
# Western Ave. Residence

## Expanded Project Notification Form

SUBMITTED TO
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

PROPONENT
The Mount Vernon Company, Inc
29 Commonwealth Ave. 6th Floor
Boston, MA 02116

PREPARED BY
vhb
99 High Street, 10th Floor
Boston, MA 02110

IN ASSOCIATION WITH
Prellwitz Chilinski Associates
Smith Duggan Buell & Rufo LLP
Howard Stein Hudson
McPhail Associates
New Ecology, Inc.
Cence Cincotti Strategies

January 4, 2016

Ref: 13237.00

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

Re: Expanded Project Notification Form
Western Avenue Residential Project
Western Avenue & Leo M Birmingham Parkway, Brighton

Dear Director Golden:

On behalf of The Mount Vernon Company, Inc. (the "Proponent"), VHB is pleased to submit the enclosed "expanded" Project Notification Form (EPNF) for a residential project known as the *Western Avenue Residence* (the "Project"). The Project will be located in the Brighton neighborhood at the intersection of Western Avenue, Leo M Birmingham Parkway, Waverly Street, and Mackin Street (the "Project Site"). The Project includes a six-story building with 132 rental apartments, 3 small retail stores. There will be 20 two-bedroom, 16 one-bedroom plus den, 43 one-bedroom and 53 studio units. Amenities include parking for 108 vehicles, storage for 132 bicycles, and a rooftop multipurpose room and fitness center. The enclosed EPNF is being filed to initiate the Article 80B, Large Project Review process required by the Boston Zoning Code and enabling Act.

The property is situated at the gateway to Brighton from Watertown at the edge of Western Avenue. The site abuts other multifamily dwellings located on Waverly and Mackin Streets. The adjacent parcel along Western Avenue is operated as an Irving gas station and on the other side along Birmingham Parkway as a Santander Bank branch. Across Western Avenue is the historic Charles River Speedway facility.

The Project Site contains approximately 49,383 square feet of land primarily within the Western Avenue/Soldiers Field Road Community Commercial Subdistrict ("CC-1") zone, with a portion in the 3F-4000 zone in the Allston Brighton Neighborhood District of Boston. All parcels are within the Greenbelt Protection Overlay District. The Proponent seeks to combine the three commercial parcels of 44,383 square feet with the one residential parcel of 5,000 square feet. In a CC-1 subdistrict, the Floor Area Ratio is 1.0; there is a height restriction of 35 feet; and multi-family residential apartments are conditionally allowed under Article 51 of the Boston Zoning Code (Allston Brighton). In addition to the proposed use, the Project will rely upon zoning relief for FAR, which we estimate will be 2.6; building height, which will be approximately 68 feet; and other dimensional and parking requirements under the Article 80 process.

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The enclosed "expanded" PNF present details about the Project and provides an analysis of transportation/traffic impacts, infrastructure needs, and historic resources, in order to inform the state and city agencies and neighborhood residents about the Project, its potential impacts, as well as the mitigation measures proposed to address those impacts. Based on the comprehensive approach to addressing potential impacts and mitigation similar to the level of information normally presented in a Draft Project Impact Report under Article 80B, it is the desire of the Proponent that the BRA, after reviewing public and agency comments as well as any further responses to comments made by the Proponent, will issue a Scoping Determination Waiving Further Review pursuant to the Article 80B process.

We look forward to working collaboratively with you and your staff, other city agencies, and members of the community to develop the best redevelopment plan for this location. We anticipate that the BRA will publish notice of the receipt of the PNF within five days, as required by Section 80A-2(3). Requests for copies of the EPNF should be directed to me at (617)607-2973 or via email at SLattrell@vhb.com.

Sincerely,

Seth Lattrell

Environmental Planner
SLattrell@vhb.com

Cc: Christopher Tracy, BRA
Bruce A. Percelay, Chairman, The Mount Vernon Company, Inc.
Bob Parsekian, Executive Vice President, The Mount Vernon Company, Inc.

# Western Ave. Residence

## Boston, Massachusetts

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29 Commonwealth Ave, 6th Floor
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January 4, 2015

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# 1

# General Information and Project Description

The Mount Vernon Company (the "Proponent") submits this "expanded" Project Notification Form (EPNF) to the Boston Redevelopment Authority (the "BRA") to initiate the Article 80B, Large Project Review process required by the Boston Zoning Code and Enabling Act for construction of mixed-use development on four parcels located at the intersection of Western Avenue, Leo M Birmingham Parkway, Waverly Street, and Mackin Street in Brighton, Boston (the "Project Site"). The Project is anticipated to include the 132 rental apartments, ground floor retail, 108 parking spaces, and covered bike storage for 132 bikes (the "Project").

Located at the entry point to Boston from Watertown and overlooking the Charles River, the Project creates a welcoming gateway into the City. Surrounded by potential future development sites, including the historic Charles River Speedway where plans are underway for a residential and retail renovation, the proposed building seeks to be a catalyst for thoughtful development in the area. By enhancing the public realm and providing a continuously activated ground floor filled with contextual retail, lobbies, and amenity spaces, the Project will create a vibrant experience for the residents of the surrounding neighborhood and beyond. These active uses, in conjunction with wide tree-lined sidewalks, will improve the pedestrian experience in an area currently dominated by vehicular traffic. The proposed building design aims to be consistent with the goals set forth in the BRA's community planning and urban design study from 2008-2009 known as the North Allston-Brighton Community-Wide Plan. The Project will also advance the goals of the Boston 2030 Housing Plan by providing additional housing options for moderate- and low-income households.

This chapter provides an overview of the existing site conditions and describes the Project and its public benefits as well as identifies the anticipated required permits and approvals. This chapter also describes how the Project is consistent with applicable local planning goals and regulatory controls.

## 1.1 Site Context and Existing Conditions

The Project Site contains approximately 49,383 square feet of land comprised of four (4) parcels: 522 Western Avenue; 530 Western Avenue; 8 Waverly Street; and 10 Waverly Street. Refer to Figure 1.1 for a site locus map. The Project Site's primary frontage is on Western Avenue to the North and Leo M Birmingham Parkway to the West, with smaller frontages on Mackin Street to the East and Waverly Street to the South. Refer to Figure 1.2 for a site aerial.

Figure 1.3 shows the existing conditions site plan of the Project Site and its immediate surroundings. The Project Site includes a variety of existing buildings including a 2.5 story multifamily dwelling operated as a rental property, a vacant single story structure previously used as an office for a used car dealership, a vacant single story structure previously used as a retail factory service center for DeWalt tools, and a single-family dwelling.

The Project Site is currently well served by existing infrastructure and walkable access to neighborhood services as evidenced by its Walk Score of "76" – "Very Walkable", as calculated by Walk Score, an industry expert on the walkability of neighborhoods. Additionally the Project Site's Bike Score is "90" – "Biker's Paradise." The Project Site is in close proximity to public transit including multiple bus lines that stop along its frontage on Western Ave and the planned Boston Landing Commuter Rail station. Additionally, the Project Site is in close proximity to some of Boston's largest employers, including New Balance, St. Elizabeth's Hospital, and Harvard University. Refer to Chapter 3, *Transportation and Parking* of this EPNF for further details on transportation infrastructure available to the Project Site.

## 1.2 Project Description

The Project includes the demolition of four (4) buildings to clear the primarily underutilized site for the construction of a single mixed-use structure with four floors of mixed income housing above at-grade parking tucked behind new on-street retail, a residential lobby, and residential amenity space. A partial sixth floor features the balance of the proposed building's residential amenity spaces. The Project Site's current uses will make way for active ground floor programming, which will enliven the pedestrian experience and create a vibrant gateway into the City. The Project plans to capitalize on its urban setting by providing a series of amenities to encourage the use of alternative methods of transportation, including:

- Covered and secure bike storage for each unit;
- A bike workshop with tools and repair parts;
- A free bike for any pre-leased apartment;
- A transit screen in the lobby providing schedules for local transit options; and
- A Hubway station.

These measures are intended to encourage smart growth in Brighton and Boston, and to reduce automobile dependency for residents. Reducing the need for car ownership aims to

alleviate congestion on surrounding roadways and allows residents the opportunity to avoid costs associated with car ownership.

### 1.2.1 Development Program

Table 1.1 summarizes the proposed development program for the Project. In total, the Project will include the construction of approximately 128,403 gross square feet, including approximately 123,223 square feet of residential space (132 units total) and 5,180 square feet of ground floor retail space. The Project is designed to include 108 at-grade parking spaces, most of which are tucked behind the retail space with the balance of the spaces in a small surface parking lot accessed from Waverly Street. Refer to Figure 1.7 for the proposed site plan. The majority of the parking spaces are to be covered, and can be accessed from Western Avenue.

**TABLE 1.1 PROPOSED DEVELOPMENT PROGRAM**

| | |
|---|---|
| Lot Area | 49,383 sf *(from GIS)* |
| Building Gross Square Footage | 128,403 gsf *(excludes parking)* |
| Height | 68'-2" |
| Residential | 123,223 gsf |
| *2 Bedroom* | *20 units* |
| *1 Bedroom + Den* | *16 units* |
| *1 Bedroom* | *43 units* |
| *Studio* | *53 units* |
| Commercial/Retail | 5,180 gsf *(3 tenants + display space)* |
| Parking | 108 spaces |
| Bicycles | 132 covered spaces and +/- 30 outdoor storage spaces |

### 1.2.2 Project Schedule

The following list provides a preliminary assessment of the construction schedule for the Project:

- Project Review, Approval, and Permitting — Fall 2015-Spring 2016
- Site Excavation and Construction — Summer 2016
- Opening — Fall 2017

It is anticipated that the Project construction will commence by Summer of 2016. The entire construction schedule is anticipated to be approximately 16 months with completion scheduled by Fall of 2017.

### 1.2.3 Summary of Public Benefits

Project-related benefits include significant public realm, urban design, and community improvements. The following summarizes the Project-related public benefits:

**Public Realm and Design**

- The Project will create an active gateway from Watertown into the City and the Brighton/Allston neighborhoods.

- The Project will replace nearly 100 feet of multiple curb cuts along Leo M Birmingham Parkway and Western Avenue with a single curb cut further down on Western Avenue away from the intersection to provide a continuous curb.

- The Project will improve the existing streetscape by adding new street lights, bike parking and trees in accordance with the Boston Complete Streets Guidelines.

- The Project will provide a pedestrian connection for the future redevelopment of the historic Charles River Speedway.

- The Project will compliment future planned uses to activate the corner of Western Ave and Leo M Birmingham Parkway with ground floor neighborhood oriented retail.

**Transportation**

- The Project will encourage alternative modes of transportation through a comprehensive Transportation Demand Management (TDM) plan.

- The Project has been designed to have minimal impact on the surrounding transportation infrastructure.

- The Project will provide key bike accommodations including covered and secure bike storage, a bike repair station, accessible bike storage, and a free bike for pre-leased units to encourage alternative transportation and reduce dependency on car ownership.

- Closure of curb cuts closest to the intersection of Western Ave and Leo M Birmingham Parkway will facilitate traffic flow through the intersection.

**Environment/Sustainability**

- The Project will incorporate a number of sustainable building and site elements to achieve LEED Silver status for mid-rise homes.

- Sustainability is integrated throughout the Project as it revitalizes an underutilized urban site, uses land efficiently by increasing density in proximity to public transportation and major regional employment centers, and encourages alternative transportation.

- The Project will improve stormwater management systems to increase capacity and improve water quality.

**Social and Economic**

- The Project will advance the goals of the Boston 2030 Housing Plan by building new, affordably priced, transit-oriented housing with easy access to public transportation.

- 15% of the market rate apartments are proposed to be affordable to households who earn below 80% of the Area Median Income.

- The Project will contribute to the economic health of the City through the creation of approximately 20 permanent new jobs related to the ground floor retail and property management, and new annual local real estate tax revenue.

## 1.3 Regulatory Context

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

### 1.3.1 Neighborhood/Corridor Plans

The Project has been designed to be consistent with the goals set forth in the BRA's community planning and urban design study from 2008-2009 known as the North Allston-Brighton Community-Wide Plan. The Project Site is within the Western Avenue Neighborhood Boulevard Zone, which is defined by pedestrian-friendly sidewalks and tree lined streets. As a Major Entry Point, the Project Site is a gateway to the City in a location where the pedestrian experience will be improved. By providing an active ground floor with mixed uses and wide sidewalks with street trees, the Project is consistent with the goals of the plan.

### 1.3.2 Anticipated Permits/Approvals

Table 1.2 lists the anticipated permits and approvals from state and local governmental agencies required for the Project.

**TABLE 1.2 ANTICIPATED PROJECT PERMITS AND APPROVALS**

| Agency/Department | Permit/Approval/Action |
|---|---|
| **Federal Agencies** | |
| US EPA | National Pollutant Discharge Elimination System (NPDES) Construction General Permit |
| **Commonwealth of Massachusetts** | |
| Massachusetts Department of Environmental Protection, Division of Air Quality Control | Notice of Commencement of Demolition and Construction |
| Massachusetts Water Resources Authority | Temporary Construction De-Watering Permit<br>8(m) Permit |
| Massachusetts Department of Conservation and Recreation | Permit Application for Construction |
| **City of Boston** | |
| Boston Redevelopment Authority | Article 80 Review and Related Agreements |
| Boston Zoning Board of Appeal | Variances |
| Boston Landmarks Commission | Article 85 Demolition Delay |
| Boston Civic Design Commission | Schematic Design Review |
| Boston Public Works Department | Design Review<br>Curb Cut Application<br>Street/Sidewalk Occupancy Permit |
| Boston Lighting Department | Design Review |
| Boston Transportation Department | Transportation Access Plan Agreement; Construction Management Plan |
| Boston Inspectional Services | Demolition Permit<br>Building Permit<br>Certificate of Occupancy |
| Boston Water and Sewer Commission | Site Plan Review and Approval; General Service Application; Dewatering Discharge Permit for Construction |
| Public Improvement Commission | Review of streetscape improvements |
| Boston Fire Department | Permits for demolition, construction and fire alarm |

### 1.3.3 Local Planning and Regulatory Controls

#### City of Boston Zoning Code Article 80 – Large Project Review

The Project exceeds the threshold of 50,000 square feet of development, which requires Large Project Review by the Boston Redevelopment Authority (BRA) pursuant to Article 80B, Large Project Review of the Code. The Proponent has commenced Large Project Review under Article 80 of the Code with the filing of a Letter of Intent with the BRA on November 12, 2015, that

indicated the Proponent's intent to file an "expanded" PNF in connection with the Project. A copy of this letter is provided in Appendix A.

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

**City of Boston Zoning**

The Project Site is comprised of four (4) parcels: 522 Western Avenue; 530 Western Avenue; 8 Waverly Street; and 10 Waverly Street. The majority of the Project Site is located within the Western Avenue/Soldiers Field Road Community Commercial Subdistrict (CC-1); however, the 10 Waverly Street parcel is located within a Three-Family Residential Subdistrict (3F-4000) in the Allston Brighton Neighborhood District, as established under the Boston Zoning Code (Article 51) and as shown on Map 7A/7B/7C/7D (Allston/Brighton). General and local retail businesses are allowed and multifamily dwellings are conditionally allowed as uses in the CC-1 zoning district. As the Project progresses, the Proponent intends to explore the possibility of incorporating the 10 Waverly Street parcel into the CC-1 zone so that the entire Project is within the commercial subdistrict.

A portion of the Project Site is located in the Soldiers Field Road/Soldiers Field Road Extension GPOD (Greenbelt Protection Overlay District). The 10 Waverly Street parcel is partially located within the GPOD and borders the CC-1 subdistrict on two sides. Current plans utilize said parcel as 668 square feet of usable open space and the remaining 4,332 square feet as a surface parking lot with entranceway for additional parking.

**Proposed Uses and Dimensional Requirements**

A breakdown of the various use and dimensional zoning requirements is located in Table 1.3 below. Multifamily residential buildings dominate the adjacent and nearby streets, with commercial buildings along Western Avenue, Leo M. Birmingham Parkway, and Soldiers Field Road.

The Project will require variances relating to use, height, parking, floor area ratios (FAR), open space and rear yard setback.

**TABLE 1.3 ZONING CODE DIMENSIONAL REGULATIONS VS. PROPOSED PROJECT DIMENSIONS**

| Applicable Requirement | CC-1 | Proposed Project |
|---|---|---|
| Use (Multi-family Dwelling) | Conditional | Multi-family Dwelling (132 Units) |
| Use (Retail) | Allowed | 3 Retail Storefronts |
| Maximum Floor Area Ratio (FAR) | 1.0 | 2.6 |
| Maximum Building Height | 35′ – Three Stories | 68′2″ – Six Stories |
| Minimum Lot Size | NONE | 49,383 |
| Minimum Usable Open Space – SF per Dwelling Unit | 50 SF<br>6,600 (132 Units) | 66 SF per DU<br>8,770 (132 Units) |
| Minimum Lot Width | NONE | 72′ (located at the pinch point between Grid Line 11 and 11.5) |
| Minimum Lot Frontage | NONE | 508.5′ along Western Ave and Leo M Birmingham Parkway, 125.5′ along Waverly Street, 127′ along Mackin Street |
| Minimum Front Yard Setback | NONE | At ground floor the proposed setback ranges from 7′ up to 14′-6″ (at residential entry). From Levels 2-6 the proposed setback is 7′ with the exception of the curved portion of the building to the left of Grid Line 7 where the setback is reduced to 4′ at the center of the curve. |
| Minimum Side Yard Setback | NONE | Ranges from 8′-9″ near Grid Line H1 and 6 to 13′-6″ near Grid Line H1 and 1 |
| Minimum Rear Yard Setback | 20′ | 20′ minimum to 50′+ near Grid Line 10 and D |
| Off-street Parking Spaces | 2.0 spaces for 1,000 square feet of retail space. 8.75 spaces for 4375 square feet of retail space.<br><br>.7 spaces for each affordable housing unit. 11.9 spaces for 17 affordable housing units.<br><br>1.75 spaces for first 9 units, plus 2 spaces for remaining 106 units, totaling 227.75 total spaces for 115 units.<br><br>Total spaces required: 248 | 108 total spaces |

**Greenbelt Overlay Protection District (GPOD)/Boston Parks Commission Review**

Portions of each parcel making up the Project Site are located within the Leo M. Birmingham Parkway GPOD, governed by Article 29 and Section 51-42 of the Zoning Code. In the GPOD, a Conditional Use Permit from the Board of Appeal is required for any project involving, among other things, new construction with a total gross floor area in excess of 5,000 square feet. The Project will involve new construction of more than 5,000 square feet of gross floor area; therefore, a Conditional Use Permit from the Board of Appeal will likely be required.

**Massachusetts Environmental Policy Act**

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

## 1.4 Agency Coordination and Community Outreach

The Proponent has been meeting with residents, neighborhood groups, community leaders, business owners, elected officials, City of Boston officials, and other stakeholders to seek input and feedback as they developed the proposed redevelopment plan. The Proponent is committed to maintaining an open dialogue on the Project with interested parties.

## 1.5 Development Team

**Proponent**
The Mount Vernon Company
19 Commonwealth Ave. 6th Floor
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Contact: Robert Parsekian

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**Environmental/Sustainability**
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**Community Outreach/Communications Consultant**
Cence Cincotti Strategies
One Beacon Street, Suite 1320
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(617)720-1900
Contact: Dan Cence

## 1.6 Legal Information

### 1.6.1 Legal Judgments or Actions Pending Concerning the Proposed Project

The Proponent is not aware of any legal judgments or other actions pending which involve or relate to the Project.

### 1.6.2 History of Tax Arrears on Property Owned in Boston by the Applicant

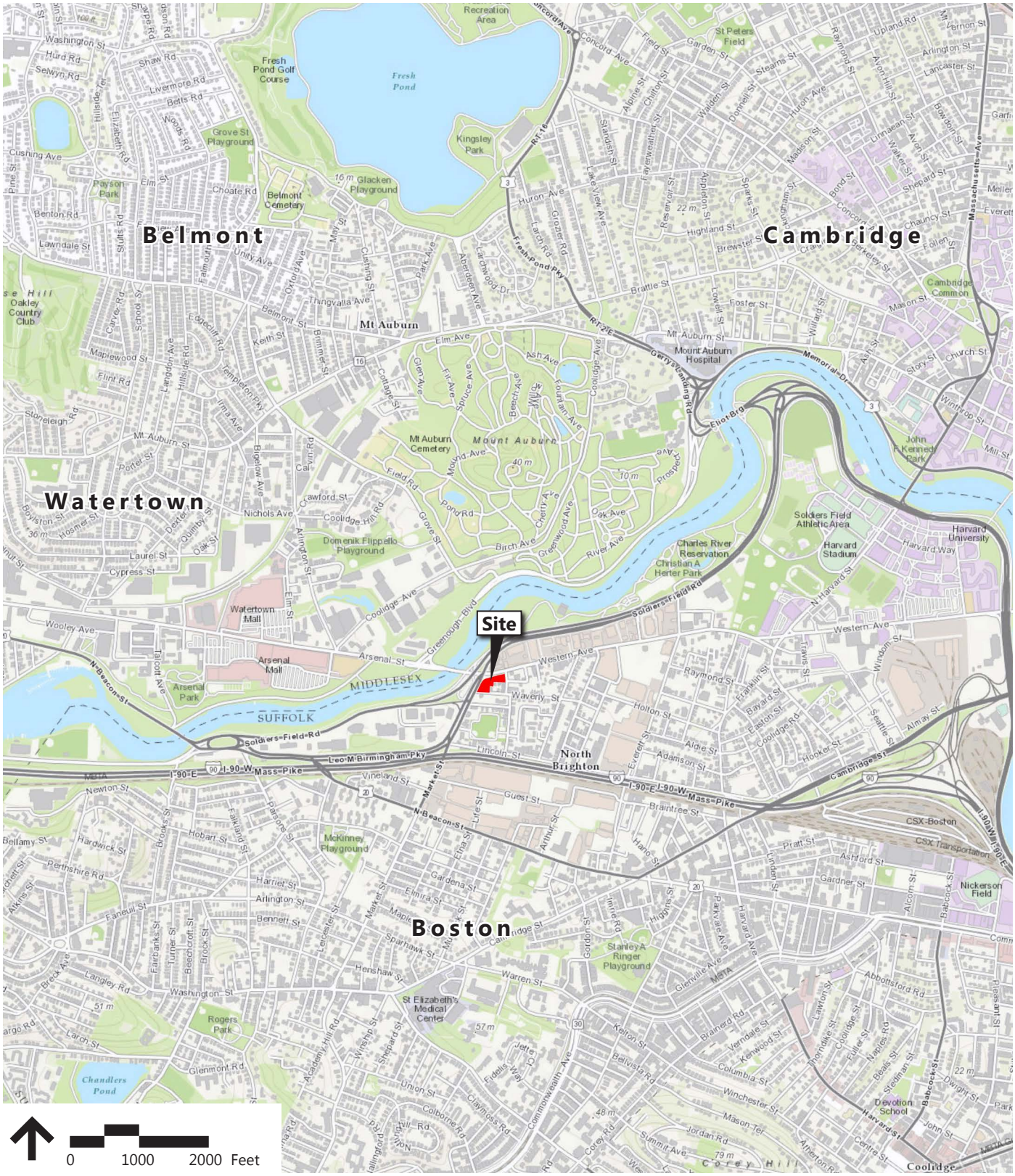
The Proponent owns no real estate in Boston for which real estate tax payments are in arrears.

### 1.6.3 Evidence of Site Control over the Entire Project Area

The Project Site consists of the following four (4) parcels: 516-522 Western Avenue; 530 Western Avenue; 8 Waverly Street; and 10 Waverly Street, in the Allston Brighton neighborhood of Boston. MVC Western Ave Realty LLC is the owner of 516-522 Western Avenue, 530 Western Avenue and 8 Waverly Street. The Manager of MVC Western Ave Realty LLC is The Mount Vernon Company, Inc. The Mount Vernon Company, Inc. has executed a Purchase and Sale Agreement with the owners of 10 Waverly Street and expects to own the single family residence by the spring of 2016.

### 1.6.4 Nature and Extent of Any and All Public Easements

The Project Site is not subject to any easements for public use.

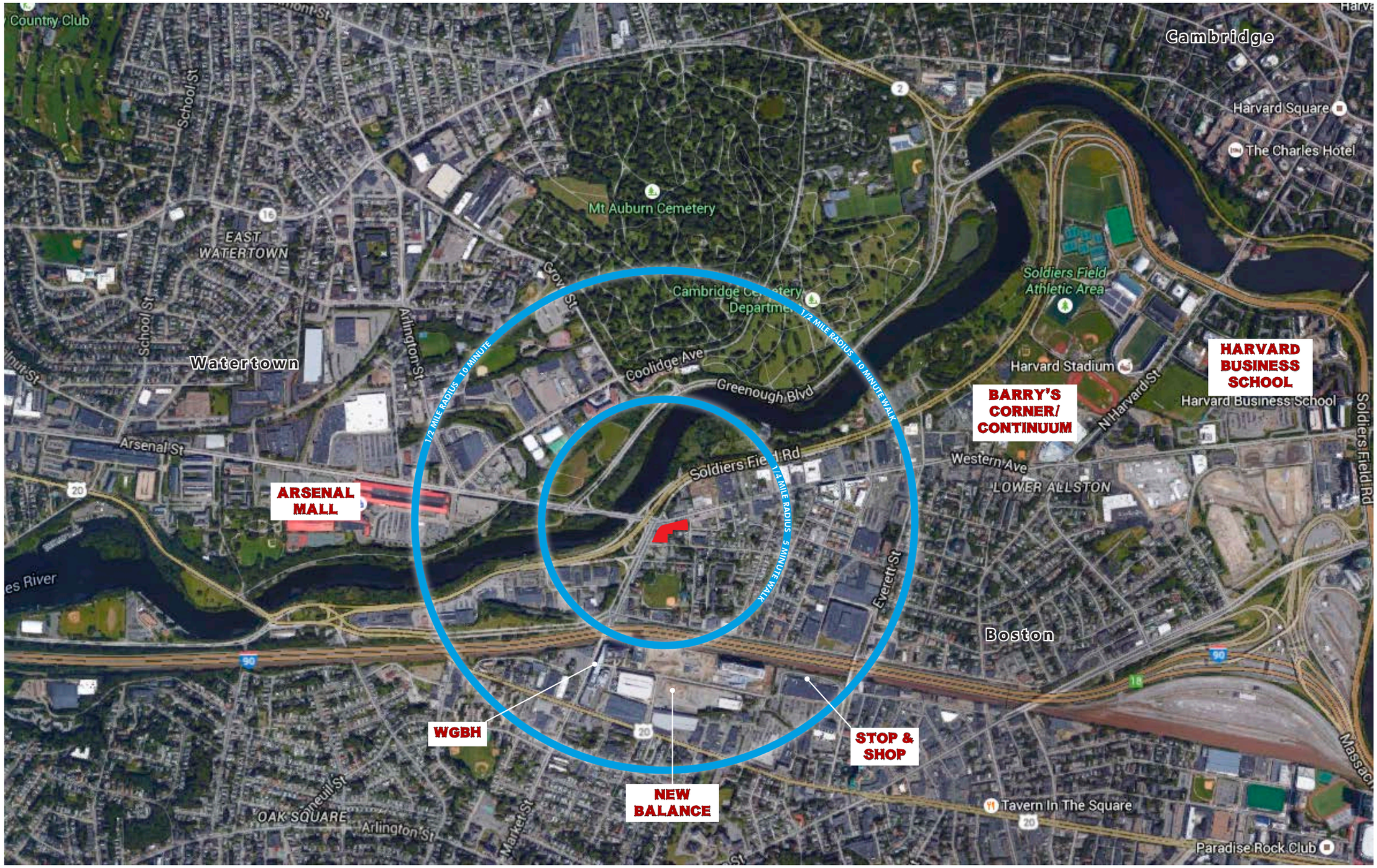



Source: ESRI World Topo Map

Figure 1.1

Locus

**W. Ave Residence**
**Brighton, MA**




Context Plan
N.T.S.

Figure 1.2

**W. Ave Residence**
**Brighton, MA**

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Architecture Planning Interiors


Source: Bing Aerial

Figure 1.3
Existing Conditions

**W. Ave Residence**
**Brighton, MA**


# Existing Conditions Aerial View

Looking Southeast

Figure 1.4

**W. Ave Residence**
**Brighton, MA**

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Looking Northwest on Mackin St.

Looking Southwest on Western Ave

Looking East on Arsenal St./Western Ave

Looking Southeast from Intersection

Looking East from Intersection

Looking South from Intersection

Looking North on Leo M Birmingham Parkway

Looking Northeast on Waverly St.

Looking West on Waverly St.

Figure 1.5

**W. Ave Residence**
**Brighton, MA**

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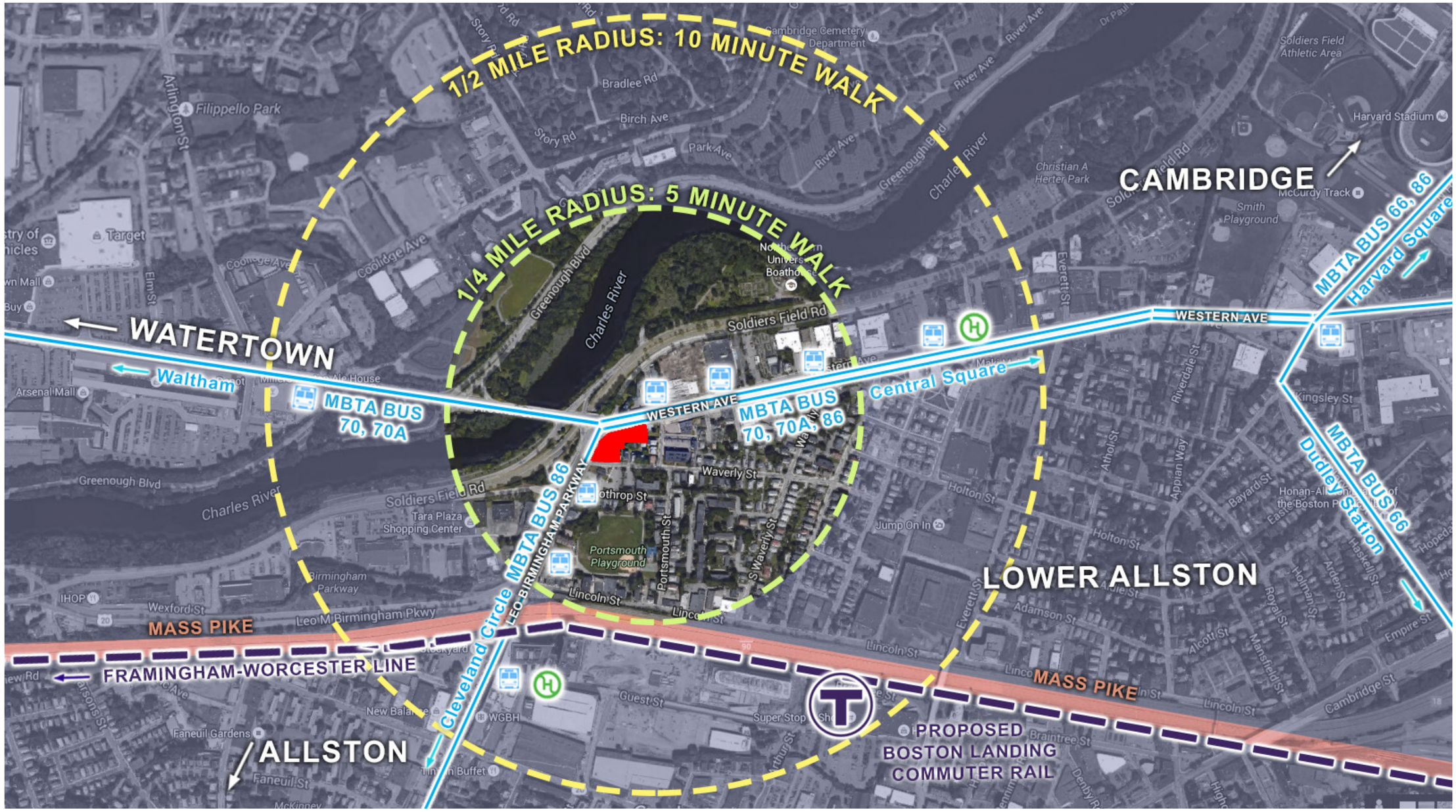
Architecture Planning Interiors




Transportation Diagram
N.T.S.

Figure 1.6

**W. Ave Residence**
**Brighton, MA**

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0 10 20 40 Feet

# Site Plan

Scale: 1/32" = 1'-0"

Figure 1.7

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

# 2

# Urban Design

This chapter describes the existing urban context of the Project Site, and discusses the planning principles and design goals for the Project. This section describes the proposed conditions urban design characteristics (i.e., height and massing) and public realm improvements, including proposed landscaping. Supporting graphics include building floorplans, building elevations, building sections and view perspectives.

## 2.1 Neighborhood Context

The Project Site is located at the Western edge of Boston where the City meets Watertown, connected by a bridge which spans the Charles River. Facing the bridge at the intersection of two major thoroughfares, Western Avenue and Leo M. Birmingham Parkway, the Project Site presents a unique opportunity to act as a gateway for the City of Boston. Bound on one side by these major throughways and on other sides by local streets (Mackin Street and Waverly Street), the Project Site has a variety of contexts as it is surrounded by retail, office, and multifamily uses.

Western Avenue features a variety of scales, setbacks, and uses moving East toward the Charlesview Residences, a pair of five story mixed use buildings. Across Western Avenue from the Project Site is the historic Charles River Speedway site, where redevelopment into mixed use retail and high-rise residential is currently being designed. Leo M. Birmingham Parkway, which runs parallel to the Charles River presents a highway scale with six lanes of traffic separated by a median in front of the Project Site. Moving south, neighboring buildings range in scale from one to four stories until the I-90 overpass which features the WGBH building at over 70 feet.

The three parcels of the Project Site fronting Western Ave and Leo M. Birmingham Parkway are located in the CC-1 neighborhood business zone. Moving away from the main streets the zoning changes to a three family residential use (3f-4000). The parcel at 10 Waverly Street is currently located within this 3f-4000 zone. The surrounding properties in this zone range in height from two to four stories.

## 2.2 Planning Principles and Design Goals

The following principles guide the development:

- Create a gateway building at the entrance to the City of Boston from Watertown uniting Western Avenue and Leo M Birmingham Parkway.
- Replace the existing open parking lots with an active ground floor while screening new parking from public view to creating vibrant street activity along Western Avenue and Leo M Birmingham Parkway.
- Enhance the pedestrian experience along the existing street, adding opportunities for landscaping, seating and bicycle parking.
- Provide a pedestrian connection to the future retail development within the historic Charles River Speedway buildings.
- Meet the goals established in the North Allston-Brighton Community-Wide Plan and City of Boston Complete Streets Guidelines.
- Maintain a sustainable approach to the building envelope including energy efficient windows and wall construction, mechanical systems, daylighting, water efficiency and construction related management.

## 2.3 Design Concept and Development

The Project Site totals approximately 49,383 square feet and features a significant change in elevation amounting to nearly ten feet between Western Avenue and Waverly Street. The Project Site offers an additional challenge in its shape as the four individual parcels and the associated rear yard setback create a pinch point that cuts into a typical double loaded corridor building. Viewing these site challenges as opportunities, the design team found ways to take advantage of the unique site constraints when forming the mass of the building as well as the access to and views of the parking areas.

To achieve its goal of being a gateway building, the mass of the Project is adjusted to follow Western Avenue and Leo M. Birmingham Parkway, introducing a soft curve to connect the two main streets. The tallest portion of the building, a partial sixth story featuring the building's amenity spaces, is oriented to front on the intersection, as is the building's main entry and lobby. With the bulk of the building lining the street, a continuously activated ground floor program including retail stores, residential amenities, and the main residential lobby will create a vibrant pedestrian experience while shielding the parking from view.

When viewed from the residential neighborhood, the Project appears as a four story building due to the Project Site's grade change. Utilizing the rear setback as a tool to sculpt the

proposed building, the mass is broken down into smaller scale four story elements contextual in size to the adjacent houses.

Due to the approximately six-foot grade change on-site, the majority of the parking on the first level is screened from view from the residential neighborhood side of the building where it is bound by a retaining wall and a continuous six foot fence. By taking advantage of the change in elevation an additional parking area accessed from Waverly Street enters the building at the second floor.

The Project will be built utilizing an environmentally sensitive approach to maximize the green design elements and site location. Strategies will maximize energy efficiency, water conservation, minimize waste during construction, and ensure good indoor air quality. Refer to Section 4.14 of Chapter 4, *Environmental Protection* for further details.

## 2.4 Height and Massing

As viewed from Western Avenue, the proposed building is primarily five stories at a height of approximately 56 feet 8 inches and articulated as four stories of residential over a ground floor of retail. At the intersection of Western Avenue and Leo M. Birmingham Parkway the proposed building steps up to six stories at approximately 68 feet. This partial sixth floor features the proposed building's amenity spaces, situated to overlook the Charles River below, and employs a unique articulation which ties to the residential entry of the building.

Due to significant grade changes moving south toward the adjacent multifamily buildings, the Project appears as a four-story building when viewed from the neighborhood – a more contextual scale. The massing is broken up to create smaller scale elements and planes.

## 2.5 Character and Exterior Materials

The basic approach to exterior character combines a palette of durable exterior materials including various metal panels, fiber cement and glass. The articulation of the proposed building is broken into three primary zones: Western Avenue; Leo M. Birmingham Parkway; and the residential neighborhood – all of which relate to their associated contexts. The active ground floor components of retail, residential amenity space, and residential lobby all feature tall, transparent storefronts. Flat metal canopies, planters, storefronts and signage along the ground floor enhance the public realm and create a neighborhood retail experience.

## 2.6 Public Realm

The following principles guide the design of the public realm:

- Improve the existing streetscape by adding new street lights and trees in accordance with the Boston Complete Streets Guidelines.
- Close three existing curb cuts stretching nearly 100 feet along Leo M Birmingham Parkway and Western Avenue and replace with a single curb cut on Western Avenue further away from the intersection.
- Provide new accessible curb cuts for pedestrians.
- Provide a pedestrian connection to the future retail development within the historic Charles River Speedway buildings.
- Provide new planters and seat walls adjacent to the main building lobby.

## 2.7 Site Landscaping

The proposed site landscaping has been designed to support the Project's role as urban infill, reinforcing the Western Avenue streetscape with large scale shade trees, and adding smaller, more columnar tree species on residential streets where the walks are narrower. Working with Boston's Complete Streets Design Guidelines, public seating areas will be created outside the retail space, and a planting strip is proposed along the curb line to infiltrate stormwater.

Tree species will be selected from the City of Boston Parks Department's list of recommended street trees. To minimize the Project’s susceptibility to drought conditions, the landscape design will incorporate native and adaptive plant materials. Additional landscape areas are intended for resident seating, gathering and/or dog-walking, and will be detailed upon final programming of the site. To help mitigate the change in use of the property, residential neighbors will be buffered by a five-foot wide evergreen planting strip augmented by a six foot fence for permanent screening.

## 2.8 Accessibility

Consistent with local, state, and federal policies, the Project will include universally accessible design elements within and around the proposed building. Improvements include ADA accessible sidewalks, entrances, and amenity spaces, as well as seven (7) accessible units and five (5) designated accessible parking spaces near the residential entrances. Refer to Appendix C for the BRA accessibility checklist and graphics

Service Entry

Speedway retail entry access point

Proposed crosswalk connection


0 15 30 60 Feet

Ground Floor Plan
N.T.S.

Figure 2.1

**W. Ave Residence**
**Brighton, MA**

vhb

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Architecture Planning Interiors

MG


# Level 2 Plan

Scale 1/32"=1'-0"

Figure 2.2

**W. Ave Residence**
**Brighton, MA**

vhb

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Architecture Planning Interiors

MC


# Level 3-5 Plan

Scale 1/32”=1’-0”

Figure 2.3

**W. Ave Residence**
**Brighton, MA**

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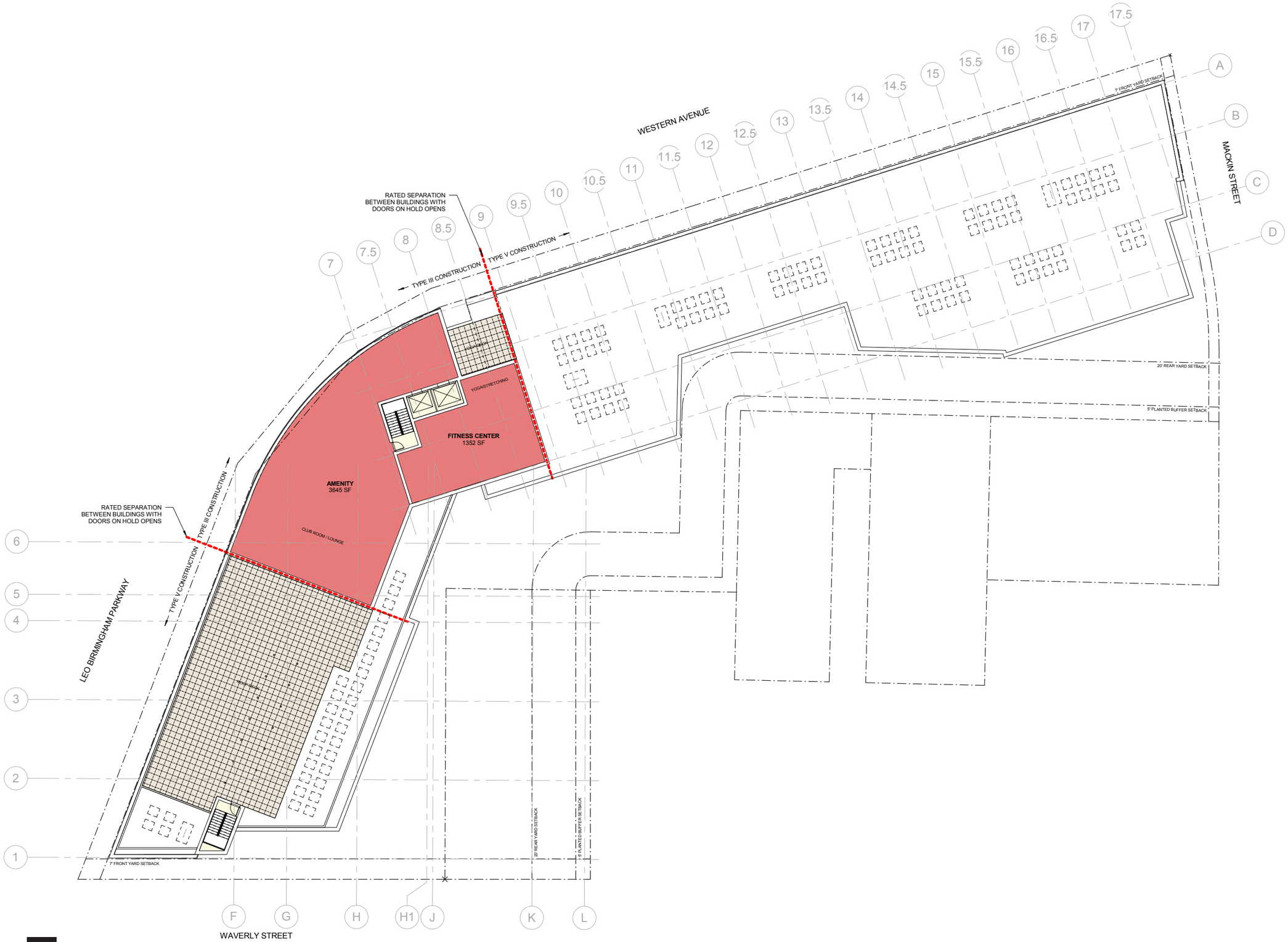


# Level 6/Roof Plan

Scale 1/32”=1’-0”

Figure 2.4

**W. Ave Residence**
**Brighton, MA**

vhb

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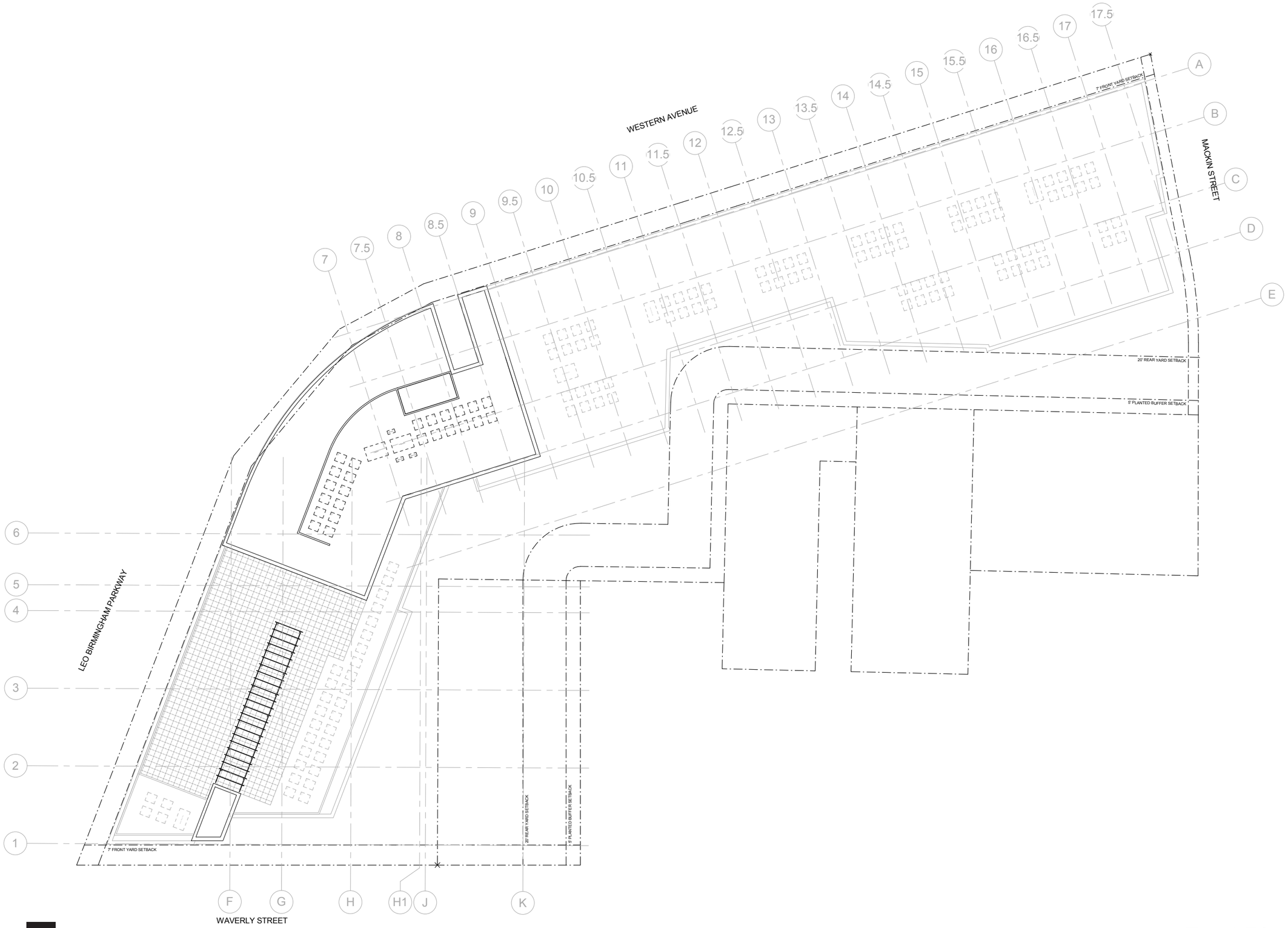


# Roof Plan
Scale 1/32"=1'-0"

Figure 2.5

**W. Ave Residence**
**Brighton, MA**

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Project Rendering
Soldiers Field Road Looking South

Figure 2.6

**W. Ave Residence**
**Brighton, MA**

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MC


Western Ave - Existing
Looking West

Figure 2.7a

**W. Ave Residence**
**Brighton, MA**

vhb

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MC


Western Ave - Proposed
Looking West

Figure 2.7b

**W. Ave Residence**
**Brighton, MA**

vhb

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Western Ave - Proposed With Adjacent Zoning
Looking West

Figure 2.7c

**W. Ave Residence**
**Brighton, MA**

vhb

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MC


Leo M Birmingham Parkway - Existing
Looking North

Figure 2.8a

**W. Ave Residence**
**Brighton, MA**

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Leo M Birmingham Parkway - Proposed
Looking North

Figure 2.8b

**W. Ave Residence**
**Brighton, MA**

vhb

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MC


Leo M Birmingham Parkway - Proposed With Adjacent Zoning
Looking North

Figure 2.8c

**W. Ave Residence**
**Brighton, MA**

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Waverly Street - Existing
Looking West Toward Leo Birmingham Parkway

Figure 2.9a

**W. Ave Residence**
**Brighton, MA**

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Waverly Street - Proposed
Looking West Toward Leo Birmingham Parkway

Figure 2.9b

**W. Ave Residence**
**Brighton, MA**

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Mackin Street - Existing
Looking North Toward Western Ave

Figure 2.10a

**W. Ave Residence**
**Brighton, MA**

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Mackin Street - Proposed
Looking North Toward Western Ave

Figure 2.10b

**W. Ave Residence**
**Brighton, MA**

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MC


Richardson Street - Existing
Looking West Toward Mackin

Figure 2.11a

**W. Ave Residence**
**Brighton, MA**

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Richardson Street - Proposed
Looking West Toward Mackin

Figure 2.11b

**W. Ave Residence**
**Brighton, MA**

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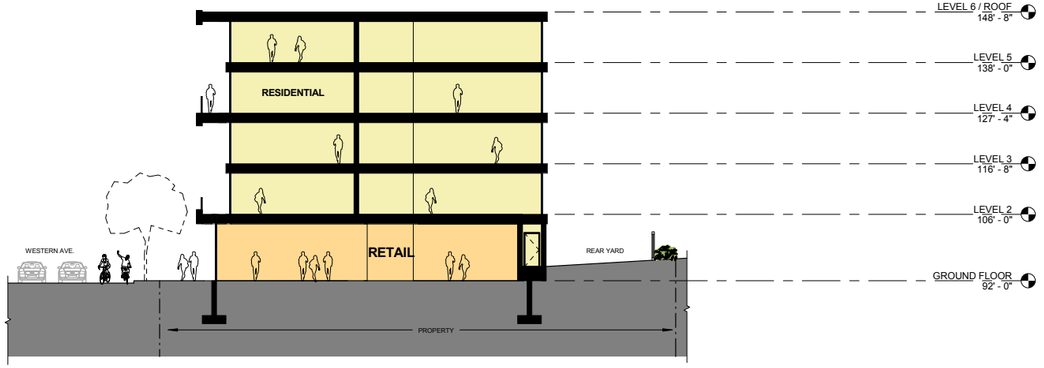
MC

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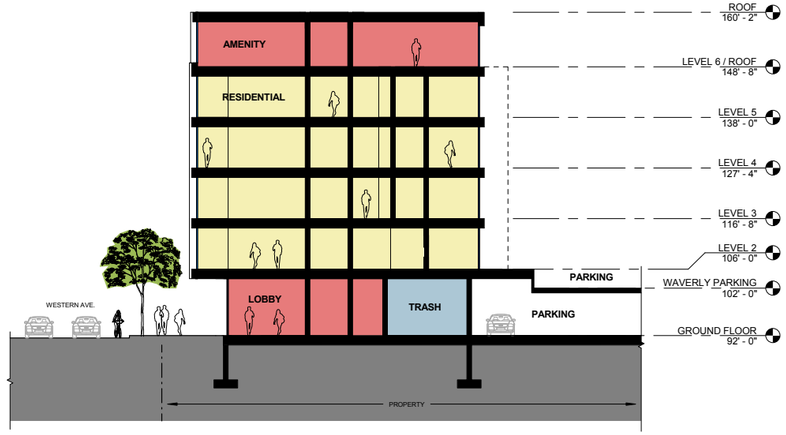


# Section C
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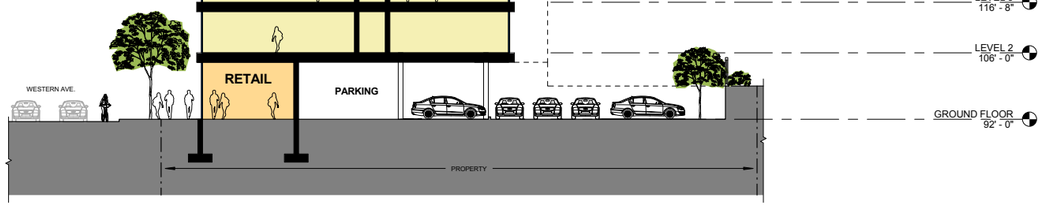


# Section B
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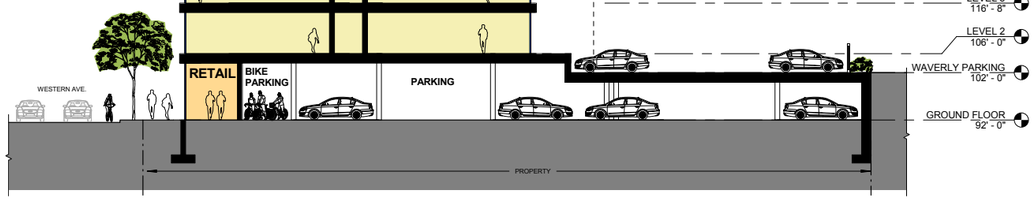


# Section D
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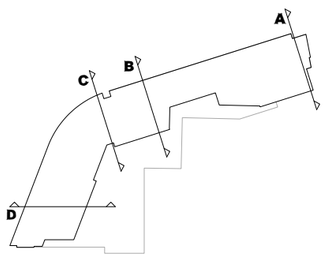


Key Plan

0 10 20 40 Feet

# Building Sections

Figure 2.12

**W. Ave Residence**
**Brighton, MA**

vhb

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Architecture Planning Interiors

MC


## 1 - Mackin Elevation

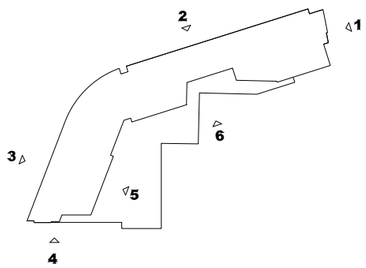
Scale: 1/32" = 1'-0"


## 2 - Western Ave Elevation

Scale: 1/32" = 1'-0"


## 3 - Leo Birmingham Elevation

Scale: 1/32" = 1'-0"




Key Plan

0 10 20 40 Feet

Figure 2.13a

**W. Ave Residence**
**Brighton, MA**

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## 4 - Waverly Elevation

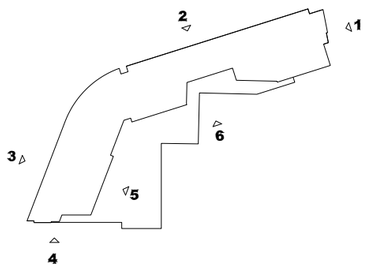
Scale: 1/32" = 1'-0"


## 5 - Waverly Parking/Loading Elevation

Scale: 1/32" = 1'-0"


## 6 - Rear Elevation

Scale: 1/32" = 1'-0"




Key Plan

0 10 20 40 Feet

Figure 2.13b

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
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Architecture Planning Interiors

# 3

# Transportation and Parking

## 3.1 Introduction

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

Howard Stein Hudson Associates (HSH) conducted an evaluation of the transportation impacts of the redevelopment of 4 parcels; 522 Western Avenue, 530 Western Avenue, 8 Waverly Street, and 10 Waverly Street, in the Brighton neighborhood of Boston, Massachusetts. The transportation study presented herein adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and Article 80 Large Project Review process. The study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, loading operations, transit services, and pedestrian activity.

### 3.1.1 Key Findings and Benefits

The Project Site is located at the corner of Western Avenue and Leo M. Birmingham Parkway in the Brighton neighborhood of Boston and will consist of 132 residential units, 108 parking spaces, and approximately 5,180 gross square feet (gsf) of retail/commercial space. The Project will also provide accommodations for secure storage of 132 bicycles and an on-site bicycle maintenance facility. Site access will be provided by way of a primary driveway along Western Avenue and a secondary driveway along Waverly Street. The Western Avenue driveway will provide access to an at-grade garage containing 85 parking spaces and the Waverly Avenue driveway will provide access to an at-grade surface lot containing 23 parking spaces.

The Project is located in proximity to several modes of alternative transportation including public transit and bicycle facilities. Several MBTA bus lines run adjacent to the site. The site is within a walking distance of the proposed Boston Landing commuter rail station, which will provide convenient access between the Allston/Brighton neighborhood and the Longwood medical area, Back Bay, and Downtown Boston. Bicycle facilities are provided along Western

Avenue and adjacent to the Charles River, providing access to Watertown and Waltham to the west and Cambridge and Boston to the east.

Loading, service, and deliveries for the Project will be accommodated on the Project site within the Waverly Avenue surface lot. Trash pick-up will be through a private contracting service. To further mitigate the transportation impacts of the Project, the proponent is committed to a comprehensive Transportation Demand Management (TDM) program and is currently working with shared-car services to locate car-share spaces on the site. Based on the analysis contained in this chapter, the Project is expected to have minimal impact on the surrounding transportation infrastructure.

### 3.1.2 Project Description

The Project Site is located in Boston's Brighton neighborhood. The Project Site is bounded by Western Avenue to the north, Leo M. Birmingham Parkway to the west, Waverly Street and residential properties to the south, and Mackin Street to the east, and currently contains residential and commercial uses.

The Project includes the demolition of the existing on-site buildings and construction of a mixed-use building containing up to 132 residential units ranging from studios to two bedroom units, approximately 5,180 gsf of retail space located in three units, and 108 parking spaces. The parking will be provided in a ground-level covered garage accessed off of Western Avenue containing 85 spaces and a surface lot accessed off of Waverly Street containing 23 spaces.

The Western Avenue garage will be accessed approximately 100 feet west of Mackin Street. The Waverly Street parking lot will be accessed approximately 175 feet east of Birmingham Parkway. Service and deliveries will occur on-site off of Waverly Street. Primary pedestrian access for the residential lobby will be provided at the corner of Western Avenue and Birmingham Parkway. Pedestrian access to the three retail spaces will be located along Birmingham Parkway and Western Avenue.

The Project will provide secure covered storage for 132 bicycles in the garage. A ground-level bicycle workshop will also be available for residents of the Project. Bicycle storage racks will be provided around the exterior of the Project site near building entrances to accommodate residents and visitors of the Project. All bicycle racks, signs, and parking areas will conform to BTD guidelines and be located in safe, secure locations. The Proponent will work with BTD to identify the most appropriate quantity and location for bicycle racks on the Project site as part of the Transportation Access Plan Agreement (TAPA) process.

The Project Site is well served by public transportation. The MBTA Bus Routes 70, 70A, and 86 run adjacent to the Project site, with stops located along the site frontage on Western Avenue. The adjacent MBTA bus routes provide access to Harvard Square, Central Square, Watertown Square, Waltham, and Sullivan Square.

### 3.1.3 Study Methodology

This transportation study and supporting analyses was conducted in accordance with BTD guidelines, and are described below.

The Existing (2015) 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 and form the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2020, based on a five-year horizon from the year of the filing of this traffic study.

The No-Build (2020) 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 site.

The Build (2020) 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 (2020) Condition analysis. Expected roadway, parking, transit, pedestrian, and bicycle accommodations, as well as loading capabilities and deficiencies, are identified.

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.

### 3.1.4 Study Area Intersections

The transportation study area is bounded by Western Avenue to the north, Soldiers Field Road to the west, Lothrop Street to the south, and Mackin Street to the east. The study area consists of the following intersections in the vicinity of the site, also shown on Figure 3.1:

- Western Avenue/Arsenal Street/Leo M. Birmingham Parkway/Soldiers Field Road Ramps (signalized);
- Leo M. Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp (signalized);
- Waverly Street/Mackin Street/Portsmouth Street (unsignalized);
- Leo M. Birmingham Parkway/Waverly Street (unsignalized); and
- Western Avenue/Mackin Street (unsignalized).

## 3.2 Existing Conditions

This section includes descriptions of existing study area roadway geometries, intersection traffic control, peak-hour vehicular, bicycle, and pedestrian volumes, public transportation availability, parking, curb usage, and availability of car and bicycle sharing services.

### 3.2.1 Existing Roadway Conditions

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

**Western Avenue** is a two-way, two lane roadway located adjacent to the north side of the Project site. Western Avenue is classified as an urban minor arterial under BTD jurisdiction and generally runs in an east-west direction between the Watertown Town Line to the west and Central Square in Cambridge the east. On-street parking and sidewalks are generally provided along both sides of the roadway in the vicinity of the site.

**Leo M. Birmingham Parkway** is a two-way, multi-lane roadway (four northbound lanes and two southbound lanes near the site) located adjacent to the west side of the Project site. Birmingham Parkway is classified as an urban principal arterial under Department of Conservation and Recreation (DCR) jurisdiction and generally runs in a north-south direction between Arsenal Street/Western Avenue to the north and North Beacon Street to the south. The directions of travel along Birmingham Parkway are separated by a raised median. On-street parking is prohibited along the eastern side of the roadway in the vicinity of the site. A sidewalk is provided along the eastern side of the roadway and intermittently provided along the western side of the roadway.

**Arsenal Street** is a two-way, four lane roadway located west of the Project site. Arsenal Street is classified as an urban minor arterial and is generally under local jurisdiction, with parts under DCR and MassDOT jurisdiction and generally runs in an east-west direction between Watertown Square to the west and Soldiers Field Road to the east. On-street parking is not provided along either side of the roadway, and sidewalks are provided along both sides of the roadway in the vicinity of the site.

**Soldiers Field Road** is a two-way, four lane roadway located north and west of the Project site. Soldiers Field Road is classified as an urban principal arterial under DCR jurisdiction and generally runs in an east-west direction between North Beacon Street to the west and Storrow Drive to the east. Soldiers Field Road provides access to downtown Boston and Cambridge to the east and to Newton and Watertown to the west. On-street parking and sidewalks are not provided along either side of the roadway, however, the Paul Dudley White mixed-use path runs along the Charles River and is locate along the north side of the roadway.

**Waverly Street** is a one-way eastbound, one lane roadway located adjacent to the south side of the Project site. Waverly Street is classified as a local road under BTD jurisdiction and generally runs in an east-west direction between Birmingham Parkway to the west and South Waverly Street to the East. On-street parking is provided along the north side of the roadway between Birmingham Parkway and Mackin Street and along the south side of the roadway between Mackin Street and South Waverly Street. Sidewalks are provided along both sides of the roadway.

**Lothrop Street** is a one-way westbound, one lane roadway located to the south of the Project site. Lothrop Street is classified as a local road under BTD jurisdiction and generally runs in an east-west direction between Birmingham Parkway to the west and Portsmouth Street to the east. On-street parking is provided along the south side of the roadway and sidewalks are provided along both sides of the roadway in the vicinity of the site.

**Mackin Street** is a one-way southbound, one lane roadway located adjacent to the east of the Project site. Mackin Street is classified as a local road under BTD jurisdiction and generally runs in a north-south direction between Western Avenue to the north and Waverly Street to the south. On-street parking is provided along the west side of the roadway and sidewalks are provided along both sides of the roadway in the vicinity of the site.

**Portsmouth Street** is a two-way, two lane roadway located south of the Project site. Portsmouth Street is classified as a local road under BTD jurisdiction and generally runs in a north-south direction between Waverly Street to the north and Lincoln Street to the south. On-street parking is provided along the east side of the roadway and sidewalks are provided along both sides of the roadway in the vicinity of the site.

### 3.2.2 Existing Intersection Conditions

Existing conditions at the study area intersections are described below.

**Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** is a group of three interconnected, adjacent, signalized intersections. Western Avenue is intersected from the north by the Soldiers Field Road eastbound on-ramp and from the south by Birmingham Parkway to form the eastern intersection. The Western Avenue eastbound approach to this intersection consists of an exclusive left-turn lane and two general-purpose travel lanes. The Western Avenue westbound approach consists of an exclusive left-turn lane and two general-purpose travel lanes. The Birmingham Parkway northbound approach consists of an exclusive left-turn lane, a shared left-turn/through lane, a through lane, and an exclusive right-turn lane. The Soldiers Field Road eastbound on-ramp consists of a single lane accommodating northbound vehicles only (vehicles exiting the intersection).

The middle intersection consists of Arsenal Street, Western Avenue, and the Soldiers Field Road westbound off-ramp. The Arsenal Street eastbound approach to this intersection consists of two general-purpose travel lanes. The Western Avenue westbound approach

consists of three through lanes. The Soldiers Field Road westbound off-ramp southbound approach consists of a through lane and a shared through/right-turn lane.

The western intersection consists of Arsenal Street and the Soldiers Field Road westbound ramps. The Arsenal Street eastbound approach consists of a through lane and a shared through/right-turn lane. Right turns enter the Soldiers Field Road westbound on-ramp by way of a channelized, right-turn slip ramp. The Arsenal Street westbound approach consists of an exclusive left-turn lane and two through lanes. The Soldiers Field Road westbound off-ramp southbound approach consists of a shared through/right-turn lane and an exclusive right-turn lane. The Soldiers Field Road on-ramp consists of a single lane that accommodates southbound vehicles only (departing the intersection). Trucks and buses are prohibited from accessing Soldiers Field Road. Sidewalks are provided along both sides of Western Avenue and Arsenal Street; along the east side of Birmingham Parkway and the Soldiers Field Road eastbound on-ramp; and along the west side of the Soldiers Field Road westbound on and off-ramps. A marked crosswalk is provided across the western leg of Arsenal Street.

**Birmingham Parkway/Soldiers Field Road Off-ramps/Lothrop Street** is a signalized intersection with four approaches. The Birmingham Parkway northbound approach consists of three through lanes. The Birmingham Parkway southbound approach consists of two through lanes. The Soldiers Field Road off-ramp eastbound approach consists of two exclusive left-turn lanes. Right turns exit the Soldiers Field Road off-ramp prior to the intersection by way of a channelized, right-turn slip-ramp. The Soldiers Field Road off-ramp accommodates eastbound vehicles only (vehicles entering the intersection). The Lothrop Street westbound approach consists of a general purpose travel lane. Lothrop Street is a one-way roadway accommodating westbound vehicles only (vehicles entering the intersection). Sidewalks are provided along the east side of Birmingham Parkway; along the west side of Birmingham Parkway south of the Soldiers Field Road off-ramp; along both sides of Lothrop Street; and along the south side of the Soldiers Field Road off-ramp. Crosswalks are not provided at the intersection. An MBTA bus stop is located along the east side of Birmingham Parkway, south of Lothrop Street.

**Waverly Street/Mackin Street/Portsmouth Street** is a four legged, offset unsignalized intersection with three approaches, located to the southeast of the Project site. The Waverly Street eastbound approach consists of a shared through/right-turn lane. Waverly Street is one-way eastbound at the intersection. The Portsmouth street northbound and Mackin Street southbound approaches both consist of a single lane. Mackin Street is one-way southbound at the intersection. On-street parking is permitted along all of the approaches. Wheelchair ramps are provided along the northern and southern legs of the intersection.

**Birmingham Parkway/Waverly Street** is a three legged, unsignalized intersection with two approaches located adjacent to the southwest of the Project Site. The Birmingham Parkway northbound approach consists of three through lanes and one shared through/right-turn lane. The Birmingham Parkway southbound approach consists of two through lanes. The directions of travel along Birmingham Parkway are separated by a raised median. Waverly Street is one-

way in the eastbound direction, departing the intersection. On-street parking is restricted along both Birmingham Parkway approaches and permitted on Waverly Street. Wheelchair ramps are provided along the eastern leg of the intersection however there is no crosswalk present.

**Western Avenue/Mackin Street** is a three legged, unsignalized intersection with two approaches, located adjacent to the northeast of the Project site. The Western Avenue eastbound approach consists of a shared through/right-turn lane. The Western Avenue westbound approach consists of a shared left-turn/through lane. Mackin Street is one-way in the southbound direction, departing the intersection. On-street parking is provided along both approaches and along Mackin Street. Wheelchair ramps are provided along the southern leg of the intersection.

### 3.2.3 Existing Vehicular Traffic Volumes

Traffic volume data was collected at the study area intersections on September 15, 2015. Turning Movement Counts (TMCs) and vehicle classification counts were conducted during the weekday a.m. and 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. The existing traffic volumes that were collected were used to develop the Existing (2015) Condition traffic volumes. The Existing (2015) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown in Figures 3.2 and Figure 3.3, respectively. The detailed traffic counts are provided in Appendix B.

### 3.2.4 Existing Traffic Operations

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay experienced by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 9) software package was used to calculate average delay and associated 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). Field observations were performed by HSH to observe queuing conditions and collect intersection geometry such as number of turning lanes, lane length, and lane width that were then incorporated into the operations analysis.

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. Table 3-1 displays 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.

**TABLE 3-1 LEVEL OF SERVICE CRITERIA**

| Level of Service | Average Stopped Delay (Seconds/Vehicle) | |
|---|---|---|
| | Signalized Intersections | Unsignalized Intersections |
| 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 and is only used for analysis of signalized intersections.

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 for signalized intersections and five percent of the time for unsignalized intersections. 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.

Table 3-2 and Table 3-3 present the Existing (2015) Condition capacity analysis for the study area intersections during the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in the Appendix.

**TABLE 3-2 EXISTING (2015) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY A.M. PEAK HOUR**

| Intersection/Approach | LOS | Delay | V/C Ratio | 50th Percentile Queue(ft) | 95th Percentile Queue(ft) |
|---|---|---|---|---|---|
| Signalized Intersections | | | | | |
| **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** | **C** | **26.2** | **-** | **-** | **-** |
| Arsenal Street eastbound thru\|thru/right | C | 34.3 | 0.68 | 367 | 445 |
| Western Avenue westbound left | C | 32.2 | 0.48 | 100 | 127 |
| Western Avenue westbound thru\|thru/right | C | 23.8 | 0.25 | 108 | 112 |
| Birmingham Parkway northbound left | E | 63.5 | 0.74 | 215 | #335 |
| Birmingham Parkway northbound left/thru\|thru | D | 53.8 | 0.67 | 197 | 260 |
| Birmingham Parkway northbound right | A | 9.1 | 0.54 | 0 | 79 |
| Soldiers Field Road Westbound Off-Ramp southbound left\|left | E | 68.5 | 0.78 | 153 | 200 |
| Soldiers Field Road Westbound Off-Ramp southbound thru\|thru/right | B | 11.7 | 0.29 | 4 | 33 |
| **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** | **A** | **9.9** | **-** | **-** | **-** |
| Soldiers Field Road Eastbound Off-Ramp eastbound left\|left | C | 24.5 | 0.24 | 26 | 42 |
| Soldiers Field Road Eastbound Off-Ramp eastbound right\|right | A | 2.7 | 0.20 | 0 | 0 |
| Lothrop Street westbound right | A | 0.2 | 0.05 | 0 | 0 |
| Birmingham Parkway northbound thru\|thru\|thru | B | 13.8 | 0.47 | 99 | 159 |
| Birmingham Parkway southbound thru\|thru | A | 4.0 | 0.35 | 58 | 78 |
| Unsignalized Intersections | | | | | |
| **Waverly Street/Mackin Street/Portsmouth Street** | - | - | - | - | - |
| Waverly Street eastbound thru/right | A | 0.0 | 0.12 | - | 0 |
| Portsmouth Street northbound right | A | 9.0 | 0.01 | - | 1 |
| Mackin Street southbound left/thru | B | 11.0 | 0.15 | - | 13 |
| **Birmingham Parkway/Waverly Street** | - | - | - | - | |
| Birmingham Parkway northbound thru\|thru\|thru\|thru/right | A | 0.0 | 0.19 | - | 0 |
| Birmingham Parkway southbound thru\|thru | A | 0.0 | 0.28 | - | 0 |
| **Western Avenue/Mackin Street** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.48 | - | 0 |
| Western Avenue westbound left/thru | A | 0.1 | 0.0 | - | 0 |

*# 95th Percentile Queues exceed capacity. Queue shown is maximum after two cycles*
*Grey Shading indicates LOS E or F*

**TABLE 3-3 EXISTING (2015) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY P.M. PEAK HOUR**

| Intersection/Approach | LOS | Delay | V/C Ratio | 50th Percentile Queue(ft) | 95th Percentile Queue(ft) |
|---|---|---|---|---|---|
| Signalized Intersections | | | | | |
| **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** | **C** | **26.8** | **-** | **-** | **-** |
| Arsenal Street eastbound thru\|thru | C | 33.0 | 0.65 | 337 | 412 |
| Western Avenue westbound left | C | 32.8 | 0.52 | 126 | 208 |
| Western Avenue westbound thru\|thru/right | C | 24.9 | 0.33 | 149 | 193 |
| Birmingham Parkway northbound left | F | >80.0 | 0.92 | 282 | #474 |
| Birmingham Parkway northbound left/thru\|thru | E | 55.3 | 0.71 | 213 | 279 |
| Birmingham Parkway northbound right | A | 9.2 | 0.54 | 0 | 77 |
| Soldiers Field Road Westbound Off-Ramp southbound left\|left | E | 60.3 | 0.60 | 113 | 160 |
| Soldiers Field Road Westbound Off-Ramp southbound thru\|thru/right | B | 12.5 | 0.25 | 4 | 34 |
| **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** | **B** | **10.8** | **-** | **-** | **-** |
| Soldiers Field Road Eastbound Off-Ramp eastbound left\|left | C | 23.9 | 0.29 | 29 | 57 |
| Soldiers Field Road Eastbound Off-Ramp eastbound right\|right | A | 6.9 | 0.32 | 0 | 35 |
| Lothrop Street westbound right | A | 0.0 | 0.03 | 0 | 0 |
| Birmingham Parkway northbound thru\|thru\|thru | B | 14.2 | 0.52 | 103 | 165 |
| Birmingham Parkway southbound thru\|thru | A | 4.4 | 0.35 | 51 | 85 |
| Unsignalized Intersections | | | | | |
| **Waverly Street/Mackin Street/Portsmouth Street** | - | - | - | - | - |
| Waverly Street eastbound thru/right | A | 0.0 | 0.11 | - | 0 |
| Portsmouth Street northbound right | A | 9.0 | 0.01 | - | 1 |
| Mackin Street southbound left/thru | B | 10.2 | 0.06 | - | 5 |
| **Birmingham Parkway/Waverly Street** | - | - | - | - | |
| Birmingham Parkway northbound thru\|thru\|thru\|thru/right | A | 0.0 | 0.20 | - | 0 |
| Birmingham Parkway southbound thru\|thru | A | 0.0 | 0.27 | - | 0 |
| **Western Avenue/Mackin Street** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.43 | - | 0 |
| Western Avenue westbound left/thru | A | 0.3 | 0.01 | - | 1 |

*# 95th Percentile Queues exceed capacity. Queue shown is maximum after two cycles*
*Grey Shading indicates LOS E or F*

As shown in Table 3-2 and Table 3-3, the signalized intersection of **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** currently operates at an overall LOS C during both the a.m. and p.m. peak hours. All approaches currently operate under capacity (v/c ratio less than 1.0).

The signalized intersection of **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** currently operates at LOS A during the a.m. peak hour and LOS B during the p.m. peak hour. All approaches at the intersection operate under capacity.

All movements at the unsignalized intersections in the study area currently operate at LOS B or better with minimal delay and queuing.

### 3.2.5 On-Street Parking and Curb Usage

An inventory of the on-street parking and the curb usage was collected in the vicinity of the Project. On-street parking is generally unrestricted along the north side of Waverly Street, adjacent to the Project Site. Parking is also intermittently allowed along Western Avenue, with bus stops and no-parking zones located along some segments. Parking is generally not allowed along Birmingham Parkway in the vicinity of the Project Site. The on-street parking regulations within the study area are shown in Figure 3.4.

### 3.2.6 Public Transportation

The Project Site is located in proximity to several public transportation opportunities. The MBTA operates five bus routes that can be accessed within a short walk from the Project Site. Figure 3.5 shows all of the public transportation options located in the vicinity of the Project Site. Table 3-4 provides a brief summary of all routes. The existing MBTA bus lines that run in proximity to the Project Site also provide convenient access to both Harvard Square and Central Square, where the MBTA Red Line can be accessed to travel to points in Cambridge and downtown Boston via public transportation.

**TABLE 3-4 EXISTING PUBLIC TRANSPORTATION SERVICE SUMMARY**

| Bus Routes | Description | Approximate Rush-hour Headway (in minutes)* |
|---|---|---|
| 64 | Oak Square – University Park, Cambridge or Kendall/MIT via North Beacon Street | 20 |
| 66 | Harvard Square – Dudley Station via Allston & Brookline Village | 9 |
| 70 | Cedarwood, North Waltham or Watertown Square – University Park via Central Square, Cambridge, Arsenal Street & Western Avenue | 20 |
| 70A | Cedarwood, North Waltham or Watertown Square – University Park via Central Square, Cambridge, Arsenal Street & Western Avenue | 25 |
| 86 | Sullivan Square Station – Reservoir (Cleveland Circle) via Harvard | 8 |

* Source: www.mbta.com; November 16, 2015.

### 3.2.7 Pedestrian Environment

Sidewalks are generally provided along both sides of all roadways with the exception of Soldiers Field Road, which is provided with a multi-use path. The sidewalks are in fair condition, with minor cracks and some vegetation growing on them. Crosswalks are typically worn away or not present and wheelchair ramps are only provided across minor street approaches. Access to the Paul Dudley White multi-use path is also provided at the intersection of Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps.

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 3.6. As shown in the figure the highest pedestrian movements are over the Arsenal Street Bridge and are most likely associated with the activity along the multi-use path that runs parallel to the Charles River. Currently pedestrian phases and signal indications are not provided to allow pedestrians to cross through the intersection of Western Avenue/Arsenal Street/Birmingham Parkway, creating an unsafe condition for pedestrians.

### 3.2.8 Bicycle Facilities

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 "Bike Routes of Boston" map indicates that the Paul Dudley White mixed-use path is designated as a beginner route, suitable for all bicycle riders. Birmingham Parkway is designated as an intermediate route, suitable for riders with some on-road experience. Western Avenue is designated as an advanced route, suitable for experienced and traffic confident riders. Bicycle counts were conducted concurrent with the vehicular TMCs, and are

presented in Figure 3.7. As shown in the figure, bicycle volumes are heaviest along Western Avenue and over the Arsenal Street Bridge.

### 3.2.9 Bicycle and Car Sharing Services

Hubway is a bicycle sharing system in Metro Boston, which was launched in July 2011 in Boston with 140 stations and 1,300 bicycles. There are currently 30 Hubway docks that exist within close proximity of the Project, with stations located along Guest Street, south of the Project Site, and along Western Avenue, east of the Project site.

Car sharing enables 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 their designated location. Zipcar and Enterprise Car Share have locations in proximity to the Project Site.

The nearby bicycle and car sharing locations are shown in Figure 3.8 and summarized in Table 3-5.

**TABLE 3-5 BICYCLE & CAR SHARING SERVICES**

| Address | # |
|---|---|
| ***Zipcar Locations*** | ***Vehicles*** |
| 370 Western Avenue | 2 |
| 218 Lincoln Street | 1 |
| 140 North Beacon Street | 2 |
| Travis Street/Western Avenue | 1 |
| ***Enterprise Car Share Locations*** | ***Vehicles*** |
| 292 Western Avenue | 1 |
| ***Hubway Locations*** | ***Bicycle Docks*** |
| 370 Western Avenue | 15 |
| 20 Guest Street | 15 |
| 175 North Harvard Street | 18 |
| 175 Western Avenue/Button Way | 14 |
| Union Square – Brighton Ave./Cambridge St. | 15 |

## 3.3 Future Conditions

For transportation impact analyses, it is standard practice to evaluate two future conditions: a No-Build Condition (without the Project) and a Build Condition (with the proposed project). In accordance with BTD guidelines, these conditions are projected to a future date five years from the Existing Condition year. For this evaluation of this Project, 2020 was selected as the horizon year for the future conditions analyses.

This section presents a description of the 2020 future conditions scenarios and includes an evaluation of the transportation facilities under the No-Build (2020) Condition and the Build (2020) Condition.

### 3.3.1 No-Build Condition

The No-Build Condition reflect a future scenario that incorporates any anticipated traffic volume changes independent of the Project, and any planned infrastructure improvements that will affect travel patterns throughout the study area. Infrastructure improvements include roadway, public transportation, pedestrian and/or bicycle improvements. Traffic volume changes are based on two factors: an annual growth rate and growth associated with specific developments near the Project.

#### Background Traffic Growth

The first part of the methodology accounts for general background traffic growth that may be affected by changes in demographics, automobile usage, and automobile ownership. Based on a review of recent and historic traffic data collected for nearby projects and to account for any additional unforeseen traffic growth, a half percent per year annual traffic growth rate was used to develop the future conditions traffic volumes.

#### Background Projects

The second part of the methodology identifies any specific planned developments that are expected to affect traffic patterns throughout the study area within the future analysis time horizon. Three projects were specifically accounted for in the traffic volumes for future scenarios and are summarized in Table 3-6.

**TABLE 3-6 BACKGROUND PROJECTS**

| Name | Address | Status | Description |
|---|---|---|---|
| Boston Landing | 38-180 Guest Street | Board Approved | 250,000 sf New Balance world headquarters; 350,000 sf sports complex; 140,000 sf boutique hotel; 650,000 sf office uses; 65,000 sf retail uses. |
| Joseph M. Smith Community Health Center | 495 Western Avenue | Under Construction | 47,901 sf including a retail pharmacy, vision clinic, eye shop, dental clinic, office space and 99 parking spaces. |
| Telford 180 | 180 Telford Street | Board Approved | 85 residential condominiums and 84 parking spaces. |

A map of the proposed development projects in the vicinity of the Project Site is shown in Figure 3.9.

**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. The Boston Landing project has several transportation related mitigation requirements as part of the development. As part of the Boston Landing project, there will be roadway and intersection improvements along Birmingham Parkway. The improvements include the following upgrades:

- ***Birmingham Parkway/Western Avenue/Arsenal Street*** – This intersection will be reconstructed and reconfigured. The improvements include consolidating and reorganizing the lane usage at the intersection, installing and upgrading the traffic signal equipment, providing pedestrian crossings and bicycle accommodations, and upgrading the intersections to be compliant with the Americans with Disabilities Act (ADA). The traffic signal will also be connected to the BTD system to allow for more efficient operations.

- ***Birmingham Parkway/Lothrop Street/Soldiers Field Road EB Off-Ramp –*** The traffic signal equipment at this intersection will be upgraded, the intersection will be upgraded to be ADA compliant, and bicycle accommodations will be provided. The traffic signal will also be connected to the BTD system to allow for more efficient operations.

  The future conditions scenarios do not incorporate the traffic signal and intersection upgrades at the two intersections listed above. It is expected that the Project will be in place before the improvements are in place.

- ***Boston Landing MBTA Station*** – This proposed MBTA station will serve the Framingham/Worcester commuter rail line, which also stops at Yawkey Station (Green Line/Longwood Medical Area/Kenmore Square), Back Bay Station (Orange Line/Copley Square), and South Station (Red Line, Silver Line, and regional transportation services). Additionally, these connector stations serve numerous bus lines and have Hubway stations to provide access to the entire Boston metropolitan region. Based on yet unpublished assessments for the Boston Landing project, the transit mode share for residential uses within the area is expected to increase by 7% with the addition of the new Boston Landing MBTA commuter rail station. This station is expected to serve as an alternative form of transportation for residents living in the Brighton/Allston neighborhoods to commute into the major employment centers in the City of Boston (Longwood Medical area, Back Bay, and Downtown). The proposed Boston Landing MBTA station will be located approximately 2/3 of a mile (walking distance) southeast from the Project site. The Boston Landing Station is expected to open in Fall 2016 and will be open prior to the completion of the Project.

**No-Build Traffic Volumes**

A one-half percent per year annual growth rate was applied to the Existing (2015) Condition traffic volumes, then the traffic volumes associated with the background development project

listed above was added to develop the No-Build (2020) Condition traffic volumes. The No-Build (2020) Condition weekday morning and evening peak hour traffic volumes are shown on Figure 3.10 and Figure 3.11, respectively.

**No-Build Traffic Operations**

The No-Build (2020) Condition capacity analysis uses the same methodology as the Existing (2015) Condition capacity analysis. Table 3-7 and Table 3-8 present the No-Build (2020) Condition capacity analysis summary for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in the Appendix.

**TABLE 3-7 NO-BUILD (2020) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY A.M. PEAK HOUR**

| Intersection/Approach | LOS | Delay | V/C Ratio | 50th Percentile Queue(ft) | 95th Percentile Queue(ft) |
|---|---|---|---|---|---|
| Signalized Intersections | | | | | |
| **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** | **C** | **31.5** | **-** | **-** | **-** |
| Arsenal Street eastbound thru\|thru/right | D | 37.8 | 0.78 | 440 | 528 |
| Western Avenue westbound left | D | 43.8 | 0.70 | 154 | 185 |
| Western Avenue westbound thru\|thru/right | C | 24.0 | 0.27 | 114 | 118 |
| Birmingham Parkway northbound left | E | 65.1 | 0.76 | 225 | #357 |
| Birmingham Parkway northbound left/thru\|thru | D | 54.7 | 0.69 | 209 | 274 |
| Birmingham Parkway northbound right | A | 9.2 | 0.58 | 0 | 85 |
| Soldiers Field Road Westbound Off-Ramp southbound left\|left | F | >80.0 | 0.93 | 185 | #267 |
| Soldiers Field Road Westbound Off-Ramp southbound thru\|thru/right | B | 11.6 | 0.29 | 4 | 34 |
| **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** | **B** | **11.2** | **-** | **-** | **-** |
| Soldiers Field Road Eastbound Off-Ramp eastbound left\|left | C | 25.5 | 0.28 | 29 | 43 |
| Soldiers Field Road Eastbound Off-Ramp eastbound right\|right | A | 3.0 | 0.22 | 0 | 1 |
| Lothrop Street westbound right | A | 0.2 | 0.05 | 0 | 0 |
| Birmingham Parkway northbound thru\|thru\|thru | B | 16.1 | 0.55 | 123 | 174 |
| Birmingham Parkway southbound thru\|thru | A | 5.1 | 0.46 | 77 | 102 |
| Unsignalized Intersections | | | | | |
| **Waverly Street/Mackin Street/Portsmouth Street** | - | - | - | - | - |
| Waverly Street eastbound thru/right | A | 0.0 | 0.12 | - | 0 |
| Portsmouth Street northbound right | A | 9.1 | 0.01 | - | 1 |
| Mackin Street southbound left/thru | B | 11.1 | 0.16 | - | 14 |
| **Birmingham Parkway/Waverly Street** | - | - | - | - | |
| Birmingham Parkway northbound thru\|thru\|thru\|thru/right | A | 0.0 | 0.20 | - | 0 |
| Birmingham Parkway southbound thru\|thru | A | 0.0 | 0.34 | - | 0 |
| **Western Avenue/Mackin Street** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.54 | - | 0 |
| Western Avenue westbound left/thru | A | 0.3 | 0.01 | - | 1 |

*# 95th Percentile Queues exceed capacity. Queue shown is maximum after two cycles.*
*Grey Shading indicates decrease in LOS to LOS E or F compared to the Existing Conditions.*

**TABLE 3-8 NO-BUILD (2020) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY P.M. PEAK HOUR**

| Intersection/Approach | LOS | Delay | V/C Ratio | 50th Percentile Queue(ft) | 95th Percentile Queue(ft) |
|---|---|---|---|---|---|
| Signalized Intersections | | | | | |
| **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** | **C** | **31.7** | **-** | **-** | **-** |
| Arsenal Street eastbound thru\|thru | C | 34.1 | 0.69 | 362 | 441 |
| Western Avenue westbound left | D | 37.3 | 0.63 | 158 | 259 |
| Western Avenue westbound thru\|thru/right | C | 25.5 | 0.37 | 167 | 214 |
| Birmingham Parkway northbound left | F | >80.0 | >1.00 | ~337 | #548 |
| Birmingham Parkway northbound left/thru\|thru | E | 61.7 | 0.87dl | 257 | #337 |
| Birmingham Parkway northbound right | A | 9.4 | 0.59 | 0 | 86 |
| Soldiers Field Road Westbound Off-Ramp southbound left\|left | E | 62.4 | 0.66 | 126 | 176 |
| Soldiers Field Road Westbound Off-Ramp southbound thru\|thru/right | B | 12.5 | 0.26 | 4 | 34 |
| **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** | **B** | **12.0** | **-** | **-** | **-** |
| Soldiers Field Road Eastbound Off-Ramp eastbound left\|left | C | 24.7 | 0.30 | 31 | 60 |
| Soldiers Field Road Eastbound Off-Ramp eastbound right\|right | A | 7.5 | 0.33 | 0 | 38 |
| Lothrop Street westbound right | A | 0.0 | 0.03 | 0 | 0 |
| Birmingham Parkway northbound thru\|thru\|thru | B | 16.0 | 0.61 | 132 | 208 |
| Birmingham Parkway southbound thru\|thru | A | 4.7 | 0.38 | 59 | 98 |
| Unsignalized Intersections | | | | | |
| **Waverly Street/Mackin Street/Portsmouth Street** | - | - | - | - | - |
| Waverly Street eastbound thru/right | A | 0.0 | 0.11 | - | 0 |
| Portsmouth Street northbound right | A | 9.1 | 0.01 | - | 1 |
| Mackin Street southbound left/thru | B | 10.2 | 0.06 | - | 5 |
| **Birmingham Parkway/Waverly Street** | - | - | - | - | |
| Birmingham Parkway northbound thru\|thru\|thru\|thru/right | A | 0.0 | 0.23 | - | 0 |
| Birmingham Parkway southbound thru\|thru | A | 0.0 | 0.29 | - | 0 |
| **Western Avenue/Mackin Street** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.47 | - | 0 |
| Western Avenue westbound left/thru | A | 0.4 | 0.01 | - | 1 |

*~ 50th Percentile Queues exceed capacity.*

*# 95th Percentile Queues exceed capacity. Queue shown is maximum after two cycles*

As shown in Table 3-7 and Table 3-8, the signalized intersection of **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road Ramps** will continue to operate at an overall LOS C during both the a.m. and p.m. peak hours.

The signalized intersection of **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** will operate at LOS B during both the a.m. and p.m. peak hours.

All movements at the unsignalized intersections in the study area will continue to operate at LOS B or better with minimal delay and queuing.

### 3.3.2 Build Conditions

As previously summarized, The Project consists of the construction of approximately 132 residential units and 4,800 square feet (sf) of retail space. A total of 108 parking spaces will be provided on the site. Covered, secure storage for 132 bicycles will be provided on the Project site for the residential uses. The Project proponent is actively working with Zipcar to provide a car-sharing service on the site.

#### Site Access and Circulation

As shown in Figure 3.12 and Figure 3.13, vehicular access will be provided in two locations. A driveway to a covered, at-grade garage will be provided along Western Avenue, approximately 100 feet west of Mackin Street and will contain a total of 85 parking spaces. A secondary driveway will provide access to a surface parking lot along Waverly Street, approximately 175 feet east of Birmingham Parkway and will contain a total of 23 parking spaces. Primary pedestrian access to the residences will be provided through the main lobby at the corner of Western Avenue/Birmingham Parkway. Secondary pedestrian access to the residences will be provided along Mackin Street and along Waverly Street. Pedestrian access to the retail spaces will be provided along their street frontage with Birmingham Parkway and Western Avenue. Loading, deliveries, and trash pick-up will take place on-site within the Waverly Street surface lot.

#### Trip Generation Methodology

Trip generation 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*[1] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the

[1] *Trip Generation Manual*, 9th Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

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 unadjusted number of vehicular trips for the Project, the following ITE land use codes (LUC) were used:

- **LUC 220 – Apartment.** The apartment land use is defined as rental dwellings located within the same building with at least three other dwelling units. Trip generation estimates are based on average vehicle rates per unit.

- **LUC 820 – Shopping Center.** The Shopping Center land use code is defined as a commercial establishment that is planned, developed, owned, and managed as a unit. The Shopping Center land use code was selected because it has slightly higher trip generation rates than the other similar retail land uses provided in the Trip Generation Manual, presenting a more conservative scenario. Trip generation estimates are based on average vehicle rates per 1,000 sf.

**Mode Share**

The BTD publishes vehicle, transit, and walking/bicycling mode split rates for different areas of Boston. The Project site is located in the western portion of BTD's designated Area 17, which includes parts of Brighton and Allston and generally covers the area between North Beacon Street/Brighton Avenue and the Charles River. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[2]. The person trips were then distributed to different travel modes according to the mode shares shown in Table 3-9. The mode shares shown in Table 3-9 are existing mode shares and do not account for the potential for increased transit usage after the completion of the Boston Landing commuter rail station.

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

**TABLE 3-9 TRAVEL MODE SHARES**

| Land Use | Direction | Transit Share[1] | Walk/Bike Share[1] | Auto Share[1] |
|---|---|---|---|---|
| | | *Daily* | | |
| Residential | In | 22% | 31% | 47% |
| | Out | 22% | 31% | 47% |
| Commercial | In | 8% | 40% | 52% |
| | Out | 8% | 40% | 52% |
| | | *a.m. Peak Hour* | | |
| Residential | In | 30% | 33% | 37% |
| | Out | 21% | 36% | 43% |
| Commercial | In | 11% | 46% | 43% |
| | Out | 7% | 46% | 47% |
| | | *p.m. Peak Hour* | | |
| Residential | In | 21% | 36% | 43% |
| | Out | 30% | 33% | 37% |
| Commercial | In | 7% | 46% | 47% |
| | Out | 11% | 46% | 43% |

1. Based on mode share data published by the Boston Transportation Department.

### Vehicle Trip Generation

To develop the overall trip generation characteristics, the adjusted vehicular trips associated with the Project were estimated. The Project-generated new vehicle trips are summarized in Table 3-10, with the detailed trip generation information provided in Appendix B.

**TABLE 3-10 PROJECT VEHICLE TRIP GENERATION**

| Time Period | Direction | Residential | Commercial | Total Vehicle Trips |
|---|---|---|---|---|
| Daily | In | 206 | 53 | 259 |
| | Out | 206 | 53 | 259 |
| | *Total* | *412* | *106* | *518* |
| a.m. Peak Hour | In | 5 | 1 | 6 |
| | Out | 23 | 1 | 24 |
| | *Total* | *28* | *2* | *30* |
| p.m. Peak Hour | In | 23 | 4 | 27 |
| | Out | 11 | 4 | 15 |
| | *Total* | *34* | *8* | *42* |

As shown in Table 3-10, the Project is expected to generate approximately 518 new daily vehicle trips (259 entering and 259 exiting), with 30 new vehicle trips (6 entering and 24 exiting) during the a.m. peak hour and 42 new vehicle trips (27 entering and 15 exiting) during the p.m. peak hour. This corresponds to one vehicle trip every one and a half to two minutes on the adjacent roadway network during the peak hours.

### Vehicle Trip Distribution

The vehicle 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 for Area 17 (Brighton/Allston). The origin-destination data specifies the percentage of trips traveling between Brighton and other areas within Boston and the metropolitan area. The trip distribution patterns for the Project are illustrated in Figure 3.14.

The Project-generated vehicle trips were assigned to the study area roadway network based on the trip distribution patterns shown in Figure 3.14, and are shown in Figure 3.15 and Figure 3.16 for the a.m. and p.m. peak hours, respectively. The Project-generated trips were added to the 2020 No-Build Condition traffic volumes to develop the 2020 Build Condition peak hour traffic volume networks and are shown in Figure 3.17 and Figure 3.18 for the a.m. and p.m. peak hours, respectively.

### Build Condition Traffic Operations

The 2020 Build Condition capacity analyses use the same methodology as the 2015 Existing and 2020 No-Build Condition capacity analyses. The results of the 2020 Build Condition capacity analysis at study area intersections are presented in Table 3-11 and Table 3-12 for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in Appendix B.

**TABLE 3-11 BUILD (2020) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY A.M. PEAK HOUR**

| Intersection/Approach | LOS | Delay | V/C Ratio | 50th Percentile Queue(ft) | 95th Percentile Queue(ft) |
|---|---|---|---|---|---|
| Signalized Intersections | | | | | |
| **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road On and Off ramps** | **C** | **31.6** | **-** | **-** | **-** |
| Arsenal Street eastbound thru\|thru/right | D | 37.8 | 0.78 | 440 | 529 |
| Western Avenue westbound left | D | 45.4 | 0.73 | 160 | 192 |
| Western Avenue westbound thru\|thru/right | C | 24.1 | 0.28 | 119 | 122 |
| Birmingham Parkway northbound left | E | 65.1 | 0.76 | 225 | #357 |
| Birmingham Parkway northbound left/thru\|thru | D | 54.7 | 0.69 | 209 | 274 |
| Birmingham Parkway northbound right | A | 9.2 | 0.58 | 0 | 85 |
| Soldiers Field Road Westbound Off-Ramp southbound left\|left | F | >80.0 | 0.93 | 186 | #269 |
| Soldiers Field Road Westbound Off-Ramp southbound thru\|thru/right | B | 11.6 | 0.29 | 4 | 34 |
| **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** | **B** | **11.2** | **-** | **-** | **-** |
| Soldiers Field Road Eastbound Off-Ramp eastbound left\|left | C | 25.5 | 0.28 | 29 | 43 |
| Soldiers Field Road Eastbound Off-Ramp eastbound right\|right | A | 3.0 | 0.22 | 0 | 1 |
| Lothrop Street westbound right | A | 0.2 | 0.05 | 0 | 0 |
| Birmingham Parkway northbound thru\|thru\|thru | B | 16.1 | 0.55 | 123 | 175 |
| Birmingham Parkway southbound thru\|thru | A | 5.2 | 0.46 | 78 | 102 |
| Unsignalized Intersections | | | | | |
| **Waverly Street/Mackin Street/Portsmouth Street** | - | - | - | - | - |
| Waverly Street eastbound thru/right | A | 0.0 | 0.12 | - | 0 |
| Portsmouth Street northbound right | A | 9.1 | 0.01 | - | 1 |
| Mackin Street southbound left/thru | B | 11.1 | 0.16 | - | 14 |
| **Birmingham Parkway/Waverly Street** | - | - | - | - | |
| Birmingham Parkway northbound thru\|thru\|thru\|thru/right | A | 0.0 | 0.18 | - | 0 |
| Birmingham Parkway southbound thru\|thru | A | 0.0 | 0.34 | - | 0 |
| **Western Avenue/Mackin Street** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.54 | - | 0 |
| Western Avenue westbound left/thru | A | 0.2 | 0.01 | - | 1 |
| **Western Avenue/Site Driveway** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.59 | - | 0 |
| Western Avenue westbound left/thru | A | 0.1 | 0.00 | - | 0 |
| Site Driveway northbound left/right | E | 36.2 | 0.15 | - | 13 |

**TABLE 3-11 BUILD (2020) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY A.M. PEAK HOUR (CONTINUED)**

| | | | | | |
|---|---|---|---|---|---|
| **Waverly Street/Site Driveway** | - | - | - | - | - |
| Waverly Street eastbound left/thru | A | 0.0 | 0.00 | - | 0 |
| Site Driveway southbound left | A | 9.5 | 0.01 | - | 0 |

*# 95th Percentile Queues exceed capacity. Queue shown is maximum after two cycles*

**TABLE 3-12 BUILD (2020) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY P.M. PEAK HOUR**

| Intersection/Approach | LOS | Delay | V/C Ratio | 50th Percentile Queue(ft) | 95th Percentile Queue(ft) |
|---|---|---|---|---|---|
| Signalized Intersections | | | | | |
| **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road On and Off ramps** | **C** | **31.7** | **-** | **-** | **-** |
| Arsenal Street eastbound thru\|thru | C | 34.2 | 0.69 | 365 | 443 |
| Western Avenue westbound left | D | 38.2 | 0.64 | 161 | 265 |
| Western Avenue westbound thru\|thru/right | C | 25.5 | 0.37 | 170 | 217 |
| Birmingham Parkway northbound left | F | >80.0 | >1.00 | ~337 | #548 |
| Birmingham Parkway northbound left/thru\|thru | E | 61.7 | 0.87dl | 257 | #337 |
| Birmingham Parkway northbound right | A | 9.4 | 0.59 | 0 | 86 |
| Soldiers Field Road Westbound Off-Ramp southbound left\|left | E | 62.9 | 0.67 | 128 | 179 |
| Soldiers Field Road Westbound Off-Ramp southbound thru\|thru/right | B | 12.5 | 0.26 | 4 | 34 |
| **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** | **B** | **12.0** | **-** | **-** | **-** |
| Soldiers Field Road Eastbound Off-Ramp eastbound left\|left | C | 24.7 | 0.30 | 31 | 60 |
| Soldiers Field Road Eastbound Off-Ramp eastbound right\|right | A | 7.5 | 0.33 | 0 | 38 |
| Lothrop Street westbound right | A | 0.2 | 0.03 | 0 | 0 |
| Birmingham Parkway northbound thru\|thru\|thru | B | 16.1 | 0.61 | 132 | 209 |
| Birmingham Parkway southbound thru\|thru | A | 4.7 | 0.38 | 59 | 98 |
| Unsignalized Intersections | | | | | |
| **Waverly Street/Mackin Street/Portsmouth Street** | - | - | - | - | - |
| Waverly Street eastbound thru/right | A | 0.0 | 0.11 | - | 0 |
| Portsmouth Street northbound right | A | 9.1 | 0.01 | - | 1 |
| Mackin Street southbound left/thru | B | 10.3 | 0.07 | - | 5 |

**TABLE 3-12 BUILD (2020) CONDITION INTERSECTION CAPACITY ANALYSIS SUMMARY, WEEKDAY P.M. PEAK HOUR (CONTINUED)**

| | | | | | |
|---|---|---|---|---|---|
| **Birmingham Parkway/Waverly Street** | - | - | - | - | |
| Birmingham Parkway northbound thru\|thru\|thru\|thru/right | A | 0.0 | 0.23 | - | 0 |
| Birmingham Parkway southbound thru\|thru | A | 0.0 | 0.29 | - | 0 |
| **Western Avenue/Mackin Street** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.47 | - | 0 |
| Western Avenue westbound left/thru | A | 0.4 | 0.01 | - | 1 |
| **Western Avenue/Site Driveway** | - | - | - | - | - |
| Western Avenue eastbound thru/right | A | 0.0 | 0.49 | - | 0 |
| Western Avenue westbound left/thru | A | 0.3 | 0.01 | - | 1 |
| Site Driveway northbound left/right | E | 43.0 | 0.12 | - | 10 |
| **Waverly Street/Site Driveway** | - | - | - | - | - |
| Waverly Street eastbound left/thru | A | 0.2 | 0.00 | - | 0 |
| Site Driveway southbound left | A | 9.4 | 0.00 | - | 0 |

*~ 50th Percentile Queues exceed capacity.*
*# 95th Percentile Queues exceed capacity. Queue shown is maximum after two cycles*

As shown in Table 3-11 and Table 3-12, the signalized intersection of **Western Avenue/Arsenal Street/Birmingham Parkway/Soldiers Field Road On and Off Ramps** will continue to operate at an overall LOS C during both the a.m. and p.m. peak hours.

The signalized intersection of **Birmingham Parkway/Lothrop Street/Soldiers Field Road Eastbound Off-Ramp** will operate at LOS B during both the a.m. and p.m. peak hours.

Movements exiting the Site Driveway at Western Avenue will operate at LOS E with minimal queuing during both the a.m. and p.m. peak hours. This type of operation is typical for a low-volume driveway intersecting with an arterial roadway. The movements at the remainder of the unsignalized intersections will operate at LOS B or better during the peak hours.

Based on the analysis presented in Table 3-11 and Table 3-12, the Project will have minimal impact on operations at the intersections in the vicinity of the site.

**Parking**

The Project will provide a total of 108 parking spaces for the residential uses on the Project Site. The parking will be provided in a ground-level covered garage accessed off of Western Avenue containing 85 spaces and a ground level-covered garage accessed off of Waverly Street containing 23 spaces. The 108 parking spaces for the residential uses represent a parking ratio of 0.82 parking spaces per unit. This parking ratio is consistent with the maximum parking ratios supported by the City of Boston for this area of Brighton (0.75 to 1.25 parking spaces per unit).

A review of the most recent available U.S. Census data on automobile ownership in the Allston/Brighton neighborhoods indicates that Brighton has 20,397 households and 20,191 total vehicles available (an average rate of 0.99 vehicles per household) and Allston has 6,609 households and 5,100 total vehicles available (an average rate of 0.77 vehicles per household). The U.S. Census data also indicates that 33 percent of Brighton households and 48 percent of Allston households to not own a vehicle.

At the recently constructed Charlesview project (240 fully occupied units) located approximately a half-mile east of the Project site along Western Avenue, about 180 parking spaces are being used by residents out of the 243 total spaces, representing a parking demand of 0.74 spaces per unit.

Further east along Western Avenue, approximately 325 residential units are currently under construction, with 180 parking spaces being provided in a below-grade garage that will serve the residential uses of that project[3].

Based on a review of City of Boston guidelines, the proximity to the proposed Boston Landing commuter rail station, current parking trends in Allston and Brighton, and parking ratios at other nearby residential developments, the parking supply of 108 spaces for the 132 units will serve the Project's total parking demand without having an adverse impact on the on-street parking along the adjacent roadways.

The parking needs of the retail components of the Project are expected to be minimal and will be served by the on-street parking regulations along Western Avenue. The Project is also proposing to modify the parking regulations along Western Avenue, adjacent to the Project site to reduce the size of the MBTA bus stop and create two additional on-street parking spaces near the intersection of Western Avenue/Mackin Street.

**Public Transportation**

As previously discussed, the Project is situated to take advantage of nearby public transportation opportunities. The existing MBTA bus routes will provide the Project with convenient access to Harvard Square and Central Square, which both provide connections to the MBTA Red Line. The proposed Boston Landing commuter rail station will also be located within 2/3 mile walking distance from the site, allowing future residents convenient transit access to the Longwood Medical area, Back Bay, and Downtown Boston.

Based on the transit mode shares presented in Table 3-9, the future transit trips associated with the Project were estimated and are summarized in Table 3-13.

▼

[3] *Expanded Notification Form – Barry's Corner Residential and Retail Commons Project*: Submitted by Samuels & Associates; December 14, 2012.

**TABLE 3-13 PROJECT TRANSIT TRIP GENERATION**

| Time Period | Direction | Transit Trips |
|---|---|---|
| Daily | In | 124 |
| | Out | 124 |
| | *Total* | *248* |
| a.m. Peak Hour | In | 6 |
| | Out | 13 |
| | *Total* | *19* |
| p.m. Peak Hour | In | 14 |
| | Out | 12 |
| | *Total* | *26* |

As shown in Table 3-13, the Project will generate an estimated 248 new transit trips on a daily basis. Approximately 19 new transit trips (6 alighting and 13 boarding) will occur during the a.m. peak hour and 26 new trips (14 alighting and 12 boarding) will occur during the p.m. peak hour. The majority of these transit trips will be accommodated by the nearby MBTA bus routes and the proposed Boston Landing commuter rail station.

**Pedestrians**

Based on the walk/bicycle mode shares presented earlier, the future walk/bicycle trips were estimated and are summarized in Table 3-14.

**TABLE 3-14 PROJECT TRANSIT TRIP GENERATION**

| Time Period | Direction | Walk/Bike Trips |
|---|---|---|
| Daily | In | 227 |
| | Out | 227 |
| | *Total* | *454* |
| a.m. Peak Hour | In | 7 |
| | Out | 24 |
| | *Total* | *31* |
| p.m. Peak Hour | In | 29 |
| | Out | 18 |
| | *Total* | *47* |

Over the course of a day, the Project will generate an estimated 454 new pedestrian trips and an additional 248 new transit trips that will require a walk to or from the site. This results in an additional 702 new pedestrian trips per day. Approximately 31 new pedestrian trips will occur during the a.m. peak hour and 47 new pedestrian trips will occur during the p.m. peak hour in addition to the transit trips that will also require a walk from the Project Site. The surrounding pedestrian infrastructure has the capacity to accommodate the new pedestrian trips expected to be generated by the Project.

Pedestrian upgrades are also being proposed by the New Boston Landing development project along Birmingham Parkway and at the intersections of Birmingham Parkway/Western Avenue/Arsenal Street and Birmingham Parkway/Lothrop Street/Soldiers Field Road EB Off-Ramp that will improve pedestrian safety in the vicinity of the site.

**Bicycle Accommodations**

BTD has established guidelines requiring projects subject to Article 80 Large Project Review to provide secure bicycle parking for employees and short-term bicycle racks for visitors. The Project will provide both on-site, secure bicycle storage and exterior bicycle racks in accordance with the BTD guidelines. Secure storage will be provided for a total of 132 bicycles in the garages located on the site. A bicycle maintenance facility will also be provided on-site.

**Loading and Service Activity**

Loading and service operations for the Project will occur on-site within the surface lot located off of Waverly Street. Most of the service and delivery operations will consist of standard mail and package deliveries with occasional move-in/move-out activity. The loading area will accommodate up to the size of an SU-36 delivery truck (a box truck up to approximately 36-feet in length). Trash pick-up will be conducted by a private trash contractor and deliveries to and from the individual buildings.

## 3.4 Transportation Mitigation Measures

The Proponent will work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible, the installation of new, accessible ramps, improvements to the street lighting where necessary, planting of street trees, and providing bicycle storage racks surrounding the site, where appropriate.

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, travel demand management 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 the Project will be defined and documented in the TAPA.

The Proponent 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. See Section 3.6 for additional information related to the CMP.

### 3.4.1 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.

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. 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 the nearby available transit access in marketing the site to future employees 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:

- **Orientation Packets:** The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices including transit routes/schedules and nearby car and bicycle sharing locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.

- **Bicycle Accommodation:** The Proponent will provide bicycle storage in secure, sheltered areas for residents. Secure bicycle storage will also be made available to employees of the retail portion of the site to encourage bicycling as an alternative mode of transportation. Subject to necessary approvals, public use bicycle racks will be placed near building entrances.

- **Shared-Car Services:** The Proponent is committed to working with a shared car services (e.g. Zipcar) to provide on-site spaces that will be easily accessible to the residents of the Project and the surrounding neighborhood.

- **Transportation Coordinator:** The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.

- **Project Web Site:** The web site will include transportation-related information for patrons, workers, and visitors.

## 3.5 Evaluation of Short-Term Construction Impacts

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

To minimize transportation impacts during the construction period, the following measures will be considered for the CMP:

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

The CMP will be executed with the City prior to commencement of construction and will document all committed measures.

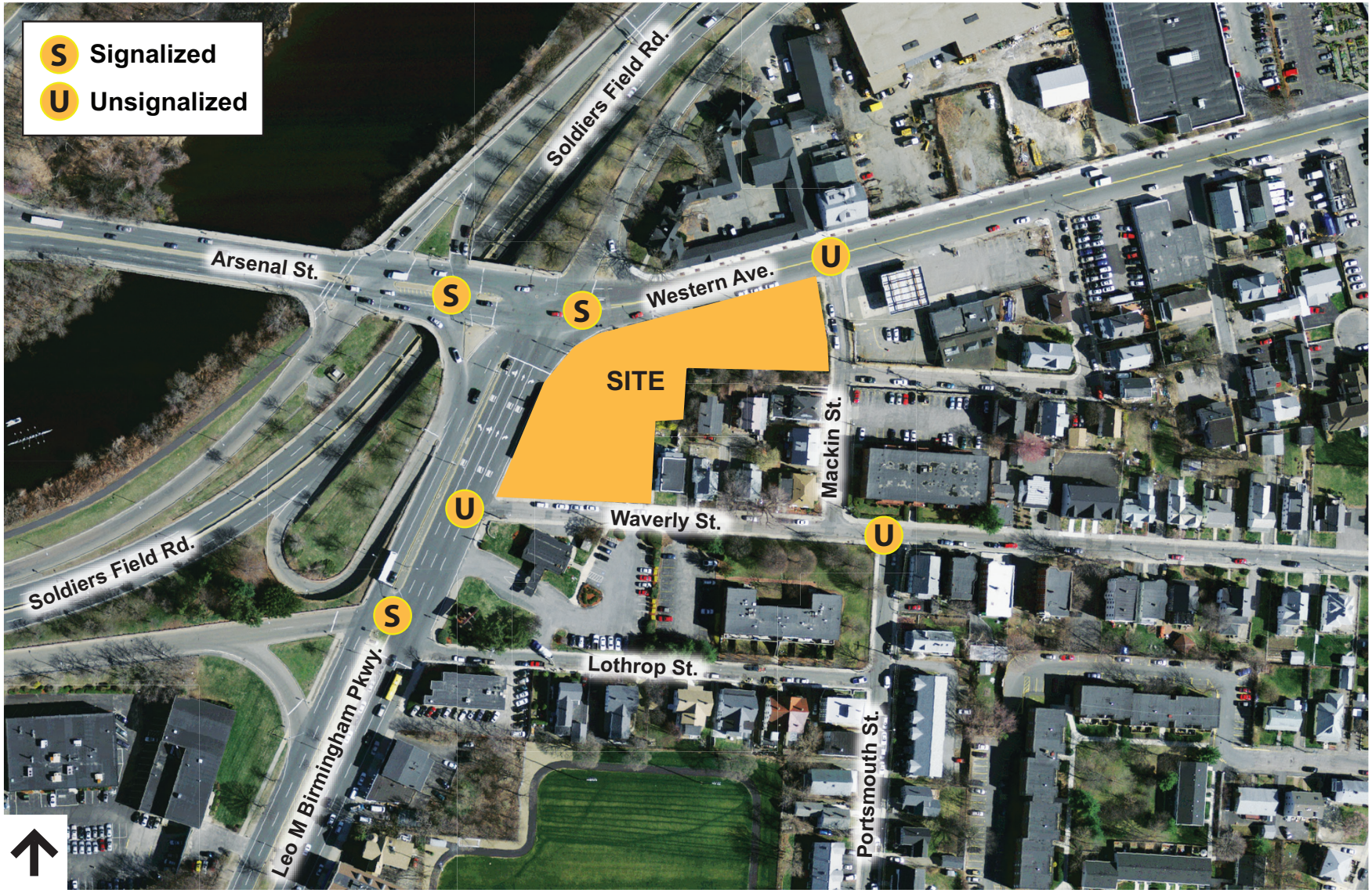


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Figure 3.1

Study Area Intersections

**W. Ave Residence**
**Brighton, MA**

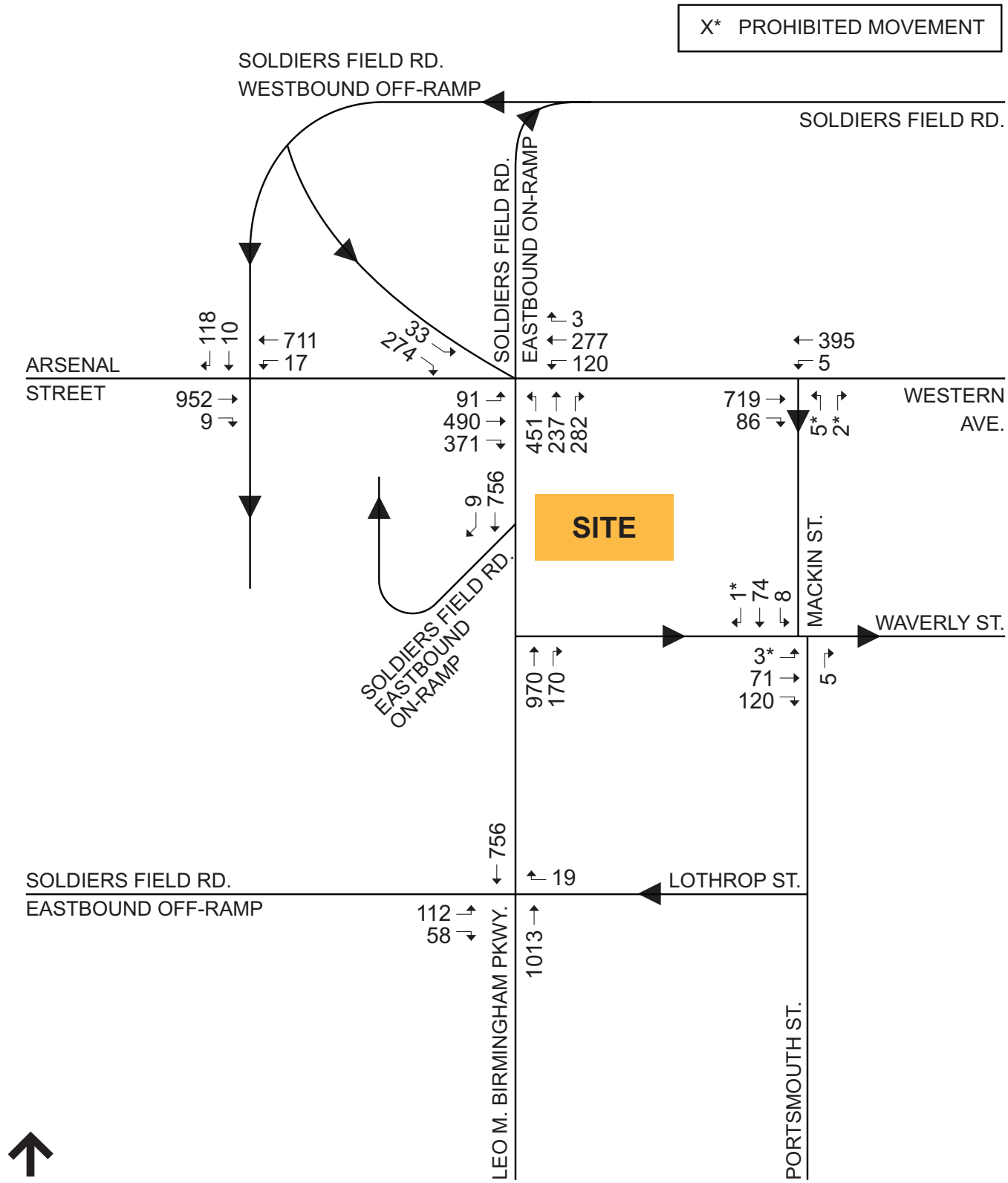


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Figure 3.2
Existing (2015) Condition Traffic Volumes,
Weekday a.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

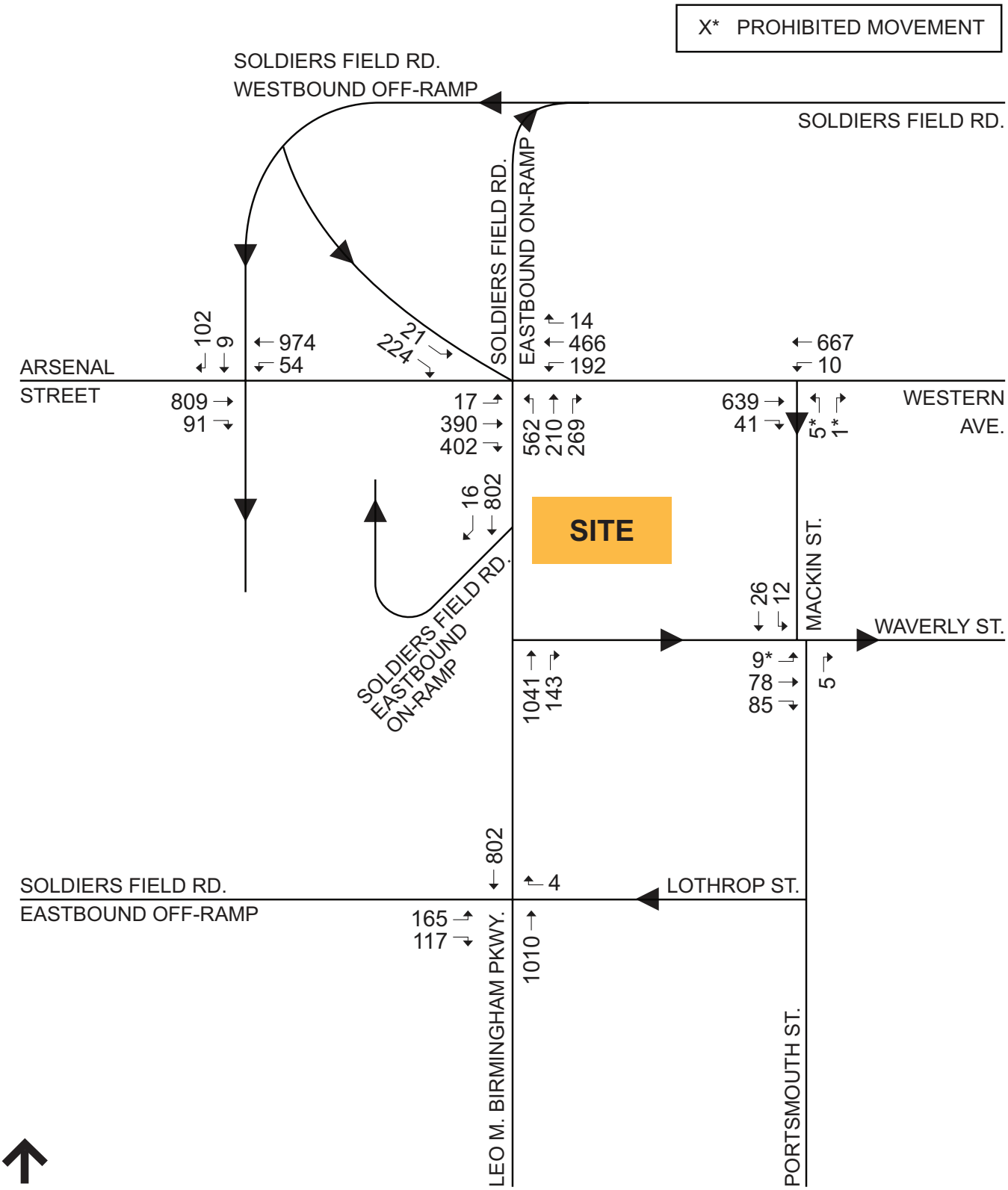


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Figure 3.3
Existing (2015) Condition Traffic Volumes,
Weekday p.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

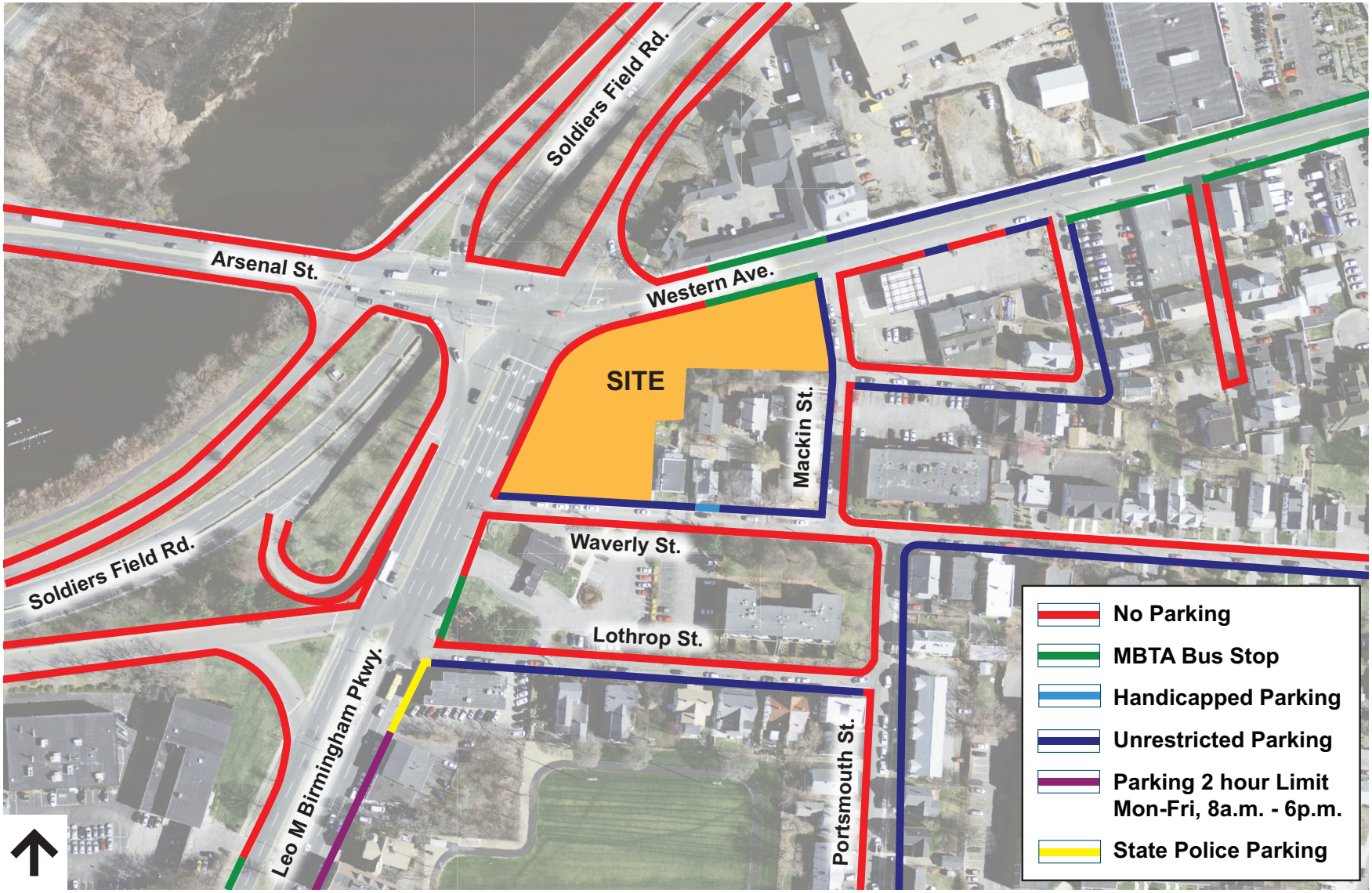


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Figure 3.4

On-Street Parking and Curb Use

**W. Ave Residence**
**Brighton, MA**

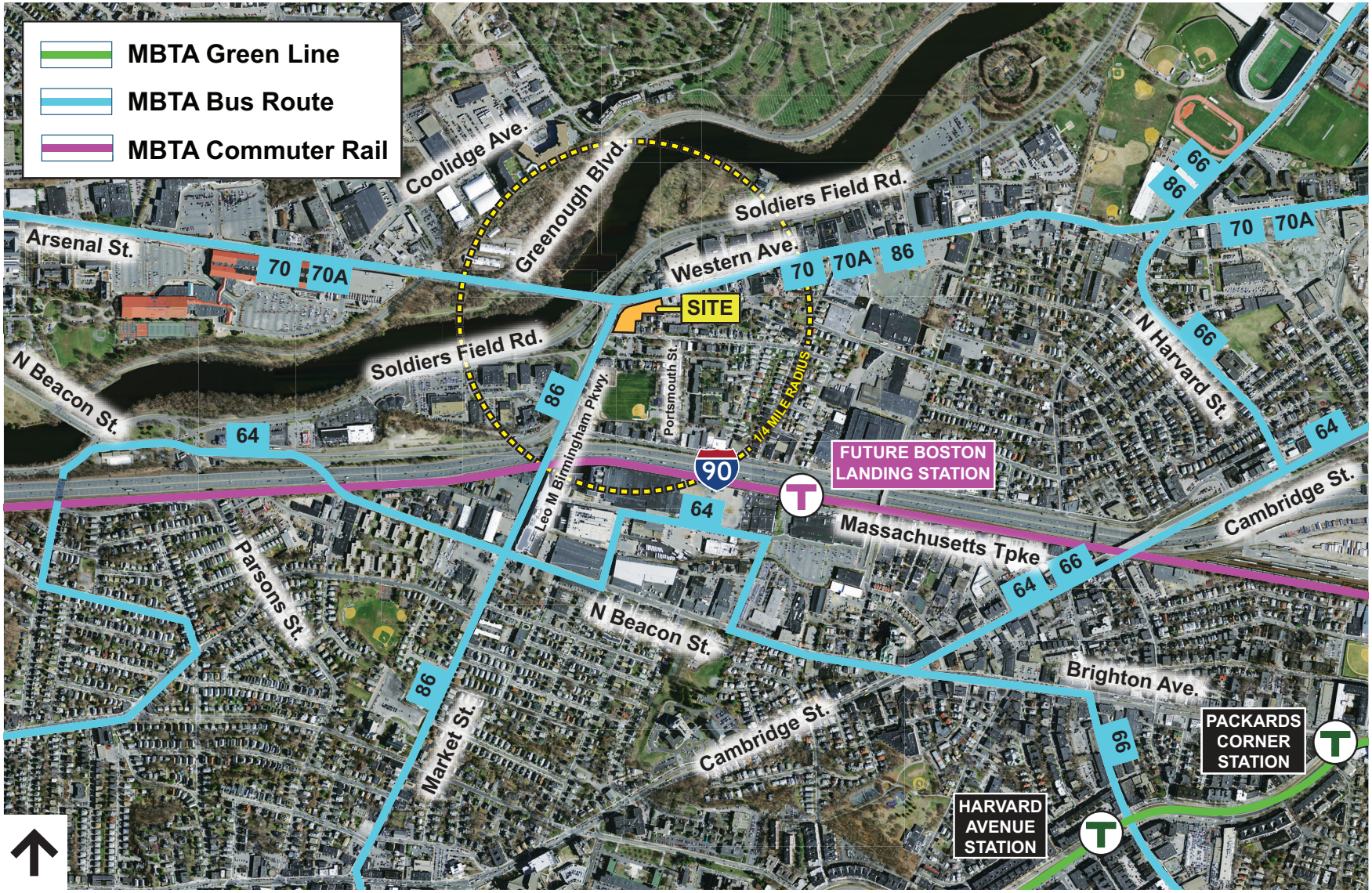


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Figure 3.5

Public Transportation Facilities

**W. Ave Residence**
**Brighton, MA**

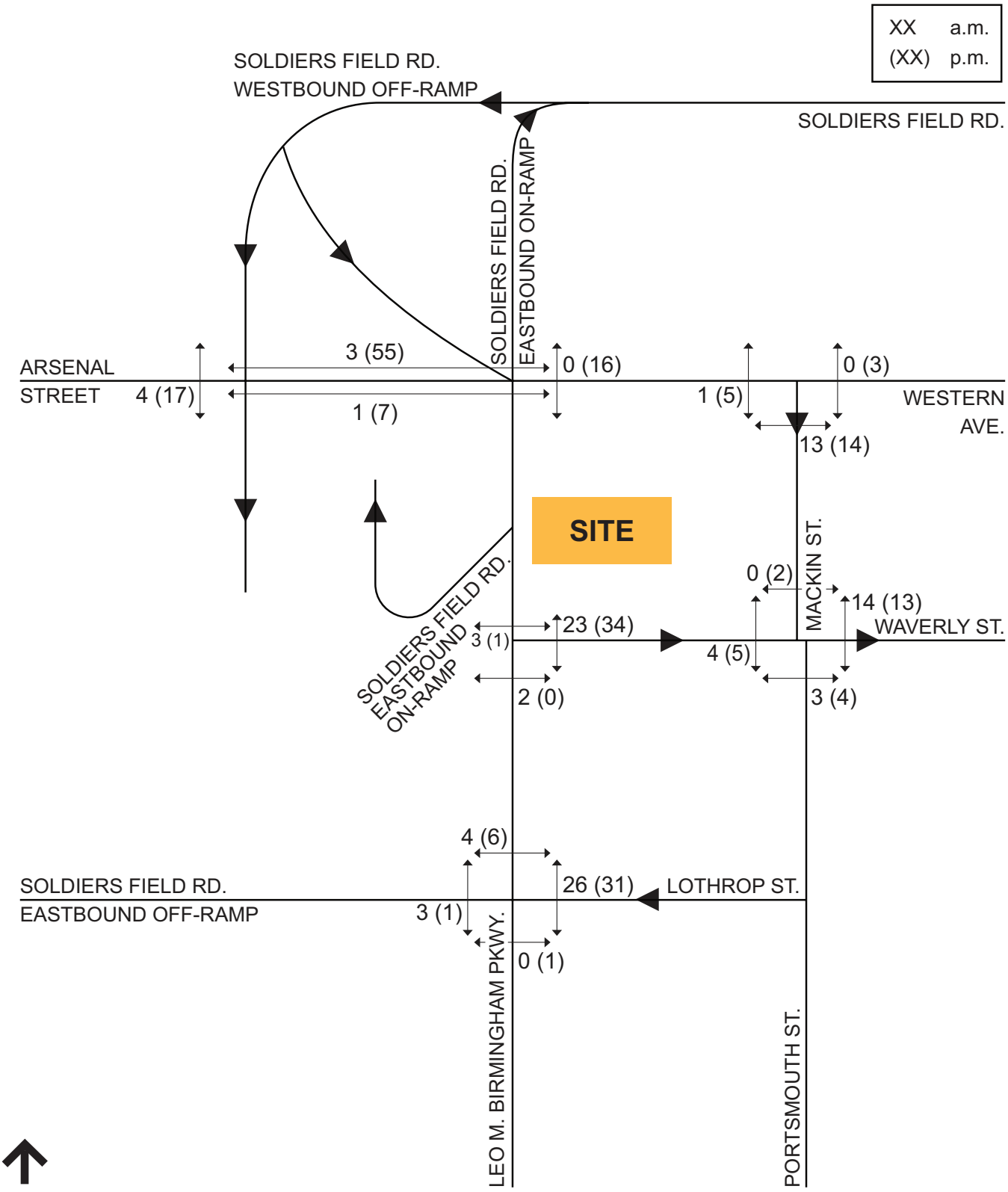


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Figure 3.6

Existing (2015) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

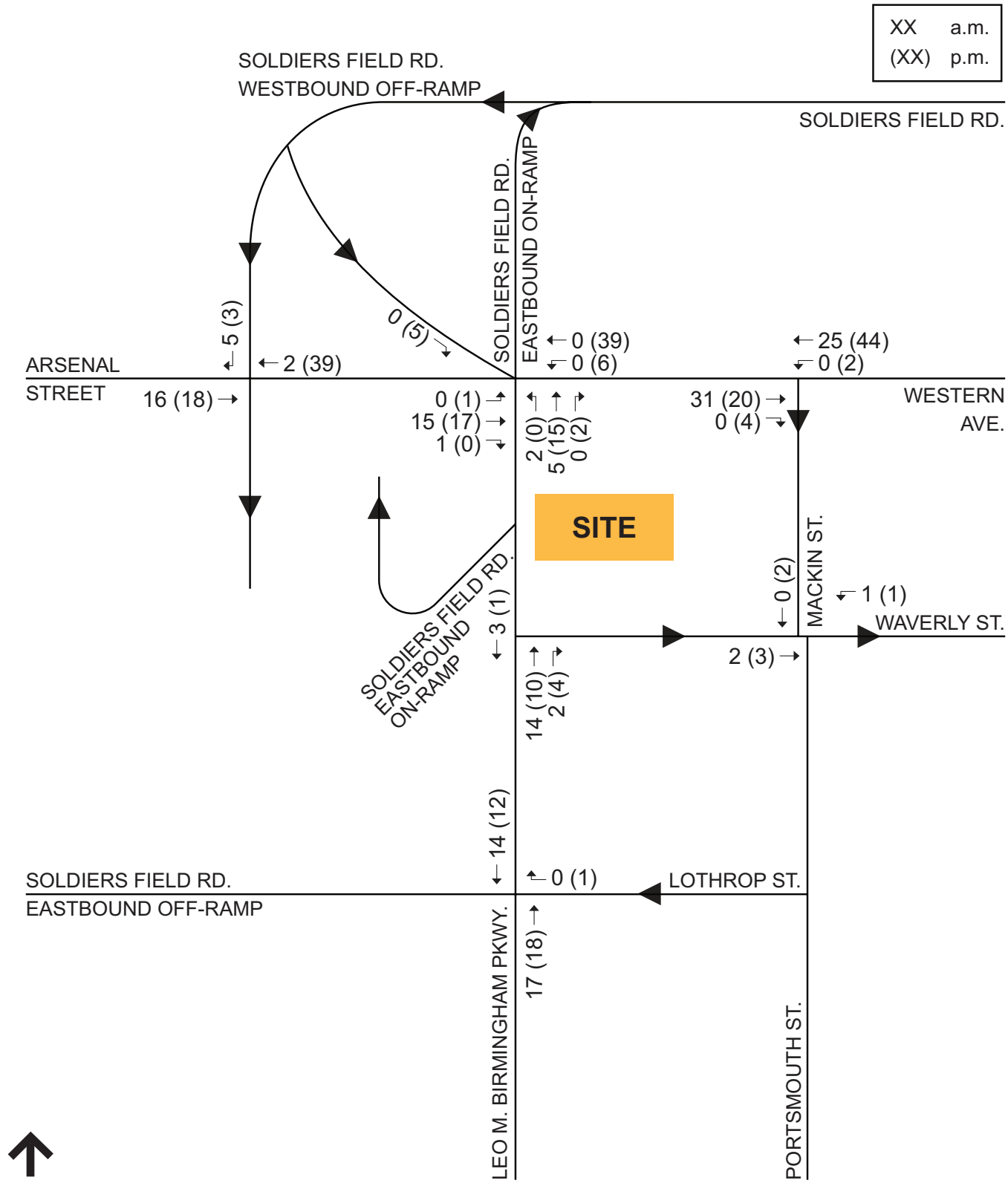


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Figure 3.7

Existing (2015) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

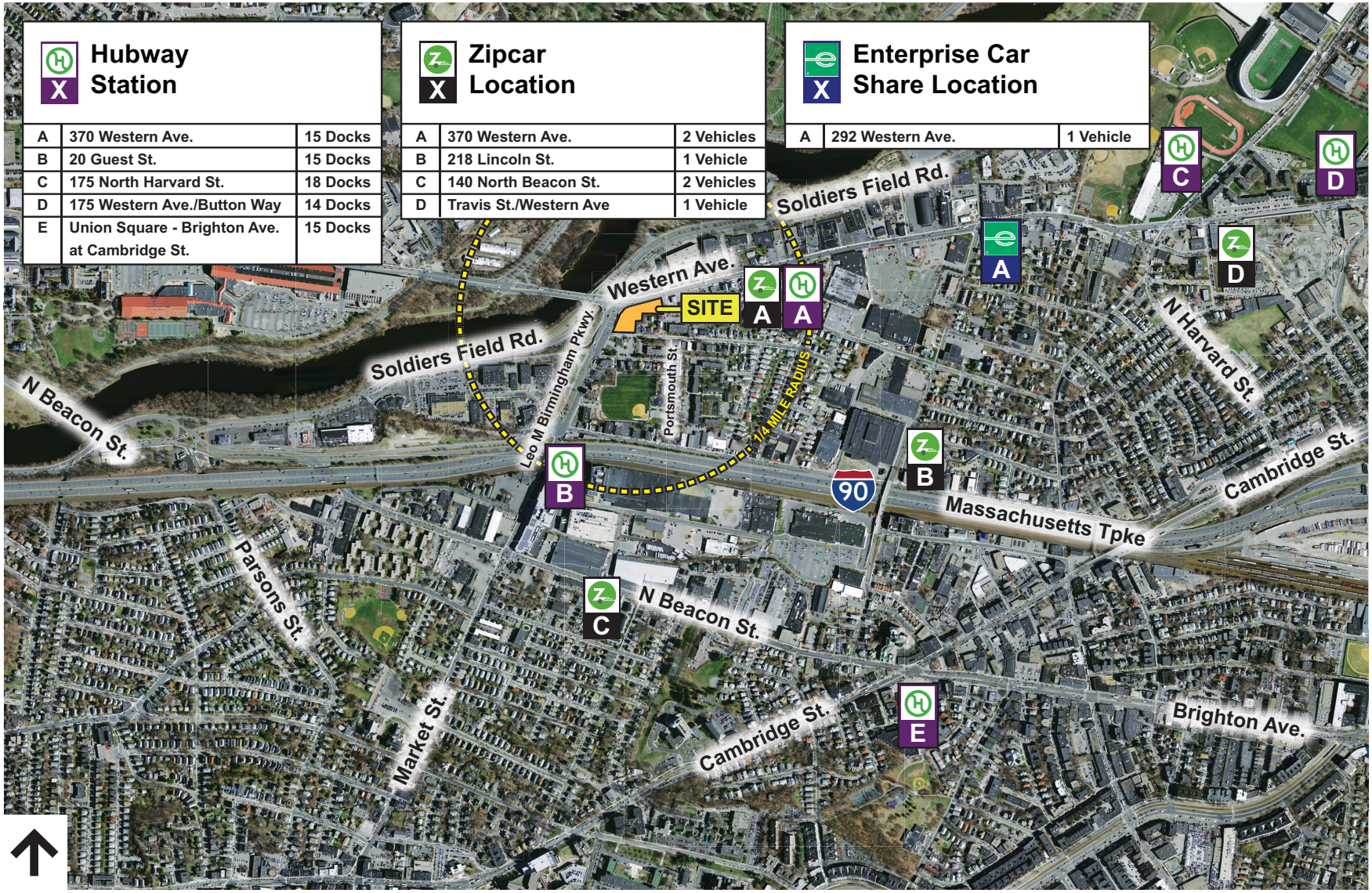


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Figure 3.8

Bicycle and Car Sharing Services

**W. Ave Residence**
**Brighton, MA**

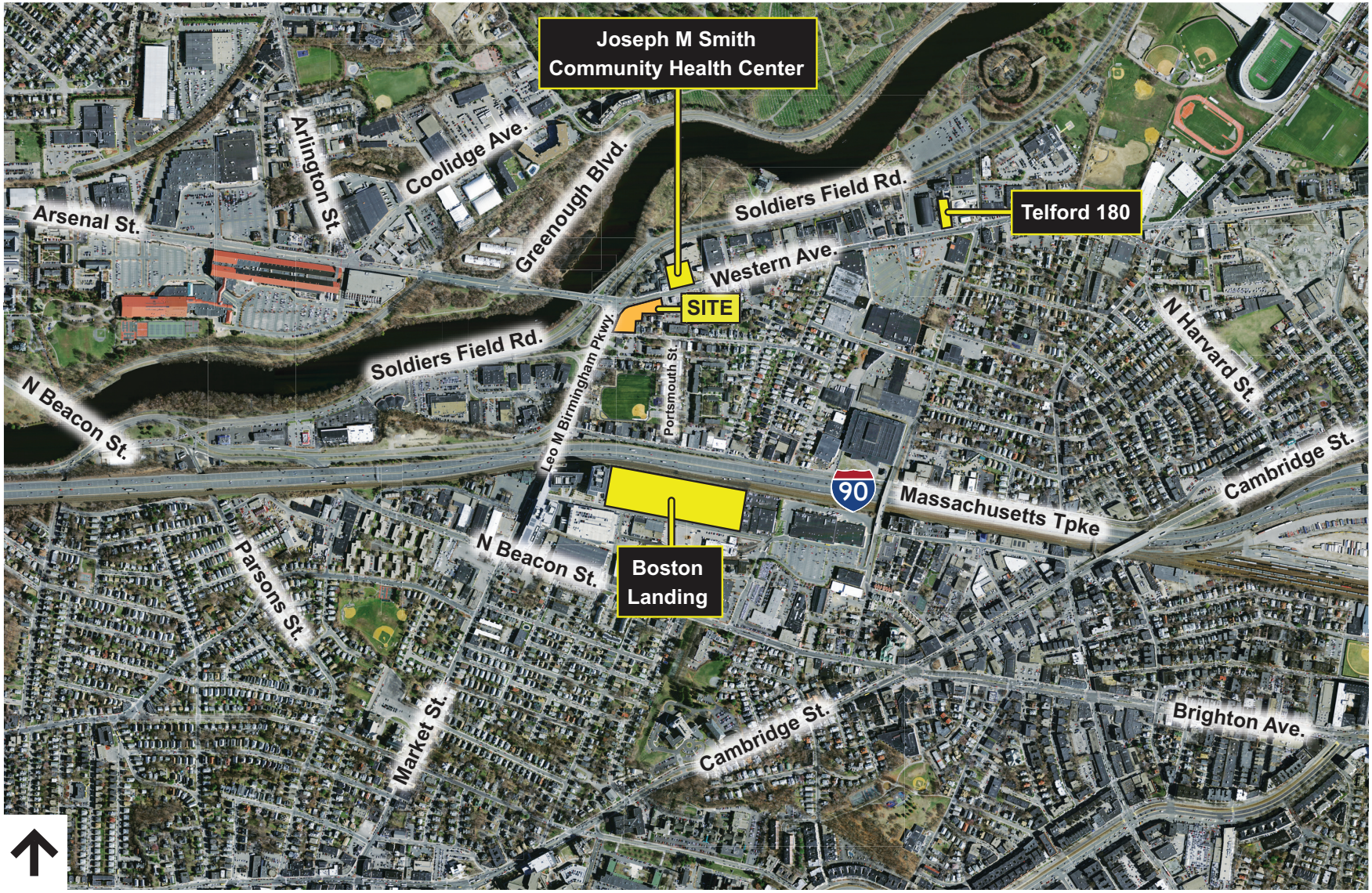


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Figure 3.9

Background Projects

**W. Ave Residence**
**Brighton, MA**

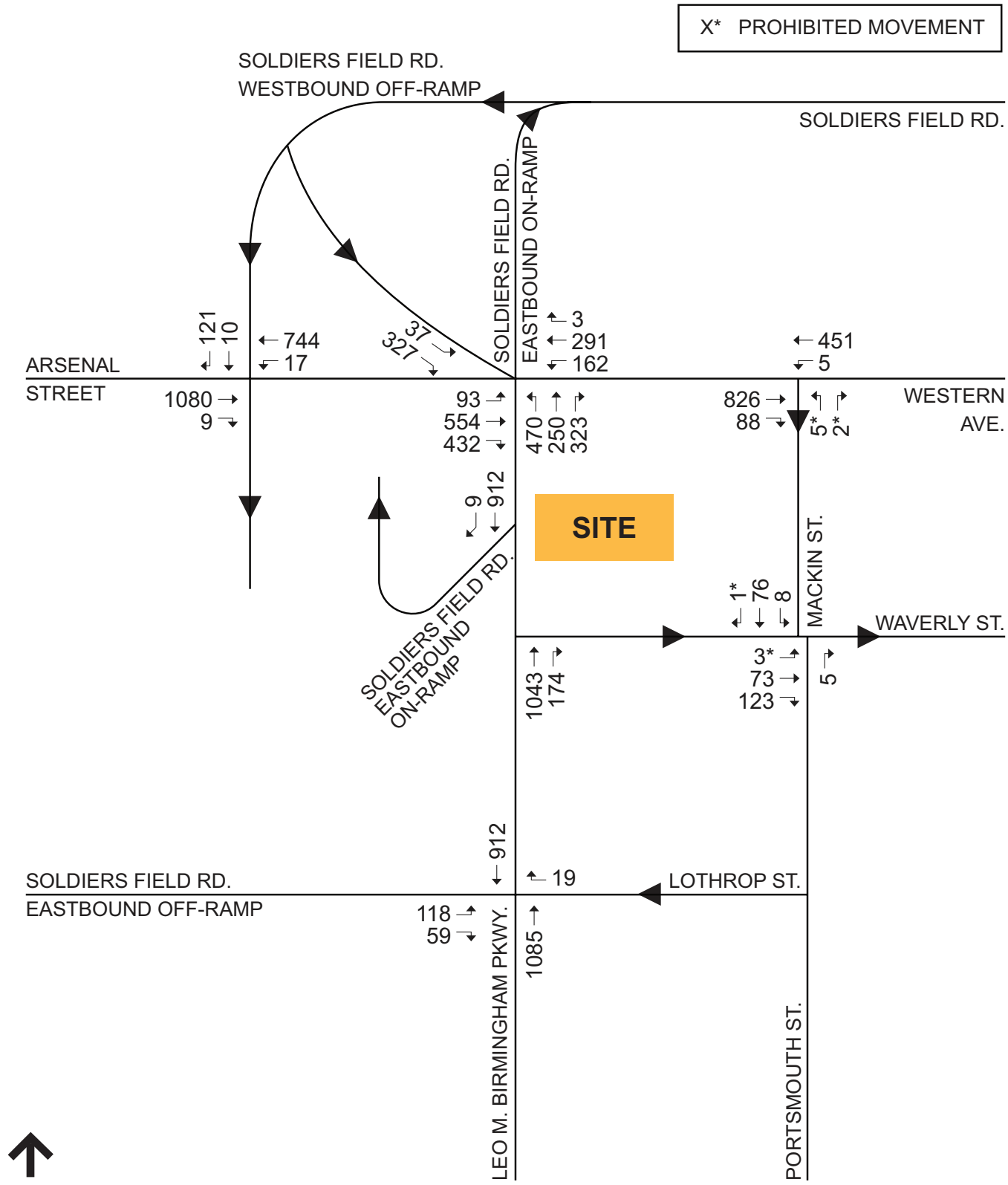


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Figure 3.10
No-Build (2020) Condition Traffic Volumes,
Weekday a.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

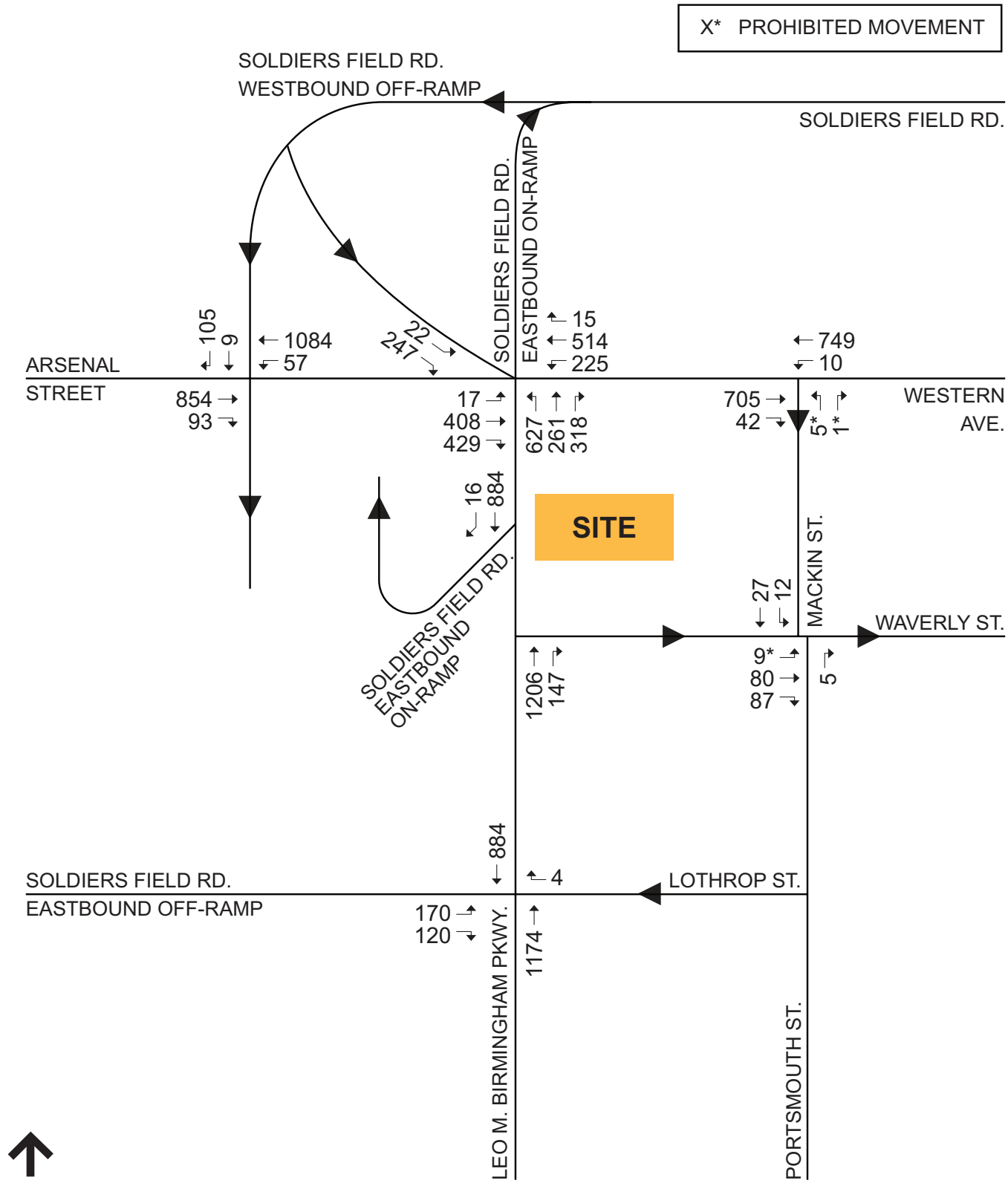


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Figure 3.11
No-Build (2020) Condition Traffic Volumes,
Weekday p.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

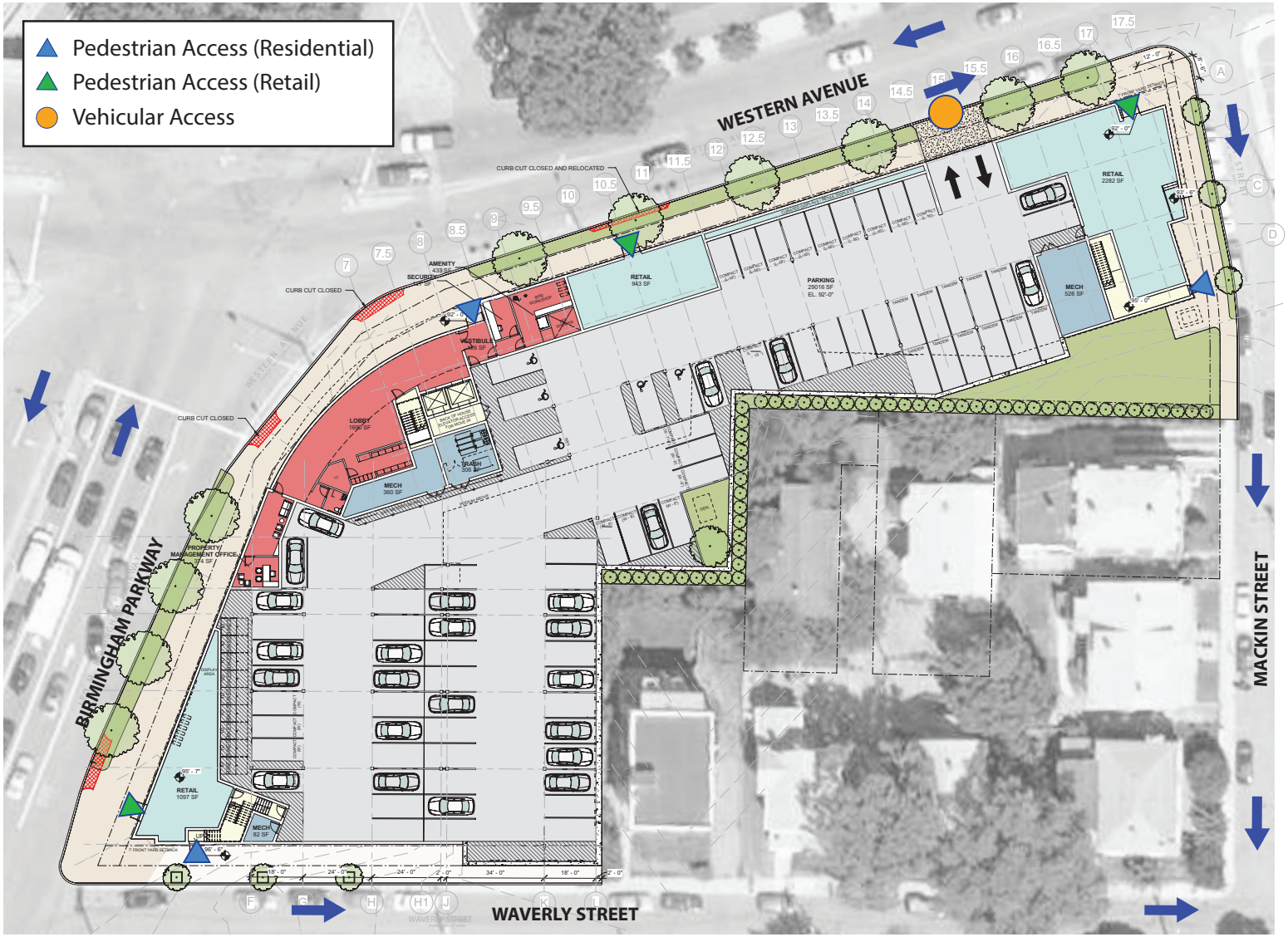


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Figure 3.12

Site Plan – Western Avenue Access

**W. Ave Residence**
**Brighton, MA**

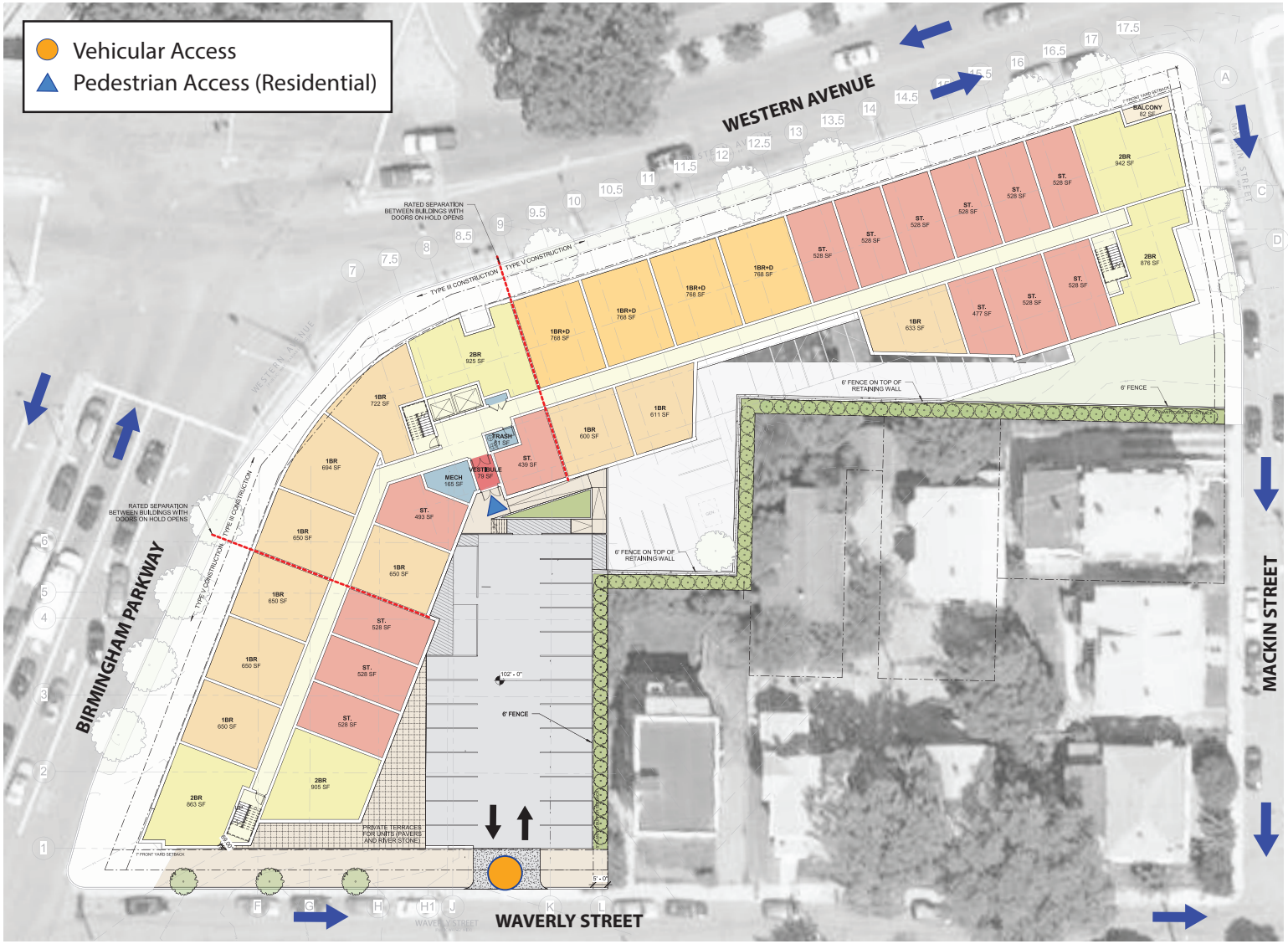


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Figure 3.13

Site Plan – Waverly Street Access

**W. Ave Residence**
**Brighton, MA**

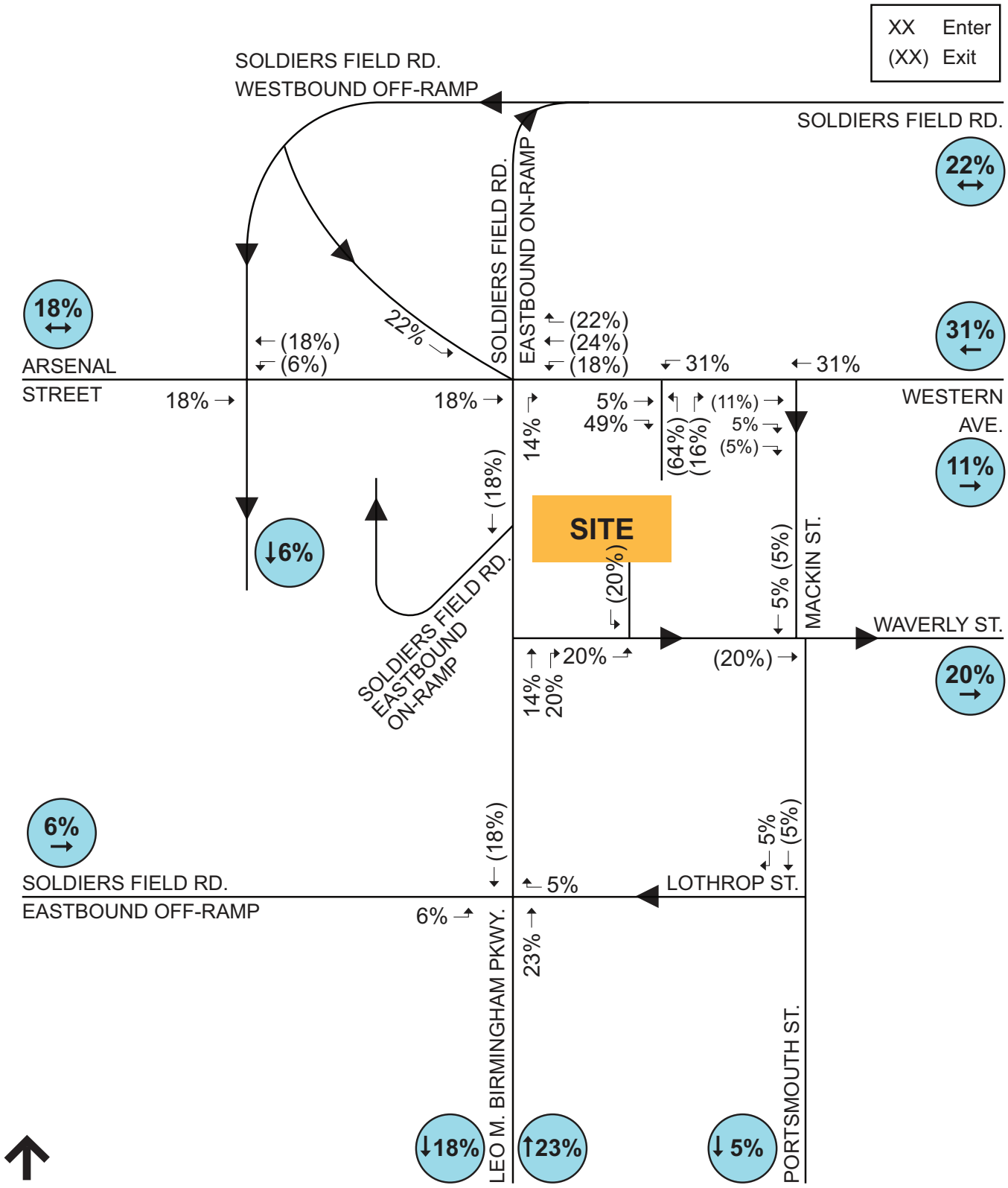


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Figure 3.14
Trip Distribution

**W. Ave Residence**
**Brighton, MA**

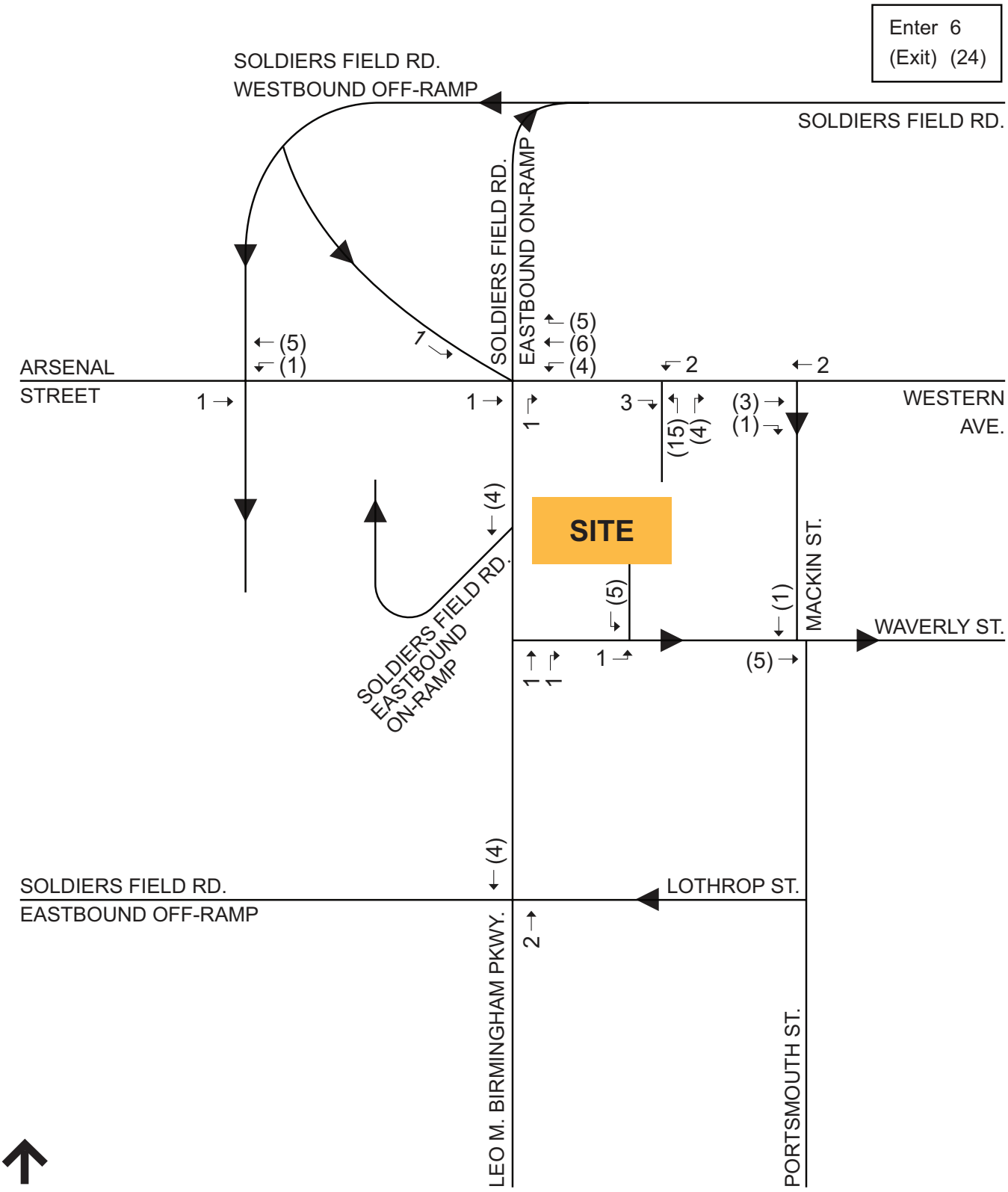


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Figure 3.15

Project-generated Trips,
a.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

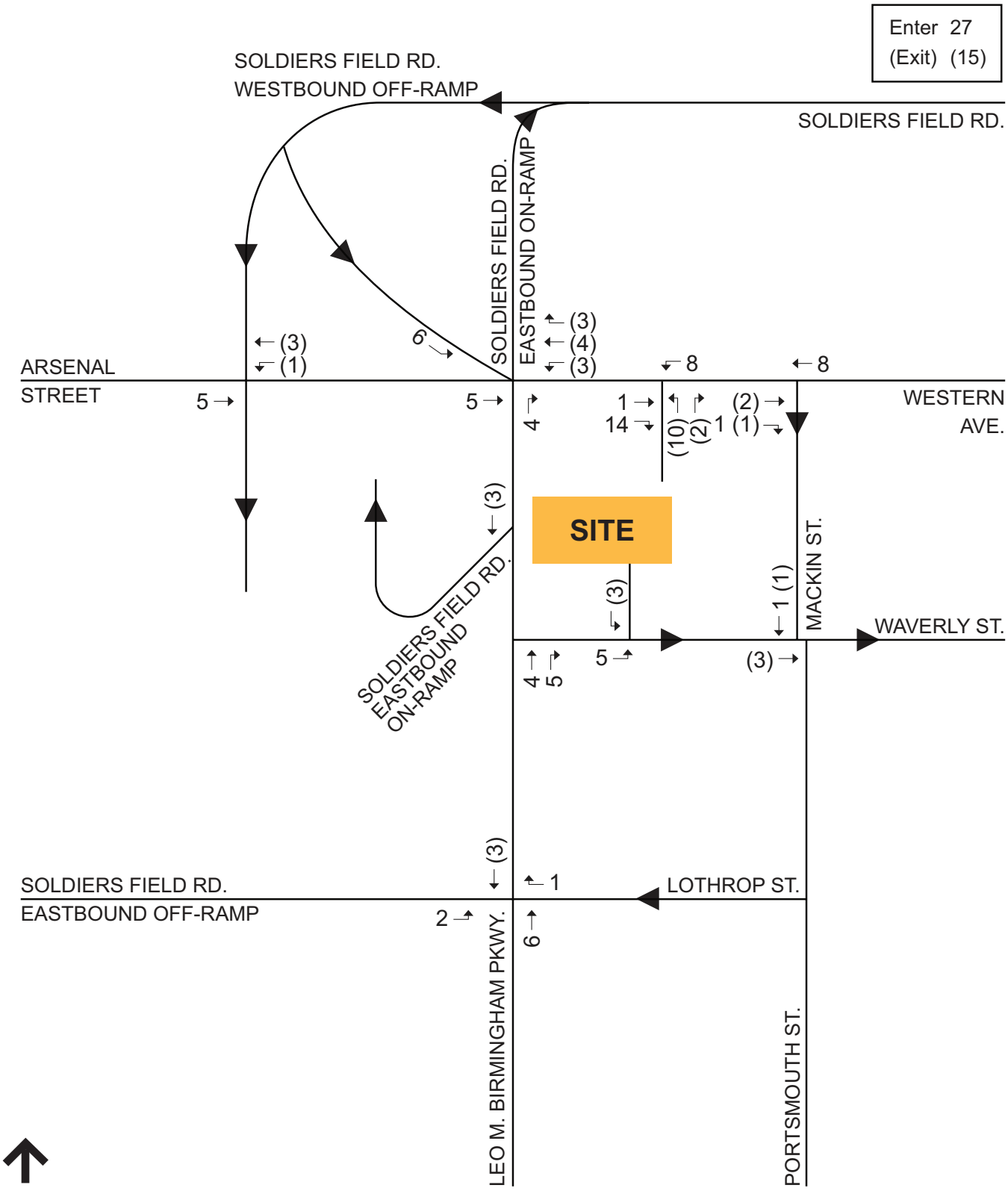


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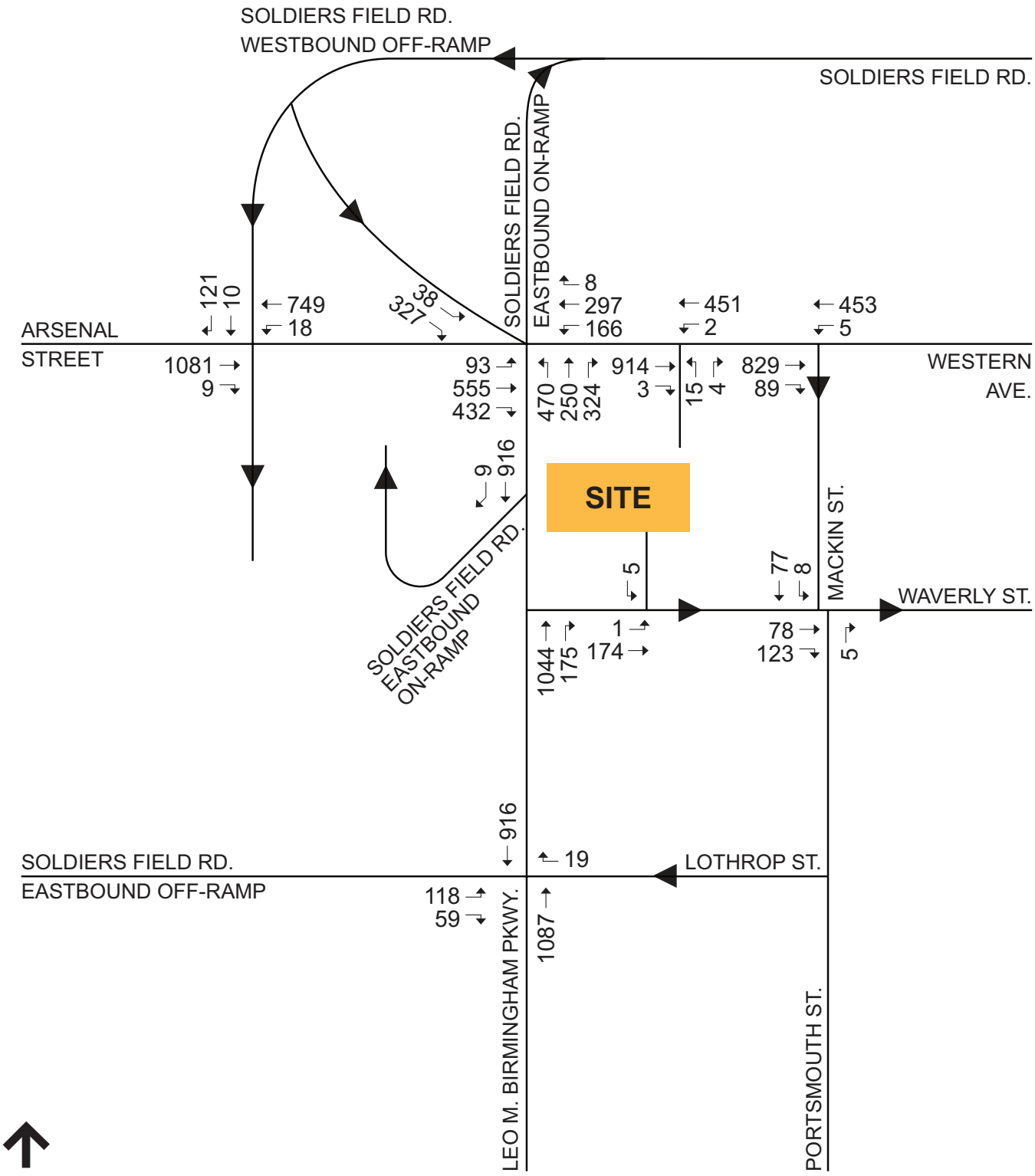
Figure 3.16

Project-generated Trips,
p.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**




HOWARD STEIN HUDSON
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Figure 3.17
Build (2020) Condition Traffic Volumes,
Weekday a.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

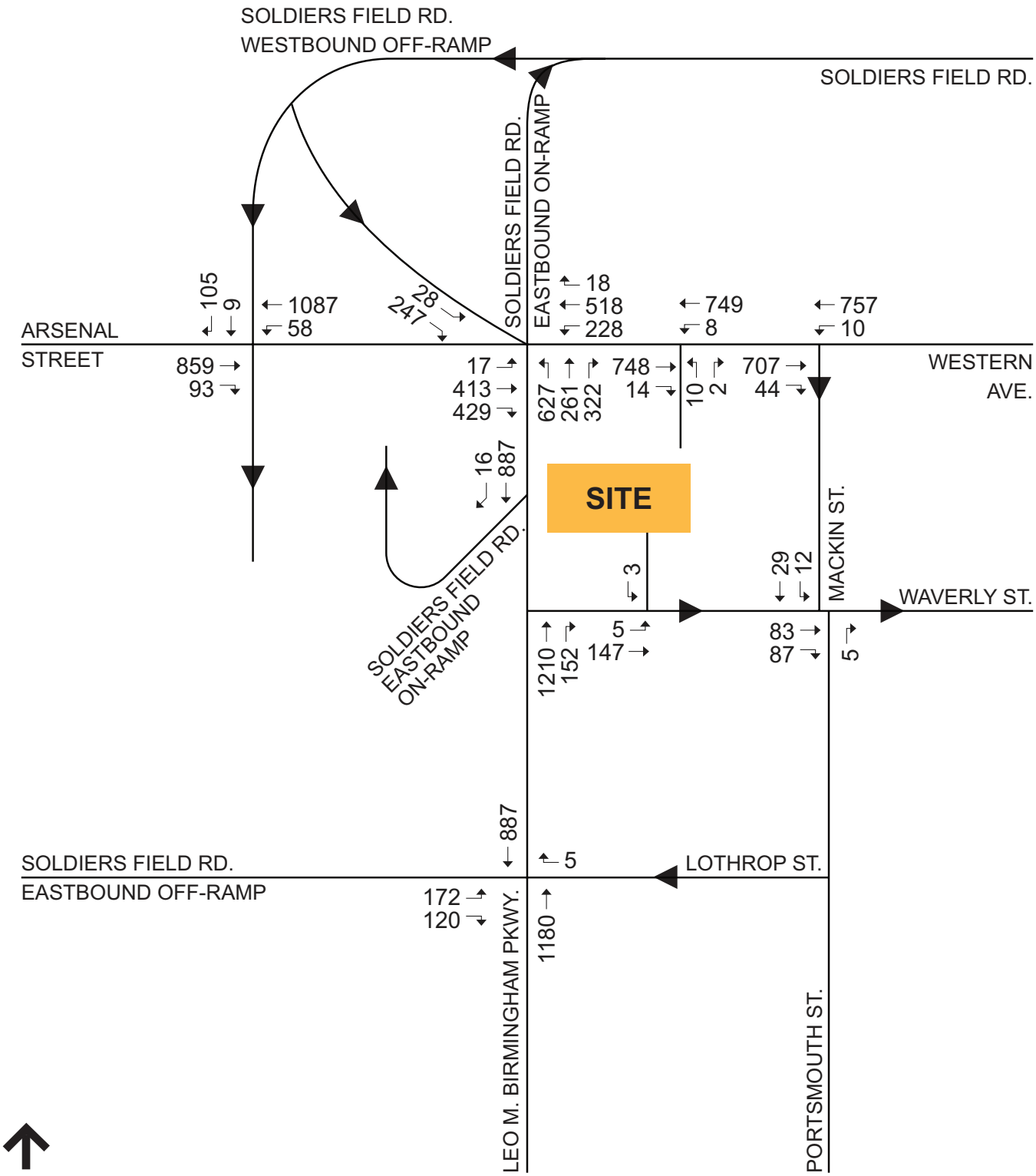


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Figure 3.18
Build (2020) Condition Traffic Volumes,
Weekday p.m. Peak Hour

**W. Ave Residence**
**Brighton, MA**

# 4

# Environmental Protection

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

As discussed in more detail below, any Project-related impacts will be mitigated by the substantial community benefits the Project will bring to the neighborhood, including new housing that will expand housing options for existing and new residents, new retail opportunities, a substantial streetscape improvements, and a new active gateway from Watertown into the City. The following sections identify Project impacts and discuss steps that have been or will be taken though design and management to avoid, minimize and/or mitigate adverse effects. Temporary construction-period impacts will also be managed to minimize disruption to the surrounding neighborhood.

In accordance with Article 80 of the Boston Zoning Code, this EPNF considers the potential for the Project-related impacts in the following Large Project Review categories:

- Shadow
- Daylight
- Solar Glare
- Air Quality
- Flood Hazard
- Noise
- Water Quality
- Solid and Hazardous Waste
- Groundwater
- Geotechnical
- Construction
- Post-Construction Rodent Control
- Green Building/Sustainable Design
- Climate Change Preparedness and Resiliency
- Historic Resources

## 4.1 Key Findings and Benefits

- Shadow impacts are not significant as the majority of net new shadow falls upon area roadways or near sunset on adjacent developed lots.

- The Project will increase skyplane obstruction at all viewpoints, which is to be expected when replacing several small buildings with larger buildings. The Project is consistent with the City's development objectives for this portion of Western Ave.

- Solar glare impacts will be limited as the building design does not include large areas of reflective materials.

- The air quality analysis demonstrates that the Project will conform to the National Ambient Air Quality Standards (NAAQS), and will not have a substantial impact on surrounding air quality.

- The Project is design to comply with the City of Boston noise regulations.

- Construction-related impacts are temporary in nature and are typically related to truck traffic, air (dust), noise, stormwater runoff, solid waste and vibration. All temporary construction-period impacts associated with the Project will be managed to minimize disruption to the surrounding neighborhood through a comprehensive Construction Management Plan and in coordination with the appropriate city agencies.

- The Project will implement sustainable design and construction principles to exceed Article 37 Green Building requirements and reach a minimum of Silver level certification through the USGBC's LEED for Homes: Midrise rating system.

- The Project is not located within a floodplain, but will include improvements to stormwater treatment capacity to handle the higher volumes of runoff during heavy rain events.

## 4.2 Shadow

This section describes the anticipated changes to shadows in the Project area as a result of the Project

### 4.2.1 Summary of Key Findings

The shadow impact study analysis shows that the shadow impacts from the Project are minor. Of these minor impacts, the majority of new shadow will fall upon adjacent roadways where impacts on pedestrians are limited. The Project will not significantly impact any public parks or outdoor congregation areas.

### 4.2.2 Methodology

The following shadow study has been prepared using methodologies consistent with accepted practices for such studies completed under Article 80 review. The analysis provides a comparison of the No-Build and Build Conditions. This is accomplished by using a three-dimensional model of the project area using data provided by the BRA, updated to include nearby foreseeable projects. The analysis is based on the BRA's 3D massing model for the Brighton neighborhood. The study was completed using standard sun altitude and azimuth data for each study date estimated to occur at latitude and longitude 42° 21' 40.7'' N, 71°08'43.6"W. Times were adjusted for daylight savings time as appropriate. The conditions were compared for the spring and autumnal equinoxes, and the summer and winter solstices at 9:00 AM, 12:00 Noon and 3:00 PM, and for the summer solstice and autumnal equinox at 6:00 PM.

### 4.2.3 Potential Effects

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

**Autumnal Equinox (September 21)**

September 21 is the fall equinox where Boston again experiences roughly equal length days and nights. Figure 4.1a illustrates the Project-related net new shadow for this condition. In comparison to the spring equinox, the fall equinox shadows are somewhat shorter in the morning and somewhat longer in the afternoon at comparable times of the day.

At 9:00 AM, the sun is located in the southeast. As during the spring equinox, the Project-related new shadow casts a new shadow west across the intersection, and north over a portion of Western Avenue. By 12:00 PM, the sun moves higher and to the south so that the Project no longer casts a shadow across the intersection. By 3:00 PM, the Project-related new shadow moves east shading a portion of Mackin Street. At 6:00 PM, the proposed building will cast a long shadow east across existing developed lots.

**Winter Solstice (December 21)**

December 21 is the winter solstice and the shortest day of the year. Boston experiences long shadows throughout the day in most locations. Figure 4.1b illustrates the Project related net new shadow for this condition. At 9:00 AM, the sun is low in the southeast sky resulting in shadows to the northwest. Under this condition, the Project casts new shadow across the intersection and Western Avenue. By 12:00 PM, the Project-related new shadow casts almost due north over Western Avenue. At 3:00 PM, the sun is located in the southwest and low in the sky shading resulting in shadows across Western Avenue and Mackin Street.

**Vernal Equinox (March 21)**

March 21 is the spring equinox on which Boston experiences roughly equal length day and night. Figure 4.1c illustrates the Project-related net new shadow for this condition. On March

21 at 9:00 AM, the Project casts a new shadow west across the intersection, and north over a portion of Western Avenue. At 12 PM the sun moves higher and to the south, and the Project no longer casts a shadow across the intersection. By 3:00 PM, the Project casts new shadow northeast across a portion of Mackin Street.

**Summer Solstice (June 21)**

June 21 is the summer solstice with the longest day of the year and the smallest shadows expected. Figure 4.1d illustrates the Project-related net new shadow for this condition. At 9:00 AM, the Project casts a new shadow west across the intersection. At 12:00 PM, the sun is very high in the sky and, therefore, very limited amounts of new shadow falls northwest of the Project. By 3:00 PM, the Project-related new shadow shifts east falling across Mackin Street. At 6:00 PM, the new shadow falls east of the Project Site across existing developed lots.

## 4.3 Daylight

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

### 4.3.1 Methodology

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

**BRADA Software**

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

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

to non-reflective materials. For the purposes of this daylight analysis, the building facades are considered non-reflective, resulting in a conservative estimate of daylight obstruction.

**Viewpoints**

The following viewpoints were used for this daylight analysis:

- **Western Ave** – This viewpoint is located on the centerline of Western Ave centered on the northern façade of the proposed building.
- **Leo M Birmingham Parkway** – This viewpoint is located on the centerline of Leo M Birmingham Parkway centered on the western façade of the proposed building.
- **Waverly Street** – This viewpoint is located on the centerline of Waverly Street centered on the southern façade of the proposed building.
- **Makin Street** – This viewpoint is located on the centerline of Makin Street centered on the eastern façade of the proposed building.

### 4.3.2 Daylight Existing/No-Build Conditions

Under the Existing/No-Build Condition, the majority of the skydome (approximately 84 to 96 percent) is visible from the selected viewpoints due to the set-back, low-rise nature of the existing building. Figure 4.2a-d illustrates the skydome obstruction under the Existing/No-Build scenarios.

### 4.3.3 Daylight Build Conditions

The Project-related daylight impacts for the viewpoints are presented in Figure 4.2 a-d. Under the Proposed Conditions, the viewpoints along the three roadways are expected to experience an increase in skydome obstruction due to the increased height and massing of the new building. Skydome obstruction impacts are as follows:

- **Western Avenue –** Increase from 10 percent to 65.7 percent skydome obstruction (Figure 4.2a)
- **Leo M Birmingham Parkway –** Increase from 16.5 percent to 62 percent skydome obstruction (Figure 4.2b)
- **Waverly Street** – Increase from 4 percent to 55.7 percent skydome obstruction (Figure 4.2c)
- **Makin Street –** Increase from 9 percent to 45.6 percent skydome obstruction (Figure 4.2d)

This effect is to be expected when replacing low-rise individual buildings with a single taller building. This change is well within the expected level of view obstruction when considered in the realm of the City's planning objectives for this portion of the Western Ave corridor. The desired density and massing of the Project necessitates obstructing a portion of the views at the Project Site.

## 4.4 Solar Glare

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

## 4.5 Air Quality Microscale Analysis

This section presents an overview of and the results for the air quality assessment conducted for the Project. The purpose of the air quality assessment is to demonstrate that the Project satisfies applicable regulatory requirements, and whether it complies with the 1990 Clean Air Act Amendments (CAAA) following the local and the U.S. Environmental Protection Agency (EPA) policies and procedures.

The air quality assessment conducted for this Project includes a qualitative localized (microscale), or "hot spot", analysis of local carbon monoxide (CO) concentrations. The microscale analysis evaluated potential CO impacts from vehicles traveling through congested intersections in the project area under the existing conditions, as well as considering site-specific impacts under the future conditions. The results from this evaluation were subject to the National Ambient Air Quality Standards (NAAQS).

### 4.5.1 Background

The CAAA resulted in states being divided into attainment and non-attainment areas, with classifications based upon the severity of their air quality problems. Air quality control regions are classified and divided into one of three categories: attainment, non-attainment and maintenance areas depending upon air quality data and ambient concentrations of pollutants. Attainment areas are regions where ambient concentrations of a pollutant are below the respective NAAQS; non-attainment areas are those where concentrations exceed the NAAQS. A maintenance area is an area that used to be non-attainment, but has demonstrated that the air quality has improved to attainment. After 20 years of clean air quality, maintenance areas can be re-designated to attainment. Projects located in maintenance areas are required to evaluate their CO concentrations with the NAAQS.

The Project is located in the City of Boston, which under the EPA designation is a CO Maintenance area. As such, CO concentrations need to be considered for this Project.

### 4.5.2 Air Quality Standards

The EPA has established the NAAQS to protect the public health. Massachusetts has adopted similar standards as those set by the EPA for carbon monoxide. Table 4-1 presents the NAAQS for carbon monoxide.

**TABLE 4-1 NATIONAL AMBIENT AIR QUALITY STANDARDS**

| | Primary Standards | | Secondary Standards | |
|---|---|---|---|---|
| **Pollutant** | **Level** | **Averaging Time** | **Level** | **Averaging Time** |
| Carbon Monoxide | 9 ppm (10 mg/m$^3$) | 8-hour | None | None |
| | 35 ppm (40 mg/m$^3$) | 1-hour | None | None |

Carbon monoxide is directly emitted by motor vehicles, and the predominant source of air pollution anticipated from typical project developments is emissions from Project-related motor vehicle traffic. A product of incomplete combustion, CO is a colorless and odorless gas that prevents the lungs from passing oxygen to the blood stream. Brief exposure to high levels of CO can also impair vision, physical coordination, and the perception of time. According to the EPA, 60 percent of CO emissions result from motor vehicle exhaust, while other sources of CO emissions include industrial processes, non-transportation fuel combustion and natural sources (i.e., wildfires). In cities, as much as 95 percent of CO emissions may emanate from automobile exhaust.1

The Department of Environmental Protection (MassDEP) maintains a network of air quality monitors to measure background CO concentrations. Background concentrations are ambient pollution levels from all stationary, mobile, and area sources. Background CO concentrations are determined by choosing the maximum of the 2nd-high annual values from the previous three years. Looking at the air quality monitor closest to the project site (Kenmore Square) for the years 2012-2014, the CO background values are 1.3 ppm for the 1-hour averaging time and 0.9 ppm for the 8-hour averaging time. These values are much less than the 1-hour and 8-hour NAAQS. The background values are presented in Table 4-2.

**TABLE 4-2 AIR QUALITY BACKGROUND CONCENTRATIONS**

| | Background Concentrations | | NAAQS | |
|---|---|---|---|---|
| **Pollutant** | **Level** | **Averaging Time** | **Level** | **Averaging Time** |
| Carbon Monoxide | 0.9 ppm | 8-hour | 9 ppm | 8-hour |
| | 1.3 ppm | 1-hour | 35 ppm | 1-hour |

Monitoring Location: Kenmore Square, Boston, MA

The CO concentrations from motor vehicle traffic related to the Project will be considered to demonstrate that the Project will comply with the NAAQS Standards.

[1] Environmental Protection Agency, *National Air Quality and Emissions Trends Report*, 1999, March 2001.

### 4.5.3 BRA Development Review Guidelines

The BRA Development Review Guidelines require "a microscale analysis predicting localized carbon monoxide concentrations should be performed, including identification of any locations projected to exceed the National or Massachusetts Ambient Air Quality Standards, for projects in which:

- Project traffic would impact intersections or roadway links currently operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D,E, or F; or
- Project traffic would increase traffic volumes on nearby roadways by 10 percent or more (unless the increase in traffic volume is less than 100 vehicles per hour); or
- The Project will generate 3,000 or more new average daily trips on roadways providing access to a single location."

**Traffic Data**

The air quality study uses traffic data (volumes, delays, and speeds) developed for the analysis conditions based upon the traffic analysis. The traffic volumes and level-of-service for the study area were evaluated at the following intersections:

Signalized Intersections:

- Western Avenue at Arsenal Street and Birmingham Parkway
- Birmingham Parkway at Lothrop Street

Unsignalized Intersections:

- Waverly Street at Mackin Street and Portsmouth Street
- Birmingham Parkway at Waverly Street
- Western Avenue at Mackin Street
- Western Avenue at Site Driveway
- Mackin Street at Site Driveway

The traffic study predicted project generated trips and evaluated LOS at the signalized intersections for the existing, no-build and build conditions. The Project is expected to generate 30 trips in the morning peak hour and 38 trips in the evening peak hour. The calculated LOS at the signalized intersections are shown in Table 4-3.

**TABLE 4-3 LEVELS OF SERVICE AT SIGNALIZED INTERSECTIONS**

| Intersection | 2015 Existing Condition | | 2020 No-Build Condition | | 2020 Build Condition | |
|---|---|---|---|---|---|---|
| | AM | PM | AM | PM | AM | PM |
| Western Avenue at Arsenal Street and Birmingham Parkway | C | C | C | C | C | C |
| Birmingham Parkway at Lothrop Street | A | B | B | B | B | B |

### 4.5.4 Microscale Analysis

The CAAA resulted in states being divided into attainment and non-attainment areas, with classifications based upon the severity of their air quality problems. The Project is located in the Boston Metropolitan area, which has been classified as a "Maintenance" area for CO.

An evaluation of the traffic data was conducted under the review guidelines developed by the BRA for determination of potential for CO impacts. It was determined that:

- Project traffic would not impact intersections or roadway links currently operating at Level of Service (LOS) D, E, or F and would not cause LOS to decline to D, E, or F. The two intersections of study currently operate at LOS C and B and will continue to operate at LOS C and B under No-Build and Build conditions.

- Project traffic would not increase traffic volumes on nearby roadways by 10 percent or more (the increase in traffic volume is less than 100 vehicles per hour). The project is expected to generate 30 vehicle trips in the morning peak hour and 42 vehicle trips in the evening peak hour, less than a 100 vehicles per hour increase.

- The Project will not generate 3,000 or more new average daily trips on roadways providing access to a single location. The project will generate less than 3,000 average daily trips and will provide two access points to the Project Site.

Thus, under BRA Review Guidelines the Project is not expected to cause or contribute to a violation of the NAAQS and a quantitative microscale analysis is not required. A review of the predicted traffic volumes at the two intersections of detailed study show that project generated trips will account for less than 1% of the total intersection volumes for both intersections during the morning and evening peak hours. The project traffic impacts are minor compared to the background traffic of the No-Build network. Since CO emissions are directly correlated to vehicular traffic, it is probable that the project will create similarly insignificant CO emissions when compared to the background concentrations and the NAAQS.

Violation of the CO standard set by the NAAQS has become increasingly infrequent. This is due to a number of factors. Primarily, the vehicular emission rates of CO have decreased and

will continue to decrease with the passage of time due to newer, more controlled vehicles entering the fleet[2]. Additionally, the CO background concentration in Boston has decreased with time[3].

Under consideration of these three controlling factors for the determination of CO impact (Project traffic, background concentration, and emission rates), it is highly unlikely for CO impacts to exist or to be created with the introduction of the Project. The Project will generate minimal vehicular activity in the surrounding network. The CO emission rates of the fleet will decrease over time, and the background CO concentration is a relatively small 10% and 4% of the respective 1-hour and 8-hour NAAQS.

### 4.5.5 Summary of Findings

The air quality evaluation demonstrated that the development of the proposed project would not result in adverse air quality impacts. The microscale analysis evaluated the potential site-specific impacts from the vehicles traveling through the study area. This analysis demonstrates that all existing and future carbon monoxide concentrations are expected to be below the NAAQS. The air quality study demonstrates that the Project conforms to the CAAA and the SIP because:

- No violation of the NAAQS are expected to be created.
- No increase in the frequency or severity of any existing violations (none of which are related to this development) would be anticipated to occur.
- No delay in attainment of any NAAQS would be expected to result due to the implementation of the proposed action.

Based upon the analysis presented herein and the conclusions summarized above, no significant adverse air quality impacts from the Project are anticipated.

## 4.6 Water Quality

The Project is expected to substantially improve the water quality of the stormwater leaving the Project Site and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. Given the Project Site's proximity to the Charles River, runoff equivalent of 1-inch over the Project Site's impervious area must be recharged. If infiltration is not possible, treatment to provide 64 percent phosphorous removal will be incorporated. While the Project will result in an overall increase in impervious area, it will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system.

▼

[2] "Transportation Air Quality Facts and Figures" *Vehicle Emissions*, Federal Highway Administration. January 2006. <https://www.fhwa.dot.gov/environment/air_quality/publications/fact_book/page15.cfm.>

[3] "Massachusetts Annual Air Quality Report" *Department of Environmental Protection, Bureau of Air and Waste, Division of Air and Climate Programs.* Multiple Years.

During construction activities, erosion and sediment controls will be used to protect adjacent properties and the municipal storm drain system. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover. All necessary construction dewatering will be conducted in accordance with applicable EPA and BWSC discharge permits.

## 4.7 Flood Hazard

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), for Suffolk County, the Project Site is not located in a special flood hazard area, floodway area, or other flood area.

## 4.8 Noise

The noise impact assessment evaluated the potential noise impacts associated with the Project's activities, including mechanical equipment and loading activities. This section discusses the noise background, existing conditions, impact criteria, and potential impacts. The analysis determined existing conditions and future conditions with the existence of the Project. Ultimately, the analysis demonstrates that the Project will comply with City of Boston noise regulations.

### 4.8.1 Background

Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, communication, work or recreation. How people perceive sound depends on several measurable physical characteristics, which include the following:

- Intensity - Sound intensity is often equated to loudness.
- Frequency - Sounds are comprised of acoustic energy distributed over a variety of frequencies. Acoustic frequencies, commonly referred to as tone or pitch, are typically measured in Hertz. Pure tones have all their energy concentrated in a narrow frequency range.

Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from the threshold of hearing (zero dB) to the threshold of pain (120 dB). Because sound levels are measured in dB, the addition of two sound levels is not linear. Adding two equal sound levels creates a 3 dB increase in the overall level. Research indicates the following general relationships between sound level and human perception:

- A 3 dB increase is a doubling of acoustic energy and is the threshold of perceptibility to the average person.

- A 10 dB increase is a tenfold increase in acoustic energy but is perceived as a doubling in loudness to the average person.

The human ear does not perceive sound levels from each frequency as equally loud. To compensate for this phenomenon in perception, a frequency filter known as A-weighted [dB(A)] is used to evaluate environmental noise levels. Table 4-4 presents a list of common outdoor and indoor sound levels.

**TABLE 4-4 COMMON OUTDOOR AND INDOOR SOUND LEVELS**

| Outdoor Sound Levels | Sound Pressure (μPa)* | | Sound Level dB(A)** | Indoor Sound Levels |
|---|---|---|---|---|
| | 6,324,555 | - | 110 | Rock Band at 5 m |
| Jet Over Flight at 300 m | | - | 105 | |
| | 2,000,000 | - | 100 | Inside New York Subway Train |
| Gas Lawn Mower at 1 m | | - | 95 | |
| | 632,456 | - | 90 | Food Blender at 1 m |
| Diesel Truck at 15 m | | - | 85 | |
| Noisy Urban Area—Daytime | 200,000 | - | 80 | Garbage Disposal at 1 m |
| | | - | 75 | Shouting at 1 m |
| Gas Lawn Mower at 30 m | 63,246 | - | 70 | Vacuum Cleaner at 3 m |
| Suburban Commercial Area | | - | 65 | Normal Speech at 1 m |
| | 20,000 | - | 60 | |
| Quiet Urban Area—Daytime | | - | 55 | Quiet Conversation at 1 m |
| | 6,325 | - | 50 | Dishwasher Next Room |
| Quiet Urban Area—Nighttime | | - | 45 | |
| | 2,000 | - | 40 | Empty Theater or Library |
| Quiet Suburb—Nighttime | | - | 35 | |
| | 632 | - | 30 | Quiet Bedroom at Night |
| Quiet Rural Area—Nighttime | | - | 25 | Empty Concert Hall |
| Rustling Leaves | 200 | - | 20 | |
| | | - | 15 | Broadcast and Recording Studios |
| | 63 | - | 10 | |
| | | - | 5 | |
| Reference Pressure Level | 20 | - | 0 | Threshold of Hearing |

Source: *Highway Noise Fundamentals*. Federal Highway Administration, September 1980.

* μPA – MicroPascals, which describe pressure. The pressure level is what sound level monitors measure.

** dB(A) – A-weighted decibels, which describe pressure logarithmically with respect to 20 μPa (the reference pressure level).

A variety of sound level indicators can be used for environmental noise analysis. These indicators describe the variations in intensity and temporal pattern of the sound levels. The following is a list of other sound level descriptors:

- L90 is the sound level which is exceeded for 90 percent of the time during the time period. The L90 is generally considered to be the ambient or background sound level.

- Leq is the A-weighted sound level, which averages the background sound levels with short-term transient sound levels and provides a uniform method for comparing sound levels that vary over time.

### 4.8.2 City of Boston Noise Impact Criteria

The City of Boston has developed noise standards that establish noise thresholds deemed to result in adverse impacts. The noise analysis for the Project used these standards to evaluate whether the proposed development will generate sound levels that result in adverse impacts.

Under Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts and Title 7, Section 50 of the City of Boston Code, the Air Pollution Control Commission of the City of Boston has adopted Regulations for the Control of Noise in the City of Boston. These regulations establish maximum allowable sound levels based upon the land use affected by the proposed development. Table 4-5 summarizes the maximum allowable sound levels that should not be exceeded.

**TABLE 4-5 CITY OF BOSTON NOISE STANDARDS**

| Land Use Zone District | Daytime (7:00 AM – 6:00 PM) | All Other Times (6:00 PM – 7:00 AM) |
|---|---|---|
| Residential | 60 dB(A) | 50 dB(A) |
| Residential/Industrial | 65 dB(A) | 55 dB(A) |
| Business | 65 dB(A) | 65 dB(A) |
| Industrial | 70 dB(A) | 70 dB(A) |

Source: Regulations for the Control of Noise in the *City of Boston, Air Pollution Control Commission*.

For a residential zoning district, the maximum noise level affecting residential uses shall not exceed the Residential Noise Standard. The residential land use noise standard is 60 dB(A) for daytime periods (7:00 AM to 6:00 PM) and 50 dB(A) for nighttime conditions (6:00 PM to 7:00 AM).

### 4.8.3 Methodology

The noise analysis evaluated the potential noise impacts associated with the Project's operations, which include mechanical equipment and loading dock activities. The noise analysis included estimation of existing ambient background sound levels and a qualitative evaluation of potential noise impacts associated with the proposed mechanical equipment (heating, ventilation, and air conditioning (HVAC) systems, and emergency generator) and loading activities. The study area was evaluated and sensitive receptor locations in the vicinity of the Project were examined. The site layout and building design, as it relates to the loading area and management of deliveries at the Project Site, were also considered. The analysis

considered sound level reductions due to distance, proposed building design, and blockages from the surrounding structures.

### 4.8.4 Receptor Locations

The noise analysis included an evaluation of the study area to identify nearby sensitive receptor locations, which typically include areas of sleep and areas of outdoor activities that may be sensitive to noise associated with the Project. The noise analysis identified five nearby sensitive receptor locations in the vicinity of the Project. The receptor locations include the following:

- R1 – 10 Waverly St
- R2 – 12 Waverly St
- R3 – 14 R Waverly St
- R4- 16 R Waverly St
- R5- 11-13 Mackin St

These receptor locations, selected based on land use considerations, represent the most sensitive locations in the vicinity of the Project Site.

### 4.8.5 Existing Noise Conditions

The Project is located in a densely populated urban environment, amongst residential and commercial land uses. The proposed residential complex will span three existing lots at the intersection of Leo M. Birmingham Parkway (Birmingham Parkway) and Western Avenue. Birmingham Parkway is located immediately adjacent to the Project Site and nearby sensitive receptors. Heavily traversed Soldiers Field Road and Interstate 90 are also in the vicinity of the Project Site.

The Federal Transit Administration (FTA) provides a means to estimate existing sound levels for neighborhoods in which the noise environment is dominated by roadway noise. In this case, the sensitive receptors are likely to experience sound levels composed primarily of vehicle noise from Birmingham Parkway and Soldiers Field Road. The estimated sound levels are a function of the distance from the roadway to the receptor and are presented in Table 4-6.

**TABLE 4-6 ESTIMATED EXISTING NOISE EXPOSURE, DB(A)**

| | City of Boston Noise Standards | | Noise Exposure Estimates | | |
|---|---|---|---|---|---|
| Distance From Roadway (ft) | Daytime | All Other Times | $L_{eq}$, Day | $L_{eq}$, Evening | $L_{eq}$, Night |
| 10-50 | 60 | 50 | 70 | 65 | 60 |
| 50-100 | 60 | 50 | 65 | 60 | 55 |
| 100-200 | 60 | 50 | 60 | 55 | 50 |
| 200-400 | 60 | 50 | 55 | 50 | 45 |
| 400 and up | 60 | 50 | 50 | 45 | 40 |

Source: "Transit Noise and Vibration Impact Assessment" *Table 5-7,* Federal Transit Administration, May 2006.

The Project is located adjacent to Birmingham Parkway and approximately 200 feet from Soldiers Field Road. Since Birmingham Parkway is the closer of the two roadways, it will be the dominant source. At a distance of 10 to 50 feet, the estimated daytime noise level is 70 dB(A) and the estimated nighttime noise level is 60 dB(A). These existing sound levels are above the City of Boston noise standards.

### 4.8.6 Future Noise Conditions

The noise analysis evaluated the potential noise impacts associated with the Project's proposed mechanical equipment and loading activities. The analysis determined the potential sound level impacts at the nearby sensitive receptor locations.

#### Mechanical Equipment

Since the Project is in the early stages of the design process, the specific details related to the potential mechanical equipment are unknown at the time of this noise assessment. However, the mechanical equipment associated with the Project would include building heating and ventilation systems. During the design and selection process, the appropriate low-noise mechanical equipment will be selected, including noise mitigation measures, such as acoustical enclosures, a penthouse, and/or acoustical screening. The system would be strategically located on the rooftop, utilizing the height of the proposed six-story building in providing noise attenuation. During the final design and selection process, the Project will incorporate noise attenuation measures necessary to comply with City of Boston's noise criteria at the sensitive receptor locations. As such, the sound levels associated with the Project's mechanical equipment is expected to be negligible at the surrounding sensitive receptor locations.

The Project also proposes to install a 75 kilowatt (kW) emergency generator for life safety purposes, such as emergency exit lighting. The emergency generator is expected to be located at ground level along the property line. The property line adjacent to the emergency generator consists of an approximately six foot concrete retaining wall with a six-foot tall wood fence on top of the retaining wall. As such, the retaining wall/wood fence combination would serve as a noise attenuation measure and reduce sound levels associated with the Project.

Additionally, the emergency generator will be required to adhere to Massachusetts Department of Environmental Protection's (MassDEP's) regulations that require such equipment to be certified and registered. As part of the air permitting process, the Project will be required to meet additional noise requirements described in MassDEP regulations under the Codes of Massachusetts Regulations (310 CMR 7.00). When the details of the emergency generator is developed, the proponent will submit the appropriate permit application to MassDEP including the noise mitigation measures (such as acoustic enclosures and exhaust silencers) necessary to meet MassDEP's noise criteria.

**Service and Loading Activities**

Loading activities associated with the proposed buildings will be located on the Project Site. The proposed site layout consists of the buildings along the perimeter of the site abutting Birmingham Parkway and Western Avenue. As such, the loading activities will be located away from the abutting sensitive receptor locations. The loading activities will be managed so that service and loading operations do not impact local roadways nor nearby sensitive receptors. Since loading activities will be located away from the adjacent sensitive receptor locations and will be managed, noise impacts to the sensitive receptor locations is expected to be negligible. It should be noted only small to medium trucks would be anticipated for loading activities.

### 4.8.7 Conclusion of Noise Impact Assessment

The noise analysis evaluated the sound levels associated with the Project. This analysis determined that the Project Site is located in an urban area, which is expected to experience sound levels greater than the City of Boston's noise criteria under the existing conditions. The existing dominant noise sources in the area consists of vehicular traffic along Leo M. Birmingham Parkway, Soldiers Field Road, and Interstate 90.

Due to the design of the proposed building and the anticipated rooftop location of the mechanical equipment, the sound levels associated with the Project's operations are expected to have negligible noise impacts on the existing background sound levels at nearby sensitive receptor locations. The proposed emergency generator will require a separate MassDEP permitting process which will ensure compliance of the project with applicable noise regulations. Finally, service and loading activities will be situated away from the abutting sensitive receptor locations and properly managed to minimize potential noise impacts. Thus, the Project is expected to comply with the City of Boston noise regulations.

## 4.9 Solid and Hazardous Waste

Prior to commencement of the work, assessments will be performed of both the site and the existing building to determine if there are contaminated soils, groundwater, asbestos, lead paint, or other hazardous materials present. If such materials are present, they will be characterized based on the type, composition and level of the contaminants. Work plans will be prepared by appropriately licensed professionals to identify the means and methods for

safe removal and legal disposal or recycling of these materials. Abatement and disposal of hazardous materials (or hazardous waste) will be performed under the provisions of MGL c21 /2C, OSHA, and the MCP by specialty contractors experienced and licensed in handling materials of this nature. The soils transported off-site will be legally disposed in accordance with the Massachusetts Contingency Plan and other regulatory requirements. Disposal of materials will be tracked via Material Shipping Records, Bills of Lading and/or other methods, as required to ensure their proper and legal disposal.

## 4.10 Groundwater

Based upon the subsurface explorations completed at the subject site, the depth to groundwater varies from about 21 to 23 feet below ground surface.

Groundwater levels at and near the Project Site could also be influenced by leakage into and out of sewers, storm drains, water utilities, and other below-grade structures, and environmental factors such as precipitation, season, and temperature.

The Project is not located within the Groundwater Conservation Overlay District ("GCOD").

## 4.11 Geotechnical

Based upon available subsurface data obtained from boreholes performed at the Project Site, it is anticipated that it is underlain by a 2.5 to 9-foot layer of granular fill material. Underlying the fill material, explorations performed at the Project Site encountered a compact to very dense natural outwash deposit, which extends to at least 27 feet below ground surface.

The proposed construction is planned to consist of a five-story residential building, which will occupy a majority of the Project Site. The lowest level floor slab will coincide with the existing ground surface, a majority of which will be occupied by an open-air parking garage.

The proposed building will be supported on a shallow foundation system consisting of spread footings with a soil-supported slab-on-grade for the lowest level floor slab within the occupied portions of the building.

To facilitate the grade change between the proposed finished grades at the interior of the site and the existing grades at the abutting properties, a retaining wall will be required along the southern and southeastern perimeter of the Project Site.

## 4.12 Construction Impacts

Construction impacts are temporary in nature and are typically related to air (dust), noise, and runoff. The following sections describe the potential temporary impacts due to construction activities and proposed mitigation measures to reduce these impacts. Construction of the Project will be completed in a single phase. Demolition is anticipated to begin in May 2016

followed by construction of the building and site improvements in June 2016. The Project is anticipated to be fully constructed and in operation by June 2017.

### 4.12.1 Site Preparation and Construction Staging

The Proponent will continue to work and coordinate with the utility companies to assure compliance and integrity of the Project. A plan to control construction-related impacts including erosion, sedimentation, and other pollutant sources during construction and any land disturbance activities shall be developed and implemented, however no dewatering is anticipated.

### 4.12.2 Construction Air Quality

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

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

### 4.12.3 Construction Noise

The construction activity associated with the Project may temporarily increase nearby sound levels due to the use of heavy machinery. Heavy machinery is expected to be used intermittently throughout the Project's construction phases, typically during daytime periods. The construction phases that will generate the highest sound levels include the demolition of existing buildings, site excavation and grading, and construction of the foundations for the proposed buildings. The City of Boston Regulations for the Control of Noise considers construction sound levels to be an impact to residential land uses if the $L_{10}$ is in excess of 75 dB(A) or the Lmax is in excess of 86 dB(A). A construction management program will be developed with the City of Boston to ensure that the City of Boston noise regulation related to construction noise is met.

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

### 4.12.4 Construction Traffic and Parking

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

The following elements are typically addressed in the CMP:

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

#### Construction Trip Generation and Worker Parking

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

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

#### Construction Truck Routes and Volumes

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

### 4.12.5 Construction Hazardous Materials and Solid Waste

All solid waste generated will be recycled off-site or disposed of in accordance with federal, state, and city regulations. The Construction Manager will implement a waste management plan that will seek to divert at least 75 percent and up to 90 percent of construction and

demolition waste material removed from the site from landfills through recycling and salvaging.

### 4.12.6 Rodent Control During Construction

The City of Boston has declared that the infestation of rodents in the city as a serious problem. In order to control this infestation, the City enforces the requirements established under the Massachusetts State Sanitary Code, Chapter 211, 105 CMR 410.550 and the State Building Code, Section 108.6. Policy Number 87-4 (City of Boston) established that preparation of a program for the extermination of rodents shall be required for issuance of permits for demolition, excavation, foundation, and basement rehabilitation. The Proponent will prepare and adhere to a rodent control program prior to demolition and on a regular basis throughout the duration of construction.

### 4.12.7 Public Safety During Construction

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

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

## 4.13 Rodent Control Post-Construction

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

## 4.14 Sustainable Design/Green Building

This section provides an overview of the sustainable design elements proposed as part of the Project at this time of preliminary design to demonstrate that the Project will meet the requirements of Article 37 of the Boston Zoning Code relative to the City's Green Building policies and procedures. The Design team for the Project includes several LEED Accredited Professionals (AP), including Lauren DeVoe (VHB), Hilary Holmes (HSH), Maciej Konieczny (New Ecology) and David Snell (PCA).

Western Avenue Residences will incorporate sustainable principles into its design, construction, and continued operation activities. The building will pursue a minimum of Silver level certification through the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Homes Mid-rise rating system. Implementation of LEED certification ensures that the project design includes the following sustainable principles:

- An integrated team, members of which will collaborate throughout the design and construction process;
- Environmentally friendly site design and consideration of landscaping to benefit both residents and the surrounding neighborhood;
- Efficient water use that minimizes waste and maximizes available technology;
- Energy efficiency through installation of high-efficiency equipment and a right-sized system design;
- Healthy materials and finishes throughout all interior spaces, reducing health risks for residents; and
- Effective ventilation and exhaust systems, designed to ensure continued health and air quality throughout the life of each building.

### 4.14.1 Regulatory Context

**Massachusetts Stretch Energy Code**

As part of the Green Communities Act of 2008, Massachusetts developed an optional building code that gives cities and towns the ability to choose stronger energy performance in buildings than the state building code (the "Stretch Energy Code"). Codified by the Board of Building Regulations and Standards as 780 CMR Appendix 115.AA of the 8th edition Massachusetts Building Code, the Stretch Energy Code is an appendix to the Massachusetts building code, based on further amendments to the International Energy Conservation Code (IECC). The Stretch Energy Code increases the energy efficiency code requirements for new construction and major residential renovations or additions in municipalities that adopt it. The Stretch Energy Code applies to both residential and commercial buildings and, specifically, for new commercial buildings over 5,000 square feet in size, including multi-family residential buildings over three (3) stories.

In 2010, the City of Boston was designated a Green Community under the Green Communities Designation and Grant Program—an initiative of the Massachusetts Department of Energy Resources. In order to be designated a Green Community and, therefore, eligible for grant money available annually, communities are required to meet five rigorous qualification criteria one of which includes minimizing life-cycle costs, such as adopt and implement the Stretch Energy Code. The goal of the grant program is for a municipality to use grant money to assist residents, businesses, and the municipality departments/facilities reduce energy use or install renewable energy systems. For the City of Boston, the Stretch Energy Code was adopted and became mandatory on July 1, 2011.

The current Stretch Energy Code requires projects to achieve at minimum a 20 percent energy efficiency compared to the state's energy code (the "Base Energy Code") by either meeting the performance standard of 20 percent better than ASHRAE 90.1-2007, or using a prescriptive energy code. On July 1, 2014, the IECC2009 and ASHRAE 90.1-2007 ceased to be a code option for non-Stretch Energy Code communities, and the IECC 2012 and ASHRAE standard 90.1-2010 became the new/updated state-wide Base Energy Code. It is expected that an updated Stretch Energy Code, if/when enacted, will require additional energy reductions beyond these standards and that Green Communities, such as Boston will automatically adopt any updates to the Stretch Energy Code (unless they vote to change their bylaw to no longer be a stretch code community). At the time of this EPNF filing, the updated Stretch Energy Code requirements remain unknown.

**Article 37 – Green Buildings of the Boston Zoning Code**

Through Article 37 – Green Buildings, the City of Boston encourages buildings to decrease energy and water use and cost, improve the efficiency and useful life of building systems and infrastructure, and reduce the burdens imposed by buildings on city services, the environment, and public health. The stated purposes of the article is as follows:

> *"The purposes of this article are to ensure that major building projects are planned, designed, constructed, and managed to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston."*

Any project that is subject to Article 80B, Large Project Review is also subject to the requirements of Article 37, which includes demonstrating that a project would meet the minimum requirements to achieve a LEED Certified level (all LEED Pre-requisites and achieve at least 40 points) without registering the project with the USGBC, or "LEED certifiable."

An interdisciplinary committee called the Boston Interagency Green Building Committee advises the BRA on a proposed project's compliance with the provisions of the article. The Committee consists of at least one representative of city agencies, including the BRA, BED, BTD, the Inspectional Services Department and the Mayor's Office.

### 4.14.2 Compliance with Article 37

Proponent intends to incorporate sustainable design and construction principles and practices into the Project, in compliance with the requirements of Article 37 of the Boston Zoning Code relative to the City's Green Building policies and procedures. The Proponent intends to take the appropriate measures to achieve a LEED Silver building. The preliminary LEED Scorecard, as presented in Appendix C, is tracking 59 'yes' points and 16 'maybe' credits for a Silver rating under the LEED for Homes Multifamily Mid-Rise rating system. The 'maybe' points represent credits that will continue to be evaluated as design progresses. This represents a noteworthy increase in LEED points compared to 36 'yes' points for a Certified rating, as required by Article 37.

The following sections provide a summary of LEED compliance for each of the credit categories for the Project.

**Innovation and Design Process**

The Innovation and Design Process (ID) category ensures the integration of sustainable principles throughout the design and construction phase, while also addressing growing concerns of building durability and longevity.

The Project will include team members from all related occupations, energy and efficiency expertise, and at least one LEED Accredited Professional. The team plans to participate in a design charrette to discuss sustainability and efficiency goals that will inform project design and future decisions.

The Project will include design strategies to address the following durability concerns: exterior water and moisture, interior water and moisture, air infiltration, interstitial condensation, pest control, heat loss, ultraviolet radiation, and natural disasters.

**Location and Linkages**

The Location and Linkages (LL) category addresses reduction of urban sprawl and rewards development on and near existing infrastructure, public transportation, and previously developed land.

The Project is a redevelopment of an existing, urban infill parcel, requiring no undeveloped land for its construction, providing existing access to existing utility lines and public transportation, as well as accessible open space for occupant recreation.

The Western Ave location also provides its residents with walkable (within ½ mile) access to numerous neighborhood amenities, including restaurants, grocery stores, pharmacies, religious institutions, laundry services, recreation facilities, and medical/dental offices.

**Sustainable Sites**

The Sustainable Sites (SS) category addresses environmental issues related to landscape and site design, ensuring a seamless co-existence between the built environment and the natural environment.

The Project will ensure that installed landscaping includes only non-invasive plantings, maximizes drought-tolerance, and minimizes the need for irrigation.

Both the site design and building roofing will seek to reduce heat island effects- increasing reflectivity of installed materials, where feasible and appropriate.

Stormwater will be managed throughout construction, as well as the life of the project. During construction, the site design will include a National Pollution Discharge Elimination System (NPDES) approved erosion and sediment control plan. Additional Best Management Practices

will minimize both run-off and possible wind erosion. Once completed, the site will retain and infiltrate all stormwater from a design storm, per city of Boston requirements.

The Project is located near multiple bus stops with connections to other MBTA services, promoting use of alternative transportation throughout the city.

Bicycle storage on-site will promote resident biking by maximizing available secure, covered storage spaces. The project is also located 0.2-miles from the Charles River Reservation, allowing residents to easily access miles of continuous off-street bike paths, as well as playing fields, walking paths, boat rental facilities and picnicking spaces.

Additional parking will be provided on-site, but will not exceed the Boston zoning requirements. All parking will be provided through dedicated lots below occupied space or on-street parking.

**Water Efficiency**

The Water Efficiency (WE) category addresses environmental degradation related to overuse of potable water within residential buildings and irrigation systems.

The site will utilize efficient irrigation methodology to ensure minimal water waste. Plants will be native and non-invasive, zoned according to watering needs, and classified as drought-tolerant where feasible; spray heads will be efficient and only installed as needed, no hardscape or building foundations will be watered, and drip irrigation will be used in the majority of planting beds.

Residential units in the Project will utilize high-efficiency, low-flow fixtures for water closets, lavatory faucets, showers, and kitchen faucets.

**Energy and Atmosphere**

The Energy and Atmosphere (EA) category addresses ongoing energy usage and continued building performance. At a minimum, the Project will meet the Massachusetts's Stretch Energy Code, providing a 20% reduction in energy usage annually. The Project will also utilize high-efficiency heating and cooling equipment and will include an effective thermal barrier at the exterior envelope, reducing thermal losses to the exterior.

All installed systems will be commissioned prior to building occupancy, according to LEED Fundamental Commissioning requirements and ASHRAE Guideline 0: Commissioning Process for Buildings and Systems.

**Materials and Resources**

The Materials and Resources (MR) category addresses all installed materials, including framing and interior finishes, as well as diversion of waste from landfills.

Where available, the Project will utilize panelized construction methodology- minimizing construction time and conditions variation. This will result in an efficient and effective exterior building envelope.

The Project will also utilize non-tropical wood products or Forestry Stewardship Council certification for necessary wood from tropical countries. Additionally, wood materials will be reviewed for reduction in added urea-formaldehyde resins.

All finish materials will be chosen for environmental benefits such as regionally sourced, low-Volatile Organic Compound (VOC) release, and green certifications for health benefits. Concrete mixture: aggregate materials will be sourced within 500-miles of the Project Site; paints, primers, adhesives, sealants will comply with the South Coast Air Quality Management District Rule #1113 and #1168; and, all flooring materials will include Green Label Plus certification (rugs) or FloorScore certification (resilient flooring), as applicable.

During demolition and construction on-site, all waste produced will be tracked to maximize diversion from landfills. The project will seek to achieve a minimum diversion rate of 50% during demolition and 75% during construction.

**Indoor Environmental Quality**

The Indoor Environmental Quality (IEQ) category addresses the exhaust and ventilation of all interior spaces within the building, ensuring a consistent healthy environment for building residents.

The Project will design all residential areas to meet the ASHRAE 62.2 ventilation standard and all common spaces areas to meet the ASHRAE 62.1 ventilation standard. All ductwork will be designed in accordance with the ACCA Manual J Heating and Cooling Loads, and Manual D Duct Sizing, standards.

All installed combustion equipment will be directly vented to the exterior; and, each floor of each unit, as well as all common spaces, will be equipped with combination smoke and carbon dioxide detectors.

All installed mechanical equipment will include minimum MERV 8 filtration media to ensure that harmful particulates are filtered out of the air stream, prior to entry into the interior spaces.

During construction, all installed ductwork will be protected from contamination, starting at delivery on-site and continuing until final cleaning and occupancy.

Garage spaces will include adequate ventilation and monitoring for carbon monoxide levels, to ensure the safety of all users and residents.

Smoking will be prohibited within the building, improving the indoor air quality and overall health of the residents.

Finally, each residential unit will be sealed for compartmentalization, per Massachusetts Multifamily Utility Rebate program standards. The maximum air leakage from each unit to both the exterior and adjacent spaces will be 7ACH at 50 Pascals.

**Awareness and Education**

The Awareness and Education category ensures that the owner, building residents, and maintenance staff are aware of the installed efficient equipment and healthy materials-especially those conditions unique to sustainable and environmentally conscious development.

During the course of the Project, the Proponent will work to develop Operation and Maintenance handbooks as well as resident green guides to be given to building occupants during move-in. Additionally, short trainings will be held with all leasing and maintenance staff at construction completion to ensure that applicable information and knowledge is passed on to building residents.

## 4.15 Climate Change Preparedness and Resiliency

As required by the BRA for all Large Project Review projects, the project team has considered anticipated changes in climate by completing the BRA Climate Change Resiliency and Preparedness Checklist, which is provided in Appendix C of this EPNF. Climate change is expected to result in rising sea levels, more frequent extreme storms, and more extreme weather events. The following sections describe what has been considered as it relates to climate change impacts as part of the early stages of project design.

### 4.15.1 Addressing Anticipated Sea Level Rise and Flooding

Rising sea levels and more frequent extreme storms as a potential result of climate change increase the probability of coastal and riverine flooding and enlarging of the 100 Year flood plain. As stated previously in Section 4.7, the Project Site is not located in a special flood hazard area, floodway area, or other flood area. While sea level rise and extreme flooding is not expected to impact the Project, as described previously in Section 4.6, the Project's stormwater management system will provide for on-site infiltration, which will help accommodate heavy rain events.

### 4.15.2 Addressing Extreme Weather and Heat Events

Climate change is expected to result in more extreme weather events, including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures.

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

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

## 4.16 Historic Resources

A search of the Massachusetts Historical Commission's (MHC) Massachusetts Cultural Resource Information System (MACRIS) database and mapping tool was completed to identify previously recorded above-ground and archaeological resources located on or within a one-quarter mile radius of the Project Site. Refer to Figure 4.3 for a location plan of historic inventoried and listed properties within 1/4 mile of the Project Site.

### 4.16.1 Project Site

The existing on-site buildings include a 2.5-story multifamily dwelling operated as a rental property, a vacant single-story structure previously used as an office for a used car dealership, a vacant single-story structure previously used as a retail factory service center for DeWalt tools and a single-family dwelling. Because all four buildings are over 50 years old, they are subject to Article 85 Demolition Delay review by the Boston Landmarks Commission. Determinations of no significance have been received (2008/2009) for two of the three parcels containing buildings, and the third will be submitted in the near future.

### 4.16.2 Adjacent Historic Context

While there are no historic resources located on any of the parcels making up the Project Site, the Project is located across Western Avenue from the Charles River Speedway Headquarters Building designed by architect William D. Austin. The shingle-style complex was listed on the National Register of Historic Places on July 19, 2010. Comprised of an eclectic group of one- and two-story buildings, the property was the subject of an RFP from the Massachusetts Department of Conservation and Recreation in 2013.

A proposal from the non-profit Architectural Heritage Foundation was ultimately selected, which called for the rehabilitation of the buildings into a mixed use complex with a new construction multi-family building in place of some of the non-historic pieces of the property. To the best of the knowledge of the Proponent at the time of this filing, this multi-family use is currently being considered as a high rise. The uses that have been publicized to date for the Speedway buildings are space for non-profits, craftspeople and artists, retail and restaurants. The interior courtyard is envisioned to be a central gathering place.

Since the property fronts on Soldiers Field Road, the portion of the building facing the Project amounts to its rear. To that end there are currently no openings in the street wall along Western Avenue save for a couple of small windows. The Architectural Heritage Foundation plans propose creating two openings in the Western Avenue street wall, one for pedestrian

access to the inner courtyard and one for service. Both are currently large, fixed barn-style doors.

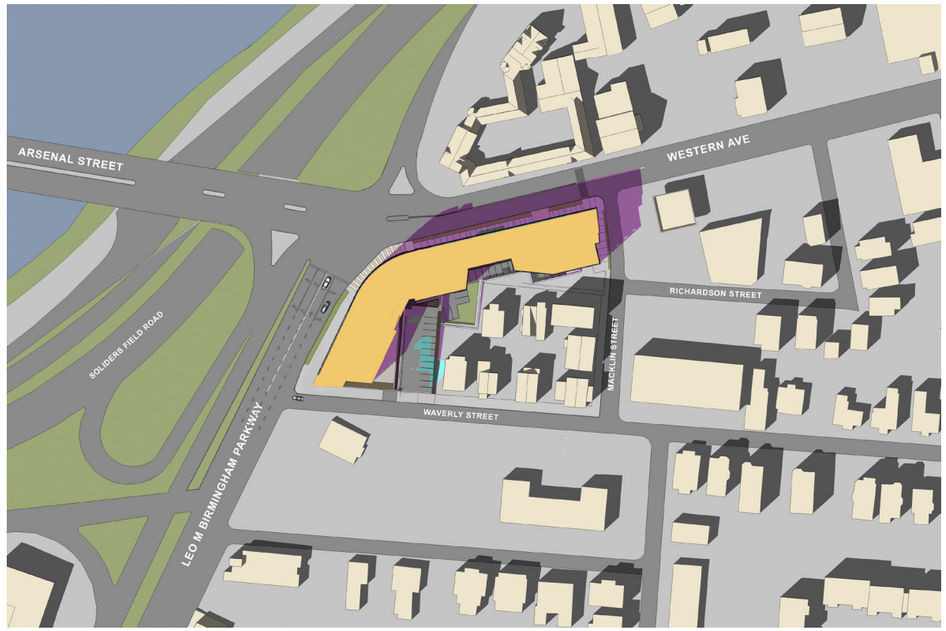
### 4.16.3 Project Response

In order to respond to the future development, the Project orients its largest retail corner to the planned pedestrian entrance of the Speedway development. A pedestrian crossing is proposed to connect safely between the two retail destinations. By providing a safe, pedestrian friendly connection the two projects can work together to create a vibrant neighborhood retail node at the end of Western Avenue.

Due to the width of Western Avenue (60 feet), the anticipated impacts of the proposed Project on the Speedway site are minimal. There are not thought to be any adverse impacts from wind or shadows caused by the Project. As demonstrated in the shadow studies (Figures 4.1a-d) the proposed shadows never impact the courtyard space and very seldom do they fall on the building.


9 AM


12 PM

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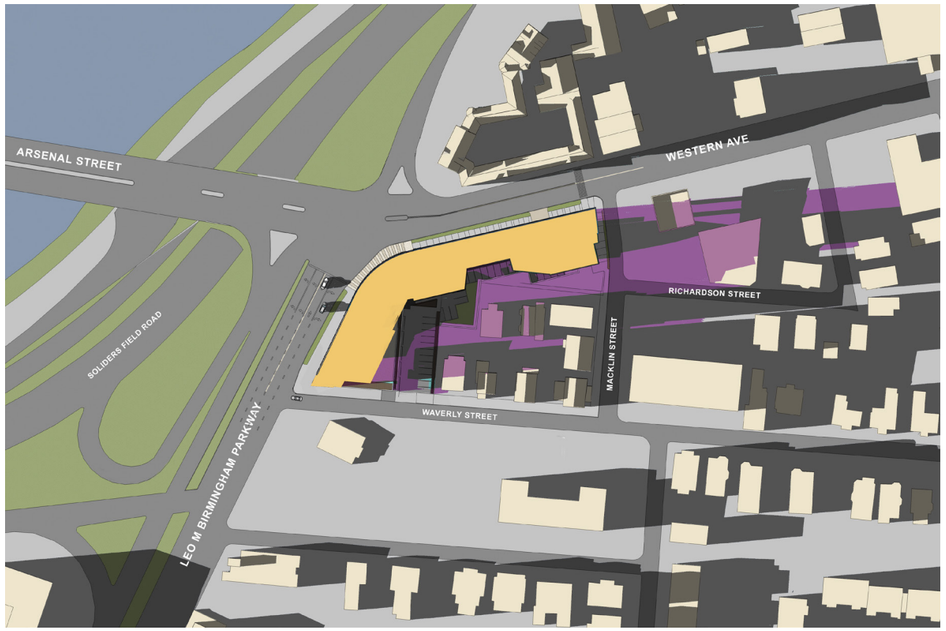



6 PM

## SEPTEMBER 21

NEW SHADOWS
EXISTING BUILDINGS
DEMO SHADOWS
NEW BUILDING
EXISTING SHADOWS

0 75 150 300 Feet

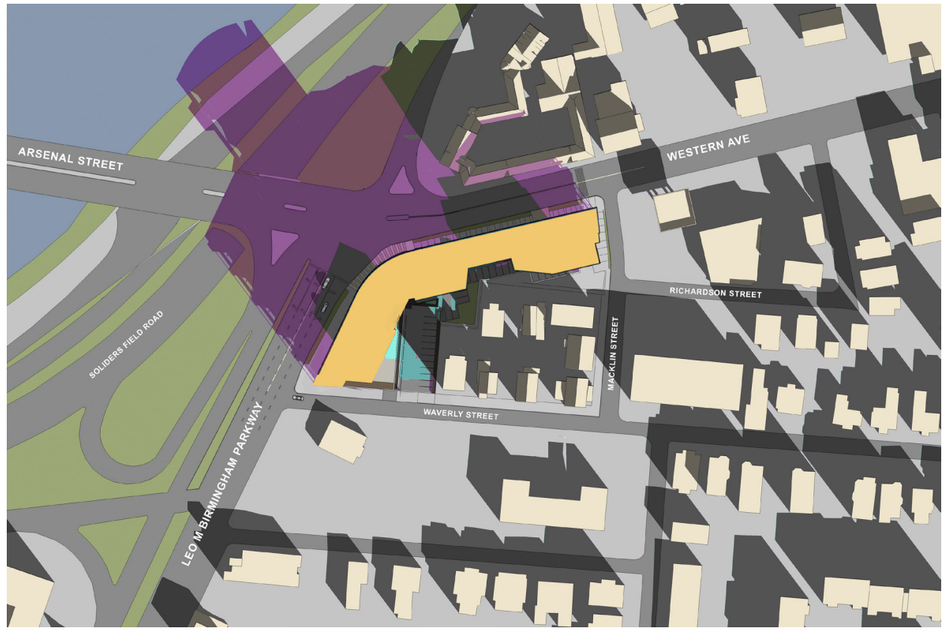
# Solar Analysis
September

Figure 4.1a

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors




9 AM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## DECEMBER 21

NEW SHADOWS | EXISTING BUILDINGS | DEMO SHADOWS
NEW BUILDING | EXISTING SHADOWS

0 75 150 300 Feet

# Solar Analysis
December

Figure 4.1b

**W. Ave Residence**
**Brighton, MA**

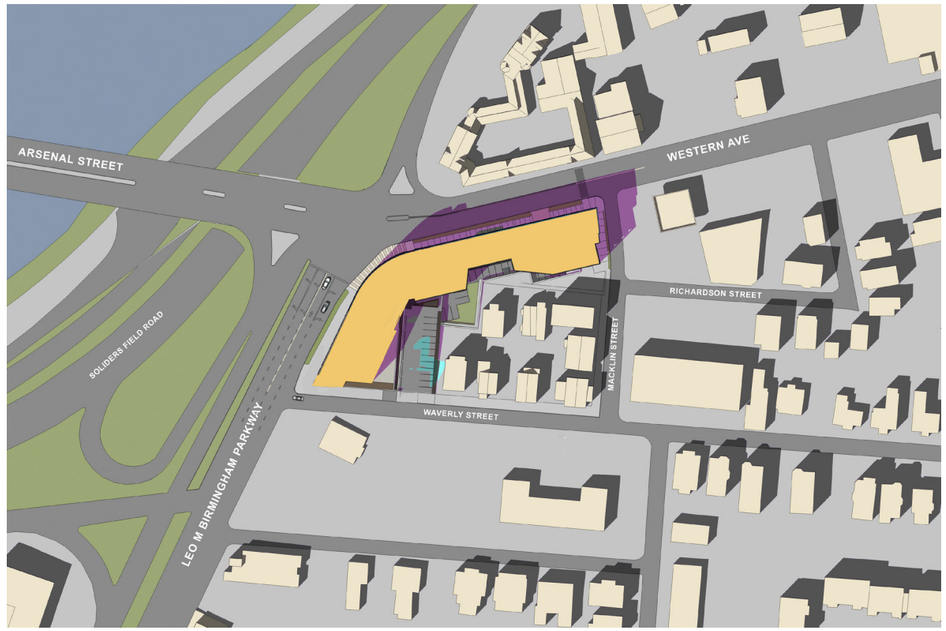
vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

MC


9 AM


12 PM




3 PM

MARCH 21

NEW SHADOWS
EXISTING BUILDINGS
DEMO SHADOWS
NEW BUILDING
EXISTING SHADOWS

0 75 150 300 Feet

# Solar Analysis
March

Figure 4.1c

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors


9 AM


12 PM


3 PM


6 PM

JUNE 21

NEW SHADOWS
EXISTING BUILDINGS
DEMO SHADOWS
NEW BUILDING
EXISTING SHADOWS

0 75 150 300 Feet

# Solar Analysis
June

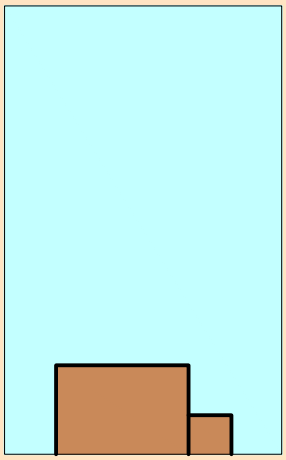
Figure 4.1d

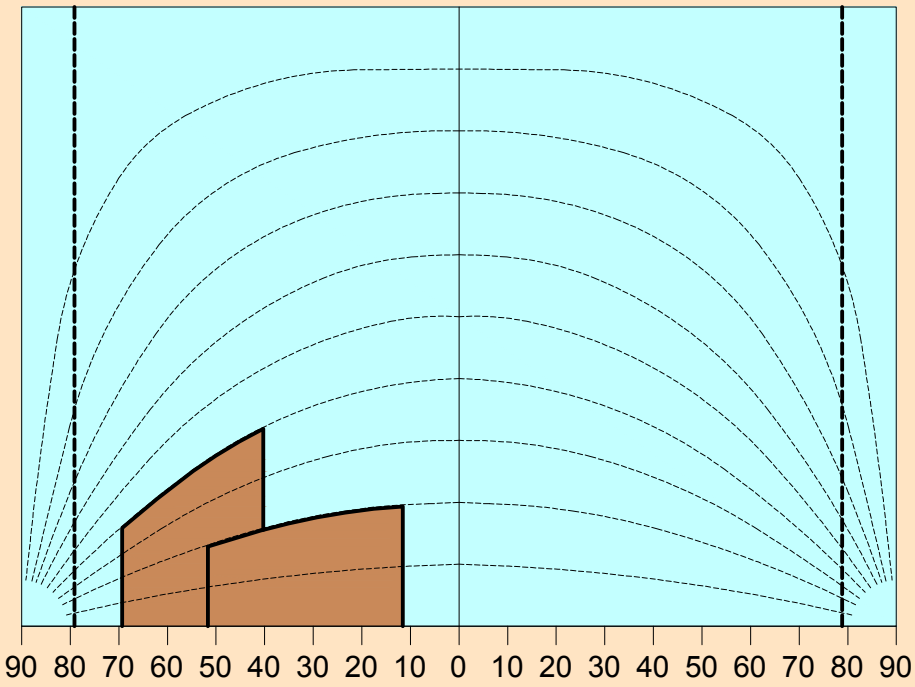
**W. Ave Residence**
**Brighton, MA**

PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

**Existing**

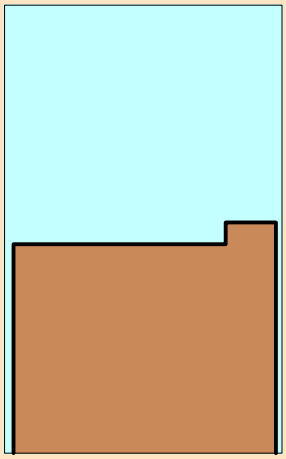
Obstruction of
Skyplane = 10.0%






**Proposed**

Obstruction of
Skyplane = 65.7%



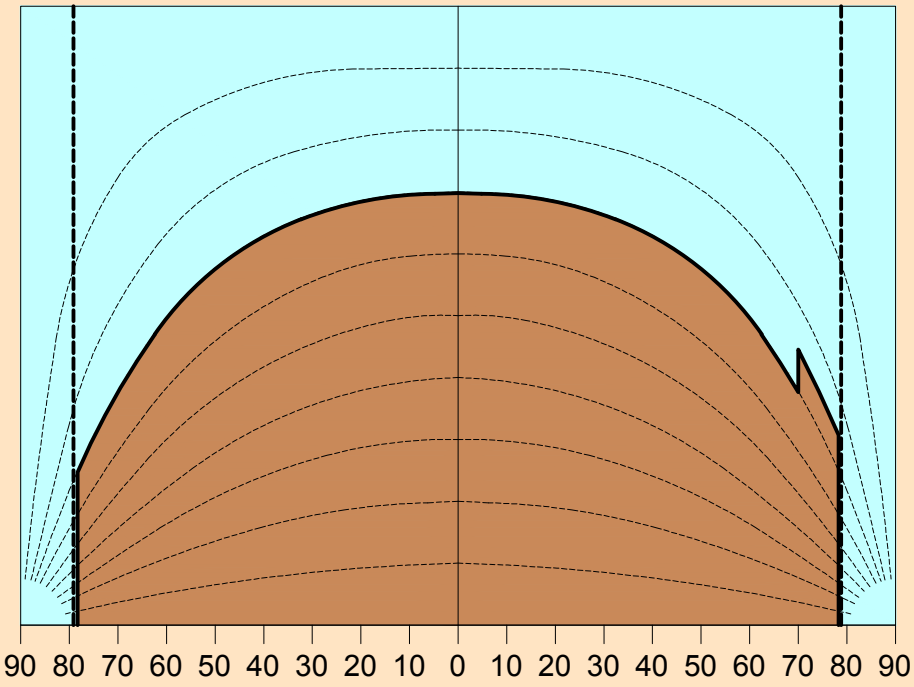


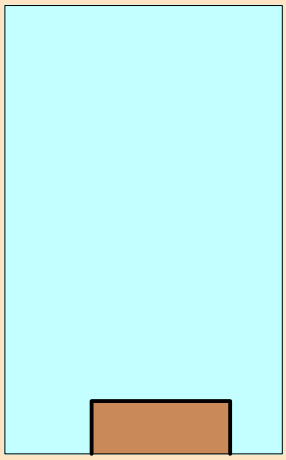

Figure 4.2a

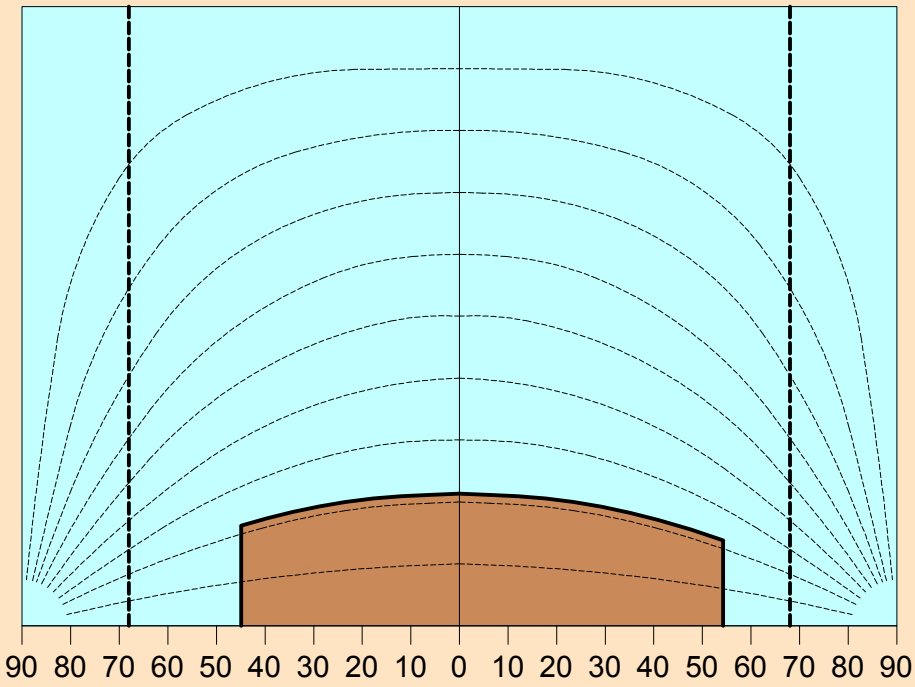
Daylight Analysis
Center of Western Avenue

**W. Ave Residence**
**Brighton, MA**

**Existing**

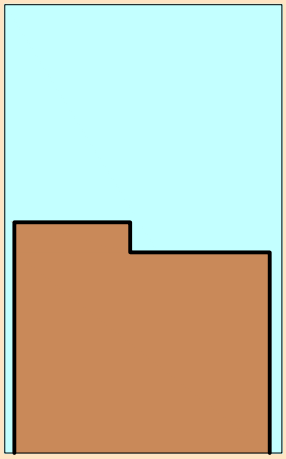
Obstruction of
Skyplane = 16.5%






**Proposed**

Obstruction of
Skyplane = 62.0%



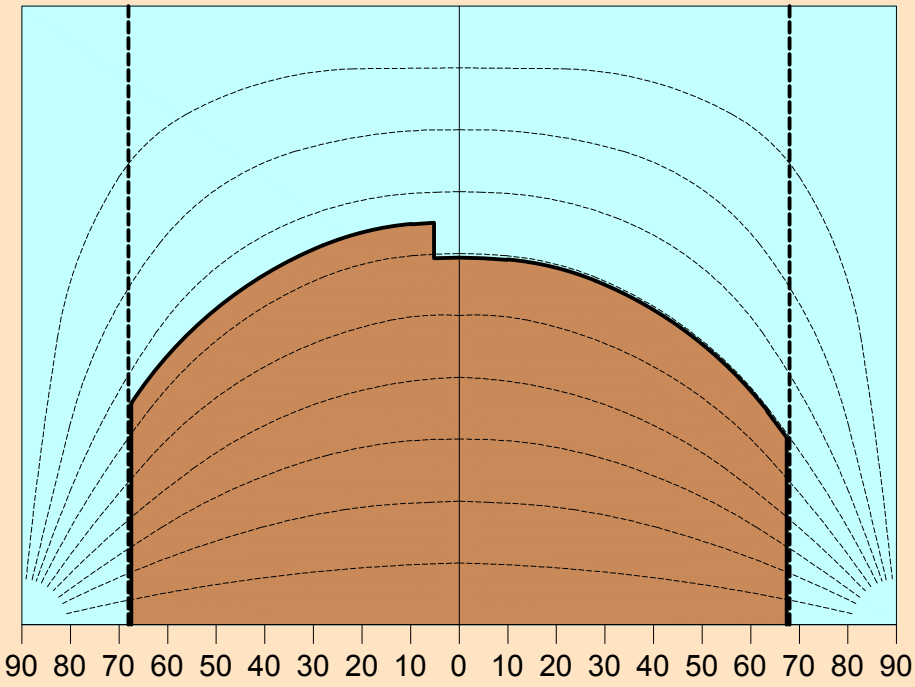


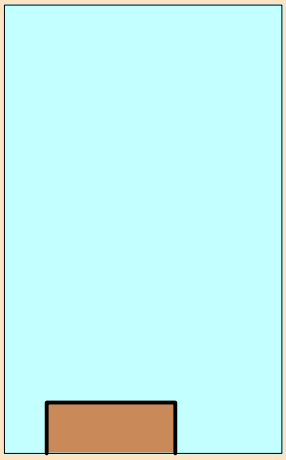

Figure 4.2b

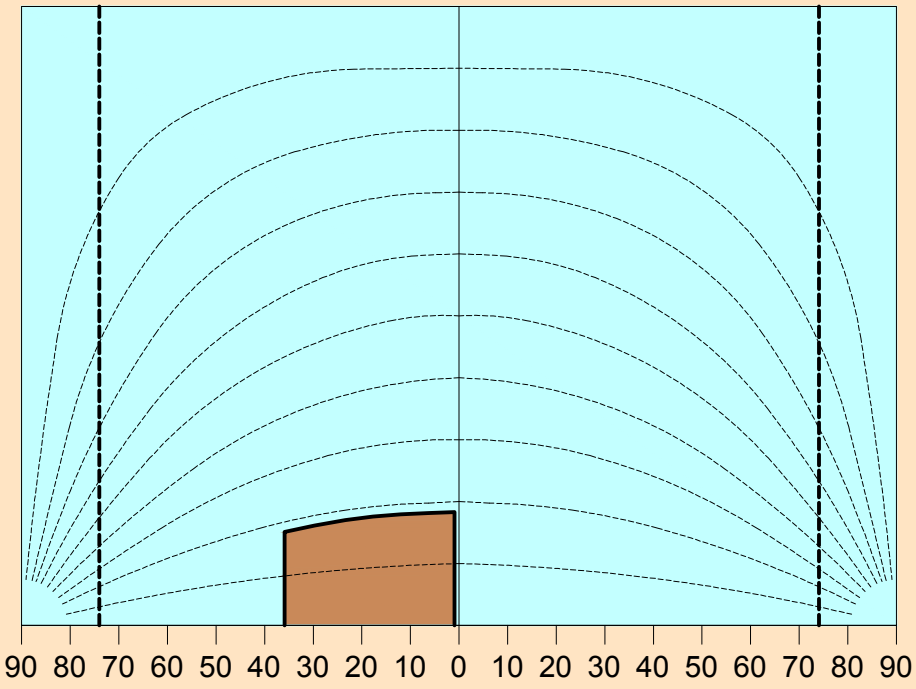
Daylight Analysis
Center of Leo M Birmingham Parkway

**W. Ave Residence**
**Brighton, MA**

**Existing**

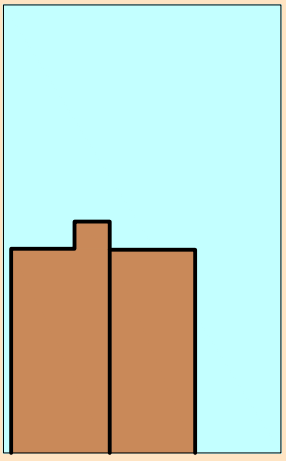
Obstruction of
Skyplane = 4.0%






**Proposed**

Obstruction of
Skyplane = 55.7%



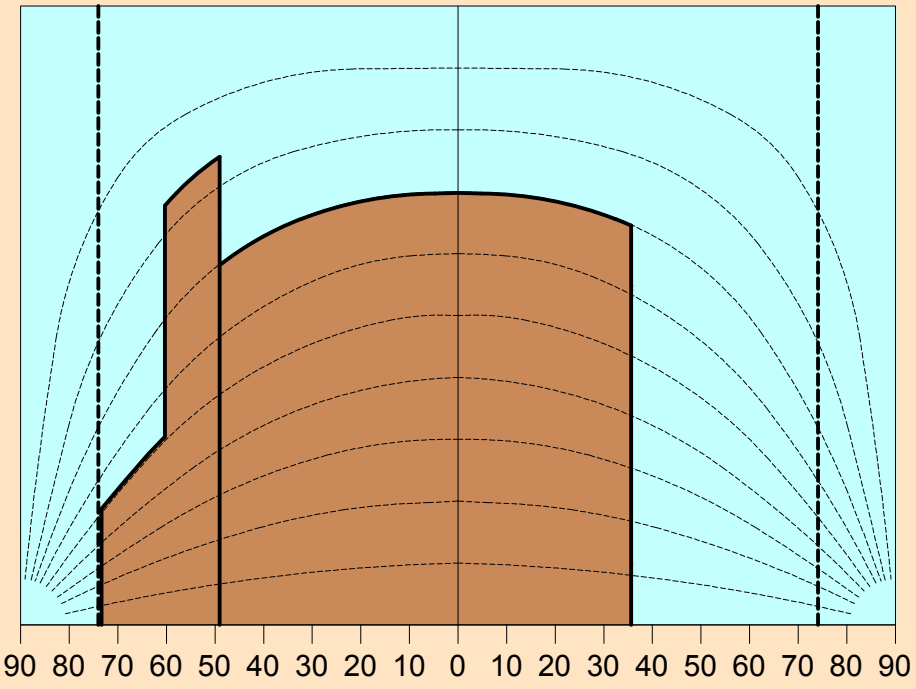


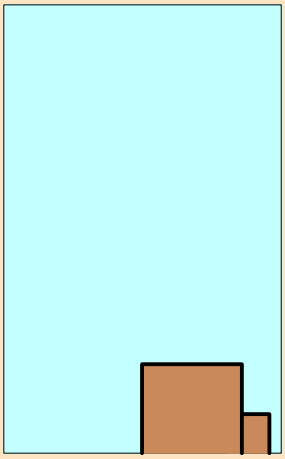

Figure 4.2c

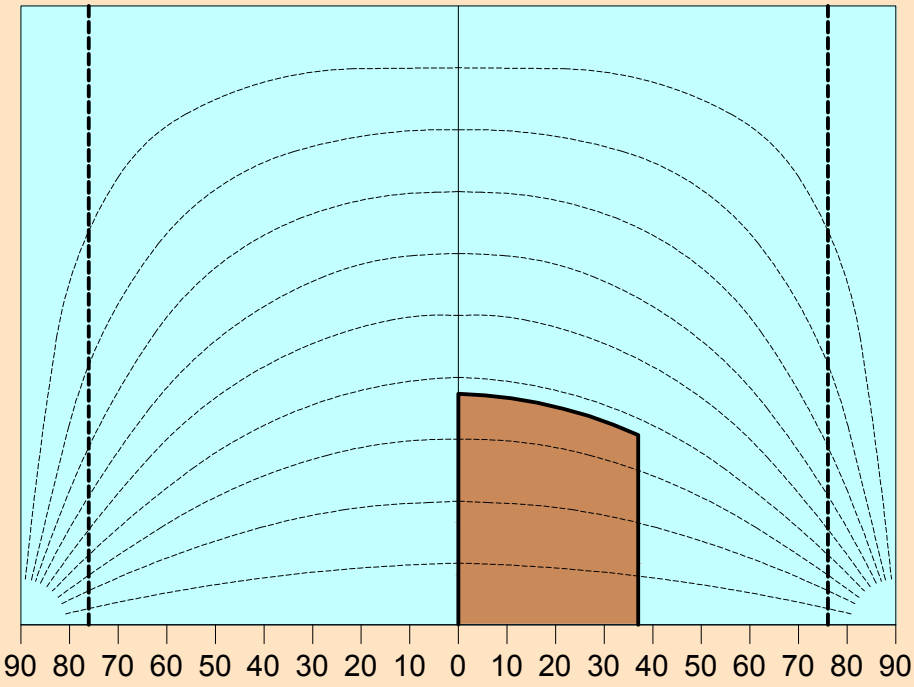
Daylight Analysis
Center of Waverly Street

**W. Ave Residence**
**Brighton, MA**

**Existing**

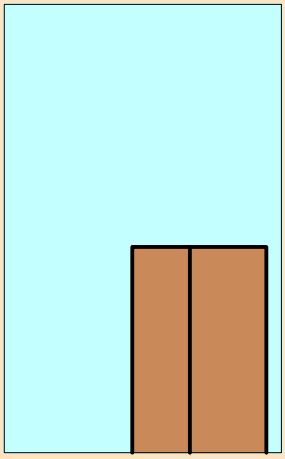
Obstruction of
Skyplane = 9.0%






**Proposed**

Obstruction of
Skyplane = 45.6%



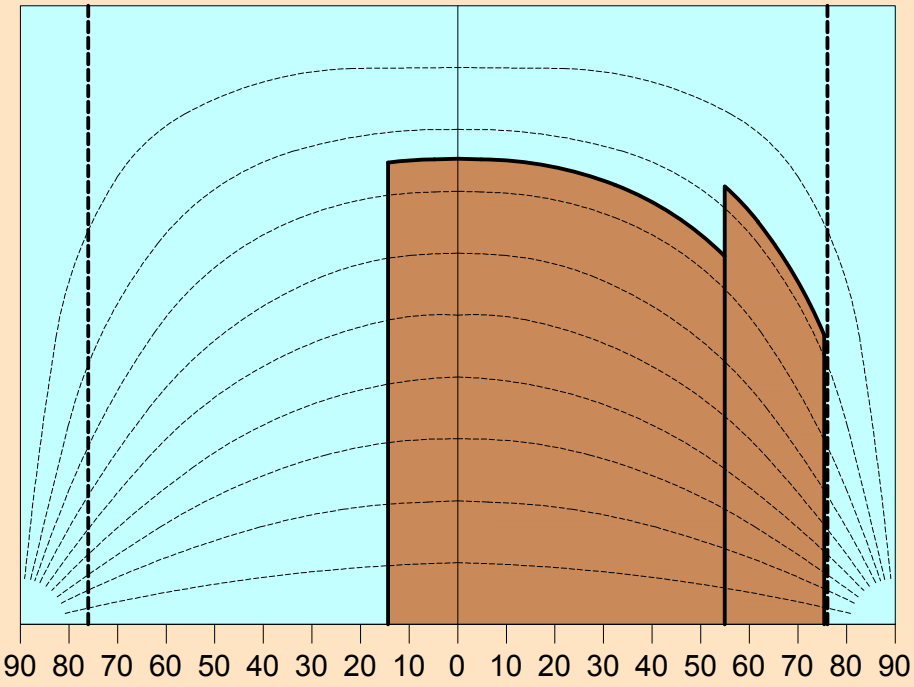
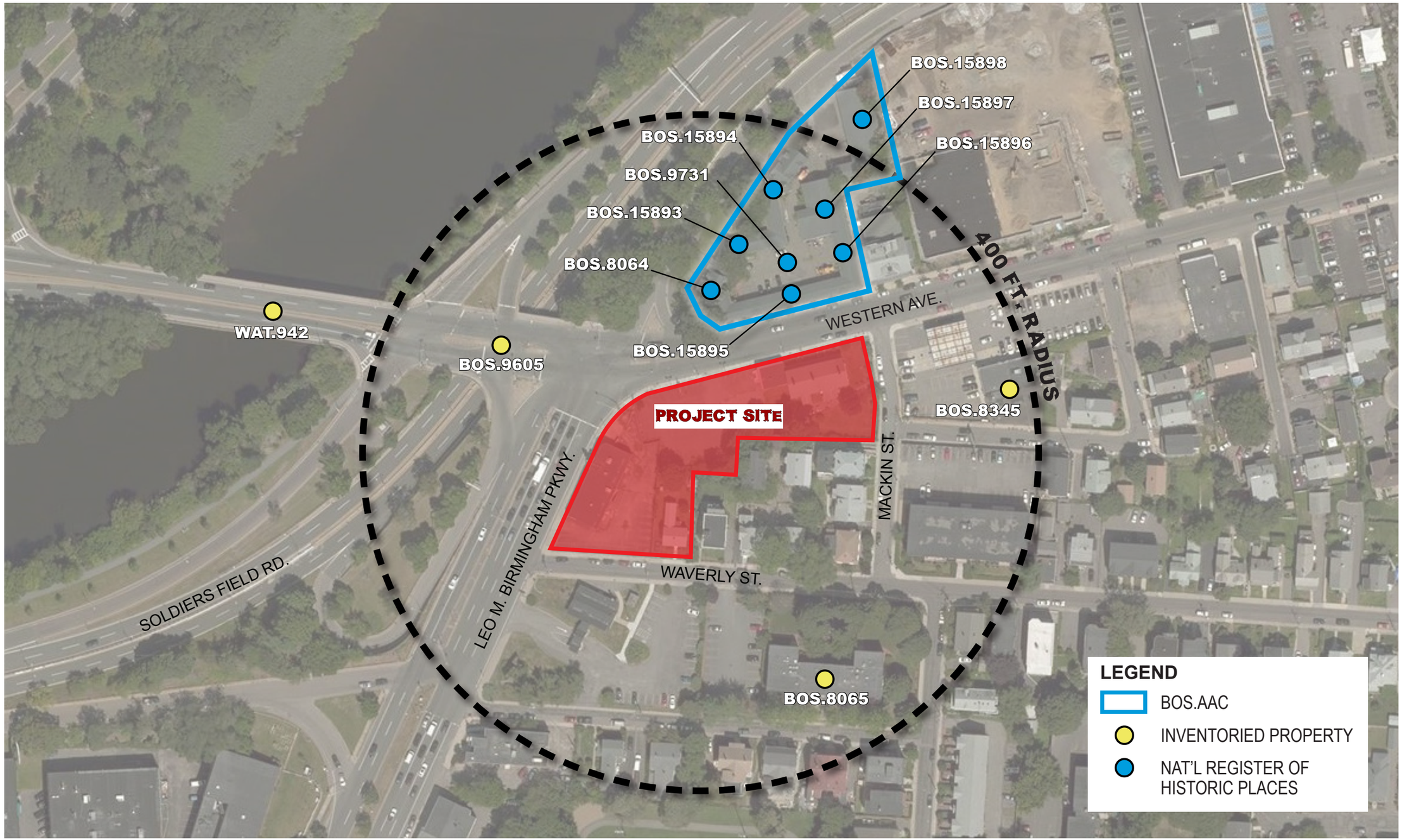



Figure 4.2d

Daylight Analysis
Center of Mackin Street

**W. Ave Residence**
**Brighton, MA**




0 25 50 100 Feet

# Inventoried and Listed Properties

Figure 4.3

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

# 5

# Infrastructure

This chapter describes the infrastructure systems that will support the Project and the regulatory framework of utility connection reviews and standards. The following utilities have been evaluated: stormwater management; wastewater generation; water demand; and utilities (natural gas, electricity, and telecommunications). The evaluation discusses any anticipated Project-related impacts on the surrounding infrastructure and identifies mitigation measures to address these potential impacts. In addition, as discussed in Chapter 4, *Environmental Protection*, consideration is given to the sustainable design elements for the Project.

A detailed infrastructure analysis will be performed when the Project proceeds into the Design Development phase. Also, the project team will coordinate with the appropriate utility companies to address the capacity of the area utilities to provide services for the new building.

All connections to Boston Water and Sewer Commission (BWSC)-owned and -managed infrastructure will be reviewed as part of the required Site Plan Approval process.

## 5.1 Key Findings and Benefits

The key impact assessment finding related to infrastructure systems include:

- The existing public and private utility infrastructure surrounding the Project Site appears sufficient to service the needs of the Project, based on initial investigations with the appropriate agencies and utility companies.
- Over three-quarter of the Project Site is currently impervious to rainfall infiltration with no stormwater management facilities on-site.
- The existing buildings on the Project Site were at one time serviced by the BWSC for domestic and fire protection water and sanitary sewage conveyance.
- The Project is projected to require a domestic water supply of approximately 18,612 gallons per day and is estimated to generate 16,920 gallons per day of sanitary sewage.

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

- The Project includes an increase in impervious areas, but will attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system.

- The quality of stormwater runoff associated with the Project will be improved through the installation of an on-site infiltration system.

## 5.2 Regulatory Context

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

- BWSC approval will be required for all water, sewer, and stormwater systems.

- The Boston Fire Department (BFD) will review the Project with respect to fire protection measures, such as Siamese connections, hydrants, and standpipes.

- An 8(m) permit will be filed for work required within the Massachusetts Water Resources Authority (MWRA) easement in Western Avenue.

- The excavation for new utility connections and existing connections to be capped will be authorized by the Boston Public Works Department (BPWD) through the street opening permit process.

- A Permit Application for Construction will be filed with Department of Conservation and Recreation (DCR) for work within Leo M. Birmingham Parkway.

- A Construction General Permit will be filed with the Environmental Protection Agency (EPA) for coverage under the National Pollutant Discharge Elimination System (NPDES) stormwater program.

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

A complete list of the state and local permits anticipated associated with Project-related infrastructure is included in the *General Information and Project Summary* chapter (Table 1.2).

## 5.3 Stormwater Management

Stormwater management controls will be established in compliance with BWSC standards. The Project will not result in the introduction of pollutants or sediments that would potentially impact the receiving waters of the local BWSC stormwater drainage system. The Project will attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system.

### 5.3.1 Existing Drainage Conditions

The existing Project Site consists of a multi-family residential building at 516-520 Western Avenue, a small vacant commercial building at 530 Western Avenue, a single family home at 10 Waverly Street and a larger vacant commercial building at 8 Waverly Street. The residential building is surrounded by landscaping with a paved driveway leading to shed at the back of the property. The other buildings are surrounded by paved bituminous parking lots. The Project Site is over three-quarters impervious and does not contain any stormwater management infrastructure. Runoff from the paved parking areas appears to sheet flow to the adjacent streets.

The BWSC owns and maintains the storm drainage systems adjacent to the Project Site on Western Avenue, Mackin Street, Waverly Street, and Leo M Birmingham Parkway. BWSC record drawings indicate a 10-inch drain pipe exists in Mackin Street, which discharges to a 20-inch by 30-inch brick drain pipe in Western Avenue. A 10-inch drain pipe, enlarging to a 12-inch drain pipe exists in Waverly Street, which flows from east to west and ties into a 20-inch by 26-inch brick drain pipe in Leo M. Birmingham Parkway. The drainage system ultimately discharges to the Charles River. Refer to Figure 5.1 for the locations of these drain lines.

### 5.3.2 Proposed Drainage Conditions

The Project is expected to substantially improve the water quality and will meet the BWSC Site Plan requirements. The existing storm drain utility infrastructure surrounding the Project Site appears to be of adequate capacity to service the needs of the Project. The Project will result in an increase in impervious area, but will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1-inch over the Project Site's impervious area can be recharged.

The Project Site ultimately discharges to the Charles River. A Total Maximum Daily Load (TMDL) for Nutrients has been established for the Lower Charles River Watershed by the Massachusetts Department of Environmental Protection (MassDEP). In order to achieve the reductions in phosphorus loading required by the TMDL, phosphorus concentrations in the lower Charles River from Boston must be reduced by 64%. BWSC is requiring developers in the lower Charles River watershed to infiltrate stormwater discharging from impervious areas on

site in order to accomplish the necessary reductions in phosphorus. The Project will meet the phosphorous reduction requirement set forth by the MassDEP and BWSC.

The Project will involve earth disturbances of greater than one acre and will be required to obtain an NPDES General Permit for Construction from the Environmental Protection Agency. As required by the permit, a stormwater pollution prevention plan will be prepared for use during construction. Erosion and sediment controls will be used during construction to protect adjacent properties and the municipal storm drain system. An Operation and Maintenance (O&M) Plan will be developed to support the long-term functionality of the proposed stormwater management system.

## 5.4 Sanitary Sewage

### 5.4.1 Existing Sewer System

The BWSC owns and maintains the sanitary sewer systems adjacent to the Project Site in Western Avenue, Mackin Street, Waverly Street, and Leo M. Birmingham Parkway. MWRA owns and maintains the Charles River Valley Sewer in Western Avenue within an easement that includes the entire width of Western Avenue. BWSC record drawings indicate an existing 10-inch sanitary sewer pipe is located in Mackin Street. The drawings show a 24-inch by 30-inch sanitary sewer pipe located in Waverly Street and a 12-inch sanitary sewer pipe in Leo M. Birmingham Parkway. The sanitary sewer lines in Waverly Street and Leo M. Birmingham Parkway discharge into the 54-inch by 61.5-inch Charles River Valley Sewer in Western Avenue. A 10-inch sanitary sewer pipe is located south of the MWRA sewer in Western Avenue. An 8(m) permit from MWRA will be required for work within MWRA's easement.

The sewer services from the existing buildings on-site will be cut and capped as part the Project. Based on the existing building uses the total existing sewer flow from on-site buildings is estimated at 1,390 gallons per day (gpd), as detailed in Table 5.1 below.

### 5.4.2 Proposed Sewage Flow and Connection

The Project, as currently proposed consists of mostly residential uses with some ground floor retail use. Table 5-1 below summarizes the estimated sanitary sewer generation for the Project.

**TABLE 5-1 EXISTING AND FUTURE SEWER GENERATION**

| Program Type | Units | Generation Rate | Sewer Generation |
|---|---|---|---|
| Existing | | | |
| Residential | 10 Bedrooms | 110 gpd/Bedroom | 1,100 gpd[1] |
| Office | 780 square feet | 75 gpd/1,000 square feet | 200 gpd[2] |
| Retail | 3,990 square feet | 50 gpd/1,000 square feet | 200 gpd[2] |
| **TOTAL** | | | **1,500 gpd** |
| Proposed | | | |
| Residential | 152 Bedrooms | 110 gpd/Bedroom | 16,720 gpd |
| Retail | 4,818 square feet | 50 gpd/1,000 square feet | 241 gpd[2] |
| **TOTAL** | | | **16,961 gpd** |
| **NET NEW** | | | **15,461 gpd** |

Note: Based on DEP 310 CMR 15 flow calculation factors
GPD Gallons Per Day
1 2 bedrooms per unit for 516-520 Western Avenue and 4 bedrooms for 10 Waverly Street.
2 Assumes 200 gpd minimum allowable gpd.

The total proposed generation of approximately 16,961 gpd results in a net increase in flow of 15,461 gpd over the existing site use. 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 ratio minimum 4:1 ratio of I/I removed to wastewater generated.

The Proponent will submit a Site Plan showing the proposed sanitary sewer connection to the BWSC for review and approval. Parking garage floor drains will be routed through an oil and sand trap in accordance with the BWSC's Requirements for Site Plans, prior to discharge to the BWSC sanitary sewer system.

## 5.5 Domestic Water and Fire Protection

### 5.5.1 Existing Water Supply System

The water mains in the vicinity of the Project Site are owned and maintained by BWSC (see Figure 5-2). The MWRA owns and maintains a 60-inch line in Western Avenue and Leo M. Birmingham Parkway. BWSC record drawings indicate there is an existing 16-inch PCI installed in 1900 and relined in 2005 in Western Avenue, an existing 12-inch DICL installed in 2005 in Leo M. Birmingham Parkway, an existing 10-inch PCI installed in 1920 and relined in 2001in Waverly Street. The water mains are part of the Northern Low service network. The existing buildings on-site have existing water services and will be cut and capped as part the Project.

The Project Site is within the service radius of several fire hydrants. There is a hydrant (H8) on Western Avenue near Mackin Street, a hydrant (H6) on the southeast corner of Western Ave. and Leo M. Birmingham Parkway, and a hydrant (H4) on the south side of Waverly Street

approximately 125 feet from the Project. The Proponent will confirm with BWSC and BFD that the hydrants are sufficient for the Project during the Design Development phase.

The BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the Project Site will be requested by the Proponent. If hydrant flow data is not available for any hydrants located near the Project Site, as the design progresses, the Proponent will request hydrant flows be conducted by the BWSC adjacent to the Project Site. Hydrant flow data must be less than a year old to be used as a design tool. The Proponent will confirm that the flow and pressure is sufficient for the Project and coordinate any proposed changes with BWSC and BFD during the Design Development phase.

### 5.5.2 Proposed Water Demand and Connection

The water demand estimated for domestic services 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 approximately 18,657 gpd. The water for the Project will be supplied by BWSC.

The water supply systems servicing the building will be gated so as to minimize public hazard or inconvenience in the event of a water main break. Final locations, sizes, and connection details for the services will be provided on a Site Plan during the Design Development phase and submitted to BWSC for review and approval.

Water service to the building will be metered in accordance with BWSC's requirements. A BWSC master water meter, from which sub-meters will be connected, will be installed. The sub-meters will be the responsibility of the property owner. The property owner will provide a suitable location for a Meter Transmission Unit (MTU) as part of BWSC's Automatic Meter Reading System. A backflow preventer will be installed on the fire protection service and will be coordinated with the BWSC Cross Connection Control Department.

## 5.6 Other Utilities

### 5.6.1 Natural Gas Service

National Grid provides natural gas in the vicinity of the Project Site. National Grid owns and maintains gas mains in Western Avenue, Leo M. Birmingham Parkway, and Waverly Street. The Project is expected to use natural gas for heating and domestic hot water. It is expected that there is adequate supply of natural gas in the area. The actual size and location of the building services will be coordinated with National Grid.

### 5.6.2 Electrical Service

Eversource owns and maintains the electrical transmission system in the vicinity of the Project Site. There is existing overhead service in the Project Area. It is expected that electrical service can be provided by Eversource. Electric power supply design, and any upgrades that may be

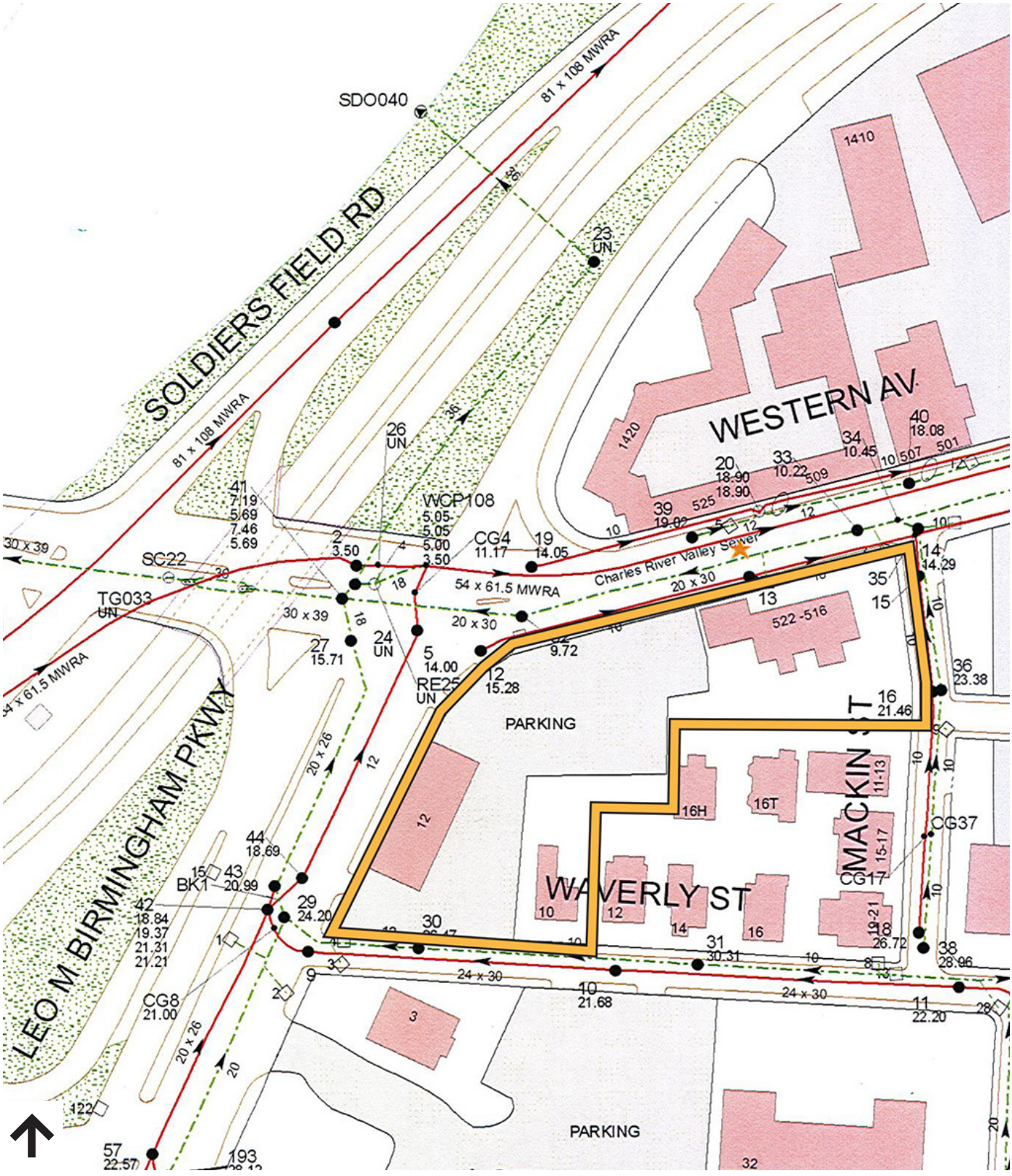
required, will be further coordinated with Eversource as the design for each phase progresses. The Proponent will investigate energy conservation measures. Additional information on energy conservation is provided in the sustainable design section of Chapter 4, *Environmental Protection*.

### 5.6.3 Telephone and Telecommunications

The Proponent will select private telecommunications companies to provide telephone, cable, and data services. Upon selection of a provider or providers, the Proponent will coordinate service connection locations and obtain appropriate approvals.

### 5.6.4 Protection of Utilities

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

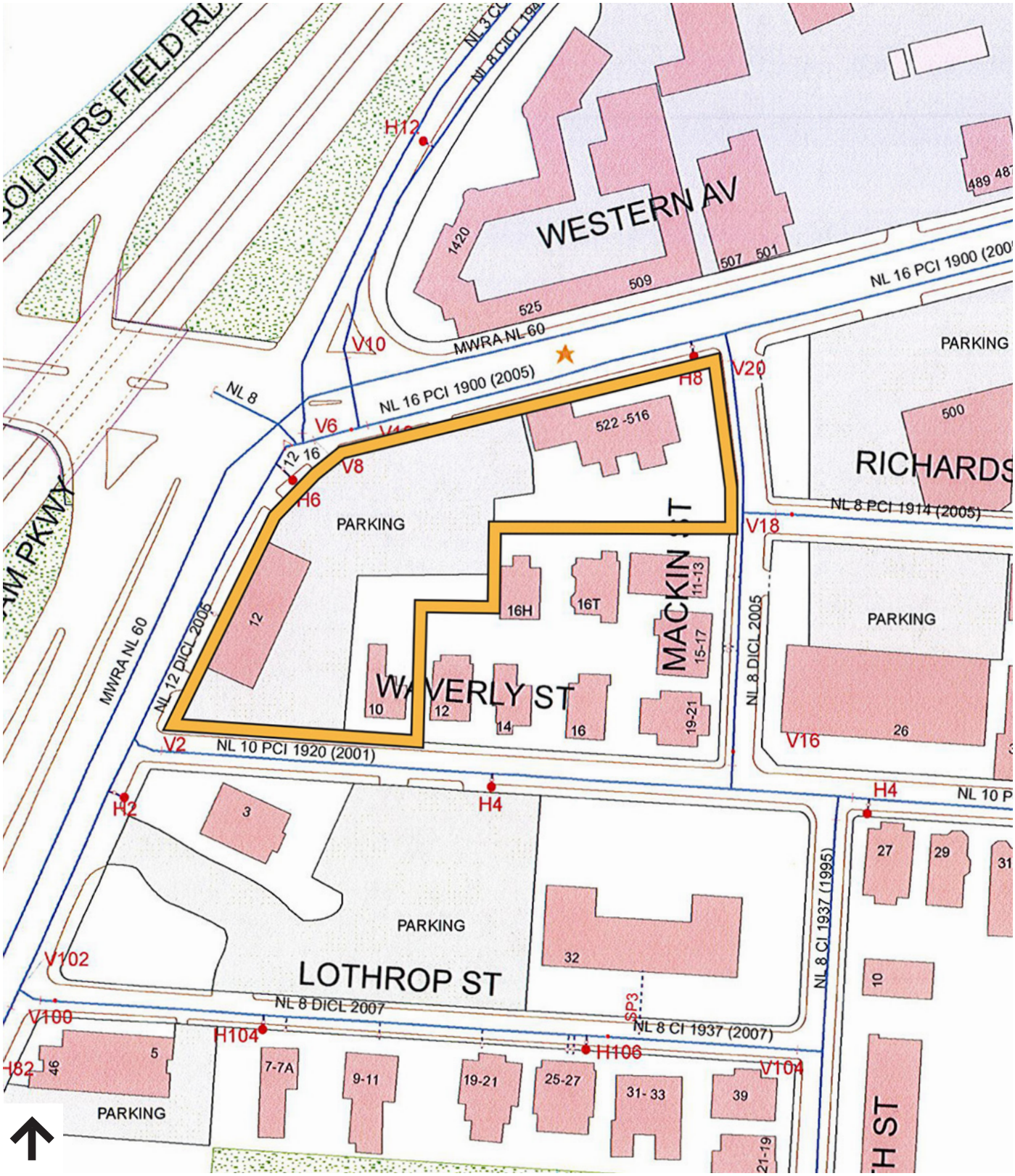



HOWARD STEIN HUDSON
Engineers + Planners

Figure 5.1

BWSC Sewer System Map

**W. Ave Residence**
**Brighton, MA**




HOWARD STEIN HUDSON
Engineers + Planners

Figure 5.2

BWSC Water System Map

**W. Ave Residence**
**Brighton, MA**

# 6

# Project Certification

This EPNF has been submitted to the Boston Redevelopment Authority, as required by Article 80B of the Zoning Code, on the 4th of January, 2016.

**Proponent**
The Mount Vernon Company

_____

Robert Parsekian
Executive Vice President

**Preparer**
Vanasse Hangen Brustlin, Inc.

_____

Seth Lattrell
Environmental Planner

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# APPENDIX A: Letter of Intent

THE MOUNT VERNON COMPANY

DEVELOPMENT · INVESTMENT · MANAGEMENT

November 20, 2015

Brian P. Golden, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201-1007
Attn: Christopher Tracy, Project Manager

RE: Letter of Intent (LOI) to File Expanded Project Notification Form (EPNF)
Article 80 – Large Project Review
516-522 Western Avenue; 530 Western Avenue; 8 & 10 Waverly Street, Brighton, MA

Dear Director Golden:

Please accept this letter as notice of our intent to file an Expanded Project Notification Form (EPNF) with the Boston Redevelopment Authority under Article 80 – Large Project Review requirements of the Boston Zoning Code to construct a multi-family residential and retail development at 516-522 Western Avenue, 530 Western Avenue, 8 Waverly Street and 10 Waverly Street, in the Allston-Brighton neighborhood of Boston (the "Project"). The Project Proponent will be The Mount Vernon Company, Inc.

The Project will consist of a six-story building at the corner of Western Avenue and Leo M. Birmingham Parkway, connected on either side to a five-story building along each street frontage. The mixed-use Project will contain 132 rental apartment units and three retail storefronts. There will be 20 two-bedroom, 16 one-bedroom plus den, 43 one-bedroom and 53 studio units. Amenities will include parking for 108 vehicles, storage for 132 bicycles, and a rooftop multipurpose room and fitness center.

The property is situated at the gateway to Brighton from Watertown at the edge of Western Avenue. The site abuts other multifamily dwellings located on Waverly and Mackin Streets. The adjacent parcel along Western Avenue is operated as an Irving gas station and on the other side along Birmingham Parkway as a Santander Bank branch. Across Western Avenue is the historic Charles River Speedway facility.

The Project site contains approximately 49,383 square feet of land primarily within the Community Commercial Subdistrict ("CC-1") zone, with a portion in the 3F-4000 zone in Boston. All parcels are within the Greenbelt Overlay Protection District. In a CC-1 subdistrict zone the Floor Area Ratio is 1.0; there is a height restriction of 35 feet; and multi-family residential apartments are Conditionally allowed under Article 51 of the Boston Zoning Code (Allston Brighton). In addition to the proposed use, the Project will

need zoning relief for FAR, which we estimate will be 2.6; building height, which will be approximately 68 feet; and other dimensional and parking requirements under the Article 80 process.

There are four existing structures that would be razed. The first is a 2.5 story three family dwelling. The second is a vacant single story structure previously used as an office for a used car dealership. The third is a vacant single story structure previously used as a retail service center for DeWalt tools. The fourth is a single family dwelling.

The Project will comply with the City's Inclusionary Development Policy.

In addition to The Mount Vernon Company, Inc., the development team will include Prellwitz Chilinski Associates as architect; Paul Alan Rufo, Esquire, Smith Duggan Buell & Rufo, LLP as legal counsel; Howard Stein Hudson as traffic and civil consultant; and McPhail Associates as the environmental consultant.

We expect to file an EPNF in the near future. The EPNF will include a transportation analysis and detailed evaluation of the proposed urban design as well as the environmental and infrastructure components. We have met with David Carlson, Deputy Director of Urban Design and Christopher Tracy, Senior Project Manager, and other members of the BRA Staff and will continue to meet with the BRA Staff throughout our pre-submission planning. We expect that our EPNF will include sufficient information to allow us to proceed to a Draft Project Impact Report ("DPIR").

We look forward to continuing the development process for this Project and to meeting with you and your staff in the coming weeks to refine our plan for this important and beneficial Project to the Allston Brighton neighborhood and to the City of Boston.

Very truly yours,

The Mount Vernon Company, Inc.

Bruce A. Percelay, Chairman

# APPENDIX B: Transportation Supporting Documentation

**Note: The following supporting transportation documentation is provided on the enclosed CD-ROM. Hard Copies are available upon request**

- Traffic Volume Counts
- Trip Generation Calculations
- Synchro Worksheets

# APPENDIX C: BRA Checklists

## Accessibility Checklist

## Climate Change Preparedness and Resiliency Checklist

## LEED Checklist

# Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

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

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

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

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

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

### Accessibility Analysis Information Sources:

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

**Article 80 | ACCESSIBILTY CHECKLIST**

## Project Information

| | |
|---|---|
| Project Name: | Western Ave. Residence |
| Project Address Primary: | 530 Western Avenue, Brighton MA |
| Project Address Additional: | |
| Project Contact (name / Title / Company / email / phone): | Robert Parsekian. Executive Vice President<br>The Mount Vernon Company<br>bobp@mvernon.com<br>617-267-0006 |

## Team Description

| | |
|---|---|
| Owner / Developer: | The Mount Vernon Company |
| Architect: | Prellwitz Chilinski Associates |
| Engineer (building systems): | WSP Parsons Brinckerhoff |
| Sustainability / LEED: | New Ecology, Inc. |
| Permitting: | VHB |
| Construction Management: | To be determined |

## Project Permitting and Phase

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

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

## Building Classification and Description

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

| | | | |
|---|---|---|---|
| Residential – One to Three Unit | **Residential - Multi-unit, Four +** | Institutional | Education |
| Commercial | Office | **Retail** | Assembly |
| Laboratory / Medical | Manufacturing / Industrial | Mercantile | Storage, Utility and Other |
| First Floor Uses (List) | Retail, Residential Lobby, Residential Amenities, Property Management Office, Parking | | |

What is the Construction Type – select most appropriate type?

| | | | |
|---|---|---|---|
| **Wood Frame (level 2-6)** | Masonry | **Steel Frame (level 1)** | Concrete |

Describe the building?

| | | | |
|---|---|---|---|
| Site Area: | *49,383 SF* | Building Area: | *128,403 SF (excludes open garage area)* |
| Building Height: | *56'-8" to 5th story roof, 68'-2" to 6th story roof* | Number of Stories: | *Primarily 5 Floors, partial 6th floor.* |
| First Floor Elevation: | *28 -31.58 Elev.* | Are there below grade spaces: | *Yes / **No*** |

## Assessment of Existing Infrastructure for Accessibility:

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

| | |
|---|---|
| Provide a description of the development neighborhood and identifying characteristics. | **The Project site contains 4 parcels. The site's primary frontage is on Western Avenue to the North and Leo M Birmingham Parkway to the West, with smaller frontages on Mackin Street to the East and Waverly Street to the South. Western Avenue features a variety of scales, setbacks and uses moving East towards** |

| | |
|---|---|
| | Charlesview Residences, a pair of 5 story mixed use buildings. The existing sidewalk at the site is approximately 6' and is generally flat. Leo M Birmingham Parkway running parallel to the river presents a highway scale with 6 lanes of traffic in front of the site. Moving South neighboring buildings range in scale from 1 to 4 stories until the I-90 overpass which features the WGBH building at 70'+. The existing sidewalk at the site ranges from 5'-15' and slopes up moving South. Mackin Street and Waverly Street feature a residential neighborhood character with older multifamily and single family buildings. The surrounding properties in this zone range in height from 2-4 stories and the sidewalks are approximately 6'. Both streets slope upward toward the residential neighborhood. In order to improve the pedestrian experience the proposed building façade has been setback from the property line at all streets. The proposed sidewalks are as follows: Western Avenue – 14', Leo M Birmingham Parkway – 15'-22', Waverly Street – 13.5', Mackin St – 11.5'-15' |
| List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc. | MBTA bus routes 70, 70A, and 86 stop directly in front of the project site on Western Avenue. The proposed Boston Landing Commuter Rail stop is within a half mile from the site. |
| List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc. | Some of Boston's largest employers are in proximity to the site such as New Balance, St. Elizabeth's Hospital and Harvard University. Faneuil Gardens, a Boston Public Housing Community is a little over a half mile from the project site. Refer to Chapter 3, Transportation and Parking of this PNG for further details |
| Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities. | No |

## Surrounding Site Conditions – Existing:

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

| | |
|---|---|
| Are there sidewalks and pedestrian ramps existing at the development site? | Yes |

| | |
|---|---|
| *If yes above*, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site. | **The existing sidewalks are all concrete and in various physical conditions. The sidewalk along Western Avenue appears to be the newest with the fewest cracks. No sidewalks feature street trees or planted strips.** |
| Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have the sidewalks and pedestrian ramps been verified as compliant? If yes, please provide surveyors report. | **No** |
| Is the development site within a historic district? If yes, please identify. | **No** |

**Surrounding Site Conditions – Proposed**

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

| | |
|---|---|
| Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org | **To the extent practicable, yes** |
| *If yes above*, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard. | **Western Ave – Neighborhood Connector**<br><br>**Leo M Birmingham Parkway – Parkway**<br><br>**Waverly Street and Mackin Street – Neighborhood Residential** |
| What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone. | **<u>Western Avenue: Total – 14'</u>**<br><br>**Frontage – between pedestrian zone & street wall (building), preferred = 2' proposed = 2.9'**<br><br>**Pedestrian – for pedestrian travel, preferred = 8'; proposed = 5' min.**<br><br>**Furnishing – between pedestrian zone & curb, preferred = 5'; proposed = 5'** |

| | |
|---|---|
| | <u>Leo M Birmingham Parkway: Total – 15'-22'</u><br><br>Frontage – preferred = N/A; proposed = 2.9'<br><br>Pedestrian – preferred = 6'; proposed = 4.6' – 9.9'<br><br>Furnishing – preferred = 10'; proposed = 10'<br><br><u>Waverly Street: Total – 13.5'</u><br><br>Frontage – preferred = 2'; proposed = 2.9'<br><br>Pedestrian – preferred = 5'; proposed = 5.7' min.<br><br>Furnishing – preferred = 4'; proposed = 5'<br><br><u>Mackin Street: Total – 11.5'-15'</u><br><br>Frontage – preferred = 2'; proposed = 2.9'<br><br>Pedestrian - preferred = 5'; proposed = 5'<br><br>Furnishing – preferred = 4'; proposed = 2' |
| 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? | Frontage – *cement concrete pavement – private property*<br><br>Pedestrian – *cement concrete pavement – largely private property*<br><br>Furnishing – *Trees, groundcover, mulch, cement concrete pavement at curb cut locations – City Right-of-way* |
| If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission? | Yes – The City will require a 5' width pedestrian sidewalk to be located on the public right-of-way. If the 5' width sidewalk cannot be provided entirely within the public right-of-way, the project can include the sidewalk within the private property. The owner shall grant the City a pedestrian easement over the portion of the sidewalk that is within the private property. This will ensure the City has continued rights to maintain a public sidewalk for public pedestrian access. The pedestrian easement granting process can be permitted through the Public Improvement Commission process. |
| Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? | Yes, at the retail space on Mackin Street |
| If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be? | *Proposed pedestrian seating area/café = 5.5' min x 18'*<br><br>*Right-of-way is 6.6' behind face of curb* |

## Proposed Accessible Parking:

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

| | |
|---|---|
| What is the total number of parking spaces provided at the development site parking lot or garage? | **A total of 108 parking spaces are located in two locations – at grade in a garage beneath the building accessed from Western Avenue and at grade in a lot accessed from Waverly Street.** |
| What is the total number of accessible spaces provided at the development site? | **5 accessible parking spaces are located within the garage nearest the residential entrance.** |
| Will any on street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need? | **No** |
| Where is accessible visitor parking located? | **The five designated accessible parking spaces will be located near the residential entrance with elevators.** |
| Has a drop-off area been identified? If yes, will it be accessible? | **No** |
| Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances. | **All ground floor retail spaces will be accessible from the adjacent sidewalks. The residential lobby will be accessible from the adjacent sidewalks and the parking areas.** |

## Circulation and Accessible Routes:

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

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

| | |
|---|---|
| Provide a diagram of the accessible route connections through the site. | **Attached PNF figure shows the proposed access and circulation through the Project Site.** |
| Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator. | **All entryways except the Waverly parking area are flush conditions. The Waverly lot entrance has stairs and a code compliant ramp due to a 4' level change.** |
| Are the accessible entrance and the standard entrance integrated? | **Yes** |
| If no above, what is the reason? | |
| Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route. | **Yes. Resident amenity spaces are located on the 6th floor accessible by two elevators, and some units have patios. All outdoor patios and decks will be flush with the interior floors.** |
| Has an accessible routes way-finding and signage package been developed? If yes, please describe. | **No** |

## Accessible Units: (If applicable)

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

| | |
|---|---|
| What is the total number of proposed units for the development? | **132** |
| How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown? | **All units are for rent. 13% will be affordable based on the City of Boston requirements.** |
| How many accessible units are being proposed? | **7 units at 5% (two studios, two 1 bedrooms, one 1 bedroom plus den, two 2 bedrooms)** |

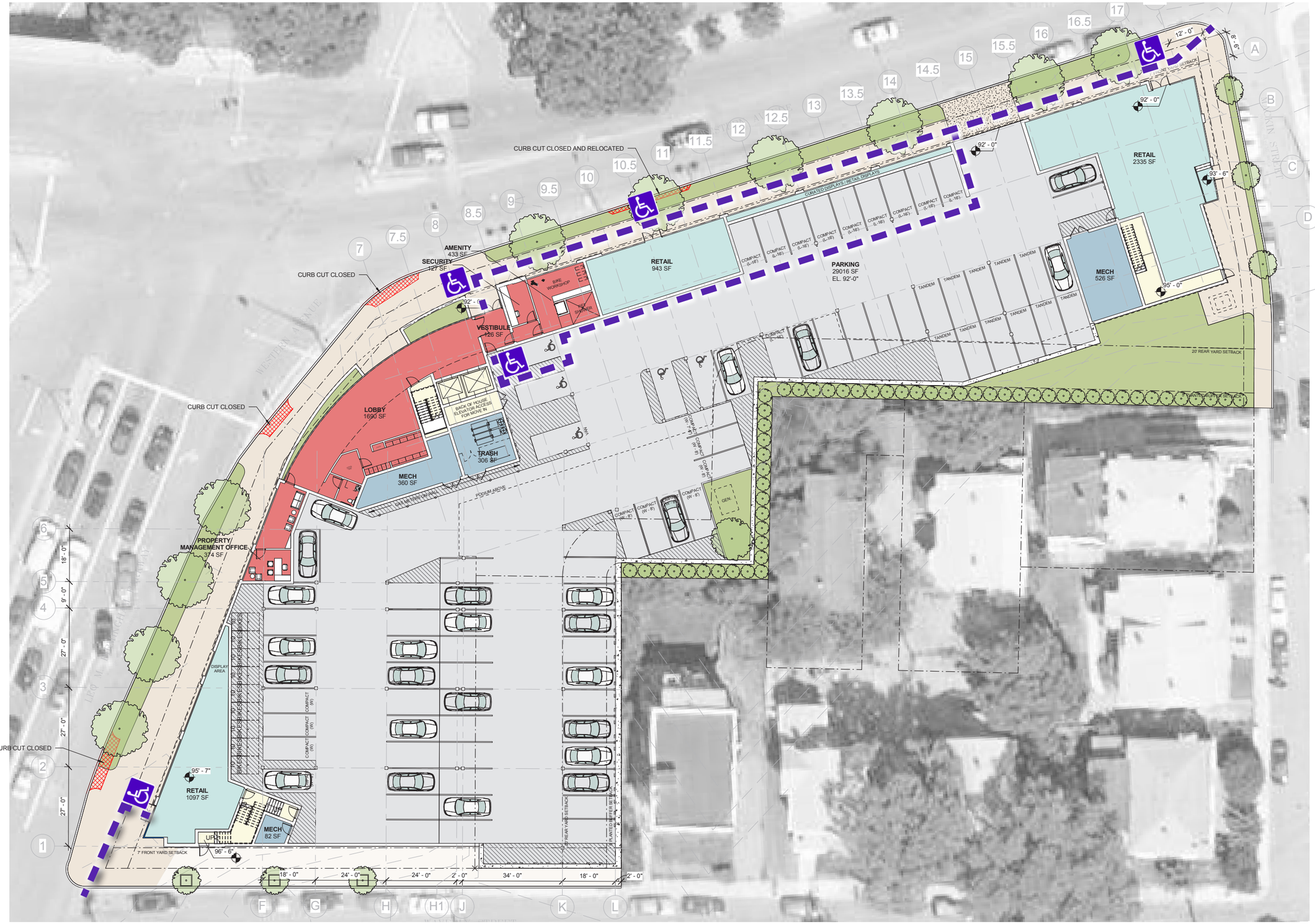
**Article 80 | ACCESSIBILTY CHECKLIST**

| | |
|---|---|
| Please provide plan and diagram of the accessible units. | **Specific locations of accessible units are to be confirmed** |
| How many accessible units will also be affordable? If none, please describe reason. | **13%** |
| Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. **If yes,** please provide reason. | **No** |
| Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board? | **Not yet** |
| Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible? | **See above** |

Thank you for completing the Accessibility Checklist!

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

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




0 10 20 40 Feet

# Level 1 Accesibility Diagram

Scale 1/32"=1'-0"

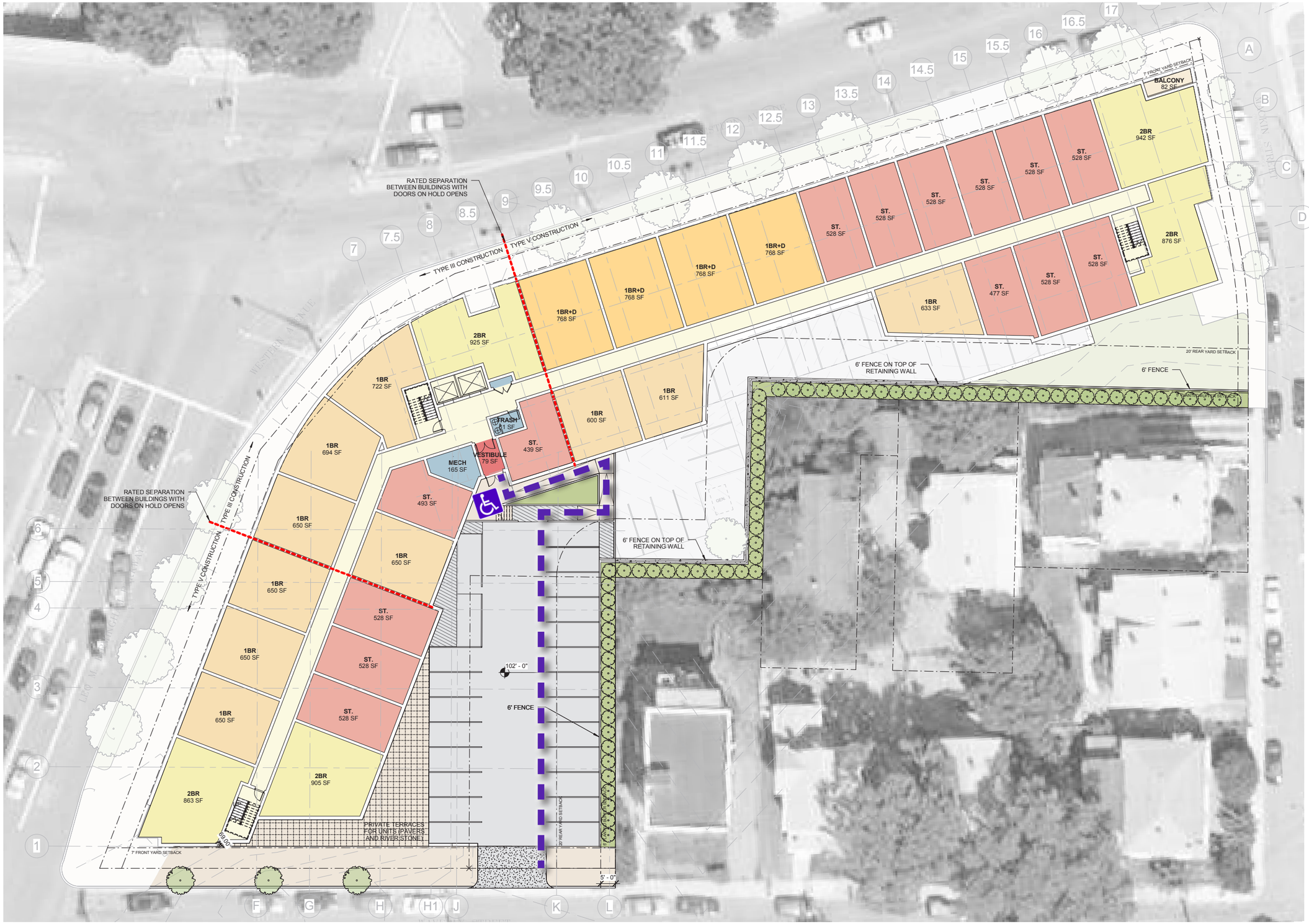
Figure C.1

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

MC




# Level 2 Accesibility Diagram

Scale 1/32"=1'-0"

Figure C.2

**W. Ave Residence**
**Brighton, MA**

vhb

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

# 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: | **W. Ave Residence** |
| Project Address Primary: | **530 Western Ave, Brighton, MA** |
| Project Address Additional: | |
| Project Contact (name / Title / Company / email / phone): | **Robert Parsekian. Executive Vice President**<br>**The Mount Vernon Company**<br>**bobp@mvernon.com**<br>**617-267-0006** |

## A.2 - Team Description

| | |
|---|---|
| Owner / Developer: | **The Mount Vernon Company** |
| Architect: | **Prellwitz Chilinski Associates, Inc.** |
| Engineer (building systems): | **WSP Parsons Brinckerhoff** |
| Sustainability / LEED: | **New Ecology, Inc.** |
| Permitting: | **VHB, Inc.** |
| Construction Management: | **To be determined** |
| Climate Change Expert: | |

## 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: | **Retail, Lobby, Amenities, Parking** |

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

| | | | |
|---|---|---|---|
| **Wood Frame (levels 2-6)** | Masonry | **Steel Frame (Level 1 and P1)** | Concrete |

Describe the building? **The building is a 132 unit residential project with 108 parking spaces contained in an underground garage (level P1) and an open garage at Level 1. At the first floor there are retail spaces along with the building lobby and some amenity spaces.**

| | | | |
|---|---|---|---|
| Site Area: | ***44,911SF*** | Building Area: | ***179,368SF*** |
| Building Height: | ***56'-8" @ 5 Stories***<br>***68'-2" @ 6 Stories*** | Number of Stories: | ***5 stories above grade with a partial 6th floor for amenity space.*** |

| | | | |
|---|---|---|---|
| First Floor Elevation (reference Boston City Base): | ***28 -31.58 Elev.*** | Are there below grade spaces/levels, if yes how many: | ***Yes, 1 level of underground parking*** |

## 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* |
| | ***YES*** | | ***YES*** |

## A.6 - Building Energy

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

| | | | |
|---|---|---|---|
| Electric: | ***195 (kW)*** | Heating: | ***3.70 (MMBtu/hr)*** |
| What is the planned building Energy Use Intensity: | ***60.8 (kbut/SF or kWh/SF)*** | Cooling: | ***212 (Tons/hr)*** |

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

| | | | |
|---|---|---|---|
| Electric: | ***80 (kW)*** | Heating: | ***0.18 (MMBtu/hr)*** |
| | | Cooling: | ***1.5 (Tons/hr)*** |

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

| | | | | |
|---|---|---|---|---|
| Electrical Generation: | *80(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?

| *0/95 Deg.* |
|---|

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

| *95 Deg.* | *1 Days* | *12 Events / yr.* |
|---|---|---|

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

| *14 Days* | *1Events / yr.* |
|---|---|

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

| *44 Inches / yr.* | *4.3 Inches* | *1 Events / yr.* |
|---|---|---|

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

| *Peak Wind* | *Hours* | *Events / yr.* |
|---|---|---|

## B.2 - Mitigation Strategies

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

| Building energy use below code: | *20 %* |
|---|---|
| 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 = 40* | Walls / Curtain Wall Assembly: | *R = 29* |
|---|---|---|---|
| Foundation: | *R = 10* | Basement / Slab: | *R = 30* |
| Windows: | *R = 3.4 / U = 0.29* | Doors: | *R = 3 / U = 0.32* |

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: | | | | |

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

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

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

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

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

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

| |
|---|
| *Yes / **No*** |

Describe site conditions? **The Project Site is outside the floodplain.**

| | |
|---|---|
| Site Elevation – Low/High Points: | *Boston City Base Elev.( Ft.) 26.5-38* |
| Building Proximity to Water: | *300 Ft.* |

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

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

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

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

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

*284 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

# LEED for Homes Mid-rise Project Checklist

*for Homes*

| | |
|---|---|
| **Builder Name:** | |
| **Project Team Leader:** | |
| **Home Address (Street/City/State):** | *, Boston, Massachusetts* |

**Project Description**

Building Type: ***Mid-rise multi-family*** # of stories: ***5***

# of Units: ***132*** Avg. Home Size Adjustment: ***-9.0***

**Adjusted Certification Thresholds**

Certified: ***36.0*** Gold: ***66.0***

Silver: ***51.0*** Platinum: ***81.0***

**Project Point Total**

**Prelim:** ***59 + 16 maybe pts*** **Final:** ***15***

**Certification Level**

**Prelim:** ***Silver*** **Final:** ***Not Certified***

**Final Credit Category Point Totals**

***ID: 0*** ***SS: 4*** ***EA: 9*** ***EQ: 0***

***LL: 0*** ***WE: 0*** ***MR: 2*** ***AE: 0***

*Minimum Point Thresholds Not Met for Final Rating*

*Date Most Recently Updated:* *Updated by:*

✍ ***Indicates that an Accountability Form is required.***

| | | Max Pts. Available | Preliminary Rating Y / Pts | Maybe | No | Notes | Project Points |
|---|---|---|---|---|---|---|---|
| **Innovation & Design Process (ID)** | (Minimum 0 ID Points Required) | ***Max: 11*** | ***Y:5*** | ***M:0*** | | ***Notes*** | ***Final: 0*** |
| **1. Integrated Project Planning** | | | | | | | |
| 1.1 | Preliminary Rating | ***Prereq.*** | ***Y*** | | | | |
| | Target performance tier: Silver | | | | | | |
| 1.2 | Energy Expertise for MID-RISE | ***Prereq.*** | ***Y*** | | | | |
| 1.3 | Professional Credentialed with Respect to LEED for Homes | ***1*** | ***1*** | *0* | | *please see ID 01-06 for details* | ***0*** |
| 1.4 | Design Charrette | ***1*** | ***0*** | *0* | | | ***0*** |
| 1.5 | Building Orientation for Solar Design *(meet all of the following)* | ***1*** | ***0*** | *0* | | | ***0*** |
| | ☐ a) Glazing area on north/south walls 50% greater than on east/west walls | | | | | ☐ c) At least 450 sq. ft. of south-facing roof area, oriented for solar applications | |
| | ☐ b) East-west axis is within 15 degrees of due east-west | | | | | ☐ d) 90% of south-facing glazing is shaded in summer, unshaded in winter | |
| 1.6 | Trades Training for MID-RISE | ***1*** | ***1*** | *0* | | | ***0*** |
| **2. Quality Management for Durability** | | | | | | | |
| 2.1 | Durability Planning *(meet all of the following)* | ***Prereq.*** | ***Y*** | | | | |
| | ☐ a) Durability evaluation completed | | | | | ☐ c-v) Install drain and drain pans for clothes washers in/over living spaces; OR | |
| | ☐ b) Strategies developed to address durability issues | | | | | ☐ no clothes washers in/over living spaces | |
| | ☐ c-i) Nonpaper-faced backer board in tub, shower, spa areas | | | | | ☐ c-vi) Exhaust conventional clothes dryers directly to outdoors | |
| | ☐ c-ii) No carpet in kitchen, bathroom, laundry, and spa areas | | | | | ☐ c-vii) Install drain and drain pan for condensing clothes dryers | |
| | ☐ c-iii) No carpet within 3 ft of each entryway | | | | | ☐ d) Durability strategies incorporated into project documentation | |
| | ☐ c-iv) Install drain and drain pans in tank water heaters in/over living spaces; OR | | | | | ☐ e) Durability measures listed in durability inspection checklist | |
| | ☐ no tank water heaters in/over living spaces | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2.2 | Durability Management *(meet one of the following)* | | *Prereq.* | *Y* | | |
| | ☐ Builder has a quality management process in place | | ☐ Builder conducted inspection using durability inspection checklist | | | |
| 2.3 | Third-Party Durability Management Verification | | *3* | *3* | *0* | *0* |

**3. Innovative or Regional Design**

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.1 | Innovation 1 (ruling #): | | *1* | *0* | *0* | *0* |
| 3.2 | Innovation 2 (ruling #): | | *1* | *0* | *0* | *0* |
| 3.3 | Innovation 3 (ruling #): | | *1* | *0* | *0* | *0* |
| 3.4 | Innovation 4 (ruling #): | | *1* | *0* | *0* | *0* |

## Location & Linkages (LL) (Minimum 0 LL Points Required)

*Max: 10* *Y:7* *M:1* **Notes** *Final: 0*

**1. LEED for Neighborhood Development**

| | | | | | |
|---|---|---|---|---|---|
| 1 | LEED for Neighborhood Development | *10* | *0* | *0* | *0* |

**2. Site Selection**

| | | | | | |
|---|---|---|---|---|---|
| 2 | Site Selection *(meet all of the following)* | *2* | *2* | *0* | *0* |

- ☑ a) Built above 100-year floodplain defined by FEMA
- ☑ b) Not built on habitat for threatened or endangered species
- ☑ c) Not built within 100 ft of water, including wetlands
- ☑ d) Not built on land that was public parkland prior to acquisition
- ☑ e) Not built on land with prime soils, unique soils, or soils of state significance

**3. Preferred Locations**

| | | | | | | |
|---|---|---|---|---|---|---|
| | 3.1 | Edge Development | *1* | *0* | *0* | *0* |
| *OR* | 3.2 | Infill | *2* | *2* | *0* | *0* |
| *AND/OR* | 3.3 | Brownfield Redevelopment for MID-RISE | *1* | *0* | *0* | *0* |

- ☐ a) Site meets criteria as "contaminated" by ASTM E1903-97 Phase II
- ☐ b) Site defined as "brownfield" by local, state, or federal government agency

**4. Infrastructure**

| | | | | | |
|---|---|---|---|---|---|
| 4 | Existing Infrastructure | *1* | *1* | *0* | *0* |

**5. Community Resources / Transit**

| | | | | | |
|---|---|---|---|---|---|
| 5.1 | Basic Community Resources for MID-RISE (meet one of the following) | *1* | *0* | *0* | *0* |

- ☐ a) Within 1/4 mile of 4 basic community resources
- ☐ b) Within 1/2 mile of 7 basic community resources

| | | | | | | |
|---|---|---|---|---|---|---|
| *OR* | 5.2 | Extensive Community Resources for MID-RISE (meet one of the following) | *2* | *2* | *0* | *0* |

- ☐ a) Within 1/4 mile of 7 basic community resources
- ☐ b) Within 1/2 mile of 11 basic community resources

| | | | | | | |
|---|---|---|---|---|---|---|
| *OR* | 5.3 | Outstanding Community Resources for MID-RISE (meet one of the following) | *3* | *0* | *0* | *0* |

- ☐ a) Within 1/4 mile of 11 basic community resources
- ☐ b) Within 1/2 mile of 14 basic community resource

**6. Access to Open Space**

| | | | | | |
|---|---|---|---|---|---|
| 6 | Access to Open Space | *1* | *0* | *1* | *0* |

## Sustainable Sites (SS) (Minimum 5 SS Points Required)

***Max: 22 Y:13.5 M:2*** | ***Notes*** | ***Final: 4***

### 1. Site Stewardship

**1.1 Erosion Controls During Construction *(meet all of the following)*** — *Prereq.* — *Y*

- [x] a) Stockpile and protect disturbed topsoil from erosion.
- [x] b) Control the path and velocity of runoff with silt fencing or equivalent.
- [x] c) Protect sewer inlets, streams, and lakes with straw bales, silt fencing, etc.
- [x] d) Provide swales to divert surface water from hillsides
- [x] e) Use tiers, erosion blankets, compost blankets, etc. on sloped areas.

**1.2 Minimize Disturbed Area for MID-RISE (meet appropriate requirements)** — *1* — *1* — *0* — *0*

Where the site is not previously developed, meet all the following:

- [ ] a) Develop tree / plant preservation plan with "no-disturbance" zones
- [ ] b) Leave 40% of buildable lot area, not including area under roof, undisturbed

***OR*** Where the site is previously developed, meet all the following:

- [ ] c) Develop tree / plant preservation plan with "no-disturbance" zones AND
- [ ] Rehabilitate lot; undo soil compaction and remove invasive plants AND
- [ ] Meet the requirements of SS 2.2

***OR*** [x] d) Build on a lot to achieve a density of 40 units per acre.

### 2. Landscaping

**2.1 ✍ No Invasive Plants** — *Prereq.* — *Y*

**2.2 ✍ Basic Landscaping Design *(meet all of the following)*** — *1* — *1* — *0* — *0*

- [x] a) Any turf must be drought-tolerant.
- [x] b) Do not use turf in densely shaded areas.
- [x] c) Do not use turf in areas with slope of 25%
- [x] d) Add mulch or soil amendments as appropriate.
- [x] e) All compacted soil must be tilled to at least 6 inches.

***AND/OR*** **2.3 ✍ Limit Conventional Turf for MID-RISE** — *2* — *2* — *0* — *0*

[ ] Percentage of designed landscape softscape area that is turf

***AND/OR*** **2.4 ✍ Drought-Tolerant Plants for MID-RISE** — *1* — *1* — *0* — *0*

[ ] Percentage of installed plants that are drought-tolerant

- [ ] Both points in SS 2.3 are met ( ≤ 20% turf)

***OR*** **2.5 ✍ Reduce Overall Irrigation Demand by at Least 20% for MID-RISE** — *3* — *0* — *0* — *0*

[ ] Percentage reduction in estimated irrigation water demand *(calculate)*

### 3. Reduce Local Heat Island Effects

**3.1 ✍ Reduce Site Heat Island Effects for MID-RISE (meet one)** — *1* — *0* — *0* — *0*

- [ ] a) Locate trees / plantings to provide shade for 50% of hardscapes
- [ ] b) Install light-colored, high-albedo materials for 50% of sidewalks, patios, and driveways

**3.2 ✍ Reduce Roof Heat Island Effects for MID-RISE (meet one)** — *1* — *1* — *0* — *0*

- [ ] a) Install roof with high albedo materials on 75% of roof area
- [ ] b) Install a vegetated roof for at least 50% of roof area
- [ ] c) Install combination of high albedo and vegetated roof

## 4. Surface Water Management

| | | | | | |
|---|---|---|---|---|---|
| 4.1 | Permeable Lot for MID-RISE | 2 | 0 | 0 | 0 |

- [ ] vegetative landscape
- [ ] permeable paving
- [ ] impermeable surfaces directed to on-site infiltration features
- [ ] other impermeable surfaces

| | | | | | |
|---|---|---|---|---|---|
| 4.2 | Permanent Erosion Controls *(meet one of the following)* | 1 | 0 | 0 | 0 |

- [ ] a) For portions of lot on steep slope, use terracing and retaining walls
- [ ] b) Plant trees, shrubs, or groundcover

| | | | | | |
|---|---|---|---|---|---|
| 4.3 | Stormwater Quality Control for MID-RISE *(meet one of the following)* | 2 | 0 | 0 | 0 |

- [ ] a) Stormwater mgmt plan designed in accordance with state or local program
- [ ] b) In-field performance monitoring data to demonstate compliance

## 5. Nontoxic Pest Control

| | | | | | |
|---|---|---|---|---|---|
| 5 | Pest Control Alternatives *(meet any of the following, 1/2 pt each)* | 2 | 1.5 | 0 | 0 |

- [ ] a) Keep all exterior wood at least 12" above soil
- [x] b) Seal external cracks, joints, etc. with caulking and install pest-proof screens
- [x] c) Include no wood-to-concrete connections, or separate connections with dividers
- [x] d) Install landscaping so mature plants are 24" from home

e) In 'moderate' to 'very heavy' termite risk areas:

- [ ] i) Treat all cellulosic material with borate product to 3' above foundation
- [ ] ii) Install sand or diatomaceous earth barrier
- [ ] iii) Install steel mesh barrier termite control system
- [ ] iv) Install non-toxic termite bait system
- [ ] v) Use noncellulosic wall structure
- [ ] vi) Use solid concrete foundation walls or pest-proof masonry wall design

## 6. Compact Development

| | | | | | |
|---|---|---|---|---|---|
| 6.1 | Moderate Density for MID-RISE | 2 | 0 | 0 | 0 |

132 # of total units on the lot | 1.1 lot size (acres) | 120.0 density (units/acre)

| | | | | | | |
|---|---|---|---|---|---|---|
| OR | 6.2 | High Density for MID-RISE | 3 | 0 | 0 | 0 |
| OR | 6.3 | Very High Density for MID-RISE | 4 | 4 | 0 | 4 |

## 7. Alternative Transportation

| | | | | | |
|---|---|---|---|---|---|
| 7.1 | Public Transit for MID-RISE (meet one of the following) | 2 | 1 | 1 | 0 |

- [x] a) Within 1/2 mile of transit services providing 30 rides per weekday
- [ ] b) Within 1/2 mile of transit services providing 60 rides per weekday

| | | | | | |
|---|---|---|---|---|---|
| 7.2 | Bicycle Storage for MID-RISE | 1 | 1 | 0 | 0 |

[ ] secure, covered storage capacity (# of bicycles)

| | | | | | |
|---|---|---|---|---|---|
| 7.3 | Parking Capacity/Low-Emitting Vehicles for MID-RISE (meet one) | 1 | 0 | 1 | 0 |

- [ ] a) Provide low-emitting, fuel-efficient vehicles for 3% of the total parking capacity
- [ ] b) 5% of total capacity is preferred parking spots for low-emitting vehicles
- [ ] c) Alternative-fuel refueling stations for 3% of total vehicle capacity
- [ ] d) Size parking to not exceed min zoning req'ts, AND
- [ ] Provide infrastructure to facilitate shared vehicle usage
- [ ] e) Provide no new parking

## Water Efficiency (WE) (Minimum 3 WE Points Required)

| Max: 15 | Y:8 | M:1 | Notes | Final: 0 |
|---|---|---|---|---|

### 1. Water Reuse

| | | Max | Y | M | Final |
|---|---|---|---|---|---|
| 1 | Water Reuse for MID-RISE | 5 | 0 | 0 | 0 |

[ ] of total water demand offset by water reuse strategies (mark any/all strategies adopted)

- [ ] Rainwater harvesting
- [ ] Graywater reuse
- [ ] Municipal recycled water

### 2. Irrigation System

| | | Max | Y | M | Final |
|---|---|---|---|---|---|
| 2.1 | High-Efficiency Irrigation System for MID-RISE *(meet any, 0.5 pt each)* | 2 | 2 | 0 | 0 |

- [ ] a) Irrigation system designed by EPA Water Sense certified professional
- [ ] b) Irrigation system with head-to-head coverage
- [x] c) Install central shut-off valve
- [ ] d) Install submeter for the irrigation system
- [x] e) Use drip irrigation for 50% of planting beds
- [x] f) Create separate zones for each type of bedding
- [x] g) Install timer or controller for each watering zone
- [ ] h) Install pressure-regulating devices
- [ ] i) High-efficiency nozzles with distribution uniformity of at least 0.70.
- [ ] j) Install check valves in heads
- [ ] k) Install moisture sensor or rain delay controller
- [ ] l) Third-party inspection of irrigation system

*OR*

| | | Max | Y | M | Final |
|---|---|---|---|---|---|
| 2.2 | Reduce Overall Irrigation Demand by at Least 45% for MID-RISE | 2 | 0 | 0 | 0 |

[0%] Percentage reduction in estimated irrigation water demand (see SS 2.5)

### 3. Indoor Water Use

| | | Max | Y | M | Final |
|---|---|---|---|---|---|
| 3.1 | High-Efficiency Fixtures and Fittings *(meet any of the following, 1 pt each)* | 3 | 1 | 0 | 0 |

- [ ] a) Average flow rate of lavatory faucets is ≤ 2.00 gpm
- [ ] b) Average flow rate for all showers is ≤ 2.00 gpm per stall
- [ ] c) Average flow rate for all toilets is ≤ 1.30 gpf; OR
  - [ ] Toilets are dual-flush; OR
  - [ ] Toilets meet the EPA Water Sense specification

| | | Max | Y | M | Final |
|---|---|---|---|---|---|
| 3.2 | Very High-Efficiency Fixtures and Fittings *(meet any, 2 pts each)* | 6 | 4 | 0 | 0 |

- [ ] a) Average flow rate of lavatory faucets is ≤ 1.50 gpm; OR
  - [ ] Lavatory faucets meet the EPA Water Sense specification
- [ ] b) Average flow rate for all showers ≤ 1.75 gpm per stall
- [ ] c) Average flow rate for all toilets is ≤ 1.10 gpf

| | | Max | Y | M | Final |
|---|---|---|---|---|---|
| 3.3 | Water Efficient Appliances for MID-RISE *(meet any of following, 1 pt each)* | 2 | 1 | 1 | 0 |

- [ ] a) Water-efficient clothes washers with MEF ≥ 2.0 and WF < 5.5
- [ ] b) ENERGY STAR dishwasher(s) that use ≤ 6.0 gallons per cycle

## Energy & Atmosphere (EA) (Minimum 0 EA Points Required) — Max: 38 Y:10 M:1 — Notes — Final: 9

### 1. Optimize Energy Performance in Mid-rise Buildings

**1.1 Minimum Energy Performance for MID-RISE *(meet all of the following)*** — Prereq. Y

- [x] Meets mandatory prov. of ASHRAE Std. 90.1-2004, Sec. 5.4, 6.4, 7.4, 8.4, 9.4, 10.4
- [x] EPA Multifamily Simulation Guidelines incorporated into modeling methodology
- [x] Achieve 15% energy cost savings compared to ASHRAE Std. 90.1-2007, Appendix G
- [x] Energy model submitted and reviewed by USGBC

**1.2 Testing and Verification for MID-RISE *(meet one of the following)*** — Prereq. Y

- [ ] Use EPA MFHR Testing & Verification Protocols
- [x] Use Alternative Compliance Path, Option 2

**1.3 Optimize Energy Performance for MID-RISE** — 34 | 9 | 0 | 9

***22.0%*** % energy cost savings compared with ASHRAE 90.1-2007

### 7. Water Heating

**7.1 Efficient Hot Water Distribution System *(meet one of the following)*** — 2 | 0 | 0 | 0

- [ ] a) Structured plumbing system
- [ ] b) Central manifold distribution system
- [ ] c) Compact design of conventional system

**7.2 Pipe Insulation** — 1 | 0 | 1 | 0

### 11. Residential Refrigerant Management

**11.1 Refrigerant Charge Test** — Prereq. Y

**11.2 Appropriate HVAC Refrigerants *(meet one of the following)*** — 1 | 1 | 0 | 0

- [ ] a) Use no refrigerants
- [x] b) Use non-HCFC refrigerants
- [ ] c) Use refrigerants that complies with global warming potential equation

## Materials & Resources (MR) (Minimum 2 MR Points Required) — Max: 16 Y:8.5 M:0 — Notes — Final: 2

### 1. Material-Efficient Framing

**1.1 Framing Order Waste Factor** — Prereq. Y

**1.2 Detailed Framing Documents** — 1 | 0 | 0 | 0

***AND/OR*** **1.3 Detailed Cut List and Lumber Order** — 1 | 0 | 0 | 0

- [ ] Requirements of MR 1.2 have been met
- [ ] Detailed cut list and lumber order corresponding to framing plans or scopes

***AND/OR*** **1.4 Framing Efficiencies *(meet any of the following, see Rating System for pts)*** — 3 | 0 | 0 | 0

- [ ] Precut framing packages
- [ ] Open-web floor trusses
- [ ] Structural insulated panel walls
- [ ] Structural insulated panel roof
- [ ] Structural insulated panel floors
- [ ] Stud spacing greater than 16" on center
- [ ] Ceiling joist spacing greater than 16" on center
- [ ] Floor joist spacing greater than 16" on center
- [ ] Roof rafter spacing greater than 16" on center
- [ ] Two of the following: Size headers for loads; ladder blocking; drywall clips; 2-stud corners

***OR*** **1.5 Off-site Fabrication *(meet one of the following)*** — 4 | 4 | 0 | 0

- [x] a) Panelized construction
- [ ] b) Modular, prefabricated construction

## 2. Environmentally Preferable Products

**2.1** FSC Certified Tropical Wood *(meet all of the following)* — ***Prereq.*** ***Y***

- [x] a) Provide suppliers with a notice of preference for FSC products; AND
- [x] Request country of manufacture for each wood product
- [ ] b) No tropical wood installed (exceptions for FSC-certified or reclaimed wood)

**2.2** Environmentally Preferable Products *(meet any, 1/2 pt each)* — ***8*** ***2.5*** *0* ***0***

| *Assembly : component* | *(a) EPP* | | | *(b) Low emission* | | *(c) Local production* | |
|---|---|---|---|---|---|---|---|
| Exterior wall: framing | ☐ | | type: | | | ☐ | |
| Exterior wall: siding or masonry | ☐ | | type: | | | ☐ | |
| Floor: flooring | ☐ | (45%) | type: | ☐ | 90% hard flooring | ☐ | (45%) |
| Floor: flooring | ☐ | (90%) | type: | ☑ | SCS FloorScore | ☐ | (90%) |
| Floor: flooring | | | | ☐ | Green Label Plus | | |
| Floor: framing | ☐ | | type: | | | ☐ | |
| Foundation: aggregate | ☐ | | type: | | | ☑ | |
| Foundation: cement | ☑ | | type: | | | ☐ | |
| Interior wall: framing | ☐ | | type: | | | ☐ | |
| Interior wall, ceiling: gypsum board | ☑ | | type: | | | ☐ | |
| Interior wall, ceiling, millwork: paint | ☐ | | type: | ☑ | type: | | |
| Landscape: decking and patio | ☐ | | type: | | | ☐ | |
| Other: cabinet | ☐ | | type: | | | ☐ | |
| Other: counter | ☐ | | type: | | | ☐ | |
| Other: door | ☐ | | type: | | | ☐ | |
| Other : interior trim | ☐ | | type: | | | ☐ | |
| Other : adhesive, sealant | | | | ☐ | type: | | |
| Other : window frame | ☐ | | type: | | | ☐ | |
| Roof: framing | ☐ | | type: | | | ☐ | |
| Roof: roofing | ☐ | | type: | | | ☐ | |
| Roof, floor, wall: cavity insulation | ☐ | | type: | ☐ | type: | ☐ | |
| Roof, floor, wall (2 of 3): sheathing | ☐ | | type: | | | ☐ | |
| Other: water supply piping | ☐ | | type: | | | | |
| Other: driveway | ☐ | | type: | | | | |

## 3. Waste Management

**3.1** Construction Waste Management Planning *(meet both of the following)* — ***Prereq.*** ***Y***

- [x] a) Investigate local options for waste diversion
- [x] b) Document diversion rate for construction waste

**3.2** Construction Waste Reduction *(use one of the following methods)* — ***3*** ***2*** *0* ***2***

- [ ] a) pounds waste / square foot
- [ ] cubic yards waste / 1,000 square feet
- ***63%*** b) percentage of waste diverted

| **Indoor Environmental Quality (EQ)** (Minimum 3 EQ Points Required) | ***Max: 21*** | ***Y:5*** | ***M:11*** | ***Notes*** | ***Final: 0*** |
|---|---|---|---|---|---|

**2. Combustion Venting**

| | | | | | |
|---|---|---|---|---|---|
| 2 | Basic Combustion Venting Measures for MID-RISE (meet all the following) | ***Prereq.*** | ***Y*** | | |

- ☑ a) no unvented combustion appliances
- ☑ b) carbon monoxide monitors on each floor of each unit
- ☑ c) no fireplace installed, OR
- ☐ all fireplaces and woodstoves have doors
- ☑ d) space, water heating equipment designed with closed combustion; OR
- ☐ space and water heating equipment has power-vented exhaust; OR
- ☐ space and water heating equipment located in detached or open-air facility; OR
- ☐ no space- or water-heating equipment with combustion

**3. Moisture Control**

| | | | | | |
|---|---|---|---|---|---|
| 3 | Moisture Load Control *(meet one of the following)* | ***1*** | ***0*** | ***1*** | ***0*** |

- ☐ a) Additional dehumidification system
- ☑ b) HVAC system equipped with additional dehumidification mode

**4. Outdoor Air Ventilation**

| | | | | | |
|---|---|---|---|---|---|
| 4.1 | Basic Outdoor Air Ventilation for MID-RISE (meet all of the following) | ***Prereq.*** | ***Y*** | | |

- ☑ a) ASHRAE 62.2-2007 met for all in-unit spaces
- ☑ b) ASHRAE 62.1-2007, Sections 4 through 7 met for residential-associated spaces

| | | | | | |
|---|---|---|---|---|---|
| 4.2 | Enhanced Outdoor Air Ventilation for MID-RISE | ***2*** | ***0*** | ***2*** | ***0*** |
| 4.3 | Third-Party Performance Testing for MID-RISE | ***1*** | ***0*** | ***1*** | ***0*** |

**5. Local Exhaust**

| | | | | | |
|---|---|---|---|---|---|
| 5.1 | Basic Local Exhaust for MID-RISE (meet all of the following) | ***Prereq.*** | ***Y*** | | |

- ☑ a) In-unit bathrooms and kitchens meet ASHRAE 62.2-2007 air flow requirements
- ☑ b) Fans and ducts designed and installed to ASHRAE Std. 62.2
- ☑ c) Air exhausted to outdoors through roof or outside wall
- ☑ d) ENERGY STAR labeled bathroom exhaust fans OR
- ☐ Multi-port bathroom exhaust systems installed
- ☑ e) Common bathrooms and kitchens meet ASHRAE 62.1-2007 air flow requirements

| | | | | | |
|---|---|---|---|---|---|
| 5.2 | Enhanced Local Exhaust *(meet one of the following)* | ***1*** | ***1*** | ***0*** | ***0*** |

- ☐ a) Occupancy sensor
- ☐ b) Automatic humidistat controller
- ☐ c) Automatic timer tied to switch to operate fan for 20+ minutes post-occupancy
- ☑ d) Continuously operating exhaust fan

| | | | | | |
|---|---|---|---|---|---|
| 5.3 | Third-Party Performance Testing for MID-RISE | ***1*** | ***0*** | ***1*** | ***0*** |

## 6. Distribution of Space Heating and Cooling

| | | | | | | |
|---|---|---|---|---|---|---|
| 6.1 | Room-by-Room Load Calculations | *Prereq.* | *Y* | | | |
| 6.2 | Return Air Flow / Room-by-Room Controls *(meet one of the following)* | *1* | *1* | *0* | | *0* |

A. Forced-Air Systems

- [x] a) Return air opening of 1 sq. inch per cfm of supply
- [ ] b) Limited pressure differential between closed room and adjacent spaces

B. Nonducted HVAC Systems

- [ ] Flow control valves on every radiator
- [ ] Radiant floor system with thermostatic controls in every room

| | | | | | | |
|---|---|---|---|---|---|---|
| 6.3 | Third-Party Performance Test / Multiple Zones *(meet one of the following)* | *2* | *0* | *2* | | *0* |

A. Forced-Air Systems

- [x] Have supply air flow rates in each room tested and confirmed

B. Nonducted HVAC Systems

- [ ] Install at least two distinct zones with independent thermostat control

## 7. Air Filtering

| | | | | | | |
|---|---|---|---|---|---|---|
| | 7.1 Good Filters | *Prereq.* | *Y* | | | |
| | 7.2 Better Filters | *1* | *0* | *1* | | *0* |
| *OR* | 7.3 Best Filters | *2* | *0* | *0* | | *0* |

## 8. Contaminant Control

| | | | | | | |
|---|---|---|---|---|---|---|
| 8.1 | Indoor Contaminant Control during Construction | *1* | *0* | *1* | | *0* |
| 8.2 | Indoor Contaminant Control for MID-RISE (meet any of following, 1 pt each) | *2* | *1* | *0* | | *0* |

- [x] a) Install permanent walk-off mats for each unit
- [x] Install central entryway system
- [ ] b) In each unit, design shoe removal and storage space near primary entryway
- [ ] c) In each unit, install central vacuum system with exhaust to outdoors

| | | | | | | |
|---|---|---|---|---|---|---|
| 8.3 | Preoccupancy Flush | *1* | *0* | *0* | | *0* |

## 9. Radon Protection

| | | | | | | |
|---|---|---|---|---|---|---|
| 9.1 | Radon-Resistant Construction in High-Risk Areas | *Prereq.* | *Y* | | | |
| 9.2 | Radon-Resistant Construction in Moderate-Risk Areas | *1* | *0* | *0* | | *0* |

## 10. Garage Pollutant Protection

| | | | | | | |
|---|---|---|---|---|---|---|
| 10.1 | No HVAC in Garage | *Prereq.* | *Y* | | | |
| 10.2 | Minimize Pollutants from Garage for MID-RISE (meet all of the following) | *2* | *2* | *0* | | *0* |

a) In conditioned spaces above garage:

- [x] Seal all penetrations and connecting floor and ceiling joist bays

b) In conditioned spaces next to garage

- [x] Weather-strip all doors
- [x] Carbon monoxide detectors in rooms that share a door with garage
- [x] Seal all penetrations and cracks at the base of walls

- [ ] c) Vestibule to provide airlock between garage and adjacent spaces; OR
- [x] Provide self-closing doors and deck-to-deck partitions
- [x] d) Continuous exhaust in garage

| | | | | | | |
|---|---|---|---|---|---|---|
| *OR* | 10.3 Detached Garage or No Garage | *3* | *0* | *0* | | *0* |

**11. Environmental Tobacco Smoke Control**

| | | | | | |
|---|---|---|---|---|---|
| 11 | Env. Tobacco Smoke Reduction for MID-RISE (meet part (a) or (b) below) | 1 | 0 | 1 | 0 |

a) Reduce smoke exposure and transfer (1/2 point)

- ☐ Prohibit smoking in all common areas
- ☐ Any exterior smoking areas are > 25 ft from entries, air intakes, windows
- ☐ Prohibit on-property smoking within 25 feet of entries, intakes, windows
- ☐ Prohibitions communicated through lease agreements, CC&Rs, signage

b) Prohibit smoking throughout the building (1 points)

- ☐ Prohibit smoking within living units
- ☐ Prohibit smoking in all common areas of the building
- ☐ Any exterior smoking areas are > 25 ft from entries, air intakes, windows
- ☐ Prohibitions communicated through lease agreements, CC&Rs, signage

**12. Compartmentalization of Units**

| | | | | | |
|---|---|---|---|---|---|
| 12.1 | Compartmentalization of Units *(meet both of the following)* | Prereq. | Y | | |

- ☐ a) Air-seal and/or weather-strip all walls, chases, doors, windows, etc.
- ☐ b) Demonstrate minimal leakage of 0.30 CFM50 per square foot of enclosure

| | | | | | |
|---|---|---|---|---|---|
| 12.2 | Enhanced Compartmentalization of Units | 1 | 0 | 1 | 0 |

## Awareness & Education (AE) (Minimum 0 AE Points Required)

Max: 3 | Y:2 | M:0 | Notes | Final: 0

**1. Education of the Homeowner or Tenant**

| | | | | | |
|---|---|---|---|---|---|
| 1.1 | Basic Operations Training *(meet both of the following)* | Prereq. | Y | | |

- ☐ a) Operations and training manual
- ☐ b) One-hour walkthrough with occupant(s)

| | | | | | |
|---|---|---|---|---|---|
| 1.2 | Enhanced Training | 1 | 0 | 0 | 0 |
| 1.3 | Public Awareness *(meet three of the following)* | 1 | 1 | 0 | 0 |

- ☐ a) Open house on at least four weekends
- ☐ b) Website about features and benefits of LEED homes
- ☐ c) Newspaper article on the project
- ☐ d) Display LEED signage on the exterior of the home

**2. Education of the Building Manager**

| | | | | | |
|---|---|---|---|---|---|
| 2 | Education of the Building Manager *(meet both of the following)* | 1 | 1 | 0 | 0 |

- ☑ a) Operations and training manual
- ☑ b) One-hour walkthrough with building manager

## USGBC LEGAL DISCLAIMER

*USGBC makes no warranty with respect to any LEED certified project, including any warranty of habitability, merchantability, or fitness for a particular purpose. There are no warranties, express or implied, written or oral, statutory or otherwise, with respect to the certifications provided by USGBC. By way of example only, and without limiting the broad scope of the foregoing, it is understood that LEED certification, whether at the Certified level or any other level, does not mean that the project is structurally sound or safe, constructed in accordance with applicable laws, regulations or codes, free of mold or mildew, free of volatile organic compounds or allegens, or free of soil gases including radon.*

## SIGNATURES BY RESPONSIBLE PARTIES

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been met for the indicated credits and will, if audited, provide the necessary supporting documents.

| | | | |
|---|---|---|---|
| Project Team Leader | | Company | |
| Signature | | Date | |

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the required inspections and performance testing for the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been completed. I have evaluated this project's documentation package and conducted the necessary QA/QC procedures with the Green Rater, and I hereby declare and affirm to USGBC that the homes included in this submittal are ready to earn LEED for Homes certification, as per the attached checklist.

| | | | |
|---|---|---|---|
| Provider QAD | | Company | |
| Signature | | Date | |

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the required inspections and performance testing for the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been completed.

I also hereby confirm that all verification services were performed in accordance with the LEED for Homes Verification & Submittal Guidelines and Addendum.

| | | | |
|---|---|---|---|
| Green Rater | | Company | |
| Signature | | Date | |

By affixing my signature below, the undersigned does hereby declare and affirm to the USGBC that the required inspections and performance testing for the LEED for Homes requirements, as specified in the LEED for Homes Rating System, have been completed.

I also hereby confirm that all verification services were performed in accordance with the LEED for Homes Verification & Submittal Guidelines and Addendum.

| | | | |
|---|---|---|---|
| Green Rater | | Company | |
| Signature | | Date | |