640	130	0	0	0	0	0	0	0	1	0	1817
% Cars	96.8	98.4	0	0	100	98.5	97.7	0	0	0	0	0	0	0	100	0	98
Heavy Vehicles	12	11	0	0	0	10	3	0	0	0	1	0	0	0	0	0	37
% Heavy Vehicles	3.2	1.6	0	0	0	1.5	2.3	0	0	0	100	0	0	0	0	0	2

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

	Shawmut Avenue From North					Marginal Road From East					Shawmut Avenue From South					Marginal Road 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
05:00 PM	53	111	0	0	164	0	63	25	0	88	0	0	0	0	0	0	0	0	0	0	252
05:15 PM	60	80	0	0	140	1	81	19	0	101	0	0	0	0	0	0	0	0	0	0	241
05:30 PM	45	83	0	0	128	0	101	18	0	119	0	0	0	0	0	0	0	1	0	1	248
05:45 PM	44	67	0	0	111	0	102	14	0	116	0	0	0	0	0	0	0	0	0	0	227
Total Volume	202	341	0	0	543	1	347	76	0	424	0	0	0	0	0	0	0	1	0	1	968
% App. Total	37.2	62.8	0	0		0.2	81.8	17.9	0		0	0	0	0		0	0	100	0		
PHF	.842	.768	.000	.000	.828	.250	.850	.760	.000	.891	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.960
Cars	196	334	0	0	530	1	344	75	0	420	0	0	0	0	0	0	0	1	0	1	951
% Cars	97.0	97.9	0	0	97.6	100	99.1	98.7	0	99.1	0	0	0	0	0	0	0	100	0	100	98.2
Heavy Vehicles	6	7	0	0	13	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	17
% Heavy Vehicles	3.0	2.1	0	0	2.4	0	0.9	1.3	0	0.9	0	0	0	0	0	0	0	0	0	0	1.8

N/S: Shawmut Avenue
E/W: Marginal Road
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

File Name : 165421 GG
Site Code : TBA
Start Date : 1/5/2017
Page No : 1

Groups Printed- Peds and Bikes

	Shawmut Avenue From North					Marginal Road From East					Shawmut Avenue From South					Marginal Road 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	0	2	7	0	0	0	25	15	0	0	0	14	1	0	0	0	6	7	78
04:15 PM	0	1	0	3	5	0	0	0	23	7	0	0	0	9	3	0	0	0	2	12	65
04:30 PM	0	0	0	4	9	1	0	0	33	14	0	0	0	13	0	0	0	0	7	10	91
04:45 PM	0	1	0	6	8	0	0	0	33	15	0	0	0	11	2	0	0	0	8	13	97
Total	0	3	0	15	29	1	0	0	114	51	0	0	0	47	6	0	0	0	23	42	331
05:00 PM	0	0	0	5	1	0	0	0	29	18	0	1	0	11	3	0	0	0	6	21	95
05:15 PM	0	1	0	4	3	0	3	0	30	13	0	1	0	5	1	0	0	0	3	9	73
05:30 PM	0	1	0	2	14	0	4	0	31	23	0	0	0	8	3	0	0	0	1	12	99
05:45 PM	0	4	0	2	7	0	3	0	29	10	0	0	0	7	1	0	0	0	12	10	85
Total	0	6	0	13	25	0	10	0	119	64	0	2	0	31	8	0	0	0	22	52	352
Grand Total	0	9	0	28	54	1	10	0	233	115	0	2	0	78	14	0	0	0	45	94	683
Apprch %	0	9.9	0	30.8	59.3	0.3	2.8	0	64.9	32	0	2.1	0	83	14.9	0	0	0	32.4	67.6	
Total %	0	1.3	0	4.1	7.9	0.1	1.5	0	34.1	16.8	0	0.3	0	11.4	2	0	0	0	6.6	13.8	

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

	Shawmut Avenue From North						Marginal Road From East						Shawmut Avenue From South						Marginal Road 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
04:45 PM	0	1	0	6	8	15	0	0	0	33	15	48	0	0	0	11	2	13	0	0	0	8	13	21	97
05:00 PM	0	0	0	5	1	6	0	0	0	29	18	47	0	1	0	11	3	15	0	0	0	6	21	27	95
05:15 PM	0	1	0	4	3	8	0	3	0	30	13	46	0	1	0	5	1	7	0	0	0	3	9	12	73
05:30 PM	0	1	0	2	14	17	0	4	0	31	23	58	0	0	0	8	3	11	0	0	0	1	12	13	99
Total Volume	0	3	0	17	26	46	0	7	0	123	69	199	0	2	0	35	9	46	0	0	0	18	55	73	364
% App. Total	0	6.5	0	37	56.5		0	3.5	0	61.8	34.7		0	4.3	0	76.1	19.6		0	0	0	24.7	75.3		
PHF	.000	.750	.000	.708	.464	.676	.000	.438	.000	.932	.750	.858	.000	.500	.000	.795	.750	.767	.000	.000	.000	.563	.655	.676	.919

N/S: Shawmut Avenue
E/W: Marginal Road
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Santos

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
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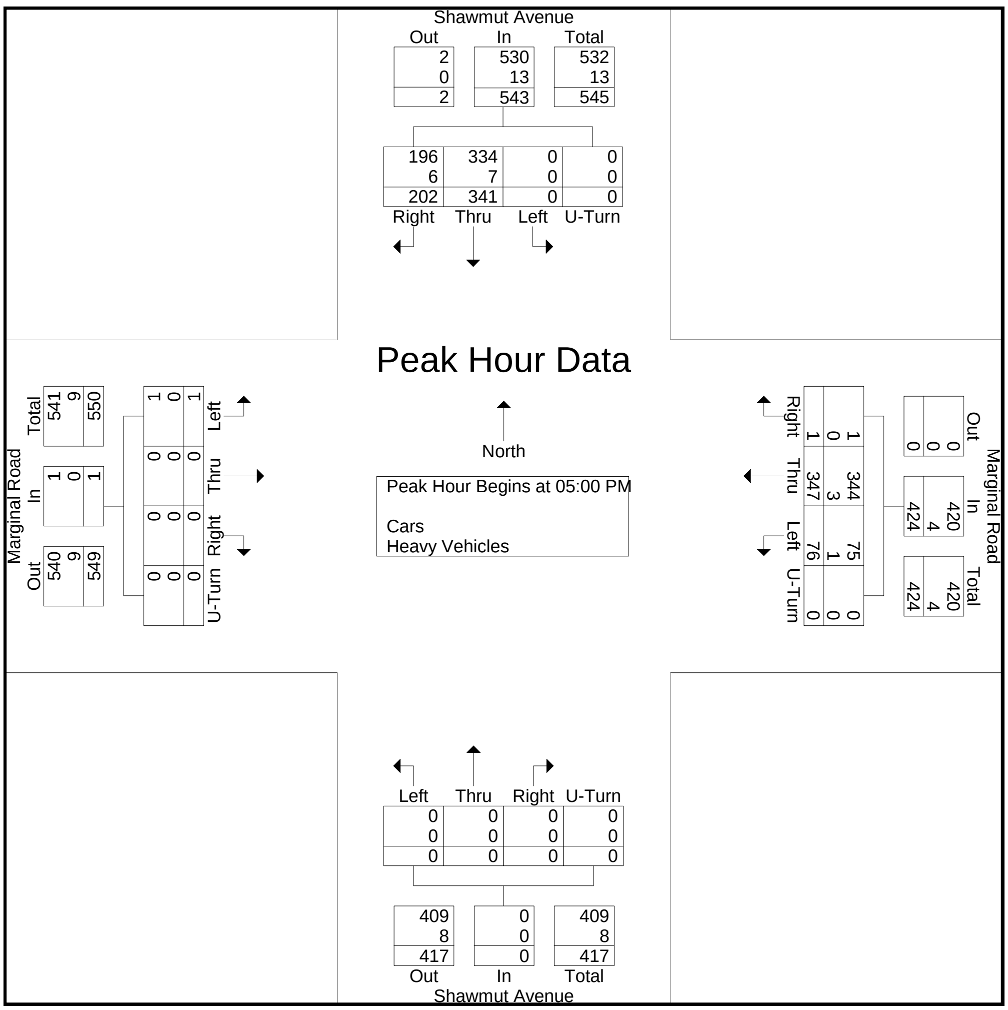
File Name : 165421 GG
Site Code : TBA
Start Date : 1/5/2017

	Shawmut Avenue From North					Marginal Road From East					Shawmut Avenue From South					Marginal Road 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 05:00 PM																					
05:00 PM	53	111	0	0	164	0	63	25	0	88	0	0	0	0	0	0	0	0	0	0	252
05:15 PM	60	80	0	0	140	1	81	19	0	101	0	0	0	0	0	0	0	0	0	0	241
05:30 PM	45	83	0	0	128	0	101	18	0	119	0	0	0	0	0	0	0	1	0	1	248
05:45 PM	44	67	0	0	111	0	102	14	0	116	0	0	0	0	0	0	0	0	0	0	227
Total Volume	202	341	0	0	543	1	347	76	0	424	0	0	0	0	0	0	0	1	0	1	968
% App. Total	37.2	62.8	0	0		0.2	81.8	17.9	0		0	0	0	0		0	0	100	0		
PHF	.842	.768	.000	.000	.828	.250	.850	.760	.000	.891	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.960
Cars	196	334	0	0	530	1	344	75	0	420	0	0	0	0	0	0	0	1	0	1	951
% Cars	97.0	97.9	0	0	97.6	100	99.1	98.7	0	99.1	0	0	0	0	0	0	0	100	0	100	98.2
Heavy Vehicles	6	7	0	0	13	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	17
% Heavy Vehicles	3.0	2.1	0	0	2.4	0	0.9	1.3	0	0.9	0	0	0	0	0	0	0	0	0	0	1.8



Trip Generation - Existing Program

112 Shawmut Avenue, South End

Existing Trip Generation Assessment

HOWARD STEIN HUDSON

11-Aug-2017

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Primary Person Trips	Transit Share[3]	Transit Person-Trips	Walk/Bike/ Other Share[3]	Walk/ Bike/ Other Trips	Auto Share[3]	Auto Person-Trips	Assumed Local Auto Occupancy Rate[4]	Total Adjusted Auto Trips
Daily Peak Hour																
Office Building[5]	70	Total		11.030	772	1.13	**872**	**872**	17%	**148**	43%	**376**	40%	**348**	1.13	**308**
	KSF	In	50%	5.515	386	1.13	**436**	**436**	17%	**74**	43%	**188**	40%	**174**	1.13	**154**
		Out	50%	5.515	386	1.13	**436**	**436**	17%	**74**	43%	**188**	40%	**174**	1.13	**154**
Total		Total			**772**		**872**	**872**		**148**		**376**		**348**		**308**
		In			**386**		**436**	**436**		**74**		**188**		**174**		**154**
		Out			**386**		**436**	**436**		**74**		**188**		**174**		**154**
AM Peak Hour																
Office Building[5]	70	Total		1.56	109	1.13	**123**	**123**		**18**		**48**		**57**	1.13	**51**
	KSF	In	88%	1.373	96	1.13	**108**	**108**	16%	**17**	33%	**36**	51%	**55**	1.13	**49**
		Out	12%	0.187	13	1.13	**15**	**15**	7%	**1**	79%	**12**	14%	**2**	1.13	**2**
Total		Total			**109**		**123**	**123**		**18**		**48**		**57**		**51**
		In			**96**		**108**	**108**		**17**		**36**		**55**		**49**
		Out			**13**		**15**	**15**		**1**		**12**		**2**		**2**
PM Peak Hour																
Office Building[5]	70	Total		1.49	105	1.13	**118**	**118**		**17**		**48**		**53**	1.13	**47**
	KSF	In	17%	0.253	18	1.13	**20**	**20**	7%	**1**	79%	**16**	14%	**3**	1.13	**3**
		Out	83%	1.237	87	1.13	**98**	**98**	16%	**16**	33%	**32**	51%	**50**	1.13	**44**
Total		Total			**105**		**118**	**118**		**17**		**48**		**53**		**47**
		In			**18**		**20**	**20**		**1**		**16**		**3**		**3**
		Out			**87**		**98**	**98**		**16**		**32**		**50**		**44**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Based on ITE Trip Generation Handbook, 3rd Edition method
3. Mode shares based on peak-hour BTD Data for Area 3
4. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates
5. ITE Trip Generation Manual, 9th Edition, LUC 710 (General Office Building), average rate

Trip Generation - Proposed Program

112 Shawmut Avenue, South End

Proposed Trip Generation Assessment

HOWARD STEIN HUDSON

9-Jan-2017

xx HARD CODED TO BALANCE (Manually change formatting)

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Primary Person Trips	Transit Share[3]	Transit Person-Trips	Walk/Bike/ Other Share[3]	Walk/ Bike/ Other Trips	Auto Share[3]	Auto Person-Trips	Assumed Local Auto Occupancy Rate[4]	Total Adjusted Auto Trips
Daily Peak Hour																
Apartment[5]	157	Total		6.650	1,044	1.13	**1,180**	**1,180**	17%	**200**	48%	**566**	35%	**414**	1.13	**366**
	units	In	50%	3.325	522	1.13	**590**	**590**	17%	**100**	48%	**283**	35%	**207**	1.13	**183**
		Out	50%	3.325	522	1.13	**590**	**590**	17%	**100**	48%	**283**	35%	**207**	1.13	**183**
Shopping Center[6]	1	Total		42.700	42	1.78	**74**	**74**	17%	**12**	43%	**32**	40%	**30**	1.78	**16**
	KSF	In	50%	21.350	21	1.78	**37**	**37**	17%	**6**	43%	**16**	40%	**15**	1.78	**8**
		Out	50%	21.350	21	1.78	**37**	**37**	17%	**6**	43%	**16**	40%	**15**	1.78	**8**
Total		Total			**1,086**		**1,254**	**1,254**		**212**		**598**		**444**		**382**
		In			**543**		**627**	**627**		**106**		**299**		**222**		**191**
		Out			**543**		**627**	**627**		**106**		**299**		**222**		**191**
AM Peak Hour																
Apartment[5]	157	Total		0.51	80	1.13	**90**	**90**		**12**		**54**		**24**	1.13	**21**
	units	In	20%	0.102	16	1.13	**18**	**18**	17%	**3**	38%	**7**	45%	**8**	1.13	**7**
		Out	80%	0.408	64	1.13	**72**	**72**	13%	**9**	65%	**47**	22%	**16**	1.13	**14**
Shopping Center[6]	1	Total		0.96	1	1.78	**2**	**2**		**0**		**1**		**1**	1.78	**1**
	KSF	In	62%	0.595	1	1.78	**2**	**2**	16%	**0**	33%	**1**	51%	**1**	1.78	**1**
		Out	38%	0.365	0	1.78	**0**	**0**	7%	**0**	79%	**0**	14%	**0**	1.78	**0**
Total		Total			**81**		**92**	**92**		**12**		**55**		**25**		**22**
		In			**17**		**20**	**20**		**3**		**8**		**9**		**8**
		Out			**64**		**72**	**72**		**9**		**47**		**16**		**14**
PM Peak Hour																
Apartment[5]	157	Total		0.62	97	1.13	**109**	**109**		**15**		**60**		**34**	1.13	**30**
	units	In	65%	0.403	63	1.13	**71**	**71**	13%	**9**	65%	**46**	22%	**16**	1.13	**14**
		Out	35%	0.217	34	1.13	**38**	**38**	17%	**6**	38%	**14**	45%	**18**	1.13	**16**
Shopping Center[6]	1	Total		3.71	4	1.78	**8**	**8**		**1**		**4**		**3**	1.78	**2**
	KSF	In	48%	1.781	2	1.78	**4**	**4**	7%	**0**	79%	**3**	14%	**1**	1.78	**1**
		Out	52%	1.929	2	1.78	**4**	**4**	16%	**1**	33%	**1**	51%	**2**	1.78	**1**
Total		Total			**101**		**117**	**117**		**16**		**64**		**37**		**32**
		In			**65**		**75**	**75**		**9**		**49**		**17**		**15**
		Out			**36**		**42**	**42**		**7**		**15**		**20**		**17**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Based on ITE Trip Generation Handbook, 3rd Edition method
3. Mode shares based on peak-hour BTD Data for Area 3
4. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates
5. ITE Trip Generation Manual, 9th Edition, LUC 220 (Apartment), average rate
6. ITE Trip Generation Manual, 9th Edition, LUC 820 (Shopping Center), average rate

Synchro Intersection Level of Service Reports

- Existing (2017) Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	29	754	140	0	0	0	0	448	339	33	133	0	
Future Volume (vph)	29	754	140	0	0	0	0	448	339	33	133	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	
Ped Bike Factor		0.99						0.95			1.00		
Frt		0.977						0.935					
Flt Protected		0.998									0.990		
Satd. Flow (prot)	0	5974	0	0	0	0	0	3079	0	0	3340	0	
Flt Permitted		0.998									0.690		
Satd. Flow (perm)	0	5965	0	0	0	0	0	3079	0	0	2317	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		50						207					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		207			774			883			176		
Travel Time (s)		4.7			17.6			20.1			4.0		
Confl. Peds. (#/hr)	59		91						117	117			
Confl. Bikes (#/hr)			1										
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94	0.81	0.81	0.81	
Heavy Vehicles (%)	4%	5%	7%	2%	2%	2%	0%	6%	2%	3%	8%	0%	
Parking (#/hr)						0							
Adj. Flow (vph)	31	802	149	0	0	0	0	477	361	41	164	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	982	0	0	0	0	0	838	0	0	205	0	
Turn Type	Split	NA						NA		Perm	NA		
Protected Phases	1	1						5			5		2
Permitted Phases										5			
Detector Phase	1	1						5		5	5		
Switch Phase													
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0		8.0
Minimum Split (s)	41.0	41.0						38.0		38.0	38.0		21.0
Total Split (s)	41.0	41.0						38.0		38.0	38.0		21.0
Total Split (%)	41.0%	41.0%						38.0%		38.0%	38.0%		21%
Maximum Green (s)	36.0	36.0						34.0		34.0	34.0		14.0
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0						1.0		1.0	1.0		4.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						4.0			4.0		
Lead/Lag	Lead	Lead											Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0						2.0		2.0	2.0		0.2
Recall Mode	C-Max	C-Max						Max		Max	Max		None
Walk Time (s)	27.0	27.0						25.0		25.0	25.0		5.0
Flash Dont Walk (s)	9.0	9.0						9.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0	0						0		0	0		357
Act Effct Green (s)		36.0						34.0			34.0		
Actuated g/C Ratio		0.36						0.34			0.34		
v/c Ratio		0.45						0.71			0.26		
Control Delay		23.9						11.5			25.0		
Queue Delay		0.0						0.0			0.0		
Total Delay		23.9						11.5			25.0		
LOS		C						B			C		
Approach Delay		23.9						11.5			25.0		
Approach LOS		C						B			C		
Queue Length 50th (ft)		129						140			49		
Queue Length 95th (ft)		161						m138			70		
Internal Link Dist (ft)		127			694			803			96		
Turn Bay Length (ft)													
Base Capacity (vph)		2182						1183			787		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.45						0.71			0.26		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 5 (5%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

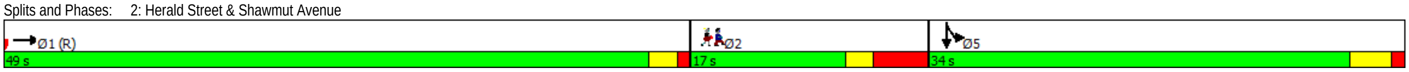
Splits and Phases: 1: Tremont Street & Arlington Street/Herald Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	1027	61	0	0	0	0	0	0	216	75	0	
Future Volume (vph)	0	1027	61	0	0	0	0	0	0	216	75	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	
Ped Bike Factor		0.99								0.87			
Frt		0.992											
Flt Protected										0.950			
Satd. Flow (prot)	0	4927	0	0	0	0	0	0	0	3213	3574	0	
Flt Permitted										0.950			
Satd. Flow (perm)	0	4927	0	0	0	0	0	0	0	2801	3574	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		12								263			
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		774			148			1006			279		
Travel Time (s)		17.6			3.4			22.9			6.3		
Confl. Peds. (#/hr)			86							128			
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.82	0.82	0.82	
Heavy Vehicles (%)	0%	4%	0%	2%	2%	2%	2%	2%	2%	9%	1%	0%	
Adj. Flow (vph)	0	1093	65	0	0	0	0	0	0	263	91	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1158	0	0	0	0	0	0	0	263	91	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								2.0	2.0		1.0
Minimum Split (s)		49.0								34.0	34.0		17.0
Total Split (s)		49.0								34.0	34.0		17.0
Total Split (%)		49.0%								34.0%	34.0%		17%
Maximum Green (s)		46.0								30.0	30.0		11.0
Yellow Time (s)		2.0								3.0	3.0		2.0
All-Red Time (s)		1.0								1.0	1.0		4.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		3.0								4.0	4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		2.0								2.0	2.0		0.2
Recall Mode		C-Max								Max	Max		None
Walk Time (s)		35.0								21.0	21.0		5.0
Flash Dont Walk (s)		11.0								9.0	9.0		6.0
Pedestrian Calls (#/hr)		0								0	0		373
Act Effct Green (s)		46.0								30.0	30.0		
Actuated g/C Ratio		0.46								0.30	0.30		
v/c Ratio		0.51								0.23	0.08		
Control Delay		8.6								5.9	18.1		
Queue Delay		0.1								0.0	0.0		
Total Delay		8.7								5.9	18.1		
LOS		A								A	B		
Approach Delay		8.7									9.1		
Approach LOS		A									A		
Queue Length 50th (ft)		106								0	21		
Queue Length 95th (ft)		106								0	36		
Internal Link Dist (ft)		694			68			926			199		
Turn Bay Length (ft)													
Base Capacity (vph)		2272								1148	1072		
Starvation Cap Reductn		0								0	0		
Spillback Cap Reductn		242								12	0		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.57								0.23	0.08		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 1:EBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 8.8 Intersection LOS: A
Intersection Capacity Utilization 51.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: Herald Street & Shawmut Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↑						↑↑	↱		↑	
Traffic Volume (vph)	100	1131	0	0	0	0	0	626	65	0	14	0
Future Volume (vph)	100	1131	0	0	0	0	0	626	65	0	14	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	11	11	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.68			
Frt									0.850			
Flt Protected		0.996										
Satd. Flow (prot)	0	4189	0	0	0	0	0	2881	1243	0	919	0
Flt Permitted		0.996										
Satd. Flow (perm)	0	4184	0	0	0	0	0	2881	843	0	919	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									33			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		200			204			253			221	
Travel Time (s)		4.5			4.6			5.8			5.0	
Confl. Peds. (#/hr)	12								165			
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.86	0.86	0.86	0.75	0.75	0.75
Heavy Vehicles (%)	6%	6%	0%	0%	0%	0%	0%	9%	13%	0%	86%	0%
Bus Blockages (#/hr)	0	9	9	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	106	1203	0	0	0	0	0	728	76	0	19	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1309	0	0	0	0	0	728	76	0	19	0
Turn Type	Split	NA						NA	Perm		NA	
Protected Phases	6	6						1			1	
Permitted Phases									1			
Detector Phase	6	6						1	1		1	
Switch Phase												
Minimum Initial (s)	8.0	8.0						8.0	8.0		8.0	
Minimum Split (s)	31.0	31.0						19.0	19.0		19.0	
Total Split (s)	50.0	50.0						50.0	50.0		50.0	
Total Split (%)	50.0%	50.0%						50.0%	50.0%		50.0%	
Maximum Green (s)	44.0	44.0						44.0	44.0		44.0	
Yellow Time (s)	3.0	3.0						3.0	3.0		3.0	
All-Red Time (s)	3.0	3.0						3.0	3.0		3.0	
Lost Time Adjust (s)		-1.0						-1.0	-1.0		-1.0	
Total Lost Time (s)		5.0						5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0						2.0	2.0		2.0	
Recall Mode	Max	Max						C-Max	C-Max		C-Max	
Walk Time (s)	20.0	20.0						8.0	8.0		8.0	
Flash Dont Walk (s)	5.0	5.0						5.0	5.0		5.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)		45.0						45.0	45.0		45.0	
Actuated g/C Ratio		0.45						0.45	0.45		0.45	
v/c Ratio		0.69						0.56	0.19		0.05	
Control Delay		12.7						22.3	11.6		16.0	
Queue Delay		0.3						0.0	0.0		0.0	
Total Delay		13.0						22.3	11.6		16.0	
LOS		B						C	B		B	
Approach Delay		13.0						21.3			16.0	
Approach LOS		B						C			B	
Queue Length 50th (ft)		160						174	15		7	
Queue Length 95th (ft)		187						217	42		17	
Internal Link Dist (ft)		120			124			173			141	
Turn Bay Length (ft)												
Base Capacity (vph)		1885						1296	397		413	
Starvation Cap Reductn		166						0	0		0	
Spillback Cap Reductn		0						0	0		0	
Storage Cap Reductn		0						0	0		0	
Reduced v/c Ratio		0.76						0.56	0.19		0.05	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 69 (69%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 54.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Washington Street & Herald Street

Ø1 (R)	Ø6
50 s	50 s

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	0	1017	0	64	0	0	0	0	103	
Future Volume (vph)	0	0	0	0	1017	0	64	0	0	0	0	103	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							0.88						
Frt												0.865	
Flt Protected							0.950						
Satd. Flow (prot)	0	0	0	0	4322	0	1593	0	0	0	0	1450	
Flt Permitted							0.950						
Satd. Flow (perm)	0	0	0	0	4322	0	1395	0	0	0	0	1450	
Right Turn on Red			Yes			Yes	Yes		Yes			Yes	
Satd. Flow (RTOR)							304					304	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		829			264			598			1006		
Travel Time (s)		18.8			6.0			13.6			22.9		
Confl. Peds. (#/hr)							62					62	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.86	0.86	0.86	0.69	0.69	0.69	
Heavy Vehicles (%)	0%	0%	0%	0%	8%	0%	2%	0%	0%	0%	0%	2%	
Adj. Flow (vph)	0	0	0	0	1143	0	74	0	0	0	0	149	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	1143	0	74	0	0	0	0	149	
Turn Type					NA		Prot					Prot	
Protected Phases					1		5!					5!	2
Permitted Phases													
Detector Phase					1		5					5	
Switch Phase													
Minimum Initial (s)					8.0		8.0					8.0	1.0
Minimum Split (s)					54.0		20.0					20.0	22.0
Total Split (s)					54.0		24.0					24.0	22.0
Total Split (%)					54.0%		24.0%					24.0%	22%
Maximum Green (s)					49.0		19.0					19.0	16.0
Yellow Time (s)					3.0		3.0					3.0	2.0
All-Red Time (s)					2.0		2.0					2.0	4.0
Lost Time Adjust (s)					0.0		0.0					0.0	
Total Lost Time (s)					5.0		5.0					5.0	
Lead/Lag					Lead								Lag
Lead-Lag Optimize?													
Vehicle Extension (s)					2.0		2.0					2.0	0.2
Recall Mode					C-Max		None					None	None
Walk Time (s)					39.0		8.0					8.0	7.0
Flash Dont Walk (s)					10.0		7.0					7.0	9.0
Pedestrian Calls (#/hr)					0		0					0	298
Act Effct Green (s)					60.0		8.0					8.0	
Actuated g/C Ratio					0.60		0.08					0.08	
v/c Ratio					0.44		0.18					0.38	
Control Delay					11.5		1.0					8.9	
Queue Delay					0.0		0.0					0.0	
Total Delay					11.5		1.0					8.9	
LOS					B		A					A	
Approach Delay					11.5			1.0			8.9		
Approach LOS					B			A			A		
Queue Length 50th (ft)					134		0					0	
Queue Length 95th (ft)					163		0					0	
Internal Link Dist (ft)		749			184			518			926		
Turn Bay Length (ft)													
Base Capacity (vph)					2593		548					521	
Starvation Cap Reductn					0		0					0	
Spillback Cap Reductn					0		0					0	
Storage Cap Reductn					0		0					0	
Reduced v/c Ratio					0.44		0.14					0.29	

Intersection Summary

Area Type: CBD	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 53 (53%), Referenced to phase 1:WBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 49.8%	ICU Level of Service A
Analysis Period (min) 15	

! Phase conflict between lane groups.

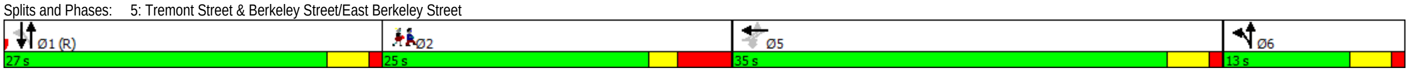
Splits and Phases: 4: Shawmut Avenue & East Berkeley Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	15	0	8	265	747	172	130	559	0	0	227	63	
Future Volume (vph)	15	0	8	265	747	172	130	559	0	0	227	63	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	
Ped Bike Factor											0.99		
Frt			0.850		0.972						0.967		
Flt Protected	0.950			0.950				0.991					
Satd. Flow (prot)	1624	0	1163	1547	2957	0	0	3090	0	0	2860	0	
Flt Permitted	0.129			0.950				0.718					
Satd. Flow (perm)	221	0	1163	1547	2957	0	0	2239	0	0	2860	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			120		29						33		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		647			829			409			883		
Travel Time (s)		14.7			18.8			9.3			20.1		
Confl. Peds. (#/hr)												40	
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.93	0.93	0.93	0.89	0.89	0.89	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	0%	25%	5%	7%	6%	5%	4%	0%	0%	7%	13%	
Adj. Flow (vph)	18	0	10	285	803	185	146	628	0	0	270	75	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	18	0	10	285	988	0	0	774	0	0	345	0	
Turn Type	D.Pm		Perm	Perm	NA		pm+pt	NA			NA		
Protected Phases					5		6	1 6			1		2
Permitted Phases	5		5	5			1 6						
Detector Phase	5		5	5	5		6	1 6			1		
Switch Phase													
Minimum Initial (s)	5.0		5.0	5.0	5.0		4.0				10.0		1.0
Minimum Split (s)	9.0		9.0	9.0	9.0		8.0				27.0		25.0
Total Split (s)	35.0		35.0	35.0	35.0		13.0				27.0		25.0
Total Split (%)	35.0%		35.0%	35.0%	35.0%		13.0%				27.0%		25%
Maximum Green (s)	31.0		31.0	31.0	31.0		9.0				23.0		19.0
Yellow Time (s)	3.0		3.0	3.0	3.0		3.0				3.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0				1.0		4.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0						0.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0						4.0		
Lead/Lag											Lead		Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0		2.0	2.0	2.0		2.0				2.0		0.2
Recall Mode	None		None	None	None		None				C-Max		None
Walk Time (s)											17.0		8.0
Flash Dont Walk (s)											6.0		11.0
Pedestrian Calls (#/hr)											0		301
Act Effct Green (s)	31.0		31.0	31.0	31.0			32.0			23.0		
Actuated g/C Ratio	0.31		0.31	0.31	0.31			0.32			0.23		
v/c Ratio	0.26		0.02	0.59	1.06			0.98			0.51		
Control Delay	38.1		0.1	36.2	79.3			58.9			41.5		
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0		
Total Delay	38.1		0.1	36.2	79.3			58.9			41.5		
LOS	D		A	D	E			E			D		
Approach Delay		24.5			69.6			58.9			41.5		
Approach LOS		C			E			E			D		
Queue Length 50th (ft)	9		0	174	~369			218			111		
Queue Length 95th (ft)	28		0	277	#500			#350			148		
Internal Link Dist (ft)		567			749			329			803		
Turn Bay Length (ft)													
Base Capacity (vph)	68		443	479	936			793			683		
Starvation Cap Reductn	0		0	0	0			0			0		
Spillback Cap Reductn	0		0	0	0			0			0		
Storage Cap Reductn	0		0	0	0			0			0		
Reduced v/c Ratio	0.26		0.02	0.59	1.06			0.98			0.51		

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 51 (51%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 61.7 Intersection LOS: E
Intersection Capacity Utilization 79.6% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Tremont Street & Berkeley Street/East Berkeley Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	83	313	0	0	0	0	0	208	77	
Future Volume (vph)	0	0	0	83	313	0	0	0	0	0	208	77	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor					1.00						0.98		
Frt											0.959		
Flt Protected					0.990								
Satd. Flow (prot)	0	0	0	0	3456	0	0	0	0	0	4579	0	
Flt Permitted					0.990								
Satd. Flow (perm)	0	0	0	0	3451	0	0	0	0	0	4579	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					39						81		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		266			231			279			323		
Travel Time (s)		6.0			5.3			6.3			7.3		
Confl. Peds. (#/hr)				9								59	
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92	0.95	0.95	0.95	
Heavy Vehicles (%)	2%	2%	2%	5%	3%	2%	2%	2%	2%	0%	8%	3%	
Adj. Flow (vph)	0	0	0	95	360	0	0	0	0	0	219	81	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	455	0	0	0	0	0	300	0	
Turn Type				Split	NA						NA		
Protected Phases				1	1						5		2
Permitted Phases													
Detector Phase				1	1						5		
Switch Phase													
Minimum Initial (s)				10.0	10.0						10.0		1.0
Minimum Split (s)				43.0	43.0						35.0		22.0
Total Split (s)				43.0	43.0						35.0		22.0
Total Split (%)				43.0%	43.0%						35.0%		22%
Maximum Green (s)				39.0	39.0						31.0		20.0
Yellow Time (s)				3.0	3.0						3.0		2.0
All-Red Time (s)				1.0	1.0						1.0		0.0
Lost Time Adjust (s)					0.0						0.0		
Total Lost Time (s)					4.0						4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				2.0	2.0						2.0		0.2
Recall Mode				C-Max	C-Max						Max		None
Walk Time (s)				28.0	28.0						23.0		13.0
Flash Dont Walk (s)				11.0	11.0						8.0		7.0
Pedestrian Calls (#/hr)				0	0						0		315
Act Effct Green (s)					39.0						31.0		
Actuated g/C Ratio					0.39						0.31		
v/c Ratio					0.33						0.20		
Control Delay					20.2						18.7		
Queue Delay					0.0						0.0		
Total Delay					20.2						18.7		
LOS					C						B		
Approach Delay					20.2						18.7		
Approach LOS					C						B		
Queue Length 50th (ft)					95						36		
Queue Length 95th (ft)					129						59		
Internal Link Dist (ft)		186			151			199			243		
Turn Bay Length (ft)													
Base Capacity (vph)					1371						1475		
Starvation Cap Reductn					0						0		
Spillback Cap Reductn					0						0		
Storage Cap Reductn					0						0		
Reduced v/c Ratio					0.33						0.20		

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 81 (81%), Referenced to phase 1:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Shawmut Avenue & Marginal Road

Ø1 (R)	Ø2	Ø5
43 s	22 s	35 s

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1228	49	0	0	0	2
Future Volume (Veh/h)	1228	49	0	0	0	2
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.38
Hourly flow rate (vph)	1279	51	0	0	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	148			200		
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			1330		1304	452
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			728		698	0
tC, single (s)			4.1		6.8	7.6
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.6
p0 queue free %			100		100	99
cM capacity (veh/h)			732		319	833

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	512	512	307	5
Volume Left	0	0	0	0
Volume Right	0	0	51	5
cSH	1700	1700	1700	833
Volume to Capacity	0.30	0.30	0.18	0.01
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	9.3
Lane LOS				A
Approach Delay (s)	0.0			9.3
Approach LOS				A

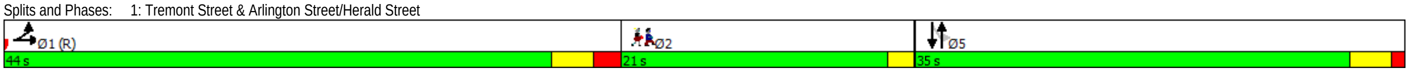
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	55	863	207	0	0	0	0	346	200	9	231	0	
Future Volume (vph)	55	863	207	0	0	0	0	346	200	9	231	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	
Ped Bike Factor		0.98						0.95			1.00		
Frt		0.972						0.945					
Flt Protected		0.998									0.998		
Satd. Flow (prot)	0	6122	0	0	0	0	0	3148	0	0	3437	0	
Flt Permitted		0.998									0.931		
Satd. Flow (perm)	0	6114	0	0	0	0	0	3148	0	0	3201	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		67						119					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		230			765			886			173		
Travel Time (s)		5.2			17.4			20.1			3.9		
Confl. Peds. (#/hr)	37		97						130	130			
Confl. Bikes (#/hr)			3										
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90	0.88	0.88	0.88	
Heavy Vehicles (%)	4%	2%	1%	2%	2%	2%	0%	3%	3%	0%	5%	0%	
Adj. Flow (vph)	59	918	220	0	0	0	0	384	222	10	263	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1197	0	0	0	0	0	606	0	0	273	0	
Turn Type	Split	NA						NA		Perm	NA		
Protected Phases	1	1						5			5		2
Permitted Phases										5			
Detector Phase	1	1						5		5	5		
Switch Phase													
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0		8.0
Minimum Split (s)	44.0	44.0						35.0		35.0	35.0		21.0
Total Split (s)	44.0	44.0						35.0		35.0	35.0		21.0
Total Split (%)	44.0%	44.0%						35.0%		35.0%	35.0%		21%
Maximum Green (s)	39.0	39.0						31.0		31.0	31.0		19.0
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0						1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						4.0			4.0		
Lead/Lag	Lead	Lead											Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0						2.0		2.0	2.0		0.2
Recall Mode	C-Max	C-Max						Max		Max	Max		None
Walk Time (s)	30.0	30.0						22.0		22.0	22.0		10.0
Flash Dont Walk (s)	9.0	9.0						9.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0	0						0		0	0		370
Act Effct Green (s)		39.0						31.0			31.0		
Actuated g/C Ratio		0.39						0.31			0.31		
v/c Ratio		0.49						0.57			0.28		
Control Delay		22.4						25.4			27.0		
Queue Delay		0.0						0.0			0.0		
Total Delay		22.4						25.4			27.0		
LOS		C						C			C		
Approach Delay		22.4						25.4			27.0		
Approach LOS		C						C			C		
Queue Length 50th (ft)		154						135			68		
Queue Length 95th (ft)		188						192			100		
Internal Link Dist (ft)		150			685			806			93		
Turn Bay Length (ft)													
Base Capacity (vph)		2428						1057			992		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.49						0.57			0.28		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 23.9 Intersection LOS: C
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Tremont Street & Arlington Street/Herald Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	1083	68	0	0	0	0	0	0	269	181	0	
Future Volume (vph)	0	1083	68	0	0	0	0	0	0	269	181	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	
Ped Bike Factor		0.99								0.90			
Frt		0.991											
Flt Protected										0.950			
Satd. Flow (prot)	0	4964	0	0	0	0	0	0	0	3367	3574	0	
Flt Permitted										0.950			
Satd. Flow (perm)	0	4964	0	0	0	0	0	0	0	3036	3574	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		14								332			
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		765			139			1015			271		
Travel Time (s)		17.4			3.2			23.1			6.2		
Confl. Peds. (#/hr)			100							82			
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	
Heavy Vehicles (%)	0%	3%	0%	2%	2%	2%	2%	2%	2%	4%	1%	0%	
Adj. Flow (vph)	0	1231	77	0	0	0	0	0	0	332	223	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1308	0	0	0	0	0	0	0	332	223	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								2.0	2.0		1.0
Minimum Split (s)		54.0								29.0	29.0		17.0
Total Split (s)		54.0								29.0	29.0		17.0
Total Split (%)		54.0%								29.0%	29.0%		17%
Maximum Green (s)		50.0								25.0	25.0		11.0
Yellow Time (s)		3.0								3.0	3.0		2.0
All-Red Time (s)		1.0								1.0	1.0		4.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		4.0								4.0	4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		2.0								2.0	2.0		0.2
Recall Mode		C-Max								Max	Max		None
Walk Time (s)		39.0								16.0	16.0		5.0
Flash Dont Walk (s)		11.0								9.0	9.0		6.0
Pedestrian Calls (#/hr)		0								0	0		399
Act Effct Green (s)		50.0								25.0	25.0		
Actuated g/C Ratio		0.50								0.25	0.25		
v/c Ratio		0.53								0.30	0.25		
Control Delay		6.7								1.2	19.9		
Queue Delay		0.0								0.2	0.0		
Total Delay		6.7								1.5	19.9		
LOS		A								A	B		
Approach Delay		6.7									8.9		
Approach LOS		A									A		
Queue Length 50th (ft)		76								2	30		
Queue Length 95th (ft)		86								4	38		
Internal Link Dist (ft)		685			59			935			191		
Turn Bay Length (ft)													
Base Capacity (vph)		2489								1090	893		
Starvation Cap Reductn		0								261	0		
Spillback Cap Reductn		87								5	0		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.54								0.40	0.25		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 1:EBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 7.4 Intersection LOS: A
Intersection Capacity Utilization 56.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Herald Street & Shawmut Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	1324	0	0	0	0	0	440	104	0	19	0
Future Volume (vph)	33	1324	0	0	0	0	0	440	104	0	19	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	11	11	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.67			
Frt									0.850			
Flt Protected		0.999										
Satd. Flow (prot)	0	4327	0	0	0	0	0	2855	1364	0	934	0
Flt Permitted		0.999										
Satd. Flow (perm)	0	4326	0	0	0	0	0	2855	911	0	934	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									33			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		203			204			266			224	
Travel Time (s)		4.6			4.6			6.0			5.1	
Confl. Peds. (#/hr)	8								188			
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.92	0.92	0.92	0.78	0.78	0.78
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	10%	3%	0%	83%	0%
Bus Blockages (#/hr)	0	9	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	37	1471	0	0	0	0	0	478	113	0	24	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1508	0	0	0	0	0	478	113	0	24	0
Turn Type	Split	NA						NA	Perm		NA	
Protected Phases	6	6						1			1	
Permitted Phases									1			
Detector Phase	6	6						1	1		1	
Switch Phase												
Minimum Initial (s)	8.0	8.0						8.0	8.0		8.0	
Minimum Split (s)	31.0	31.0						19.0	19.0		19.0	
Total Split (s)	58.0	58.0						42.0	42.0		42.0	
Total Split (%)	58.0%	58.0%						42.0%	42.0%		42.0%	
Maximum Green (s)	52.0	52.0						36.0	36.0		36.0	
Yellow Time (s)	3.0	3.0						3.0	3.0		3.0	
All-Red Time (s)	3.0	3.0						3.0	3.0		3.0	
Lost Time Adjust (s)		-1.0						-1.0	-1.0		-1.0	
Total Lost Time (s)		5.0						5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0						2.0	2.0		2.0	
Recall Mode	Max	Max						C-Max	C-Max		C-Max	
Walk Time (s)	20.0	20.0						8.0	8.0		8.0	
Flash Dont Walk (s)	5.0	5.0						5.0	5.0		5.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)		53.0						37.0	37.0		37.0	
Actuated g/C Ratio		0.53						0.37	0.37		0.37	
v/c Ratio		0.66						0.45	0.32		0.07	
Control Delay		5.6						25.6	18.7		21.2	
Queue Delay		0.0						0.0	0.0		0.0	
Total Delay		5.6						25.6	18.7		21.2	
LOS		A						C	B		C	
Approach Delay		5.6						24.2			21.2	
Approach LOS		A						C			C	
Queue Length 50th (ft)		59						119	35		10	
Queue Length 95th (ft)		69						166	81		24	
Internal Link Dist (ft)		123			124			186			144	
Turn Bay Length (ft)												
Base Capacity (vph)		2293						1056	357		345	
Starvation Cap Reductn		0						0	0		0	
Spillback Cap Reductn		0						0	0		0	
Storage Cap Reductn		0						0	0		0	
Reduced v/c Ratio		0.66						0.45	0.32		0.07	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 60 (60%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 11.0 Intersection LOS: B
Intersection Capacity Utilization 52.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Washington Street & Herald Street

Ø1 (R)	Ø6
42 s	58 s

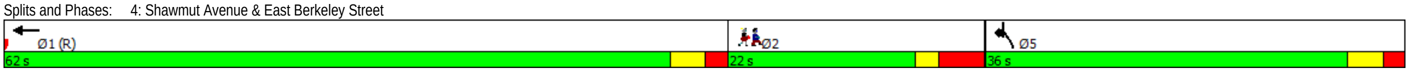
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL
Lane Configurations							
Traffic Volume (vph)	0	0	0	0	714	0	96
Future Volume (vph)	0	0	0	0	714	0	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	1.00	1.00
Ped Bike Factor							0.89
Frt							
Flt Protected							0.950
Satd. Flow (prot)	0	0	0	0	4532	0	1577
Flt Permitted							0.950
Satd. Flow (perm)	0	0	0	0	4532	0	1403
Right Turn on Red			Yes			Yes	Yes
Satd. Flow (RTOR)							328
Link Speed (mph)		30			30		
Link Distance (ft)		829			256		
Travel Time (s)		18.8			5.8		
Confl. Peds. (#/hr)							46
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.80
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	3%
Adj. Flow (vph)	0	0	0	0	811	0	120
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	0	811	0	120
Turn Type					NA		Prot
Protected Phases					1		5!
Permitted Phases							
Detector Phase					1		5
Switch Phase							
Minimum Initial (s)					8.0		8.0
Minimum Split (s)					62.0		20.0
Total Split (s)					62.0		36.0
Total Split (%)					51.7%		30.0%
Maximum Green (s)					57.0		31.0
Yellow Time (s)					3.0		3.0
All-Red Time (s)					2.0		2.0
Lost Time Adjust (s)					0.0		0.0
Total Lost Time (s)					5.0		5.0
Lead/Lag					Lead		
Lead-Lag Optimize?							
Vehicle Extension (s)					2.0		2.0
Recall Mode					C-Max		None
Walk Time (s)					47.0		8.0
Flash Dont Walk (s)					10.0		7.0
Pedestrian Calls (#/hr)					0		0
Act Effct Green (s)					79.9		8.1
Actuated g/C Ratio					0.67		0.07
v/c Ratio					0.27		0.29
Control Delay					8.4		1.8
Queue Delay					0.0		0.0
Total Delay					8.4		1.8
LOS					A		A
Approach Delay					8.4		
Approach LOS					A		
Queue Length 50th (ft)					85		0
Queue Length 95th (ft)					103		0
Internal Link Dist (ft)		749			176		
Turn Bay Length (ft)							
Base Capacity (vph)					3019		650
Starvation Cap Reductn					0		0
Spillback Cap Reductn					0		0
Storage Cap Reductn					0		0
Reduced v/c Ratio					0.27		0.18

Lane Group	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	240	
Future Volume (vph)	0	0	0	0	240	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor						
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	0	0	0	0	1465	
Flt Permitted						
Satd. Flow (perm)	0	0	0	0	1465	
Right Turn on Red		Yes			Yes	
Satd. Flow (RTOR)					328	
Link Speed (mph)	30			30		
Link Distance (ft)	598			1015		
Travel Time (s)	13.6			23.1		
Confl. Peds. (#/hr)					46	
Confl. Bikes (#/hr)					2	
Peak Hour Factor	0.80	0.80	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	0%	0%	0%	1%	
Adj. Flow (vph)	0	0	0	0	253	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	253	
Turn Type					Prot	
Protected Phases					5!	2
Permitted Phases						
Detector Phase					5	
Switch Phase						
Minimum Initial (s)					8.0	1.0
Minimum Split (s)					20.0	22.0
Total Split (s)					36.0	22.0
Total Split (%)					30.0%	18%
Maximum Green (s)					31.0	16.0
Yellow Time (s)					3.0	2.0
All-Red Time (s)					2.0	4.0
Lost Time Adjust (s)					0.0	
Total Lost Time (s)					5.0	
Lead/Lag						Lag
Lead-Lag Optimize?						
Vehicle Extension (s)					2.0	0.2
Recall Mode					None	None
Walk Time (s)					8.0	7.0
Flash Dont Walk (s)					7.0	9.0
Pedestrian Calls (#/hr)					0	240
Act Effct Green (s)					8.1	
Actuated g/C Ratio					0.07	
v/c Ratio					0.63	
Control Delay					8.8	
Queue Delay					0.0	
Total Delay					8.8	
LOS					A	
Approach Delay	1.8			8.8		
Approach LOS	A			A		
Queue Length 50th (ft)					0	
Queue Length 95th (ft)					21	
Internal Link Dist (ft)	518			935		
Turn Bay Length (ft)						
Base Capacity (vph)					621	
Starvation Cap Reductn					0	
Spillback Cap Reductn					0	
Storage Cap Reductn					0	
Reduced v/c Ratio					0.41	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 7.8 Intersection LOS: A
Intersection Capacity Utilization 53.2% ICU Level of Service A
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 4: Shawmut Avenue & East Berkeley Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	29	0	25	342	543	159	100	348	0	0	390	58	
Future Volume (vph)	29	0	25	342	543	159	100	348	0	0	390	58	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	
Ped Bike Factor					1.00			0.99			0.99		
Frt			0.850		0.966						0.981		
Flt Protected	0.950			0.950				0.989					
Satd. Flow (prot)	1624	0	1454	1593	3031	0	0	3126	0	0	3053	0	
Flt Permitted	0.143			0.950				0.628					
Satd. Flow (perm)	245	0	1454	1593	3031	0	0	1971	0	0	3053	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			100		34						14		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		647			829			409			886		
Travel Time (s)		14.7			18.8			9.3			20.1		
Confl. Peds. (#/hr)							77					77	
Confl. Bikes (#/hr)						2						4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.87	0.87	0.87	0.83	0.83	0.83	
Heavy Vehicles (%)	0%	0%	0%	2%	3%	4%	2%	3%	0%	0%	3%	4%	
Adj. Flow (vph)	39	0	33	389	617	181	115	400	0	0	470	70	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	39	0	33	389	798	0	0	515	0	0	540	0	
Turn Type	D.Pm		Perm	Perm	NA		pm+pt	NA			NA		
Protected Phases					5		6	1 6			1		2
Permitted Phases	5		5	5			1 6						
Detector Phase	5		5	5	5		6	1 6			1		
Switch Phase													
Minimum Initial (s)	5.0		5.0	5.0	5.0		4.0				10.0		1.0
Minimum Split (s)	9.0		9.0	9.0	9.0		8.0				38.0		25.0
Total Split (s)	44.0		44.0	44.0	44.0		13.0				38.0		25.0
Total Split (%)	36.7%		36.7%	36.7%	36.7%		10.8%				31.7%		21%
Maximum Green (s)	40.0		40.0	40.0	40.0		9.0				34.0		19.0
Yellow Time (s)	3.0		3.0	3.0	3.0		3.0				3.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0				1.0		4.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0						0.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0						4.0		
Lead/Lag											Lead		Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0		2.0	2.0	2.0		2.0				2.0		0.2
Recall Mode	None		None	None	None		None				C-Max		None
Walk Time (s)											28.0		8.0
Flash Dont Walk (s)											6.0		11.0
Pedestrian Calls (#/hr)											0		322
Act Effct Green (s)	36.3		36.3	36.3	36.3			46.7			37.7		
Actuated g/C Ratio	0.30		0.30	0.30	0.30			0.39			0.31		
v/c Ratio	0.53		0.06	0.81	0.85			0.60			0.56		
Control Delay	61.2		0.2	48.0	42.6			30.2			36.8		
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0		
Total Delay	61.2		0.2	48.0	42.6			30.2			36.8		
LOS	E		A	D	D			C			D		
Approach Delay		33.3			44.4			30.2			36.8		
Approach LOS		C			D			C			D		
Queue Length 50th (ft)	24		0	277	292			147			183		
Queue Length 95th (ft)	51		0	388	362			191			223		
Internal Link Dist (ft)		567			749			329			806		
Turn Bay Length (ft)													
Base Capacity (vph)	81		551	531	1033			852			967		
Starvation Cap Reductn	0		0	0	0			0			0		
Spillback Cap Reductn	0		0	0	0			0			0		
Storage Cap Reductn	0		0	0	0			0			0		
Reduced v/c Ratio	0.48		0.06	0.73	0.77			0.60			0.56		

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 75 (63%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: Tremont Street & Berkeley Street/East Berkeley Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	89	357	0	0	0	0	0	361	208	
Future Volume (vph)	0	0	0	89	357	0	0	0	0	0	361	208	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor					0.99						0.97		
Frt											0.945		
Flt Protected					0.990								
Satd. Flow (prot)	0	0	0	0	3539	0	0	0	0	0	4653	0	
Flt Permitted					0.990								
Satd. Flow (perm)	0	0	0	0	3513	0	0	0	0	0	4653	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					35						155		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		310			237			271			312		
Travel Time (s)		7.0			5.4			6.2			7.1		
Confl. Peds. (#/hr)				44								73	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.92	0.92	0.92	0.83	0.83	0.83	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	0%	2%	3%	
Adj. Flow (vph)	0	0	0	100	401	0	0	0	0	0	435	251	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	501	0	0	0	0	0	686	0	
Turn Type				Split	NA						NA		
Protected Phases				1	1						5		2
Permitted Phases													
Detector Phase				1	1						5		
Switch Phase													
Minimum Initial (s)				10.0	10.0						10.0		1.0
Minimum Split (s)				41.0	41.0						37.0		22.0
Total Split (s)				41.0	41.0						37.0		22.0
Total Split (%)				41.0%	41.0%						37.0%		22%
Maximum Green (s)				37.0	37.0						33.0		20.0
Yellow Time (s)				3.0	3.0						3.0		2.0
All-Red Time (s)				1.0	1.0						1.0		0.0
Lost Time Adjust (s)					0.0						0.0		
Total Lost Time (s)					4.0						4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				2.0	2.0						2.0		0.2
Recall Mode				C-Max	C-Max						Max		None
Walk Time (s)				26.0	26.0						25.0		13.0
Flash Dont Walk (s)				11.0	11.0						8.0		7.0
Pedestrian Calls (#/hr)				0	0						0		352
Act Effct Green (s)					37.0						33.0		
Actuated g/C Ratio					0.37						0.33		
v/c Ratio					0.38						0.42		
Control Delay					22.3						20.7		
Queue Delay					0.0						0.0		
Total Delay					22.3						20.7		
LOS					C						C		
Approach Delay					22.3						20.7		
Approach LOS					C						C		
Queue Length 50th (ft)					112						93		
Queue Length 95th (ft)					154						114		
Internal Link Dist (ft)		230			157			191			232		
Turn Bay Length (ft)													
Base Capacity (vph)					1331						1639		
Starvation Cap Reductn					0						0		
Spillback Cap Reductn					0						0		
Storage Cap Reductn					0						0		
Reduced v/c Ratio					0.38						0.42		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 1 (1%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.42
Intersection Signal Delay: 21.4 — Intersection LOS: C
Intersection Capacity Utilization 56.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Shawmut Avenue & Marginal Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1348	3	0	0	0	29
Future Volume (Veh/h)	1348	3	0	0	0	29
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	1481	3	0	0	0	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	139			203		
pX, platoon unblocked			0.83		0.83	0.83
vC, conflicting volume			1484		1482	495
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			858		856	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			645		249	903

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	592	592	299	39
Volume Left	0	0	0	0
Volume Right	0	0	3	39
cSH	1700	1700	1700	903
Volume to Capacity	0.35	0.35	0.18	0.04
Queue Length 95th (ft)	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	9.2
Lane LOS				A
Approach Delay (s)	0.0			9.2
Approach LOS				A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

- No-Build (2024) Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	31	870	150	0	0	0	0	480	388	41	143	0	
Future Volume (vph)	31	870	150	0	0	0	0	480	388	41	143	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	
Ped Bike Factor		0.99						0.95			1.00		
Frt		0.979						0.933					
Flt Protected		0.999									0.989		
Satd. Flow (prot)	0	5998	0	0	0	0	0	3069	0	0	3340	0	
Flt Permitted		0.999									0.625		
Satd. Flow (perm)	0	5989	0	0	0	0	0	3069	0	0	2102	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		47						221					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		207			774			883			176		
Travel Time (s)		4.7			17.6			20.1			4.0		
Confl. Peds. (#/hr)	59		91						117	117			
Confl. Bikes (#/hr)			1										
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94	0.81	0.81	0.81	
Heavy Vehicles (%)	4%	5%	7%	2%	2%	2%	0%	6%	2%	3%	8%	0%	
Parking (#/hr)						0							
Adj. Flow (vph)	33	926	160	0	0	0	0	511	413	51	177	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1119	0	0	0	0	0	924	0	0	228	0	
Turn Type	Split	NA						NA		Perm	NA		
Protected Phases	1	1						5			5		2
Permitted Phases										5			
Detector Phase	1	1						5		5	5		
Switch Phase													
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0		8.0
Minimum Split (s)	41.0	41.0						38.0		38.0	38.0		21.0
Total Split (s)	41.0	41.0						38.0		38.0	38.0		21.0
Total Split (%)	41.0%	41.0%						38.0%		38.0%	38.0%		21%
Maximum Green (s)	36.0	36.0						34.0		34.0	34.0		14.0
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0						1.0		1.0	1.0		4.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						4.0			4.0		
Lead/Lag	Lead	Lead											Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0						2.0		2.0	2.0		0.2
Recall Mode	C-Max	C-Max						Max		Max	Max		None
Walk Time (s)	27.0	27.0						25.0		25.0	25.0		5.0
Flash Dont Walk (s)	9.0	9.0						9.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0	0						0		0	0		357
Act Effct Green (s)		36.0						34.0			34.0		
Actuated g/C Ratio		0.36						0.34			0.34		
v/c Ratio		0.51						0.78			0.32		
Control Delay		24.9						22.3			26.0		
Queue Delay		0.0						0.0			0.0		
Total Delay		24.9						22.3			26.0		
LOS		C						C			C		
Approach Delay		24.9						22.3			26.0		
Approach LOS		C						C			C		
Queue Length 50th (ft)		153						291			56		
Queue Length 95th (ft)		187						m131			78		
Internal Link Dist (ft)		127			694			803			96		
Turn Bay Length (ft)													
Base Capacity (vph)		2189						1189			714		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.51						0.78			0.32		

Intersection Summary

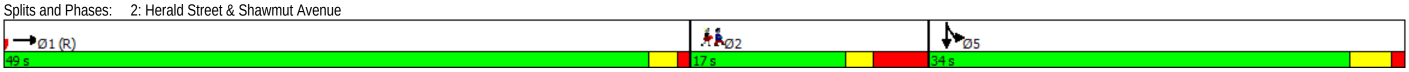
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 5 (5%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 24.0 Intersection LOS: C
Intersection Capacity Utilization 71.9% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Tremont Street & Arlington Street/Herald Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	1172	87	0	0	0	0	0	0	247	81	0	
Future Volume (vph)	0	1172	87	0	0	0	0	0	0	247	81	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	
Ped Bike Factor		0.99								0.87			
Frt		0.990											
Flt Protected										0.950			
Satd. Flow (prot)	0	4912	0	0	0	0	0	0	0	3213	3574	0	
Flt Permitted										0.950			
Satd. Flow (perm)	0	4912	0	0	0	0	0	0	0	2801	3574	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		16								301			
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		774			148			1006			279		
Travel Time (s)		17.6			3.4			22.9			6.3		
Confl. Peds. (#/hr)			86							128			
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.82	0.82	0.82	
Heavy Vehicles (%)	0%	4%	0%	2%	2%	2%	2%	2%	2%	9%	1%	0%	
Adj. Flow (vph)	0	1247	93	0	0	0	0	0	0	301	99	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1340	0	0	0	0	0	0	0	301	99	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								2.0	2.0		1.0
Minimum Split (s)		49.0								34.0	34.0		17.0
Total Split (s)		49.0								34.0	34.0		17.0
Total Split (%)		49.0%								34.0%	34.0%		17%
Maximum Green (s)		46.0								30.0	30.0		11.0
Yellow Time (s)		2.0								3.0	3.0		2.0
All-Red Time (s)		1.0								1.0	1.0		4.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		3.0								4.0	4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		2.0								2.0	2.0		0.2
Recall Mode		C-Max								Max	Max		None
Walk Time (s)		35.0								21.0	21.0		5.0
Flash Dont Walk (s)		11.0								9.0	9.0		6.0
Pedestrian Calls (#/hr)		0								0	0		373
Act Effct Green (s)		46.0								30.0	30.0		
Actuated g/C Ratio		0.46								0.30	0.30		
v/c Ratio		0.59								0.26	0.09		
Control Delay		8.6								6.2	17.9		
Queue Delay		0.3								0.4	0.0		
Total Delay		8.9								6.6	17.9		
LOS		A								A	B		
Approach Delay		8.9									9.4		
Approach LOS		A									A		
Queue Length 50th (ft)		121								0	23		
Queue Length 95th (ft)		115								13	39		
Internal Link Dist (ft)		694			68			926			199		
Turn Bay Length (ft)													
Base Capacity (vph)		2268								1174	1072		
Starvation Cap Reductn		0								455	0		
Spillback Cap Reductn		343								20	0		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.70								0.42	0.09		

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 1:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Herald Street & Shawmut Avenue

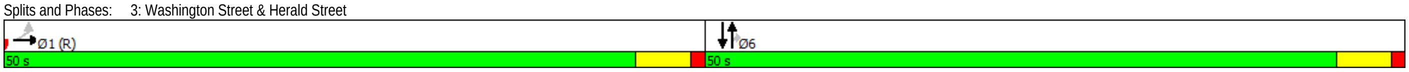


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	1223	77	0	0	0	0	700	93	0	19	0
Future Volume (vph)	108	1223	77	0	0	0	0	700	93	0	19	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	11	11	12	12	12
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.79			
Frt		0.992							0.850			
Flt Protected		0.996										
Satd. Flow (prot)	0	4169	0	0	0	0	0	1517	1243	0	919	0
Flt Permitted		0.996										
Satd. Flow (perm)	0	4166	0	0	0	0	0	1517	977	0	919	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12							23			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		200			204			253			221	
Travel Time (s)		4.5			4.6			5.8			5.0	
Confl. Peds. (#/hr)	12								165			
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.86	0.86	0.86	0.75	0.75	0.75
Heavy Vehicles (%)	6%	6%	0%	0%	0%	0%	0%	9%	13%	0%	86%	0%
Bus Blockages (#/hr)	0	9	9	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	115	1301	82	0	0	0	0	814	108	0	25	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1498	0	0	0	0	0	814	108	0	25	0
Turn Type	Perm	NA						NA	Perm		NA	
Protected Phases		1						6			6	
Permitted Phases	1								6			
Detector Phase	1	1						6	6		6	
Switch Phase												
Minimum Initial (s)	12.0	12.0						12.0	12.0		12.0	
Minimum Split (s)	50.0	50.0						29.0	29.0		29.0	
Total Split (s)	50.0	50.0						50.0	50.0		50.0	
Total Split (%)	50.0%	50.0%						50.0%	50.0%		50.0%	
Maximum Green (s)	45.0	45.0						45.0	45.0		45.0	
Yellow Time (s)	4.0	4.0						4.0	4.0		4.0	
All-Red Time (s)	1.0	1.0						1.0	1.0		1.0	
Lost Time Adjust (s)		-1.0						-1.0	-1.0		-1.0	
Total Lost Time (s)		4.0						4.0	4.0		4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0	3.0		3.0	
Recall Mode	C-Max	C-Max						None	None		None	
Walk Time (s)	36.0	36.0						15.0	15.0		15.0	
Flash Dont Walk (s)	9.0	9.0						9.0	9.0		9.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)		46.0						46.0	46.0		46.0	
Actuated g/C Ratio		0.46						0.46	0.46		0.46	
v/c Ratio		0.78						1.17	0.23		0.06	
Control Delay		14.5						118.0	14.3		15.6	
Queue Delay		1.1						0.0	0.0		0.0	
Total Delay		15.6						118.0	14.3		15.6	
LOS		B						F	B		B	
Approach Delay		15.6						105.9			15.6	
Approach LOS		B						F			B	
Queue Length 50th (ft)		337						~620	31		9	
Queue Length 95th (ft)		400						#793	64		20	
Internal Link Dist (ft)		120			124			173			141	
Turn Bay Length (ft)												
Base Capacity (vph)		1922						697	461		422	
Starvation Cap Reductn		202						0	0		0	
Spillback Cap Reductn		0						0	0		0	
Storage Cap Reductn		0						0	0		0	
Reduced v/c Ratio		0.87						1.17	0.23		0.06	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 19 (19%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 49.7 Intersection LOS: D
Intersection Capacity Utilization 78.2% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Herald Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	0	1116	0	72	0	0	0	0	121	
Future Volume (vph)	0	0	0	0	1116	0	72	0	0	0	0	121	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							0.88						
Frt												0.865	
Flt Protected							0.950						
Satd. Flow (prot)	0	0	0	0	4322	0	1593	0	0	0	0	1450	
Flt Permitted							0.950						
Satd. Flow (perm)	0	0	0	0	4322	0	1395	0	0	0	0	1450	
Right Turn on Red			Yes			Yes	Yes		Yes			Yes	
Satd. Flow (RTOR)							295					295	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		829			264			598			1006		
Travel Time (s)		18.8			6.0			13.6			22.9		
Confl. Peds. (#/hr)							62					62	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.86	0.86	0.86	0.69	0.69	0.69	
Heavy Vehicles (%)	0%	0%	0%	0%	8%	0%	2%	0%	0%	0%	0%	2%	
Adj. Flow (vph)	0	0	0	0	1254	0	84	0	0	0	0	175	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	1254	0	84	0	0	0	0	175	
Turn Type					NA		Prot					Prot	
Protected Phases					1		5!					5!	2
Permitted Phases													
Detector Phase					1		5					5	
Switch Phase													
Minimum Initial (s)					8.0		8.0					8.0	1.0
Minimum Split (s)					54.0		20.0					20.0	22.0
Total Split (s)					54.0		24.0					24.0	22.0
Total Split (%)					54.0%		24.0%					24.0%	22%
Maximum Green (s)					49.0		19.0					19.0	16.0
Yellow Time (s)					3.0		3.0					3.0	2.0
All-Red Time (s)					2.0		2.0					2.0	4.0
Lost Time Adjust (s)					0.0		0.0					0.0	
Total Lost Time (s)					5.0		5.0					5.0	
Lead/Lag					Lead								Lag
Lead-Lag Optimize?													
Vehicle Extension (s)					2.0		2.0					2.0	0.2
Recall Mode					C-Max		None					None	None
Walk Time (s)					39.0		8.0					8.0	7.0
Flash Dont Walk (s)					10.0		7.0					7.0	9.0
Pedestrian Calls (#/hr)					0		0					0	298
Act Effct Green (s)					60.0		8.0					8.0	
Actuated g/C Ratio					0.60		0.08					0.08	
v/c Ratio					0.48		0.21					0.45	
Control Delay					12.1		1.2					9.9	
Queue Delay					0.0		0.0					0.0	
Total Delay					12.1		1.2					9.9	
LOS					B		A					A	
Approach Delay					12.1			1.2			9.9		
Approach LOS					B			A			A		
Queue Length 50th (ft)					153		0					1	
Queue Length 95th (ft)					184		0					1	
Internal Link Dist (ft)		749			184			518			926		
Turn Bay Length (ft)													
Base Capacity (vph)					2593		541					514	
Starvation Cap Reductn					0		0					0	
Spillback Cap Reductn					0		0					0	
Storage Cap Reductn					0		0					0	
Reduced v/c Ratio					0.48		0.16					0.34	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 53 (53%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 11.2 Intersection LOS: B
Intersection Capacity Utilization 53.0% ICU Level of Service A
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 4: Shawmut Avenue & East Berkeley Street

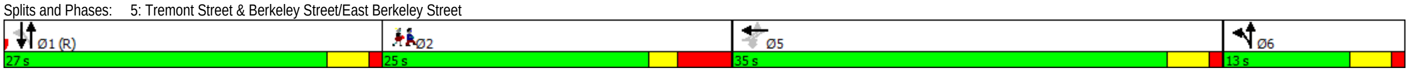
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	16	0	9	285	818	206	139	636	0	0	243	68	
Future Volume (vph)	16	0	9	285	818	206	139	636	0	0	243	68	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	
Ped Bike Factor											0.99		
Frt			0.850		0.970						0.967		
Flt Protected	0.950			0.950				0.991					
Satd. Flow (prot)	1624	0	1163	1547	2951	0	0	3091	0	0	2859	0	
Flt Permitted	0.129			0.950				0.706					
Satd. Flow (perm)	221	0	1163	1547	2951	0	0	2202	0	0	2859	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			120		32						33		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		647			829			409			883		
Travel Time (s)		14.7			18.8			9.3			20.1		
Confl. Peds. (#/hr)												40	
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.93	0.93	0.93	0.89	0.89	0.89	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	0%	25%	5%	7%	6%	5%	4%	0%	0%	7%	13%	
Adj. Flow (vph)	19	0	11	306	880	222	156	715	0	0	289	81	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	19	0	11	306	1102	0	0	871	0	0	370	0	
Turn Type	D.Pm		Perm	Perm	NA		pm+pt	NA			NA		
Protected Phases					5		6	1 6			1		2
Permitted Phases	5		5	5			1 6						
Detector Phase	5		5	5	5		6	1 6			1		
Switch Phase													
Minimum Initial (s)	5.0		5.0	5.0	5.0		4.0				10.0		1.0
Minimum Split (s)	9.0		9.0	9.0	9.0		8.0				27.0		25.0
Total Split (s)	35.0		35.0	35.0	35.0		13.0				27.0		25.0
Total Split (%)	35.0%		35.0%	35.0%	35.0%		13.0%				27.0%		25%
Maximum Green (s)	31.0		31.0	31.0	31.0		9.0				23.0		19.0
Yellow Time (s)	3.0		3.0	3.0	3.0		3.0				3.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0				1.0		4.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0						0.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0						4.0		
Lead/Lag											Lead		Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0		2.0	2.0	2.0		2.0				2.0		0.2
Recall Mode	None		None	None	None		None				C-Max		None
Walk Time (s)											17.0		8.0
Flash Dont Walk (s)											6.0		11.0
Pedestrian Calls (#/hr)											0		301

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Act Effct Green (s)	31.0		31.0	31.0	31.0			32.0			23.0		
Actuated g/C Ratio	0.31		0.31	0.31	0.31			0.32			0.23		
v/c Ratio	0.28		0.02	0.64	1.18			1.11			0.54		
Control Delay	39.0		0.1	28.1	116.2			98.3			30.6		
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0		
Total Delay	39.0		0.1	28.1	116.2			98.3			30.6		
LOS	D		A	C	F			F			C		
Approach Delay		24.7			97.0			98.3			30.6		
Approach LOS		C			F			F			C		
Queue Length 50th (ft)	9		0	169	~438			~296			113		
Queue Length 95th (ft)	29		0	264	#572			#450			149		
Internal Link Dist (ft)		567			749			329			803		
Turn Bay Length (ft)													
Base Capacity (vph)	68		443	479	936			784			682		
Starvation Cap Reductn	0		0	0	0			0			0		
Spillback Cap Reductn	0		0	0	0			0			0		
Storage Cap Reductn	0		0	0	0			0			0		
Reduced v/c Ratio	0.28		0.02	0.64	1.18			1.11			0.54		

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 38 (38%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 87.5 Intersection LOS: F
Intersection Capacity Utilization 85.6% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Tremont Street & Berkeley Street/East Berkeley Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	89	336	0	0	0	0	0	239	83	
Future Volume (vph)	0	0	0	89	336	0	0	0	0	0	239	83	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor					1.00						0.98		
Frt											0.962		
Flt Protected					0.990								
Satd. Flow (prot)	0	0	0	0	3456	0	0	0	0	0	4594	0	
Flt Permitted					0.990								
Satd. Flow (perm)	0	0	0	0	3451	0	0	0	0	0	4594	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					39						87		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		266			231			279			323		
Travel Time (s)		6.0			5.3			6.3			7.3		
Confl. Peds. (#/hr)				9								59	
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92	0.95	0.95	0.95	
Heavy Vehicles (%)	2%	2%	2%	5%	3%	2%	2%	2%	2%	0%	8%	3%	
Adj. Flow (vph)	0	0	0	102	386	0	0	0	0	0	252	87	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	488	0	0	0	0	0	339	0	
Turn Type				Split	NA						NA		
Protected Phases				1	1						5		2
Permitted Phases													
Detector Phase				1	1						5		
Switch Phase													
Minimum Initial (s)				10.0	10.0						10.0		1.0
Minimum Split (s)				43.0	43.0						35.0		22.0
Total Split (s)				43.0	43.0						35.0		22.0
Total Split (%)				43.0%	43.0%						35.0%		22%
Maximum Green (s)				39.0	39.0						31.0		20.0
Yellow Time (s)				3.0	3.0						3.0		2.0
All-Red Time (s)				1.0	1.0						1.0		0.0
Lost Time Adjust (s)					0.0						0.0		
Total Lost Time (s)					4.0						4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				2.0	2.0						2.0		0.2
Recall Mode				C-Max	C-Max						Max		None
Walk Time (s)				28.0	28.0						23.0		13.0
Flash Dont Walk (s)				11.0	11.0						8.0		7.0
Pedestrian Calls (#/hr)				0	0						0		315
Act Effct Green (s)					39.0						31.0		
Actuated g/C Ratio					0.39						0.31		
v/c Ratio					0.36						0.23		
Control Delay					20.6						19.3		
Queue Delay					0.0						0.0		
Total Delay					20.6						19.3		
LOS					C						B		
Approach Delay					20.6						19.3		
Approach LOS					C						B		
Queue Length 50th (ft)					104						42		
Queue Length 95th (ft)					139						66		
Internal Link Dist (ft)		186			151			199			243		
Turn Bay Length (ft)													
Base Capacity (vph)					1371						1484		
Starvation Cap Reductn					0						0		
Spillback Cap Reductn					0						0		
Storage Cap Reductn					0						0		
Reduced v/c Ratio					0.36						0.23		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 81 (81%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 52.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: Shawmut Avenue & Marginal Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1403	49	0	0	0	2
Future Volume (Veh/h)	1403	49	0	0	0	2
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.38
Hourly flow rate (vph)	1461	51	0	0	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	148			200		
pX, platoon unblocked			0.80		0.80	0.80
vC, conflicting volume			1512		1486	512
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			785		753	0
tC, single (s)			4.1		6.8	7.6
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.6
p0 queue free %			100		100	99
cM capacity (veh/h)			667		281	798

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	584	584	343	5
Volume Left	0	0	0	0
Volume Right	0	0	51	5
cSH	1700	1700	1700	798
Volume to Capacity	0.34	0.34	0.20	0.01
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	9.5
Lane LOS				A
Approach Delay (s)	0.0			9.5
Approach LOS				A

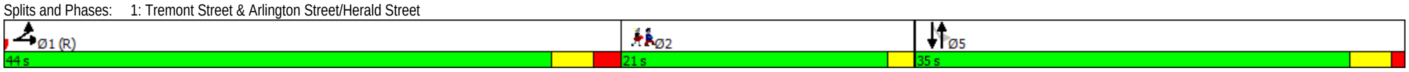
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	59	965	222	0	0	0	0	371	244	15	248	0	
Future Volume (vph)	59	965	222	0	0	0	0	371	244	15	248	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	
Ped Bike Factor		0.98						0.95			1.00		
Frt		0.973						0.940					
Flt Protected		0.998									0.997		
Satd. Flow (prot)	0	6131	0	0	0	0	0	3118	0	0	3437	0	
Flt Permitted		0.998									0.904		
Satd. Flow (perm)	0	6123	0	0	0	0	0	3118	0	0	3110	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		64						161					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		230			765			886			173		
Travel Time (s)		5.2			17.4			20.1			3.9		
Confl. Peds. (#/hr)	37		97						130	130			
Confl. Bikes (#/hr)			3										
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90	0.88	0.88	0.88	
Heavy Vehicles (%)	4%	2%	1%	2%	2%	2%	0%	3%	3%	0%	5%	0%	
Adj. Flow (vph)	63	1027	236	0	0	0	0	412	271	17	282	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1326	0	0	0	0	0	683	0	0	299	0	
Turn Type	Split	NA						NA		Perm	NA		
Protected Phases	1	1						5			5		2
Permitted Phases										5			
Detector Phase	1	1						5		5	5		
Switch Phase													
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0		8.0
Minimum Split (s)	44.0	44.0						35.0		35.0	35.0		21.0
Total Split (s)	44.0	44.0						35.0		35.0	35.0		21.0
Total Split (%)	44.0%	44.0%						35.0%		35.0%	35.0%		21%
Maximum Green (s)	39.0	39.0						31.0		31.0	31.0		19.0
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0						1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						4.0			4.0		
Lead/Lag	Lead	Lead											Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0						2.0		2.0	2.0		0.2
Recall Mode	C-Max	C-Max						Max		Max	Max		None
Walk Time (s)	30.0	30.0						22.0		22.0	22.0		10.0
Flash Dont Walk (s)	9.0	9.0						9.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0	0						0		0	0		370
Act Effct Green (s)		39.0						31.0			31.0		
Actuated g/C Ratio		0.39						0.31			0.31		
v/c Ratio		0.55						0.63			0.31		
Control Delay		23.4						25.3			27.4		
Queue Delay		0.0						0.0			0.0		
Total Delay		23.4						25.3			27.4		
LOS		C						C			C		
Approach Delay		23.4						25.3			27.4		
Approach LOS		C						C			C		
Queue Length 50th (ft)		177						149			76		
Queue Length 95th (ft)		213						212			110		
Internal Link Dist (ft)		150			685			806			93		
Turn Bay Length (ft)													
Base Capacity (vph)		2430						1077			964		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.55						0.63			0.31		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 24.5 Intersection LOS: C
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Tremont Street & Arlington Street/Herald Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	1223	85	0	0	0	0	0	0	297	195	0	
Future Volume (vph)	0	1223	85	0	0	0	0	0	0	297	195	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	
Ped Bike Factor		0.99								0.90			
Frt		0.990											
Flt Protected										0.950			
Satd. Flow (prot)	0	4957	0	0	0	0	0	0	0	3367	3574	0	
Flt Permitted										0.950			
Satd. Flow (perm)	0	4957	0	0	0	0	0	0	0	3036	3574	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		16								367			
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		765			139			1015			271		
Travel Time (s)		17.4			3.2			23.1			6.2		
Confl. Peds. (#/hr)			100							82			
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	
Heavy Vehicles (%)	0%	3%	0%	2%	2%	2%	2%	2%	2%	4%	1%	0%	
Adj. Flow (vph)	0	1390	97	0	0	0	0	0	0	367	241	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1487	0	0	0	0	0	0	0	367	241	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								2.0	2.0		1.0
Minimum Split (s)		54.0								29.0	29.0		17.0
Total Split (s)		54.0								29.0	29.0		17.0
Total Split (%)		54.0%								29.0%	29.0%		17%
Maximum Green (s)		50.0								25.0	25.0		11.0
Yellow Time (s)		3.0								3.0	3.0		2.0
All-Red Time (s)		1.0								1.0	1.0		4.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		4.0								4.0	4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		2.0								2.0	2.0		0.2
Recall Mode		C-Max								Max	Max		None
Walk Time (s)		39.0								16.0	16.0		5.0
Flash Dont Walk (s)		11.0								9.0	9.0		6.0
Pedestrian Calls (#/hr)		0								0	0		399
Act Effct Green (s)		50.0								25.0	25.0		
Actuated g/C Ratio		0.50								0.25	0.25		
v/c Ratio		0.60								0.33	0.27		
Control Delay		7.8								1.2	19.4		
Queue Delay		1.5								0.2	0.0		
Total Delay		9.2								1.4	19.4		
LOS		A								A	B		
Approach Delay		9.2									8.5		
Approach LOS		A									A		
Queue Length 50th (ft)		91								2	32		
Queue Length 95th (ft)		103								3	39		
Internal Link Dist (ft)		685			59			935			191		
Turn Bay Length (ft)													
Base Capacity (vph)		2486								1117	893		
Starvation Cap Reductn		0								252	0		
Spillback Cap Reductn		746								54	0		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.85								0.42	0.27		

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 1:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Herald Street & Shawmut Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1386	109	0	0	0	0	535	179	0	21	0
Future Volume (vph)	36	1386	109	0	0	0	0	535	179	0	21	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	11	11	12	12	12
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.88			
Frt		0.989							0.850			
Flt Protected		0.999										
Satd. Flow (prot)	0	4285	0	0	0	0	0	1503	1364	0	934	0
Flt Permitted		0.999										
Satd. Flow (perm)	0	4284	0	0	0	0	0	1503	1205	0	934	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14							22			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		203			204			266			224	
Travel Time (s)		4.6			4.6			6.0			5.1	
Confl. Peds. (#/hr)	8								188			
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.92	0.92	0.92	0.78	0.78	0.78
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	10%	3%	0%	83%	0%
Bus Blockages (#/hr)	0	9	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	40	1540	121	0	0	0	0	582	195	0	27	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1701	0	0	0	0	0	582	195	0	27	0
Turn Type	Perm	NA						NA	Perm		NA	
Protected Phases		1						6			6	
Permitted Phases	1								6			
Detector Phase	1	1						6	6		6	
Switch Phase												
Minimum Initial (s)	12.0	12.0						12.0	12.0		12.0	
Minimum Split (s)	42.0	42.0						58.0	58.0		58.0	
Total Split (s)	42.0	42.0						58.0	58.0		58.0	
Total Split (%)	42.0%	42.0%						58.0%	58.0%		58.0%	
Maximum Green (s)	37.0	37.0						53.0	53.0		53.0	
Yellow Time (s)	4.0	4.0						4.0	4.0		4.0	
All-Red Time (s)	1.0	1.0						1.0	1.0		1.0	
Lost Time Adjust (s)		-1.0						-1.0	-1.0		-1.0	
Total Lost Time (s)		4.0						4.0	4.0		4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0	3.0		3.0	
Recall Mode	C-Max	C-Max						Max	Max		Max	
Walk Time (s)	28.0	28.0						44.0	44.0		44.0	
Flash Dont Walk (s)	9.0	9.0						9.0	9.0		9.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)		38.0						54.0	54.0		54.0	
Actuated g/C Ratio		0.38						0.54	0.54		0.54	
v/c Ratio		1.04						0.72	0.30		0.05	
Control Delay		49.8						23.5	12.5		11.4	
Queue Delay		0.0						0.0	0.0		0.0	
Total Delay		49.8						23.5	12.5		11.4	
LOS		D						C	B		B	
Approach Delay		49.8						20.8			11.4	
Approach LOS		D						C			B	
Queue Length 50th (ft)		~434						264	56		8	
Queue Length 95th (ft)		#531						403	102		18	
Internal Link Dist (ft)		123			124			186			144	
Turn Bay Length (ft)												
Base Capacity (vph)		1636						811	660		504	
Starvation Cap Reductn		0						0	0		0	
Spillback Cap Reductn		0						0	0		0	
Storage Cap Reductn		0						0	0		0	
Reduced v/c Ratio		1.04						0.72	0.30		0.05	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 14 (14%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 40.4 Intersection LOS: D
Intersection Capacity Utilization 84.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

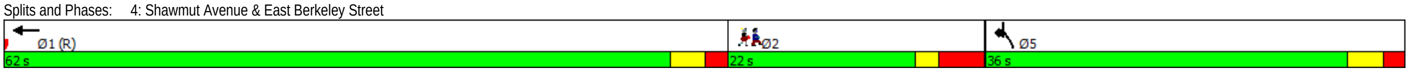
Splits and Phases: 3: Washington Street & Herald Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	0	814	0	105	0	0	0	0	282	
Future Volume (vph)	0	0	0	0	814	0	105	0	0	0	0	282	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							0.89						
Frt												0.865	
Flt Protected							0.950						
Satd. Flow (prot)	0	0	0	0	4532	0	1577	0	0	0	0	1465	
Flt Permitted							0.950						
Satd. Flow (perm)	0	0	0	0	4532	0	1403	0	0	0	0	1465	
Right Turn on Red			Yes			Yes	Yes		Yes			Yes	
Satd. Flow (RTOR)							303					303	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		829			256			598			1015		
Travel Time (s)		18.8			5.8			13.6			23.1		
Confl. Peds. (#/hr)							46					46	
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.80	0.80	0.80	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	3%	0%	0%	0%	0%	1%	
Adj. Flow (vph)	0	0	0	0	925	0	131	0	0	0	0	297	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	925	0	131	0	0	0	0	297	
Turn Type					NA		Prot					Prot	
Protected Phases					1		5!					5!	2
Permitted Phases													
Detector Phase					1		5					5	
Switch Phase													
Minimum Initial (s)					8.0		8.0					8.0	1.0
Minimum Split (s)					62.0		20.0					20.0	22.0
Total Split (s)					62.0		36.0					36.0	22.0
Total Split (%)					51.7%		30.0%					30.0%	18%
Maximum Green (s)					57.0		31.0					31.0	16.0
Yellow Time (s)					3.0		3.0					3.0	2.0
All-Red Time (s)					2.0		2.0					2.0	4.0
Lost Time Adjust (s)					0.0		0.0					0.0	
Total Lost Time (s)					5.0		5.0					5.0	
Lead/Lag					Lead								Lag
Lead-Lag Optimize?													
Vehicle Extension (s)					2.0		2.0					2.0	0.2
Recall Mode					C-Max		None					None	None
Walk Time (s)					47.0		8.0					8.0	7.0
Flash Dont Walk (s)					10.0		7.0					7.0	9.0
Pedestrian Calls (#/hr)					0		0					0	240
Act Effct Green (s)					78.1		9.9					9.9	
Actuated g/C Ratio					0.65		0.08					0.08	
v/c Ratio					0.31		0.32					0.75	
Control Delay					9.8		2.1					17.5	
Queue Delay					0.0		0.0					0.0	
Total Delay					9.8		2.1					17.5	
LOS					A		A					B	
Approach Delay					9.8			2.1			17.5		
Approach LOS					A			A			B		
Queue Length 50th (ft)					100		0					0	
Queue Length 95th (ft)					147		0					80	
Internal Link Dist (ft)		749			176			518			935		
Turn Bay Length (ft)													
Base Capacity (vph)					2951		632					603	
Starvation Cap Reductn					0		0					0	
Spillback Cap Reductn					0		0					0	
Storage Cap Reductn					0		0					0	
Reduced v/c Ratio					0.31		0.21					0.49	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 10.7 Intersection LOS: B
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 4: Shawmut Avenue & East Berkeley Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	31	0	27	369	641	195	107	378	0	0	418	62	
Future Volume (vph)	31	0	27	369	641	195	107	378	0	0	418	62	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	
Ped Bike Factor					1.00			0.99			0.99		
Frt			0.850		0.965						0.981		
Flt Protected	0.950			0.950				0.989					
Satd. Flow (prot)	1624	0	1454	1593	3028	0	0	3126	0	0	3053	0	
Flt Permitted	0.102			0.950				0.589					
Satd. Flow (perm)	174	0	1454	1593	3028	0	0	1850	0	0	3053	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			100		36						14		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		647			829			409			886		
Travel Time (s)		14.7			18.8			9.3			20.1		
Confl. Peds. (#/hr)							77					77	
Confl. Bikes (#/hr)						2						4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.87	0.87	0.87	0.83	0.83	0.83	
Heavy Vehicles (%)	0%	0%	0%	2%	3%	4%	2%	3%	0%	0%	3%	4%	
Adj. Flow (vph)	41	0	36	419	728	222	123	434	0	0	504	75	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	41	0	36	419	950	0	0	557	0	0	579	0	
Turn Type	D.Pm		Perm	Perm	NA		pm+pt	NA			NA		
Protected Phases					5		6	1 6			1		2
Permitted Phases	5		5	5			1 6						
Detector Phase	5		5	5	5		6	1 6			1		
Switch Phase													
Minimum Initial (s)	5.0		5.0	5.0	5.0		4.0				10.0		1.0
Minimum Split (s)	9.0		9.0	9.0	9.0		8.0				38.0		25.0
Total Split (s)	44.0		44.0	44.0	44.0		13.0				38.0		25.0
Total Split (%)	36.7%		36.7%	36.7%	36.7%		10.8%				31.7%		21%
Maximum Green (s)	40.0		40.0	40.0	40.0		9.0				34.0		19.0
Yellow Time (s)	3.0		3.0	3.0	3.0		3.0				3.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0				1.0		4.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0						0.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0						4.0		
Lead/Lag											Lead		Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0		2.0	2.0	2.0		2.0				2.0		0.2
Recall Mode	None		None	None	None		None				C-Max		None
Walk Time (s)											28.0		8.0
Flash Dont Walk (s)											6.0		11.0
Pedestrian Calls (#/hr)											0		322
Act Effct Green (s)	39.3		39.3	39.3	39.3			43.7			34.7		
Actuated g/C Ratio	0.33		0.33	0.33	0.33			0.36			0.29		
v/c Ratio	0.72		0.07	0.80	0.94			0.72			0.65		
Control Delay	97.4		0.2	46.1	50.5			35.8			40.6		
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0		
Total Delay	97.4		0.2	46.1	50.5			35.8			40.6		
LOS	F		A	D	D			D			D		
Approach Delay		51.9			49.2			35.8			40.6		
Approach LOS		D			D			D			D		
Queue Length 50th (ft)	28		0	304	373			165			203		
Queue Length 95th (ft)	#73		0	#429	#479			208			241		
Internal Link Dist (ft)		567			749			329			806		
Turn Bay Length (ft)													
Base Capacity (vph)	58		551	531	1033			769			893		
Starvation Cap Reductn	0		0	0	0			0			0		
Spillback Cap Reductn	0		0	0	0			0			0		
Storage Cap Reductn	0		0	0	0			0			0		
Reduced v/c Ratio	0.71		0.07	0.79	0.92			0.72			0.65		

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 75 (63%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 44.4 Intersection LOS: D
Intersection Capacity Utilization 82.8% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Tremont Street & Berkeley Street/East Berkeley Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	95	383	0	0	0	0	0	397	223	
Future Volume (vph)	0	0	0	95	383	0	0	0	0	0	397	223	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor					0.99						0.97		
Frt											0.946		
Flt Protected					0.990								
Satd. Flow (prot)	0	0	0	0	3539	0	0	0	0	0	4661	0	
Flt Permitted					0.990								
Satd. Flow (perm)	0	0	0	0	3513	0	0	0	0	0	4661	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					35						152		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		310			237			271			312		
Travel Time (s)		7.0			5.4			6.2			7.1		
Confl. Peds. (#/hr)				44								73	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.92	0.92	0.92	0.83	0.83	0.83	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	0%	2%	3%	
Adj. Flow (vph)	0	0	0	107	430	0	0	0	0	0	478	269	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	537	0	0	0	0	0	747	0	
Turn Type				Split	NA						NA		
Protected Phases				1	1						5		2
Permitted Phases													
Detector Phase				1	1						5		
Switch Phase													
Minimum Initial (s)				10.0	10.0						10.0		1.0
Minimum Split (s)				41.0	41.0						37.0		22.0
Total Split (s)				41.0	41.0						37.0		22.0
Total Split (%)				41.0%	41.0%						37.0%		22%
Maximum Green (s)				37.0	37.0						33.0		20.0
Yellow Time (s)				3.0	3.0						3.0		2.0
All-Red Time (s)				1.0	1.0						1.0		0.0
Lost Time Adjust (s)					0.0						0.0		
Total Lost Time (s)					4.0						4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				2.0	2.0						2.0		0.2
Recall Mode				C-Max	C-Max						Max		None
Walk Time (s)				26.0	26.0						25.0		13.0
Flash Dont Walk (s)				11.0	11.0						8.0		7.0
Pedestrian Calls (#/hr)				0	0						0		352
Act Effct Green (s)					37.0						33.0		
Actuated g/C Ratio					0.37						0.33		
v/c Ratio					0.40						0.46		
Control Delay					22.8						21.7		
Queue Delay					0.0						0.0		
Total Delay					22.8						21.7		
LOS					C						C		
Approach Delay					22.8						21.7		
Approach LOS					C						C		
Queue Length 50th (ft)					122						107		
Queue Length 95th (ft)					166						128		
Internal Link Dist (ft)		230			157			191			232		
Turn Bay Length (ft)													
Base Capacity (vph)					1331						1639		
Starvation Cap Reductn					0						0		
Spillback Cap Reductn					0						0		
Storage Cap Reductn					0						0		
Reduced v/c Ratio					0.40						0.46		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 1 (1%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 22.2 Intersection LOS: C
Intersection Capacity Utilization 56.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Shawmut Avenue & Marginal Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1516	3	0	0	0	29
Future Volume (Veh/h)	1516	3	0	0	0	29
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	1666	3	0	0	0	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	139			203		
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1669		1668	557
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			928		926	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	95
cM capacity (veh/h)			581		215	865

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	666	666	336	39
Volume Left	0	0	0	0
Volume Right	0	0	3	39
cSH	1700	1700	1700	865
Volume to Capacity	0.39	0.39	0.20	0.05
Queue Length 95th (ft)	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	9.4
Lane LOS				A
Approach Delay (s)	0.0			9.4
Approach LOS				A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

- Build (2024) Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	31	857	150	0	0	0	0	482	368	41	143	0	
Future Volume (vph)	31	857	150	0	0	0	0	482	368	41	143	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	
Ped Bike Factor		0.99						0.95			1.00		
Frt		0.978						0.935					
Flt Protected		0.999									0.989		
Satd. Flow (prot)	0	5990	0	0	0	0	0	3079	0	0	3340	0	
Flt Permitted		0.999									0.631		
Satd. Flow (perm)	0	5982	0	0	0	0	0	3079	0	0	2121	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		48						209					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		207			774			883			176		
Travel Time (s)		4.7			17.6			20.1			4.0		
Confl. Peds. (#/hr)	59		91						117	117			
Confl. Bikes (#/hr)			1										
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.94	0.94	0.94	0.81	0.81	0.81	
Heavy Vehicles (%)	4%	5%	7%	2%	2%	2%	0%	6%	2%	3%	8%	0%	
Parking (#/hr)						0							
Adj. Flow (vph)	33	912	160	0	0	0	0	513	391	51	177	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1105	0	0	0	0	0	904	0	0	228	0	
Turn Type	Split	NA						NA		Perm	NA		
Protected Phases	1	1						5			5		2
Permitted Phases										5			
Detector Phase	1	1						5		5	5		
Switch Phase													
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0		8.0
Minimum Split (s)	41.0	41.0						38.0		38.0	38.0		21.0
Total Split (s)	41.0	41.0						38.0		38.0	38.0		21.0
Total Split (%)	41.0%	41.0%						38.0%		38.0%	38.0%		21%
Maximum Green (s)	36.0	36.0						34.0		34.0	34.0		14.0
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0						1.0		1.0	1.0		4.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						4.0			4.0		
Lead/Lag	Lead	Lead											Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0						2.0		2.0	2.0		0.2
Recall Mode	C-Max	C-Max						Max		Max	Max		None
Walk Time (s)	27.0	27.0						25.0		25.0	25.0		5.0
Flash Dont Walk (s)	9.0	9.0						9.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0	0						0		0	0		357
Act Effct Green (s)		36.0						34.0			34.0		
Actuated g/C Ratio		0.36						0.34			0.34		
v/c Ratio		0.51						0.76			0.32		
Control Delay		24.8						21.7			25.9		
Queue Delay		0.0						0.0			0.0		
Total Delay		24.8						21.7			25.9		
LOS		C						C			C		
Approach Delay		24.8						21.7			25.9		
Approach LOS		C						C			C		
Queue Length 50th (ft)		151						168			56		
Queue Length 95th (ft)		184						m120			77		
Internal Link Dist (ft)		127			694			803			96		
Turn Bay Length (ft)													
Base Capacity (vph)		2187						1184			721		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.51						0.76			0.32		

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 5 (5%), Referenced to phase 1:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 23.7	Intersection LOS: C
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

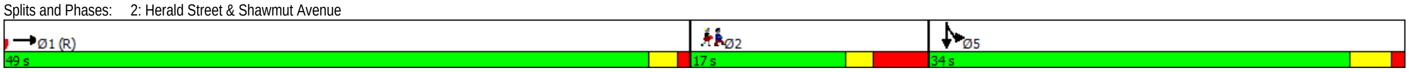
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Tremont Street & Arlington Street/Herald Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	1135	91	0	0	0	0	0	0	244	81	0	
Future Volume (vph)	0	1135	91	0	0	0	0	0	0	244	81	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	
Ped Bike Factor		0.99								0.87			
Frt		0.989											
Flt Protected										0.950			
Satd. Flow (prot)	0	4906	0	0	0	0	0	0	0	3213	3574	0	
Flt Permitted										0.950			
Satd. Flow (perm)	0	4906	0	0	0	0	0	0	0	2801	3574	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		17								298			
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		774			148			155			279		
Travel Time (s)		17.6			3.4			3.5			6.3		
Confl. Peds. (#/hr)			86							128			
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.82	0.82	0.82	
Heavy Vehicles (%)	0%	4%	0%	2%	2%	2%	2%	2%	2%	9%	1%	0%	
Adj. Flow (vph)	0	1207	97	0	0	0	0	0	0	298	99	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1304	0	0	0	0	0	0	0	298	99	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								2.0	2.0		1.0
Minimum Split (s)		49.0								34.0	34.0		17.0
Total Split (s)		49.0								34.0	34.0		17.0
Total Split (%)		49.0%								34.0%	34.0%		17%
Maximum Green (s)		46.0								30.0	30.0		11.0
Yellow Time (s)		2.0								3.0	3.0		2.0
All-Red Time (s)		1.0								1.0	1.0		4.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		3.0								4.0	4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		2.0								2.0	2.0		0.2
Recall Mode		C-Max								Max	Max		None
Walk Time (s)		35.0								21.0	21.0		5.0
Flash Dont Walk (s)		11.0								9.0	9.0		6.0
Pedestrian Calls (#/hr)		0								0	0		373
Act Effct Green (s)		46.0								30.0	30.0		
Actuated g/C Ratio		0.46								0.30	0.30		
v/c Ratio		0.58								0.25	0.09		
Control Delay		8.4								6.1	18.0		
Queue Delay		0.3								0.0	0.0		
Total Delay		8.7								6.1	18.0		
LOS		A								A	B		
Approach Delay		8.7									9.1		
Approach LOS		A									A		
Queue Length 50th (ft)		116								0	23		
Queue Length 95th (ft)		111								10	39		
Internal Link Dist (ft)		694			68			75			199		
Turn Bay Length (ft)													
Base Capacity (vph)		2265								1172	1072		
Starvation Cap Reductn		0								0	0		
Spillback Cap Reductn		353								21	0		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.68								0.26	0.09		

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 6 (6%), Referenced to phase 1:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Herald Street & Shawmut Avenue

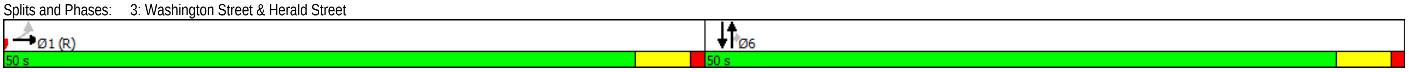


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	1230	78	0	0	0	0	700	93	0	19	0
Future Volume (vph)	110	1230	78	0	0	0	0	700	93	0	19	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	11	11	12	12	12
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.79			
Frt		0.992							0.850			
Flt Protected		0.996										
Satd. Flow (prot)	0	4169	0	0	0	0	0	1517	1243	0	919	0
Flt Permitted		0.996										
Satd. Flow (perm)	0	4166	0	0	0	0	0	1517	977	0	919	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12							23			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		200			204			253			221	
Travel Time (s)		4.5			4.6			5.8			5.0	
Confl. Peds. (#/hr)	12								165			
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.86	0.86	0.86	0.75	0.75	0.75
Heavy Vehicles (%)	6%	6%	0%	0%	0%	0%	0%	9%	13%	0%	86%	0%
Bus Blockages (#/hr)	0	9	9	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	117	1309	83	0	0	0	0	814	108	0	25	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1509	0	0	0	0	0	814	108	0	25	0
Turn Type	Perm	NA						NA	Perm		NA	
Protected Phases		1						6			6	
Permitted Phases	1								6			
Detector Phase	1	1						6	6		6	
Switch Phase												
Minimum Initial (s)	12.0	12.0						12.0	12.0		12.0	
Minimum Split (s)	50.0	50.0						29.0	29.0		29.0	
Total Split (s)	50.0	50.0						50.0	50.0		50.0	
Total Split (%)	50.0%	50.0%						50.0%	50.0%		50.0%	
Maximum Green (s)	45.0	45.0						45.0	45.0		45.0	
Yellow Time (s)	4.0	4.0						4.0	4.0		4.0	
All-Red Time (s)	1.0	1.0						1.0	1.0		1.0	
Lost Time Adjust (s)		-1.0						-1.0	-1.0		-1.0	
Total Lost Time (s)		4.0						4.0	4.0		4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0	3.0		3.0	
Recall Mode	C-Max	C-Max						None	None		None	
Walk Time (s)	36.0	36.0						15.0	15.0		15.0	
Flash Dont Walk (s)	9.0	9.0						9.0	9.0		9.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)		46.0						46.0	46.0		46.0	
Actuated g/C Ratio		0.46						0.46	0.46		0.46	
v/c Ratio		0.79						1.17	0.23		0.06	
Control Delay		14.9						118.0	14.3		15.6	
Queue Delay		1.1						0.0	0.0		0.0	
Total Delay		16.1						118.0	14.3		15.6	
LOS		B						F	B		B	
Approach Delay		16.1						105.9			15.6	
Approach LOS		B						F			B	
Queue Length 50th (ft)		339						~620	31		9	
Queue Length 95th (ft)		403						#793	64		20	
Internal Link Dist (ft)		120			124			173			141	
Turn Bay Length (ft)												
Base Capacity (vph)		1922						697	461		422	
Starvation Cap Reductn		202						0	0		0	
Spillback Cap Reductn		0						0	0		0	
Storage Cap Reductn		0						0	0		0	
Reduced v/c Ratio		0.88						1.17	0.23		0.06	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 19 (19%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 49.8 — Intersection LOS: D
Intersection Capacity Utilization 78.4% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Washington Street & Herald Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations					↑↑↑		↰					↱	
Traffic Volume (vph)	0	0	0	0	1090	0	72	0	0	0	0	128	
Future Volume (vph)	0	0	0	0	1090	0	72	0	0	0	0	128	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							0.88						
Frt												0.865	
Flt Protected							0.950						
Satd. Flow (prot)	0	0	0	0	4322	0	1593	0	0	0	0	1450	
Flt Permitted							0.950						
Satd. Flow (perm)	0	0	0	0	4322	0	1395	0	0	0	0	1450	
Right Turn on Red			Yes			Yes	Yes		Yes			Yes	
Satd. Flow (RTOR)							297					297	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		829			264			598			851		
Travel Time (s)		18.8			6.0			13.6			19.3		
Confl. Peds. (#/hr)							62					62	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.86	0.86	0.86	0.69	0.69	0.69	
Heavy Vehicles (%)	0%	0%	0%	0%	8%	0%	2%	0%	0%	0%	0%	2%	
Adj. Flow (vph)	0	0	0	0	1225	0	84	0	0	0	0	186	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	1225	0	84	0	0	0	0	186	
Turn Type					NA		Prot					Prot	
Protected Phases					1		5!					5!	2
Permitted Phases													
Detector Phase					1		5					5	
Switch Phase													
Minimum Initial (s)					8.0		8.0					8.0	1.0
Minimum Split (s)					54.0		20.0					20.0	22.0
Total Split (s)					54.0		24.0					24.0	22.0
Total Split (%)					54.0%		24.0%					24.0%	22%
Maximum Green (s)					49.0		19.0					19.0	16.0
Yellow Time (s)					3.0		3.0					3.0	2.0
All-Red Time (s)					2.0		2.0					2.0	4.0
Lost Time Adjust (s)					0.0		0.0					0.0	
Total Lost Time (s)					5.0		5.0					5.0	
Lead/Lag					Lead								Lag
Lead-Lag Optimize?													
Vehicle Extension (s)					2.0		2.0					2.0	0.2
Recall Mode					C-Max		None					None	None
Walk Time (s)					39.0		8.0					8.0	7.0
Flash Dont Walk (s)					10.0		7.0					7.0	9.0
Pedestrian Calls (#/hr)					0		0					0	298
Act Effct Green (s)					60.0		8.0					8.0	
Actuated g/C Ratio					0.60		0.08					0.08	
v/c Ratio					0.47		0.21					0.48	
Control Delay					11.9		1.2					10.2	
Queue Delay					0.0		0.0					0.0	
Total Delay					11.9		1.2					10.2	
LOS					B		A					B	
Approach Delay					11.9			1.2			10.2		
Approach LOS					B			A			B		
Queue Length 50th (ft)					147		0					2	
Queue Length 95th (ft)					178		0					2	
Internal Link Dist (ft)		749			184			518			771		
Turn Bay Length (ft)													
Base Capacity (vph)					2593		543					516	
Starvation Cap Reductn					0		0					0	
Spillback Cap Reductn					0		0					0	
Storage Cap Reductn					0		0					0	
Reduced v/c Ratio					0.47		0.15					0.36	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 53 (53%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 11.1 — Intersection LOS: B
Intersection Capacity Utilization 52.9% — ICU Level of Service A
Analysis Period (min) 15
! Phase conflict between lane groups.

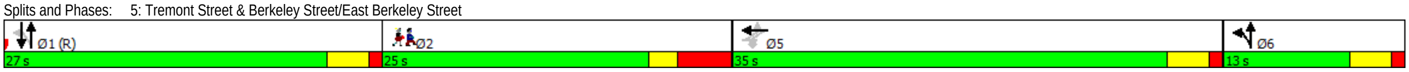
Splits and Phases: 4: Shawmut Avenue & East Berkeley Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	16	0	9	285	818	187	139	637	0	0	243	68	
Future Volume (vph)	16	0	9	285	818	187	139	637	0	0	243	68	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	
Ped Bike Factor											0.99		
Frt			0.850		0.972						0.967		
Flt Protected	0.950			0.950				0.991					
Satd. Flow (prot)	1624	0	1163	1547	2957	0	0	3091	0	0	2859	0	
Flt Permitted	0.129			0.950				0.706					
Satd. Flow (perm)	221	0	1163	1547	2957	0	0	2202	0	0	2859	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			120		28						33		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		647			829			409			883		
Travel Time (s)		14.7			18.8			9.3			20.1		
Confl. Peds. (#/hr)												40	
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.83	0.83	0.83	0.93	0.93	0.93	0.89	0.89	0.89	0.84	0.84	0.84	
Heavy Vehicles (%)	0%	0%	25%	5%	7%	6%	5%	4%	0%	0%	7%	13%	
Adj. Flow (vph)	19	0	11	306	880	201	156	716	0	0	289	81	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	19	0	11	306	1081	0	0	872	0	0	370	0	
Turn Type	D.Pm		Perm	Perm	NA		pm+pt	NA			NA		
Protected Phases					5		6	1 6			1		2
Permitted Phases	5		5	5			1 6						
Detector Phase	5		5	5	5		6	1 6			1		
Switch Phase													
Minimum Initial (s)	5.0		5.0	5.0	5.0		4.0				10.0		1.0
Minimum Split (s)	9.0		9.0	9.0	9.0		8.0				27.0		25.0
Total Split (s)	35.0		35.0	35.0	35.0		13.0				27.0		25.0
Total Split (%)	35.0%		35.0%	35.0%	35.0%		13.0%				27.0%		25%
Maximum Green (s)	31.0		31.0	31.0	31.0		9.0				23.0		19.0
Yellow Time (s)	3.0		3.0	3.0	3.0		3.0				3.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0				1.0		4.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0						0.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0						4.0		
Lead/Lag											Lead		Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0		2.0	2.0	2.0		2.0				2.0		0.2
Recall Mode	None		None	None	None		None				C-Max		None
Walk Time (s)											17.0		8.0
Flash Dont Walk (s)											6.0		11.0
Pedestrian Calls (#/hr)											0		301
Act Effct Green (s)	31.0		31.0	31.0	31.0			32.0			23.0		
Actuated g/C Ratio	0.31		0.31	0.31	0.31			0.32			0.23		
v/c Ratio	0.28		0.02	0.64	1.16			1.11			0.54		
Control Delay	39.0		0.1	28.4	107.9			98.8			30.6		
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0		
Total Delay	39.0		0.1	28.4	107.9			98.8			30.6		
LOS	D		A	C	F			F			C		
Approach Delay		24.7			90.4			98.8			30.6		
Approach LOS		C			F			F			C		
Queue Length 50th (ft)	9		0	169	~425			~297			113		
Queue Length 95th (ft)	29		0	264	#558			#451			149		
Internal Link Dist (ft)		567			749			329			803		
Turn Bay Length (ft)													
Base Capacity (vph)	68		443	479	935			784			682		
Starvation Cap Reductn	0		0	0	0			0			0		
Spillback Cap Reductn	0		0	0	0			0			0		
Storage Cap Reductn	0		0	0	0			0			0		
Reduced v/c Ratio	0.28		0.02	0.64	1.16			1.11			0.54		

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 38 (38%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 84.1 — Intersection LOS: F
Intersection Capacity Utilization 85.0% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Tremont Street & Berkeley Street/East Berkeley Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	89	337	0	0	0	0	0	236	83	
Future Volume (vph)	0	0	0	89	337	0	0	0	0	0	236	83	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor					1.00						0.98		
Frt											0.961		
Flt Protected					0.990								
Satd. Flow (prot)	0	0	0	0	3456	0	0	0	0	0	4589	0	
Flt Permitted					0.990								
Satd. Flow (perm)	0	0	0	0	3451	0	0	0	0	0	4589	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					39						87		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		266			231			279			323		
Travel Time (s)		6.0			5.3			6.3			7.3		
Confl. Peds. (#/hr)				9								59	
Peak Hour Factor	0.92	0.92	0.92	0.87	0.87	0.87	0.92	0.92	0.92	0.95	0.95	0.95	
Heavy Vehicles (%)	2%	2%	2%	5%	3%	2%	2%	2%	2%	0%	8%	3%	
Adj. Flow (vph)	0	0	0	102	387	0	0	0	0	0	248	87	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	489	0	0	0	0	0	335	0	
Turn Type				Split	NA						NA		
Protected Phases				1	1						5		2
Permitted Phases													
Detector Phase				1	1						5		
Switch Phase													
Minimum Initial (s)				10.0	10.0						10.0		1.0
Minimum Split (s)				43.0	43.0						35.0		22.0
Total Split (s)				43.0	43.0						35.0		22.0
Total Split (%)				43.0%	43.0%						35.0%		22%
Maximum Green (s)				39.0	39.0						31.0		20.0
Yellow Time (s)				3.0	3.0						3.0		2.0
All-Red Time (s)				1.0	1.0						1.0		0.0
Lost Time Adjust (s)					0.0						0.0		
Total Lost Time (s)					4.0						4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				2.0	2.0						2.0		0.2
Recall Mode				C-Max	C-Max						Max		None
Walk Time (s)				28.0	28.0						23.0		13.0
Flash Dont Walk (s)				11.0	11.0						8.0		7.0
Pedestrian Calls (#/hr)				0	0						0		315
Act Effct Green (s)					39.0						31.0		
Actuated g/C Ratio					0.39						0.31		
v/c Ratio					0.36						0.23		
Control Delay					20.7						19.2		
Queue Delay					0.0						0.0		
Total Delay					20.7						19.2		
LOS					C						B		
Approach Delay					20.7						19.2		
Approach LOS					C						B		
Queue Length 50th (ft)					104						42		
Queue Length 95th (ft)					140						65		
Internal Link Dist (ft)		186			151			199			243		
Turn Bay Length (ft)													
Base Capacity (vph)					1371						1482		
Starvation Cap Reductn					0						0		
Spillback Cap Reductn					0						0		
Storage Cap Reductn					0						0		
Reduced v/c Ratio					0.36						0.23		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 81 (81%), Referenced to phase 1:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 20.1 Intersection LOS: C
Intersection Capacity Utilization 52.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: Shawmut Avenue & Marginal Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1408	4	0	0	0	7
Future Volume (Veh/h)	1408	4	0	0	0	7
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.92	0.92	0.92	0.38
Hourly flow rate (vph)	1467	4	0	0	0	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	148			200		
pX, platoon unblocked			0.81		0.81	0.81
vC, conflicting volume			1471		1469	491
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			768		766	0
tC, single (s)			4.1		6.8	7.6
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.6
p0 queue free %			100		100	98
cM capacity (veh/h)			683		279	805

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	587	587	297	18
Volume Left	0	0	0	0
Volume Right	0	0	4	18
cSH	1700	1700	1700	805
Volume to Capacity	0.35	0.35	0.17	0.02
Queue Length 95th (ft)	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	9.6
Lane LOS				A
Approach Delay (s)	0.0			9.6
Approach LOS				A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	7	0	0	0	4	168
Future Volume (Veh/h)	7	0	0	0	4	168
Sign Control	Yield		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)	8	0	0	0	4	183
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			851			155
pX, platoon unblocked	0.97					
vC, conflicting volume	191	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	151	0			0	
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)	814	1085			1623	

Direction, Lane #	WB 1	SB 1
Volume Total	8	187
Volume Left	8	4
Volume Right	0	0
cSH	814	1623
Volume to Capacity	0.01	0.00
Queue Length 95th (ft)	1	0
Control Delay (s)	9.5	0.2
Lane LOS	A	A
Approach Delay (s)	9.5	0.2
Approach LOS	A	

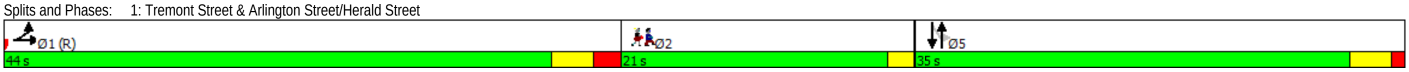
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	59	968	222	0	0	0	0	373	258	15	248	0	
Future Volume (vph)	59	968	222	0	0	0	0	373	258	15	248	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	
Ped Bike Factor		0.98						0.94			1.00		
Frt		0.973						0.939					
Flt Protected		0.998									0.997		
Satd. Flow (prot)	0	6132	0	0	0	0	0	3109	0	0	3437	0	
Flt Permitted		0.998									0.903		
Satd. Flow (perm)	0	6123	0	0	0	0	0	3109	0	0	3106	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		64						183					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		230			765			886			173		
Travel Time (s)		5.2			17.4			20.1			3.9		
Confl. Peds. (#/hr)	37		97						130	130			
Confl. Bikes (#/hr)			3										
Peak Hour Factor	0.94	0.94	0.94	0.92	0.92	0.92	0.90	0.90	0.90	0.88	0.88	0.88	
Heavy Vehicles (%)	4%	2%	1%	2%	2%	2%	0%	3%	3%	0%	5%	0%	
Adj. Flow (vph)	63	1030	236	0	0	0	0	414	287	17	282	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1329	0	0	0	0	0	701	0	0	299	0	
Turn Type	Split	NA						NA		Perm	NA		
Protected Phases	1	1						5			5		2
Permitted Phases										5			
Detector Phase	1	1						5		5	5		
Switch Phase													
Minimum Initial (s)	10.0	10.0						10.0		10.0	10.0		8.0
Minimum Split (s)	44.0	44.0						35.0		35.0	35.0		21.0
Total Split (s)	44.0	44.0						35.0		35.0	35.0		21.0
Total Split (%)	44.0%	44.0%						35.0%		35.0%	35.0%		21%
Maximum Green (s)	39.0	39.0						31.0		31.0	31.0		19.0
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0						1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						4.0			4.0		
Lead/Lag	Lead	Lead											Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0	2.0						2.0		2.0	2.0		0.2
Recall Mode	C-Max	C-Max						Max		Max	Max		None
Walk Time (s)	30.0	30.0						22.0		22.0	22.0		10.0
Flash Dont Walk (s)	9.0	9.0						9.0		9.0	9.0		9.0
Pedestrian Calls (#/hr)	0	0						0		0	0		370
Act Effct Green (s)		39.0						31.0			31.0		
Actuated g/C Ratio		0.39						0.31			0.31		
v/c Ratio		0.55						0.64			0.31		
Control Delay		23.4						24.7			27.5		
Queue Delay		0.0						0.0			0.0		
Total Delay		23.4						24.7			27.5		
LOS		C						C			C		
Approach Delay		23.4						24.7			27.5		
Approach LOS		C						C			C		
Queue Length 50th (ft)		178						148			76		
Queue Length 95th (ft)		213						212			110		
Internal Link Dist (ft)		150			685			806			93		
Turn Bay Length (ft)													
Base Capacity (vph)		2430						1090			962		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.55						0.64			0.31		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 24.3 Intersection LOS: C
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Tremont Street & Arlington Street/Herald Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	1232	93	0	0	0	0	0	0	298	195	0	
Future Volume (vph)	0	1232	93	0	0	0	0	0	0	298	195	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.95	1.00	
Ped Bike Factor		0.99								0.90			
Frt		0.989											
Flt Protected										0.950			
Satd. Flow (prot)	0	4949	0	0	0	0	0	0	0	3367	3574	0	
Flt Permitted										0.950			
Satd. Flow (perm)	0	4949	0	0	0	0	0	0	0	3036	3574	0	
Right Turn on Red			Yes			Yes			Yes	Yes		Yes	
Satd. Flow (RTOR)		17								368			
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		765			139			152			271		
Travel Time (s)		17.4			3.2			3.5			6.2		
Confl. Peds. (#/hr)			100							82			
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92	0.81	0.81	0.81	
Heavy Vehicles (%)	0%	3%	0%	2%	2%	2%	2%	2%	2%	4%	1%	0%	
Adj. Flow (vph)	0	1400	106	0	0	0	0	0	0	368	241	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	1506	0	0	0	0	0	0	0	368	241	0	
Turn Type		NA								Split	NA		
Protected Phases		1								5	5		2
Permitted Phases													
Detector Phase		1								5	5		
Switch Phase													
Minimum Initial (s)		8.0								2.0	2.0		1.0
Minimum Split (s)		54.0								29.0	29.0		17.0
Total Split (s)		54.0								29.0	29.0		17.0
Total Split (%)		54.0%								29.0%	29.0%		17%
Maximum Green (s)		50.0								25.0	25.0		11.0
Yellow Time (s)		3.0								3.0	3.0		2.0
All-Red Time (s)		1.0								1.0	1.0		4.0
Lost Time Adjust (s)		0.0								0.0	0.0		
Total Lost Time (s)		4.0								4.0	4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)		2.0								2.0	2.0		0.2
Recall Mode		C-Max								Max	Max		None
Walk Time (s)		39.0								16.0	16.0		5.0
Flash Dont Walk (s)		11.0								9.0	9.0		6.0
Pedestrian Calls (#/hr)		0								0	0		399
Act Effct Green (s)		50.0								25.0	25.0		
Actuated g/C Ratio		0.50								0.25	0.25		
v/c Ratio		0.61								0.33	0.27		
Control Delay		8.1								1.2	19.3		
Queue Delay		1.4								0.2	0.0		
Total Delay		9.5								1.4	19.3		
LOS		A								A	B		
Approach Delay		9.5									8.5		
Approach LOS		A									A		
Queue Length 50th (ft)		94								2	31		
Queue Length 95th (ft)		106								3	39		
Internal Link Dist (ft)		685			59			72			191		
Turn Bay Length (ft)													
Base Capacity (vph)		2483								1117	893		
Starvation Cap Reductn		0								253	0		
Spillback Cap Reductn		718								53	0		
Storage Cap Reductn		0								0	0		
Reduced v/c Ratio		0.85								0.43	0.27		

Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 1:EBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Herald Street & Shawmut Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	1369	110	0	0	0	0	535	179	0	21	0
Future Volume (vph)	35	1369	110	0	0	0	0	535	179	0	21	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	12	11	11	12	12	12
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.88			
Frt		0.989							0.850			
Flt Protected		0.999										
Satd. Flow (prot)	0	4285	0	0	0	0	0	1503	1364	0	934	0
Flt Permitted		0.999										
Satd. Flow (perm)	0	4284	0	0	0	0	0	1503	1205	0	934	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14							22			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		203			204			266			224	
Travel Time (s)		4.6			4.6			6.0			5.1	
Confl. Peds. (#/hr)	8								188			
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.92	0.92	0.92	0.78	0.78	0.78
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	10%	3%	0%	83%	0%
Bus Blockages (#/hr)	0	9	0	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	39	1521	122	0	0	0	0	582	195	0	27	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1682	0	0	0	0	0	582	195	0	27	0
Turn Type	Perm	NA						NA	Perm		NA	
Protected Phases		1						6			6	
Permitted Phases	1								6			
Detector Phase	1	1						6	6		6	
Switch Phase												
Minimum Initial (s)	12.0	12.0						12.0	12.0		12.0	
Minimum Split (s)	42.0	42.0						58.0	58.0		58.0	
Total Split (s)	42.0	42.0						58.0	58.0		58.0	
Total Split (%)	42.0%	42.0%						58.0%	58.0%		58.0%	
Maximum Green (s)	37.0	37.0						53.0	53.0		53.0	
Yellow Time (s)	4.0	4.0						4.0	4.0		4.0	
All-Red Time (s)	1.0	1.0						1.0	1.0		1.0	
Lost Time Adjust (s)		-1.0						-1.0	-1.0		-1.0	
Total Lost Time (s)		4.0						4.0	4.0		4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0	3.0		3.0	
Recall Mode	C-Max	C-Max						Max	Max		Max	
Walk Time (s)	28.0	28.0						44.0	44.0		44.0	
Flash Dont Walk (s)	9.0	9.0						9.0	9.0		9.0	
Pedestrian Calls (#/hr)	0	0						0	0		0	
Act Effct Green (s)		38.0						54.0	54.0		54.0	
Actuated g/C Ratio		0.38						0.54	0.54		0.54	
v/c Ratio		1.03						0.72	0.30		0.05	
Control Delay		45.6						23.5	12.5		11.4	
Queue Delay		0.0						0.0	0.0		0.0	
Total Delay		45.6						23.5	12.5		11.4	
LOS		D						C	B		B	
Approach Delay		45.6						20.8			11.4	
Approach LOS		D						C			B	
Queue Length 50th (ft)		~424						264	56		8	
Queue Length 95th (ft)		#523						403	102		18	
Internal Link Dist (ft)		123			124			186			144	
Turn Bay Length (ft)												
Base Capacity (vph)		1636						811	660		504	
Starvation Cap Reductn		0						0	0		0	
Spillback Cap Reductn		0						0	0		0	
Storage Cap Reductn		0						0	0		0	
Reduced v/c Ratio		1.03						0.72	0.30		0.05	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 14 (14%), Referenced to phase 1:EBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 37.5 Intersection LOS: D
Intersection Capacity Utilization 83.7% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

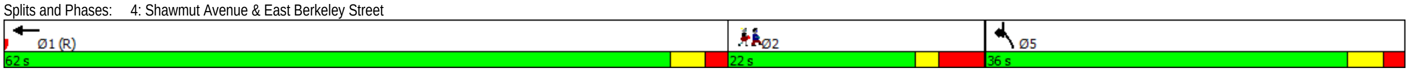
Splits and Phases: 3: Washington Street & Herald Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations					↑↑↑		↰					↱	
Traffic Volume (vph)	0	0	0	0	821	0	105	0	0	0	0	278	
Future Volume (vph)	0	0	0	0	821	0	105	0	0	0	0	278	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							0.89						
Frt												0.865	
Flt Protected							0.950						
Satd. Flow (prot)	0	0	0	0	4532	0	1577	0	0	0	0	1465	
Flt Permitted							0.950						
Satd. Flow (perm)	0	0	0	0	4532	0	1403	0	0	0	0	1465	
Right Turn on Red			Yes			Yes	Yes		Yes			Yes	
Satd. Flow (RTOR)							301					301	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		829			256			598			862		
Travel Time (s)		18.8			5.8			13.6			19.6		
Confl. Peds. (#/hr)							46					46	
Confl. Bikes (#/hr)												2	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.80	0.80	0.80	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	3%	0%	0%	0%	0%	1%	
Adj. Flow (vph)	0	0	0	0	933	0	131	0	0	0	0	293	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	933	0	131	0	0	0	0	293	
Turn Type					NA		Prot					Prot	
Protected Phases					1		5!					5!	2
Permitted Phases													
Detector Phase					1		5					5	
Switch Phase													
Minimum Initial (s)					8.0		8.0					8.0	1.0
Minimum Split (s)					62.0		20.0					20.0	22.0
Total Split (s)					62.0		36.0					36.0	22.0
Total Split (%)					51.7%		30.0%					30.0%	18%
Maximum Green (s)					57.0		31.0					31.0	16.0
Yellow Time (s)					3.0		3.0					3.0	2.0
All-Red Time (s)					2.0		2.0					2.0	4.0
Lost Time Adjust (s)					0.0		0.0					0.0	
Total Lost Time (s)					5.0		5.0					5.0	
Lead/Lag					Lead								Lag
Lead-Lag Optimize?													
Vehicle Extension (s)					2.0		2.0					2.0	0.2
Recall Mode					C-Max		None					None	None
Walk Time (s)					47.0		8.0					8.0	7.0
Flash Dont Walk (s)					10.0		7.0					7.0	9.0
Pedestrian Calls (#/hr)					0		0					0	240
Act Effct Green (s)					78.3		9.7					9.7	
Actuated g/C Ratio					0.65		0.08					0.08	
v/c Ratio					0.32		0.32					0.74	
Control Delay					9.8		2.1					17.2	
Queue Delay					0.0		0.0					0.0	
Total Delay					9.8		2.1					17.2	
LOS					A		A					B	
Approach Delay					9.8			2.1			17.2		
Approach LOS					A			A			B		
Queue Length 50th (ft)					101		0					0	
Queue Length 95th (ft)					148		0					78	
Internal Link Dist (ft)		749			176			518			782		
Turn Bay Length (ft)													
Base Capacity (vph)					2956		630					601	
Starvation Cap Reductn					0		0					0	
Spillback Cap Reductn					0		0					0	
Storage Cap Reductn					0		0					0	
Reduced v/c Ratio					0.32		0.21					0.49	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 1:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 10.6 Intersection LOS: B
Intersection Capacity Utilization 58.6% ICU Level of Service B
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 4: Shawmut Avenue & East Berkeley Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	31	0	27	369	629	210	107	379	0	0	418	62	
Future Volume (vph)	31	0	27	369	629	210	107	379	0	0	418	62	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	0.95	0.95	
Ped Bike Factor					1.00			0.99			0.99		
Frt			0.850		0.962						0.981		
Flt Protected	0.950			0.950				0.989					
Satd. Flow (prot)	1624	0	1454	1593	3017	0	0	3126	0	0	3053	0	
Flt Permitted	0.102			0.950				0.589					
Satd. Flow (perm)	174	0	1454	1593	3017	0	0	1850	0	0	3053	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			100		41						14		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		647			829			409			886		
Travel Time (s)		14.7			18.8			9.3			20.1		
Confl. Peds. (#/hr)							77					77	
Confl. Bikes (#/hr)						2						4	
Peak Hour Factor	0.75	0.75	0.75	0.88	0.88	0.88	0.87	0.87	0.87	0.83	0.83	0.83	
Heavy Vehicles (%)	0%	0%	0%	2%	3%	4%	2%	3%	0%	0%	3%	4%	
Adj. Flow (vph)	41	0	36	419	715	239	123	436	0	0	504	75	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	41	0	36	419	954	0	0	559	0	0	579	0	
Turn Type	D.Pm		Perm	Perm	NA		pm+pt	NA			NA		
Protected Phases					5		6	1 6			1		2
Permitted Phases	5		5	5			1 6						
Detector Phase	5		5	5	5		6	1 6			1		
Switch Phase													
Minimum Initial (s)	5.0		5.0	5.0	5.0		4.0				10.0		1.0
Minimum Split (s)	9.0		9.0	9.0	9.0		8.0				38.0		25.0
Total Split (s)	44.0		44.0	44.0	44.0		13.0				38.0		25.0
Total Split (%)	36.7%		36.7%	36.7%	36.7%		10.8%				31.7%		21%
Maximum Green (s)	40.0		40.0	40.0	40.0		9.0				34.0		19.0
Yellow Time (s)	3.0		3.0	3.0	3.0		3.0				3.0		2.0
All-Red Time (s)	1.0		1.0	1.0	1.0		1.0				1.0		4.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0						0.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0						4.0		
Lead/Lag											Lead		Lag
Lead-Lag Optimize?													
Vehicle Extension (s)	2.0		2.0	2.0	2.0		2.0				2.0		0.2
Recall Mode	None		None	None	None		None				C-Max		None
Walk Time (s)											28.0		8.0
Flash Dont Walk (s)											6.0		11.0
Pedestrian Calls (#/hr)											0		322
Act Effct Green (s)	39.3		39.3	39.3	39.3			43.7			34.7		
Actuated g/C Ratio	0.33		0.33	0.33	0.33			0.36			0.29		
v/c Ratio	0.72		0.07	0.80	0.94			0.73			0.65		
Control Delay	96.8		0.2	46.0	50.8			35.9			40.6		
Queue Delay	0.0		0.0	0.0	0.0			0.0			0.0		
Total Delay	96.8		0.2	46.0	50.8			35.9			40.6		
LOS	F		A	D	D			D			D		
Approach Delay		51.7			49.3			35.9			40.6		
Approach LOS		D			D			D			D		
Queue Length 50th (ft)	28		0	304	374			166			203		
Queue Length 95th (ft)	#73		0	#428	#482			209			241		
Internal Link Dist (ft)		567			749			329			806		
Turn Bay Length (ft)													
Base Capacity (vph)	58		551	531	1033			768			892		
Starvation Cap Reductn	0		0	0	0			0			0		
Spillback Cap Reductn	0		0	0	0			0			0		
Storage Cap Reductn	0		0	0	0			0			0		
Reduced v/c Ratio	0.71		0.07	0.79	0.92			0.73			0.65		

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 75 (63%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 44.6 Intersection LOS: D
Intersection Capacity Utilization 82.8% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Tremont Street & Berkeley Street/East Berkeley Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	0	0	95	384	0	0	0	0	0	398	223	
Future Volume (vph)	0	0	0	95	384	0	0	0	0	0	398	223	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.91	
Ped Bike Factor					0.99						0.97		
Frt											0.946		
Flt Protected					0.990								
Satd. Flow (prot)	0	0	0	0	3539	0	0	0	0	0	4661	0	
Flt Permitted					0.990								
Satd. Flow (perm)	0	0	0	0	3513	0	0	0	0	0	4661	0	
Right Turn on Red			Yes	Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					35						151		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		310			237			271			312		
Travel Time (s)		7.0			5.4			6.2			7.1		
Confl. Peds. (#/hr)				44								73	
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.92	0.92	0.92	0.83	0.83	0.83	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	0%	2%	3%	
Adj. Flow (vph)	0	0	0	107	431	0	0	0	0	0	480	269	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	538	0	0	0	0	0	749	0	
Turn Type				Split	NA						NA		
Protected Phases				1	1						5		2
Permitted Phases													
Detector Phase				1	1						5		
Switch Phase													
Minimum Initial (s)				10.0	10.0						10.0		1.0
Minimum Split (s)				41.0	41.0						37.0		22.0
Total Split (s)				41.0	41.0						37.0		22.0
Total Split (%)				41.0%	41.0%						37.0%		22%
Maximum Green (s)				37.0	37.0						33.0		20.0
Yellow Time (s)				3.0	3.0						3.0		2.0
All-Red Time (s)				1.0	1.0						1.0		0.0
Lost Time Adjust (s)					0.0						0.0		
Total Lost Time (s)					4.0						4.0		
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)				2.0	2.0						2.0		0.2
Recall Mode				C-Max	C-Max						Max		None
Walk Time (s)				26.0	26.0						25.0		13.0
Flash Dont Walk (s)				11.0	11.0						8.0		7.0
Pedestrian Calls (#/hr)				0	0						0		352
Act Effct Green (s)					37.0						33.0		
Actuated g/C Ratio					0.37						0.33		
v/c Ratio					0.40						0.46		
Control Delay					22.8						21.8		
Queue Delay					0.0						0.0		
Total Delay					22.8						21.8		
LOS					C						C		
Approach Delay					22.8						21.8		
Approach LOS					C						C		
Queue Length 50th (ft)					122						108		
Queue Length 95th (ft)					166						128		
Internal Link Dist (ft)		230			157			191			232		
Turn Bay Length (ft)													
Base Capacity (vph)					1331						1639		
Starvation Cap Reductn					0						0		
Spillback Cap Reductn					0						0		
Storage Cap Reductn					0						0		
Reduced v/c Ratio					0.40						0.46		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 1 (1%), Referenced to phase 1:WBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Shawmut Avenue & Marginal Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1522	7	0	0	0	6
Future Volume (Veh/h)	1522	7	0	0	0	6
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.92	0.92	0.75	0.75
Hourly flow rate (vph)	1673	8	0	0	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	139			203		
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1681		1677	562
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			924		919	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			579		216	860

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	669	669	343	8
Volume Left	0	0	0	0
Volume Right	0	0	8	8
cSH	1700	1700	1700	860
Volume to Capacity	0.39	0.39	0.20	0.01
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	9.2
Lane LOS				A
Approach Delay (s)	0.0			9.2
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	0	0	0	8	280
Future Volume (Veh/h)	11	0	0	0	8	280
Sign Control	Yield		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)	12	0	0	0	9	304
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			862			152
pX, platoon unblocked	0.93					
vC, conflicting volume	322	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			99	
cM capacity (veh/h)	697	1085			1623	

Direction, Lane #	WB 1	SB 1
Volume Total	12	313
Volume Left	12	9
Volume Right	0	0
cSH	697	1623
Volume to Capacity	0.02	0.01
Queue Length 95th (ft)	1	0
Control Delay (s)	10.3	0.3
Lane LOS	B	A
Approach Delay (s)	10.3	0.3
Approach LOS	B	

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C

Air Quality

AIR QUALITY APPENDIX

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 4.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale air quality analysis.

Motor Vehicle Emissions

The EPA MOVES computer program generated motor vehicle emissions used in the garage stationary source analysis along with the mobile source CAL3QHC modeling and mesoscale analysis. The model input parameters were provided by MassDEP. Emission rates were derived for 2017 and 2024 for speed limits of idle, 10, 15, and 25 mph for use in the microscale analyses.

MOVES CO Emission Factor Summary

Carbon Monoxide Only

		2017	2024
Free Flow	25 mph	2.611	1.758
Right Turns	10 mph	4.058	2.693
Left Turns	15 mph	3.508	2.369
Queues	Idle	8.013	3.216

Notes: Winter CO emission factors are higher than Summer and are conservatively used
Urban Unrestricted Roadway type used

CAL3QHC

For the intersection studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOVES. The intersection's queue links and free flow links were input to the model along with sensitive receptors at all locations nearby each intersection. The meteorological assumptions input into the model were a 1.0 meter per second wind speed, Pasquill-Gifford Class D stability combined with a mixing height of 1000 meters. For each direction, the full range of wind directions at 10 degree intervals was examined. In addition, a surface roughness (z_0) of 321 cm was used for the intersection. Idle emission rates for queue links were based on 0 mph emission rates derived in MOVES. Emission rates for speeds of 10, 15, and 25 mph were used for right turn, left turn, and free flow links, respectively.

112 Shawmut Avenue
Background Concentrations

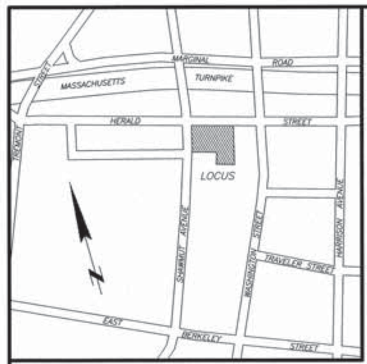
POLLUTANT	AVERAGING TIME	Form	2013	2014	2015	Units	ppm/ppb to µg/m³ Conversion Factor	2013-2015 Background Concentration (µg/m³)	Location
SO_2 (1)(6)(7)	1-Hour (5)	99th %	14	28	9.4	ppb	2.62	44.9	531A E. 1st St., Boston (7)
	3-Hour	H2H	16.3	24.3	8.7	ppb	2.62	63.7	531A E. 1st St., Boston (7)
	24-Hour	H2H	6.5	8.1	4.3	ppb	2.62	21.2	531A E. 1st St., Boston (7)
	Annual	H	1.53	1.74	0.8	ppb	2.62	4.6	531A E. 1st St., Boston (7)
PM-10	24-Hour	H2H	34	61	28	µg/m³	1	61	Harrison Ave., Boston
	Annual	H	15.1	13.9	12.4	µg/m³	1	15.1	Harrison Ave., Boston
PM-2.5	24-Hour (4)	98th %	19.9	14.5	16.8	µg/m³	1	17.1	174 North St, Boston
	Annual (4)	H	8.8	7.1	7.4	µg/m³	1	7.8	174 North St, Boston
NO_2 (3)	1-Hour (5)	98th %	47	62	53	ppb	1.88	101.5	531A E. 1st St., Boston (7)
	Annual	H	12.2	14	15.0	ppb	1.88	28.1	531A E. 1st St., Boston (7)
CO (2)	1-Hour	H2H	1.9	1.7	1.4	ppm	1146	2145.3	Harrison Ave., Boston
	8-Hour	H2H	1.2	1.3	0.9	ppm	1146	1489.8	Harrison Ave., Boston
Ozone (4)	8-Hour	H4H	0.059	0.054	0.056	ppm	1963	115.8	Harrison Ave., Boston
Lead	Rolling 3-Month	H	0.006	0.014	0.016	µg/m³	1	0.016	Harrison Ave., Boston

Notes:
From 2013-2015 EPA's AirData Website
(1) SO_2 reported ppb. Converted to µg/m^3 using factor of 1 ppm = 2.62 µg/m^3.
(2) CO reported in ppm. Converted to µg/m^3 using factor of 1 ppm = 1146 µg/m^3.
(3) NO_2 reported in ppb. Converted to µg/m^3 using factor of 1 ppm = 1.88 µg/m^3.
(4) O_3 reported in ppm. Converted to µg/m^3 using factor of 1 ppm = 1963 µg/m^3.
(5) Background level is the average concentration of the three years.
(6) The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.
(7) The E. 1st St. monitor was closed in 2014. Harrison Avenue data used for 2015 SO_2 and NO_2.

Due to excessive size CAL3QHC, and MOVES input and output files are available on digital media upon request.

Appendix D

Survey



LOCUS MAP
NOT TO SCALE

ZONING CLASSIFICATION – "SOUTH END NEIGHBORHOOD" DISTRICT – ECONOMIC DEVELOPMENT AREA (EDA) NORTH

MINIMUM LOT SIZE	NONE
MINIMUM FRONTAGE	NONE
MINIMUM FRONT YARD	NONE
MINIMUM SIDE YARD	NONE
MINIMUM REAR YARD	20 FEET
MAXIMUM FLOOR AREA RATIO	4.0
MAXIMUM BUILDING HEIGHT	100 FEET

SEE ARTICLE 64 OF CITY OF BOSTON ZONING CODE.

THE SOUTH END NEIGHBORHOOD DISTRICT IS WITHIN THE RESTRICTED PARKING (OVERLAY) DISTRICT, AND THE GROUNDWATER CONSERVATION OVERLAY DISTRICT.

NOTES:

1) BY GRAPHIC PLOTTING ONLY, THE PARCEL SHOWN HEREON LIES WITHIN A ZONE "X" (UNSHADED), AN AREA OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD, AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A) FLOOD INSURANCE RATE MAP (F.I.R.M.) FOR SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0077G, CITY OF BOSTON COMMUNITY, HAVING AN EFFECTIVE DATE OF SEPTEMBER 25, 2009.

2) ZONING INFORMATION AS SHOWN HEREON WAS OBTAINED BY FELDMAN LAND SURVEYORS VIA THE BOSTON REDEVELOPMENT AUTHORITY'S WEBSITE, AND NOT PROVIDED BY THE TITLE INSURER AS REQUIRED BY ITEM 6 (A OR B) OF TABLE "A" IN THE 2011 ALTA SURVEY REQUIREMENTS.

3) THERE WAS NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.

4) THERE WAS NO OBSERVED EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

5) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES.

6) THERE ARE 48 STRIPED PARKING SPACES PLUS 1 HANDICAP PARKING SPACE ON LOCUS.

7) PROPERTY HAS ACCESS TO HERALD STREET AND SHAWMUT AVENUE, BOTH PUBLIC WAYS IN THE CITY OF BOSTON.

8) THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF FELDMAN LAND SURVEYORS. ISSUED TO OUR CLIENT FOR PURPOSES RELATED DIRECTLY AND SOLELY TO FELDMAN LAND SURVEYORS' SCOPE OF SERVICES UNDER CONTRACT TO OUR CLIENT FOR THIS PROJECT. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN CONSENT IS PROVIDED BY FELDMAN LAND SURVEYORS.

9) A TERMINATION OF THE WATER AND SEWER EASEMENT IN THE FORMER MAYO STREET IS RECORDED IN BOOK 54502, PAGE 261.

BOUNDARY DESCRIPTIONS TITLE COMMITMENT NO. C22184–LP ISSUED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, HAVING AN EFFECTIVE DATE OF NOVEMBER 12, 2015.

PARCEL I (REGISTERED LAND)

A CERTAIN PARCEL OF LAND SITUATED IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS, WITH THE BUILDINGS THEREON, SITUATED ON SHAWMUT AVENUE, CASTLE STREET AND HERALD STREET.

SAID LAND IS DETERMINED BY THE LAND COURT TO BE LOCATED AS SHOWN ON A PLAN DRAWN BY GEORGE H. SHERMAN, SURVEYOR, DATED MAY 5, 1914, AS APPROVED BY SAID COURT, FILED IN THE LAND REGISTRATION OFFICE AS PLAN NO. 5597–A, A COPY OF A PORTION OF WHICH IS FILED WITH CERTIFICATE OF TITLE NO. 7798.

PARCEL II (UNREGISTERED LAND)

A CERTAIN PARCEL OF LAND IN BOSTON, SUFFOLK COUNTY, MASSACHUSETTS BEING PRESENTLY KNOWN AND NUMBERED AS 60 HERALD STREET AND COMPROMISING LOTS 8 THROUGH 12 INCLUSIVE AS SHOWN ON A PLAN BY S.C. ELLIS DATED APRIL 1, 1880, AND RECORDED WITH SUFFOLK REGISTRY OF DEEDS IN BOOK 1494, PAGE 640, SAID LOTS TOGETHER BEING BOUNDED AND DESCRIBED AS FOLLOWS:

NORTHERLY: BY HERALD STREET (FORMERLY CASTLE STREET), FORTY–EIGHT (48) FEET;

EASTERLY: BY MAYO STREET, ONE HUNDRED EIGHTY–THREE AND 90/100 (183.90) FEET;

SOUTHERLY: BY LAND NOW OR FORMERLY OF THE HEIRS OF WILLIAM S. WHITE, SIXTY–SEVEN AND 71/100 (67.71) FEET;

WESTERLY: BY LOTS 13 AND 14 SHOWN ON SAID PLAN, FIFTY–SEVEN AND 10/100 (57.10) FEET;

NORTHERLY: BY PARCEL 1 HEREINABOVE DESCRIBED, TWENTY–ONE AND 7/100 (21.07) FEET; AND

WESTERLY: BY PARCEL 1 HEREINABOVE DESCRIBED, ONE HUNDRED TWENTY–FIVE AND 42/100 (125.42) FEET.

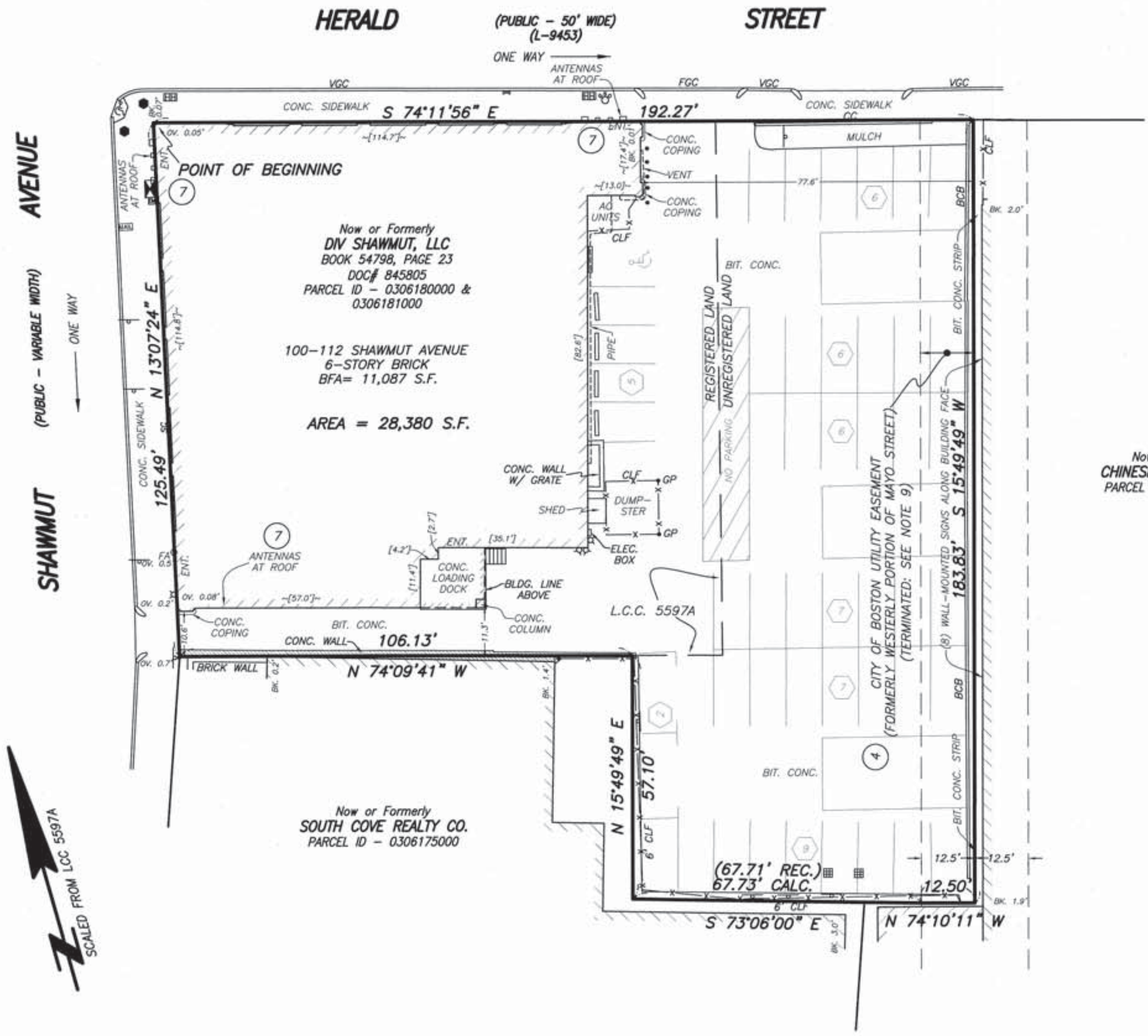
EXCEPTIONS FROM COVERAGE (SURVEY RELATED ONLY) SCHEDULE B, SECTION 2, LISTED IN TITLE COMMITMENT NO. C22184–LP ISSUED BY COMMONWEALTH LAND TITLE INSURANCE COMPANY, HAVING AN EFFECTIVE DATE OF NOVEMBER 12, 2015.

4 DISCONTINUANCE OF MAYO STREET, RECORDED WITH SUFFOLK REGISTRY OF DEEDS IN BOOK 8013, PAGE 252, EXCEPTING AND RESERVING TO THE CITY OF BOSTON THE RIGHT AND EASEMENT TO LAY, CONSTRUCT, MAINTAIN, REPAIR AND RENEW WATER AND SEWER WORKS IN LOCATIONS SHOWN ON PLAN RECORDED WITH SUFFOLK REGISTRY OF DEEDS IN BOOK 8012–END. (AS SHOWN HEREON) (SEE NOTE 9)

5 VOTE OF DESIGNATION BY THE BOSTON LANDMARKS COMMISSION RECORDED WITH SAID DEEDS IN BOOK 11641, PAGE 62. (NOT PLOTTABLE)

6 NOTICE OF LEASE DATED DECEMBER 31, 1987 BETWEEN SHAWMUT 112 LIMITED PARTNERSHIP, LESSOR, AND HARRY R. FELDMAN, INC. ANTI H.W. MOORE ASSOCIATES, INC., LESSEES, RECORDED IN BOOK 14489, PAGE 59. (NOT PLOTTABLE)

7 NOTICES OF LEASE DATED MARCH 8 1997 AND JULY 1, 1997, RESPECTIVELY, BETWEEN ACTION FOR BOSTON COMMUNITY DEVELOPMENT REAL ESTATE CORPORATION AND CELLCO PARTNERSHIP D/B/A BELL ATLANTIC–MOBILE, INC. (NOW VERIZON WIRELESS BOSTON PCS, LLC), RECORDED IN BOOK 21861 PAGE 151 AND FILED AS DOCUMENT NO. 558167. (AS SHOWN HEREON)



LEGEND

- GAS SHUT OFF/GAS GATE
- CATCH BASIN
- TRAFFIC CONTROL BOX
- TRAFFIC SIGNAL
- ELECTRIC HANDHOLE
- VALVE (UNKNOWN)
- BOLLARD
- MAIL BOX
- SIGN
- FA — FIRE ALARM
- SECURITY CAMERA
- SIAMESE CONNECTION
- EM — ELECTRIC METER
- GP — GATE POST
- HANDICAP PARKING SPACE
- HANDICAP RAMP
- CURB RETURN
- (X) — NUMBER OF PARKING SPACES
- (X) — EXCEPTION NUMBER LISTED IN TITLE COMMITMENT
- BCB — BIT. CONC. BERM
- [X.X'] — BUILDING DIMENSION
- BIT — BITUMINOUS
- BK — BACK
- CC — CONCRETE CURB
- CLF — CHAIN LINK FENCE
- CONC — CONCRETE
- FGC — FLUSH GRANITE CURB
- LCC — LAND COURT CASE
- N/F — NOW OR FORMERLY
- OV — OVER
- SQ. FT. — SQUARE FEET
- —X——X— METAL FENCE

BOUNDARY DESCRIPTION (PER SURVEY)

A CERTAIN PARCEL OF LAND, CONTAINING REGISTERED AND UNREGISTERED LAND, SITUATED IN THE CITY OF BOSTON, COUNTY OF SUFFOLK, AND COMMONWEALTH OF MASSACHUSETTS, BOUNDED AND DESCRIBED AND FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EASTERLY SIDELINE OF SHAWMUT AVENUE AND THE SOUTHER SIDELINE OF HERALD STREET;

THENCE RUNNING S74°11'76"E ALONG SAID SOUTHERLY SIDELINE OF HERALD STREET, A DISTANCE OF 192.27 FEET TO A POINT;

THENCE TURNING AND RUNNING S15°49'49"W, BY LAND NOW OR FORMERLY OF CHINESE CONSOLIDATED, A DISTANCE OF 183.83 FEET;

THENCE TURNING AND RUNNING N73°06'00"W, A DISTANCE OF 67.71 FEET;

THENCE TURNING AND RUNNING N15°49'49"E, A DISTANCE OF 57.10 FEET;

THENCE TURNING AND RUNNING N74°09'41"W, A A DISTANCE OF 106.13 FEET TO A POINT ON THE EASTERLY SIDELINE OF SHAWMUT AVENUE, THE PREVIOUS THREE COURSES BY LAND NOW OR FORMERLY OF SOUTH COVE REALTY;

THENCE TURNING AND RUNNING ALONG SAID SHAWMUT AVENUE, N13°07'24"E, A DISTANCE OF 125.49 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINING AN AREA OF 28,380 SQUARE FEET.

TO: COMMONWEALTH LAND TITLE INSURANCE CORPORATION; DIV SHAWMUT, LLC, AND FIRST NIAGARA BANK, N.A. ITS SUCCESSORS AND/OR ASSIGNS, AS THEIR INTERESTS MAY APPEAR:

THIS IS TO CERTIFY THAT THIS PLAN AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 7(A), 7(B)(1), 8, 9, 11(A), 13, 14, 16, 17, 18, AND 21 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON MAY 15, 2015.

PAUL R. FOLEY, PLS (MA# 48355)
PRF@FELDMANSURVEYORS.COM

11/21/2015
DATE

COMMONWEALTH OF MASSACHUSETTS
PAUL R. FOLEY
No. 48355
PROFESSIONAL LAND SURVEYOR

LIST OF VISIBLE ENCROACHMENTS

HERALD STREET:
1) 4 ANTENNAS – OVER 1.2 FEET

LAND OF CHINESE CONSOLIDATED:
1) BIT. CONC. STRIP – OVER 2.4 FEET
2) 8 WALL MOUNTED SIGNS – OVER 1.9–2.0 FEET

SHAWMUT AVENUE:
1) SIGN – OVER 0.7 FEET
2) SECURITY CAMERA – OVER 0.2 FEET
3) FIRE ALARM – OVER 0.5 FEET
4) 4 ANTENNAS – OVER 1.2 FEET

REFERENCES

SUFFOLK COUNTY REGISTRY OF DEEDS
BOOK 20304 PAGE 346
BOOK 8013 PAGE 252

PLAN BOOK 1494 PAGE 640
PLAN BOOK 8050 PAGE 521

MASSACHUSETTS LAND COURT
LCC 5597A
CERTIFICATE OF TITLE 110377

CITY OF BOSTON ENGINEERING DEPARTMENT
FIELD BOOK 1286 PAGES 78–81

UPDATED TITLE COMMITMENT: NOVEMBER 17, 2015
UPDATED VISUAL INSPECTION: NOVEMBER 12, 2015

ALTA/ACSM LAND TITLE SURVEY
100–112 SHAWMUT AVENUE
BOSTON, MASS.

FELDMAN LAND SURVEYORS
112 SHAWMUT AVENUE
BOSTON, MASS. 02118

MAY 18, 2015
PHONE: (617)357–9740
www.feldmansurveyors.com

FELDMAN
LAND SURVEYORS

20 0 10 20 40 80
SCALE: 1"=20'

RESEARCH	FIELD CHIEF CS	PROJ MGR PRF	APPROVED	SHEET NO. 1 OF 1
CALC	CADD DCH	FIELD CHECKED	CRD FILE 14658PL	JOB NO. 14658

FILENAME: S:\PROJECTS\14600s\14658\DWG\14658–ALTA.dwg

Appendix E

Climate Change Checklist

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:	112 Shawmut Avenue
Project Address Primary:	112 Shawmut Avenue
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Dante Angelucci, Senior Vice President, TDC Development Group, LLC, dangelucci@TheDavisCompanies.com, (617) 451-1300

A.2 - Team Description

Owner / Developer:	DIV Shawmut, LLC
Architect:	The Architectural Team
Engineer (building systems):	RW Sullivan
Sustainability / LEED:	
Permitting:	Epsilon Associates, Inc.
Construction Management:	
Climate Change Expert:	Epsilon Associates, Inc.

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:	Residential
List the First Floor Uses:	*Lobby, retail/café*

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

☐ Wood Frame	☑ Masonry	☑ Steel Frame	☑ Concrete

Describe the building?

Site Area:	*28,378 ± SF*	Building Area:	*192,568 ± SF*
Building Height:	*150 ± Ft.*	Number of Stories:	*13 Flrs.*
First Floor Elevation (reference Boston City Base):	*23 ft BCB*	Are there below grade spaces/levels, if yes how many:	*Yes, one level*

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:	*Yes / No*

A.6 - Building Energy-

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

Electric:	*5000 (kW)*	Heating:	*3000 (MMBtu/hr)*
What is the planned building Energy Use Intensity:	*10 VA/SF (kWh/SF)*	Cooling:	*450 (Tons/hr)*

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

Electric:	*350 (kW)*	Heating:	*900 (MMBtu/hr)*
		Cooling:	*120 (Tons/hr)*

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

Electrical Generation:	*350 (kW)*		Fuel Source:	*diesel*
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?

8/91 Deg.

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

90 Deg.	*25-90 Days*	*Per year*

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

30-90 Days	*0.2 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?

45 Inches / yr.	*4 Inches*	*0.5 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?

105 Peak Wind	*10 Hours*	*0.25 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:	*10%*
How is performance determined:	Energy model

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-30 continuous above deck*	Walls / Curtain Wall Assembly:	*Opaque walls = R-13 + R-7.5 continuous exterior*
Foundation:	*N/A*	Basement / Slab:	*R-10 at elevated slabs above garage areas.*
Windows:	*Fixed - 0.38 Maximum U-Value Operable - 0.45 Maximum U-Value*	Doors:	*0.77 Maximum U-Value*

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:	Solar PV is being considered			

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?

	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 Envelop
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?

	No

Describe site conditions?

Site Elevation – Low/High Points:	*18.5'-24'*
Building Proximity to Water:	*1,490 Ft.*

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

Coastal Zone:	*No*	Velocity Zone:	*No*
Flood Zone:	*No*	Area Prone to Flooding:	*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:	*No*	Future floodplain delineation updates:	*No*

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

	1,080 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

Appendix F

Accessibility Checklist

Article 80 – Accessibility Checklist

A requirement of the Boston Planning & Development Agency (BPDA) Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

1. *Accessible Route* – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. *Accessible Group 2 Units* – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. *Accessible Guestrooms* – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. *Inclusionary Development Policy (IDP)* – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. *Public Improvement Commission (PIC)* – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. *Visitability* – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

Article 80 | ACCESSIBILTY CHECKLIST

1. Project Information: *If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*			
Project Name:	112 Shawmut Avenue		
Primary Project Address:	112 Shawmut Avenue, Boston MA		
Total Number of Phases/Buildings:	1		
Primary Contact (Name / Title / Company / Email / Phone):	Dante Angelucci, Senior Vice President, TDC Development Group, LLC, dangelucci@TheDavisCompanies.com, (617) 451-1300		
Owner / Developer:	DIV Shawmut, LLC		
Architect:	The Architectural Team, Inc.		
Civil Engineer:	Howard Stein Hudson		
Landscape Architect:			
Permitting:	Epsilon Associates, Inc.		
Construction Management:			
At what stage is the project at time of this questionnaire? Select below:			
	PNF / **Expanded PNF Submitted**	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:
Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? *If yes,* identify and explain.			

2. Building Classification and Description: *This section identifies preliminary construction information about the project including size and uses.*			
What are the dimensions of the project?			
Site Area:	*28,378 ± SF*	Building Area:	*192,568 ± GSF*
Building Height:	*150 ± FT.*	Number of Stories:	*13 Flrs.*
First Floor Elevation:	23 FT	Is there below grade space:	*Yes*

What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	**Steel Frame**	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	**Residential - Multi-unit, Four +**	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	*Lobby, retail/café*			

3. Assessment of Existing Infrastructure for Accessibility: *This section explores the proximity to accessible transit lines and institutions, such as (but not limited to) hospitals, elderly & disabled housing, and general neighborhood resources. Identify how the area surrounding the development is accessible for people with mobility impairments and analyze the existing condition of the accessible routes through sidewalk and pedestrian ramp reports*.	
Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	The Project is located in a transitional area of the south end at the intersection of Shawmut Ave and Herald Streets. To the south is Boston Chinese Evangelical Church. To the north across Herald Street and the Mass-Pike is the Josiah Quincy School. To the east is the C-mart Supermarket. And to the west is a multi-level above grade parking garage.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	The Project is located 0.3-miles from the Tufts Medical Center on the MBTA Orange Line. This station is accessible and provides constant subway and bus service on both weekday and weekend days. There is also a major bus line that runs along Washington St. to the east of the site.
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	Boston Chinese Evangelical Church, Josiah Quincy School, Tufts Medical Center, Wang YMCA, Benjamin Franklin Institute of Technology, Boston Center for the Arts
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	None
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	

Is the development site within a historic district? *If yes,* identify which district:	No. The site is located within the South End Industrial Area which included in the MHC's Inventory of Historic and Archaeological Assets of the Commonwealth, as well as the South End Landmark District's Harrison/Albany Protection Area.
Are there sidewalks and pedestrian ramps existing at the development site? *If yes*, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Sidewalk material is poured in place concrete. Material condition is fair.
Are the sidewalks and pedestrian ramps existing-to-remain? *If yes,* have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? *If yes,* provide description and photos:	No, the sidewalks will be removed and rebuilt

5. Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort 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. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? *If yes*, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	Shawmut Ave: Total width- 11', Furnishing Zone- 3', Pedestrian Zone- 8'. Herald St: Total width- 8', Furnishing Zone- 3', Pedestrian Zone- 5'.
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?	Furnishing Zone: Permeable unit pavers. Pedestrian Zone: Cast in place concrete. Proposed materials will be on City of Boston pedestrian right-of-way.

Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	No
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	Yes, Specific Repairs, Canopy License, Earth Retention System approvals
6. 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 – Disabled Parking Regulations*.	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	124 ± parking spaces will be provided on-site
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle?	5 ± of the 124 ± spaces will be accessible
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	TBD
Where is the accessible visitor parking located?	No visitor parking proposed

Has a drop-off area been identified? ***If yes,*** will it be accessible?	TBD
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.*	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	Flush Condition
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no,*** what is the reason?	Yes they are the same
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	To be determined
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	143 ±
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	All are for sale
If a residential development, how many accessible Group 2 units are being proposed?	In accordance with the requirements, 5% will meet MAAB Group 2A requirements.
If a residential development, how many accessible Group 2 units will	TBD

also be IDP units? *If none*, describe reason.	
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? *If yes,* provide amount and location of equipment.	
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. *If yes,* provide reason.	TBD
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? *If yes,* describe:	Yes, the Project includes elevators.
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community*.	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	TBD
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	TBD
Are any restrooms planned in common public spaces? *If yes,* will	No

any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? *If no*, explain why not.	
Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments?	No
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible?	No

10. Attachments

Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances.
Provide a diagram of the accessible route connections through the site, including distances.
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable)
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry.
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. • • •

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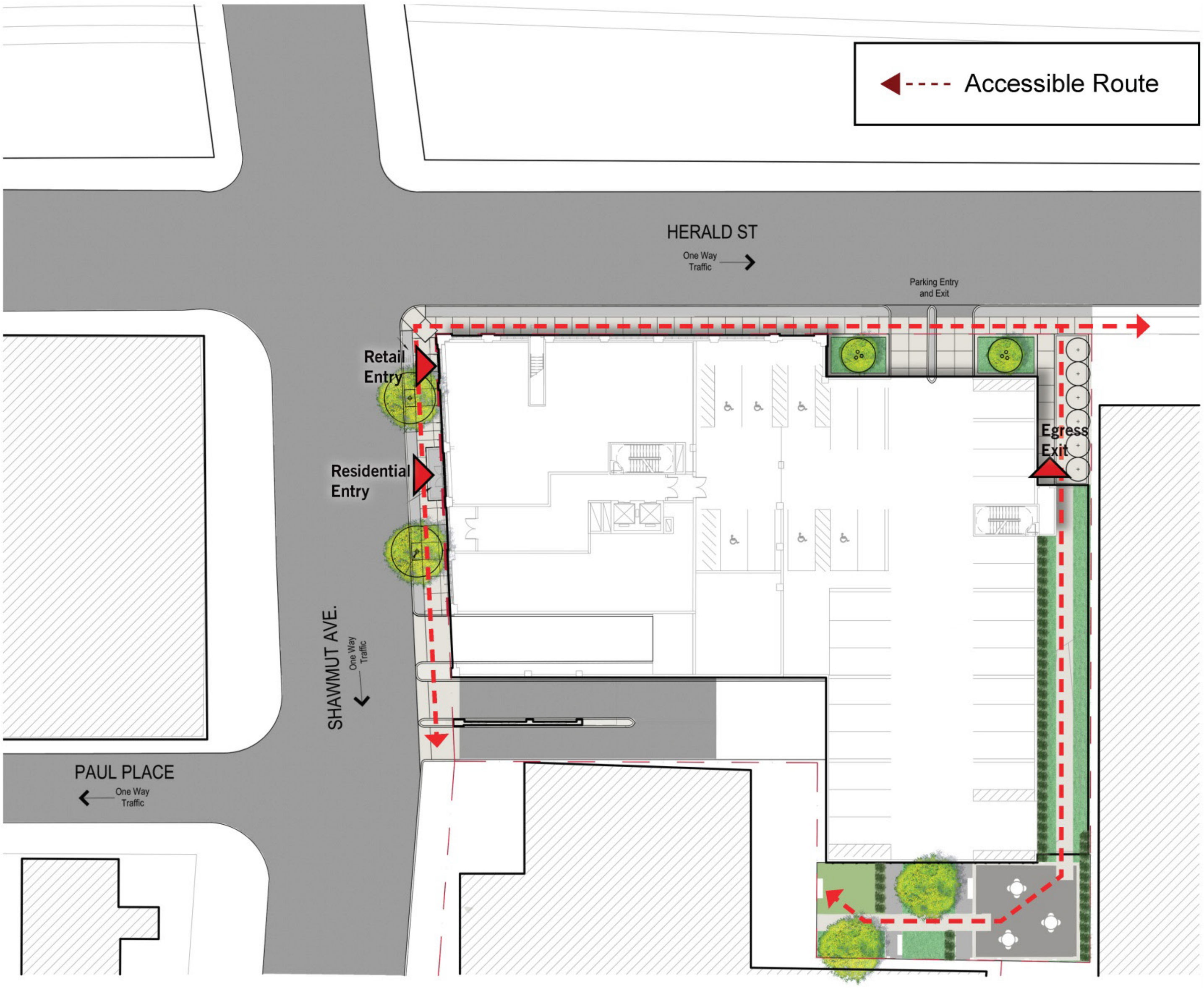
This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

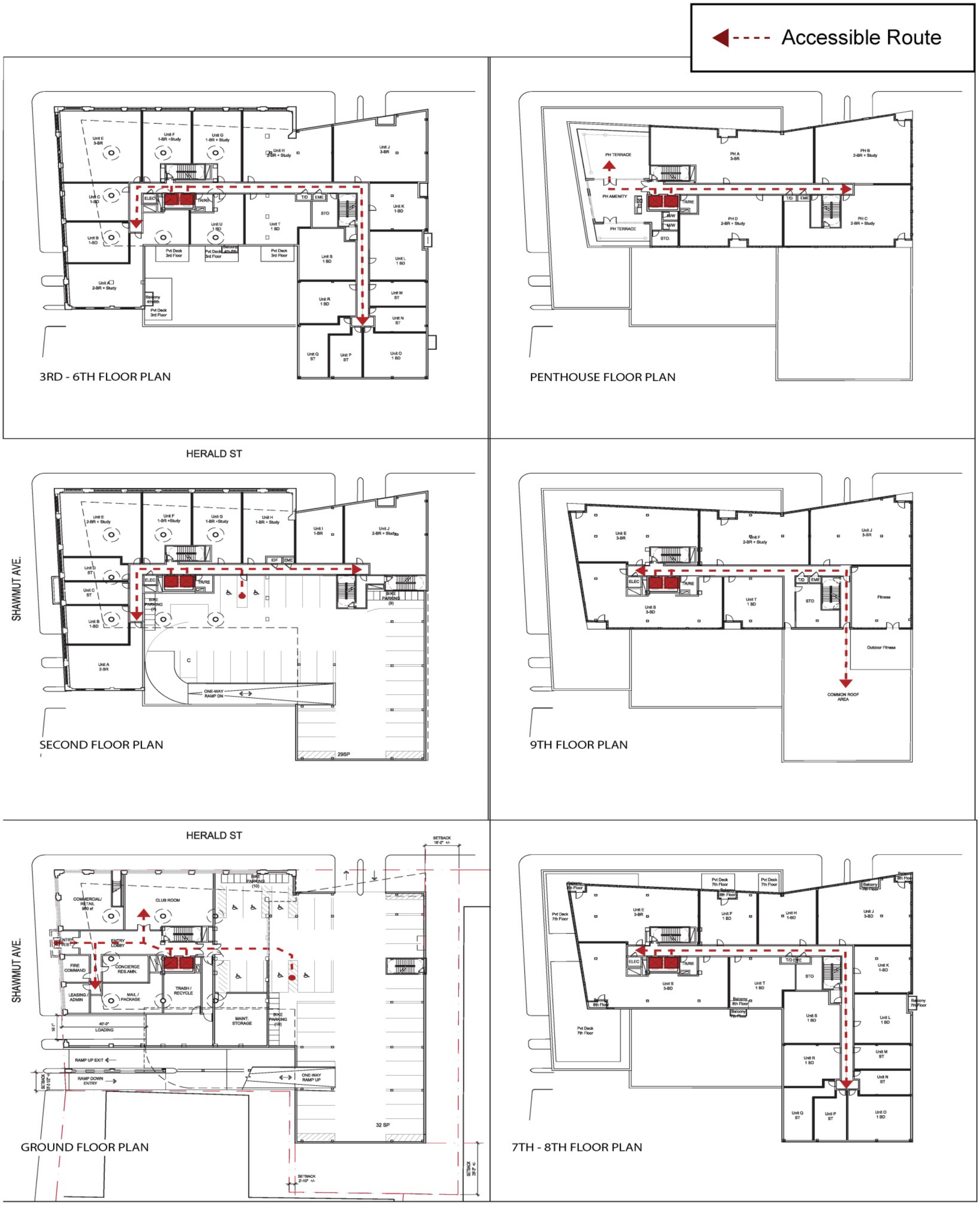
For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682


Accessible Route
HERALD ST
One Way Traffic
Parking Entry and Exit
Retail Entry
Residential Entry
Egress Exit
SHAWMUT AVE.
One Way Traffic
PAUL PLACE
One Way Traffic


Accessible Route
3RD - 6TH FLOOR PLAN
PENTHOUSE FLOOR PLAN
HERALD ST
SHAWMUT AVE.
SECOND FLOOR PLAN
9TH FLOOR PLAN
HERALD ST
SHAWMUT AVE.
GROUND FLOOR PLAN
7TH - 8TH FLOOR PLAN