87-93 West Broadway, South Boston, MA

Mixed-Use Residential/Commercial Development

PROJECT NOTIFICATION FORM June 21, 2017

Submitted Pursuant to Article 80B of the Boston Zoning Code

SUBMITTED BY:

Broadway & A St. LLC
c/o Oranmore Enterprises LLC
36 Central Avenue, Unit C-2
Milton, MA 02186

SUBMITTED TO:

Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201

PREPARED BY:

Mitchell L. Fischman ("MLF Consulting") LLC
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IN ASSOCIATON WITH:

Adams & Morancy, P.C.
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Howard Stein Hudson
Tech Environmental, Inc.
Soden Sustainability Consulting
BSC Group
Cooperstown Environmental LLC
KMM Geotechnical Consultants LLC

Adams & Morancy
COUNSELORS - AT - LAW

June 21, 2017

Mr. Brian Golden, Director
Boston Planning and Development Agency
Boston City Hall, 9th Floor
Boston, MA 02201
Attn: Mr. Michael Rooney, Project Manager

Re: 87-93 West Broadway Mixed-Use Residential / Commercial Project
South Boston
Project Notification Form (PNF)

Dear Director Golden:

On behalf of the Proponent, **Broadway & A St. LLC**, we are pleased to submit this Project Notification Form ("PNF") to the Boston Planning and Development Agency ("BPDA") in accordance with the Article 80B-2 Large Project Review requirements of the Boston Zoning Code, with respect to a proposed mixed-use residential/commercial development at 87-93 West Broadway in South Boston. The public notice for the PNF appears in the June 21, 2017, edition of the *Boston Herald*.

The Project proposes construction of a new mixed-use building with approximately 65 residential units and 9,000 square feet of ground floor commercial space, comprising 98,000 square feet of gross floor area, with 88 below-grade garage parking spaces accessed from Silver Street, and two HP van spaces on the first floor accessed from the right-of-way abutting 101 West Broadway (the South Boston District C-6 Police Station) connecting West Broadway to Silver Street (the "Proposed Project"). The scope and scale of the Proponent's residential program is intended to advance the residential policy goals of Mayor Walsh's "Housing Boston 2030" housing strategy.

The site comprises 0.45 acres (19,723 square feet), and is bounded to the north by West Broadway, to the south by Silver Street, to the west by A Street, and to the east on West Broadway by the right-of-way referenced in the preceding paragraph. The site is currently occupied by a gas station with access from both West Broadway and A Street via three large curb cuts, two on the West Broadway side and one on the A Street side of the property. The gas station includes a main retail store, a cashier's building, and six pump stations on two covered islands, all of which would be demolished to allow for the completion of the Proposed Project.

350 West Broadway, South Boston, MA 02127-1972
Tel.: 617-269-5800 • Fax: 617-657-5934

In accordance with BPDA requirements, please find attached ten (10) copies of the PNF plus a CD containing the electronic PNF file to be uploaded to the BPDA's online portal for public review.

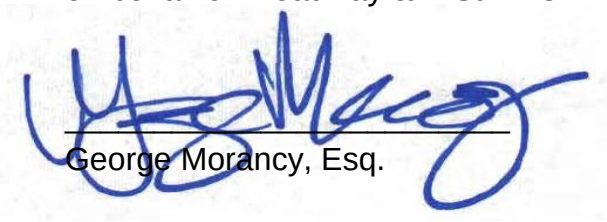
The Proposed Project exceeds the 50,000 square foot size threshold of Article 80 for a project within a Boston neighborhood, and therefore requires several additional filings pursuant to Large Project Review regulations. A Letter of Intent to File a Project Notification Form was filed with the BPDA on April 21, 2017 (attached hereto as Appendix "A").

In support of the Article 80 Large Project Review process, the Proponent has conducted, and will continue to conduct, community outreach with neighbors and abutters of the site, including meetings and discussions with elected representatives and other officials, as well as presentations to residents of the surrounding neighborhood sponsored by relevant local civic associations.

On behalf of the entire project team, we would like to thank you and the BPDA staff assigned to the 87-93 West Broadway Mixed-Use Project, particularly the Project Manager, Michael Rooney, and the reviewing Urban Design staff, Michael Cannizzo and Matthew Martin, for their invaluable assistance to date in assisting the development team in shaping the Proposed Project and in completing this comprehensive PNF filing.

We believe that the Proposed Project will constitute a significant positive addition to the South Boston neighborhood, by revitalizing this underutilized site with much-needed new housing in an attractive and thoughtfully designed building. We look forward to continuing the Large Project Review process and advancing the Proposed Project through public review with the cooperation of the BPDA, other City officials, members of the Impact Advisory Committee, and the South Boston community.

Very truly yours,
Adams & Morancy, P.C.,
on behalf of Broadway & A St. LLC



George Morancy, Esq.

350 West Broadway, South Boston, MA 02127-1972
Tel.: 617-269-5800 • Fax: 617-657-5934

Attachment: 87-93 West Broadway Project Notification Form

Cc: Jonathan Greeley, BPDA
Michael Rooney, BPDA
Michael Moore, Broadway & A St LLC
Mitchell Fischman, Mitchell L. Fischman ("MLF") Consulting, LLC
Joseph Rull, MJR Consulting, LLC

350 West Broadway, South Boston, MA 02127-1972
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1.0 EXECUTIVE SUMMARY

1.1 Introduction

Broadway & A St LLC, a Massachusetts Limited Liability Company c/o Oranmore Enterprises LLC (the "Proponent") is submitting this Project Notification Form ("PNF") to the Boston Planning and Development Agency ("BPDA") for a mixed use multi-family residential/ retail development at 87-93 West Broadway in the South Boston neighborhood in accordance with the Article 80 requirements of the Boston Zoning Code ("Code"). The Project proposes construction of approximately 65 residential units with 9,000 square feet (sf) of ground floor retail space with a total overall project floor area of approximately 98,000 sf and with approximately 88 below-level garage spaces accessed from a new driveway off Silver Street and two handicapped van spaces accessed from the adjacent private driveway on the first floor (the "Proposed Project"). The existing curb cuts along West Broadway and A Street will be closed as part of the Project. Loading and service will be from West Broadway. The Project will include an on-site bicycle storage room for approximately 65 bicycles.

The proposed site includes 0.45 acres (19,723 sf) bounded to the north by West Broadway, to the south by Silver Street, to the west by A Street, and to the east by the right-of-way abutting 101 West Broadway (the South Boston District C-6 Police Station). The scope and scale of the Proponent's residential program is also intended to further the residential policy goals of Martin Walsh's 2030 Housing Plan. It should also be noted that the BPDA is in the process, with City officials and neighborhood participants, of updating the zoning of both East Broadway and West Broadway, and that the Proposed Project was designed taking into consideration anticipated new building height and massing limitations on West Broadway. Please see **Figures 1-1** thru **1-5**.

A Letter of Intent to File a Project Notification Form was filed with the Boston Planning and Development Agency for the proposed mixed-use development on April 21, 2017 (See **Appendix A**).

The nearby neighborhood is a mix of light industrial, retail, and other commercial uses, as well as residential buildings ranging from a small number of single-family homes to numerous multi-unit condominiums and apartments. MBTA buses run on routes 9, 11 and 47 close to the site on both Dorchester Avenue and West Broadway, and the Broadway Redline Line rapid transit station is one block from the site. Broadway Station provides a direct connection to South Station and downtown Boston, and points north to Cambridge and south to Quincy. The context of the immediate area is supportive of, and well-suited to, the proposed scale and scope of the Proposed Project, including several buildings of four to six stories in height, and the Macallen Building with a height of up to ten stories at Dorchester Avenue and West Fourth Street.

Figure 1-1. Project Locus

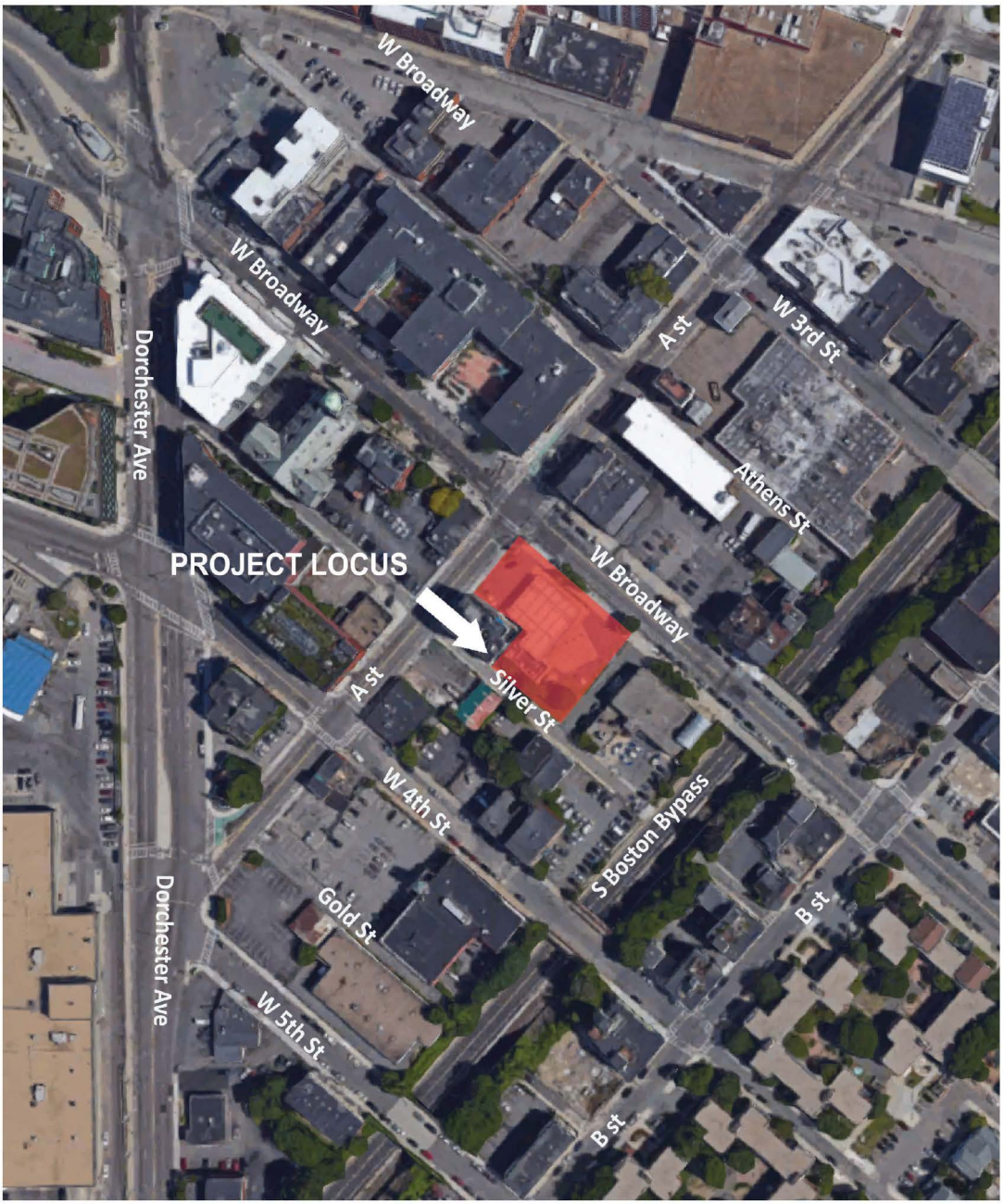


Figure 1-2. USGS Map

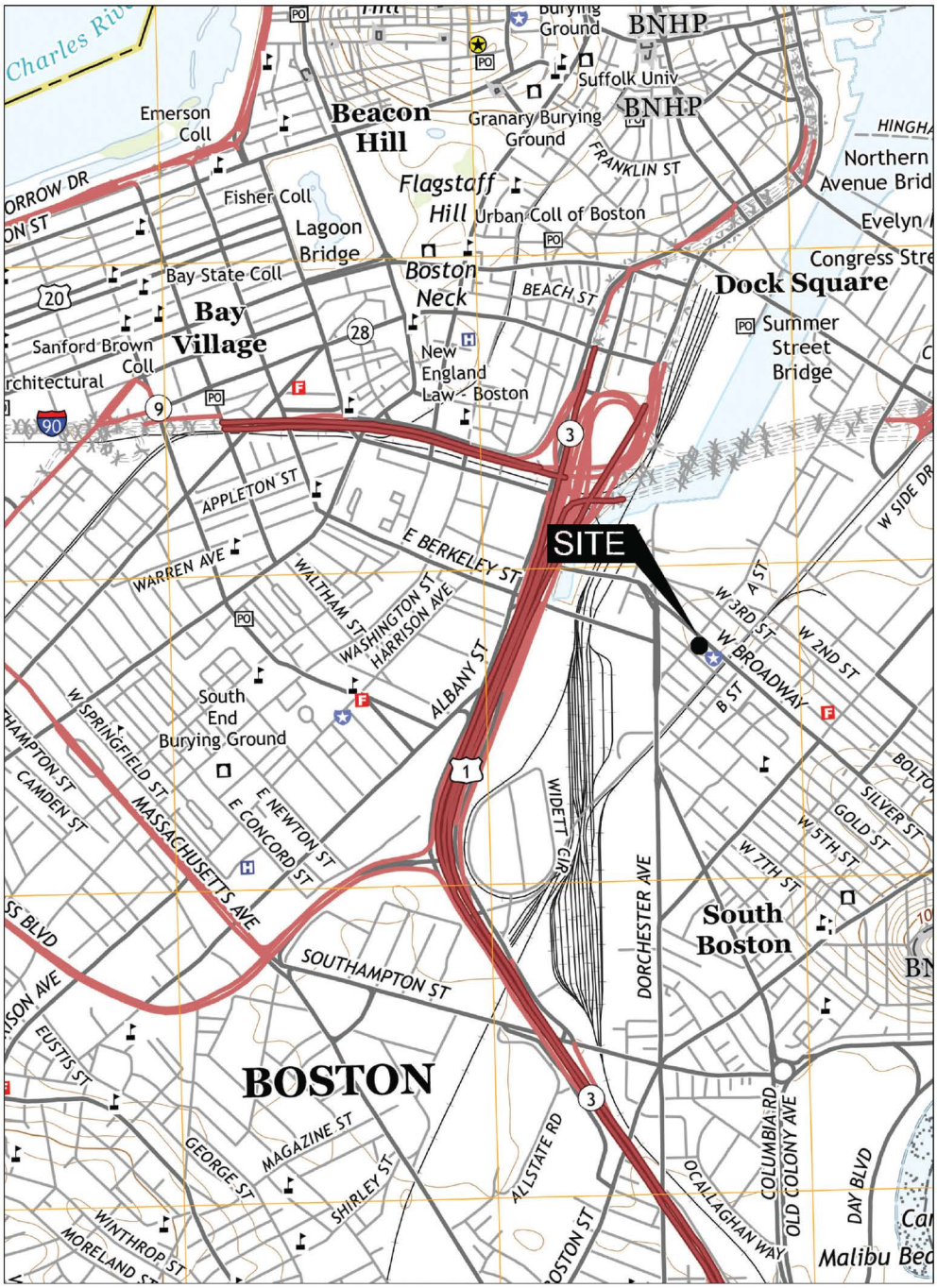


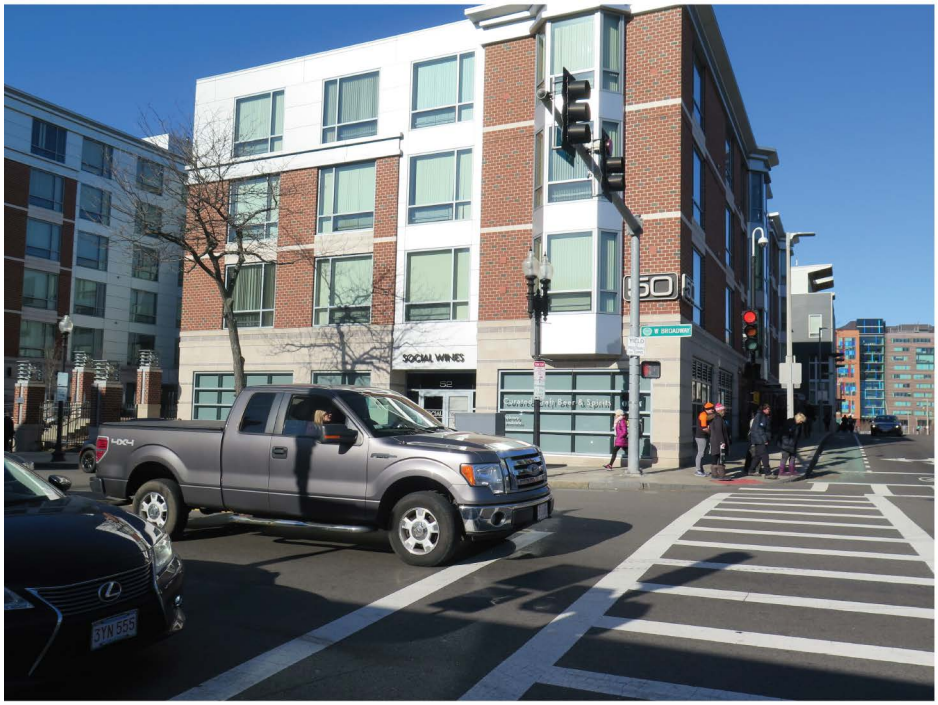
Figure 1-3. Existing Site Photos

Existing Gas Station on Site

View of Site Along West Broadway

Figure 1-4. Existing Site Photos

Amarins Restaurant Across From Site



50 West Broadway at the Corner of A Street

Figure 1-5. Existing Site Photos

Driveway Next to the Site at 103-111 West Broadway

Silver Street at Rear of the Site

Figure 1-6. Existing Site Photos

Adjacent Buildings Along Silver Street

Rear of Existing Gas Station Along Silver Street

1.2 Detailed Project Description

1.2.1 Existing Conditions Plan

The proposed site includes 0.45 acres (19,723 sf) bounded to the north by West Broadway, to the south by Silver Street, to the west by A Street and to the east by the right-of-way abutting 101 West Broadway (the South Boston District C-6 Police Station). The site is currently occupied by a gas station with access from West Broadway and A Street from two large curb cuts on West Broadway and one on A Street. The station includes a main structure with six gas pumps on two islands, all of which will be demolished to allow for the new construction. (See **Figure 1-7**. **Existing Conditions Plan.**)

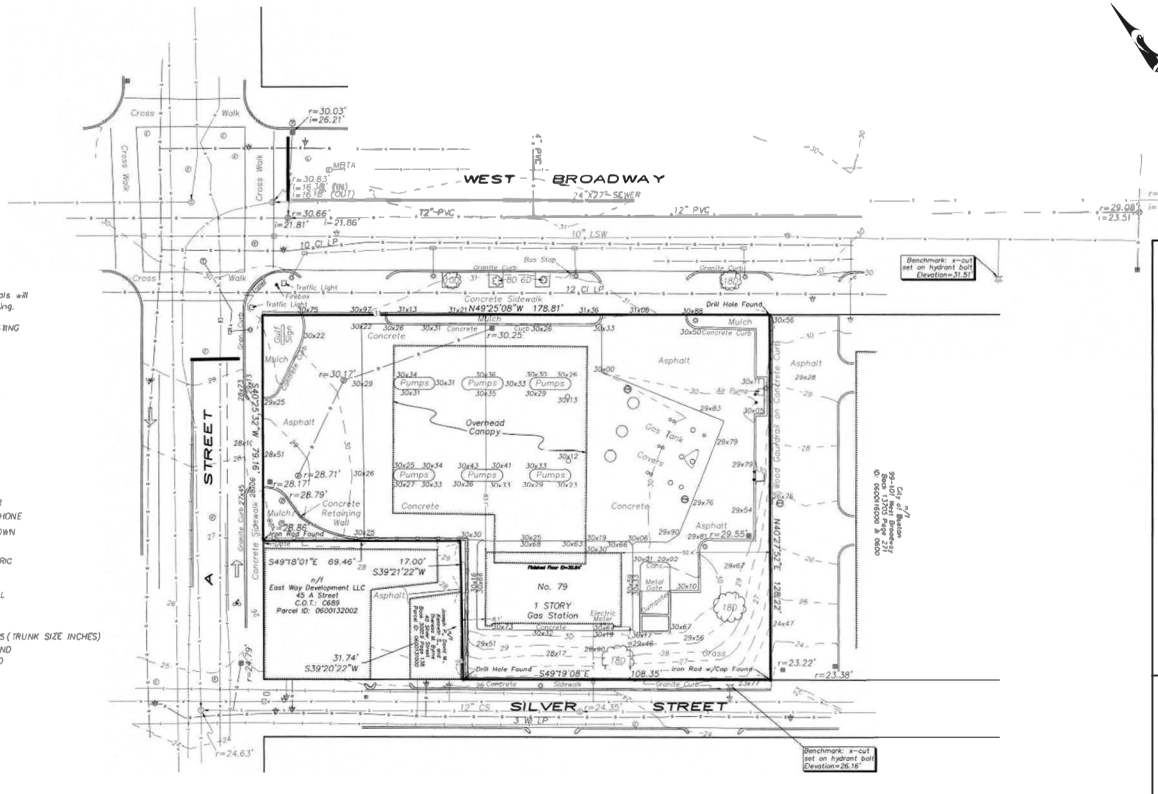
1.2.2 Detailed Project Program

The Project proposes construction of 65 multi-family residential units with 9,000 square feet of ground-floor retail space and lobby, with a total buildout of approximately 98,000 square feet, including approximately 88 below-level garage spaces accessed from a new driveway along Silver Street, and two handicapped van spaces on the first floor accessed from the adjacent right-of-way (the "Proposed Project"). The residential units currently planned to include 55 two-bedroom and 10 one-bedroom units. At least two retail spaces are planned for the ground floor along West Broadway. Surrounded by several abutting and nearby structures of four (4) to six (6) stories in height, including a multi-story apartment building across from the site at the corner of West Broadway and A Street, the context of the immediate area is supportive of and well-suited to the scale and scope of the Proposed Project. See Project Dimensions in **Table 1-1** below.

Table 1-1. Approximate Project Dimensions of Proposed Project

Lot Area	0.45 acres / 19,723 square feet
Gross Floor Area	98,000 square feet
Floor Area Ratio	4.9
Floors	6
Height*	69.5 feet

*Height from Average Front Grade



LOCUS MAP (N.T.S.)

LEGEND

These standard symbols will be found in the drawing.

- STRUCTURE EXISTING
- GAS LINE
- WATER LINE
- DRAIN LINE
- SEWER LINE
- ELECTRIC LINE
- TELEPHONE LINE
- FENCE WOOD
- GUARD RAIL
- GAS GATE
- WATER GATE
- HYDRANT
- CATCH BASIN
- MANHOLE DRAIN
- MANHOLE SEWER
- MANHOLE TELEPHONE
- MANHOLE UNKNOWN
- MANHOLE CABLE
- MANHOLE ELECTRIC
- UTILITY POLE
- LIGHT POLE
- MONITORING WELL
- SIGN
- BOLLARD
- TREE DECIDUOUS (TRUNK SIZE INCHES)
- DRILL HOLE FOUND
- IRON ROD FOUND

GENERAL NOTES

OWNER OF RECORD: MOAWED PROPERTIES, LLC
79 WEST BROADWAY S. BOSTON, MA 02127

DEED REFERENCE: BOOK 26803, PAGE 347
CERT OF TITLE No. 117258 / DOCUMENT No. 618711

PLAN REFERENCE: L.C.P. 25786A

TAX MAP REFERENCE: PARCEL ID 0600113000 & 0600112000

DATUM REFERENCE: BOSTON CITY BASE

CURRENT DIMENSIONAL AND DENSITY REGULATIONS

THE ENTIRE SITE IS LOCATED IN A SBM(MFR/LS) ZONING DISTRICT

MINIMUM FRONT YARD (FT.)		
MINIMUM SIDE YARD (FT.)		
MINIMUM REAR YARD (FT.)	20'	18.7'
MAX. R. YD. ACC. BLDG. AREA (%)	25%	NA

THE ZONING INFORMATION DEPICTED HEREON IS FROM THE LATEST ZONING ORDINANCE OF THE MUNICIPALITY AND, AS SUCH, IS FOR REFERENCE PURPOSE ONLY. OTTE & DWYER, INC. MAKES NO OPINION OR CERTIFICATION AS TO ZONING COMPLIANCE. THE FINAL INTERPRETATION OF THE ORDINANCE CAN ONLY BE MADE BY THE APPROPRIATE ZONING AUTHORITY. SINCE BUILDING ORIENTATION, PROPOSED USE, AND OTHER FACTORS CAN AFFECT THE SETBACKS, PRIOR TO ANY DEVELOPMENT OF THIS PROPERTY THE BUILDER/OWNER MUST CONSULT WITH THE CITY/TOWN TO INSURE THE CORRECT APPLICATION OF THE ZONING ORDINANCE.

*THE FRONT YARD SETBACK SHALL BE DETERMINED THROUGH SMALL OR LARGE PROJECT REVIEW IF APPLICABLE, BUT SHALL BE THE MODAL FRONT YARD DEPTH AS CALCULATED BY THE METHOD PROVIDED IN SECTION 18.2 OF THE ZONING CODE.

ACCORDING TO THE F.E.M.A. MAP FOR SUFFOLK COUNTY MAP No. 25025C0063J DATED MARCH 16, 2016, THE PARCEL(S) FALLS IN AN AREA CLASSIFIED AS ZONE "X".

GENERAL UTILITY NOTE

The underground utilities depicted hereon are from field locations of observable evidence and/or compiled according to available record plans and are approximate only. The surveyor makes no guarantees that underground utilities depicted comprise all such utilities in the area, either in service or abandoned. The surveyor further does not warrant that the underground utilities are in the exact location indicated hereon although they were located as accurately as possible from the information available. Otte & Dwyer, Inc. and its surveyor assume no responsibility for damages incurred as a result of utilities shown or not shown on this plan. Always call DIGSAFE at 811 before you dig

UTILITY PLAN REFERENCE: BWSC AS-BUILT PLAN # 12-309-009 WestBroadway_M02 DATED 6/30/2016

I HEREBY CERTIFY THAT THIS SURVEY IS BASED ON AN ACTUAL FIELD SURVEY BY OTTE & DWYER, INC. - LAND SURVEYORS ON MARCH 22, 2017.

PROFESSIONAL LAND SURVEYOR
FOR OTTE & DWYER, INC.

EXISTING CONDITIONS PLAN OF LAND

91 93 WEST BROADWAY
BOSTON, MASS. 02127

PREPARED FOR

BRENCO CONSTRUCTION

BY

OTTE & DWYER, INC.
LAND SURVEYORS
WWW.OTTEDWYER.COM
59 APPLETON STREET — SAUGUS, MA 01906
P.O. BOX 982 — (781)233-8155

SCALE: 1"=20' — MARCH 30 2017

0' 20' 40' 60'
SCALE

JN. 12093

This map or plat is not valid without the seal and signature of the responsible surveyor

Figure 1-7. Existing Conditions Plan

The Site circulation plan is designed to create a safe and pleasant entry to the Proposed Project from West Broadway with a front door vehicle drop off at West Broadway. The rear facing garage will be accessed from Silver Street, with access to Silver Street from West Broadway being possible utilizing the existing right-of-way bounding the easterly side of the site. Service vehicle access will be provided from West Broadway.

1.3 Summary of Project Impacts and Mitigation

1.3.1 Urban Design

The proposed building is a six-story mixed use building whose first floor will be commercial space and parking with five floors of approximately 65 residences above, topped by a rooftop of private and common decks. The building also contains tenant storage areas and bicycle parking.

On the busy traffic intersection of West Broadway and A Street, this building stands as a gateway building into South Boston, both coming up A Street from the Seaport District, and into the City from Dorchester Avenue, as well as coming across the James M. Kelly Bridge. The proposed structure is similar in scale to the other developments around the MBTA's Broadway rapid transit station. This site, currently occupied by a gas station, has no substantial urban presence. A glass tower at the corner of West Broadway and A Street would occupy the corner, with a planned outdoor space at its base, and would be illuminated at night.

West Broadway, one block up from the Broadway Station, is quite busy with pedestrians. This building will offer varied commercial opportunities, with a potential restaurant and other retail spaces that would enhance the neighborhood with a more active streetscape. Street trees and bicycle parking would occupy the band of the sidewalk closest to the street, with an ample sidewalk next to the building. The trees and projecting canopy with a signage band above the retail space will bring the scale down on the sidewalk to the pedestrian level, while the signage above will appeal to the vehicular traffic passing by.

The mass of the building is scaled down by introduction of vertical recessed areas that are glazed at the backside, providing a break of the primary surface cladding and reflecting back the side walls of the recess. Horizontally, there is the commercial first floor, which is a glazed curtain wall with spandrel glass terminated by a projecting horizontal sign band. The main body of the building is the four floors of residences, which would be clad in a smooth surface indicative of stone or another solid material punctuated by both open and closed balconies vertically. These balconies would provide an outside space for the tenants to watch the activity on West Broadway. The top floor would be set back slightly and would be clad in a textured metal tile, forming the topmost portion of a classic tripartite horizontal design approach. The resulting combination of vertical recessed elements and strong horizontal materiality will create smaller visual areas of the building, breaking down the massing of the building as a whole. This approach would wrap around West Broadway to A Street, providing visual continuity. The sidewalk would be enlarged on A Street to match that on West Broadway, in accordance with the city's Complete Streets initiative, so that more street trees could be added, thus further activating the West Broadway side of the building. The design concept is finally brought together at the corner of West Broadway

and A Street with an outdoor seating area, partially recessed under the building and the projecting glass tower above, offering a commanding and impressive view of street activity on West Broadway and A Street.

1.3.2 Sustainable Design

To meet the requirements of Article 37, the following section describes how the Project complies with the LEED Building Design & Construction v4 criteria. The project is currently tracking 44 points in the "yes" column with 50 in the "maybe" column, with all to be further evaluated. The project will demonstrate compliance with the LEED Certifiability Requirements. Further study over the coming weeks and months will determine final credit achievement.

In conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the BPDA requires projects subject to Boston Zoning Article 80 Large Project Review to complete a Resiliency Checklist to assess potential adverse impacts that might arise under future climate conditions, and any project resiliency, preparedness, and/or mitigation measures identified early in the design stage. The Resiliency Checklist (Climate Change Questionnaire) is provided **Appendix E.**

Boston signed on to the Green Communities Act of 2008, which requires compliance with the Stretch Energy Code. The Stretch Energy Code applies to both residential and commercial buildings and, specifically, to new commercial buildings over 5,000 square feet in size, including multi-family residential buildings over three (3) stories. The City of Boston adopted the Stretch Energy Code, which became mandatory on July 1, 2011.

Effective January 1, 2017, the Stretch Energy Code now requires 10 percent greater energy efficiency compared to the state's energy code (the "Base Code"). This PNF assesses the energy performance of the Project using the Stretch Energy Code requirements in effect as of January 1, 2017 in order to demonstrate the Project can meet such requirements.

1.3.3 Pedestrian Level Wind Conditions

The height of the proposed structure does not exceed 70 feet. Wind conditions are expected to be similar to that of existing buildings along West Broadway where nearby buildings range from 4-8 floors.

1.3.4 Shadow Impact Analysis

Stefanov Architects Inc., the Project's architect, prepared a shadow study to assess the potential shadow impacts of the Project on the surrounding neighborhood with the shadow drawings contained in detail in **Section 4.1**. The proposed height of 6 floors does generate shadows in the winter, but the impacts are generally not extensive during the spring through the fall since most of the shadow is generally limited to the streets; West Broadway, A Street, the abutting right-of-way, and adjacent District C-6 Police Station. Morning shadows are cast over A Street, the commercial building at 75 West Broadway, and the residentially-converted former rectory of

Saints Peter and Paul Church (the 55 West Broadway condominium building). Mid-day shadows are cast over West Broadway and towards the restaurant building and parking lot located across West Broadway. Late afternoon and evening shadows will extend in an easterly direction toward the right-of-way and police station. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings.

1.3.5 Daylight Analysis

Although the Proposed Project would cause an increase in daylight obstruction when compared to the existing vacant site condition, the Proposed Project was designed to be of a similar massing to existing buildings along West Broadway and the surrounding neighborhood.

1.3.6 Solar Glare

It is not expected that the Proposed Project will include the extensive use of reflective glass or other reflective materials on the building facades that would face the sun that would result in adverse impacts from reflected solar glare. The glazing on the front of the building faces North.

1.3.7 Air Quality Analysis

Tech Environmental, Inc., the Project's air quality consultant, conducted analyses to evaluate the existing air quality in the Project area, predict the worst-case air quality impacts from the Project's enclosed parking garage, and evaluate the potential impacts of Project-generated traffic on the air quality at the most congested local intersections (See **Section 4.2**).

Recent representative air quality measurements from the Massachusetts Department of Environmental Protection (DEP) monitors reveal that the existing air quality in the Project area is in compliance with Massachusetts and National Ambient Air Quality Standards (NAAQS) for all of the criteria air pollutants.

The worst-case air quality impacts from the Project's parking garage will not have an adverse impact on air quality. The maximum one-hour and eight-hour ambient CO impacts from the parking garage, at all locations around the Project site, including background CO concentrations, are predicted to be safely in compliance with the NAAQS for CO.

A microscale air quality analysis was not performed for the Proposed Project due to the estimated Project trip generation having minimal impacts on the overall delays at the three intersections. Therefore, the motor vehicle traffic generated by the project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project. The air quality in the Project area will remain safely in compliance with the NAAQS for CO after the Project is built.

1.3.8 Noise Analysis

Tech Environmental, Inc., the Project's noise consultant, conducted a noise study to determine whether the operation of the proposed Project will comply with the Massachusetts DEP Noise Policy and City of Boston Noise Regulations (See **Section 4.3**).

This acoustical analysis involved five steps: (1) establishment of pre-construction ambient sound levels in the vicinity of the Site; (2) identification of potential major noise sources; (3) development of noise source terms based on manufacturer specifications (where available) and similar project designs; (4) conservative predictions of maximum sound level impacts at sensitive locations using industry standard acoustic methodology; and (5) determination of compliance with applicable City of Boston noise regulations, ordinances and guidelines and with the DEP Noise Policy.

Nighttime ambient baseline sound level (L_{90}) monitoring was conducted at four locations deemed to be representative of the nearby residential areas, during the time period when human activity is at a minimum and any future noise would be most noticeable. The lowest nighttime L_{90} measured in the Project area was 51.1 dBA.

The potential significant sources of exterior sound from the Project have been identified as:

- 10 rooftop condensing units (2-10 ton units)
- Garage exhaust

The results of the acoustical modeling demonstrated that the Project will not create a noise nuisance condition and will fully comply with the most stringent sound level limits set by the Massachusetts DEP Noise Policy and City of Boston Noise Regulations.

1.3.9 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See **Section 4.4**) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The Project will not result in an increase in impervious area, and 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 site's impervious area can be recharged.

In addition to the installation of an on-site infiltration system, stormwater runoff will be treated through the use of deep sump catch basins and water quality treatment units. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

1.3.10 Solid and Hazardous Waste

Solid Waste

During the preparation of the Site, debris, including asphalt, trash, and demolition debris, will be removed from the Project Site. The Proponent will ensure that waste removal and disposal during construction and operation will be in conformance with the City and DEP's Regulations for Solid Waste.

In order to meet the requirements for the Boston Environmental Department and the LEED™ rating system, the Project will include space dedicated to the storage and collection of recyclables, including dedicated dumpsters and bins in a trash room. The recycling program will meet or exceed the City's guidelines, and provide areas for waste paper and newspaper, metal, glass, and plastics (21 through 27, co-mingled).

Hazardous Waste

Based on soils characterization sampling as a part of the Phase I Assessment and Soil Characterization Results completed by Cooperstown Environmental on April 26, 2017, the soils profile at the site consists of 7-10 feet of fill and sand deposits underlain by native silt, clay and till deposits. Based on site and area history, there was concern in particular regarding the upper fill layers, which generally consists of what is characterized as "urban fill" as well as potential petroleum impacts resulting from site use as a filling station since at least since 1941. The investigation provided a good indication of expected soil quality in the fill and native soils at the site in order to plan for appropriate soil disposal during excavation. Additional sample that will be needed to meet disposal facility requirements will be collected close to the date of excavation.

1.3.11 Geotechnical/Groundwater Impacts Analysis

Based on the results of the explorations performed at the project site, urban fill was encountered to depths of approximately 8-11 feet below grade. Groundwater was encountered in the test holes selected at depths of approximately 10 feet below grade. The subgrade conditions were considered suitable for supporting the proposed building on a conventional spread footing foundation with a concrete floor slab. Questionable soils as well as UST's, abandoned foundations, intersecting utilities and other questionable matter will be removed from the building footprint.

Due to the proposed basement level which is expected to encroach into the groundwater table, a foundation drainage system will be required to permanently control the high groundwater. Groundwater was encountered near elevation 20 in the geotechnical consultant's analysis. Additional engineering review and design will be necessary to address concerns with groundwater encroachment. See **Section 4.6** for additional information.

1.3.12 Construction Impacts Analysis

Section 4.7 describes impacts likely to result from the Proposed Project's construction and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager who will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

Construction is expected to commence in the 2nd quarter 2018 with completion expected in the 4th quarter of 2019.

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractor comply with the Construction Management Plan ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Most construction activities will be accommodated within the current site boundaries. 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 to be filed with BTD in accordance with the City's transportation maintenance plan requirements. To minimize transportation impacts during the construction period, there will be limited construction worker parking on-site, carpooling will be encouraged, secure on-site spaces will be provided for workers' supplies and tools so they do not have to be brought to the site each day, and subsidies for MBTA passes will be considered. The Construction Management Plan to be executed with the City prior to commencement of construction will document all committed measures.

1.3.13 Wetlands/Flood Hazard Zone

The existing Project Site is not a part of a wetland resource area regulated by the Massachusetts Wetland Protection Act. Based on the Preliminary Flood Insurance Rate Maps (FIRM) for Suffolk County, the Project site is not located in a special flood hazard area, floodway area, or other flood area.

1.3.14 Historic Resources Component

According to files at the Massachusetts Historical Commission, there are no structures listed in the National or State Register of Historic Places, or the Inventory of Historical and

Archaeological Assets of the Commonwealth on-site. It is not expected that the Project will cause adverse impacts on the historic or architectural elements of nearby historic resources outside the Project Site (see **Section 5.0**).

1.3.15 Infrastructure Systems Component

An infrastructure system's analysis (**Section 6.0**) was completed by Howard Stein Hudson (HSH), the Project's Civil Engineer. The existing infrastructure surrounding the site appears sufficient to service the needs of the Proposed Project. This section describes the existing sewer, water, and drainage systems surrounding the site and explains how these systems will service the development. This analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

1.3.16 Transportation Component

Section 7.0 presents the comprehensive transportation study completed by HSH for the proposed Project in conformance with the BTD Transportation Access Plan Guidelines (2001). The study analyzes existing conditions within the Project study area, as well as conditions forecast to be in place under the seven-year planning horizon of 2024.

The Project is situated to take advantage of the numerous public transportation opportunities in the area including Broadway Station, which serves the MBTA's Red Line subway. It is expected that due to the availability of public transportation and the walkability of the surrounding neighborhood, the Project will rely on alternative non-vehicular modes of transportation to access the site. The existing use of the site includes a gas station, which generates a significant amount of vehicular activity during the peak periods.

Vehicular access to the Project site will be provided by a new curb cut along Silver Street. The existing curb cuts along A Street and West Broadway will be closed as part of the Project. The curb cut along Silver Street will provide access to a parking garage with capacity of up to 46 vehicles. Based on the nature of the location of the Project, including its proximity to nearby transit opportunities, vehicle and bike share outlets, and the walkability of the surrounding neighborhood, it is expected that the parking supply will accommodate the overall parking demand for the Project. The Project will also provide secure and covered storage for approximately 65 bicycles. Loading and service will be from West Broadway and trash/recycling activity will occur on-site. Move-in/move-out activity is expected to be light and dispersed throughout the year and will occur along the curb by permit.

Primary pedestrian access to the site will be provided along West Broadway. The Proponent is committed to upgrading all abutting sidewalks

The Proponent is committed to implementing a transportation demand management ("TDM") program that supports the City's efforts to reduce dependency on the automobile by encouraging

alternatives to driving alone, especially during the peak travel periods. Proposed measures include, but are not limited to designating an on-site transportation coordinator, secure covered bicycle parking, transit incentives, and vehicle and bike-sharing incentive programs for residents.

The transportation analysis employed mode use data for the area surrounding the Project site based on the 2000 U.S. Census data and BTD data for the surrounding neighborhoods and identifies the number of trips expected to be generated by the Project by mode (walk, bicycle, transit, and vehicle). Due to the transit-oriented nature of the Project and non-automobile ownership alternatives such as Zipcar and Hubway, it is anticipated that many of the Project-generated trips will occur via transit, on foot, and by bicycle.

The Project is expected to generate approximately 19 trips during the weekday a.m. peak hour and 32 trips during the weekday p.m. peak hour. When compared with the existing uses on the site, this results in a significant decrease of vehicular traffic related to the site. However, since the existing use is a gas station, it is assumed that the existing trips to/from the site will continue to be on the roadway network, as trips to gas stations are not typically primary trips.

A detailed traffic operations analysis was conducted for the nearby intersections including the following:

- West Broadway/A Street;
- A Street/Silver Street; and
- West Broadway/Right-of-Way.

Due to the low number of vehicle trips generated by the Project, there will be minimal impact to traffic operations at the study area intersections.

1.3.17 Response to Climate Change Questionnaire

Please see **Appendix E** for the Proponent's Response to the City of Boston's Climate Change Questionnaire.

1.3.18 Response to City of Boston Accessibility Checklist

Please see **Appendix F** for the Proponent's Response to the City of Boston Accessibility Checklist.

2.0 GENERAL INFORMATION

2.1 Applicant Information

2.1.1 Project Proponent

The Proponent, Broadway & A St LLC, a Massachusetts limited liability company formed for the express purpose of completing the 87-93 West Broadway Mixed-Use Development Project. Its managers, Michael Moore, Joseph Allen, Patrick Costello and Seamus Moore have over two decades of experience successfully developing residential projects in Boston, particularly in the South Boston market.

All these managers have been members of Oranmore Enterprises LLC, a real-estate development company that have been in operation since 2002 and completed many projects in South Boston including the St. Augustine's Church residential conversion project and 637 East First Street, South Boston.

The Proponent has a strong and established working relationship with several major local lenders, a record of proven financial security, and intends to finance the construction and development of the Project using traditional institutional lender financing, with an initial financing commitment from the Needham Bank.

2.1.2 Project Team

Project Name	87-93 West Broadway, South Boston
Property Owner / Developer	**Broadway & A St LLC,** a Massachusetts Limited Liability Company c/o Oranmore Enterprises LLC 36 Central Avenue, Unit C-2 Milton, MA 02186 Michael Moore Tel: 617-296-4548 brencoconstruction@gmail.com Seamus Moore seamiemoore72@gmail.com

Article 80 Permitting Consultant	**Mitchell L. Fischman Consulting ("MLF Consulting") LLC** 41 Brush Hill Road Newton, MA 02461 Mitch Fischman mitchfischman@gmail.com Tel: 781-760-1726 Claudia Zarazua czarazua@gmail.com Tel: 210-843-5276
Legal Counsel	**Adams & Morancy, P.C.** 350 West Broadway South Boston, MA 02127 Tel: 617-269-5800 George Morancy, Esq. gmorancy@admorlaw.com Patrick Mahoney, Esq. pmahoney@admorlaw.com
Public/Agency Outreach	**Joe Rull** MJR Consulting LLC 15 Broad Street Boston, MA 02109 Tel: 617-686-4034 joerull76@gmail.com
Architect	**Stefanov Architects, Inc** 423 West Broadway, Suite 404 South Boston, MA Tel: 617-765-0573 Douglas Stefanov douglasjstefanov@gmail.com Gary Galfoman galfoman@gmail.com
Landscape Architect	**BSC Group** 803 Summer Street Boston, MA 02127 Tel: 617 896 4327 Monique Hall moniquehall@gmail.com

Transportation Planner / Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Michael Santos, P.E. msantos@hasassoc.com Tel: 617-348-3350
Civil Engineer/ Infrastructure	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Rick Latini, P.E. rlatini@hshassoc.com James Downing, EIT jdowning@hshassoc.com
Sustainability Consultant	**Soden Sustainability Consulting** 19 Richardson Street Winchester, MA 01890 Tel: 617-372-7857 Colleen Ryan Soden, LEED AP BD+C colleen@sodensustainability.com
Noise and Air Consultant	**Tech Environmental, Inc.** Hobbs Brook Office Park 303 Wyman Street, Suite 295 Waltham, MA 02451 Tel: 781-890-2220 Marc C. Wallace mwallace@techenv.com Tel: 781-890-2220 x30
Geotechnical	**Kevin Martin, P.E.** 7 Marshall Road Hampstead, NH 03841 Tel: 781-718-4084 kevinmartinpe@aol.com
Environmental / 21E	**Cooperstown Environmental LLC** 23 Main Street Andover, MA 01810 Tel: 978-470-4755 www.copperstownenv.com

Surveyor	**Otte & Dwyer** Land Surveyors 59 Appleton Street Saugus, MA 01906 Tel: 781-233-8155
Construction Commencement	2nd Quarter 2018
Construction Completion	4th Quarter 2019
Status of Project Design	Schematic

2.1.3 Legal Information

Proponent Control of Site

The property site is under agreement to be purchased by the Proponent from the present owner, Moawed Properties, LLC, a Massachusetts Limited Liability Company.

Legal Judgments or Actions Pending Concerning the Proposed Project:

None, based on information and belief.

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

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

Nature and Extent of Any and All Public Easements:

Public utility easements only.

2.2 Public Benefits

The Proposed Project will provide substantial public benefits to the City of Boston and the South Boston neighborhood. The Proposed Project provides for:

- Creation of 65 new housing units, including 8 affordable units in accordance with the City's Inclusionary Development Policy (IDP);
- Addition of approximately 9,000 square feet of new commercial space on West Broadway;
- Introduction of new neighborhood residents who will provide support to the local community and utilize local businesses;
- Encouraging the use of alternative modes of transportation, such as mass transit, ride sharing services, and bicycle use;
- Improving the safety and visual appearance of the site by removing large curb cuts on A Street and West Broadway, and improving environmental conditions at the property, which is the site of a gas station;
- Exploring the planting of new street trees, widened sidewalks, and other streetscape amenities to improve and enhance the pedestrian landscape and experience;
- Establishing a premier example of sustainable construction and development;
- temporary creation of many new jobs in the construction and building trade industries; and
- Substantial addition to real property taxes for the City of Boston.

2.3 Regulatory Controls and Permits

2.3.1 Zoning Overview

The Project Site is located within an MFR/LS (Multifamily Residential/ Local Service) sub-district of the South Boston Neighborhood District, Article 68 of the Code, which allows for new multi-family residential and mixed-use buildings of the sort contemplated by the Proposed Project, but certain dimensional characteristics of the proposed building would require relief from the terms of the Boston Zoning Code. It should be noted that the BPDA is in the process, with City officials and neighborhood participants, of updating the zoning of both East Broadway and West Broadway and that the Proposed Project was designed taking into consideration anticipated new building height and massing limitations on West Broadway. The surrounding neighborhood is a mix of commercial/retail, residential, and office uses. While 88 off-street garage spaces are currently programmed, the final amount of off-street parking and loading will be reviewed and determined by the BPDA pursuant to the provisions of the Article 80 Large Project review process.

2.3.2 Boston Zoning Code – Use Requirements

The Proposed Project will include residential space and accessory uses thereto. Multifamily residential use is an allowed use within the relevant zoning sub-district, as are most commercial uses that are envisioned for inclusion in the new development.

2.3.3 Boston Zoning Code – Dimensional Requirements

The Proposed Project will include approximately 98,000 feet of gross floor area on a site that consists of 19,723 square feet of land, for a resulting projected floor area ratio of approximately 5. Current zoning establishes a maximum Floor Area Ratio (FAR) of 2. The applicable dimensional regulations under zoning require a front setback as determined by Article 80 review, side setbacks of three feet, a rear setback of twenty feet, and a maximum building height of forty feet. Article 68 requires 200 square feet of usable open space per dwelling unit. While the proposed building is designed to reach a height of seventy feet, and will therefore require variances under current zoning for building height, excessive FAR, and rear yard setback, at a minimum, the development team is being responsive to cues about future height and density goals being discussed as both West Broadway and East Broadway are being studied for updated zoning.

For a project that is subject to Large Project Review, required off-street parking spaces and off-street loading facilities are expected to be determined as a part of the Large Project Review process in accordance with the provisions of Article 80 of the Boston Zoning Code. Design elements of the Proposed Project will also be reviewed pursuant to Large Project Review.

Table 2-1. Multifamily Residential/Local Service (MFR/LS) Subdistrict - Dimensional and Off-Street Parking Requirements

Dimensional Element	Multifamily Residential/Local Service (MFR/LS) Subdistrict	Proposed Project[1]	Expected Zoning Relief Required?
Minimum Lot Size	None	19,723 sf	No
Max. Floor Area Ratio	2.0	5.0	Yes
Max. Building Height	40 feet	70 feet	Yes
Minimum Lot Width	20 feet	95 feet	No
Minimum Lot Frontage	20 feet	95 feet	No
Minimum Front Yard Setback	5 feet[2]	Per Article 80[2]	No
Minimum Side Yard	3 feet	0 feet	Yes
Minimum Rear Yard	20 feet	0 feet	Yes
Required Off-Street Parking	Per Article 80[3]	88 spaces	Per Article 80[3]
Minimum Number of Loading Bays	Per Article 80	2 in the Garage	Per Article 80[3]
Minimum Usable Open Space	200 sf/dwelling unit(du)	93 sf/du	Yes

1. The dimensions cited in the prior table may change as the Proposed Project undergoes ongoing review by BPDA staff.
2. The required front yard setback shall be determined through the Large Project Review process.
3. Required off-street parking and loading spaces shall be determined through the Large Project Review process.

2.3.4 Preliminary List of Permits or Other Approvals Which May be Sought

Agency Name	Permit or Action*
Local Agencies	
Boston Planning and Development Agency	Article 80 Review and Execution of Related Agreements; Section 80B-6 Certificate of Compliance
Boston Public Safety Commission – Committee on Licenses	Garage License, Flammable Fuels
Boston Transportation Department	Transportation Access Plan Agreement; Construction Management Plan
Boston Department of Public Works Public Improvements Commission	Possible Sidewalk Repair Plan; Curb-Cut Permit; Street/Sidewalk Occupancy Permit; Permit for Street Opening
Boston Fire Department	Approval of Fire Safety Equipment
Boston Water and Sewer Commission	Approval for Sewer and Water and Connections; Construction Site Dewatering; and Storm Drainage
Boston Department of Inspectional Services	Building Permits; Certificates of Occupancy; Other Construction-Related Permits

*This is a preliminary list based on project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits may be needed.

2.4 Public Review Process and Agency Coordination

In support of the required Article 80 Large Project Review process, the Proponent has conducted, and will continue to conduct, community outreach with neighbors and abutters of the Site, including meetings and discussions with the elected representatives and officials from the area, and with area residents.

This process has included, to date, presentations to the West Broadway Neighborhood Association, the St. Vincent/Lower End Neighborhood Association, and the Cityside Neighborhood Association, as well as two meetings with a review group consisting of South Boston elected officials and their representatives.

The Proponent has also discussed the Proposed Project with representatives of the Boston Planning and Development Agency prior to filing this Project Notification Form in order to identify issues/concerns as well as design requirements related to the Project.

In accordance with Article 80 requirements, an Impact Advisory Committee ("IAG") has been formed and neighborhood meeting will be scheduled to review the PNF and receive community comments on the Project during the PNF public review period.

The Proponent will continue to meet with public agencies, neighborhood representatives, local business organizations, abutting property owners, and other interested parties, and will follow the requirements of Article 80 pertaining to the public review process.

2.5 Development Impact Project ("DIP") Status

Based on current schematic design plans, it is not anticipated that the Proposed Project will be subject to the requirements of Section 80B-7 of the Article 80, owing to the fact the Proposed Project will not occupy an aggregate gross floor area of more than 100,000 square feet.

3.0 URBAN DESIGN AND SUSTAINABILITY COMPONENT

3.1 Urban Design Overview

The proposed building is a six-story mixed use building whose first floor will be commercial space and parking with five floors of approximately 65 residences above, topped by a rooftop of private and common decks. The building also contains tenant storage areas and bicycle parking.

On the busy traffic intersection of West Broadway and A Street, this building stands as a gateway building into South Boston, both coming up A Street from the Seaport District, and into the City from Dorchester Avenue, as well as coming across the James M. Kelly Bridge. The proposed structure is similar in scale to the other developments around the MBTA's Broadway rapid transit station. This site, currently occupied by a gas station, has no substantial urban presence. A glass tower at the corner of West Broadway and A Street would occupy the corner, with a planned outdoor space at its base, and would be illuminated at night.

West Broadway, one block up from the Broadway Station, is quite busy with pedestrians. This building will offer varied commercial opportunities, with a potential restaurant and other retail spaces that would enhance the neighborhood with a more active streetscape. Street trees and bicycle parking would occupy the band of the sidewalk closest to the street, with an ample sidewalk next to the building. The trees and projecting canopy with a signage band above the retail space will bring the scale down on the sidewalk to the pedestrian level, while the signage above will appeal to the vehicular traffic passing by.

The mass of the building is scaled down by introduction of vertical recessed areas that are glazed at the backside, providing a break of the primary surface cladding and reflecting back the side walls of the recess. Horizontally, there is the commercial first floor, which is a glazed curtain wall with spandrel glass terminated by a projecting horizontal sign band. The main body of the building is the four floors of residences, which would be clad in a smooth surface indicative of stone or another solid material punctuated by both open and closed balconies vertically. These balconies would provide an outside space for the tenants to watch the activity on West Broadway. The top floor would be set back slightly and would be clad in a textured metal tile, forming the topmost portion of a classic tripartite horizontal design approach. The resulting combination of vertical recessed elements and strong horizontal materiality will create smaller visual areas of the building, breaking down the massing of the building as a whole. This approach would wrap around West Broadway to A Street, providing visual continuity. The sidewalk would be enlarged on A Street to match that on West Broadway, in accordance with the city's Complete Streets initiative, so that more street trees could be added, thus further activating the West Broadway side of the building. The design concept is finally brought together at the corner of West Broadway and A Street with an outdoor seating area, partially recessed under the building and the projecting glass tower above, offering a commanding and impressive view of street activity on West Broadway and A Street.

The urban design drawings and LEED v4 BD+C Checklist are included at the end of this section (**Figures 3-1** thru **3-19**).

3.2 Building Design

The proposed building is a six-story mixed use building whose first floor will be commercial space and parking with five floors of containing approximately 65 residences above, topped by a roof top of private and common decks. In addition to the residential units, the building includes a lobby, open and enclosed bays, an open-air seating area at grade on the corner of A Street and West Broadway, a parking garage for 88 cars, bicycle parking, and tenant storage areas. The Proponent has already made a number of presentations of the Project's conceptual design to the neighborhood and BPDA as part of the refinements for the schematic design drawings.

The Proponent is committed to adopting solid surfacing materials that are consistent with the surrounding context. The use of vertical recessed and protruding elements coupled with horizontal material banding reduces the apparent scale of the project by creating smaller areas.

The vehicular access is from the private way connecting West Broadway to Silver Street . There is a mechanical parking system proposed for the building which would allow 11 cars to be parked in a space that would normally hold three at grade, in addition to having these spaces be in a tandem arrangement. Where there might otherwise be 12 tandem spaces, there will instead be 88 parking spaces using an automated vertical parking system that will deliver the desired car to grade upon exiting the garage, or store a car upon parking in the garage. Exiting cars would turn onto Silver Street and exit onto A Street. There would also be two at-grade handicap van spaces off the adjoining private way. Tenants would be able to drive in and walk into the elevator lobby close by, walk to the lobby, or walk out to the street.

The residential units wrap the building's exterior, flanked by streets on most of sides. Windows will populate the exterior of the building, providing light and air to the units within. Each building face would have commanding city views, with the front of the building facing north basked in soft even light facing the Seaport District, the units located on the easterly side greeting the morning sun, the Silver Street face likewise benefitting from direct sunlight and views of South Boston and the Dorchester Avenue corridor, and the A Street side facing the setting sun and views of downtown Boston.

Units are generous in size, consisting of two bedroom and two baths with ample living kitchen dining areas. Nine private rooftop decks are proposed, as well as common deck and common green space for roof-top recreation.

3.3 Landscape Design

The large residential entry on West Broadway with the building marquee above will clearly announce the building's residential entrance while also providing access to the two flanking commercial spaces. There will be a secondary entrance under the vertical recessed element, providing access to the commercial space, which includes the open- air seating area at the A Street corner of the building. Both West Broadway and A Street will be supplied with 10 foot wide sidewalks. All the existing curb cuts would be

eliminated, providing more public parking along West Broadway. The sidewalks will be populated with street trees, bike locking racks, and pedestrian-friendly street furniture.

The roofscape will provide both private roof decks for building residents, as well as a common deck and greenspace area. All the decks will be accessed by elevators with second means of egress by the stairs. The private roof decks will be deeded to the units on the top floor, while the common roof deck will have tables and for the enjoyment of building residents guests. The common green area will be of low-maintenance material for passive recreation.

3.4 Sustainable Design/Energy Conservation

The proposed project involves developing 65 residential units with approximately 9,000 square of retail space, , with a total overall project floor area of approximately 98,000 square feet and including approximately 88 below-level garage spaces accessed from Silver Street. The proposed site consists of 0.45 acre (19,723 square feet).

To meet the City of Boston Requirements the project is demonstrating the compliance with the LEED BD&C v4 criteria. The project is currently tracking 44 points in the YES column with 50 in the "maybe" column, with all to be further evaluated over the coming weeks and months to determine final credit achievement. The Project team has outlined in the narrative below how the project intends to achieve the prerequisites and credits for the LEED BD&C v4 certification (See **Figure 3-19).**

3.4.1 Introduction

Sustainability informs every design decision. Enduring and efficient buildings conserve embodied energy and preserve natural resources. The Proposed Project embraces the opportunity to positively influence the urban environment. Its urban location takes advantage of existing infrastructure, while good access to mass transportation will reduce dependence on single-occupant vehicle trips and minimize transportation impacts.

The Proponent and the Project design team are committed to an integrated design approach and are using the LEED Building Design and Construction v4 rating system and intend to meet certification as presented below. This rating will meet or exceed Boston's Green Building standard. The LEED rating system tracks the sustainable features of the Project by achieving points in following categories: Location & Transportation; Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.

3.4.2 Location and Transportation

The Location and Transportation credit category encourages development on previously developed land, minimizing a building's impact on ecosystems and waterways, regionally appropriate landscaping, smart transportation choices.

The Project is located on a site that has been previously developed earning sensitive land protection. The site is also located on a brownfield where soil or groundwater contamination has been identified, and where the local, state, or national authority (whichever has jurisdiction) requires its remediation. The Proponent will perform remediation to the satisfaction of that authority.

The site is surrounded by existing higher density development within a ¼-mile [400-meter] radius of the project boundary, and dozens of amenities are provided within 0.5 mile of the project site.

The City of Boston requires 1 bicycle parking space per residential unit. With a proposed 65 dwelling units, 65 secure and covered bicycle parking spaces are required and will be provided. Additionally, the City requires one outdoor/open bicycle parking space per 5 dwelling units, meaning this project requires 13 outdoor bicycle parking spaces, which will also be provided onsite.

The project provides access to quality public transit as the project is located within 0.1 mile of the MBTA Red Line, and within 0.2 miles of the number 9, 11, and 47 MBTA bus lines.

The project will provide bicycle facilities and showers for residents of the building, along with bicycle parking spots for visitors, far exceeding the LEED requirement.

3.4.3 Sustainable Sites

The development of sustainable sites is at the core of sustainable design. Stormwater runoff management, and reduction of erosion, light pollution, heat island effect, and pollution related to construction and site maintenance are all critical to lessening the impact of development.

A portion of the building will utilize green roof technologies to hold and absorb rainfall on roof areas. The vegetated roof areas will also reduce heat island effects associated with building roof areas. During larger events, clean roof runoff will be directed to underground infiltration chambers where the runoff will be infiltrated into the groundwater, similar to as would occur on the property in its natural vegetated state. Rain gardens will also be provided along West Broadway to provide water quality treatment and groundwater recharge.

The project will create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan will conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent.

The project will complete and document a site survey or assessment that will demonstrate the relationships between the site features and topics, Topography, Hydrology, Climate, Vegetation, Soils, Human use. The project will evaluate compliance with light pollution reduction from both the building and from the site lighting.

In order to reduce the impact of urban heat island effect, 100% of the parking spaces will be below grade under an SRI compliant roof.

3.4.4 Water Efficiency

Buildings are major users of our potable water supply and conservation of water preserves a natural resource while reducing the amount of energy and chemicals used for sewage treatment. The goal of the Water Efficiency credit category is to encourage smarter use of water, inside and out. Water reduction is typically achieved through more efficient appliances, fixtures and fittings inside and water-wise landscaping outside. To satisfy the requirements of the Water Use Reduction Prerequisite and credit, the project will incorporate water conservation strategies that include low flow plumbing fixtures for water closets and faucets. The landscape will be designed so it will reduce the need for potable water for irrigation by 50% and select plant material that is native and adaptive.

The project is targeting a minimum 45% indoor water use reduction from the baseline. All newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling will have the Water Sense label.

The project will install permanent water meters that measure the total potable water use for the building and associated grounds in addition to water meters for two or more of the following water subsystems, as applicable to the project: Irrigation, Indoor plumbing fixtures and fittings, Domestic hot water, Boiler. Metering data will be compiled into monthly and annual summaries; and will be shared with USGBC the resulting whole-project water usage data.

The project will evaluate the ability to conserve water used for cooling tower makeup while controlling microbes, corrosion, and scale in the condenser water system.

3.4.5 Energy & Atmosphere

According to the U.S. Department of Energy, buildings use 39% of the energy and 74% of the electricity produced each year in the United States. The Energy and Atmosphere credit category encourages a wide variety of energy strategies: commissioning; energy use monitoring; efficient design and construction; efficient appliances, systems and lighting; the use of renewable and clean sources of energy, generated on-site or off-site; and other innovative practices.

Fundamental Commissioning and Enhanced Commissioning will be pursued for the project. Envelope commissioning will also be evaluated as an alternative.

A whole-building energy simulation will be performed for the project demonstrating a minimum improvement of 20% for new construction according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata. The team will analyze efficiency measures during the design process and account for the results in design decision making. The team will use energy simulation of efficiency opportunities, and past energy simulation analyses for similar buildings.

The project will install new building-level energy meters or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc). The project will not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems.

The project will evaluate renewable energy production, and if not possible, the building will be solar ready.

The project will select refrigerants that are used in heating, ventilating, air-conditioning, and refrigeration (HVAC&R) equipment to minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The development team will perform the calculations once systems are selected.

The development team will also consider engaging in a contract for 50% or 100% of the project's energy from green power, carbon offsets, or renewable energy certificates (RECs).

3.4.6 Materials & Resources

During both construction and operations, buildings generate tremendous waste and use many materials and resources. This credit category encourages the selection of sustainable materials, including those that are harvested and manufactured locally, contain high-recycled content, and are rapidly renewable. It also promotes the reduction of waste through building and material reuse, construction waste management, and ongoing recycling programs.

The project will provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclable materials will include mixed paper, corrugated cardboard, glass, plastics, and metals. The project will also take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.

The project will develop and implement a construction and demolition waste management plan that will identify at least five materials (both structural and nonstructural) targeted for diversion, and approximate a percentage of the overall project waste that these materials represent. The project will divert at least 75% of the total construction and demolition material; diverted materials must include at least four material streams. The project will also consider completing a life-cycle assessment.

Careful material selection will be performed for the project. Where possible the project hopes to integrate products that have Environmental Product Declarations (EPD), Sourcing of Raw Materials and Corporate Sustainability Reporting, and Material Ingredients Disclosures.

3.4.7 Indoor Environmental Quality

The U.S. Environmental Protection Agency estimates that Americans spend about 90% of their day indoors, where the air quality can be significantly worse than outside. The Indoor Environmental Quality credit category promotes strategies that can improve indoor air through low emitting materials selection and increased ventilation. It also promotes access to natural daylight and views.

The project will meet the minimum requirements of ASHRAE Standard 62.1–2010, Sections 4–7, Ventilation for Acceptable Indoor Air Quality (with errata), or a local equivalent, whichever is more stringent.

The project will provide enhanced indoor air quality strategies. The project will provide entryway design systems, interior cross-contamination prevention and filtration. The project will target Low emitting materials for all materials within the building interior (defined as everything within the waterproofing membrane). This includes requirements for product manufacturing volatile organic compound (VOC) emissions in the indoor air and the VOC content of materials.

The project will develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building, meeting or exceeding all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008–2008, Chapter 3. The project will protect from moisture damage absorptive materials stored and installed on-site.

The project prohibits the use of all tobacco products inside the building and within 25 feet (8 meters) of the building entrance during construction. Daylight will be evaluated for energy efficiency opportunities and benefits for the occupants.

The project will achieve a direct line of sight to the outdoors for at least 75% of all regularly occupied floor area. View glazing in the contributing area will provide a clear image of the exterior, not obstructed by frits, fibers, patterned glazing, or added tints that distort color balance.

3.4.8 Innovation and Design Process

The Innovation in Design and Innovation in Operations credit categories provide additional points for projects that use new and innovative technologies, achieve performance well beyond what is required by LEED credits, or utilize green building strategies that are not specifically addressed elsewhere in LEED. This credit category also rewards projects for including a LEED Accredited Professional on the team to ensure a holistic, integrated approach to design, construction, operations and maintenance.

Five credits are being pursued and could include the following.

- Innovation in Design: Exemplary Perf Quality Transit
- Innovation in Design: Green Housekeeping
- Innovation in Design: Modern Mobility
- Innovation in Design: Integrated Pest Mgmt
- Innovation in Design: Exemplary Water Use Reduction

Regional Priority:

- Regional Priority: Optimize Energy (maybe)
- Regional Priority: High Priority Site (yes)
- Regional Priority: Indoor water use reduction (yes)
- Regional Priority: Renewable Energy (maybe)

3.5 Urban Design Drawings and LEED Checklist

Urban design drawings and renderings depicting the Proposed Project and the LEED BD&C v4 Checklist include:

Figure 3-1. Proposed Development Aerial View
Figure 3-2. Proposed Site Plan View
Figure 3-3. Ground Floor Landscape Plan
Figure 3-4. Roof Level Landscape Plan
Figure 3-5. Garage Plan
Figure 3-6. First Floor Plan
Figure 3-7. Typical 2nd through 5th Floor Plans
Figure 3-8. 6th Level Penthouse Floor Plan
Figure 3-9. Roof Level
Figure 3-10. West Broadway Street Elevation
Figure 3-11. A Street Elevation
Figure 3-12. West Elevation at Police Station
Figure 3-13. Longitudinal Section
Figure 3-14. Cross Section Looking East
Figure 3-15. Cross Section Looking West
Figure 3-16. Perspective – Front Entrances
Figure 3-17. Perspective at Corner- West Broadway and A Street
Figure 3-18. Perspective From West Access Road
Figure 3-19. LEED v4 BD+C: New Construction and Major Renovation

Proposed Development Aerial View

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-1

Proposed Site Plan

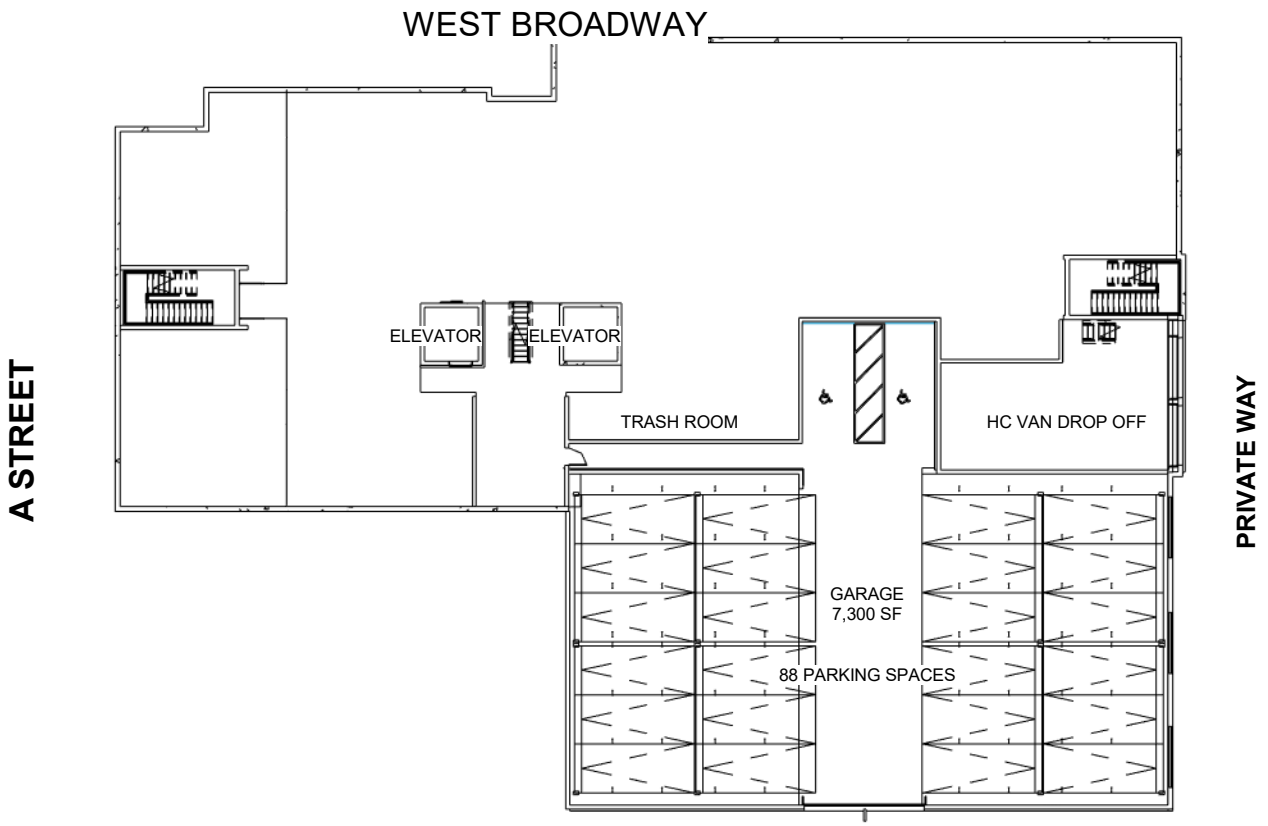
STEFANOVA ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 3-2

Ground Floor Landscape Plan

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-3

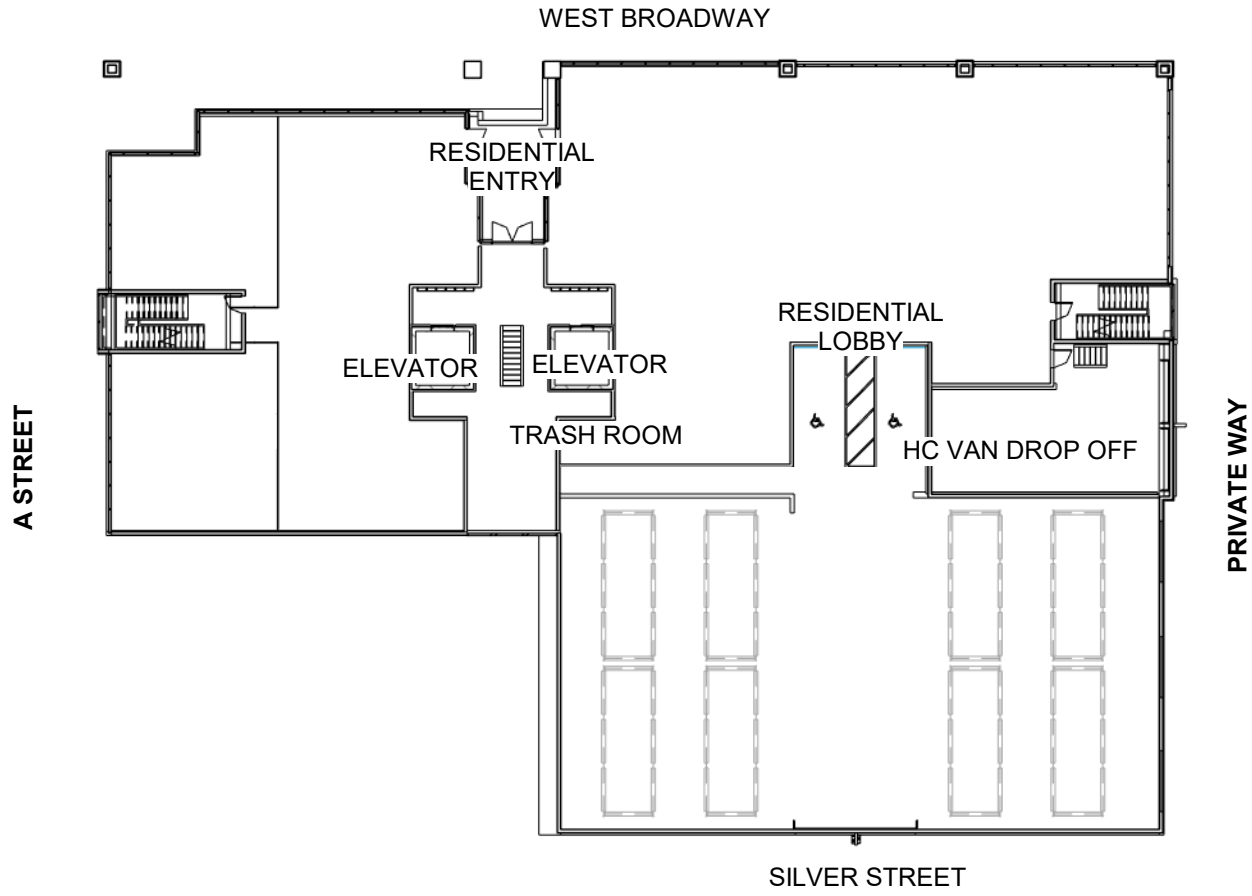
Roof Level Landscape Plan

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-4



Garage Plan

STEFANOVA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-5

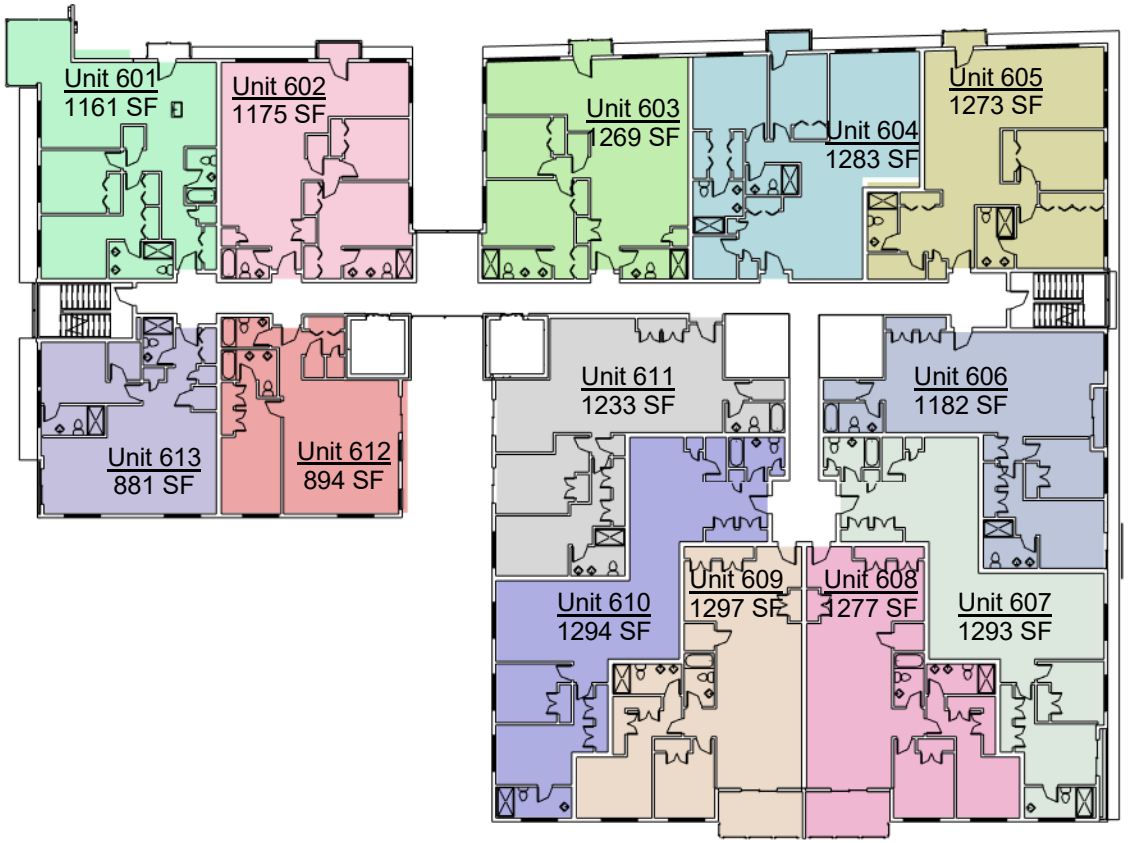


First Floor Plan

STEFANOVA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-6

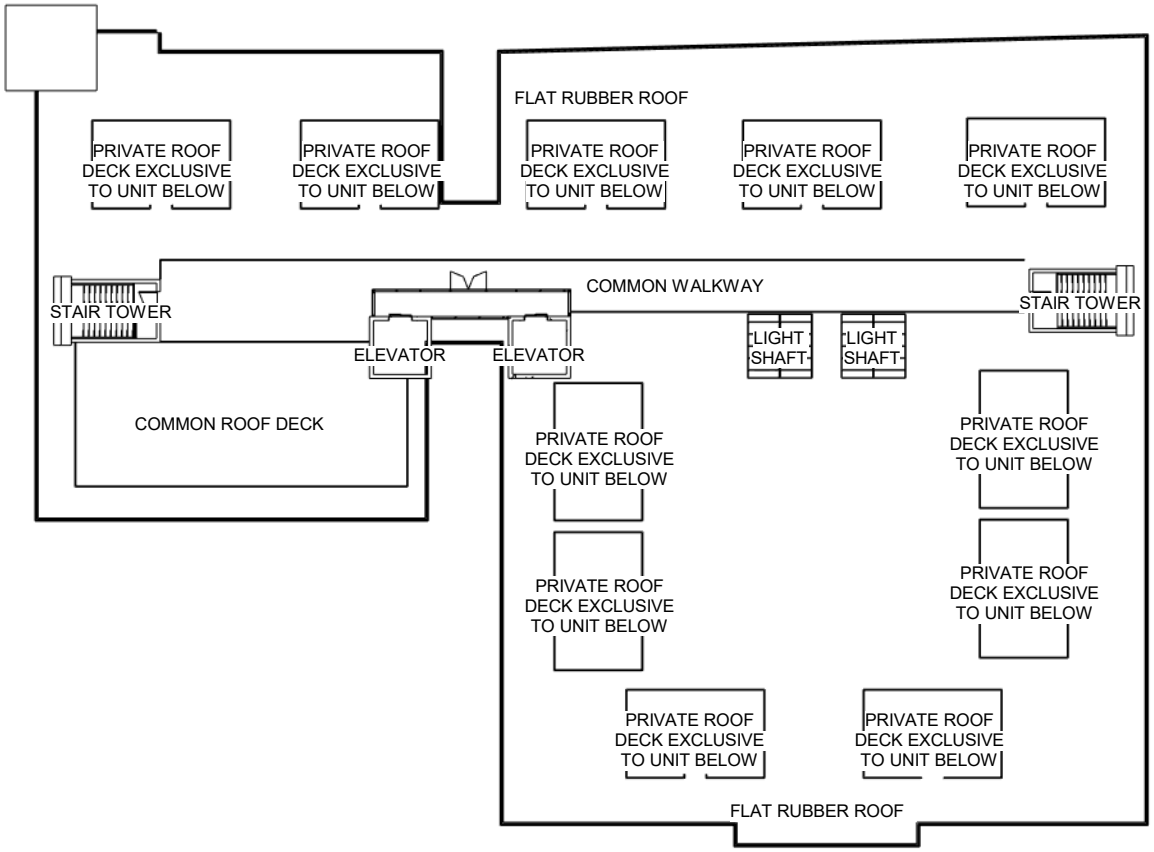
Typical 2nd through 5th Floor Plan (3rd Floor Shown)

STEFANOVA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-7



6th Floor Plan

STEFANOVA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-8



Roof Plan

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-9

West Broadway Street Elevation

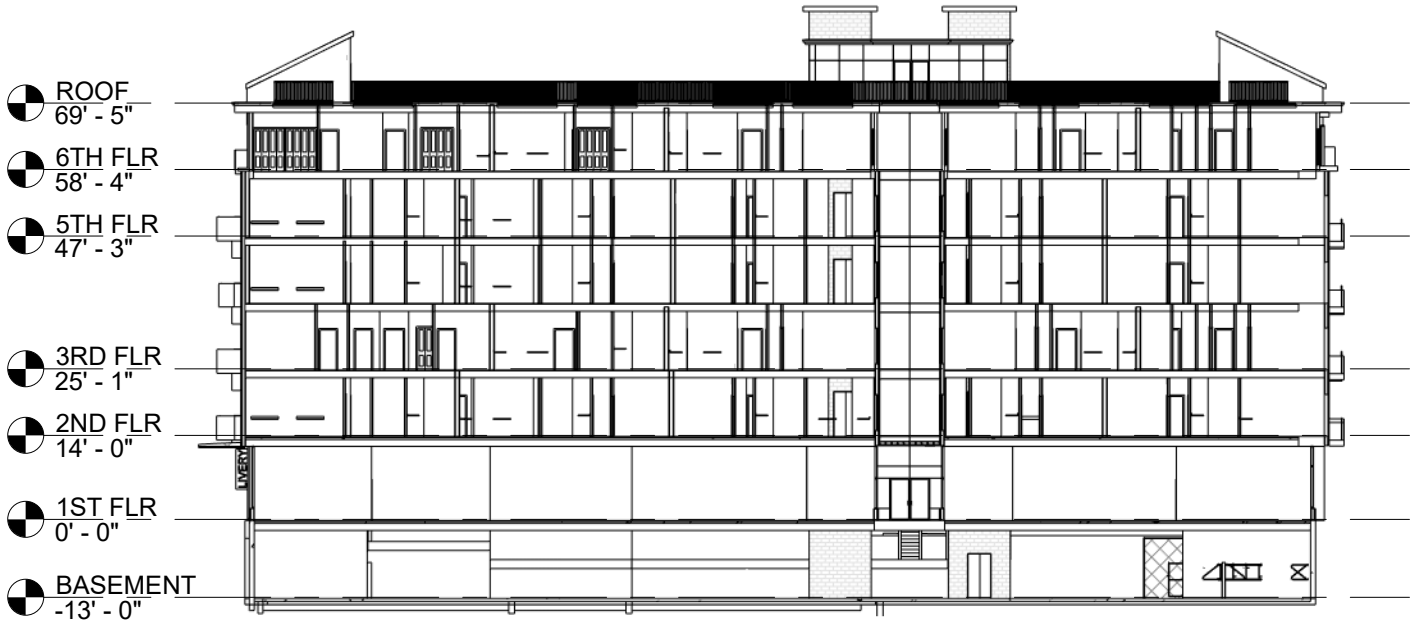
STEFANOVA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-10

A Street Elevation

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-11

West Elevation at Police Station

STEFANOVA ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 3-12

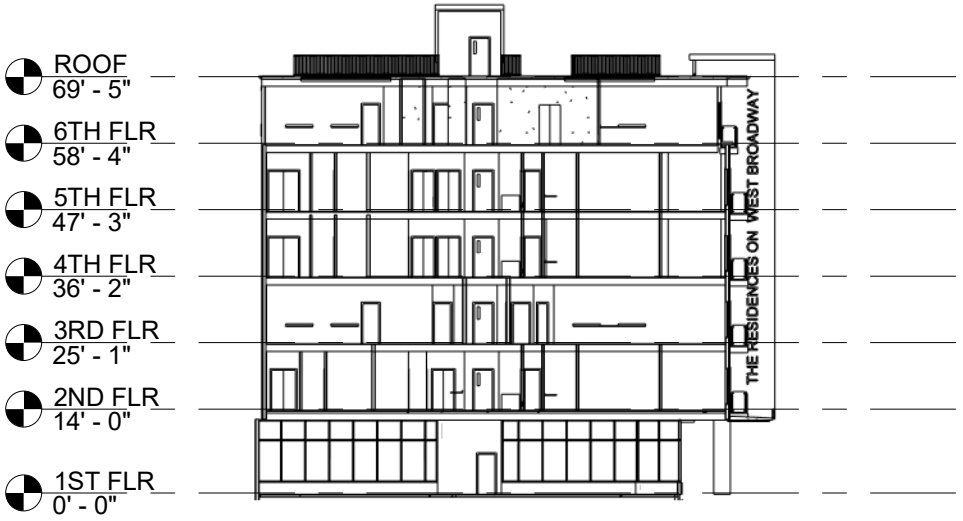


Longitudinal Section

STEFANOVA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-13

Cross Section looking East

STEFANOVA ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 3-14



Cross Section looking West

STEFANO VA ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-15

Perspective - Front Entrances

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-16

Perspective at Corner - West Broadway and A Streets

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-17

Perspective from West Access Road

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 3-18

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

Project Checklist

Project Name: 87-93 West Broadway
Date: 30-May-17

Y	?	N			
	1		Credit	Integrative Process	1

13	3	0	Location and Transportation		16
			Credit	LEED for Neighborhood Development Location	16
	1		Credit	Sensitive Land Protection	1
2			Credit	High Priority Site	2
5			Credit	Surrounding Density and Diverse Uses	5
5			Credit	Access to Quality Transit	5
1			Credit	Bicycle Facilities	1
	1		Credit	Reduced Parking Footprint	1
	1		Credit	Green Vehicles	1

0	7	3	Sustainable Sites		10
Y			Prereq	Construction Activity Pollution Prevention	Required
	1		Credit	Site Assessment	1
	2		Credit	Site Development - Protect or Restore Habitat	2
	1		Credit	Open Space	1
		3	Credit	Rainwater Management	3
	2		Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

6	5	0	Water Efficiency		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1	1		Credit	Outdoor Water Use Reduction	2
5	1		Credit	Indoor Water Use Reduction	6
	2		Credit	Cooling Tower Water Use	2
	1		Credit	Water Metering	1

12	13	8	Energy and Atmosphere		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
4		2	Credit	Enhanced Commissioning	6
6	6	6	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
	2		Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

2	5	6	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
	3	2	Credit	Building Life-Cycle Impact Reduction	5
	1	1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	1	1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

6	9	1	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
	2	1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	2		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1	1		Credit	Interior Lighting	2
	3		Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

4	2	0	Innovation		6
3	2		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

1	3	0	Regional Priority		4
	1		Credit	Regional Priority: Building Life Cycle Impactg	1
1			Credit	Regional Priority: High Priority Site	1
	1		Credit	Regional Priority: Optimize Energy	1
	1		Credit	Regional Priority: Renewable	1

44	48	18	TOTALS	Possible Points:	110

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

Figure 3-19. LEED v4 BD+C: New Construction and Major Renovation

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Shadow Impacts Analysis

4.1.1 Introduction

The following shadow study describes and graphically depicts anticipated new shadow impacts from the Project compared to shadows from existing buildings. The study presents the existing and built conditions for the proposed Project for the hours 9:00 AM, 12:00 Noon, and 3:00 PM for the vernal equinox, summer solstice, autumnal equinox, and winter solstice. In addition, shadows are depicted for 6:00 PM during the summer solstice and autumnal equinox.

4.1.2 Vernal Equinox (March 21)

Figures 4-1 through **4-3** depict shadows on March 21.

At 9:00 AM, shadows are cast in onto portions of buildings west of A Street including a small portion of the converted church along West Broadway and on lots on the other side of Silver Street.

At 12:00 Noon, new shadow is cast on additional sidewalk area on A Street and along West Broadway sidewalk next to the Project.

At 3:00 PM, new shadow extends to more of the sidewalk on West Broadway and crossing over to the other side of the street to existing restaurant building and parking lot.

4.1.3 Summer Solstice (June 21)

Figures 4-4 through **4-7** depict shadow impacts on June 21.

At 9:00 AM, new shadow is cast on other side of A Street at corner of West Broadway and on opposite side of Silver Street including the vacant lot at A Street and existing building behind the corner lot.

At 12:00 Noon, new shadow generally stays within the site but extends to a portion of the A Street sidewalk next to the Project at the corner of West Broadway.

At 3:00 PM, new shadow extends to West Broadway sidewalk next to the Project.

At 6:00 PM, new shadow from the Project is cast over portions of the West Broadway roadway, and extending in front of the police station and onto the front of the buildings opposite the police station on the other side of West Broadway.

4.1.4 Autumnal Equinox (September 21)

Figures 4-8 through **4-11** depict shadow impacts on September 21.

At 9:00 AM, new shadow extends to the other side of A Street beyond the existing structure at the corner of West Broadway and extends into the site on the other side of Silver Street at A Street.

At 12:00 Noon, new shadow extends to more of the West Broadway sidewalk and to the restaurant building and parking lot on the other side of West Broadway from the Project.

At 3:00 PM, new shadow extends to the restaurant building and parking lot on the other side of West Broadway from the Project.

At 6:00 PM, new and existing shadows are approximately the same at this time period, except that the new shadow covers a portion of the adjoining police station building.

4.1.5 Winter Solstice (December 21)

Figures 4-12 through **4-14** depict shadow impacts on December 21. Winter sun casts the longest shadows of the year.

At 9:00 AM, existing and new shadow is similar except some additional shadow is cast on church building (converted Rectory of Saint Peter's Church) along West Broadway.

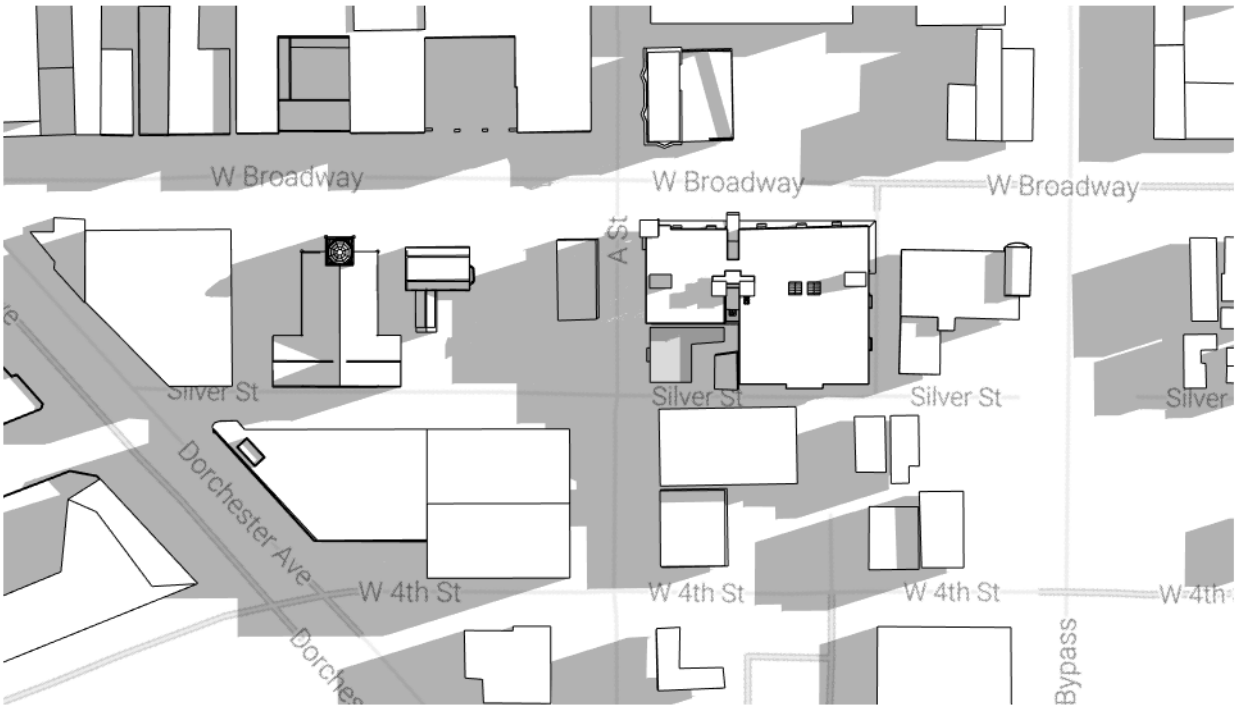
At 12:00 Noon, new shadow is cast on both sidewalks on West Broadway and additional shadow crosses to corner buildings at A Street and West Broadway on the opposite side from the Project.

At 3:00 PM, new shadow covers all of the existing West Broadway restaurant building and parking lot on the other side of West Broadway

4.1.6 Summary

The proposed height of 6-floors does generate shadows in the winter, but the impacts are generally not extensive during the spring through the fall since most of the shadow is generally limited to the streets; West Broadway, A Street and the Right-of-Way adjacent District C-6 Police Station. Morning shadows are cast over A Street, the Mull's Diner building, and the 55 West Broadway condominium building. Mid-day shadows are cast over West Broadway and towards Amrheins Restaurant and parking lot. Late afternoon and evening shadows will extend in an easterly direction toward the right-of-way and police station. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project site and surroundings.

1 Phase: Existing
Sun Date: 3/21 Sun Time: 9AM Sun Altitude: 23° Sun Azimuth: 113°



2 Phase: New Construction
Sun Date: 3/21 Sun Time: 9AM Sun Altitude: 23° Sun Azimuth: 113°

Vernal Equinox - 9AM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-1

1 Phase: Existing
Sun Date: 3/21 Sun Time: 12PM Sun Altitude: 46° Sun Azimuth: 161°

2 Phase: New Construction
Sun Date: 3/21 Sun Time: 12PM Sun Altitude: 46° Sun Azimuth: 161°

Vernal Equinox - 12PM Shadow Study

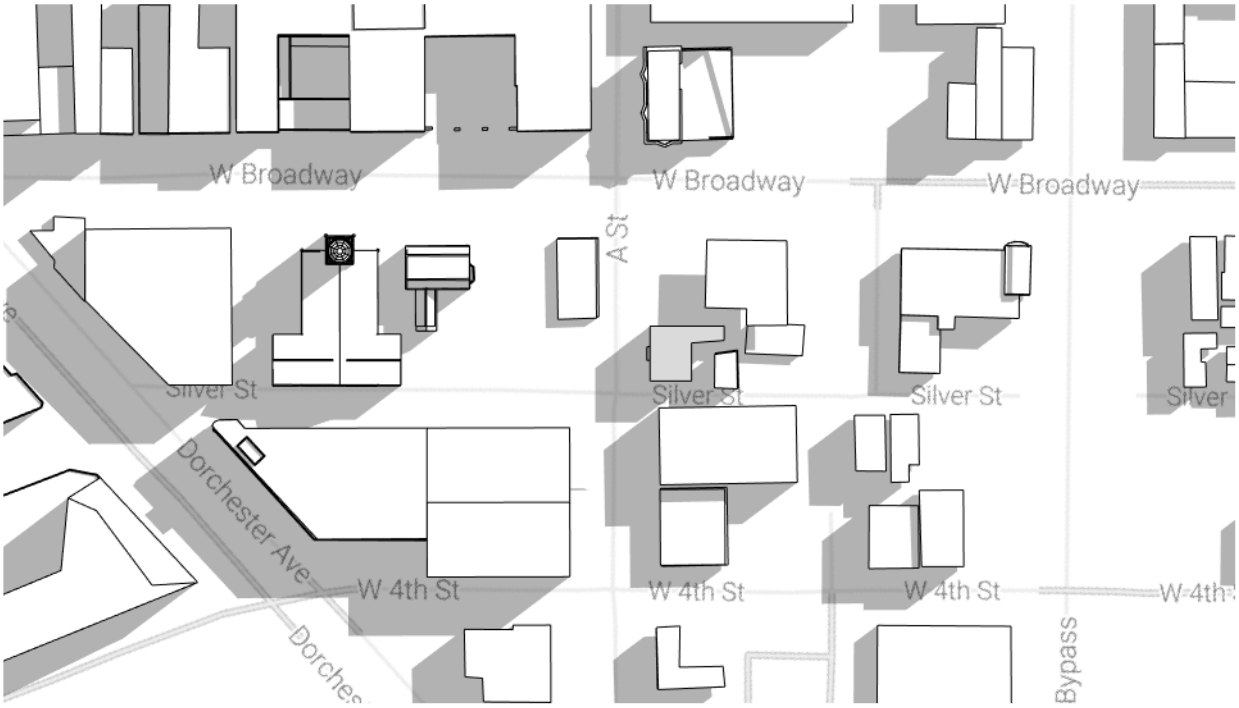
STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-2

1 Phase: Existing
Sun Date: 3/21 Sun Time: 3PM Sun Altitude: 39° Sun Azimuth: -137°

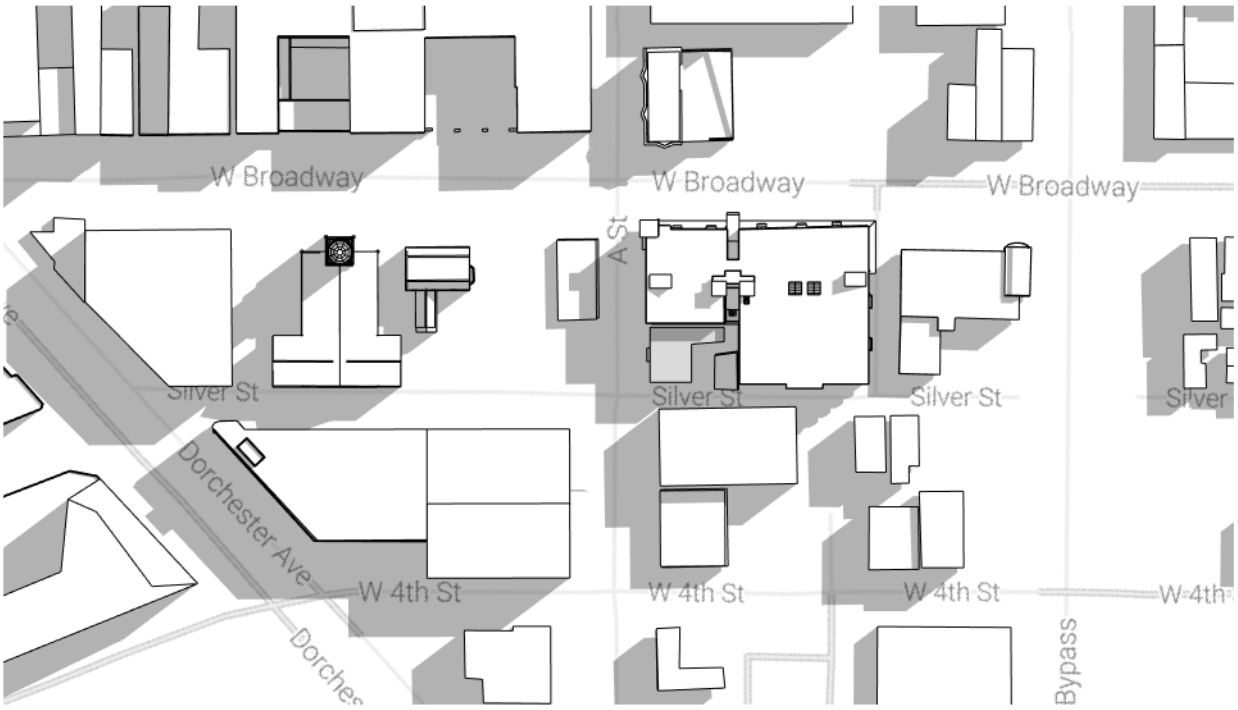
2 Phase: New Construction
Sun Date: 3/21 Sun Time: 3PM Sun Altitude: 39° Sun Azimuth: -137°

Vernal Equinox - 3PM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-3



1 Phase: Existing
Sun Date: 6/21 Sun Time: 9AM Sun Altitude: 40° Sun Azimuth: 94°



2 Phase: New Construction
Sun Date: 6/21 Sun Time: 9AM Sun Altitude: 40° Sun Azimuth: 94°

Summer Solstice - 9AM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-4

1 Phase: Existing
Sun Date: 6/21 Sun Time: 12PM Sun Altitude: 69° Sun Azimuth: 150°

2 Phase: New Construction
Sun Date: 6/21 Sun Time: 12PM Sun Altitude: 69° Sun Azimuth: 150°

Summer Solstice - 12PM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-5

1 Phase: Existing
Sun Date: 6/21 Sun Time: 3PM Sun Altitude: 56° Sun Azimuth: -114°

2 Phase: New Construction
Sun Date: 6/21 Sun Time: 3PM Sun Altitude: 56° Sun Azimuth: -114°

Summer Solstice - 3PM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-6

1 Phase: Existing
Sun Date: 6/21 Sun Time: 6PM Sun Altitude: 24° Sun Azimuth: -79°

2 Phase: New Construction
Sun Date: 6/21 Sun Time: 6PM Sun Altitude: 24° Sun Azimuth: -79°

Summer Solstice - 6PM Shadow Study

1 Phase: Existing
Sun Date: 9/21 Sun Time: 9AM Sun Altitude: 26° Sun Azimuth: 115°

2 Phase: New Construction
Sun Date: 9/21 Sun Time: 9AM Sun Altitude: 26° Sun Azimuth: 115°

Autumnal Equinox - 9AM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-8

1 Phase: Existing
Sun Date: 9/21 Sun Time: 12PM Sun Altitude: 48° Sun Azimuth: 166°

2 Phase: New Construction
Sun Date: 9/21 Sun Time: 12PM Sun Altitude: 48° Sun Azimuth: 166°

Autumnal Equinox - 12PM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-9

1 Phase: Existing
Sun Date: 9/21 Sun Time: 3PM Sun Altitude: 38° Sun Azimuth: -133°

2 Phase: New Construction
Sun Date: 9/21 Sun Time: 3PM Sun Altitude: 38° Sun Azimuth: -133°

Autumnal Equinox - 3PM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-10

1 Phase: Existing
Sun Date: 9/21 Sun Time: 6PM Sun Altitude: 8° Sun Azimuth: -96°

2 Phase: New Construction
Sun Date: 9/21 Sun Time: 6PM Sun Altitude: 8° Sun Azimuth: -96°

Autumnal Equinox - 6 PM Shadow Study

STEFANO ARCHITECTS	87-93 West Broadway, S. Boston, MA	Figure 4-11

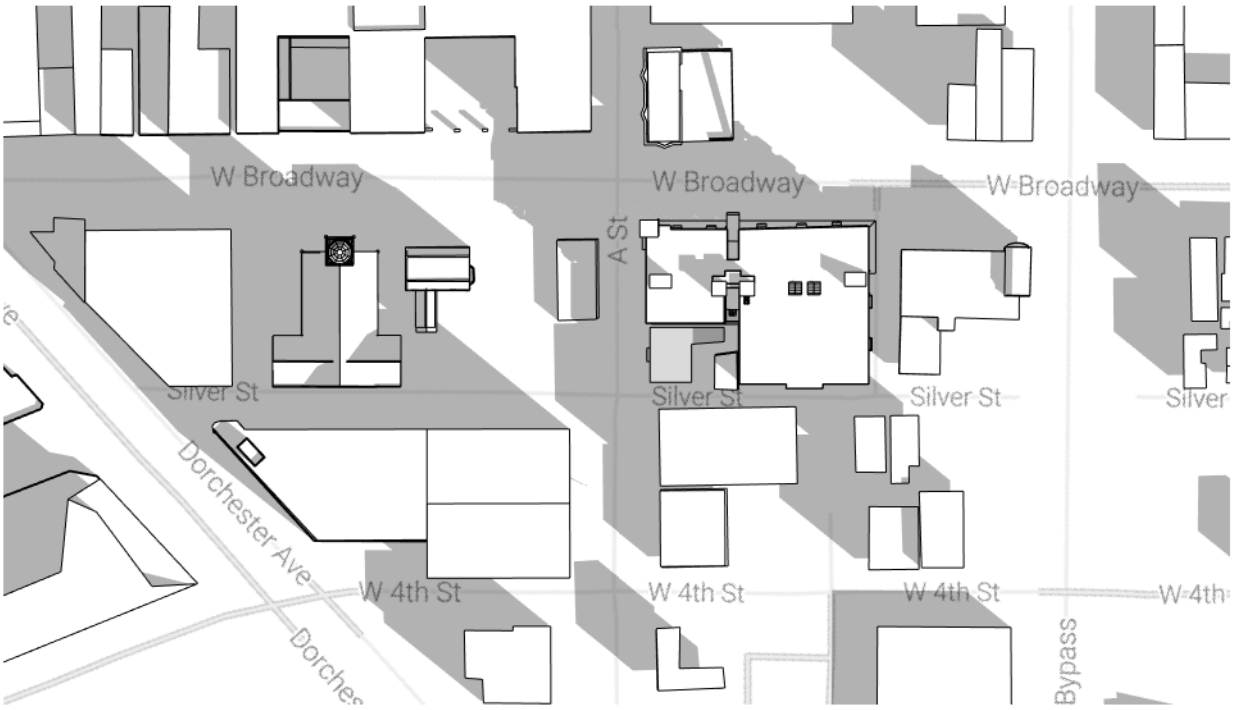
1 Phase: Existing
Sun Date: 12/21 Sun Time: 9AM Sun Altitude: 7° Sun Azimuth: 130°

2 Phase: New Construction
Sun Date: 12/21 Sun Time: 9AM Sun Altitude: 7° Sun Azimuth: 130°

Winter Solstice - 9AM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-12

1 Phase: Existing
Sun Date: 12/21 Sun Time: 12PM Sun Altitude: 24° Sun Azimuth: 169°



2 Phase: New Construction
Sun Date: 12/21 Sun Time: 12PM Sun Altitude: 24° Sun Azimuth: 169°

Winter Solstice - 12pm Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-13

1 Phase: Existing
Sun Date: 12/21 Sun Time: 3PM Sun Altitude: 17° Sun Azimuth: -147°

2 Phase: New Construction
Sun Date: 12/21 Sun Time: 3PM Sun Altitude: 17° Sun Azimuth: -147°

Winter Solstice - 3PM Shadow Study

STEFANO ARCHITECTS | 87-93 West Broadway, S. Boston, MA | Figure 4-14

4.2 Air Quality

Tech Environmental, Inc. performed air quality analyses for the Project. These analyses consisted of: 1) an evaluation of existing air quality; 2) an evaluation of potential carbon monoxide (CO) impacts from the operation of the Project's underground parking garage, and 3) a microscale CO analysis for intersections in the Project area that meet the BRA criteria for requiring such an analysis.

4.2.1 Existing Air Quality

The City of Boston is currently classified as being in attainment of the Massachusetts and National Ambient Air Quality Standards ("NAAQS") for all of the criteria air pollutants except ozone (see **Table 4.2-1**). These air quality standards have been established to protect the public health and welfare in ambient air, with a margin for safety.

The Massachusetts Department of Environmental Protection ("DEP") currently operates air monitors in various locations throughout the city. The closest, most representative, DEP monitors for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), fine particulate matter ($PM_{2.5}$), coarse particulate matter (PM_{10}), and lead are located at Dudley Square (Harrison Avenue). Harrison Avenue, Boston, MA. The closest, most representative, DEP monitor for ozone is located at Dudley Square (Harrison Avenue).

Table 4.3-2 summarizes the DEP air monitoring data, for the most recent available, complete, three-year period (2013-2015), that are considered to be representative of the project area. **Table 4.3-2** shows that the existing air quality in the Project area is generally much better than the NAAQS. The highest impacts relative to a NAAQS are for ozone, NO_2 and $PM_{2.5}$. Ozone is a regional air pollutant on which the small amount of additional traffic generated by this Project will have an insignificant impact. The Project's operations will not have a significant impact on local NO_2 and $PM_{2.5}$ concentrations.

Table 4.2-1. Massachusetts and National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	NAAQS (µg/m^3)
Sulfur Dioxide ($SO_{2)}$	1-hour^{P} 3-hour^{S} Annual^{P} (Arithmetic Mean)	196[a] 1,300[b] 80
Carbon Monoxide (CO)	1-hour^{P} 8-hour^{P}	40,000[b] 10,000[b]
Nitrogen Dioxide ($NO_{2)}$	1-hour^{P} Annual$^{P/S}$ (Arithmetic Mean)	188[c] 100
Coarse Particulate Matter ($PM_{10)}$	24-hour$^{P/S}$	150
Fine Particulate Matter ($PM_{2.5)}$	24-hour$^{P/S}$ Annual^{P} (Arithmetic Mean) Annual^{S} (Arithmetic Mean)	35[d] 12[e,f] 15
Ozone ($O_{3)}$	8-hour$^{P/S}$	137[g]
Lead (Pb)	Rolling 3-Month Avg.$^{P/S}$	0.15

P = primary standard; S = secondary standard.
[a] 99th percentile 1-hour concentrations in a year (average over three years).
[b] One exceedance per year is allowed.
[c] 98th percentile 1-hour concentrations in a year (average over three years).
[d] 98th percentile 24-hour concentrations in a year (average over three years).
[e] Three-year average of annual arithmetic means.
[f] As of March 18, 2013, the U.S. EPA lowered the $PM_{2.5}$ annual standard from 15 ug/m^3 to 12 ug/m^3.
[g] Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m^3) (effective December 28, 2015); the annual PM_{10} standard was revoked in 2006.

Table 4.2-2. Representative Existing Air Quality in the Project Area

Pollutant, Averaging Period	Monitor Location	Value ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
CO, 1-hour	Harrison Avenue, Boston	2,141	40,000	5%
CO, 8-hour	Harrison Avenue, Boston	1,260	10,000	12%
NO_2, 1-hour	Harrison Avenue, Boston	96.6	188	51%
NO_2, Annual	Harrison Avenue, Boston	32.8	100	33%
Ozone, 8-hour	Harrison Avenue, Boston	110	137	80%
PM_{10}, 24-hour	Harrison Avenue, Boston	61	150	41%
$PM_{2.5}$, 24-hour	Harrison Avenue, Boston	14.7	35	42%
$PM_{2.5}$, Annual	Harrison Avenue, Boston	6.5	12	54%
Lead, Quarterly	Harrison Avenue, Boston	0.0033	1.5	0.2%
SO_2, 1-hour	Harrison Avenue, Boston	28.5	196	15%

Source: MassDEP, http://www.mass.gov/eea/agencies/massdep/air/quality/air-monitoring-reports-and-studies.html, downloaded January 30, 2017.

Notes:

(1) Annual averages are highest measured during the most recent three-year period for which data are available (2013 - 2015). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.

(2) The eight-hour ozone value is the 3-year average of the annual fourth-highest values, the 24-hour $PM_{2.5}$ value is the 3-year average of the 98th percentile values, the annual $PM_{2.5}$ value is the 3-year average of the annual values – these are the values used to determine compliance with the NAAQS for these air pollutants.

(3) The one-hour NO_2 value is the -year average of the 98th percentile values and the one-hour SO_2 value is the -year average of the 99th percentile values.

(4) Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m^3) (effective December 28, 2015); the annual PM_{10} standard was revoked in 2006 and the 3-hour SO_2 standard was revoked by the US EPA in 2010.

4.2.2 Impacts from Parking Garage

The Project also includes a parking garage designed to provide parking spaces for 88 vehicles. An analysis of the worst-case air quality impacts from the proposed parking garage was performed (see **Appendix B**). The procedures used for this analysis are consistent with U.S. EPA's Volume 9 guidance.[1] The objective of this analysis was to determine the maximum CO concentrations inside the garage and at the closest sensitive receptors surrounding the Project. These closest sensitive receptors include: air intakes located on the proposed building and nearby existing buildings and pedestrians at ground level anywhere near the Project. CO emissions from motor

[1] US EPA, "Guidelines for Air Quality Maintenance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources," EPA-450/4-78-001, September 1978.

vehicles operating inside the garage were calculated and the CO concentrations inside the garage and surrounding the Project were based on morning and afternoon peak traffic periods.

The objective of this analysis was to determine the maximum CO concentrations at the closest sensitive receptors surrounding the Project. These closest sensitive receptors include: air intakes located on the proposed building and nearby existing buildings, and pedestrians at ground level anywhere near the Project. The parking garage CO emissions were modeled using an U.S. EPA-approved air model.

Garage Ventilation System

The proposed parking garage will require mechanical ventilation. The garage ventilation system will be designed to provide adequate dilution of the motor vehicle emissions before they are vented outside. The design of the garage ventilation system will meet all building code requirements. Full ventilation of the garage will require a maximum flow of approximately 9,000 cubic feet per minute (cfm) of fresh air. This quantity of air is designed to meet the building code and will be more than adequate to dilute the emissions inside the parking garage to safe levels before they are vented outside. The garage ventilation exhausts will likely be located at two side vents.

Peak Garage Traffic Volumes

The peak morning and afternoon one-hour entering and exiting traffic volumes for the garage are shown in **Table 4.2-3**.

Table 4.2-3. Peak-Hour Garage Traffic Volumes

Period	Entering (vehicles/hour)	Exiting (vehicles/hour)	Total (vehicles/hour)
Morning Peak Hour	6	13	19
Afternoon Peak Hour	18	14	32

Source: Howard-Stein Hudson, Inc.

Motor Vehicle Emission Rates

The U.S. Environmental Protection Agency (EPA) MOVES2014 emission factor model was used to calculate single vehicle CO emissions rates, for a vehicle speed of 5 mph. The inputs to the MOVES2014 model followed the latest guidance from the Massachusetts Department of Environmental Protection (DEP) and were performed for the future traffic year of 2024. The CO

emission rate calculated by MOVES2014, for vehicles moving at 5 miles per hour (mph), was 2.976 grams per vehicle-mile for each entering and exiting vehicle. These emission rates apply to wintertime conditions when motor vehicle CO emissions are greatest due to cold temperatures. MOVES2014 model output is provided in the **Appendix B.**

To determine the maximum one-hour CO emissions inside the garage it was necessary to estimate the amount of time each motor vehicle will be in the parking garage with its engine running. To be conservative, it was assumed that every car entering or leaving the garage will be operating during that peak hour. The calculations in **Appendix B** show how long each vehicle will be operating in the garage for both the morning and afternoon peak periods.

Peak Garage CO Emission Rate and CO Concentration Inside the Garage

The peak one-hour CO emission rate for the parking garage was calculated to be 0.066 grams per minute for the morning peak hour and 0.108 grams per minute for the afternoon peak hour. Applying the maximum volumetric garage ventilation flow rate for the parking garage, the peak one-hour CO concentration inside the garage was calculated to be 0.22 parts of CO per million parts of air (ppm) for the morning peak hour and 0.37 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 0.37 ppm with a peak one-hour emission rate of 0.108 grams/minute (0.0018 grams/second), corresponding to the afternoon peak period. These predictions represent conservative estimates of the peak garage CO emissions and concentrations.

Peak Ambient CO Concentration

Worst-case concentrations of CO from the parking garage were predicted for locations around the building with using AERMOD model (Version16216r) in screening-mode. The results of the air quality analysis for locations outside and around the building are summarized in **Table 4.2-4**. The results in **Table 4.2-4** represent all outside locations on and near the Project Site, including nearby building air intakes and nearby residences. **Appendix B** contains the AERMOD model output.

The AERMOD model in screening-mode was used to predict the maximum concentration of CO by modeling the parking garage emissions as volume sources using worst-case meteorological conditions for an urban area. The screening-mode option simulates modeling results predicted by AERMOD. The predicted concentrations presented here represent the worst-case air quality impacts from the building heating system and parking garage at all locations on and around the Project. AERMOD predicted one-hour average concentrations of air pollutants.

AERMOD predicted that the maximum one-hour CO concentration from the parking garage will be 0.0022 ppm (2.55 $\mu g/m^3$). This concentration represents the maximum CO concentration at any location surrounding the Project. AERSCREEN guidance allows the maximum eight-hour CO impact to be conservatively estimated by multiplying the maximum one-hour impact by a

factor of 0.9 (i.e. the eight-hour impact is 90% of the one-hour impact). The maximum predicted eight-hour CO concentration was determined to be approximately 0.0020 ppm (0.0022 ppm x 0.9).

The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare in ambient air, with a margin for safety. The NAAQS for CO are 35 ppm for a one-hour average and 9 ppm for an eight-hour average. The Commonwealth of Massachusetts has established the same standards for CO. The CO background values of 1.9 ppm for a one-hour period and 1.1 ppm for an eight-hour period were added to the maximum predicted garage ambient impacts to represent the CO contribution from other, more distant, sources. With the background concentration added, the peak, total, one-hour and eight-hour CO impacts from the parking garage, at any location around the building, will be no larger than 1.9002 ppm and 1.1002 ppm, respectively. These maximum predicted total CO concentrations (garage exhaust impacts plus background) are safely in compliance with the NAAQS. This analysis demonstrates that the operation of the parking garage will not have an adverse impact on air quality.

Table 4.2-4. Peak Predicted Parking Garage Air Quality Impacts

Location	Peak Predicted One-Hour Impact (ppm)	One-Hour NAAQS (ppm)	Peak Predicted Eight-Hour Impact (ppm)	Eight-Hour NAAQS (ppm)
Outside – Surrounding the Building* (Parking Garage)	1.9002**	35 (NAAQS)	1.1002**	9 (NAAQS)

NAAQS = Massachusetts and National Ambient Air Quality Standards for CO (ppm = parts per million)
* Representative of maximum CO impact at all nearby residences, buildings, and sidewalks.
** Includes background concentrations of 1.9 ppm for the one-hour period and 1.1 ppm for the eight-hour period.

4.2.3 Microscale CO Analysis for Selected Intersections

The Boston Planning and Development Agency (BPDA) and the Massachusetts DEP typically require a microscale air quality analysis for any intersection in the Project study area where the level of service (LOS) is expected to deteriorate to D and the proposed project causes a 10% increase in traffic or where the level of service is E or F and the project contributes to a reduction in LOS. For such intersections, a microscale air quality analysis is required to examine the carbon monoxide (CO) concentrations at sensitive receptors near the intersection.

A microscale air quality analysis was not performed for this Project due to the Project trip generation having minimal impacts on the overall delays at the four intersections. The Project will generate approximately 19 motor vehicle trips during the morning peak traffic hour and

approximately 32 motor vehicle trips during the afternoon traffic hour. Under the Build scenario, the overall LOS will be the same or better during the morning peak traffic hour for all intersections. Under the Build scenario, the overall LOS will be the same or better during the afternoon peak traffic hour for all intersections, except for the A Street/West Broadway intersection where the overall LOS degrades from D to F. This degradation is due increases in future background traffic. Furthermore, the increase in traffic at this intersection is less than 10%. **Table 4.2-5** shows a comparison of the Existing (2017) and Build (2024) LOS at the three intersections. The motor vehicle trip generation from the Project will not have a significant impact on motor vehicle delays and air pollutant emissions at the analyzed intersections. Therefore, the motor vehicle traffic generated by the Project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project.

Table 4.2-5. Summary of Build Case Level of Service

Intersection	Existing LOS (AM/PM)	Build LOS (AM/PM)	Requires Analysis?
A Street/West Broadway – signalized	D/E	F/E	NO*
A Street/Silver Street – unsignalized	A/A	A/B	NO
West Broadway	A/A	A/A	NO

The LOS shown represents the overall delay at each intersection
*Project does not contribute to reduction in level of service.

Source: Howard/Stein-Hudson Associates, Inc.

Conclusions

The microscale CO air quality dispersion modeling analysis clearly indicates that the worst-case traffic generated by the Project will not cause or contribute to any violations of the NAAQS for CO, and will not significantly affect air quality. Total CO impacts at the intersections with the largest delays and at the Project site, including the impacts from the parking garage, are predicted to be safely in compliance with the NAAQS for CO.

4.3 Noise Impacts

Tech Environmental, Inc., performed a noise study to determine whether the operation of the proposed Project will comply with the City of Boston Noise Regulations and the Massachusetts Department of Environmental Protection ("DEP") Noise Policy.

4.3.1 Common Measures of Community Noise

The unit of sound pressure is the decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 70 dB is added to another sound of 70 dB, the total is only a 3-decibel increase (or 73 dB), not a doubling to 140 dB. Thus, every 3 dB increase represents a doubling of sound energy. For broadband sounds, a 3 dB change is the minimum change perceptible to the human ear. **Table 4.3-1** gives the perceived change in loudness of different changes in sound pressure levels.[2]

Table 4.3-1. Subjective Effects of Changes in Sound Pressure Levels

Change in Sound Level	Apparent Change in Loudness
3 dB	Just perceptible
5 dB	Noticeable
10 dB	Twice (or half) as loud

Non-steady noise exposure in a community is commonly expressed in terms of the A-weighted sound level (dBA); A-weighting approximates the frequency response of the human ear. Levels of many sounds change from moment to moment. Some are sharp impulses lasting 1 second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L_{90} metric, which is the sound level exceeded 90 percent of the time, is typically used. The L_{90} can also be thought of as the level representing the quietest 10 percent of any time period. Similarly, the L_{10} can also be thought of as the level representing the quietest 90 percent of any time period. The L_{10} and L_{90} are broadband sound pressure measures, i.e., they include sounds at all frequencies.

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines nine octave bands from 32 Hz to 8,000 Hz. A source is said to create a pure tone if acoustic energy is concentrated in a narrow frequency range and one octave band has a sound level 3 dB greater than both adjacent octave bands.

The acoustic environment in an urban area such as the Project area results from numerous sources. Observations show that major contributors to the background sound level in the Project area include motor vehicle traffic on local and distant streets, aircraft over-flights, mechanical equipment on nearby buildings, nature noises such as insects, tree frogs, small animals, and

[2] American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1989 ASHRAE Handbook--Fundamentals (I-P) Edition, Atlanta, GA, 1989.

general city noises such as street sweepers and police/fire sirens. Typical sound levels associated with various activities and environments are presented in **Table 4.4-2**.

4.3.2 Noise Regulations

Commonwealth Noise Policy

The DEP regulates noise through 310 CMR 7.00, "Air Pollution Control." In these regulations "air contaminant" is defined to include sound and a condition of "air pollution" includes the presence of an air contaminant in such concentration and duration as to "cause a nuisance" or "unreasonably interfere with the comfortable enjoyment of life and property."

Regulation 7.10 prohibits "unnecessary emissions" of noise. The DEP DAQC Policy Statement 90-001 (February 1, 1990) interprets a violation of this noise regulation to have occurred if the noise source causes either:

1. An increase in the broadband sound pressure level of more than 10 dBA above the ambient level; or
2. A "pure tone" condition.

The ambient background level is defined as the L_{90} level as measured during equipment operating hours. A "pure tone" condition occurs when any octave band sound pressure level exceeds both of the two adjacent octave band sound pressure levels by 3 dB or more.

The DEP does not regulate noise from motor vehicles accessing a site or the equipment backup notification alarms. Therefore, the provisions described above only apply to a portion of the sources that may generate sound following construction of the Project.

Local Regulations

The City of Boston Environment Department regulates noise through the Regulations for the Control of Noise as administered by the Air Pollution Control Commission. The Project is located in an area consisting of commercial and residential uses. The Project will have low-rise residential uses to the north, east, and south. The Project must comply with Regulation 2.2 for noise levels in Residential Zoning Districts at these residential locations**. Table 4.3-3** lists the maximum allowable octave band and broadband sound pressure levels for residential and business districts. Daytime is defined by the City of Boston Noise Regulations as occurring between the hours of 7:00 a.m. and 6:00 p.m. daily except Sunday. Compliance with the most restrictive nighttime residential limits will ensure compliance for other land uses with equal or higher noise limits.

Table 4.3-2. Common Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Pressure (μPa)	Sound Level (dBA)	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 1m
	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	Average Whisper
		15	Broadcast and Recording Studios
	63	10	
		5	Human Breathing
Reference Pressure Level	20	0	Threshold of Hearing

Notes: μPa, or micro-Pascals, describes sound pressure levels (force/area). DBA, or A-weighted decibels, describes sound pressure on a logarithmic scale with respect to 20 μPa (reference pressure level).

Table 4.3-3. Maximum Allowable Sound Pressure Levels (dB) City of Boston

Octave Band (Hz)	Zoning District		
	Residential (Daytime)	Residential (All Other Times)	Business (anytime)
32 Hz	76	68	79
63 Hz	75	67	78
125 Hz	69	61	73
250 Hz	62	52	68
500 Hz	56	46	62
1000 Hz	50	40	56
2000 Hz	45	33	51
4000 Hz	40	28	47
8000 Hz	38	26	44
Broadband (dBA)	**60**	**50**	**65**

4.3.3 Pre-Construction Sound Level Measurements

Existing baseline sound levels in the Project area were measured during the quietest overnight period when human activity and street traffic were at a minimum, and when the Project's mechanical equipment (the principal sound sources) could be operating. Since the Project's mechanical equipment may operate at any time during a 24-hour day, a weekday between 11:00 p.m. and 4:00 a.m. was selected as the worst-case time period, i.e., the time period when Project-related sounds may be most noticeable due to the quieter background sound levels. Establishing an existing background (L_{90}) during the quietest hours of the facility operation is a conservative approach for noise impact assessment and is required by the DEP Noise Policy.

The nighttime noise measurement locations are as follows (see the **Figure 1** in the **Appendix C**):

Monitoring Location #1: 45 A Street

Monitoring Location #2: 66 Silver St

Monitoring Location #3: 118 West Broadway St

Broadband (dBA) and octave band sound level measurements were made with a Larson Davis Type 831 environmental sound level analyzer, at each monitoring location, for a duration of approximately thirty minutes. The full octave band frequency analysis was performed on the frequencies spanning 16 to 16,000 Hertz. A time-integrated statistical analysis of the data used to quantify the sound variation was also performed, including the calculation of the L_{90}, which is used to set the ambient background sound level.

The Larson Davis 831 is equipped with a ½" precision condenser microphone and has an operating range of 5 dB to 140 dB and an overall frequency range of 3.5 Hz to 20,000 Hz. This meter meets or exceeds all requirements set forth in the ANSI S1.4-1983 Standards for Type 1 quality and accuracy and the State and City requirements for sound level instrumentation. Prior to any measurements, this sound analyzer was calibrated with an ANSI Type 1 calibrator that has an accuracy traceable to the National Institute of Standards and Technology (NIST). During all measurements, the Larson Davis was tripod mounted at approximately five feet above the ground in open areas away from vertical reflecting surfaces.

The sound level monitoring was conducted Thursday night, March 30, into Friday morning, March 31, 2017. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was 39°F, the skies were clear, and the winds were 5 to 10 mph, from the south. The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The nighttime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. A significant source of existing sound at all locations is motor vehicle traffic on nearby highways and local streets, residential and commercial air handling equipment, crickets and other insects/animals and aircraft over-flights.

The results of the nighttime baseline sound level measurements are presented in **Table 4.3-4**, and the complete measurement printouts are provided in **Appendix C**. The nighttime background L_{90} level was 52.3 dBA at Location #1, 51.1 dBA at Location #2, and 50.8 at Location #3. The octave band data in **Table 4.3-4** show that no pure tones were detected in the nighttime noise measurements.

Noise monitoring at the Project Site during the morning peak traffic period was used to evaluate the existing ambient sound levels and to evaluate conformance with the Site Acceptability Standards established by HUD for residential development. The purpose of the HUD guidelines is to provide standards for determining the acceptability of residential project locations with regards to existing sound levels. The HUD criteria regarding the day-night average sound level (L_{dn}) are listed below. These standards apply to L_{dn} measurements taken several feet from the building in the direction of the predominant source of noise.

- Normally Acceptable – L_{dn} not exceeding 65 dBA
- Normally Unacceptable – L_{dn} above 65 dBA but not exceeding 75 dBA
- Unacceptable – L_{dn} above 75 dBA.

These HUD standards do not apply to this Project, but are used as guidance regarding the suitability of the Project area with regard to background sound levels.

Daytime sound level measurements were taken to help estimate the L_{dn} for the Project Site. A 30-minute sound level measurement was taken during the afternoon, on Wednesday, April 19, 2017 between 2:43 pm. and 3:15 p.m. at 66 Silver Street (Location #2) representing the closest location to the Project Site. The weather conditions during the sound survey were conducive to accurate sound level monitoring: the skies were overcast, and the winds were 5-10 mph. The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The daytime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. The main sources of noise during the peak morning traffic period sound level measurement were motor vehicle traffic on nearby local streets, construction vehicles in the distance, adjacent MBTA Broadway Red line activity, and aircraft over-flights. The L_{eq} measured during the afternoon period was 64.2 dBA. The L_{eq} sound level measured during the nighttime at the same location was 54.8 dBA. Using both the daytime and nighttime L_{eq} sound levels, the calculated L_{dn} for the site is 64.2 dBA, which is below the HUD guideline noise limit of 65 dBA.

It is assumed that standard building construction practices will result in at least a 20 dBA reduction of sound from outdoor sound levels. The Proponent will incorporate sound mitigation, as necessary, to assure that motor vehicle sound sources and the MBTA rail yard do not result in noise impacts greater than 45 dBA inside the residential units closest to the neighboring streets.

Table 4.3-4. Nighttime Baseline Sound Level Measurements, March 30-31, 2017

Sound Level Measurement	(Location #1) 45 A Street 11:13 p.m. - 11:43 p.m.	(Location #2) 66 Silver St 11:44 p.m.- 12:14 a.m.	(Location #3) 118 West Broadway St 12:15 a.m. - 12:45 a.m.
Broadband (dBA)			
Background (L_{90})	52.3	51.1	50.8
Octave Band L_{90} (dB)			
16 Hz	61.3	60	60.6
32 Hz	63.4	62.7	57.7
63 Hz	59.4	60.2	57.9
125 Hz	55.1	55.4	55.2
250 Hz	51.7	48.5	53.8
500 Hz	49.5	45.9	48.4
1000 Hz	48.3	46.4	45.5
2000 Hz	42.4	43.1	39.8
4000 Hz	33.8	39.4	29.8
8000 Hz	25.4	30.7	21.6
16000 Hz	17.9	21.3	15.5
Pure Tone?	No	No	No

4.3.4 Reference Data and Candidate Mitigation Measures

The mechanical systems for the Proposed Project are in the early design stage. Typical sound power data for the equipment of the expected size and type for the Project have been used in the acoustic model to represent the Project's mechanical equipment. The sound levels from all potential significant Project noise sources are discussed in this section.

The design for the Proposed Project is expected to include the following significant mechanical equipment:

- 10 rooftop condensing units (2-10 ton units)
- Garage exhaust

The equipment listed above, which will be located on the building rooftop, was included in the noise impact analysis. The Project's traffic was not included in the noise analysis because motor vehicles are exempt under both the City of Boston and Massachusetts DEP noise regulations.

The sound generation profiles for the mechanical equipment noise sources operating concurrently under full-load conditions were used to determine the maximum possible resultant sound levels from the Project Site as a whole, to define a worst-case scenario. To be in compliance with City

and DEP regulations, the resultant sound level must not exceed the allowable octave band limits in the City of Boston noise regulation and must be below the allowable incremental noise increase, relative to existing noise levels, as required in the DEP Noise Policy.

This sound level impact analysis was performed using sound generation data for representative equipment to demonstrate compliance with noise regulations. As the building design evolves, the sound generation for the actual equipment selected may differ from the values that were utilized for the analysis.

4.3.5 Calculated Future Sound Levels

Methodology

Future maximum sound levels at the upper floors of all existing residences bordering the Project, and at the nearest residential property lines, were calculated with acoustic modeling software assuming simultaneous operation of all mechanical equipment at their maximum loads.

The Cadna-A computer program, a comprehensive 3-dimensional acoustical modeling software package was used to calculate Project generated sound propagation and attenuation.[3] The model is based on ISO 9613, an internationally recognized standard specifically developed to ensure the highly accurate calculation of environmental noise in an outdoor environment. ISO 9613 standard incorporates the propagation and attenuation of sound energy due to divergence with distance, surface and building reflections, air and ground absorption, and sound wave diffraction and shielding effects caused by barriers, buildings, and ground topography.

Receptors

The closest/worst-case sensitive (residential) location is to the south of the project area at 53 Silver Street. This location was selected based on the proximity of the equipment (smaller distances correspond to larger noise impacts) and the amount of shielding by the project (residences further from the project will experience less shielding from the Project's rooftop mechanical equipment, which may result in larger potential noise impacts from the Project). This location is expected to receive the largest sound level impacts from the Project's rooftop mechanical equipment. It can be classified as a residential zone.

The sound level impacts from the building's mechanical equipment were predicted at the closest residential location, as well as additional residential uses to the east (45 A Street & 40 Silver Street), southeast (53 Silver Street & 55 Silver Street,) and west (48, 55, 80 & 116 West Broadway) Figure 1 in Appendix C shows the locations of the modeled noise receptors. Noise impacts at other nearby noise-sensitive locations (residences, parks, etc.) farther from the Project Site will be less than those predicted for these receptors.

[3]Cadna-A Computer Aided Noise Abatement Program, Version 4.3

4.3.6 Compliance with State and Local Noise Standards

The City of Boston and DEP noise standards apply to the operation of the mechanical equipment at the proposed Project. The details of the noise predictions are presented in **Tables 4.3-5** through **4.3-12**. The sound impact analysis includes the simultaneous operation of the Project's rooftop HVAC equipment. The predicted sound levels are worst-case predictions that represent all hours of the day, as the analysis assumes full operation of the mechanical equipment 24-hours a day. The typical sound level impacts from the mechanical equipment will likely be lower than what is presented here, since most of the mechanical equipment will operate at full-load only during certain times of the day and during the warmer months of the year, it is not likely that all of the mechanical equipment will operate at the same time. Sound level impacts at locations farther from the Project (e.g. other residences, etc.) will be lower than those presented in this report.

City of Boston Noise Standards

The noise impact analysis results, presented in **Tables 4.3-5** through **4.3-12**, reveal that the sound level impact at the upper floors of the closest residences will be between 32.2 and 41.8 dBA. The smallest sound level impact of 27.9 dBA is predicted to occur at 55 West Broadway. The largest sound level impact of 41.8 dBA is predicted to occur at 53 Silver Street. Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. Note that sound levels from the Project will be below the residential nighttime limits at all times. The results also demonstrate compliance with the City of Boston, residential, non-daytime, octave band noise limits at both closest locations.

The City of Boston noise limits for business areas are significantly higher than the nighttime noise limits for residential areas (see **Table 4.3-3**). The Project will also easily comply with the City of Boston business area noise limits at all surrounding commercial properties.

Massachusetts DEP Noise Regulations

The predicted sound level impacts at the worst-case residential locations were added to the measured L_{90} value of the quietest daily hour to test compliance with DEP's noise criteria. Assuming the Project's mechanical noise is constant throughout the day, the Project will cause the largest increase in sound levels during the period when the lowest background noise occurs. Minimum background sound levels (diurnal) typically occur between 12:00 a.m. and 5:00 a.m.

The predicted sound level impacts at the upper floors of the closest residences were added to the L_{90} values measured during the period with the least amount of background noise to test compliance with DEP's noise criteria. The predicted noise impacts at the property line and the closest residences were added to the most-representative measured L_{90} values to determine the largest possible increase in the sound level at each location during the quietest hour at the Project Site.

As shown in **Tables 4.3-5** through **4.3-12**, the Project is predicted to produce a less than 1 dBA change in the background sound levels at all modeled locations. Therefore, the Project's worst-case sound level impacts during the quietest nighttime periods will be in compliance with the Massachusetts DEP allowed noise increase of 10 dBA. The noise predictions for each octave band indicate that the mechanical equipment will not create a pure tone condition at any location.

Table 4.3-5. Estimated Future Sound Level Impacts – Anytime, 53 Silver Street (Closest/Worst Case Residence) – Location R2

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	56
63 Hz	67	56
125 Hz	61	49
250 Hz	52	42
500 Hz	46	38
1000 Hz	40	36
2000 Hz	33	32
4000 Hz	28	26
8000 Hz	26	18
Broadband (dBA)	**50**	**42**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	51.1
87-93 West Broadway Street Project*	41.8
Calculated Combined Future Sound Level	51.6
Calculated Incremental Increase	+0.5
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-6. Estimated Future Sound Level Impacts – Anytime, 40 Silver Street – Location R1

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41
63 Hz	67	39
125 Hz	61	38
250 Hz	52	35
500 Hz	46	29
1000 Hz	40	36
2000 Hz	33	26
4000 Hz	28	16
8000 Hz	26	8.5
Broadband (dBA)	**50**	**42**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	52.3
87-93 West Broadway Street Project*	32.2
Calculated Combined Future Sound Level	52.3
Calculated Incremental Increase	+0
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-7. Estimated Future Sound Level Impacts – Anytime, 55 Silver Street – Location R3

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	55
63 Hz	67	55
125 Hz	61	48
250 Hz	52	42
500 Hz	46	38
1000 Hz	40	36
2000 Hz	33	31
4000 Hz	28	26
8000 Hz	26	17
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	51.1
87-93 West Broadway Street Project*	41.3
Calculated Combined Future Sound Level	51.5
Calculated Incremental Increase	+0.4
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-8. Estimated Future Sound Level Impacts – Anytime, 45 A Street – Location R4

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41
63 Hz	67	40
125 Hz	61	43
250 Hz	52	40
500 Hz	46	33
1000 Hz	40	27
2000 Hz	33	20
4000 Hz	28	13
8000 Hz	26	6
Broadband (dBA)	**50**	**35**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	52.3
87-93 West Broadway Street Project*	35.1
Calculated Combined Future Sound Level	52.4
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-9. Estimated Future Sound Level Impacts – Anytime, 48 West Broadway – Location R5

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	35
63 Hz	67	34
125 Hz	61	37
250 Hz	52	35
500 Hz	46	29
1000 Hz	40	23
2000 Hz	33	15
4000 Hz	28	5
8000 Hz	26	--
Broadband (dBA)	**50**	**30**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	50.8
87-93 West Broadway Street Project*	30.4
Calculated Combined Future Sound Level	50.8
Calculated Incremental Increase	+0
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-10. Estimated Future Sound Level Impacts – Anytime, 55 West Broadway– Location R6

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	34
63 Hz	67	33
125 Hz	61	34
250 Hz	52	32
500 Hz	46	26
1000 Hz	40	20
2000 Hz	33	13
4000 Hz	28	4
8000 Hz	26	--
Broadband (dBA)	**50**	**28**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	50.8
87-93 West Broadway Street Project*	27.9
Calculated Combined Future Sound Level	50.8
Calculated Incremental Increase	+0
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-11. Estimated Future Sound Level Impacts – Anytime, 80 West Broadway – Location R7

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	38
63 Hz	67	37
125 Hz	61	39
250 Hz	52	37
500 Hz	46	30
1000 Hz	40	24
2000 Hz	33	17
4000 Hz	28	8
8000 Hz	26	--
Broadband (dBA)	**50**	**32**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	50.8
87-93 West Broadway Street Project*	32.2
Calculated Combined Future Sound Level	50.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.3-12. Estimated Future Sound Level Impacts – Anytime, 116 West Broadway – Location R8

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	49
63 Hz	67	49
125 Hz	61	44
250 Hz	52	38
500 Hz	46	33
1000 Hz	40	30
2000 Hz	33	25
4000 Hz	28	19
8000 Hz	26	7
Broadband (dBA)	**50**	**36**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	50.8
87-93 West Broadway Street Project*	32.2
Calculated Combined Future Sound Level	50.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

4.3.7 Conclusions

Sound levels at all nearby sensitive locations and at all property lines will fully comply with the most stringent City of Boston and DEP daytime and nighttime sound level limits.

This acoustic analysis demonstrates that the Project's design will meet the applicable acoustic criteria.

4.4 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See Section 4.6) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The existing storm drain utility infrastructure surrounding the 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 site's impervious area can be recharged.

In addition to the installation of an on-site infiltration system, stormwater runoff will be treated through the use of deep sump catch basins and water quality treatment units. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

Erosion and sediment controls will be used during construction to protect adjacent properties, the municipal storm drain system and the on-site storm drain system. A pollution prevention plan, if required, will be prepared for use during construction including during demolition activity.

4.5 Solid and Hazardous Waste Materials

4.5.1 Solid Waste

During the preparation of the Site, debris from the gas station will be removed from the Project Site. The Proponent will ensure that waste removal and disposal during construction and operation will be in conformance with the City and DEP's Regulations for Solid Waste.

Upon completion of construction, the Project is estimated to generate approximately 91 tons of solid waste per year, based on the assumption that each of the 65 units will each generate approximately 1.4 tons per year, currently we do not know the nature of the commercial space. A significant portion of the waste will be recycled. The project will also include ambitious goals for construction waste management in order to meet the requirements for the LEED™ rating system. This strategy will divert demolition and construction waste by reusing and recycling materials.

In order to meet the requirements for the Boston Environmental Department and the LEED™ rating system, the Project will include space dedicated to the storage and collection of recyclables within the trash room. The recycling program will meet or exceed the City's guidelines, and provide–areas for waste paper and newspaper, metal, glass, and plastics (21 through 27, co-mingled).

4.5.2 Hazardous Waste and Materials

Based on soils characterization sampling as a part of the Phase I Assessment and Soil Characterization Results completed by Cooperstown Environmental on April 26, 2017, the soils profile at the site consists of 7-10 feet of fill and sand deposits underlain by native silt, clay and till deposits. Based on site and area history, there was concern in particular regarding the upper fill layers, which generally consists of what is characterized as "urban fill" as well as potential petroleum impacts resulting from site use as a filling station since at least since 1941. The investigation provided a good indication of expected soil quality in the fill and native soils at the site in order to plan for appropriate soil disposal during excavation. Additional sample that will be needed to meet disposal facility requirements will be collected close to the date of excavation. The Phase I Site Assessment report is available upon request.

The construction of the proposed building foundations will require the removal of the site soils to a depth ranging up to about 5 to 20 feet below existing grade.

The Project Proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or off-site disposal of contaminated soil and groundwater encountered during construction. If necessary, the LSP will also prepare the required Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) regulatory submittals.

4.6 Geotechnical/Groundwater Impacts Analysis

KMM Geotechnical Consultants, LLC, completed a "Geotechnical Summary Report" for the Proposed Site on May 30, 2017. The existing site uses include a gasoline service station with associated building and pavement areas. This building and associated construction will be raised to accommodate the project. Based on the proposed site plan, grades across the property vary from elevation 31-24 feet. Typical site grades are reportedly near elevation 30 feet with a sloped contour towards the rear (south).

The Project includes a six-story, steel and wood framed mixed use residential building with approximately 18,800 sf in footprint, occupying most of the lot. The construction methodology is intended to support the building on basement foundation using conventional spread footings.

Based on the results of the explorations performed at the project site, urban fill was encountered to depths of approximately 8-11 feet below grade. Groundwater was encountered in the test holes selected at depths of approximately 10 feet below grade. The subgrade conditions were considered suitable for supporting the proposed building on a conventional spread footing foundation with a concrete floor slab. Questionable soils as well as UST's, abandoned foundations, intersecting utilities and other questionable matter will be removed from the building footprint.

Due to the proposed basement level which is expected to encroach into the groundwater table, a foundation drainage system will be required to permanently control the high groundwater. Groundwater

was encountered near elevation 20 in the geotechnical consultant's analysis. Additional engineering review and design will be necessary to address concerns with groundwater encroachment.

The Geotechnical engineer has recommended that a qualified engineer or representative be retained to review earthwork activities such as preparation of the foundation bearing subgrade and the placement/compaction of Structural Fill. The more complete Geotechnical Summary Report is available upon request from the Project Proponent.

4.7 Construction Impact

The following section describes impacts likely to result from the Proposed Project construction and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager who will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

4.7.1 Construction Management Plan

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractor comply with the Construction Management Plan, ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The construction manager will be bound by the CMP, which will establish the guidelines for the duration of the Project and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Proper pre-construction planning with the neighborhood will be essential to the successful construction of this Project. Construction methodologies that will ensure safety will be employed, signage will include construction manager contact information with emergency contact numbers.

The Proponent will also coordinate construction with other ongoing projects in the neighborhood.

4.7.2 Proposed Construction Program

Construction Activity Schedule

The construction period for the Proposed Project is expected to last approximately 18 months, beginning in the 2nd Quarter 2018 and reaching completion in the 4th Quarter 2019. The City of Boston Noise and Work Ordinances will dictate the normal work hours, which will be from 7:00 AM to 6:00 PM, Monday through Friday.

Perimeter Protection/Public Safety

The CMP will describe any necessary sidewalk closures, pedestrian re-routings, and barrier placements and/or fencing deemed necessary to ensure safety around the Site perimeter. If possible, the sidewalk will remain open to pedestrian traffic during the construction period. Barricades and secure fencing will be used to isolate construction areas from pedestrian traffic. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to ensure pedestrian safety.

Proper signage will be placed at every corner of the Project as well as those areas that may be confusing to pedestrians and automobile traffic.

The Proponent will continue to coordinate with all pertinent regulatory agencies and representatives of the surrounding neighborhoods to ensure they are informed of any changes in construction activities.

4.7.3 Construction Traffic Impacts

Construction Vehicle Routes

Estimated truck deliveries and routes are identified in at the end of this section. Specific truck routes will be established with BTD through the CMP. These established truck routes will prohibit travel on any residential side streets. Construction contracts will include clauses restricting truck travel to BTD requirements. Maps showing approved truck routes will be provided to all suppliers, contractors, and subcontractors. It is anticipated that all deliveries will be via West Broadway direct to the site, not passing through any residential areas.

Construction Worker Parking

The number of workers required for construction of the Project will vary during the construction period. However, it is anticipated that all construction workers will arrive and depart prior to peak traffic periods.

Limited parking in designated areas of the Project Site and lay-down area(s) will be allowed. Parking will be discouraged in the immediate neighborhood. Further, public transit use will be encouraged with the Proponent and construction manager working to ensure the construction workers are informed of the public transportation options serving the area. Terms and conditions related to worker parking will be written into each subcontractor's contract. The contractor will provide a weekly orientation with all new personnel to ensure enforcement of this policy.

Pedestrian Traffic

The Site abuts sidewalks on three streets. Pedestrian traffic may be temporarily impacted in these areas. The Construction Manager will minimize the impact the construction of the proposed

building will have and the adjacent sidewalks. The contractor will implement a plan that will clearly denote all traffic patterns. Safety measures such as jersey barriers, fencing, and signage will be used to direct pedestrian traffic around the construction site and to secure the work area.

4.7.4 Construction Environmental Impacts and Mitigation

Construction Air Quality

Construction activities may generate fugitive dust, which will result in a localized increase of airborne particle levels. Fugitive dust emission from construction activities will depend on such factors as the properties of the emitting surface (e.g. moisture content), meteorological variables, and construction practices employed.

To reduce the emission of fugitive dust and minimize impacts on the local environment the construction contractor will adhere to a number of strictly enforceable mitigation measures. These measures may include:

- Using wetting agents to control and suppress dust from construction debris;
- Ensuring that all trucks traveling to and from the Project Site will be fully covered;
- Removing construction debris regularly;
- Monitoring construction practices closely to ensure any emissions of dust are negligible;
- Cleaning streets and sidewalks to minimize dust and dirt accumulation;
- Monitoring construction activities by the job site superintendent and safety officer; and
- Wheel-washing trucks before they leave the Project Site during the excavation phase.

Construction Noise Impacts

To reduce the noise impacts of construction on the surrounding neighborhood, a number of noise mitigation measures will be included in the CMP. Some of the measures that may be taken to ensure a low level of noise emissions include:

- Initiating a proactive program for compliance to the City of Boston's noise limitation impact;
- Scheduling of work during regular working hours as much as possible;
- Using mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously operating equipment, such as air compressors and welding generators;

- Scheduling construction activities so as to avoid the simultaneous operation of the noisiest construction activities;
- Turning off all idling equipment;
- Reminding truck drivers that trucks cannot idle more than five (5) minutes unless the engine is required to operate lifts of refrigeration units;
- Locating noisy equipment at locations that protect sensitive locations and neighborhoods through shielding or distance;
- Installing a site barricade at certain locations;
- Identifying and maintaining truck routes to minimize traffic and noise throughout the project;
- Replacing specific construction techniques by less noisy ones where feasible-e.g., using vibration pile driving instead of impact driving if practical and mixing concrete off-site instead of on-site; and
- Maintaining all equipment to have proper sound attenuation devices.

4.7.5 Rodent Control

The City of Boston enforces the requirements established under Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550. This policy establishes that the elimination of rodents is required for issuance of any building permits. During construction, rodent control service visits will be made by a certified rodent control firm to monitor the situation.

4.7.6 Utility Protection During Construction

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 project abutters to minimize impacts and inconveniences.

5.0 HISTORIC RESOURCES COMPONENT

This section provides a discussion of the history of the Project Site and the historic resources/ districts in the Project vicinity.

5.1 Historic Resources on the Project Site and Property History

Much of the area known today as the Seaport was initially tidal marsh. Originally a peninsula of approximately 579 acres, South Boston separated Boston Harbor and South Bay from Dorchester Bay. A rural area of little activity, South Boston during the 17th and 18th centuries served Dorchester as pasturage. In 1804, South Boston was annexed to Boston and legislation was passed allowing for landfill to create new sites for commercial development. In 1805, the South Boston toll bridge opened, providing access from South Boston to the center of the city and the Dorchester Turnpike was established, connecting the growing district to Dorchester. A commercial axis developed along Broadway with residential uses clustering around West Fourth Street. Industrial activities began to appear around Fort Point Channel, including iron and glass foundries and shipyards. The Old Colony Railroad was laid along Old Colony Avenue in 1845. During the period between 1830 and 1850, the population of South Boston had increased from 2,200 to 13,000 and by 1870 it stood at over 39,000. By 1910, South Boston' land area had increased in size to 1,333 acres. During the early industrial era of the first half of the 19th century, iron foundries and machine shops formed the area's economic base. The next phase of industrialism focused on the area's premier intermodal transportation access (by rail and water) and manufacturing for transport took the lead as the single most important industry.

According to files at the Massachusetts Historical Commission, the on-site gas station building and related structure are not listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth. It is not expected that the Project will cause adverse impacts on the historic or architectural elements of nearby historic resources outside the Project Site (see **Figure 5-1** for identifications of historic resources in the Project vicinity).

5.2 Historic Districts and Resources

While there are no buildings or districts within a quarter mile of the Project Site that are presently on the National Register of Historic Places, two sites and districts that have previously been recommended for National Register historic designation exist in the surrounding area. A discussion of these locations is provided below:

5.2.1 Church of Saints Peter and Paul and Parochial Residence

Located at 45 West Broadway a block away from the Project Site, this church was designed by Boston architect Gridley J. F. Bryant in the early 19th century. Constructed of Quincy granite, the building was begun in 1842 and completed in 1845. A severe fire in 1848 destroyed the interior leaving only the outer walls, but the structure was rebuilt and was rededicated in 1853.

Located at 55 West Broadway, the parish house is a large 3-story red brick building with double swell bowed façade, sandstone trim, and a porch with a single arched entry. Between 1891 and 1899 the building was connected to the Church.

Both buildings were recommended as eligible for inclusion on the National Register of Historic Places and for recognition as Boston Landmarks.

5.2.2 Fort Point Historic District

Lying north of the site, just east of the Fort Point Channel, this area is composed of large, ornamental brick warehouses constructed by the Boston Wharf Company during the latter half of the 19th century and early 20th century. Renovated and rehabilitated over time, these structures now house a variety of uses. Many of the buildings house commercial uses such as financial, architectural, and computer office space, while there also exists a residential base with many artists residing in the renovated warehouses. A portion of this area, consisting of 98 industrial, commercial, and civic buildings in addition to five bridges, was determined eligible for inclusion on the National Register of Historic Places.

The historic resources within one-quarter-mile radius of the Proposed Project are summarized in **Table 5-1** that follows.

Table 5.1. Historic Resources in the Vicinity of the Project Site

Key to Historic Resources Figure (Figure 5-1)	Historic Resource	Address/Description
National Register Listing		
15	Abbott, W. Herbert, Inc. Building	1-5 Channel Center St
Properties Included the MA Inventory of Historic and Archaeological Assets		
1	Lawrence, William R. Row House	167 West Second St
2	Foley, John House	163 West Second St
3	Saint Peter Roman Catholic Church Rectory	50 Orton Marotta Way
4	Hausman, Harry and Joseph Building	150-154 West Fourth St
5	Broadway Streetcar - Broadway Bus Station	Broadway
6	Pike, Jacob - Abbott, Timothy Double House	92-94 B St
7	Macallen Electric Railway Material Co. Building	135-137 Dorchester Ave
8	Saints Peter and Paul Roman Catholic Rectory	55-59 West Broadway
9	Saint Peter Lithuanian Roman Catholic Church	75 Flaherty Way
10	Collins, James Liquor Import and Wholesale Dealers	262-270 West Broadway
11	Saints Peter and Paul Roman Catholic Church	45 West Broadway
12	Lawrence School	125 B St
13	West Third Street Bridge over Conrail	West Third St
14	York House - South Boston Hotel	99-101 West Fourth St
15	Casey, Thomas Building	82 West Broadway
16	Dahlquist Coppersmiths Manufacturing Company	87-97 A St

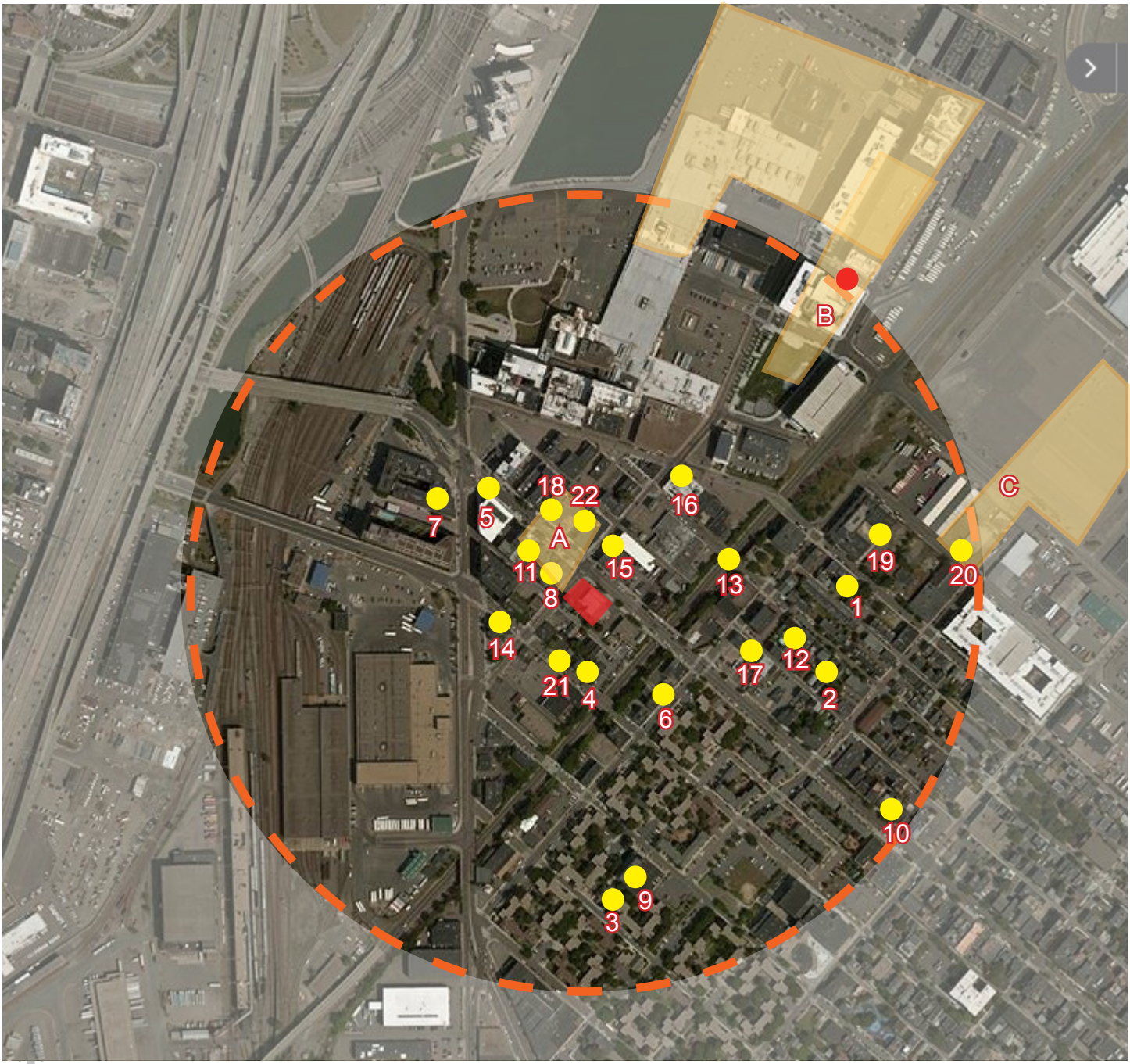
17	Boston Fire Department Hose Company #9	116 B St
18	Cardinal Cushing Central High School for Girls	50-72 West Broadway
19	Ipswich Hosiery Mill	154 West Second St
20	Estabrook's, Rufus Sons Building	202 West First St
21	Hausman, Harry and Joseph Building	142 West Fourth St
22	Devine Block	72 West Broadway
Historic Areas Inventoried		
A	Saints Peter and Paul Roman Catholic Church	Other Institutional; Other Religious;
B	Fort Point Channel Historic District	NRDIS
C	C Street Industrial Area	Industrial Complex or District

The Proposed Project is not expected to have effects on any of the listed historically significant resources in **Table 5-1**.

5.3 Archeological Resources

No known archaeological resources were located within the Project site during the review of Massachusetts Historic Commission files and MACRIS, therefore no impacts to archaeological resources are anticipated.

Figure 5-1 Historic Resources



Project Site

1/4 mi Radius (see table 5-1 for listing)

Property on the Massachusetts Inventory of Historic and Archaeological Assets

Property on the National and State Register of Historic Places

Historic Inventoried Areas

6.0 INFRASTRUCTURE SYSTEMS COMPONENT

6.1 Introduction

The existing infrastructure surrounding the site of 87-93 West Broadway appears of adequate capacity to service the needs of the Project. The following sections describe the existing sanitary sewer, water, and storm drain systems surrounding the site and explain how these systems will service the development. The analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

The Project is moving into the Design Development phase where a detailed infrastructure analysis will be performed. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the proposed new water, sanitary sewer, and storm drain connections.

A Drainage Discharge Permit Application will be submitted to the BWSC for any required construction dewatering. The appropriate approvals from the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA) will also be sought.

6.2 Wastewater

6.2.1 Existing Sanitary Sewer System

The sanitary sewer system in the vicinity of the Project site is owned, operated, and maintained by BWSC (see **Figure 6-1**). There is an existing 24 x 27-inch sewer located in West Broadway to the north of the Project site.

The total sewer flow from the existing building is estimated at 450 gallons per day (gpd) based on the existing building uses and design sewer flows provided in 310 CMR 12.203: System Sewage Flow Design Criteria, as summarized in **Table 6-1.**

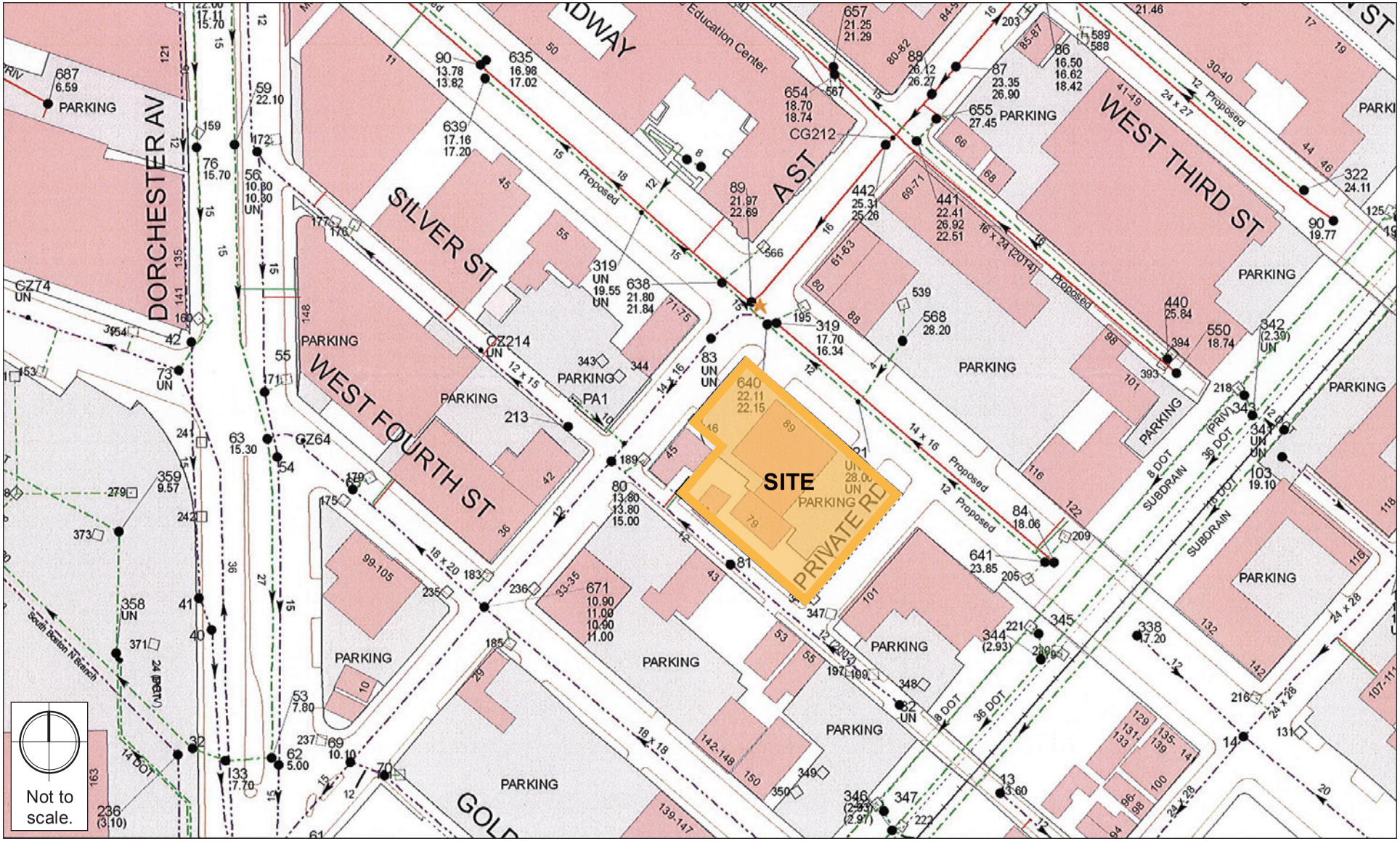


Figure 6-1.
BWSC Sanitary Sewer Map

Table 6-1. Existing Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Gasoline Station	6 islands	75 gpd/island	450 gpd
Total			**450 gpd**

6.2.2 Project-Generated Sanitary Sewer Flow

The Project will generate an estimated 13,590 gallons per day (gpd) based on design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program as summarized in **Table 6-2**. This is a net increase of 13,200 gpd over the estimated flows from the existing buildings.

Table 6-2. Projected Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Retail Space	9,000 sf	50 gpd/1,000sf	450 gpd
Residential	120 bedrooms	110 gpd/bedroom	13,200 gpd
Total			**13,650 gpd**

6.2.3 Sanitary Sewer Connection

It is anticipated that the sanitary services for the Project will tie into the 24 x 27-inch sewer in West Broadway. It is expected that the building will have one 10-inch sanitary service. The proponent will submit a Site Plan to BWSC for review and approval. All existing building services will be cut and capped at the main if the wyes are not reused.

6.2.4 Effluent Quality

The Project is not expected to generate industrial wastes.

6.2.5 Sewer System Mitigation

The environmental design goals for the Proposed Project include reducing wastewater volumes by incorporating efficient fixtures into the design. Low-flow faucets, aerated shower-heads, and dual-flush toilets are being considered to reduce water usage and sewer generation.

The Project shall be designed, constructed and maintained so as to minimize all inflow and infiltration into the BWSC's sanitary sewer system and to meet the needs of the Commission's ongoing Infiltration and Inflow reduction program.

6.3 Water System

6.3.1 Existing Water Service

The water distribution system in the vicinity of the Project site is owned and maintained by BWSC (see **Figure 6-2**). There is a 10-inch pit cast iron distribution line located in West Broadway to the north of the Project site. The 10-inch pit cast iron line was originally installed in 1918 and cleaned and cement-lined in 1999. There is also an 8-inch ductile iron line in Silver Street to the south of the Project site. The 8-inch ductile iron line was installed in 2000.

The locations of the existing water services will be confirmed as the Project moves to the Design Development phase. The services are not expected to be reused and will be cut and capped at the main.

There are three fire hydrants located in the vicinity of the Project site. There is one hydrant located to the northeast of the property on West Broadway (H156). Hydrant (H158) is located to the west on A Street across the street from the project site. Another hydrant is located on the north side of Silver Street located in the sidewalk adjacent to the property (H179). The Proponent will confirm this with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

6.3.2 Anticipated Water Consumption

The maximum daily water demand is estimated to be approximately 14,905 gpd based on the sewage flow estimate and an added factor for system losses including the average requirements for the Project's cooling system. More detailed water use and meter sizing calculations will be submitted to BWSC as part of the Site Plan approval process.

6.3.3 Proposed Water Service

It is anticipated that separate domestic water and fire protection services for the Project will be directly tapped from the 10-inch service main in West Broadway. 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 and sizes of the services will be provided on a Site Plan during the detailed design phase and submitted to BWSC for review and approval.

Water service to the building will be metered in accordance with BWSC's requirements. The property owner will provide a suitable location for a Meter Transmission Unit (MTU) as part of BWSC's Automatic Meter Reading System. Water meters over 3-inches will be provided with a bypass to allow BWSC testing without service interruption. A backflow preventer will be installed on the fire protection service and will be coordinated with BWSC's Cross Connection Control Department. Separate services will be provided for domestic use and fire protection.

6.3.4 Water Supply Conservation and Mitigation Measures

As discussed in the Sewer System Mitigation Section, water conservation measures such as low-flow fixtures, aerated showerheads, and dual-flush toilets are being considered to reduce potable water usage.

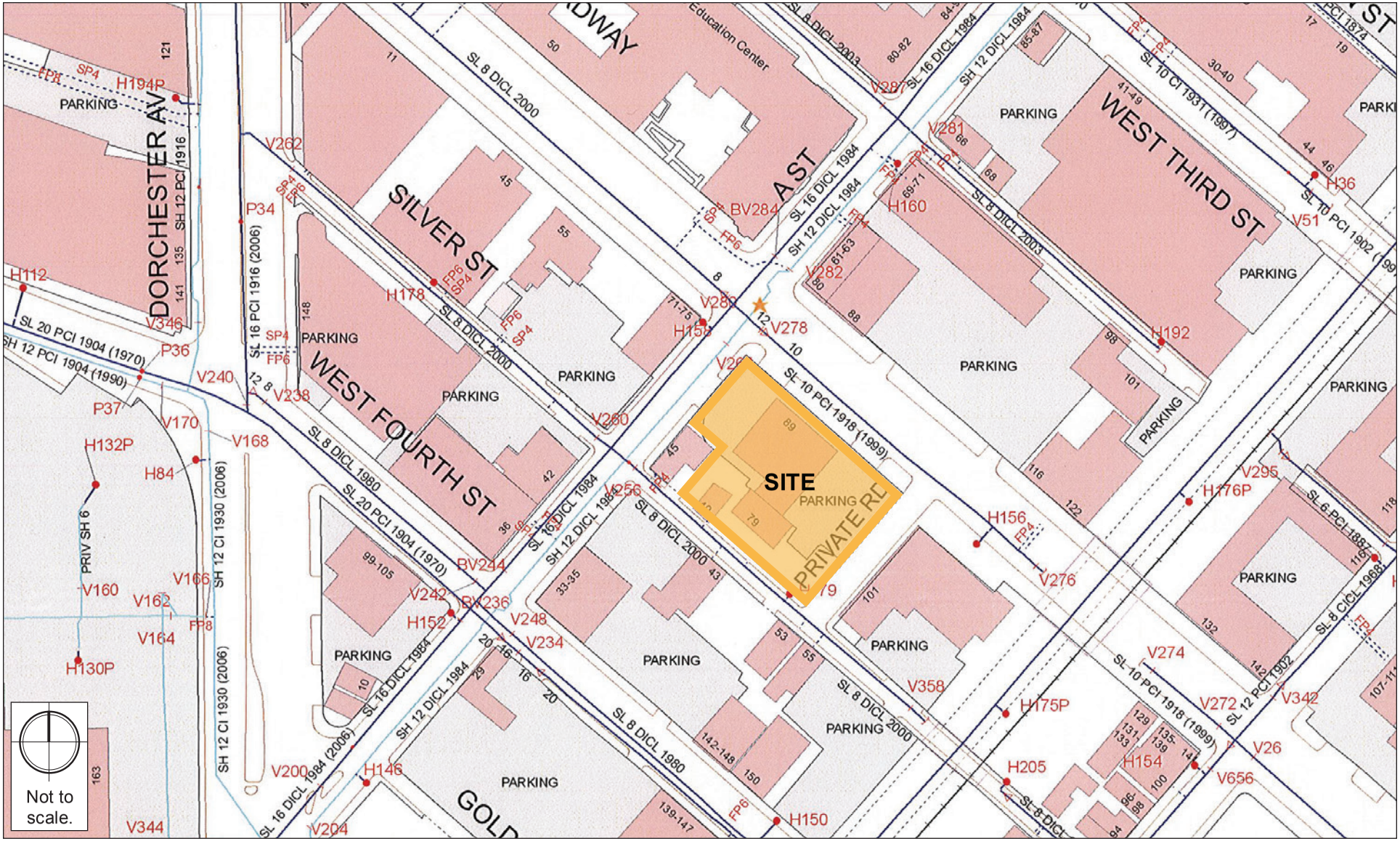


Figure 6-2.
Water Supply Map

6.4 Storm Drainage System

6.4.1 Existing Storm Drainage System

The storm drain system in the vicinity of the Project site is owned and maintained by BWSC (see **Figure 6-1**). There is an existing 10-inch storm drain in West Broadway to the north of the Project site.

The existing building occupies a small portion of the site. The existing gasoline island canopy covers a large portion of the site. Rooftop runoff from the existing building and canopy discharges directly to the surrounding municipal storm drain system. Runoff from the parking lot and paved surfaces around the property is captured in catch basins and connects to the municipal storm drain system. There are no existing storm water management systems that would attenuate peak flows and the Project site provides little opportunity for recharge. Very little water quality treatment is realized before these areas are drained to the municipal storm drain system.

6.4.2 Proposed Storm Water System

The proposed building will occupy almost the entire Project site, however there is an opportunity at the southeast side of the property to infiltrate stormwater. The overflow from the infiltration system will discharge to the surrounding storm water system in West Broadway.

After construction, the Project site will continue to consist primarily of impervious surfaces, associated with building roofs and the paved sidewalks surrounding the Project site. The existing drainage patterns will not change significantly as the runoff will continue to drain to surrounding municipal storm drain systems.

All storm drain system improvements will be designed in accordance with BWSC's design standards and the BWSC "Requirements for Site Plans." A Site Plan will be submitted for BWSC approval and a General Service Application will be completed prior to any off-site storm drain work. Any storm drain connections terminated as a result of construction will be cut and capped at the storm drain in the street in accordance with BWSC standards.

Erosion and sediment controls will be used during construction to protect adjacent properties and the municipal storm drain system. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

6.5 Electrical Service

Eversource owns and maintains the electrical transmission system located in South Boston. The actual size and location of the proposed building services will be coordinated with Eversource during the detailed design phase. It is anticipated that a transformer room will be provided on the first floor of the proposed building.

The Proponent is investigating energy conservation measures, including high efficiency lighting.

6.6 Telecommunications Systems

Verizon owns and maintains infrastructure in the vicinity of the Project site. It is anticipated Verizon will supply telephone and high-speed internet service to the proposed building. The actual size and location of the proposed building services will be coordinated with Verizon during the detailed design phase.

6.7 Gas Systems

National Grid owns and maintains a 10-inch gas main in West Broadway, a 3-inch gas main in Silver Street, and a gas main in A Street. The Project is expected to use natural gas for heating and domestic hot water. The actual size and location of the building services will be coordinated with National Grid during the detailed design phase.

6.8 Steam Systems

Veolia Energy does not own or maintain any steam infrastructure within the vicinity of the Project site.

6.9 Utility Protection During Construction

The Project's 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 Project abutters to minimize impacts and inconveniences.

7.0 TRANSPORTATION COMPONENT

7.1 Introduction

Howard Stein Hudson (HSH) has conducted an evaluation of the transportation impacts of the Project. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and the BPDA's Article 80 development review process. The study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, transit services, and pedestrian and bicycle activity. The Project will have minimal impact on the study area intersections and the public transportation facilities in the area. The Project will also upgrade the existing pedestrian facilities by reducing the number of curb cuts and improving the sidewalks along West Broadway and A Street. The Project will take advantage of good public transportation access and will have minimal impact on the surrounding transportation infrastructure.

7.1.1 Project Description

The Project site is bounded by West Broadway to the north, A Street to the west, Silver Street to the south, and the right-of-way adjacent to the Boston Police Area C-6 station to the east. The site is currently occupied by an operational gas station with three curb cuts (two along West Broadway and one along A Street).

The Project will include the demolition of the gas station and the construction of a new building containing approximately 65 residential units, 88 parking spaces and two handicapped van spaces, and 9,000 square feet (sf) of ground floor retail space. Vehicular access will be provided via a new driveway off Silver Street. The existing curb cuts along West Broadway and A Street will be closed as part of the Project. Loading and service will be from West Broadway. The Project will include an on-site bicycle storage room for at least 65 bicycles.

7.1.2 Study Methodology

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

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

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

The Build (2024) Condition includes a net increase in traffic volume due to the addition of Project-generated trip estimates to the traffic volumes developed as part of the No-Build (2024) Condition. 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.

7.1.3 Study Area

The transportation study area consists of intersections surrounding the Project site along West Broadway and A Street. The study area includes the following intersections, also shown in **Figure 7-1**:

- West Broadway/A Street (signalized);
- A Street/Silver Street (unsignalized); and
- West Broadway/Right-of-Way (unsignalized).

7.2 Existing (2017) Condition

This section includes descriptions of existing study area roadway geometries, intersection traffic control, peak-hour vehicular and pedestrian volumes, average daily traffic volumes, transit availability, parking, curb usage, and loading conditions.

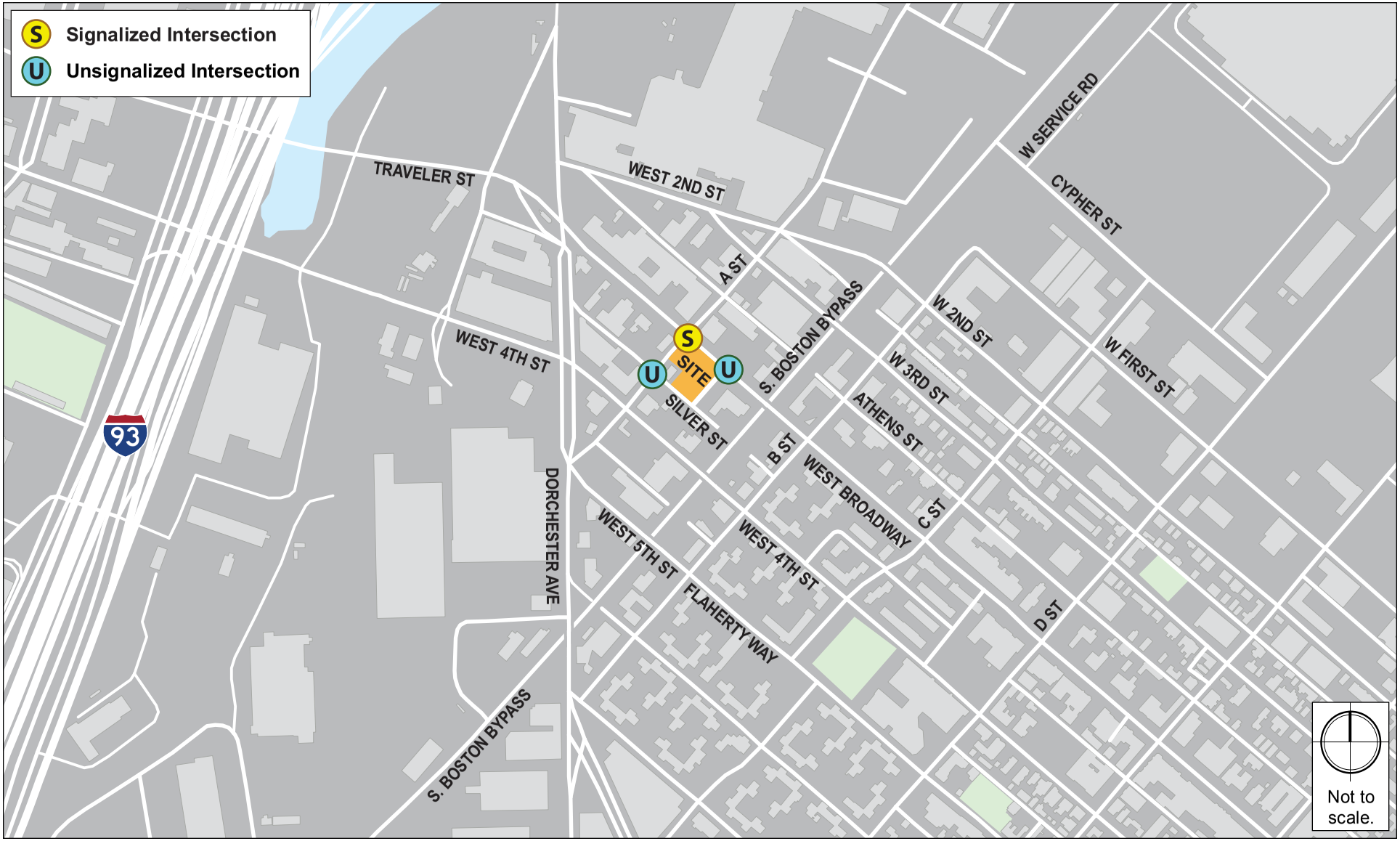


Figure 7-1.
Study Area Intersections

7.2.1 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:

West Broadway is a two-way, two lane roadway located adjacent to the north side of the Project site. West Broadway is classified as an urban minor arterial roadway under BTD jurisdiction and generally runs in an east-west direction between Dorchester Street to the east and Dorchester Avenue to the west. A mix of 2 hour and 15 minute on-street parking is provided on both sides of the roadway in the vicinity of the site. Sidewalks are provided along both sides of West Broadway.

A Street is a two-way, two lane roadway located adjacent to the west side of the Project site. A Street is classified as an urban minor arterial under BTD jurisdiction and runs in a north-south direction between Congress Street to the north and Dorchester Avenue to the south. On-street parking is not provided on either side of the roadway in the vicinity of the Project site. Sidewalks are provided along both sides of A Street.

Silver Street is a one-way, one-lane roadway located adjacent to the south side of the Project site. Silver Street is classified as a local roadway under BTD jurisdiction and runs in a westbound direction between Dorchester Avenue to the west and terminates before South Boston Bypass Road to the east. On-street parking is not provided on either side of the roadway, and sidewalks are provided along both sides of the roadway.

The **Right-of-Way** is a two-way, two lane roadway located adjacent to the east side of the Project site. The Right-of-Way runs in a north-south direction between West Broadway to the north and Silver Street to the south. In the vicinity of the site, sidewalks and private parking are provided on the east side of the roadway.

7.2.2 Existing Intersection Conditions

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

West Broadway/A Street is a four legged, signalized intersection with four approaches, located at the northwest corner of the Project site. The West Broadway eastbound and westbound approaches both consist of a single travel lane and an adjacent parking lane. The A Street northbound approach consists of a single travel lane and a designated bike lane. The A Street southbound approach consists of an exclusive left-turn lane, a shared through/right-turn lane, and a designated bike lane. Crosswalks, wheelchair ramps, and pedestrian signal equipment are

provided across all approaches of the intersection. Land use in the vicinity of the intersection includes the Project site, residential, and commercial properties.

A Street/Silver Street is a four legged, unsignalized intersection with three approaches. The intersection is located at the southwest corner of the Project site. The Silver Street westbound approach consists of a single travel lane and operates under stop control. The A Street northbound and southbound approaches both consist of a single travel lane and a designated bike lane. On-street parking is restricted along all approaches to the intersection. Crosswalks and wheelchair ramps are provided across the west leg of the intersection only (across Silver Street). Land use in the vicinity of the intersection includes the Project site and residential properties.

West Broadway/Right-of-Way is a four legged, unsignalized intersection with four approaches, located adjacent to the northeast of the Project site. The West Broadway eastbound and westbound approaches each consist of a single travel lane and an adjacent parking lane. The Right-of-Way northbound approach consists of a single travel lane and operates under stop control. The southbound approach to the intersection is a private driveway and consists of a single travel lane and operates under stop control. Crosswalks and wheelchair ramps are not provided at the intersection. Land use in the vicinity of the intersection includes the Project site, residential, and commercial properties.

7.2.3 Existing Parking and Curb Use

An inventory of the on-street parking in the vicinity of the Project was collected. On-street parking in the area generally consists of 15 minute and 2 hour parking. The on-street parking regulations within the study area are shown in **Figure 7-2**.

7.2.4 Car and Bicycle Sharing Services

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

Car sharing, predominantly served by Zipcar in the Boston area, provides easy access to vehicular transportation for those who do not own cars. The nearby car sharing locations within a quarter-mile of the Project site are shown in **Figure 7-3.**

Figure 7-2.
On-Street Parking Regulations

Figure 7-3.
Vehicle Sharing Locations

7.2.5 Existing Traffic Data

Turning Movement Counts (TMCs) 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 counts were conducted on March 29, 2017 at all three intersections. The TMCs included traffic classification including car, heavy vehicle, pedestrian, and bicycle movements. The detailed traffic counts are provided in **Appendix D.**

Seasonal Adjustment

In order to account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the March 2017 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6) during the month of March is 0.96. This indicates that average month traffic volumes are approximately four percent less than the traffic volumes that were collected. The traffic counts were not adjusted downward to reflect average month conditions in order to provide a conservatively high analysis consistent with the peak season traffic volumes.

The 2017 Existing Condition weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown in **Figure 7-4** and **Figure 7-5**, respectively.

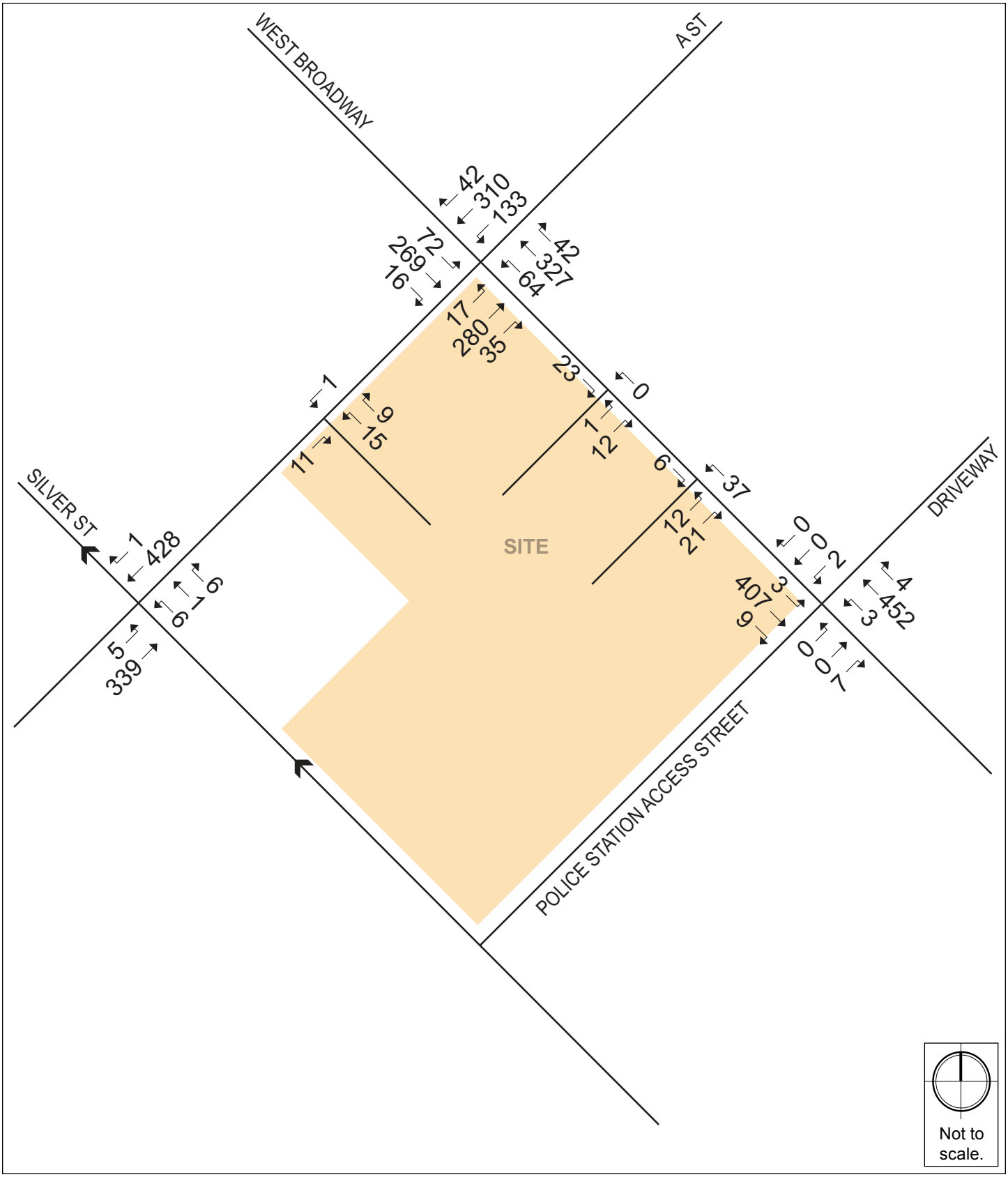


Figure 7-4.
Existing (2017) Condition Traffic Volumes, Weekday a.m. Peak Hour

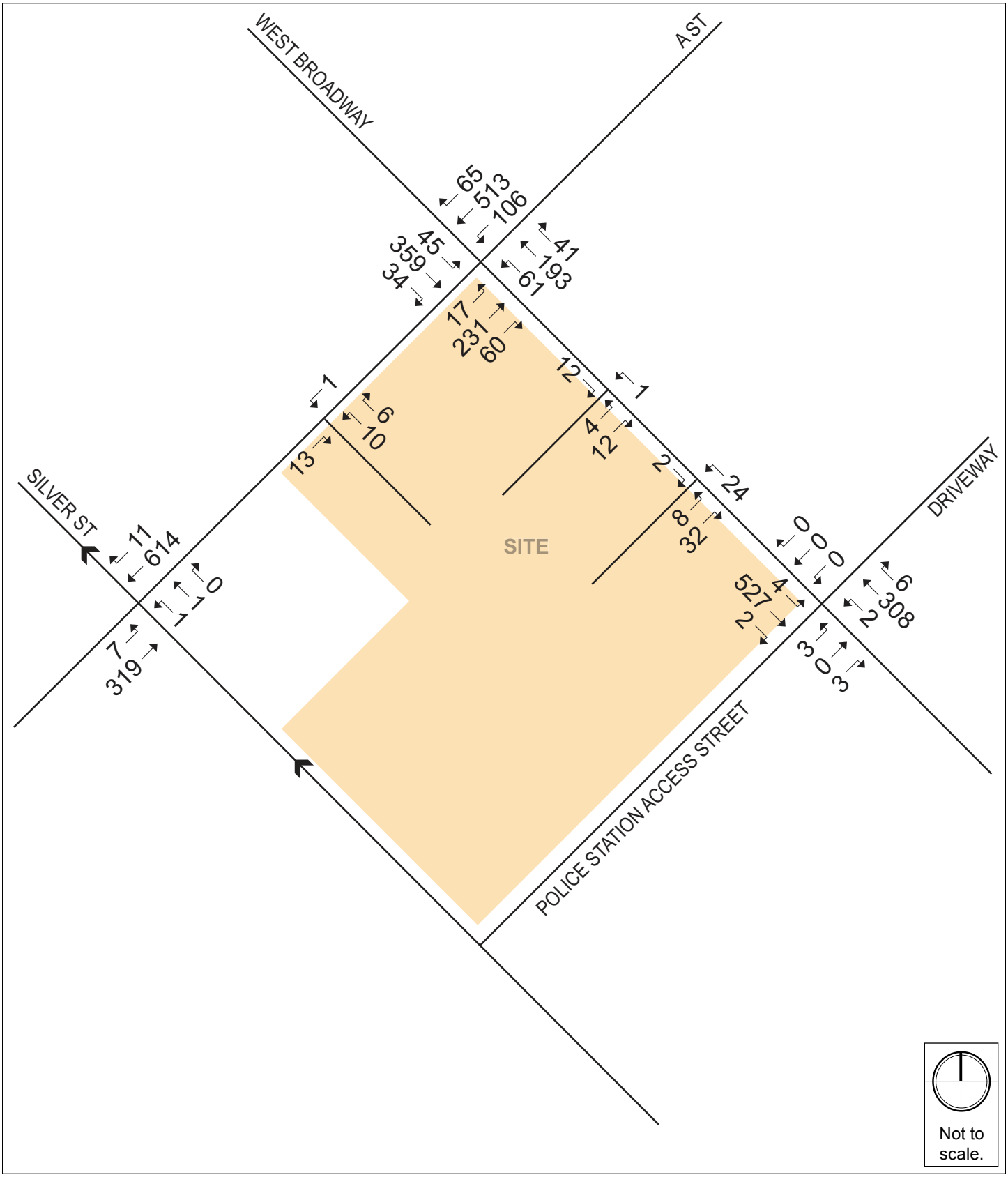


Figure 7-5.
Existing (2017) Condition Traffic Volumes, Weekday p.m. Peak Hour

7.2.6 Existing Pedestrian Conditions

In general, the sidewalks that are provided along the roadways in the study area are in good condition. The Right-of-Way does not have a sidewalk on the west side of the roadway. The two unsignalized study area intersections have minimal pedestrian facilities, with A Street/Silver Street only having a crosswalk across Silver Street and West Broadway/Right-of-Way having no crosswalks. The signalized intersection of West Broadway/A Street has pedestrian signal equipment, crosswalks, and wheelchair ramps across all legs of the intersection.

To determine the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersection. The weekday a.m. Peak Hour and weekday p.m. Peak Hour pedestrian volumes are presented in **Figure 7-6**.

7.2.7 Existing Bicycle Conditions

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located in close proximity to several bicycle facilities. The City of Boston's "Bike Routes of Boston" map indicates that West Broadway is designated as advanced route suitable for more traffic-confident cyclists and A Street is designated as intermediate route suitable for riders with some on-road experience. A Street is a roadway marked for bicycles with bike lanes on both directions.

Bicycle volumes were collected during the TMCs. The weekday a.m. Peak Hour and weekday p.m. Peak Hour bicycle volumes are presented in **Figure 7-7**.

Bicycle Sharing Services

The Project is also located in proximity to a bicycle sharing station provided by Hubway. Hubway is the bicycle sharing system in the Boston area, which was launched in 2011 and consists of over 140 stations and 1,300 bicycles. The nearby Hubway stations within approximately a quarter-mile of the Project site are shown in **Figure 7-8**.

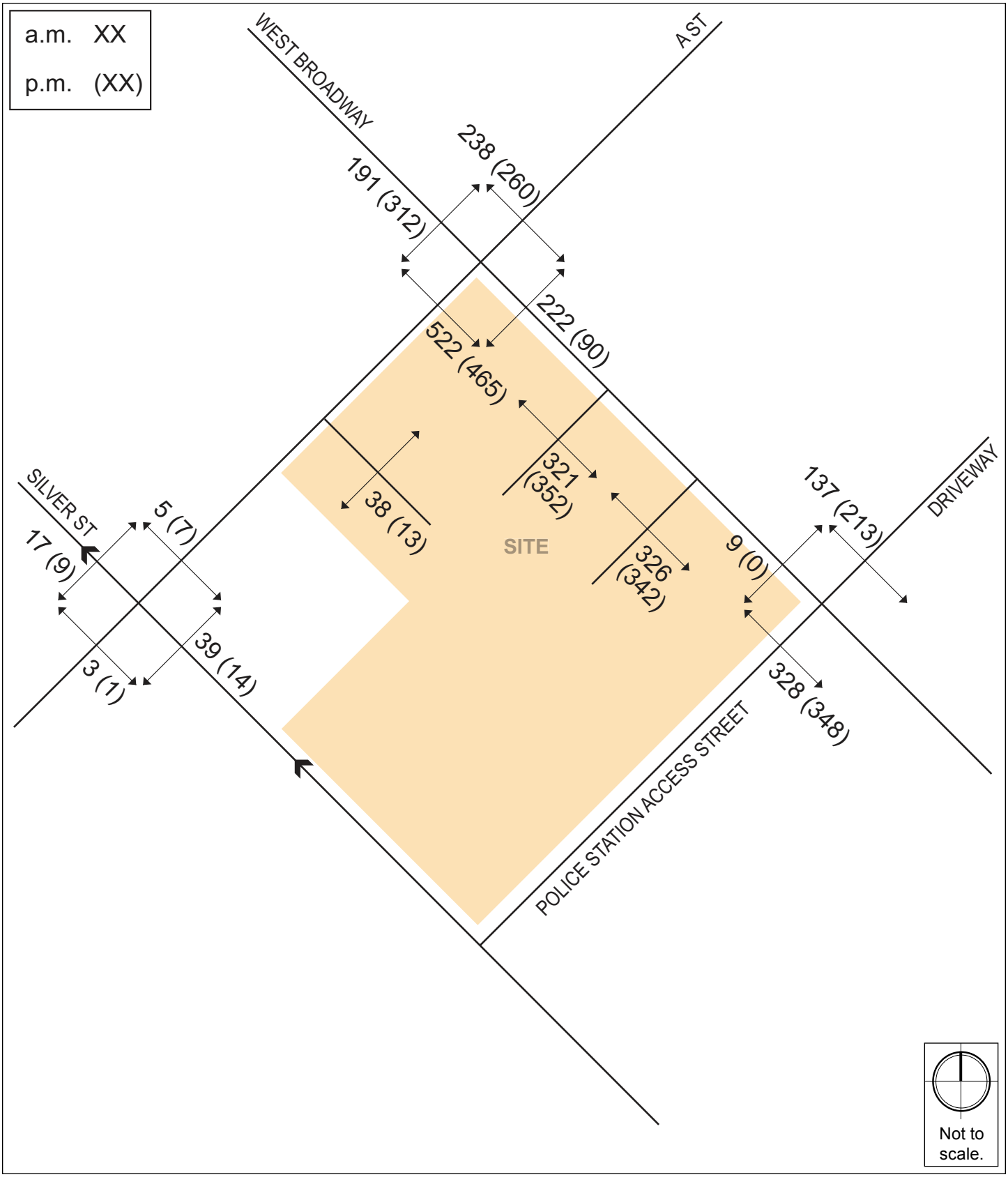


Figure 7-6.
Existing (2017) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hours

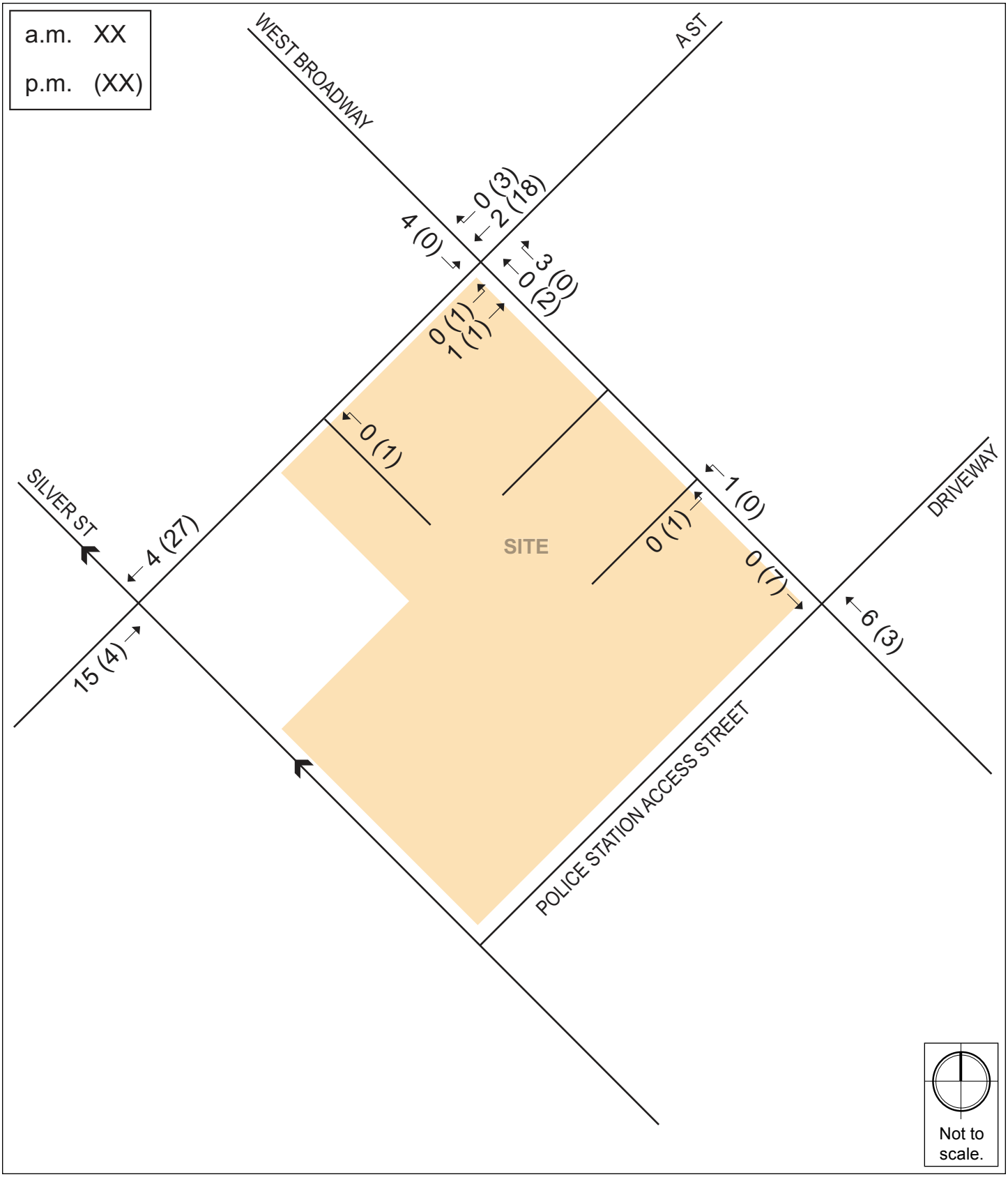


Figure 7-7.
Existing (2017) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hours

Figure 7-8.
Bicycle Sharing Locations

7.2.8 Existing Public Transportation

The Project is located near the MBTA Broadway Red Line station and several bus routes. The following describes each public transportation route located in the vicinity of the Project site. The nearby public transit services are shown in **Figure 7-9** and summarized in **Table 7-1**.

MBTA Red Line Broadway Station

The Red Line branch of the MBTA subway system stops at Broadway Station. The Red Line provides access between Alewife Station to the north and both Ashmont Station and Braintree Station to the south. The Red Line also provides convenient access to downtown Boston, Cambridge, and Quincy. South Station, which provides access to bus terminals, commuter rail lines, regional rail lines, and Logan Airport via the MBTA Silver Line, is one stop north of Broadway Station on the Red Line. The Red Line operates with headways of approximately nine minutes during peak hours and runs from 5:16 a.m. to 2:15 a.m.

MBTA Bus Routes

There are three bus routes that stop in close proximity of the Project site. The MBTA 9 and 11 Routes travel adjacent to the site, and the 47 Route stops at the Broadway Station which is less than a quarter-mile away from the Project site. The buses can be accessed at the nearby Broadway Station. A bus stop is also provided along Broadway, adjacent to the Project site.

Table 7-1. Existing Public Transportation

Route	Description	Peak-hour Headway (mins)*	Weekday Service Duration*	Saturday Service Duration*
Subway				
Red Line	Alewife – Ashmont/Braintree	9	5:05 a.m. - 1:05 a.m.	5:05 a.m. - 1:05 a.m.
Local Bus Routes				
9	City Point – Copley Square via Broadway Station	5-10	5:13 a.m.- 1:14 a.m.	5:10 a.m.- 1:14 a.m.
11	City Point – Downtown BayView Route	6-12	5:11 a.m. - 1:22 a.m.	5:10 a.m. - 1:20 a.m.
47	Central Square, Cambridge – Broadway Station via B.U. Medical Center, Dudley Station and Longwood Medical Area	10-20	5:15 a.m.- 1:24 a.m.	5:00 a.m.- 1:09 a.m.

* Source: MBTA.com, March 2017. Headway varies.

Figure 7-9.
Existing Public Transportation

7.2.9 Traffic Operations Analysis

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).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 7-2** 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. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

Table 7-2. Vehicle Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

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

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

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

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

percentile queue throughout the course of the peak hour. It is also unlikely that the 95th percentile queues for each approach to the intersection will occur simultaneously.

7.2.10 Existing (2017) Condition Traffic Operations Analysis

Table 7-3 and **Table 7-4** summarize the Existing (2017) Condition capacity analysis for the study area intersection during the weekday a.m. Peak Hour and the weekday p.m. Peak Hour. The detailed analysis sheets are provided in **Appendix D.**

Table 7-3. Existing (2017) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
West Broadway Street / A Street	**C**	**33.0**	**-**	**-**	**-**
W Broadway EB left/thru/right	B	16.3	0.50	136	276
W Broadway WB left/thru/right	B	16.8	0.54	157	348
A Street NB left/thru/right	D	41.6	0.77	205	249
A Street SB left	F	>80.0	0.97	89	#169
A Street SB thru/right	D	38.7	0.74	210	251
Unsignalized Intersections					
A Street / Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	C	17.0	0.07	-	6
A Street NB left/thru	A	0.2	0.00	-	0
A Street SB thru/right	A	0.0	0.29	-	0
West Broadway Street / Right-of-Way	-	-	-	-	-
W Broadway EB left/thru/right	A	0.1	0.00	-	0
W Broadway WB left/thru/right	A	0.2	0.01	-	0
Police Station NB left/thru/right	C	19.0	0.06	-	5
Driveway SB left/thru/right	F	>50.0	0.11	-	9

95th percentile volume exceeds capacity. Queue may be longer. Queue shown is the maximum after two cycles.
Grey shading indicates LOS E or F.

Table 7-4. Existing (2017) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
West Broadway / A Street	**C**	**28.5**	**-**	**-**	**-**
W Broadway EB left/thru/right	C	25.6	0.64	229	383
W Broadway WB left/thru/right	C	22.9	0.53	153	238
A Street NB left/thru/right	C	26.3	0.62	169	212
A Street SB left	C	22.4	0.37	47	83
A Street SB thru/right	D	36.6	0.84	327	425
Unsignalized Intersections					
A Street/ Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	D	28.0	0.05	-	4
A Street NB left/thru	A	0.3	0.01	-	1
A Street SB thru/right	A	0.0	0.38	-	0
West Broadway / Right-of-Way	-	-	-	-	-
W Broadway EB left/thru/right	A	0.1	0.00	-	0
W Broadway WB left/thru/right	A	0.2	0.01	-	0
ROW NB left/thru/right	F	>50.0	0.24	-	22
ROW SB left/thru/right	A	0.0	0.00	-	0

Grey shading indicates LOS E or F.

The signalized intersection of West Broadway / A Street currently operates at LOS C during both the weekday a.m. and p.m. hours. During the a.m. peak hour the A Street southbound left-turn lane operates at LOS F. The longest queues at the intersection occur in the A Street southbound thru/right lane during both the a.m. and p.m. peak hour.

At the unsignalized intersection of West Broadway/ Right-of-Way, the West Broadway approaches operate at LOS A during both the weekday a.m. and p.m. peak hours. The Right-of-Way northbound approach operates at LOS C during the a.m. peak hour and LOS F during the p.m. peak hour. Queues at the intersection are minimal (approximately one vehicle).

7.3 No-Build (2024) Condition

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

7.3.1 Background Traffic Growth

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

7.3.2 Specific Development Traffic Growth

Traffic volumes associated with the larger or closer known development projects can affect traffic patterns throughout the study area within the future analysis time horizon. Nearby development projects were identified in the vicinity of the Project and are shown in **Figure 7-10**. Traffic volumes associated with the following projects were directly incorporated into the future conditions traffic volumes:

South Boston Boutique Hotel: This project calls for a new 87,000 sf, 156-room hotel at the corner of Dorchester Avenue and West Broadway. This project is currently under construction.

14 West Broadway: This project calls for the construction of approximately 109,013 sf of residential space (47 units) and 8,715 sf of commercial and restaurant space. The project will also provide 70 parking spaces in an underground garage. This project is currently under construction.

45 West Third Street: This project involves the demolition of the existing one story industrial brick building to construct one mixed use building with residential dwellings, retail/commercial space, interior parking, sidewalk improvements and other public benefits. The construction will include 105 residential units, 3,400 sf of retail space and 109 parking spaces. This project is currently under construction.

105 West First Street: This project involves the construction of an eight story, approximately 266,000 square foot office building containing office/research and development space as well as ground floor retail, café, or retail space. The project will also include 35 parking spaces in an underground parking garage. This project is currently under review by the BPDA.

181-185 West First Street and 184, 190, and 206 West Second Street: This project consists of a multi-family residential development on 49,751 sf of land with 104 residential units, 4,000 sf of retail space and garage parking for 115 vehicles. The construction calls for the demolition of an existing warehouse and storage yard. This project has been approved by the BPDA but construction has not started.

Traffic volumes for all other nearby development projects, listed in **Table 7-5,** are included in the general background traffic growth.

Table 7-5. Other Development Projects in the Project Vicinity

Project	Program Description	Status
148-152 Dorchester Avenue, Allele Building Phase II	30 residential condominium units and related parking.	Under Construction
Artists for Humanity	Expansion of existing EpiCenter by adding 57,000 sf of new studios, studio partners, event and retail space.	Board Approved
69 A Street	Five levels of 51,700 sf of commercial office space and 12,000 sf of ground level retail.	Board Approved
39 A Street	Demolition of existing structure and the construction of a 5-story building with 23 condominium units and 30 parking spaces.	Board Approved
120 West Fourth Street	Demolition of the existing building and the construction of a new building with 9 residential units and indoor parking.	Board Approved
248 Dorchester Avenue	A six-story building that includes 4,400 sf of retail and 33 residential units.	Board Approved
55 West Fifth Street	Construction of a 5-story building with 36 residential units and 2,045 sf of commercial space.	Board Approved
30 B Street	Construction of a 5-story building containing 32 condominium units and 28 parking spaces.	Under Construction
270 Dorchester Avenue	Construction of 116 residential units and 6,520 sf of commercial space.	Under Review
150 West Broadway	Construction of 24 residential condominiums and a commercial retail space.	Under Construction
135 Athens	Project includes a 15 residential condominium units and related parking.	Under Construction
170 West Broadway	Project includes 33 residential condominium units, 4,283 sf of retail/restaurant space, and related parking.	Under Construction
206 West Broadway	Construction of 1,000 sf of commercial space and 16 residential rental units.	Board Approved
Patriot Homes	Construction of 24 new units of affordable housing.	Under Construction

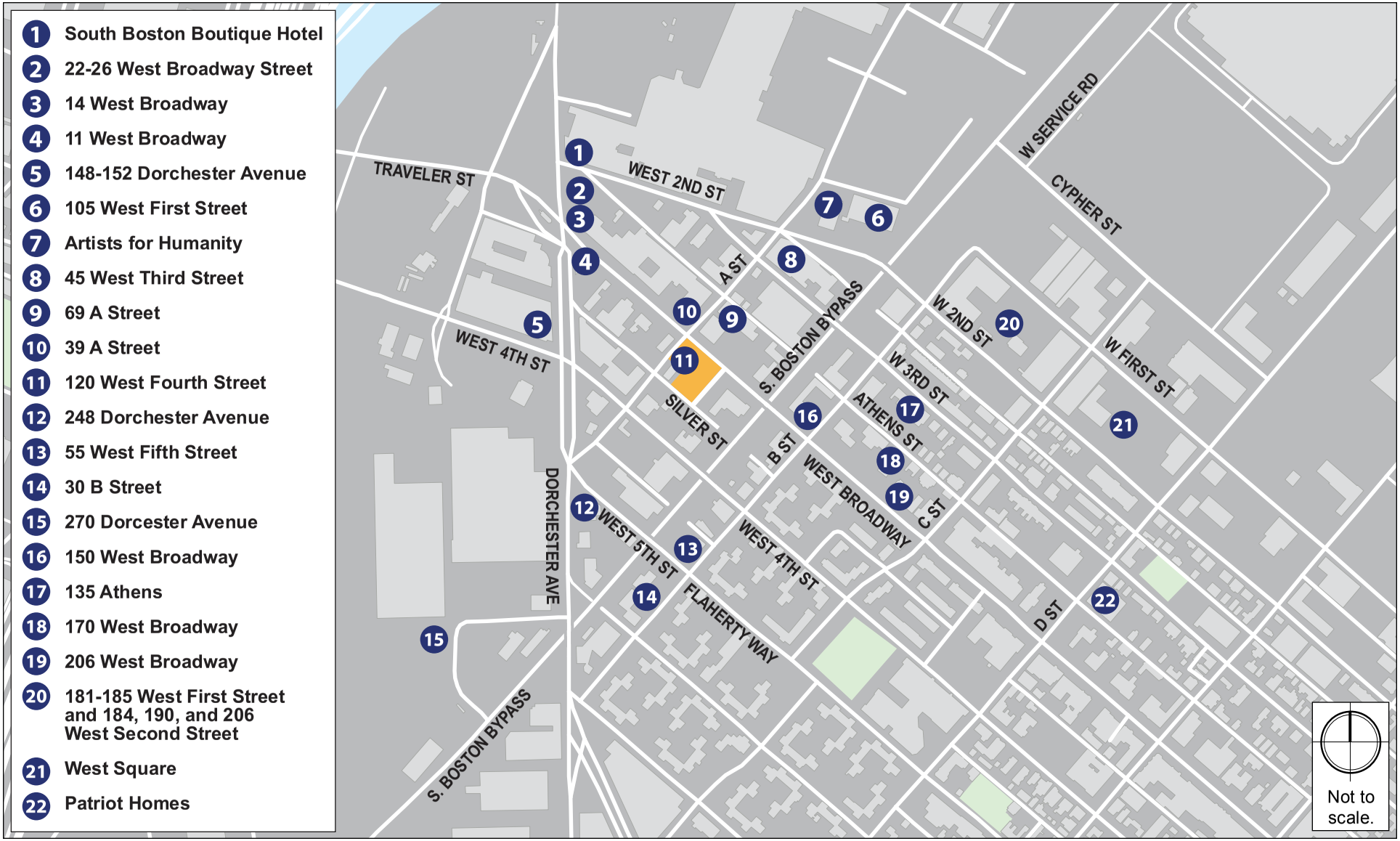


Figure 7-10.
Area Develoment Projects

7.3.3 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. This review determined that there are no proposed infrastructure improvements currently planned in the vicinity of the study area.

7.3.4 No-Build (2024) Condition Traffic Volumes

The one percent per year annual growth rate was applied to the Existing (2017) Condition traffic volumes, then the traffic volumes associated with the background development project listed above was added to develop the No-Build (2024) Condition traffic volumes. The No-Build (2024) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on **Figure 7-11** and **Figure 7-12**, respectively.

7.3.5 No-Build (2024) Condition Traffic Operations Analysis

The No-Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis. **Table 7-6** and **Table 7-7** present the No-Build (2024) Condition capacity analysis for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in **Appendix D**.

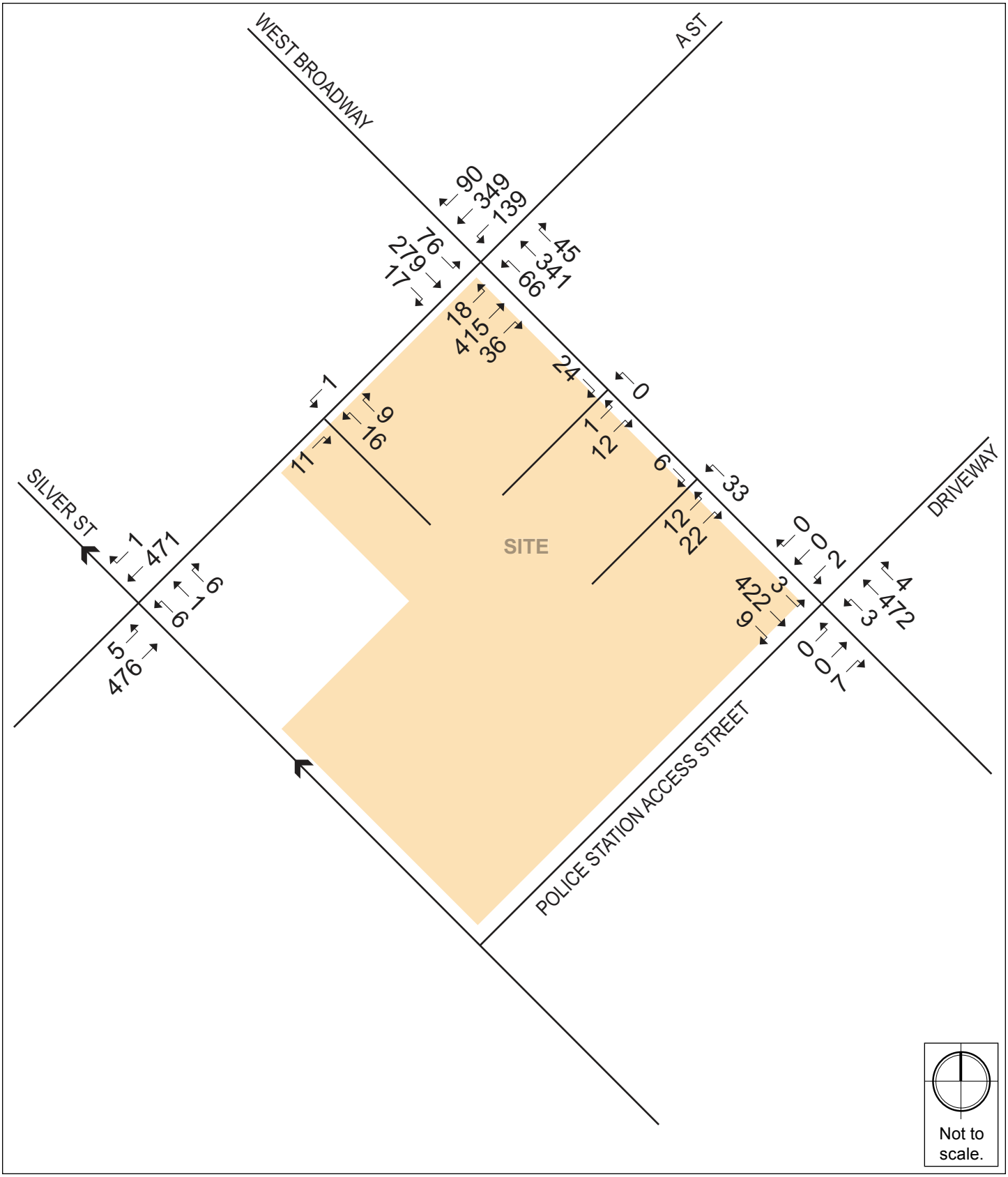


Figure 7-11.
No-Build (2024) Condition Traffic Volumes, Weekday a.m. Peak Hour

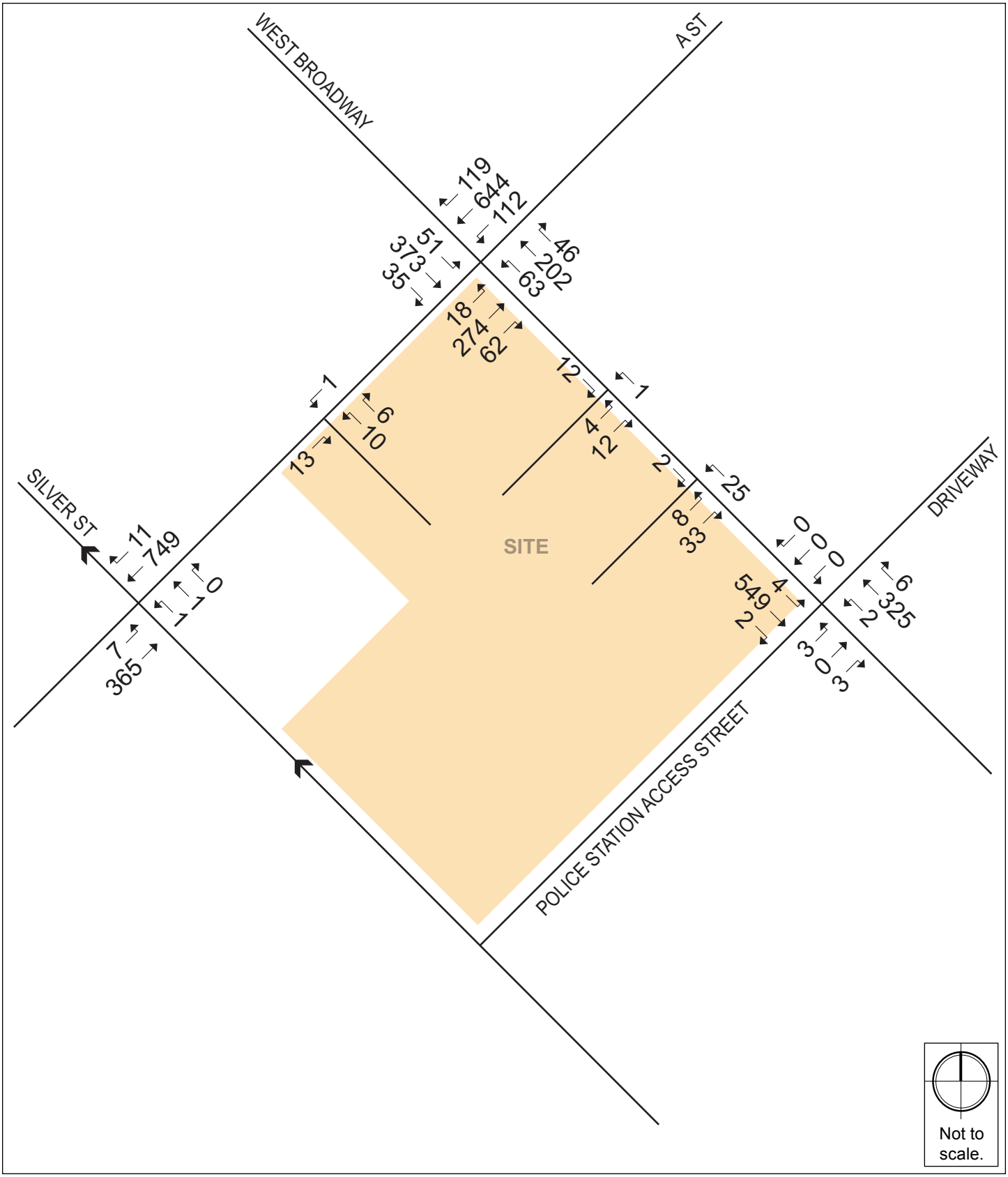


Figure 7-12.
No-Build (2024) Condition Traffic Volumes, Weekday p.m. Peak Hour

Table 7-6. No-Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
West Broadway Street / A Street	**C**	**33.7**	**-**	**-**	**-**
W Broadway EB left/thru/right	C	22.2	0.60	185	307
W Broadway WB left/thru/right	C	23.1	0.64	216	388
A Street NB left/thru/right	D	41.9	0.85	283	372
A Street SB left	E	67.9	0.85	83	#179
A Street SB thru/right	D	36.2	0.78	245	326
Unsignalized Intersections					
A Street / Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	C	22.3	0.10	-	9
A Street NB left/thru	A	0.1	0.00	-	0
A Street SB thru/right	A	0.0	0.32	-	0
West Broadway Street / Police Station Access Driveway	-	-	-	-	-
W Broadway EB left/thru/right	A	0.1	0.00	-	0
W Broadway WB left/thru/right	A	0.2	0.01	-	0
ROW NB left/thru/right	C	19.4	0.06	-	5
ROW SB left/thru/right	F	>50.0	0.12	-	10

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

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
West Broadway Street / A Street	**D**	**39.1**	**-**	**-**	**-**
W Broadway EB left/thru/right	D	36.0	0.79	278	#419
W Broadway WB left/thru/right	C	32.7	0.71	192	264
A Street NB left/thru/right	C	28.2	0.72	198	287
A Street SB left	B	18.8	0.33	44	88
A Street SB thru/right	D	52.7	0.98	476	#752
Unsignalized Intersections					
A Street / Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	E	44.7	0.08	-	6
A Street NB left/thru	A	0.3	0.01	-	1
A Street SB thru/right	A	0.0	0.46	-	0
West Broadway Street / Police Station Access Driveway	-	-	-	-	-
W Broadway EB left/thru/right	A	0.1	0.01	-	0
W Broadway WB left/thru/right	A	0.2	0.01	-	0
ROW NB left/thru/right	F	>50.0	0.20	-	18
ROW SB left/thru/right	A	0.0	0.00	-	0

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

The signalized intersection of West Broadway/A Street will continue to operate at LOS C during the weekday a.m. peak hour but will decrease to LOS D during the weekday p.m. peak hour under the No-Build Condition. During the a.m. peak hour, the A Street southbound left-turn lane improves to LOS E. The longest queues will occur in the West Broadway westbound approach during the weekday a.m. peak hour and occur in the A Street southbound thru/right lane during the weekday p.m. peak hour.

At the unsignalized intersection of A Street/Silver Street, the A street northbound approach and A Street southbound approach will continue to operate at LOS A during both the weekday a.m. and p.m. peak hours. The Silver Street westbound approach will continue to operate at LOS C during the weekday a.m. peak hour but will decrease to LOS E during the p.m. peak hour. The longest queues will continue to occur at the Silver Street westbound approach during both the a.m. and p.m. peak hours.

At the unsignalized intersection of West Broadway/Right-of-Way, the West Broadway approaches will continue to operate at LOS A during both the weekday a.m. and p.m. peak hours. The Right-of-Way northbound approach will continue to operate at LOS C during the a.m. peak hour and LOS F during the p.m. peak hour. The southbound Right-of-Way approach will continue to operate at LOS F during the a.m. peak hour and LOS A during the p.m. peak hour. The longest queues at the intersection will continue to occur at the Right-of-Way southbound approach during the a.m. peak hour and the Right-of-Way northbound approach during the p.m. peak hour.

7.4 Build (2024) Condition

As previously summarized, The Project will include the construction of approximately 65 residential units, 88 parking spaces, and 9,000 square feet of ground floor retail space. Vehicular access to the garage will be provided via a new driveway on Silver Street.

7.4.1 Vehicle Site Access and Circulation

As shown in the Project site plan in **Figure 7-13**, vehicular access to the garage will be provided by a new curb cut along Silver Street. The existing curb cuts along West Broadway and A Street will be closed as part of the Project.

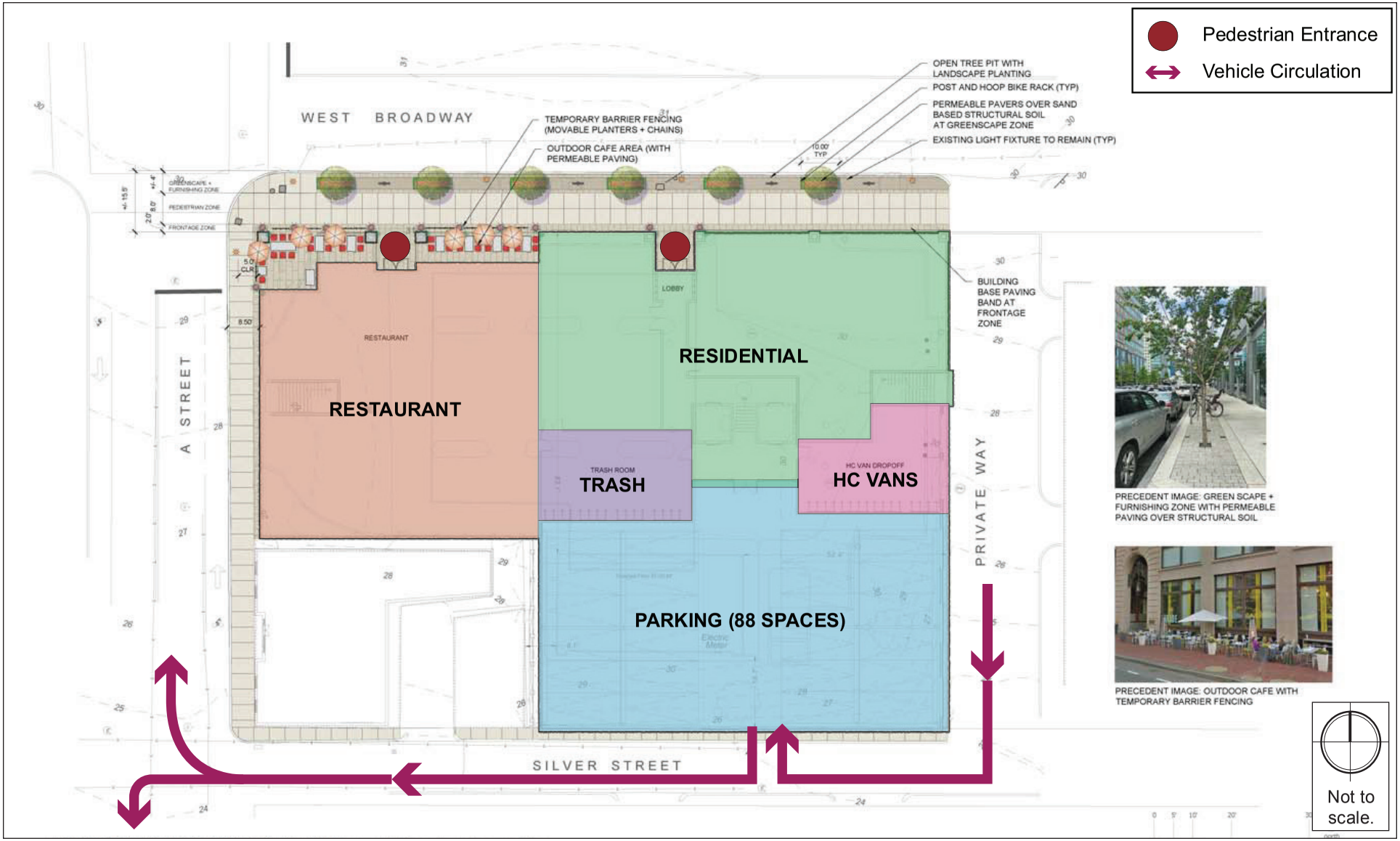


Figure 7-13.
Site Access Plan

7.4.2 Parking

This section presents the Project's parking supply and an evaluation of the Project's parking demand. As previously mentioned, the Project will contain 88 parking spaces in an enclosed garage. This results in a parking ratio of over 1.0 parking spaces per dwelling unit is consistent with the BTD maximum parking goals for this area of South Boston.

7.4.3 Loading and Service Accommodations

Loading and service operations will occur on-site or by permit along Silver Street. Truck trip estimates for the residential element of the Project are based on data provided in the Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area report[4]. Deliveries to the Project site will likely be SU-36 trucks and smaller delivery vehicles. Residential units primarily generate delivery trips related to small packages and prepared food. Based on the CTPS report, the Project is expected to generate two deliveries per day.

7.4.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and short-term bicycle racks for visitors. Based on BTD guidelines, the Project will supply a minimum of 65 secure bicycle parking/storage spaces within the parking garage.

7.4.5 Trip Generation Methodology

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

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[5] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

To estimate the unadjusted number of vehicular trips for the Project, the following ITE land use code (LUCs) was used:

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

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

Land Use Code 220 – Apartment. This land use code refers to dwelling units located within the same building with at least three other dwelling units. Calculation of the number of trips uses ITE's average rate per dwelling unit.

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

7.4.6 Mode Share

BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[6]. The person trips were then distributed to different modes according to the mode shares shown in **Table 7-8**, which reflect BTD's data for the area in which the Project is located.

Table 7-8. Travel Mode Shares

Land Use		Vehicle Occupancy Rate[a]	Walk/Bike Share[b]	Transit Share[b]	Vehicle Share[b]
Daily					
Residential	In	1.13	24%	23%	53%
	Out	1.13	24%	23%	53%
Shopping Center	In	1.78	28%	11%	61%
	Out	1.78	28%	11%	61%
A.M. Peak Hour					
Residential	In	1.13	22%	29%	49%
	Out	1.13	30%	26%	44%
Shopping Center	In	1.78	27%	14%	59%
	Out	1.78	36%	12%	52%
P.M. Peak Hour					
Residential	In	1.13	30%	26%	44%
	Out	1.13	22%	29%	49%
Shopping Center	In	1.78	36%	12%	52%
	Out	1.78	27%	14%	59%

a 2009 National Household Travel Survey.
b Based on rates published by the Boston Transportation Department for Area 8 – Harbor Point.

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

7.4.7 Project Trip Generation

The mode share percentages shown in **Table 7-8** were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The trip generation for the Project by mode is shown in **Table 7-9**. The detailed trip generation information is provided in **Appendix D**.

Table 7-9. Trip Generation Summary

Time Period		Walk/Bicycle Trips	Transit Trips	Primary Vehicle Trips
Daily				
Apartment [a]	In	59	56	114
	Out	59	56	114
	Total	**118**	**112**	**228**
Shopping Center [b]	In	77	30	94
	Out	77	30	94
	Total	**154**	**60**	**188**
Total Daily Trips		**272**	**172**	**416**
A.M. Peak Hour				
Apartment [a]	In	2	2	4
	Out	9	8	12
	Total	**11**	**10**	**16**
Shopping Center [b]	In	2	1	2
	Out	2	1	1
	Total	**4**	**2**	**3**
Total a.m.Peak Hour Trips		**15**	**12**	**19**
P.M. Peak Hour				
Apartment [a]	In	9	8	11
	Out	4	5	6
	Total	**13**	**13**	**17**
Shopping Center [b]	In	8	3	7
	Out	7	4	8
	Total	**15**	**7**	**15**
Total p.m. Peak Hour Trips		**28**	**20**	**32**

a Based on ITE LUC 220 – 65 Apartment units, average rate.
b Based on ITE LUC 820 –7,230 square feet (sf), average rate.

As shown in **Table 7-9**, the Project is expected to generate approximately 19 vehicular trips during the weekday a.m. peak hour and 32 vehicular trips during the weekday p.m. peak hour. **Table 7-10** shows the expected vehicular trip generation when compared to the existing gas station that currently occupies the site.

Table 7-10. Trip Generation Comparison

Peak Hour Vehicle Trips		Existing Site Trips	Proposed Site Trip Generation	Difference
a.m. Peak Hour	**Total**	**148**	**19**	**-129**
	In	78	6	-72
	Out	70	13	-57
p.m. Peak Hour	**Total**	**125**	**32**	**-93**
	In	53	18	-35
	Out	72	14	-58

As shown in **Table 7-10**, the existing uses on the Project site currently generate 148 vehicular trips during the a.m. peak hour and 125 trips during the weekday p.m. peak hour. The gas stations uses on the site typically have a high-turnover and tend to serve vehicles already on the roadway en route to their destination in the form of "pass-by" trips. When compared to the Project, the vehicular traffic on the site is expected to decrease by 129 trips during the weekday a.m. peak hour and 93 trips during the weekday p.m. peak hour. However, since the gas station primarily serves "pass-by" trips, most of the trips related to the existing uses will remain on the roadway network.

7.4.8 Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 8 – Harbor Point and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in **Figure 7-14**.

7.4.9 Build (2024) Traffic Volumes

The vehicle trips were distributed through the study area. The project-generated trips for the weekday a.m. Peak Hour and weekday p.m. Peak Hour are shown in **Figure 7-15** and **Figure 7-16**, respectively. The trip assignments were added to the No-Build (2024) Condition vehicular traffic volumes to develop the Build (2024) Condition vehicular traffic volumes. The Build (2024) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown on **Figure 7-17** and **Figure 7-18**, respectively.

7.4.10 Build (2024) Condition Traffic Operations Analysis

The Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis and the No-Build (2024) Condition capacity analysis. **Table 7-11** and **Table 7-12** present the Build (2024) Condition capacity analysis for the weekday a.m. Peak Hour and weekday p.m. Peak Hour, respectively. The detailed analysis sheets are provided in **Appendix D**.

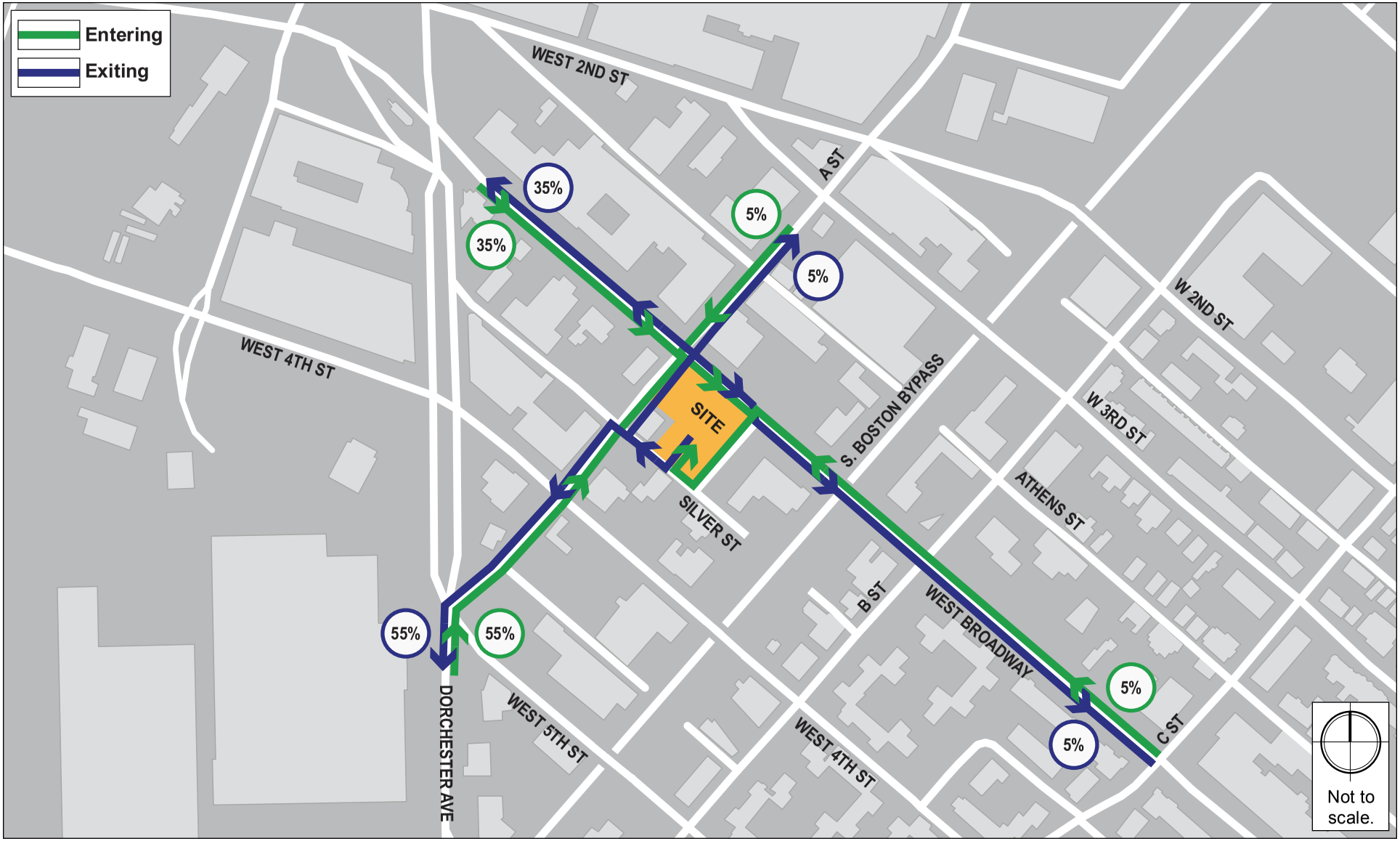


Figure 7-14.
Vehicle Trip Distribution

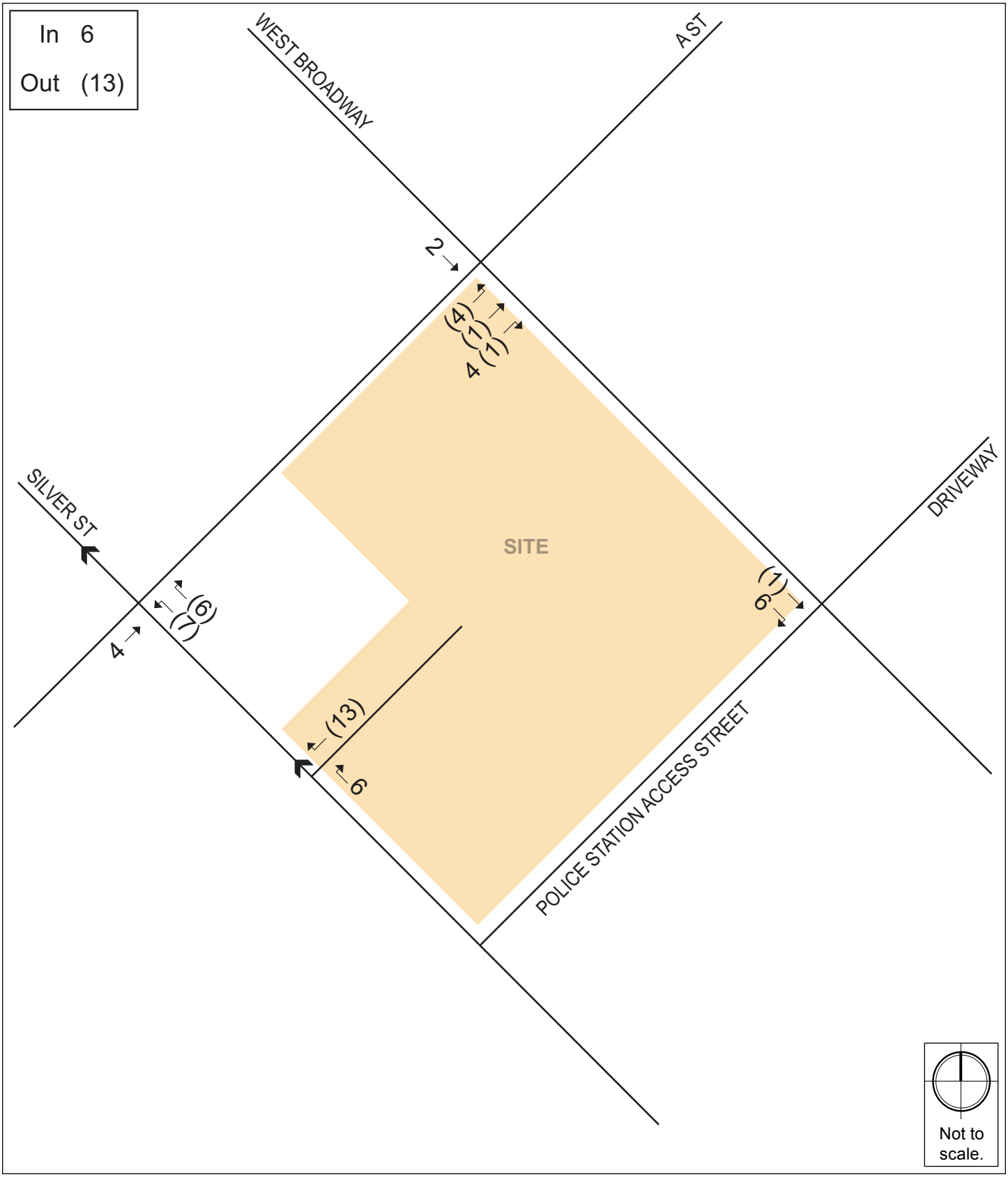


Figure 7-15.
Project-generated Trips, Weekday a.m. Peak Hour

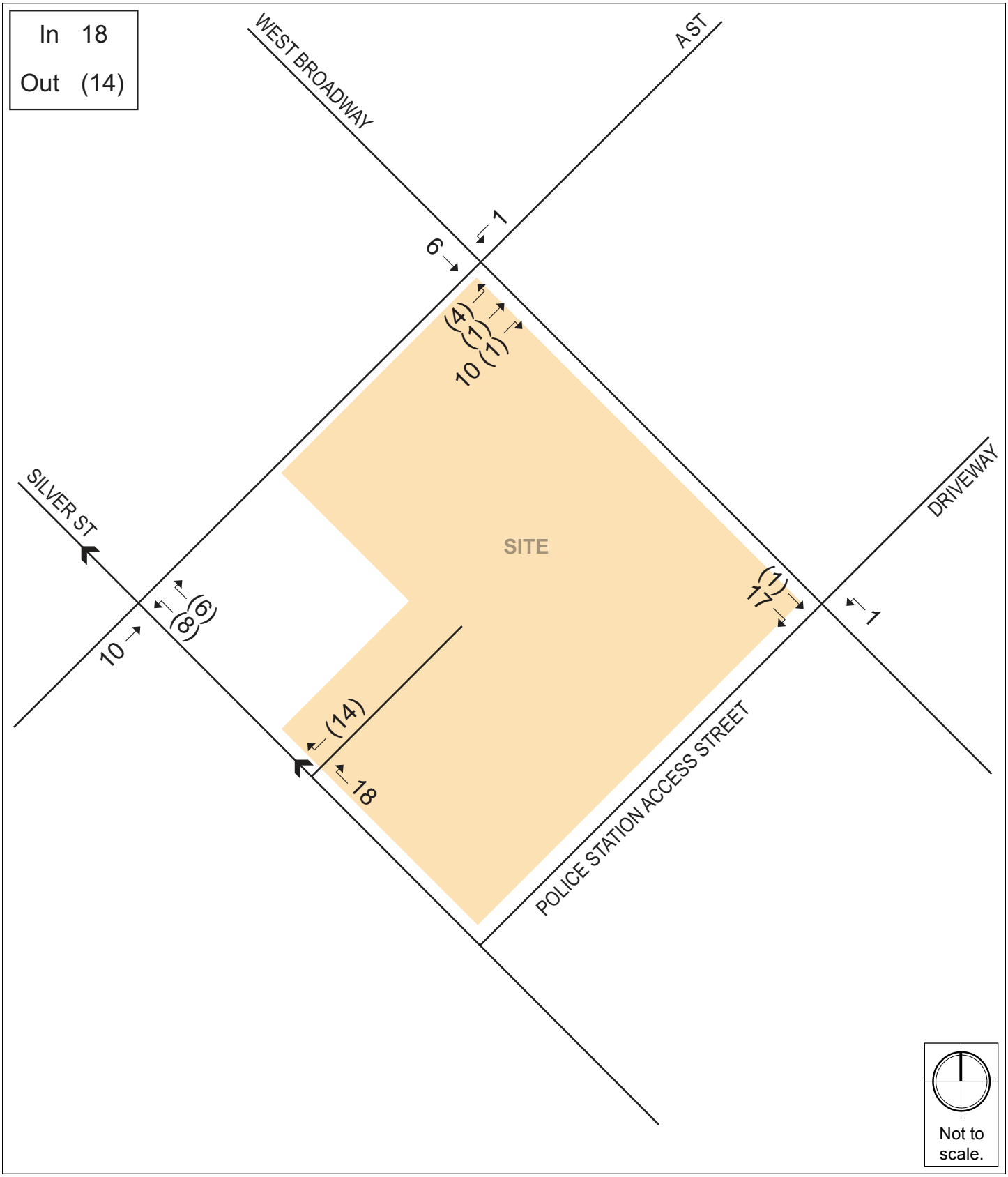


Figure 7-16.
Project-generated Trips, Weekday p.m. Peak Hour

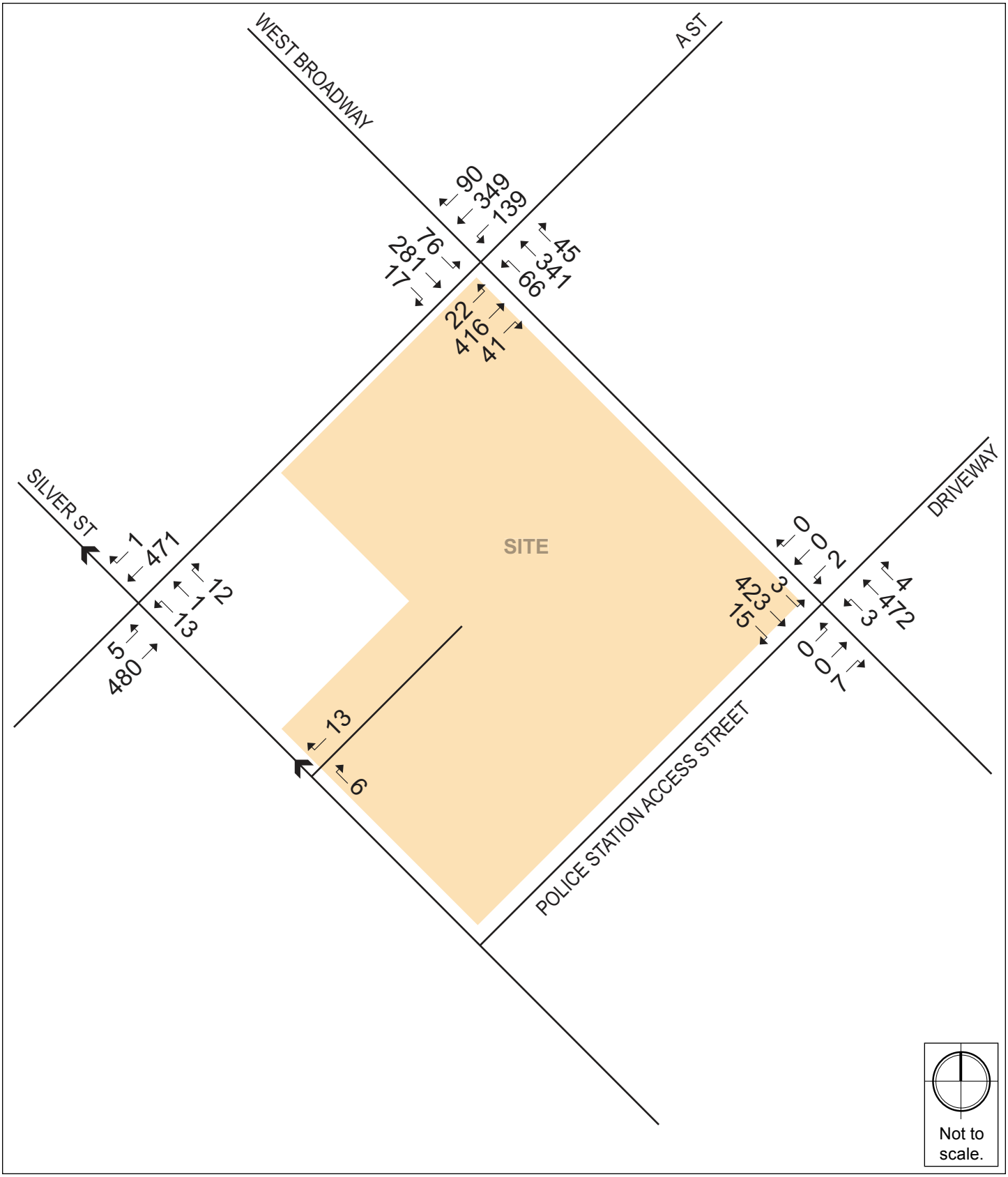


Figure 7-17.
Build (2024) Condition Traffic Volumes, Weekday a.m. Peak Hour

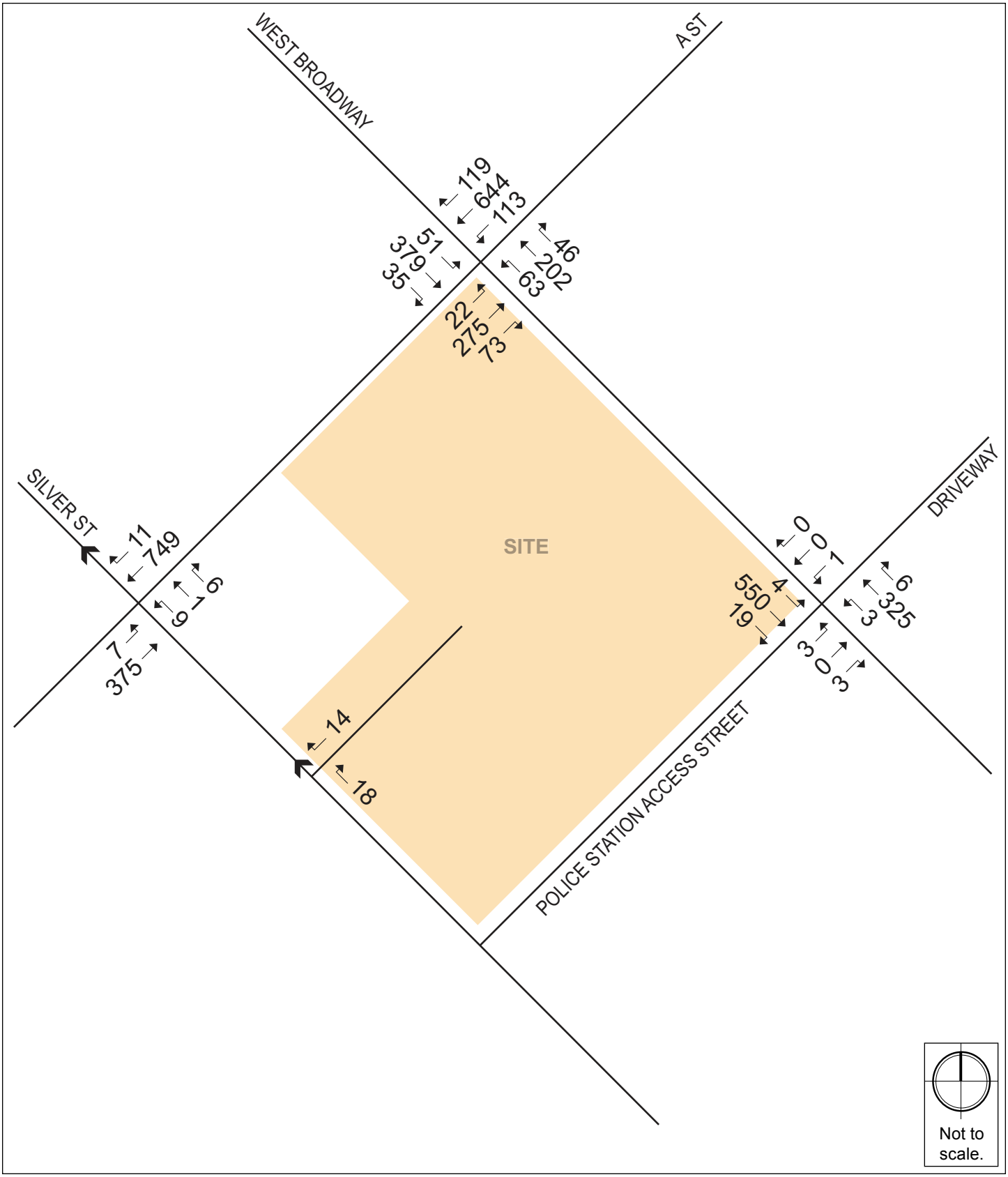


Figure 7-18.
Build (2024) Condition Traffic Volumes, Weekday p.m. Peak Hour

Table 7-11. Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
West Broadway Street / A Street	**C**	**34.2**	**-**	**-**	**-**
W Broadway EB left/thru/right	C	23.1	0.61	194	310
W Broadway WB left/thru/right	C	23.9	0.65	224	388
A Street NB left/thru/right	D	45.5	0.88	290	395
A Street SB left	E	61.4	0.82	80	#177
A Street SB thru/right	C	34.5	0.77	238	326
Unsignalized Intersections					
A Street / Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	C	22.9	0.12	-	10
A Street NB left/thru	A	0.1	0.00	-	0
A Street SB thru/right	A	0.0	0.32	-	0
West Broadway Street / Police Station Access Driveway	-	-	-	-	-
W Broadway EB left/thru/right	A	0.1	0.00	-	0
W Broadway WB left/thru/right	A	0.2	0.01	-	0
ROW NB left/thru/right	C	19.4	0.06	-	5
ROW SB left/thru/right	F	>50.0	0.12	-	10

= 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.

Table 7-12. Build (2024) Condition Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
West Broadway Street / A Street	**D**	**40.7**	**-**	**-**	**-**
W Broadway EB left/thru/right	D	36.6	0.80	283	#436
W Broadway WB left/thru/right	C	32.8	0.71	192	265
A Street NB left/thru/right	D	36.3	0.82	225	#343
A Street SB left	B	19.1	0.34	45	89
A Street SB thru/right	D	52.7	0.98	476	#752
Unsignalized Intersections					
A Street / Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	E	39.9	0.15	-	13
A Street NB left/thru	A	0.3	0.01	-	1
A Street SB thru/right	A	0.0	0.46	-	0
West Broadway Street / Police Station Access Driveway	-	-	-	-	-
W Broadway EB left/thru/right	A	0.1	0.01	-	0
W Broadway WB left/thru/right	A	0.3	0.01	-	1
ROW NB left/thru/right	F	>50.0	0.21	-	18
ROW SB left/thru/right	A	0.0	0.00	-	0

= 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.

The signalized intersection of West Broadway/A Street will continue to operate at LOS C during both the weekday a.m. and p.m. peak hour. During the a.m. peak hour, the A Street southbound left-turn lane will continue to operate at LOS E. The longest queues during the a.m. peak hour will occur at the A Street northbound approach. During the p.m. peak hour, the longest queue will continue to occur at the A Street southbound thru/right-turn lane.

At the unsignalized intersection of A Street/Silver Street, the A Street northbound approach and A Street southbound approach will continue to operate at LOS A during both the weekday a.m. and p.m. peak hours. The Silver Street westbound approach will continue to operate at LOS C during the weekday a.m. peak hour and continue to operate at LOS E during the p.m. peak hour. The longest queues will continue to occur at the Silver Street westbound approach during both the a.m. and p.m. peak hours.

At the unsignalized intersection of West Broadway/ Right-of-Way, the West Broadway eastbound approach and West Broadway westbound approach will continue to operate at LOS A during both the weekday a.m. and p.m. peak hours. The Right-of-Way northbound approach will continue to

operate at LOS C during the a.m. peak hour and LOS F during the p.m. peak hour. The Right-of-Way southbound approach will continue to operate at LOS F during the a.m. peak hour and LOS A during the p.m. peak hour. The longest queues at the intersection will continue to occur at the Right-of-Way southbound approach during the a.m. peak hour and the Right-of-Way northbound approach during the p.m. peak hour.

Based on the operations analysis, the Project will have minimal impact on the surrounding intersections and roadway network. The Project will also remove the curb cuts along West Broadway and A Street, reducing the congestion and vehicular conflicts related to the existing uses on the site.

7.5 Transportation Demand Management

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

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 site. The Proponent will work with the City to develop a TDM program appropriate to the Project and consistent with its level of impact.

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

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

- 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 vehicle sharing and bicycle sharing locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.
- Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options.
- 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.
- Provide information on travel alternatives for employees and visitors via the Internet and in the building lobby.

- Electric Vehicle Charging: The Proponent will explore the feasibility of providing electric vehicle charging station(s) within the garage.
- Vehicle Sharing Program: The Proponent will explore the feasibility of providing spaces in the garage for a car sharing service.

7.6 Transportation Mitigation Measures

The Proponent will continue to 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 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 this 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.

7.7 Evaluation of Short-Term Construction Impacts

Most construction activities will be accommodated within the current site boundaries. 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 to be filed with BTD in accordance with the City's transportation maintenance plan requirements.

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

- Limited construction worker parking on-site;
- Encouragement of worker carpooling;
- Consideration of a subsidy for MBTA passes for full-time employees; and

- Providing secure spaces on-site for workers' supplies and tools so they do not have to be brought to the site each day.

The Construction Management Plan to be executed with the City prior to commencement of construction will document all committed measures.

8.0 COORDINATION WITH GOVERNMENTAL AGENCIES

8.1 Architectural Access Board Requirements

While the Project will comply with the requirements of the Architectural Access Board, and designed to comply with the Standards of the Americans with Disabilities Act, a waiver from total number of accessible parking spaces required may be needed due to the type of mechanical parking system utilized.

8.2 Massachusetts Environmental Policy Act

Based on information currently available, development of the Proposed Project will not result in a state permit/state agency action or meet a review threshold that would require MEPA review by the MEPA Office of the Executive Office of Energy and Environmental Affairs.

8.3 Boston Civic Design Commission

The Project expects to be at, or exceed, the 100,000 square feet size threshold requirement for review by the Boston Civic Design Commission.

9.0 PROJECT CERTIFICATION

This form has been circulated to the Boston Planning and Development Agency as required by Article 80 of the Boston Zoning Code.

Broadway & A St LLC

Michael Moore
Signature of Proponent

06-15-17
Date

Mitchell L. Fischman (MLF) Consulting LLC

Signature of Preparer

06/16/17
Date

Mitchell L. Fischman, Principal

APPENDIX A – LETTER OF INTENT (LOI) TO FILE PNF, APRIL 21, 2017

Adams & Morancy
COUNSELORS - AT - LAW

April 21, 2017

Via In-Hand Delivery and by Email

Mr. Brian Golden, Director
Boston Redevelopment Authority
One City Hall Square, 9th Floor
Boston, MA 02201

Attn: Michael Rooney, Project Manager

RE: Letter of Intent to File Project Notification - Article 80 Large Project Review
87-93 West Broadway, South Boston

Dear Director Golden:

This office represents Oranmore Enterprises, LLC (the "Proponent"), a Massachusetts limited liability company and proposed owner-developer of the real property situated at 87-93 West Broadway in South Boston. The purpose of this letter is to notify the Boston Planning and Development Agency of our client's intent to file an Expanded Project Notification Form with the BPDA pursuant to Article 80B, Large Project Review, of the Boston Zoning Code.

The Proponent's project contemplates the construction of a new mixed-use building of approximately 98,000 square feet of gross floor area, to contain approximately 65 residential units, 5,617 square feet of ground-floor commercial space, 2,020 square feet of proposed community-use space, and 64 garage parking spaces accessed from Silver Street (the "Proposed Project"). The scope and scale of the Proposed Project's residential component is intended to advance the housing creation goals of Mayor Walsh's 2030 Housing Plan.

The site comprises .45 acres (19,723 square feet of land), and is bounded to the north by West Broadway, to the south by Silver Street, to the west by A Street, and to the east on West Broadway by the Area C-6 police station. The site is currently occupied by a gas station with access from West Broadway and A Street via three large curb cuts, two on the West Broadway side and one on the A Street side of the property. The gas station includes a main retail and cashier's building and six pump stations on two covered islands, all of which would be demolished to allow for the completion of the Proposed Project.

The surrounding neighborhood is a mix of commercial/retail, residential, and office uses. MBTA buses run on routes 9, 11 and 47 close to the site on both West Broadway and Dorchester Avenue, and the Broadway Red Line rapid transit station is less than a block from the site.

350 West Broadway, South Boston, MA 02127-2241
Tel.: 617-269-5800 • Fax: 617-269-5923

Broadway Station provides a direct connection to South Station and downtown Boston, and points north to Cambridge and south to Quincy. As the site is surrounded by several abutting and nearby structures of four to six stories in height, including a multi-story apartment building across from the site at the corner of West Broadway and A Street, the context of the immediate area is supportive of and well-suited to the scale and scope of the Proposed Project. Please see Figure 1, Project Locus, attached hereto.

The Proposed Project is located within a Multi-Family Residential/Local Service (MFR/LS) zoning sub-district of the South Boston Neighborhood District, Article 68, which allows for new multi-family residential and mixed-use buildings of the sort contemplated by the Proposed Project, but certain dimensional characteristics of the proposed building would require relief from the terms of the Boston Zoning Code. It should be noted that the BPDA is in the process, with City officials and neighborhood participants, of updating the zoning of both East Broadway and West Broadway and that the Proposed Project was designed taking into consideration anticipated new building height and massing limitations on West Broadway.

The size of the Proposed Project, at nearly 100,000 square feet of gross floor area, will require the preparation and filing of submissions under the Large Project Review requirements of Article 80 of the zoning code. The Expanded PNF filing is expected to address many issues normally presented in a Draft Project Impact Report, including a transportation analysis, and air and noise, shadow, infrastructure, historic resources, and other environmental evaluations, all of which will help explain potential project impacts arising from the Proposed Project, and any needed mitigation measures to reduce these impacts.

Prior to submitting this Letter of Intent, we conducted extensive preliminary community outreach to seek initial input and support for the Proposed Project, including a presentation on March 21, 2017, to the St. Vincent/Lower End Neighborhood Association, and on April 4, 2017, a presentation to the West Broadway Neighborhood Association. We also presented the Proposed Project to an informal meeting of South Boston's elected officials, held at Boston City Hall on March 23, 2017. We look forward to continuing to work closely with abutters and other neighbors in order to craft a development project that will be met with considerable public support.

We wish to thank you and BPDA staff for the time and attention given to this matter. Our team looks forward to continuing to work close with the BPDA, the members of the Impact Advisory Group to be formed, local elected officials, other city agencies, and the local South Boston community in advancing towards a successful project outcome.

Very truly yours,

George Morancy, Esq.

Attachment: Figure 1, Project Locus

350 West Broadway, South Boston, MA 02127-2241
Tel.: 617-269-5800 • Fax: 617-269-5923

cc: Jonathan Greeley, BPDA
Michael Rooney, BPDA
City Councilor Michael F. Flaherty
City Councilor Bill Linehan
Edward McGuire, Mayor's Office of Neighborhood Services
John Allison, Mayor's Office of Neighborhood Services
Senator Linda Dorcena Forry
Representative Nick Collins
Michael Moore, Oranmore Enterprises, LLC
Mitchell L. Fischman, MLF Consulting, LLC
Joseph Rull, MJR Consultants, LLC

FIGURE 1 - PROJECT LOCUS

Figure 1. Project Locus
87-93 West Broadway, South Boston

APPENDIX B – AIR QUALITY APPENDIX

APPENDIX B
AIR QUALITY

87-93 WEST BROADWAY
PROJECT NOTIFICATION FORM

Pages **Contents**

2-5 AERMOD Model Output
6 MOVES2014 Output for Garage Analysis (vehicles exiting garage)
7 Garage Emissions Analysis Calculations - AM and PM Peak Hour

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

***   MODEL SETUP OPTIONS SUMMARY   ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

  -- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for   1 Source(s),
  for Total of   1 Urban Area(s):
  Urban Population =   3964.0 ; Urban Roughness Length = 1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Assumes Receptors on FLAT Terrain.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Urban Roughness Length of 1.0 Meter Used.

**Other Options Specified:
        NOCHKD   - Suppresses checking of date sequence in meteorology files
        SCREEN   - Use screening option
which forces calculation of centerline values

**Model Accepts FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: CO

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 1 Source(s);   1 Source Group(s); and   416 Receptor(s)

               with: 0 POINT(s), including
                          0 POINTCAP(s) and   0 POINTHOR(s)
                and: 1 VOLUME source(s)
                and: 0 AREA type source(s)
                and: 0 LINE source(s)
                and: 0 OPENPIT source(s)
                and: 0 BUOYANT LINE source(s) with   0 lines

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 16216

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) =   5.00 ; Decay Coef. =   0.000   ; Rot. Angle =   0.0
                 Emission Units = GRAMS/SEC   ; Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =   3.5 MB of RAM.

**Input Runstream File: CO_5yrs_CO.DTA
**Output Print File: CO_5yrs_CO.LST

```
**File for Summary of Results:   W:\Apps\aermod\4235\CO_5yrs_CO.SUM

*** AERMOD - VERSION  16216 ***   *** 87-93 West Broadway  Project                                       ***        05/18/17
*** AERMET - VERSION 16216  ***   *** CO 1-hour Screening Modeling                                       ***        08:47:56
                                                                                                                    PAGE   2
*** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN

                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                          (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.



                              *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                       (METERS/SEC)

                                             1.54,    3.09,    5.14,    8.23,   10.80,
```

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: Urban.sfc Met Version: 16216
Profile file: Urban.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 11111 Upper air station no.: 22222
Name: UNKNOWN Name: UNKNOWN
Year: 2010 Year: 2010

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	10.	10.0	255.2	2.0
10	01	02	2	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	20.	10.0	255.2	2.0
10	01	03	3	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	30.	10.0	255.2	2.0
10	01	04	4	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	40.	10.0	255.2	2.0
10	01	05	5	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	50.	10.0	255.2	2.0
10	01	06	6	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	60.	10.0	255.2	2.0
10	01	07	7	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	70.	10.0	255.2	2.0
10	01	08	8	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	80.	10.0	255.2	2.0
10	01	09	9	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	90.	10.0	255.2	2.0
10	01	10	10	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	100.	10.0	255.2	2.0
10	01	11	11	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	110.	10.0	255.2	2.0
10	01	12	12	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	120.	10.0	255.2	2.0
10	01	13	13	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	130.	10.0	255.2	2.0
10	01	14	14	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	140.	10.0	255.2	2.0
10	01	15	15	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	150.	10.0	255.2	2.0
10	01	16	16	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	160.	10.0	255.2	2.0
10	01	17	17	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	170.	10.0	255.2	2.0
10	01	18	18	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	180.	10.0	255.2	2.0
10	01	19	19	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	190.	10.0	255.2	2.0
10	01	20	20	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	200.	10.0	255.2	2.0
10	01	21	21	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	210.	10.0	255.2	2.0
10	01	22	22	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	220.	10.0	255.2	2.0
10	01	23	23	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	230.	10.0	255.2	2.0
10	01	24	24	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	240.	10.0	255.2	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
10	01	01	01	10.0	1	10.	0.50	255.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	2.55317	ON 10011206: AT (229924.80, 900591.20, 5.00, 5.00, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** AERMOD - VERSION 16216 *** *** 87-93 West Broadway Project *** 05/18/17
*** AERMET - VERSION 16216 *** *** CO 1-hour Screening Modeling *** 08:47:56

*** MODELOPTs: NonDFAULT CONC FLAT FLGPOL NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 2 Warning Message(s)
A Total of 0 Informational Message(s)

A Total of 18504 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 0 Missing Hours Identified (0.00 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

INDOOR GARAGE ANALYSIS PROGRAM

PROJECT: 87-93 WEST BROADWAY GARAGE PEAK PM HOUR - YEAR: 2017

DISTANCE IN:	55	METERS
DISTANCE OUT:	55	METERS
NUMBER OF EXIT LANES:	1	LANE(S)
TOTAL EXIT VOLUME:	32	VEH/HOUR
CO RATE:	2.976	GRAMS CO/MILE
SPEED IN GARAGE:	5.0	M.P.H.
VENT CFM:	9,000	CFM

TOTAL CO EMISSIONS = 0.108 GRAMS/MIN = 0.0018 GRAMS/SEC
TOTAL VENTILATION = 255 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 0.37 PPM

MOVES2014 OUTPUT

Road Type ID	Link Length (miles)	Link Volume (Vehicles/Hr)	Link Avg Speed (Miles/Hr)	Pollutant	Emission Factor (Grams/veh-mi)
5	0.07	19	5	CO	2.976
5	0.07	32	5	CO	2.976

APPENDIX C – NOISE APPENDIX

APPENDIX C
NOISE

87-93 WEST BROADWAY
PROJECT NOTIFICATION FORM

Page Contents

2 Figure 1: Modeling Receptor Locations
3-5 Cadna Noise Modeling Results

FIGURE 1
Sound Monitoring & Sound Receptor Modeling Locations
87-93 West Broadway
Boston, MA

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Cadna Noise Modeling Results

City of Boston Noise Ordinance Analysis

Name	Level Lr				Octave Band Day							Height		Coordinates		
	Day	Night	31	63	125	250	500	1000	2000	4000	8000			X	Y	Z
	(dBA)	(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(m)		(m)	(m)	(m)
40 Silver Street	32.2	32.2	41.3	39	38.4	34.9	29.1	25.8	21.8	15.7	8.5	11	r	236617.11	899080.54	17.6
53 Silver Street	41.8	41.8	55.9	55.9	49.4	42.1	38.2	36	31.8	26.2	17.8	11	r	236633.72	899041.92	16.56
55 Silver Street	41.3	41.3	55.4	55.4	48.9	41.7	37.8	35.5	31.3	25.6	17	11	r	236640.64	899036.31	16.29
45 A Street	35.1	35.1	40.5	40.1	42.5	39.5	32.9	26.6	19.7	13.3	5.5	14.6	r	236609.82	899090.88	21.13
48 West Broadway	30.4	30.4	34.8	34.4	36.9	34.6	28.6	22.6	15.3	5.3	-7.6	11	r	236626.47	899161.17	18.56
55 West Broadway	27.9	27.9	33.7	32.6	34.4	32.1	26	20	12.7	3.9	-8.4	11	r	236581.63	899141.83	17.41
80 West Broadway	32.2	32.2	37.6	37.1	39.1	36.5	30.2	24	16.9	7.6	-2.5	11	r	236648.97	899140.5	18.59
116 West Broadway	36.2	36.2	49.2	49.3	43.5	37.9	33.3	30	25.2	18.5	7.3	11	r	236706.35	899089.02	18.33

MassDEP Noise Policy Analysis

	Nighttime					
	Name	**ID**	**Project Level (dBA)**	**Background Level (dBA)**	**Total New Level (dBA)**	**Increase Over Existing (dBA)**
R2	40 Silver Street	Top_Floor	32.2	52.3	52.3	0.0
R1	53 Silver Street	Top_Floor	41.8	51.1	51.6	0.5
R3	55 Silver Street	Top_Floor	41.3	51.1	51.5	0.4
R4	45 A Street	Top_Floor	35.1	52.3	52.4	0.1
R5	48 West Broadway	Top_Floor	30.4	50.8	50.8	0.0
R6	55 West Broadway	Top_Floor	27.9	50.8	50.8	0.0
R7	80 West Broadway	Top_Floor	32.2	50.8	50.9	0.1
R8	116 West Broadway	Top_Floor	36.2	50.8	50.9	0.1
	Daytime					
	Name	**ID**	**Project Level (dBA)**	**Background Level (dBA)**	**Total New Level (dBA)**	**Increase Over Existing (dBA)**
R2	40 Silver Street	Top_Floor	32.2	60.5	60.5	0.0
R1	53 Silver Street	Top_Floor	41.8	53.1	53.4	0.3
R3	55 Silver Street	Top_Floor	41.3	53.1	53.4	0.3
R4	45 A Street	Top_Floor	35.1	60.5	60.5	0.0
R5	48 West Broadway	Top_Floor	30.4	56.6	56.6	0.0
R6	55 West Broadway	Top_Floor	27.9	56.6	56.6	0.0
R7	80 West Broadway	Top_Floor	32.2	56.6	56.6	0.0
R8	116 West Broadway	Top_Floor	36.2	56.6	56.6	0.0

APPENDIX D – TRANSPORTATION APPENDIX

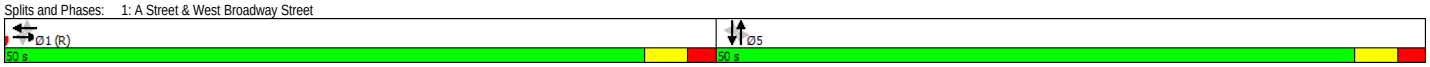
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	269	16	64	327	42	17	280	35	133	310	42
Future Volume (vph)	72	269	16	64	327	42	17	280	35	133	310	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.94			0.91			0.93		0.78	0.94	
Frt		0.994			0.987			0.986			0.982	
Flt Protected		0.990			0.993			0.997		0.950		
Satd. Flow (prot)	0	1720	0	0	1706	0	0	1664	0	1656	1668	0
Flt Permitted		0.828			0.885			0.934		0.358		
Satd. Flow (perm)	0	1393	0	0	1464	0	0	1540	0	487	1668	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7			8			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		454			226			175			460	
Travel Time (s)		10.3			5.1			4.0			10.5	
Confl. Peds. (#/hr)	238		522	522		238	222		191	191		222
Confl. Bikes (#/hr)									1			2
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95
Heavy Vehicles (%)	6%	5%	0%	8%	2%	5%	0%	6%	9%	9%	5%	2%
Adj. Flow (vph)	85	316	19	70	359	46	18	301	38	140	326	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	420	0	0	475	0	0	357	0	140	370	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		60.3			60.3			29.7		29.7	29.7	
Actuated g/C Ratio		0.60			0.60			0.30		0.30	0.30	
v/c Ratio		0.50			0.54			0.77		0.97	0.74	
Control Delay		16.3			16.8			41.6		101.1	38.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		16.3			16.8			41.6		101.1	38.7	
LOS		B			B			D		F	D	
Approach Delay		16.3			16.8			41.6			55.9	
Approach LOS		B			B			D			E	
Stops (vph)		211			263			281		125	293	
Fuel Used(gal)		4			4			5		4	6	
CO Emissions (g/hr)		253			258			337		273	395	
NOx Emissions (g/hr)		49			50			65		53	77	
VOC Emissions (g/hr)		59			60			78		63	92	
Dilemma Vehicles (#)		0			0			0		0	0	
Queue Length 50th (ft)		136			157			205		89	210	
Queue Length 95th (ft)		276			348			249		#169	251	
Internal Link Dist (ft)		374			146			95			380	
Turn Bay Length (ft)										100		
Base Capacity (vph)		840			884			697		219	755	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.50			0.54			0.51		0.64	0.49	

Intersection Summary

Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 33.0		Intersection LOS: C	
Intersection Capacity Utilization 80.4%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 1: A Street & West Broadway Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	6	1	6	5	339	0	0	428	1
Future Volume (Veh/h)	0	0	0	6	1	6	5	339	0	0	428	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.62	0.62	0.62	0.54	0.54	0.54	0.95	0.95	0.95	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	11	2	11	5	357	0	0	486	1
Pedestrians		17			39			3			5	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			4			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											175	
pX, platoon unblocked	0.81	0.81	0.81	0.81	0.81		0.81					
vC, conflicting volume	888	910	506	896	910	401	504			396		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	741	768	268	750	768	401	265			396		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.0	3.5	2.2			2.2		
p0 queue free %	100	100	100	95	99	98	100			100		
cM capacity (veh/h)	254	258	624	232	258	586	1057			1130		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	362	487
Volume Left	11	5	0
Volume Right	11	0	1
cSH	325	1057	1700
Volume to Capacity	0.07	0.00	0.29
Queue Length 95th (ft)	6	0	0
Control Delay (s)	17.0	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	17.0	0.2	0.0
Approach LOS	C		

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			36.7%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	2	408	9	3	452	4	0	0	7	2	0	0
Future Volume (Veh/h)	2	408	9	3	452	4	0	0	7	2	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.44	0.44	0.44	0.25	0.25	0.25
Hourly flow rate (vph)	2	453	10	3	526	5	0	0	16	8	0	0
Pedestrians		9						328			137	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		1						31			13	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		226										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	668			791			1334	1464	786	1150	1466	674
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	668			664			1304	1458	658	1087	1460	674
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	4.0	4.0	3.3
p0 queue free %	100			99			100	100	94	89	100	100
cM capacity (veh/h)	810			545			55	66	273	75	65	395

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	465	534	16	8
Volume Left	2	3	0	8
Volume Right	10	5	16	0
cSH	810	545	273	75
Volume to Capacity	0.00	0.01	0.06	0.11
Queue Length 95th (ft)	0	0	5	9
Control Delay (s)	0.1	0.2	19.0	59.0
Lane LOS	A	A	C	F
Approach Delay (s)	0.1	0.2	19.0	59.0
Approach LOS			C	F

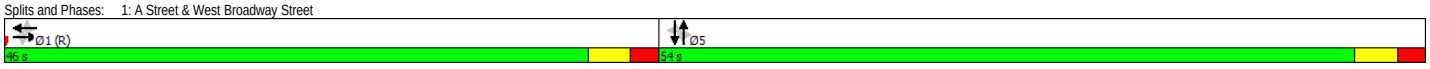
Intersection Summary					
Average Delay			0.9		
Intersection Capacity Utilization			38.8%	ICU Level of Service	A
Analysis Period (min)			15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	359	34	61	193	41	17	231	60	106	513	65
Future Volume (vph)	45	359	34	61	193	41	17	231	60	106	513	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.92			0.92			0.95		0.88	0.93	
Frt		0.990			0.981			0.974			0.983	
Flt Protected		0.995			0.990			0.997		0.950		
Satd. Flow (prot)	0	1750	0	0	1678	0	0	1726	0	1719	1724	0
Flt Permitted		0.929			0.821			0.804		0.450		
Satd. Flow (perm)	0	1597	0	0	1391	0	0	1392	0	720	1724	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			10			13			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		454			226			175			460	
Travel Time (s)		10.3			5.1			4.0			10.5	
Confl. Peds. (#/hr)	260		465	465		260	312		90	90		312
Confl. Bikes (#/hr)						2			1			18
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.84	0.84	0.84	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	3%	2%	1%	0%	6%	1%	0%	5%	1%	2%
Adj. Flow (vph)	51	403	38	74	235	50	20	275	71	112	540	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	492	0	0	359	0	0	366	0	112	608	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Total Split (s)	46.0	46.0		46.0	46.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%		54.0%	54.0%		54.0%	54.0%	
Maximum Green (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		48.4			48.4			41.6		41.6	41.6	
Actuated g/C Ratio		0.48			0.48			0.42		0.42	0.42	
v/c Ratio		0.64			0.53			0.62		0.37	0.84	
Control Delay		25.6			22.9			26.3		22.4	36.6	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		25.6			22.9			26.3		22.4	36.6	
LOS		C			C			C		C	D	
Approach Delay		25.6			22.9			26.3			34.4	
Approach LOS		C			C			C			C	
Stops (vph)		329			204			221		67	491	
Fuel Used(gal)		6			3			3		1	9	
CO Emissions (g/hr)		395			211			229		86	636	
NOx Emissions (g/hr)		77			41			45		17	124	
VOC Emissions (g/hr)		92			49			53		20	147	
Dilemma Vehicles (#)		0			0			0		0	0	
Queue Length 50th (ft)		229			153			169		47	327	
Queue Length 95th (ft)		383			238			212		83	425	
Internal Link Dist (ft)		374			146			95			380	
Turn Bay Length (ft)										100		
Base Capacity (vph)		774			678			688		352	849	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.64			0.53			0.53		0.32	0.72	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 28.5 Intersection LOS: C
Intersection Capacity Utilization 85.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: A Street & West Broadway Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	1	1	0	7	319	0	0	614	11
Future Volume (Veh/h)	0	0	0	1	1	0	7	319	0	0	614	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.87	0.87	0.87	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	4	4	0	8	367	0	0	627	11
Pedestrians		9			14			1			7	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											175	
pX, platoon unblocked	0.69	0.69	0.69	0.69	0.69		0.69					
vC, conflicting volume	1034	1038	642	1030	1044	388	647			381		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	822	829	253	817	837	388	260			381		
tC, single (s)	7.1	6.5	6.2	8.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.4	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	98	100	99			100		
cM capacity (veh/h)	195	207	543	137	205	651	905			1173		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	375	638
Volume Left	4	8	0
Volume Right	0	0	11
cSH	164	905	1700
Volume to Capacity	0.05	0.01	0.38
Queue Length 95th (ft)	4	1	0
Control Delay (s)	28.0	0.3	0.0
Lane LOS	D	A	
Approach Delay (s)	28.0	0.3	0.0
Approach LOS	D		

Intersection Summary					
Average Delay			0.3		
Intersection Capacity Utilization			45.1%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	4	527	2	2	308	6	3	0	3	0	0	0
Future Volume (Veh/h)	4	527	2	2	308	6	3	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.89	0.89	0.89	0.30	0.30	0.30	0.25	0.25	0.25
Hourly flow rate (vph)	4	579	2	2	346	7	10	0	10	0	0	0
Pedestrians								348			213	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								33			20	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		226										
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	566			929			1290	1506	928	1164	1504	562
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	566			766			1229	1508	765	1069	1504	562
tC, single (s)	4.1			4.6			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.7			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			80	100	95	100	100	100
cM capacity (veh/h)	810			347			51	50	211	75	50	422

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	585	355	20	0
Volume Left	4	2	10	0
Volume Right	2	7	10	0
cSH	810	347	82	1700
Volume to Capacity	0.00	0.01	0.24	0.00
Queue Length 95th (ft)	0	0	22	0
Control Delay (s)	0.1	0.2	62.3	0.0
Lane LOS	A	A	F	A
Approach Delay (s)	0.1	0.2	62.3	0.0
Approach LOS			F	A

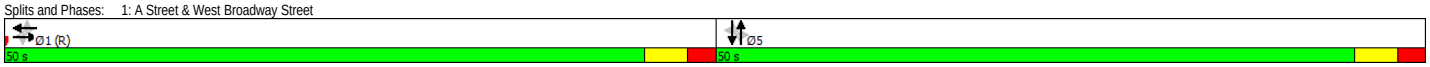
Intersection Summary					
Average Delay			1.5		
Intersection Capacity Utilization			40.6%	ICU Level of Service	A
Analysis Period (min)			15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	279	17	66	341	45	18	415	36	139	349	90
Future Volume (vph)	76	279	17	66	341	45	18	415	36	139	349	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.94			0.91			0.95		0.85	0.89	
Frt		0.994			0.987			0.990			0.969	
Flt Protected		0.990			0.993			0.998		0.950		
Satd. Flow (prot)	0	1720	0	0	1704	0	0	1699	0	1656	1568	0
Flt Permitted		0.819			0.883			0.948		0.312		
Satd. Flow (perm)	0	1380	0	0	1462	0	0	1604	0	465	1568	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7			5			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		454			226			175			460	
Travel Time (s)		10.3			5.1			4.0			10.5	
Confl. Peds. (#/hr)	238		522	522		238	222		191	191		222
Confl. Bikes (#/hr)									1			2
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95
Heavy Vehicles (%)	6%	5%	0%	8%	2%	5%	0%	6%	9%	9%	5%	2%
Adj. Flow (vph)	89	328	20	73	375	49	19	446	39	146	367	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	437	0	0	497	0	0	504	0	146	462	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		53.1			53.1			36.9		36.9	36.9	
Actuated g/C Ratio		0.53			0.53			0.37		0.37	0.37	
v/c Ratio		0.60			0.64			0.85		0.85	0.78	
Control Delay		22.2			23.1			41.9		67.9	36.2	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		22.2			23.1			41.9		67.9	36.2	
LOS		C			C			D		E	D	
Approach Delay		22.2			23.1			41.9			43.8	
Approach LOS		C			C			D			D	
Stops (vph)		261			326			409		122	360	
Fuel Used(gal)		4			5			7		3	7	
CO Emissions (g/hr)		310			330			482		216	475	
NOx Emissions (g/hr)		60			64			94		42	93	
VOC Emissions (g/hr)		72			77			112		50	110	
Dilemma Vehicles (#)		0			0			0		0	0	
Queue Length 50th (ft)		185			216			283		83	245	
Queue Length 95th (ft)		307			388			372		#179	326	
Internal Link Dist (ft)		374			146			95			380	
Turn Bay Length (ft)										100		
Base Capacity (vph)		734			779			724		209	714	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.60			0.64			0.70		0.70	0.65	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 33.7 Intersection LOS: C
Intersection Capacity Utilization 94.1% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West Broadway Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	6	1	6	5	476	0	0	471	1
Future Volume (Veh/h)	0	0	0	6	1	6	5	476	0	0	471	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.62	0.62	0.62	0.54	0.54	0.54	0.95	0.95	0.95	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	11	2	11	5	501	0	0	535	1
Pedestrians		17			39			3			5	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			4			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											175	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	1080	1102	556	1088	1103	545	553			540		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	946	975	252	956	976	545	249			540		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.0	3.5	2.2			2.2		
p0 queue free %	100	100	100	93	99	98	100			100		
cM capacity (veh/h)	172	184	597	157	184	484	1006			1000		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	506	536
Volume Left	11	5	0
Volume Right	11	0	1
cSH	232	1006	1700
Volume to Capacity	0.10	0.00	0.32
Queue Length 95th (ft)	9	0	0
Control Delay (s)	22.3	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	22.3	0.1	0.0
Approach LOS	C		

Intersection Summary					
Average Delay			0.6		
Intersection Capacity Utilization			43.2%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	423	9	3	472	4	0	0	7	2	0	0
Future Volume (Veh/h)	2	423	9	3	472	4	0	0	7	2	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.44	0.44	0.44	0.25	0.25	0.25
Hourly flow rate (vph)	2	470	10	3	549	5	0	0	16	8	0	0
Pedestrians		9						328			137	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		1						31			13	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		226										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	691			808			1374	1504	803	1190	1506	698
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	691			655			1345	1505	648	1121	1508	698
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	4.0	4.0	3.3
p0 queue free %	100			99			100	100	94	88	100	100
cM capacity (veh/h)	794			530			49	59	267	68	59	383

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	482	557	16	8
Volume Left	2	3	0	8
Volume Right	10	5	16	0
cSH	794	530	267	68
Volume to Capacity	0.00	0.01	0.06	0.12
Queue Length 95th (ft)	0	0	5	10
Control Delay (s)	0.1	0.2	19.4	65.0
Lane LOS	A	A	C	F
Approach Delay (s)	0.1	0.2	19.4	65.0
Approach LOS			C	F

Intersection Summary					
Average Delay			0.9		
Intersection Capacity Utilization			39.8%	ICU Level of Service	A
Analysis Period (min)			15		

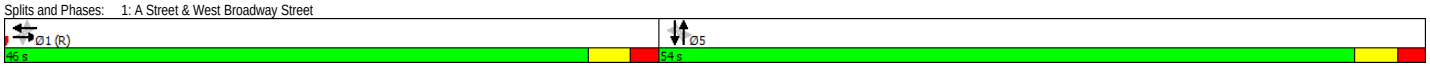
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	373	35	63	202	46	18	274	62	112	644	119
Future Volume (vph)	51	373	35	63	202	46	18	274	62	112	644	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.92			0.91			0.95		0.90	0.91	
Frt		0.990			0.980			0.976			0.977	
Flt Protected		0.994			0.990			0.998		0.950		
Satd. Flow (prot)	0	1750	0	0	1667	0	0	1741	0	1719	1664	0
Flt Permitted		0.919			0.762			0.676		0.448		
Satd. Flow (perm)	0	1582	0	0	1283	0	0	1179	0	729	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			11			12			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		454			226			175			460	
Travel Time (s)		10.3			5.1			4.0			10.5	
Confl. Peds. (#/hr)	260		465	465		260	312		90	90		312
Confl. Bikes (#/hr)						2			1			18
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.84	0.84	0.84	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	3%	2%	1%	0%	6%	1%	0%	5%	1%	2%
Adj. Flow (vph)	57	419	39	77	246	56	21	326	74	118	678	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	515	0	0	379	0	0	421	0	118	803	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Total Split (s)	46.0	46.0		46.0	46.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%		54.0%	54.0%		54.0%	54.0%	
Maximum Green (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		41.1			41.1			48.9		48.9	48.9	
Actuated g/C Ratio		0.41			0.41			0.49		0.49	0.49	
v/c Ratio		0.79			0.71			0.72		0.33	0.98	
Control Delay		36.0			32.7			28.2		18.8	52.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		36.0			32.7			28.2		18.8	52.7	
LOS		D			C			C		B	D	
Approach Delay		36.0			32.7			28.2			48.4	
Approach LOS		D			C			C			D	
Stops (vph)		382			253			272		67	634	
Fuel Used(gal)		7			4			4		1	14	
CO Emissions (g/hr)		496			281			281		84	1009	
NOx Emissions (g/hr)		96			55			55		16	196	
VOC Emissions (g/hr)		115			65			65		19	234	
Dilemma Vehicles (#)		0			0			0		0	0	
Queue Length 50th (ft)		278			192			198		44	476	
Queue Length 95th (ft)		#419			264			287		88	#752	
Internal Link Dist (ft)		374			146			95			380	
Turn Bay Length (ft)										100		
Base Capacity (vph)		652			533			583		357	821	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.79			0.71			0.72		0.33	0.98	

Intersection Summary

Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 39.1		Intersection LOS: D	
Intersection Capacity Utilization 90.6%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West Broadway Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	1	1	0	7	365	0	0	749	11
Future Volume (Veh/h)	0	0	0	1	1	0	7	365	0	0	749	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.25	0.25	0.25	0.87	0.87	0.87	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	4	4	0	8	420	0	0	764	11
Pedestrians		9			14			1			7	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											175	
pX, platoon unblocked	0.53	0.53	0.53	0.53	0.53		0.53					
vC, conflicting volume	1224	1228	780	1220	1234	441	784			434		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	981	990	147	975	1000	441	155			434		
tC, single (s)	7.1	6.5	6.2	8.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.4	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	97	100	99			100		
cM capacity (veh/h)	117	129	482	80	127	608	765			1121		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	428	775
Volume Left	4	8	0
Volume Right	0	0	11
cSH	99	765	1700
Volume to Capacity	0.08	0.01	0.46
Queue Length 95th (ft)	6	1	0
Control Delay (s)	44.7	0.3	0.0
Lane LOS	E	A	
Approach Delay (s)	44.7	0.3	0.0
Approach LOS	E		

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization			52.2%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	549	2	2	325	6	2	0	3	0	0	0
Future Volume (Veh/h)	4	549	2	2	325	6	2	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.89	0.89	0.89	0.30	0.30	0.30	0.25	0.25	0.25
Hourly flow rate (vph)	4	603	2	2	365	7	7	0	10	0	0	0
Pedestrians								348			213	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								33			20	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		226										
pX, platoon unblocked				0.74			0.74	0.74	0.74	0.74	0.74	
vC, conflicting volume	585			953			1332	1549	952	1208	1546	582
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585			759			1273	1566	758	1104	1563	582
tC, single (s)	4.1			4.6			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.7			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			85	100	95	100	100	100
cM capacity (veh/h)	797			332			45	44	203	67	44	412

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	609	374	17	0
Volume Left	4	2	7	0
Volume Right	2	7	10	0
cSH	797	332	83	1700
Volume to Capacity	0.01	0.01	0.20	0.00
Queue Length 95th (ft)	0	0	18	0
Control Delay (s)	0.1	0.2	59.0	0.0
Lane LOS	A	A	F	A
Approach Delay (s)	0.1	0.2	59.0	0.0
Approach LOS			F	A

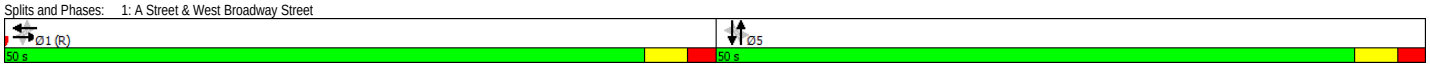
Intersection Summary					
Average Delay			1.2		
Intersection Capacity Utilization			41.8%	ICU Level of Service	A
Analysis Period (min)			15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	281	17	66	341	45	22	416	41	139	349	90
Future Volume (vph)	76	281	17	66	341	45	22	416	41	139	349	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.94			0.91			0.95		0.86	0.89	
Frt		0.994			0.987			0.988			0.969	
Flt Protected		0.990			0.993			0.998		0.950		
Satd. Flow (prot)	0	1720	0	0	1704	0	0	1689	0	1656	1568	0
Flt Permitted		0.818			0.883			0.915		0.315		
Satd. Flow (perm)	0	1379	0	0	1463	0	0	1537	0	472	1568	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7			6			17	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		454			226			175			460	
Travel Time (s)		10.3			5.1			4.0			10.5	
Confl. Peds. (#/hr)	238		522	522		238	222		191	191		222
Confl. Bikes (#/hr)									1			2
Peak Hour Factor	0.85	0.85	0.85	0.91	0.91	0.91	0.93	0.93	0.93	0.95	0.95	0.95
Heavy Vehicles (%)	6%	5%	0%	8%	2%	5%	0%	6%	9%	9%	5%	2%
Adj. Flow (vph)	89	331	20	73	375	49	24	447	44	146	367	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	440	0	0	497	0	0	515	0	146	462	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Total Split (s)	50.0	50.0		50.0	50.0		50.0	50.0		50.0	50.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	45.0	45.0		45.0	45.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		52.2			52.2			37.8		37.8	37.8	
Actuated g/C Ratio		0.52			0.52			0.38		0.38	0.38	
v/c Ratio		0.61			0.65			0.88		0.82	0.77	
Control Delay		23.1			23.9			45.5		61.4	34.5	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		23.1			23.9			45.5		61.4	34.5	
LOS		C			C			D		E	C	
Approach Delay		23.1			23.9			45.5			41.0	
Approach LOS		C			C			D			D	
Stops (vph)		269			331			427		118	356	
Fuel Used(gal)		5			5			7		3	7	
CO Emissions (g/hr)		319			337			521		202	463	
NOx Emissions (g/hr)		62			66			101		39	90	
VOC Emissions (g/hr)		74			78			121		47	107	
Dilemma Vehicles (#)		0			0			0		0	0	
Queue Length 50th (ft)		194			224			290		80	238	
Queue Length 95th (ft)		310			388			395		#177	326	
Internal Link Dist (ft)		374			146			95			380	
Turn Bay Length (ft)										100		
Base Capacity (vph)		721			767			694		212	714	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.61			0.65			0.74		0.69	0.65	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 34.2 Intersection LOS: C
Intersection Capacity Utilization 94.9% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West Broadway Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	13	1	12	5	480	0	0	471	1
Future Volume (Veh/h)	0	0	0	13	1	12	5	480	0	0	471	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.62	0.62	0.62	0.92	0.92	0.92	0.95	0.95	0.95	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	14	1	13	5	505	0	0	535	1
Pedestrians		17			39			3			5	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			4			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											175	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	1086	1106	556	1092	1107	549	553			544		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	956	983	259	964	983	549	255			544		
tC, single (s)	7.1	6.5	6.2	7.3	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.7	4.0	3.5	2.2			2.2		
p0 queue free %	100	100	100	91	99	97	100			100		
cM capacity (veh/h)	170	183	596	156	183	481	1005			997		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	28	510	536
Volume Left	14	5	0
Volume Right	13	0	1
cSH	229	1005	1700
Volume to Capacity	0.12	0.00	0.32
Queue Length 95th (ft)	10	0	0
Control Delay (s)	22.9	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	22.9	0.1	0.0
Approach LOS	C		

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			45.1%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	423	15	3	472	4	0	0	7	2	0	0
Future Volume (Veh/h)	3	423	15	3	472	4	0	0	7	2	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.44	0.44	0.44	0.25	0.25	0.25
Hourly flow rate (vph)	3	470	17	3	549	5	0	0	16	8	0	0
Pedestrians		9						328			137	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		1						31			13	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		226										
pX, platoon unblocked				0.81			0.81	0.81	0.81	0.81	0.81	
vC, conflicting volume	691			815			1379	1510	806	1195	1516	698
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	691			659			1351	1512	648	1125	1519	698
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	4.0	4.0	3.3
p0 queue free %	100			99			100	100	94	88	100	100
cM capacity (veh/h)	794			526			49	58	265	67	58	383

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	490	557	16	8
Volume Left	3	3	0	8
Volume Right	17	5	16	0
cSH	794	526	265	67
Volume to Capacity	0.00	0.01	0.06	0.12
Queue Length 95th (ft)	0	0	5	10
Control Delay (s)	0.1	0.2	19.4	66.0
Lane LOS	A	A	C	F
Approach Delay (s)	0.1	0.2	19.4	66.0
Approach LOS			C	F

Intersection Summary					
Average Delay			0.9		
Intersection Capacity Utilization			39.7%	ICU Level of Service	A
Analysis Period (min)			15		

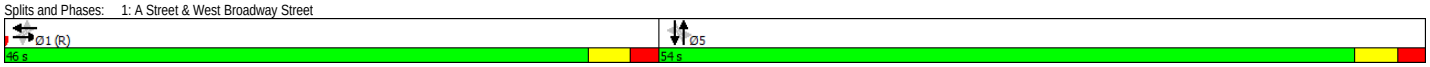
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	379	35	63	202	46	22	275	73	113	644	119
Future Volume (vph)	51	379	35	63	202	46	22	275	73	113	644	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.93			0.91			0.94		0.90	0.91	
Frt		0.990			0.980			0.973			0.977	
Flt Protected		0.995			0.990			0.997		0.950		
Satd. Flow (prot)	0	1753	0	0	1667	0	0	1722	0	1719	1664	0
Flt Permitted		0.920			0.759			0.626		0.437		
Satd. Flow (perm)	0	1585	0	0	1278	0	0	1081	0	715	1664	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			11			12			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		454			226			175			460	
Travel Time (s)		10.3			5.1			4.0			10.5	
Confl. Peds. (#/hr)	260		465	465		260	312		90	90		312
Confl. Bikes (#/hr)						2			1			18
Peak Hour Factor	0.89	0.89	0.89	0.82	0.82	0.82	0.84	0.84	0.84	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	3%	2%	1%	0%	6%	1%	0%	5%	1%	2%
Adj. Flow (vph)	57	426	39	77	246	56	26	327	87	119	678	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	522	0	0	379	0	0	440	0	119	803	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			5			5	
Permitted Phases	1			1			5			5		
Detector Phase	1	1		1	1		5	5		5	5	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Total Split (s)	46.0	46.0		46.0	46.0		54.0	54.0		54.0	54.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%		54.0%	54.0%		54.0%	54.0%	
Maximum Green (s)	41.0	41.0		41.0	41.0		49.0	49.0		49.0	49.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0			5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		41.1			41.1			48.9		48.9	48.9	
Actuated g/C Ratio		0.41			0.41			0.49		0.49	0.49	
v/c Ratio		0.80			0.71			0.82		0.34	0.98	
Control Delay		36.6			32.8			36.3		19.1	52.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		36.6			32.8			36.3		19.1	52.7	
LOS		D			C			D		B	D	
Approach Delay		36.6			32.8			36.3			48.4	
Approach LOS		D			C			D			D	
Stops (vph)		388			253			293		69	634	
Fuel Used(gal)		7			4			5		1	14	
CO Emissions (g/hr)		507			281			340		86	1009	
NOx Emissions (g/hr)		99			55			66		17	196	
VOC Emissions (g/hr)		118			65			79		20	234	
Dilemma Vehicles (#)		0			0			0		0	0	
Queue Length 50th (ft)		283			192			225		45	476	
Queue Length 95th (ft)		#436			265			#343		89	#752	
Internal Link Dist (ft)		374			146			95			380	
Turn Bay Length (ft)										100		
Base Capacity (vph)		653			531			535		350	821	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.80			0.71			0.82		0.34	0.98	

Intersection Summary

Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 40.7		Intersection LOS: D	
Intersection Capacity Utilization 87.6%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West Broadway Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	9	1	6	7	375	0	0	749	11
Future Volume (Veh/h)	0	0	0	9	1	6	7	375	0	0	749	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.92	0.92	0.92	0.87	0.87	0.87	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	10	1	7	8	431	0	0	764	11
Pedestrians		9			14			1			7	
Lane Width (ft)		0.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			1			0			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											175	
pX, platoon unblocked	0.53	0.53	0.53	0.53	0.53		0.53					
vC, conflicting volume	1240	1240	780	1232	1245	452	784			445		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1012	1011	147	996	1021	452	155			445		
tC, single (s)	7.1	6.5	6.2	8.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.4	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	99	99	99			100		
cM capacity (veh/h)	112	126	482	78	124	600	765			1111		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	18	439	775
Volume Left	10	8	0
Volume Right	7	0	11
cSH	121	765	1700
Volume to Capacity	0.15	0.01	0.46
Queue Length 95th (ft)	13	1	0
Control Delay (s)	39.9	0.3	0.0
Lane LOS	E	A	
Approach Delay (s)	39.9	0.3	0.0
Approach LOS	E		

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			55.8%	ICU Level of Service	B
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	550	19	3	325	6	2	0	3	0	0	0
Future Volume (Veh/h)	4	550	19	3	325	6	2	0	3	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.89	0.89	0.89	0.30	0.30	0.30	0.25	0.25	0.25
Hourly flow rate (vph)	4	604	21	3	365	7	7	0	10	0	0	0
Pedestrians								348			213	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								33			20	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		226										
pX, platoon unblocked				0.73			0.73	0.73	0.73	0.73	0.73	
vC, conflicting volume	585			973			1345	1562	962	1220	1568	582
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585			781			1289	1584	767	1118	1593	582
tC, single (s)	4.1			4.6			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.7			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			84	100	95	100	100	100
cM capacity (veh/h)	797			323			44	42	199	65	42	412

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	629	375	17	0
Volume Left	4	3	7	0
Volume Right	21	7	10	0
cSH	797	323	81	1700
Volume to Capacity	0.01	0.01	0.21	0.00
Queue Length 95th (ft)	0	1	18	0
Control Delay (s)	0.1	0.3	61.1	0.0
Lane LOS	A	A	F	A
Approach Delay (s)	0.1	0.3	61.1	0.0
Approach LOS			F	A

Intersection Summary					
Average Delay			1.2		
Intersection Capacity Utilization			42.9%	ICU Level of Service	A
Analysis Period (min)			15		

APPENDIX E – RESPONSE TO CLIMATE CHANGE QUESTIONNAIRE

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:	87-93 West Broadway
Project Address Primary:	87-93 West Broadway, South Boston MA
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Michael Moore Tel: 617-296-4548 brencoconstruction@gmail.com

A.2 - Team Description

Owner / Developer:	Broadway & A St LLC, a Massachusetts Limited Liability Company c/o Oranmore Enterprises LLC 36 Central Avenue, Unit C-2 Milton, MA 02186
Architect:	Stefanov Architects Inc.
Engineer (building systems):	LVR Corp.
Sustainability / LEED:	Soden Sustainability Consulting
Permitting:	Mitchell L. Fischman Consulting ("MLF Consulting") LLC mitchfischman@gmail.com
Construction Management:	
Climate Change Expert:	Soden Sustainability Consulting

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

List the principal Building Uses:	Residential
List the First Floor Uses:	*Lobby/Commercial/Parking*

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

× Wood Frame	☐ Masonry	☑ Steel Frame	☐ Concrete

Describe the building?

Site Area:	*19,723 SF*	Building Area:	*98,000 SF*
Building Height:	*69.5 Ft.*	Number of Stories:	*6 Flrs.*
First Floor Elevation (reference Boston City Base):	*31 Elev.*	Are there below grade spaces/levels, if yes how many:	*Yes 1*

A.5 - Green Building

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

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

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

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

A.6 - Building Energy-

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

Electric:	*(kW)*	Heating:	*(MMBtu/hr)*
What is the planned building Energy Use Intensity:	*(kWh/SF)*	Cooling:	*(Tons/hr)*

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

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

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

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

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

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

Select most appropriate:	☐ 10 Years	☑ 25 Years	☐ 50 Years	☐ 75 Years

What time span of future Climate Conditions was considered?

Select most appropriate:	☐ 10 Years	☐ 25 Years	☑ 50 Years	☐ 75 Years

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

8/91 Deg.	Based on ASHRAE Fundamentals 2013 99.6% heating; 0.4% cooling

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

95 Deg.	*5 Days*	*6 Events / yr.*

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

30-90 Days	*0.2 Events / yr.*

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

45 Inches / yr.	*4 Inches*	*0.5 Events / yr.*

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

130 Peak Wind	*10 Hours*	*0.25 Events / yr.*

B.2 - Mitigation Strategies

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

Building energy use below code:	***TBD***
How is performance determined:	Energy Model to be completed

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

Select all appropriate:				
	✓ High performance building envelope	✓ 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 = 49*	Walls / Curtain Wall Assembly:	*R = 2.6*
Foundation:	*R = 10 ci*	Basement / Slab:	*R =10 for 24"*
Windows:	*R = 2.2 / U =.45*	Doors:	*R =1.3 / U =.77*

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?	No		
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?

Site Elevation – Low/High Points:	*Boston City Base Elev.24-31 ft.(Ft.)*
Building Proximity to Water:	*1,361 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?

	1.361 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:	.	Frequency of storms:	

C.3 - Building Flood Proofing

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

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

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

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

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

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

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

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

Yes / No

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

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

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

Yes / No

If Yes, describe:	

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

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

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

C.4 - Building Resilience and Adaptability

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

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

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

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

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

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

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

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

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

APPENDIX F – RESPONSE TO COB ACCESSIBILTY CHECKLIST

Accessibility Checklist

(to be added to the BPDA 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/

Project Information

Project Name:	**87-93 West Broadway, South Boston**
Project Address Primary:	**87-93 West Broadway, South Boston**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Broadway & A St LLC, a Massachusetts Limited Liability Company** **c/o Oranmore Enterprises LLC** 36 Central Avenue, Unit C-2 Milton, MA 02186

Team Description

Owner / Developer:	**Broadway & A St LLC**
Architect:	**Stefanov Architects**
Engineer (building systems):	**n/a**
Sustainability / LEED:	**Soden Sustainability**
Permitting:	**MLF Consulting LLC**
Construction Management:	Oranmore Enterprises LLC

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)	*Residential, Amenity Space, Accessory Retail Space*			

What is the Construction Type – select most appropriate type?

	☑ Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	18,991 SF	Building Area:	Approx. 98,000 GSF +/-
Building Height:	69.5’	Number of Stories:	6
First Floor Elevation:	Varying, 30’-31’ +/- across the site. *Final Elevation to be determined during Construction Drawing phase*	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.	87-93 West Broadway is bounded to the north by West Broadway, to the south by Silver Street, to the west by A Street and to the east by 103-111 West Broadway (South Boston District C-6 Police Station). The site is currently occupied by a gas service station with access from West Broadway from two curb-cuts. The station includes a main structure and six gas pumps on two islands, all of which will be demolished to allow for the new construction to commence. The site is naturally sloping from West Broadway to Silver Street at the rear. The site is surrounded by several abutting and nearby structures of four (4) to six (6) stories in height, including that of a multi-story apartment building across from the site at the corner of West Broadway and A Street.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	Redline Broadway MBTA Station (less than 0.25 miles away – one block away at West Broadway and Dorchester Avenue) which provides connection to South Station and downtown Boston and points north to Cambridge and South to Quincy. In addition, Bus 9, 11, and 47.
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	**Affordable/Public Housing:** West Broadway **School:** J F Condon School **Public Library:** Boston Public Library (South Boston Branch) **Community Centers:** Condon Community Center, Action Center **Police:** Boston Police District C-6 South Boston **Hospital:** South Boston Community Health Center
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.	Site is located adjacent (0.25 miles) to Redline Broadway MBTA Station that links the site to major Boston public facilities.

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, existing sidewalks abuts the project site, The West Broadway existing sidewalk includes pedestrian ramps.
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	The existing sidewalk material is concrete with granite curbing. The physical condition of the existing concrete sidewalk and pedestrian ramps are good.
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.	Yes with modifications for new driveway entrances into the property. No, the existing sidewalks and pedestrian ramps have not been verified as being in compliance at this time but will be verified during the project design.
Is the development site within a historic district? **If yes,** please identify.	MLF Consulting is not aware of the project site being located within an historic district.

Surrounding Site Conditions – Proposed

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

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	Yes (pending confirmation of existing cross slopes and clearances).

If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Neighborhood Connector
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	The sidewalk along West Broadway is approximately 10 feet (including the curb), 8.5 feet along A Street, and 2.5 feet along Silver Street. Changes to the Pedestrian and Furnishing zone will be discussed at the BPDA scoping meeting.
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?	The paving material for the sidewalk will be poured in place concrete.
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?	NA
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	No
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	

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?	88 spaces
What is the total number of accessible spaces provided at the development site?	2 Additional Handicapped Van Spaces
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?	In enclosed garage
Has a drop-off area been identified? **If yes,** will it be accessible?	No drop-off area.
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.	See attached AD 1.00- 1.04 drawings

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.	The accessible route is along the West Broadway and A Street sidewalks. All entryways to the building will be accessible. See attached AD 1.00 and 1.01 plans for reference.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Flush Condition at most if not all entryway locations. Ramps to be added where/if needed. This will enable access and promote "Visit-ability". The apartment building is serviced by an elevator and flush condition at the entryway. All common areas are accessible and all units will have good "Visit-ability".
Are the accessible entrance and the standard entrance integrated?	Yes
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	Not yet but all future way finding signage will be developed to meet Building Code and Accessibility Board Requirements

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.

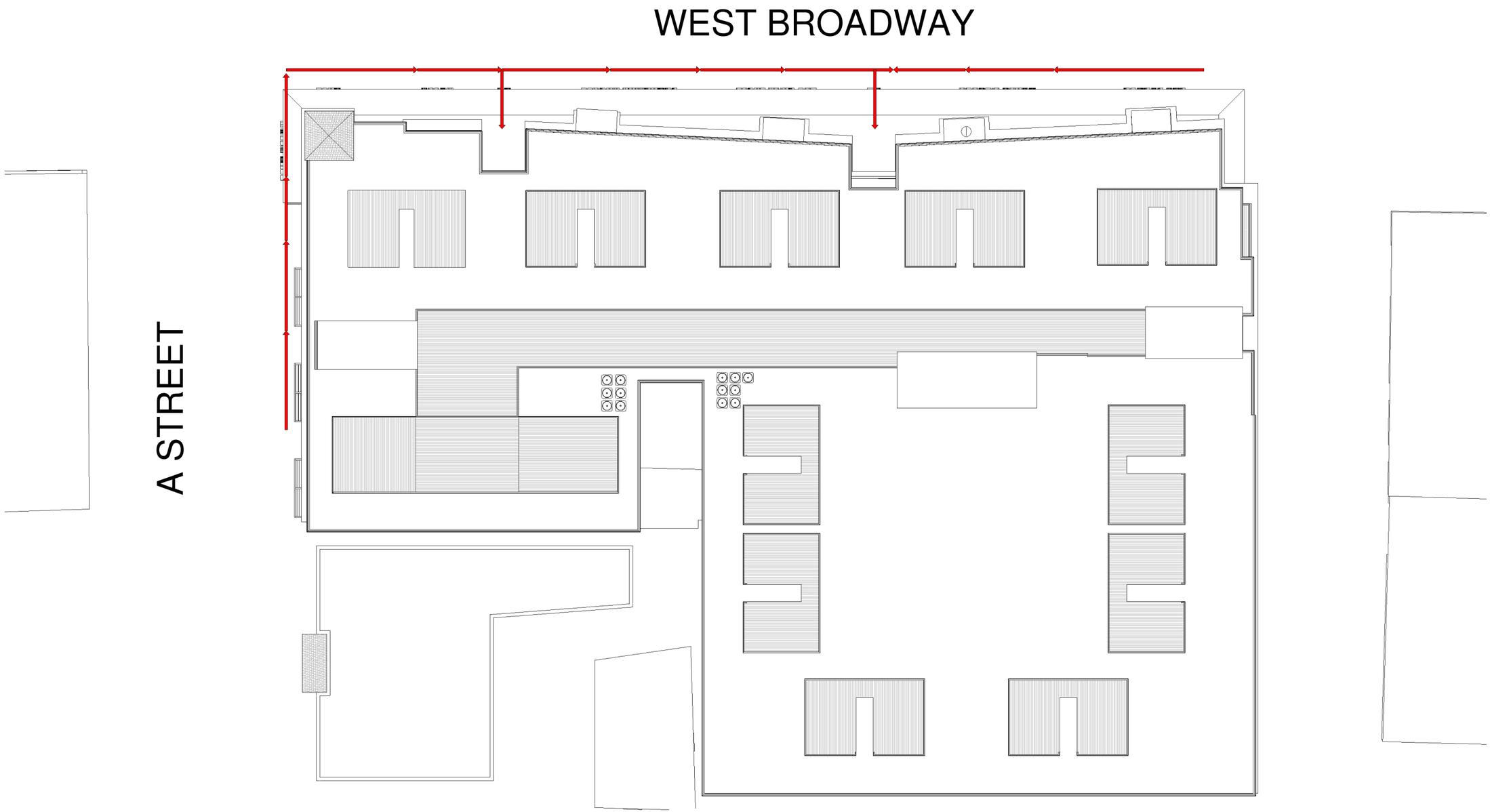
What is the total number of proposed units for the development?	65 units +/-

How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	(57 +/- market rate units; 8 +/- affordable units)
How many accessible units are being proposed?	3 as per 521 CMR
Please provide plan and diagram of the accessible units.	See attached drawings, AD 1.00-1.04.
How many accessible units will also be affordable? If none, please describe reason.	It will be a mix of affordable and market rate units. Final combination to be determined.
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?	Yes
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	Decision Pending

Thank you for completing the Accessibility Checklist!

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

sarah.leung@boston.gov | Mayors Commission for Persons with Disabilities



1 Proposed Site Accessibility
1" = 20'-0"

LEGEND

ACCESSIBLE ROUTE

87-93 West Broadway

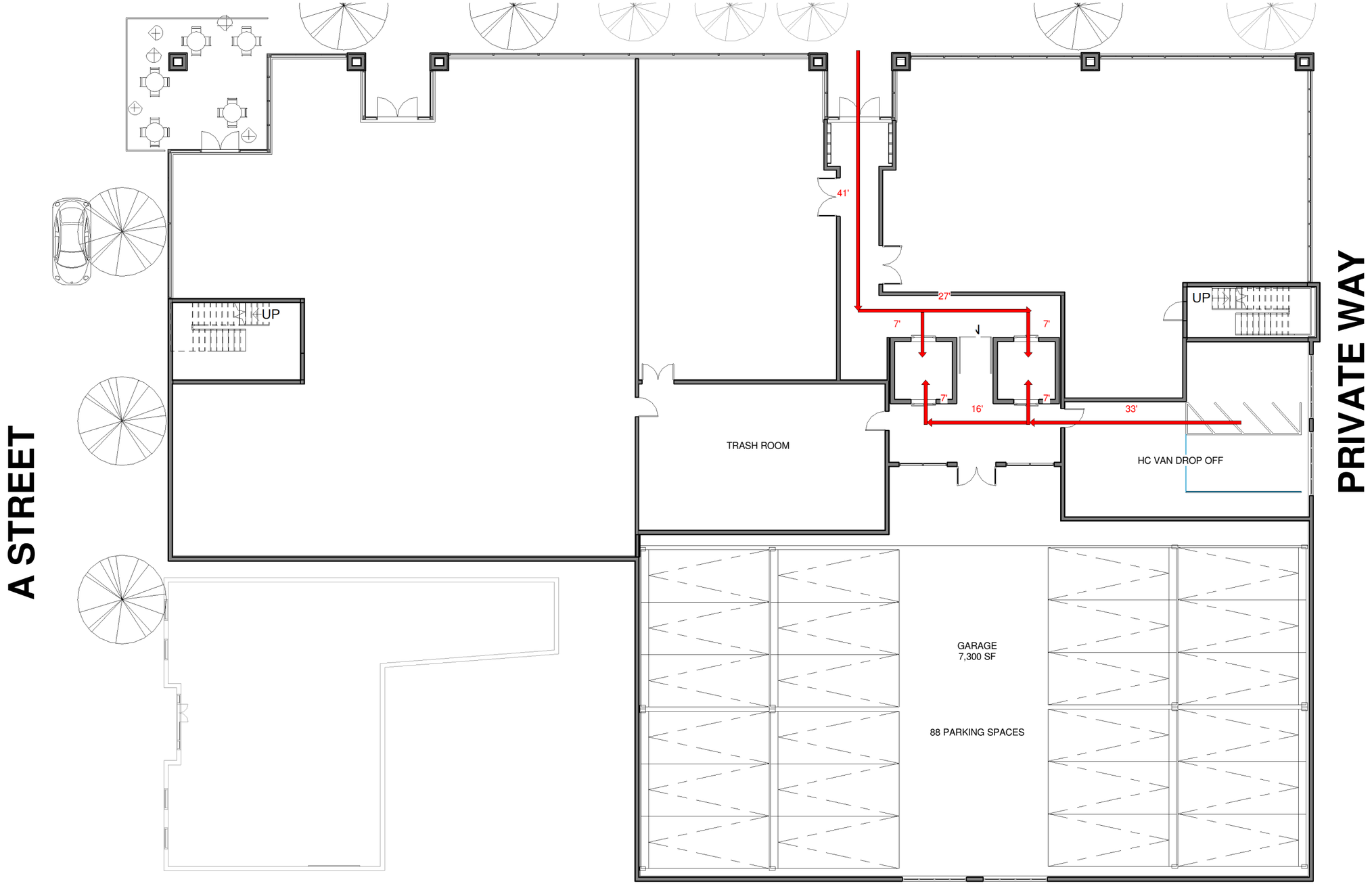
Proposed Site Accessibility

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.00

Date 2017-05-30

Scale As indicated



1 Proposed Ground Floor Accesibility
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

87-93 West Broadway

Proposed Ground Floor Accesibility

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.01

Date 2017-05-30

Scale As indicated

1 Typical Floor Accessibility (1 BR)
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

ACCESSIBLE UNIT

87-93 West Broadway

Typical Floor Accessibility (1 BR)

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.02

Date 2017-05-30

Scale As indicated

1 Typical Floor Accessibility (2 BR)
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

ACCESSIBLE UNIT

87-93 West Broadway

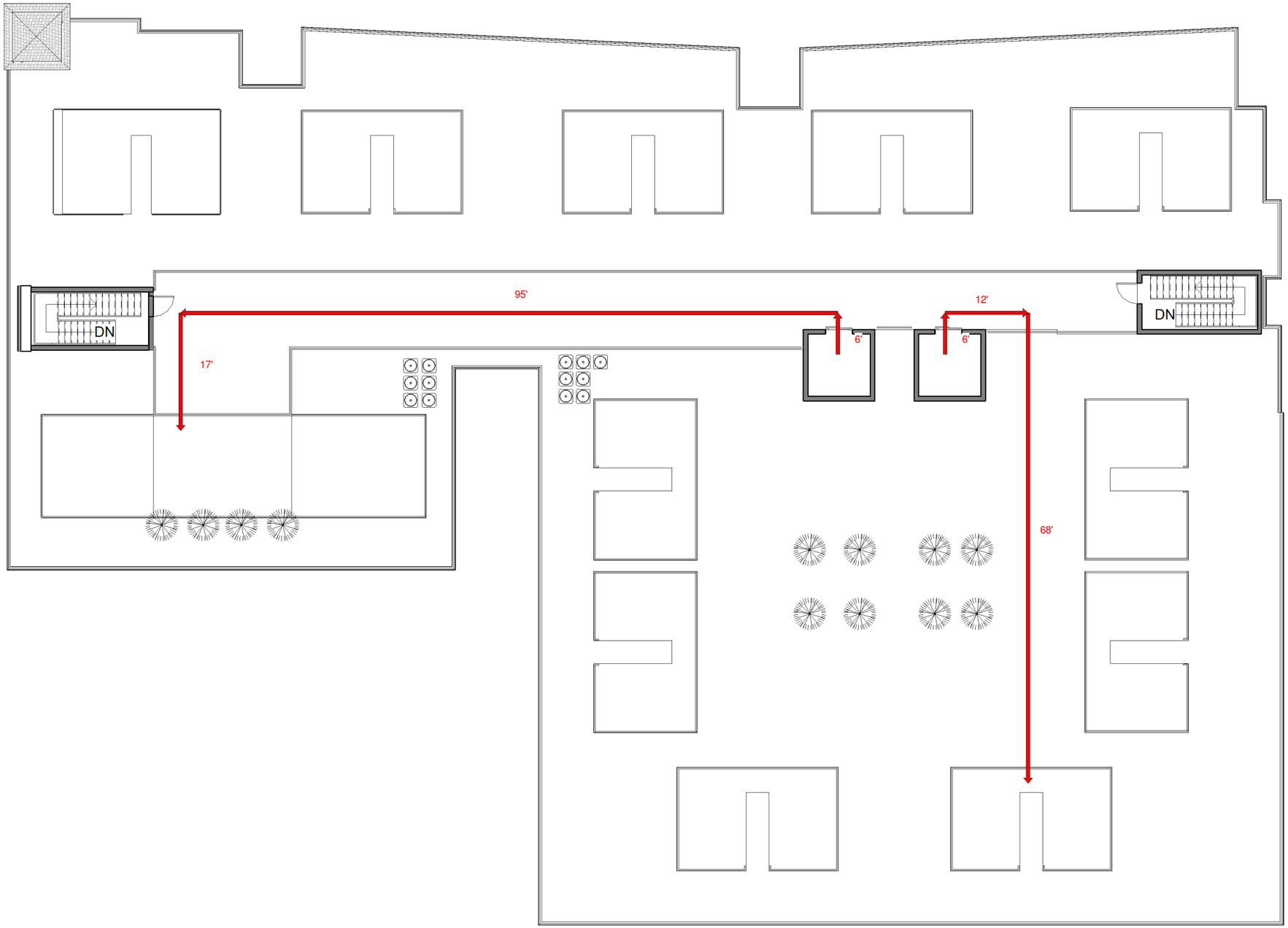
Typical Floor Accessibility (2 BR)

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.03

Date 2017-05-30

Scale As indicated



1 Proposed Roof Accessibility
1/16" = 1'-0"

87-93 West Broadway

Proposed Roof Accessibility

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.04

Date 2017-05-30

Scale 1/16" = 1'-0"

87-93 West Broadway, South Boston, MA

MLF CONSULTING LLC

STEFANOV ARCHITECTS