457- 469A West Broadway, South Boston, MA

Mixed-Use Residential/Commercial Development

PROJECT NOTIFICATION FORM December 1, 2017

Submitted Pursuant to Article 80B
of the Boston Zoning Code

SUBMITTED BY:

463 West Broadway 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
41 Brush Hill Road
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IN ASSOCIATION WITH:

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

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41 Brush Hill Road
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December 1, 2017

Mr. Brian Golden, Director
Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201
Attn: John Campbell, Project Manager

RE: Project Notification Form
Proposed Mixed - Use Residential / Commercial Development
457-469A West Broadway, Ward 6, South Boston

Dear Director Golden:

On behalf of 463 West Broadway LLC, a Massachusetts Limited Liability Company c/o Oranmore Enterprises LLC (the "Proponent") as developer of 15,628 sf square feet of real property located at 457-469A West Broadway, South Boston (the "Project Site"), 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. The proposal is for a mixed-use, multi-family residential / commercial development at 457-469A West Broadway in the South Boston neighborhood. The Project proposes the construction of approximately 44 residential units with 13,500 square feet (sf) of ground floor commercial space with a total overall project floor area of 65,282 gross square feet, 50 below-level garage spaces including 2 handicapped spaces in the garage accessed from a new driveway off Silver Street plus related open space, sidewalk and site improvements ("Proposed Project"). Loading and service will be from Silver Street and large deliveries will be from West Broadway. The Project will include an on-site bicycle storage room for approximately 48 bicycles.

The public notice for the PNF appears in the December 1, 2017 edition of the *Boston Herald*.

The Proposed Project will exceed 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 September 6, 2017 (attached hereto as Appendix "A").

In support of the Article 80 Large Project Review process, the Proponent has conducted, and continues to conduct, community outreach with neighbors and abutters of the site, including meetings and discussions with elected representatives and other officials. The Proponent has also made 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 457-469A West Broadway Project, particularly the Project Manager, John Campbell, and the reviewing BPDA Urban Designers, Michael Cannizzo, 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 Group, and the South Boston community.

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.

Very truly yours,
MLF CONSULTING LLC

Mitchell L. Fischman, Principal

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

463 West Broadway 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 / commercial development at 457-469A 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 44 residential units with 13,500 square feet (sf) of ground floor retail space with a total overall project floor area of 65,282 square feet and with 50 below-level garage spaces accessed from a new driveway off Silver Street including 2 handicapped spaces in surface parking spaces in the garage, and related open space, sidewalk and site improvements ("Proposed Project"). Loading and service will be from Silver Street and large deliveries from West Broadway. The Project will include an on-site bicycle storage room for approximately 48 bicycles.

The proposed site includes 0.36 acres (15,628 sf) bounded to the north by West Broadway, to the south by Silver Street, to the west by 455 West Broadway, and to the east by 471West Broadway. 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. Please see **Figures 1-1** thru **1-6**.

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 September 6, 2017 (See **Appendix A**).

The nearby neighborhood is a mix of 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 5, 9, 10, 11 close to or in front of the site on West Broadway. 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 five stories in height.

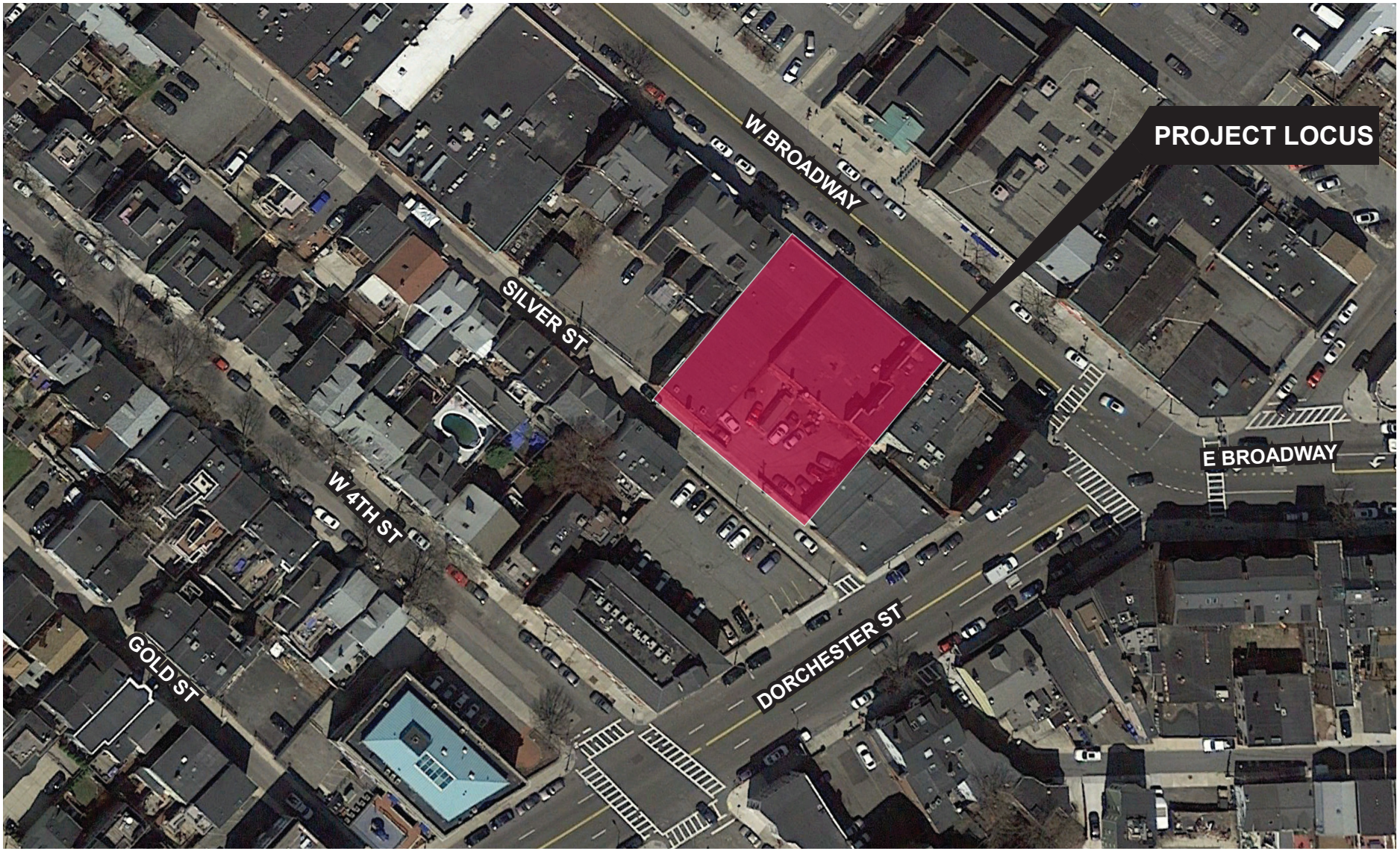

Figure 1-1. Project Locus
457-469A West Broadway, So. Boston, MA

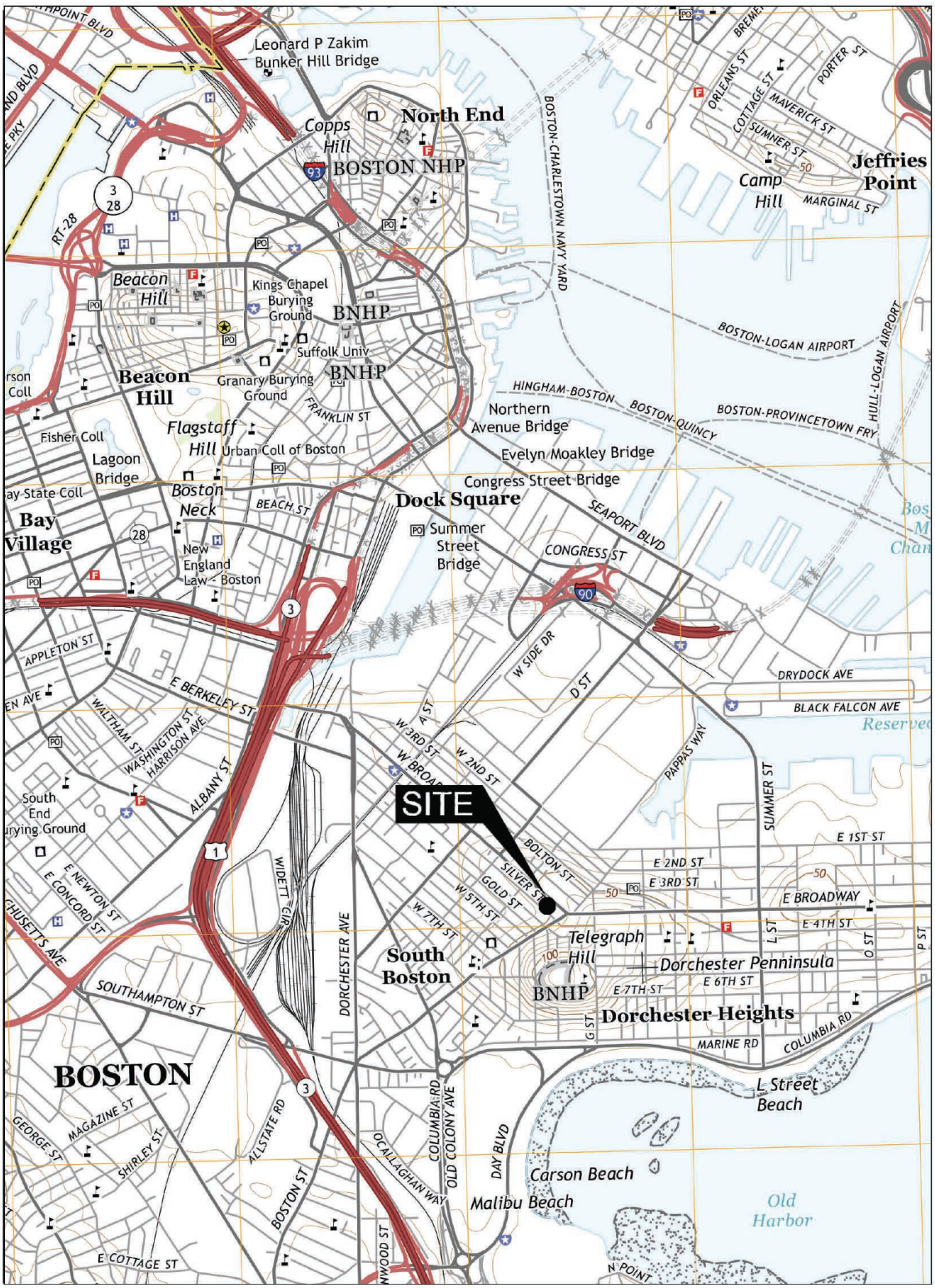

Figure 1-2. USGS Map

Figure 1-3. Existing Site Photos

Existing Family Dollar Store

Existing Buildings Next to Family Dollar Store Along West Broadway

Figure 1-4. Existing Site Photos

Goodwill Store Opposite Existing Family Dollar Store

Existing Stores Opposite Family Dollar Store

Figure 1-5. Existing Site Photos

Parking Lot at Rear of Family Dollar Store

Adjacent Rear Parking Lot Next to Family Dollar Store

Figure 1-6. Existing Site Photos

Silver St and Family Dollar Store Towards Dorchester Street

Nearby Apartment Building Facing Silver Street

1.2 Detailed Project Description

1.2.1 Existing Conditions Plan

The proposed site includes 0.36 acres (15,628 sf) bounded to the north by West Broadway, to the south by Silver Street, to the west by 455 West Broadway, and to the east by 471 West Broadway. The site is currently occupied by a Dollar Store and several additional retail stores with pedestrian access from West Broadway and with surface parking access from Silver Street. The existing buildings will be demolished to allow for the new construction (see **Figure 1-7**. **Existing Conditions Plan** and **Figure 1-8. Certified Plot Plan**).

1.2.2 Detailed Project Program

The Project proposes construction of 44 multi-family residential apartment units with 13,500 square feet of ground-floor retail space, with a total build-out of 65,282 square feet, including approximately 50 below-level garage spaces including 2 handicapped spaces in the garage (the "Proposed Project"). The residential units currently planned to include 28 two-bedroom and 16 one-bedroom units. Surrounded by several abutting and nearby structures of four to five stories in height, 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	0.36 acres / 15,628 square feet
Gross Floor Area	65,282 square feet
Floor Area Ratio	4.2
Floors	5
Height*	55 feet

*Height from Average Front Grade

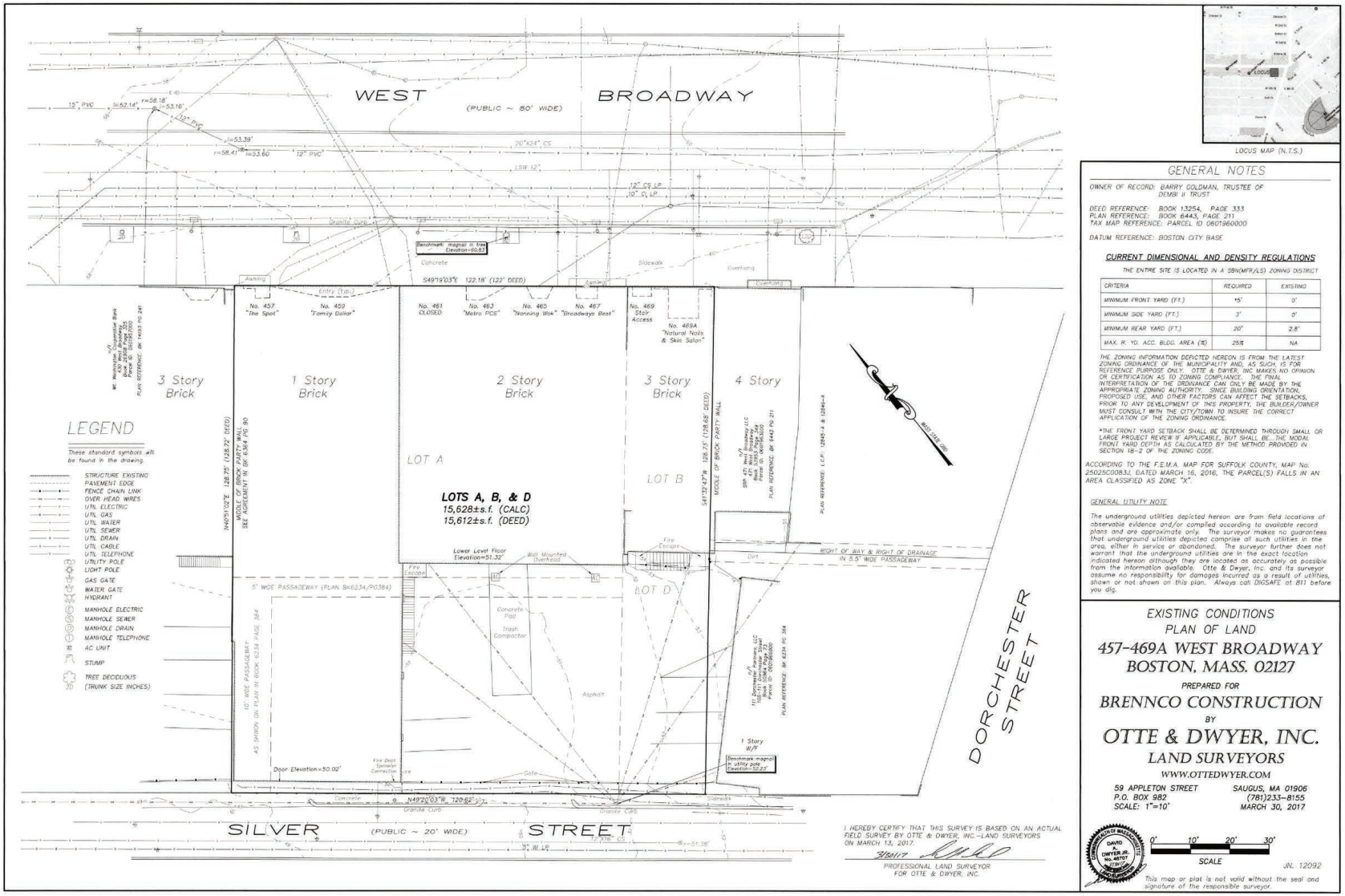

Figure 1-7. Existing Conditions Plan

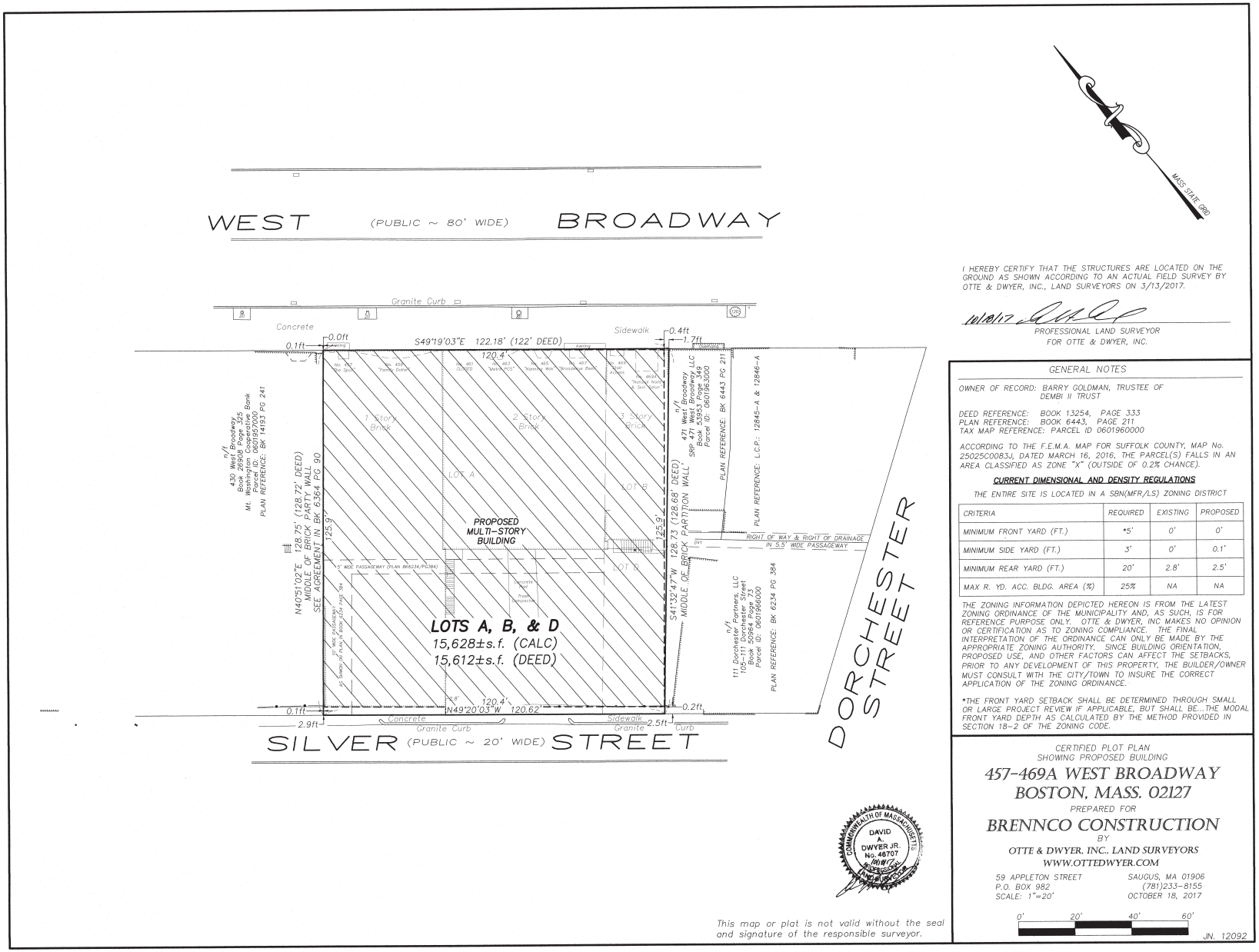

Figure 1-8. Certified Plot Plan

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 on West Broadway. The rear facing garage will be accessed from Silver Street.

1.3 Summary of Project Impacts and Mitigation

1.3.1 Urban Design

The proposed building at 457-469A West Broadway, South Boston, is a five-story mixed use building whose first floor will be 13,500 sf of commercial space accessed off Broadway. The lower level, which is at-grade on Silver Street in the back, has 50 parking spaces, including two handicap spaces accessed at grade, 48 spaces use a mechanical parking system and two are dedicated accessible spaces that allow for the exception of a separate van drop off space, common space for the tenants, storage, mechanical space, trash room and bicycle parking. The second through the fifth floors include 44 residential units, 11 units on each floor, some with french balconies, others with dedicated outdoor space in the form of decks. The rooftop consists of common space, private decks and a dog walking area.

Near the busy traffic intersection of West Broadway and Dorchester Street, the dividing line of East and West Broadway, this building stands tall along the main traffic thoroughfare of Broadway. It sits across from the Old South Boston Market building, now known as Eastern Bank Building and the Bank of America Building. The proposed structure is similar in scale to two other new developments to be built in the immediate vicinity, 480 West Broadway, on the corner of Broadway and Dorchester Street which is to be a five-story structure, and 420 West Broadway, the old movie theatre (known as the "Bug House"), which is also five stories with 42 residential units. 457-469A West Broadway is currently occupied by a string of separate buildings. There are five separate businesses with at-grade level office and retail uses including the largest tenant, Family Dollar. There are residences on the partial second and third floors above some of these businesses.

West Broadway has many new restaurants and is quite busy with traffic and pedestrians, this building will offer commercial opportunities bringing businesses back to the neighborhood. West Broadway is the main bus route corridor from multiple downtown locations ending at City Point. Street trees and bicycle parking would occupy the band of the sidewalk closest to the street, with an ample sidewalk remaining next to the building.

The building is organized with a panelized façade that is held above the glazed commercial first floor and horizontal sign band. The main body of the building is the four floors of residences, which would be clad in a smooth solid surface material relieved by balconies carved out of the facade. These balconies would provide an outside space for the tenants to watch and be part of the activity on West Broadway. There are also decks on the back courtyard side of the building providing outdoor space and other decks on the rooftop would be screened to maintain the privacy of both the tenants and local residents.

The back of the building on Silver Street is organized with a two-story base that is the parking level and the back of the commercial space with the residential units recessed on top, the residential units take the shape of two wings around a courtyard. These are pulled back 12 feet 8 inches from the edge of the two story base which is three feet back from the property line. This arrangement allows for windows on the sides allowing light and air into the residential units. The height of the roof is the same height of the ridge of the bank building next door.

1.3.2 Landscape Design

Along West Broadway, the existing sidewalk width will be maintained. Concrete walkway paving will include an 11-foot clear width pedestrian zone, a 4-foot greenscape/site furnishing zone and a 6-inch curb. Landscape planting in the greenscape/site furnishing zone will provide two tree planting areas and includes the reinstatement of a tree planting area that is currently paved over with asphalt paving. Bike racks will also be installed at the greenscape/site furnishing zone to accommodate 10 bicycles.

At the rear of the property, sidewalk widths will be maintained adjacent to Silver Street and the proposed building will be setback 3-feet from the property line.

At the roof level, individual private terraces frame a 2,700 square foot common amenity space. This roof amenity space includes a 650 square foot synthetic lawn, a pet relief area, passive seating and outdoor dining opportunities.

1.3.3 Sustainable Design

To meet the requirements of Article 37, the following section describes how the Project complies with the LEED v4 Building Design & Construction criteria. The project is currently tracking 55 points in the "yes" column with 15 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 response to 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.

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.

1.3.4 Pedestrian Level Wind Conditions

The height of the proposed structure does not exceed 55 feet. Wind conditions are expected to be similar to that of existing buildings along West Broadway which range in height from 4 to 5 floors.

1.3.5 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 5-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 West Broadway and Silver Street roadways. Morning shadows generally are cast to the west onto the rooftops of nearby buildings. Mid-day shadows are generally cast on the buildings to the east and on the West Broadway sidewalk, and late afternoon and evening shadows will extend in an easterly direction onto the West Broadway sidewalk and nearby rooftops with some extending to Dorchester Street and beyond, particularly in December. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project site and surroundings.

1.3.6 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.

1.3.7 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.

1.3.8 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.

1.3.9 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 52.3 dBA.

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

- Cooling Tower; and
- Boiler

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.

1.3.10 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.

An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

An infrastructure system's analysis (**Section 6.0**) was completed by Howard Stein Hudson, 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.

1.3.11 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 Environmental Site Assessment and Preliminary Soil Sampling Results completed by Cooperstown Environmental ("Cooperstown") in November 2017, the Phase I analysis did not reveal the presence of any Recognized Environmental Conditions (REC) at the property. Nonetheless, the following conditions were recommended by Cooperstown to be rectified as a matter of "good housekeeping":

- Two Above Ground Storage Tanks (AST) were identified: one on the basement of the Family Dollar Store, and one in the basement of Nanning Wok. They are presumed unused and abandoned from the early 1980's when the buildings were switched from

heating oil to natural gas, and while there is no rust on the tanks and fill lines or other evidence to indicate a release has occurred, these AST's should be removed; and

- Two unsealed 55-gallon drums, filled with what is presumed to be used cooking oil based on labeling are located in the rear parking lot which should be sealed and disposed of properly.

Soil samples collected during the geotechnical investigation described below were submitted for laboratory analysis and this analysis indicated that there is evidence of a release of both light and heavy petroleum products in the soil in the parking area. These samples revealed EPH, VPH VOC, exceedances of the RCS-1 standards in two of the borings in the center of the property. These detections create a 120-day reportable condition to Mass DEP by a person required to notify (in this case upon purchase of the property). Three surrounding soil borings showed no detection of organic contaminants or detections at concentrations below RCS-1 standards. There was also detection of lead above RCS-1 standards in one sample which also falls under the 120-day reporting condition.

1.3.12 Geotechnical/Groundwater Impacts Analysis

Based on the Geotechnical consultant's Summary Report of the results of the explorations performed at the project site, urban fill was reported to be encountered to depths of approximately 3-6 feet below grade. The fill varied in composition but generally included a brown to black, silty Sand, little gravel. Trace amounts of brick, rubble, ash, clay, organic, slag and other insert matter are embedded in the Fill. The Fill was typically loose suggesting variable compaction. The predominant overburden consisted of a dense Glacial Till.

Groundwater was encountered in the test holes selected at depths of approximately 7-10 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 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. Given a basement floor elevation near elevation 48 feet, an under-slab drain system is expected to also be necessary given expected seasonal groundwater impact. See **Section 4.6** for additional information on the Geotechnical Summary Report.

1.3.13 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 1st quarter of 2019 with completion expected in the 4th quarter of 2020.

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.

1.3.14 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.

1.3.15 Historic Resources Component

According to files at the Massachusetts Historical Commission, there are no structures on-site 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 **Section 5.0**).

1.3.16 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.

1.3.17 Transportation Component

Section 7.0 presents the comprehensive transportation study completed by Howard Stein Hudson (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 multiple bus lines and 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 on the site includes ground floor commercial space, including a family dollar store, and residential units.

Vehicular access to the Project site will be provided by an existing curb cut along Silver Street. The curb cut along Silver Street will provide access to a parking garage with capacity of 50 vehicles. Mechanical lifts will provide parking for 48 vehicles and the remaining two parking spaces will be handicapped accessible also located in the garage. 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 48 bicycles and an additional five public bicycle racks, parking for ten bicycles. Loading and service, move-in/move-out activity, as well as trash/recycling will be accommodated on-site.

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 7 new vehicle trips, 7 new transit trips, and 13 new walk/bike trips during the weekday a.m. peak hour and 15 new vehicle trips, 7 new transit trips, and 25 new walk/bike trips during the weekday p.m. peak hour.

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

- West Broadway/East Broadway/Dorchester Street (signalized);
- West Broadway/F Street (unsignalized);
- Dorchester Street/Silver Street (unsignalized); and
- F Street/Silver Street (unsignalized).

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.

1.3.18 Response to Climate Change Questionnaire

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

1.3.19 Response to City of Boston Accessibility Checklist

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

2.0 GENERAL INFORMATION

2.1 Applicant Information

2.1.1 Project Proponent

The Proponent, 463 West Broadway LLC, a Massachusetts limited liability company formed for the express purpose of completing the 457-469A West Broadway Mixed-Use Development Project. Its managers, Michael Moore, Joseph Allen, Patrick Costello and Seamus Moore have over twenty years of experience successfully developing residential projects in Boston, particularly in the South Boston housing market. This same team is currently developing a new mixed-use, residential/commercial development at 87-93 West Broadway in South Boston.

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	457- 469A West Broadway, South Boston
Property Owner / Developer	**463 West Broadway LLC,** a Massachusetts Limited Liability Company c/o Oranmore Enterprises LLC 36 Central Avenue, Unit C-2 Milton, MA 02186 Tel: 617-296-4548 Michael Moore brencoconstruction@gmail.com Seamus Moore seamiemoore72@gmail.com

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Landscape Architect	**BSC Group** 803 Summer Street Boston, MA 02127 Tel: 617-896-4327 Monique Hall mhall@bscgroup.com

Transportation Planner / Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Keri Pyke, P.E., PTOE kpyke@hshassoc.com Michael Littman mlittman@hshassoc.com
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 Lauren Brown lauren@cooperstownenv.com
Surveyor	**Otte & Dwyer** Land Surveyors 59 Appleton Street Saugus, MA 01906 Tel: 781-233-8155
Construction Commencement	1st Quarter 2019
Construction Completion	4th Quarter 2020
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 Barry R. Goldman, Trustee of Dembi II Trust.

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 44 new housing units, including 6 affordable units in accordance with the City's Inclusionary Development Policy (IDP);
- Addition of approximately 13,500 square feet of replacement 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;
- Exploring the planting of new street trees 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 West Broadway and that the Proposed Project was designed taking into consideration anticipated new building height and massing limitations on West Broadway. Additionally, the Project Site is also located within the boundaries of, and is subject to the provisions of, the South Boston Interim Planning Overlay District (IPOD), Article 27S of the Code. The stated purposes of the South Boston IPOD are to (a) provide appropriate urban design guidelines to govern and facilitate proper development, including an effective transition between residential and other types of areas; (b) protect one-, two-, and three-family neighborhoods from more intensive multifamily development; (c) promote new residential and commercial development that is sensitive in scale, form, and density to the established neighborhood character; and (d) provide appropriate off-street parking controls. The surrounding neighborhood is a mix of commercial/retail, residential, and office uses. While 50 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, as well as ground floor commercial/retail uses. 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 65,282 feet of gross floor area on a site that consists of 15,628 square feet of land, for a resulting projected floor area ratio of approximately 4.2. Current zoning establishes a Maximum Floor Area Ratio (FAR) of 1.5. 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 (subject to the additional requirements of Section 68-34.9, with respect to through lots and Section 68-34.2, with respect to conformity with existing building alignment), and a maximum building height of forty feet. Article 68 requires 200 square feet of usable open space per dwelling unit. The proposed building is designed to reach a height of fifty-five feet and will require variances under current zoning for excessive height and FAR, insufficient side yard setback (West Broadway is typified by many connecting buildings with few side yards), insufficient rear yard setback (subject to modal alignment requirements), insufficient usable open space, and likely for design of off-street parking facilities, owing to the use of an automated parking solution. The development team is being responsive to cues about the future height and density goals being discussed as West Broadway is being studied for updated zoning.

Since this project is subject to Large Project Review, the total number of required off-street parking spaces and off-street loading facilities will 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 and refined during the Large Project Review process.

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	15,628 sf	No
Max. Floor Area Ratio	1.5	4.2	Yes
Max. Building Height	40 feet	55 feet	Yes
Minimum Lot Width	20 feet	120 feet	No
Minimum Lot Frontage	20 feet	120 feet	No
Minimum Front Yard Setback	5 feet[1]	Per Article 80	No
Minimum Side Yard	3 feet	0 feet	Yes
Minimum Rear Yard	20 feet[2]	0 feet	Yes
Required Off-Street Parking	Per Article 80[3]	50 spaces	Per Article 80
Minimum Number of Loading Bays	Per Article 80	0	Per Article 80
Minimum Usable Open Space	200 sf/dwelling unit(du)	180 sf/du	Yes

1. Subject to the additional requirements of Section 68-34.2, with respect to conformity with existing building alignment.
2. Subject to the additional requirements of Section 68-34.9, with respect to rear yards of through lots.
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 Zoning Board of Appeal	Variances, Zoning Relief, as Required
Boston Department of Inspectional Services	Building Permits; Certificates of Occupancy; Other Construction-Related Permits; Demolition Permit

*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, the Impact Advisory Group (IAG), and area residents.

To date, this process has included presentations to the Cityside Neighborhood Association, as well as meetings with a review group consisting of South Boston's 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.

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, as 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 at 457-469 West Broadway, South Boston, is a five-story mixed-use building whose first floor will be 13,500 sf of commercial space accessed off West Broadway. The lower level, which is at-grade on Silver Street in the back, has 48 parking spaces using a mechanical parking system and 2 handicap spaces accessed at grade totaling 50 spaces, common space for the tenants, storage, mechanical space, trash room and bicycle parking. The second through the fifth floors have 44 residences, 11 units on each floor. The rooftop consists of common space, private decks and a dog walk area.

Near the busy traffic intersection of West Broadway and Dorchester Street, the dividing line of East and West Broadway, this building stands tall along the main traffic thoroughfare of Broadway. It sits across from the Old South Boston Market building, now known as Eastern Bank Building and the Bank of America Building. The proposed structure is similar in scale to two other new developments to be built in the immediate vicinity, 480 West Broadway, on the corner of Broadway and Dorchester Street which is a five-story structure, and 420 West Broadway, the old movie theatre (known as the "Bug House"), which is also five stories with 42 housing units. 457-469A West Broadway is currently occupied by a string of separate buildings. There are five separate businesses with at-grade level office and retail uses including the largest tenant, Family Dollar. There are residences on the partial second and third floors above some of these businesses.

West Broadway has many new restaurants in this area and is quite busy with traffic and pedestrians, this building will offer varied commercial opportunities bringing businesses back to the neighborhood. West Broadway is the main bus route corridor from multiple downtown locations ending at City Point. Street trees and bicycle parking would occupy the band of the sidewalk closest to the street, with an ample sidewalk remaining next to the building.

The building is organized with a panelized façade that is held above the glazed commercial first floor and horizontal sign band. The main body of the building is the four floors of residences, which would be clad in a smooth solid surface material relieved by balconies carved out of the facade. These balconies would provide an outside space for the tenants to watch and be part of the activity on West Broadway. There would be outdoor space for the units in the back that face the courtyard and French balconies on those on Silver Street. Decks on the rooftop would be screened to maintain the privacy of both the tenants and local residents.

The back of the building on Silver Street is organized with a two-story base that is the parking level and the back of the commercial space with the residential units on top, the residential units take the shape of two wings around a courtyard. These are pulled back 12 feet 8 inches from the edge of the two-story base which is three feet back from the property line. This arrangement allows for windows on the sides allowing light and air into the residential units. The height of the roof is the same height as the bank building next door.

The urban design drawings and LEED v4 for BD+C Checklist are included at the end of this section (**Figures 3-1** thru **3-18**).

3.2 Building Design

457-469A West Broadway is designed with a prominent façade on Broadway, a textured array of terra cotta tiles in a decorative pattern punctuated by recessed balconies whose interiors would be finished in a contrasting material. The edges of the front of the building have small flanking balconies for the units at the edges. This sits atop a glazed storefront for the retail space capped by a sign band. The sides of the residential portion of the building are pulled back 4-feet to allow for light and air to reach the windows of the units within. The back of the building is designed as two projecting elements around a courtyard allowing for more light and air into the residences. The finish of the back is suggested to be clapboards to fit into the residential vernacular of the neighborhood. There is a roof top area proposed that is both common and private decks around green roof plantings and a dog walk area.

There will be a residential entry on the front of the building off West Broadway leading to a lobby and the two elevators; this brings the tenants up to the corridor that traces the middle of the building. Likewise, if driving into the building off Silver Street, once parked in the mechanical parking system, residents and others can access the elevator bank to the floors above. There are eleven units on each floor, floor two is seven - two bedroom units and four - one bedroom units, floors 3 through 5 are nine - two bedroom units and two - one bedroom units. There is a trash room and a bike storage area in the lower level for all the tenants.

The commercial space is currently designed as a blank shell as there are no dedicated tenants as yet for the space. The Project is planning that any loading would be done from the front, West Broadway.

Most of the two-bedroom units include two bedrooms and one baths with living kitchen dining areas. Outside space is provided by private decks on the front and on the back courtyard and French balconies on Silver Street. Nine private rooftop decks are proposed, as well as common deck and a dog walk area.

3.3 Landscape Design

Along West Broadway, the existing sidewalk width of approximately 15 feet-6 inches will be maintained. Concrete walkway paving will include an 11-foot clear width pedestrian zone, a 4-foot greenscape/site furnishing zone and a 6-inch curb. Landscape planting in the greenscape/site furnishing zone will provide two tree planting areas (4 feet by 12 feet each) and includes the reinstatement of a tree planting area that is currently paved over with asphalt paving. Bike racks will also be installed at the greenscape/site furnishing zone to accommodate 10 bicycles.

At the rear of the property, sidewalk widths of +\- 6 feet will be maintained adjacent to Silver Street. It is worth noting that neighboring sidewalk widths vary from 3 feet to 5 feet and that the proposed building will be setback 3-feet from the property line in order to accommodate the existing sidewalk width.

At the roof level, individual private terraces frame a 2,700 square foot common amenity space. This roof amenity space includes a 650 square foot synthetic lawn, a pet relief area, passive seating and outdoor dining opportunities.

3.4 Sustainable Design/Energy Conservation

The proposed project involves developing residences at 457-469A West Broadway. The Project proposes construction of 44 residential units with 13,500 square feet (sf) of ground floor retail space with a total overall project floor area of 65,282 sf and with approximately 50 below-level garage spaces.

To meet the City of Boston Requirements the project is demonstrating the compliance with the LEED v4 for BD+C criteria. The project is currently tracking 55 points in the YES column with 15 in the study column. Further study over the coming weeks and months will determine final credit achievement. We have outlined in the narrative below, how the project intends to achieve the prerequisites and credits for the LEED v4 for BD+C Certification (See **Figure 3-18).**

3.4.1 Introduction

Sustainability informs every design decision. Enduring and efficient buildings conserve embodied energy and preserve natural resources. The project embraces the opportunity to positively influence the urban environment. Its urban location takes advantage of existing infrastructure while some 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 v4 Building Design and Construction rating system and intend to meet certification as presented above. 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 site is located on a site whose surrounding existing density within a ¼-mile [400-meter] radius of the project boundary and provided dozens of amenities within 0.5 mile of the project site.

The City of Boston requires 1 bicycle parking space per residential unit. With a proposed 44 dwelling units, we are providing, at a minimum 48 secure and covered bicycle parking spaces.

The project provides access to quality transit as the project is located within 0.25 mile of the following busses: 5, 9, 10, and 11.

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 critical to lessening the impact of development.

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 the building and the site lighting.

In order to reduce the impact of urban heat island effect, more than 75% of the parking spaces will be below grade under an SRI compliant roof along with light colored paving materials.

The project will also meet the requirements of Light Pollution Reduction.

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 50 % 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 evaluate installing 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.

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 projects demonstrating a minimum improvement of 26% 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, past energy simulation analyses for similar buildings.

The project will evaluate installing new or use existing 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.). Prereq 4- Fundamental refrigerant management. 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 if it is 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. Project will perform the calculations once systems are selected.

The project will also engage 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 identifying 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 systems design systems, interior cross-contamination prevention and filtration. The project will target Low emitting materials for all materials within the building interior is 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 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. Six credits are being pursued and could include the following.

- Innovation in Design: Exemplary Perf Quality Transit (yes)
- Innovation in Design: Green Housekeeping (yes)
- Innovation in Design: Integrated Pest Mgmt (yes)
- Innovation in Design: Education (maybe)
- Innovation in Design: Water Rec (maybe)

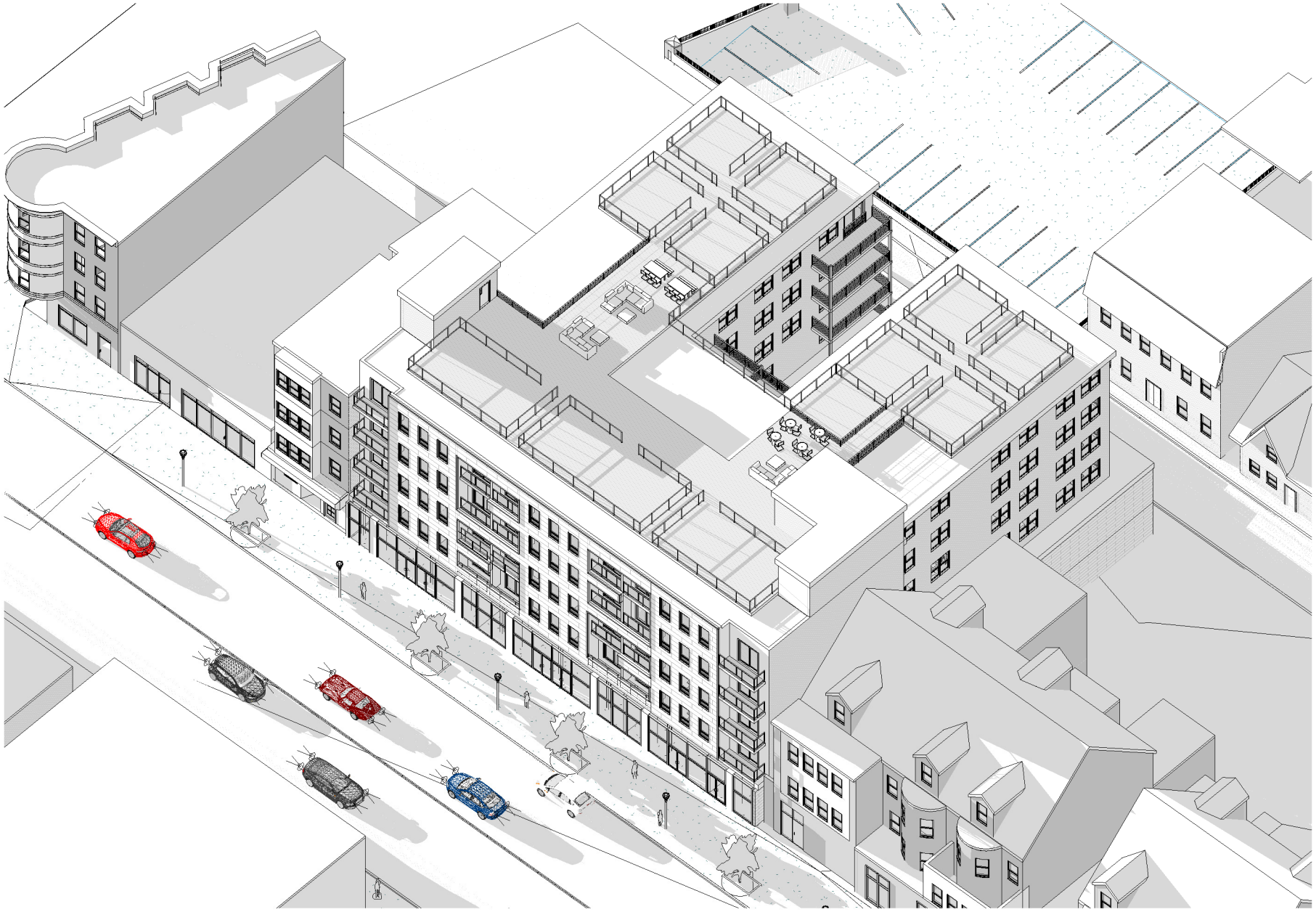
Regional Priority:

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

3.5 Urban Design Drawings and LEED Checklist

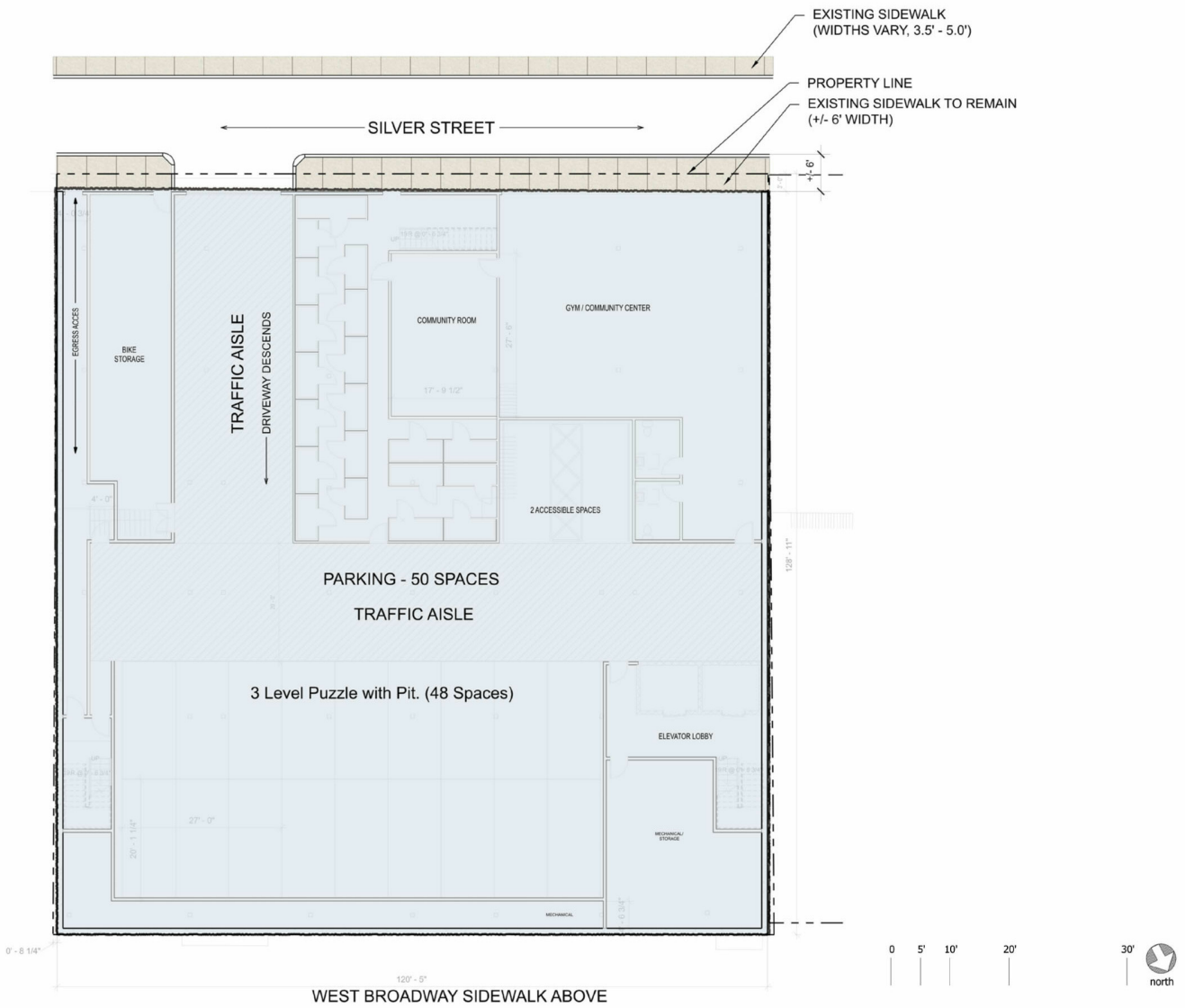
Urban design drawings and renderings depicting the Proposed Project and the LEED v4 for BD+C Checklist include:

Figure 3-1. Proposed Development Aerial View
Figure 3-2. Basement/Garage Floor Landscape Plan
Figure 3-3. Basement/Garage Plan
Figure 3-4. First Floor Landscape Plan
Figure 3-5. First Floor Plan
Figure 3-6. Second Floor Plan
Figure 3-7. Typical 2nd through 5th Floor Plans
Figure 3-8. Roof Level Landscape Plan
Figure 3-9. West Broadway Street Elevation
Figure 3-10. Silver Street Elevation
Figure 3-11. West Elevation
Figure 3-12. East Elevation
Figure 3-13. Longitudinal Section
Figure 3-14. Perspective - Front on West Broadway
Figure 3-15. Perspective at Corner - West Broadway and Dorchester Street
Figure 3-16. Perspective From Silver Street
Figure 3-17. Birds-Eye View From Back of the Building.
Figure 3-18. LEED V4 for BD+C: New Construction and Major Renovation



Proposed Development Aerial View

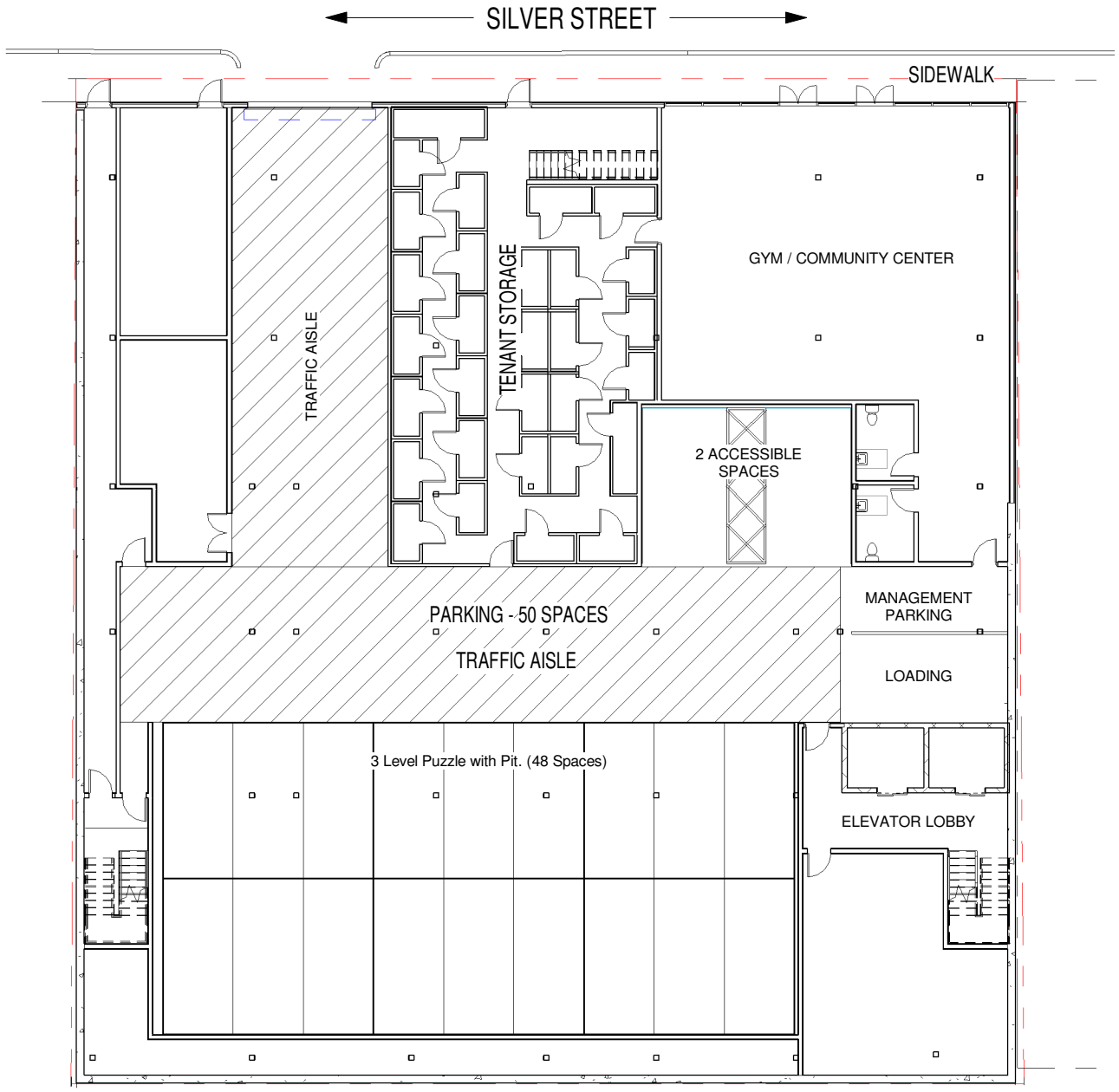
STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-1



BSC GROUP

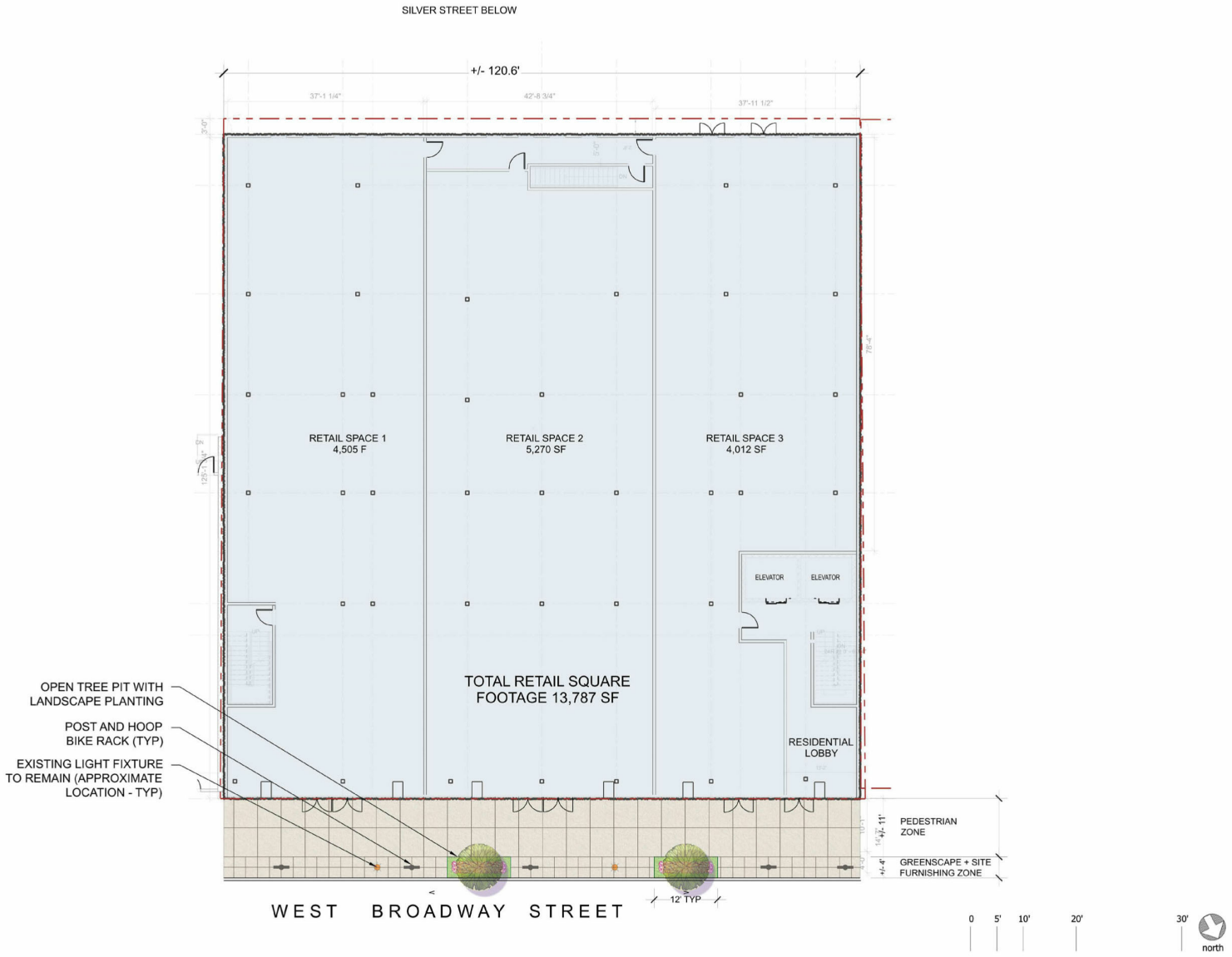
Basement/Garage Floor Landscape Plan

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-2



Basement / Garage Plan

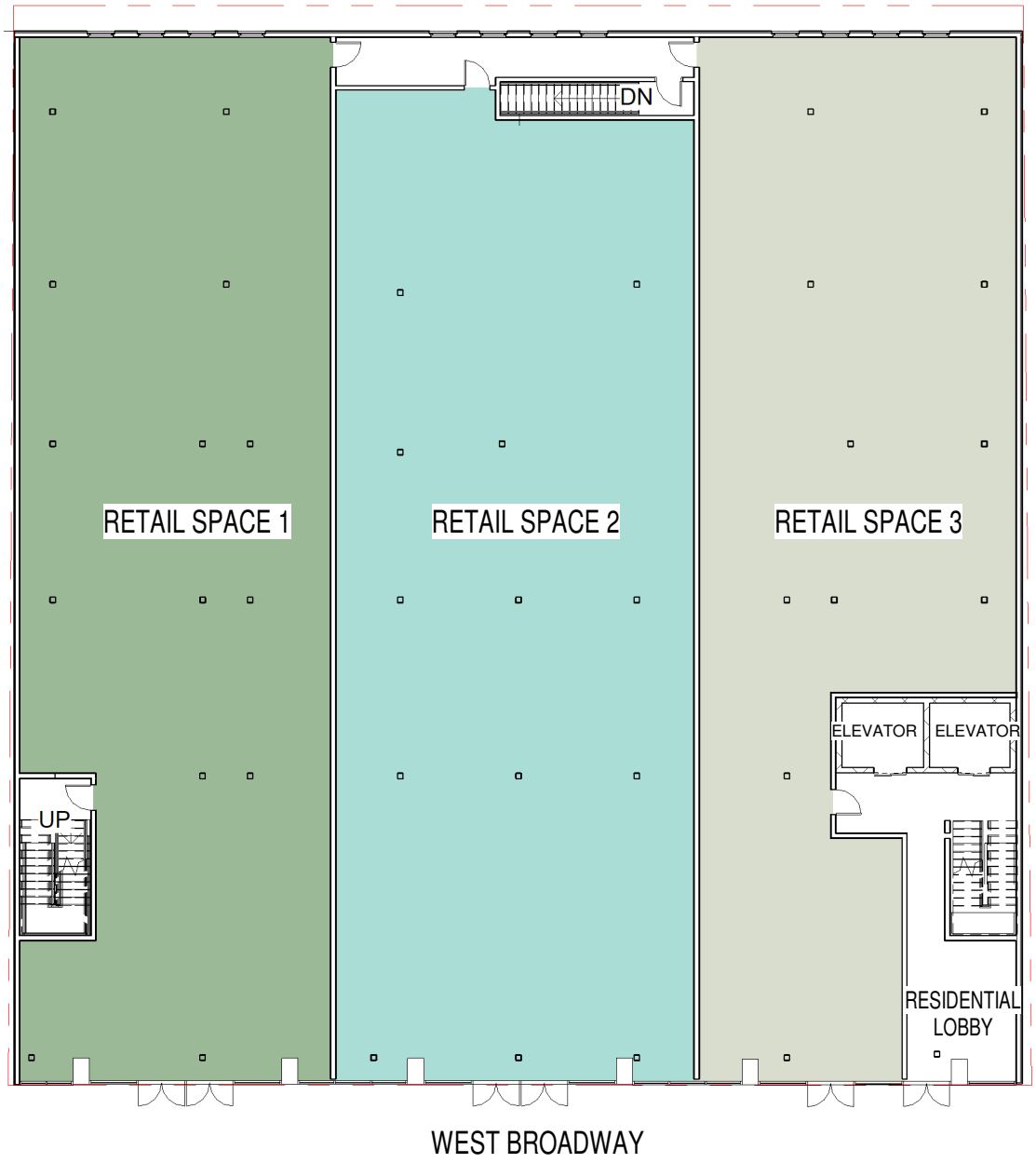
STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-3



BSC GROUP

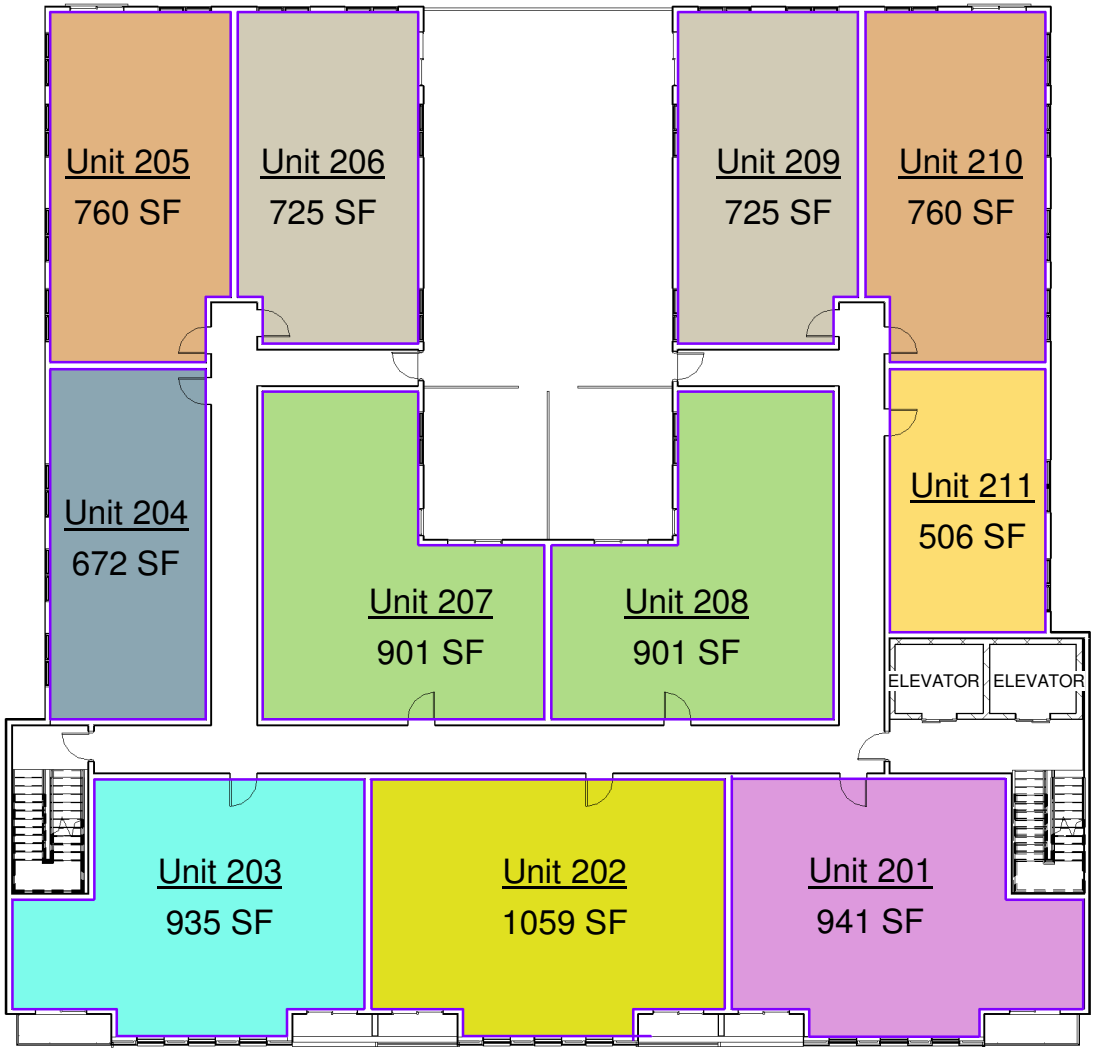
First Floor Landscape Plan

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-4



First Floor Plan

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-5



Second Floor Plan

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-6

Typical 3rd through 5th Floor Plans

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-7

Roof Level Landscape Plan

STEFANOVARCHITECTS	457-469A West Broadway, South Boston	Figure 3-8

West Broadway Street Elevation

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-9

Silver Street Elevation

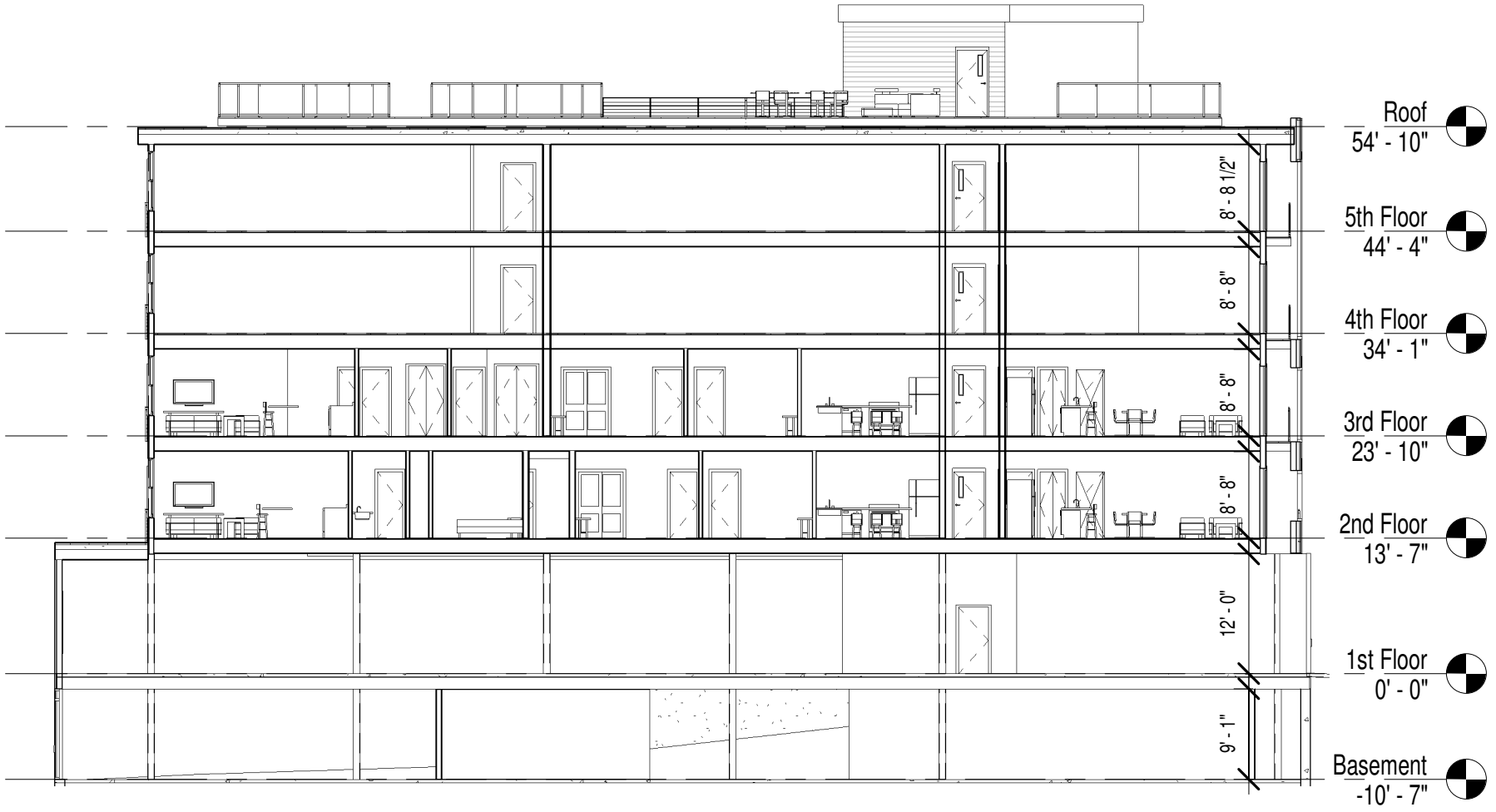
STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-10

West Elevation

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-11

East Elevation

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-12



Longitudinal Section

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-13

Perspective - Front on West Broadway

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-14

Perspective at Corner - West Broadway and Dorchester Street

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-15

Perspective from Silver Street

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-16

Birds eye view from the back of the building

STEFANOV ARCHITECTS	457-469A West Broadway, South Boston	Figure 3-17

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

Project Checklist

Project Name: 457 West Broadway
Date: 13-Sep-17

Y	?	N			
1			Credit	Integrative Process	1

15	1	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

4	0	6		**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

8	0	3		**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
6			Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

12	5	16		**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
8	1	9	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	2	9		**Materials and Resources**	13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
	1	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	4	6		**Indoor Environmental Quality**	16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
		3	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
1	1		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1		1	Credit	Interior Lighting	2
	1	2	Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

4	2	0		**Innovation**	6
3	2		Credit	Innovation - EP Transit, Green Houskeeping, Education	5
1			Credit	LEED Accredited Professional	1

3	1	0		**Regional Priority**	4
1			Credit	Regional Priority: Building Indoor Waster Use Reduction	1
1			Credit	Regional Priority: High Priority Site	1
1			Credit	Regional Priority: Optimize Energy	1
	1		Credit	Regional Priority: Renewable	1

55	15	40	**TOTALS**	Possible Points:	110

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

Figure 3-18. LEED V4 for 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 onto portions of buildings to the west along West Broadway and onto a portion of the fronts of buildings along the south side of Silver Street. In addition, a portion of the courtyard within the Project along Silver Street is partially covered with shadow.

At 12:00 Noon, new shadow is cast onto additional sidewalk area on West Broadway and onto the rooftop of the building to the west. In addition, a portion of the courtyard within the Project along Silver Street is partially covered with shadow.

At 3:00 PM, new shadow extends onto more of the West Broadway roadway in the front of the Project.

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 to the west onto the rooftops of the two closest buildings, onto these buildings' rear surface parking lots, and onto the frontage of two buildings on the other side of Silver Street.

At 12:00 Noon, new shadow extends onto a portion of the West Broadway sidewalk in front of the Project and onto the closest building's rooftop to the west.

At 3:00 PM, new shadow extends onto West Broadway sidewalk in front of the Project, and onto the rooftop of the closest building to the east.

At 6:00 PM, new shadow from the Project is cast over portions of the West Broadway roadway, and extends onto buildings to the east to Dorchester Street.

4.1.4 Autumnal Equinox (September 21)

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

At 9:00 AM, shadows are cast in onto portions of buildings to the west along West Broadway and onto a portion of the fronts of buildings along the south side of Silver Street. In addition, a portion of the courtyard within the Project along Silver Street is partially covered with shadow.

At 12:00 Noon, new shadow is cast onto additional sidewalk area on West Broadway and onto the rooftop of the building to the west. In addition, a portion of the courtyard within the Project along Silver Street is partially covered with shadow.

At 3:00 PM, new shadow extends onto more of the street in the front of the Project on West Broadway.

At 6:00 PM, new and existing shadows are approximately the same at this time period, except that the new shadow covers a great portion of rooftops of buildings to the east and onto buildings on the other side of West Broadway toward the intersection of West Broadway and Dorchester Street.

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 there is some additional shadow on rooftops to the east along West Broadway.

At 12:00 Noon, new shadow is cast onto both sidewalks on West Broadway in front and to the west of the Project, and additional shadow crosses West Broadway to the public parking lot.

At 3:00 PM, the time of the year with the longest shadow, new shadow covers all of West Broadway in front of the Project and extends further to the north beyond the buildings along West Broadway.

4.1.6 Summary

The proposed height of 5-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 West Broadway and Silver Street roadways. Morning shadows generally are cast to the west onto the rooftops of nearby buildings. Mid-day shadows are generally cast on the buildings to the east and on the West Broadway sidewalk, and late afternoon and evening shadows will extend in an easterly direction onto the West Broadway sidewalk and nearby rooftops with some extending to Dorchester Street and beyond, particularly in December.

Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project site and surroundings.

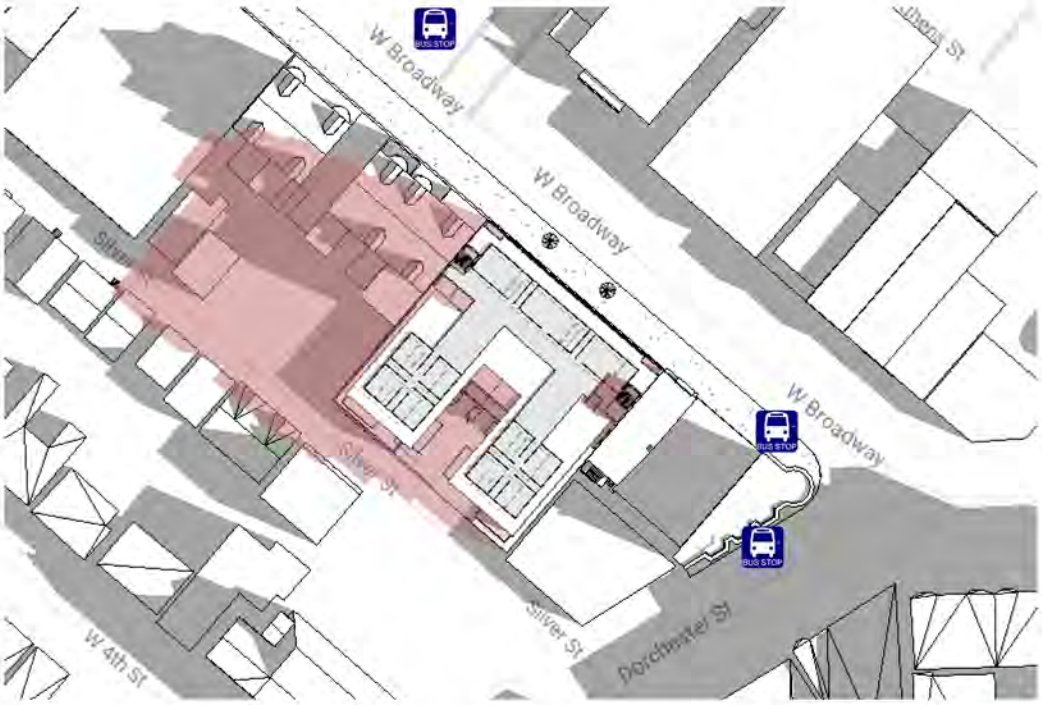


Figure 4-1. March 21, 9:00 AM

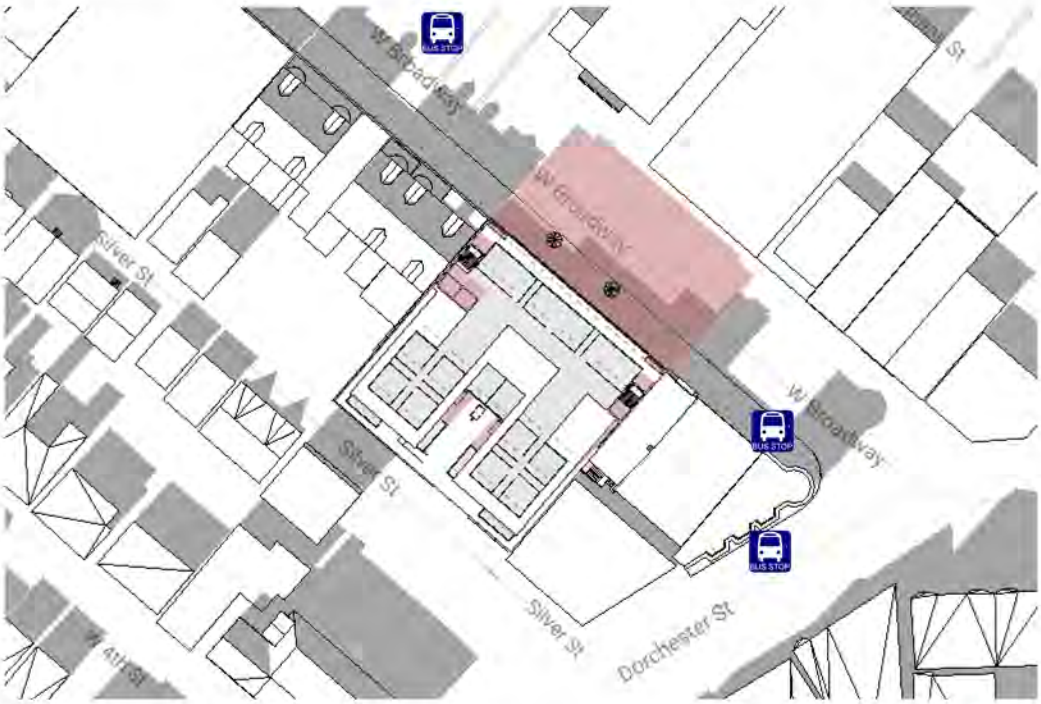
Sun Altitude: 23.34° Sun Azimuth: 112.78°

Figure 4-2. March 21, 12:00 NOON

Sun Altitude: 46.32° Sun Azimuth: 161.20°

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston



EXISTING SHADOW
UNDERLAIN EXISTING
NEW SHADOW

Figure 4-3. March 21, 3:00 PM

Sun Altitude: 38.95° Sun Azimuth: -136.86°

EXISTING SHADOW
UNDERLAIN EXISTING
NEW SHADOW

Figure 4-4. June 21, 9:00 AM

Sun Altitude: 40.00° Sun Azimuth: 93.54°

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston

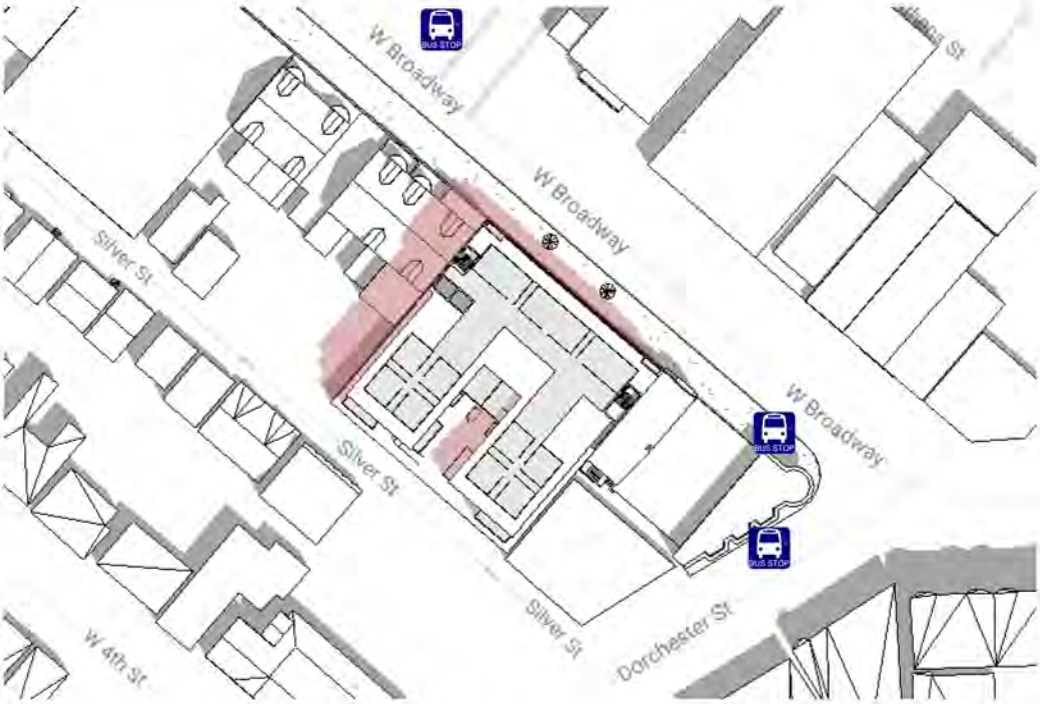


Figure 4-5. June 21, 12:00 NOON

Sun Date: 6/21 Sun Time: 12PM Sun Altitude: 68.84° Sun Azimuth: 149.64°

Figure 4-6. June 21, 3:00 PM

Sun Date: 6/21 Sun Time: 3PM Sun Altitude: 56.45° Sun Azimuth: -113.57°

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston

Figure 4-7. June 21, 6:00 PM

Sun Date: 6/21 Sun Time: 6PM Sun Altitude: 23.79° Sun Azimuth: -79.22°

EXISTING SHADOW
UNDERLAIN EXISTING
NEW SHADOW

Figure 4-8. September 21, 9:00 AM

Sun Date: 9/21 Sun Time: 9AM Sun Altitude: 26.10° Sun Azimuth: 115.24°

EXISTING SHADOW
UNDERLAIN EXISTING
NEW SHADOW

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston

Figure 4-9. September 21, 12:00 NOON

Sun Date: 9/21 Sun Time: 12PM Sun Altitude: 47.57° Sun Azimuth: 166.07°

Figure 4-10. September 21, 3:00 PM

Sun Date: 9/21 Sun Time: 3PM Sun Altitude: 37.56° Sun Azimuth: -132.70°

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston

EXISTING SHADOW
UNDERLAIN EXISTING
NEW SHADOW

Figure 4-11. September 21, 6:00 PM
Sun Altitude: 7.51° Sun Azimuth: -95.78°

EXISTING SHADOW
UNDERLAIN EXISTING
NEW SHADOW

Figure 4-12. December 21, 9:00 AM
Sun Altitude: 6.79° Sun Azimuth: 130.40°

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston

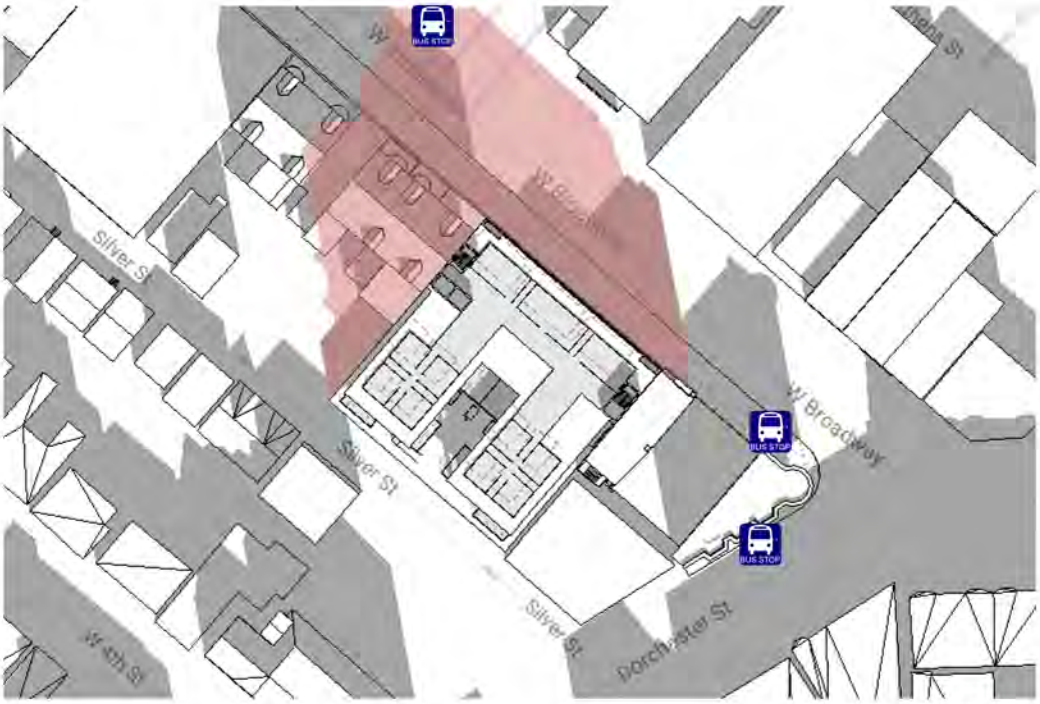


Figure 4-13. December 21, 12:00 NOON
Sun Altitude: 23.55° Sun Azimuth: 169.47°

Figure 4-14. December 21, 3:00 PM
Sun Altitude: 16.99° Sun Azimuth: -147.12°

Shadow Studies

STEFANOV ARCHITECTS | 457-469A West Broadway, South Boston

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 September 29, 2017.

Notes:

(1) Annual averages are highest measured during the most recent three-year period for which data are available (2014 - 2016). 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 64 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 10,700 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	1	5	6
Afternoon Peak Hour	4	3	7

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 the garage will travel to the farthest parking spot, and that the vehicles leaving the garage will have to travel the same distance from inside the garage to the exit. The calculations in **Appendix B** show how long each vehicle was calculated to travel in the garage for the weekday afternoon peak period.

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 0.010 grams per minute for the morning peak hour and 0.012 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 0.029 parts of CO per million parts of air (ppm) for the morning peak hour and 0.034 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 0.034 ppm with a peak one-hour emission rate of 0.012 grams/minute (0.0020 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 0.000070 ppm (0.082 $\mu g/m^3$). 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 0.000063 ppm (0.000070 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 1.90007 ppm and 1.10006 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)	1.90007**	35 (NAAQS)	1.10006**	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 Redevelopment Authority (BRA) 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 five intersections. Only the Dorchester Street/West and East Broadway intersection operates at LOS E and F. However, the Project will generate approximately 7 motor vehicle trips during the morning peak traffic hour and approximately 15 motor vehicle trips during the afternoon traffic hour. This represents an increase of approximately 1 vehicle trip every eight minutes during the morning peak hour and 1 vehicle trips every four minutes during the afternoon peak hour. These increases in traffic generate less than one second increase in delay times the Dorchester Street/West and East Broadway intersection. **Table 4.2-5** shows a comparison of the Existing (2017) and Build (2024) LOS at the five 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?
Dorchester Street/West & East Broadway	E/E	E/F	NO*
F Street/West Broadway	C/C	C/C	NO
Dorchester Street/Silver Street	B/C	A/A	NO
F Street/Silver Street	A/A	A/A	NO
Silver Street/Site Driveway	--	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]

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

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 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: 457 West Broadway

Monitoring Location #2: Intersection of West Broadway and Dorchester Avenue

Monitoring Location #3: Across from 309 Silver Street

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, September 7th, into Friday morning, September 8th, 2017. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was 60^{o}F, the skies were clear, and the winds were 5 to 10 miles per hour (mph), from the southwest. 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, foot traffic, 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 52.8 dBA at Location #1, 52.3 dBA at Location #2, and 53.2 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 afternoon 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 Friday, September 8, 2017 between 1:00 pm. and 1:30 p.m. at 457 West Broadway (the closest location to the project). The weather conditions during the sound survey were conducive to accurate sound level monitoring: the skies were clear, and the winds were approximately 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 afternoon period sound level measurements were motor vehicle traffic on nearby local streets, construction vehicles in the distance, passing sirens, and aircraft over-flights.

The L_{eq} measured during the afternoon period was 67.1 dBA at 457 West Broadway. The L_{eq} sound level measured during the nighttime at the same location was 59.2 dBA. Using both the daytime and nighttime L_{eq} sound levels, the calculated L_{dn} for the site is 68.0 dBA, which is slightly above the HUD guideline noise limit of 65 dBA primarily due to the traffic on West Broadway St.

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 the typical urban sound sources 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, September 7-8, 2017

Sound Level Measurement	(Location #1) 457 West Broadway 12:00 a.m. – 12:30 a.m.	(Location #2) Intersection of West Broadway and Dorchester Avenue 1:10 a.m. – 1:40 a.m.	(Location #3) Across from 309 Silver Street 12:35 a.m. – 1:05 a.m.
Broadband (dBA)			
Background (L_{90})	52.8	52.3	53.2
Octave Band L_{90} (dB)			
16 Hz	58.3	57.9	57.3
32 Hz	63.7	59.9	59.2
63 Hz	56.7	58.9	57.8
125 Hz	55.0	55.4	55.5
250 Hz	51.2	52.4	52.1
500 Hz	49.0	48.9	50.0
1000 Hz	49.1	47.8	49.7
2000 Hz	43.8	42.1	43.0
4000 Hz	36.1	34.4	37.8
8000 Hz	28.0	25.8	30.6
16000 Hz	19.5	18.3	19.7
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:

- Rooftop Cooling Tower; and
- Rooftop Boiler inside Mechanical Room

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 451 West Broadway 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 (472 & 479 West Broadway St), south (313 Silver St) and west (309 Silver St) 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 23.6 and 38.6 dBA. The smallest sound level impact of 23.6 dBA is predicted to occur at 479 West Broadway. The largest sound level impact of 38.6 dBA is predicted to occur at 309 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 **4.3-9**, 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 451 West Broadway (Closest/Worst Case Residence) – Location R1

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	42
63 Hz	67	44
125 Hz	61	42
250 Hz	52	35
500 Hz	46	21
1000 Hz	40	27
2000 Hz	33	24
4000 Hz	28	18
8000 Hz	26	8
Broadband (dBA)	**50**	**34**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	52.8
87-93 West Broadway Street Project*	34
Calculated Combined Future Sound Level	52.9
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 4.3-6. Estimated Future Sound Level Impacts – Anytime, 472 West Broadway– Location R2

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	35
63 Hz	67	38
125 Hz	61	37
250 Hz	52	33
500 Hz	46	32
1000 Hz	40	29
2000 Hz	33	27
4000 Hz	28	20
8000 Hz	26	6
Broadband (dBA)	**50**	**34**
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*	34
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 4.3-7. Estimated Future Sound Level Impacts – Anytime, 479 West Broadway– Location R3

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	33
63 Hz	67	34
125 Hz	61	31
250 Hz	52	24
500 Hz	46	21
1000 Hz	40	17
2000 Hz	33	14
4000 Hz	28	6
8000 Hz	26	-6
Broadband (dBA)	**50**	**23.6**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #2)	52.3
87-93 West Broadway Street Project*	23.6
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 4.3-8. Estimated Future Sound Level Impacts – Anytime, 313 Silver St – Location R4

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41
63 Hz	67	41
125 Hz	61	36
250 Hz	52	29
500 Hz	46	27
1000 Hz	40	25
2000 Hz	33	25
4000 Hz	28	21
8000 Hz	26	12
Broadband (dBA)	**50**	**31**
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*	31.2
Calculated Combined Future Sound Level	53.2
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 4.3-9. Estimated Future Sound Level Impacts – Anytime, 309 Silver St – Location R5

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	41
63 Hz	67	43
125 Hz	61	41
250 Hz	52	36
500 Hz	46	36
1000 Hz	40	33
2000 Hz	33	32
4000 Hz	28	26
8000 Hz	26	13
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 #1)	53.2
87-93 West Broadway Street Project*	31.2
Calculated Combined Future Sound Level	53.2
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

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 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 demolition of the existing buildings 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 at least approximately 110 tons of solid waste per year, based on the assumption that each of the 44 units will each generate approximately 1.4 tons per year. The 13,500 sf of commercial space will generate approximately 49 tons of solid waste per year based on the assumption that there will be .02 lbs per square feet per day generated of retail trash. During operations, 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 Environmental Site Assessment and Preliminary Soil Sampling Results completed by Cooperstown Environmental ("Cooperstown") in November 2017, the Phase I analysis did not reveal the presence of any Recognized Environmental Conditions (REC) at the property. Nonetheless, the following conditions were recommended to be rectified as a matter of "good housekeeping":

- Two Above Ground Storage Tanks (AST) were identified: one on the basement of the Family Dollar Store, and one in the basement of Nanning Wok. They are presumed unused and abandoned from the early 1980's when the buildings were switched from heating oil to natural gas, and while there is no rust on the tanks and fill lines to indicate a release has occurred, these AST's should be removed; and
- Two unsealed 55-gallon drums, filled with what is presumed to be cooking oil in the rear parking lot which should be sealed and disposed of properly.

Soil samplings taken during the geotechnical investigation described below, indicate that there is evidence of a release of both light and heavy petroleum products in the soil in the parking area. These samples revealed EPH, VPH VOC, exceedances of the RCS-1 standards in two of the borings in the center of the property. These detections created a 120-day reportable condition to Mass DEP upon purchase of the property. Three surrounding soil borings showed no detection of organic contaminants or detections below RCS-1 standards. There was also detection of lead above RCS-1 standards in one sample which also falls under the 120-day reporting condition upon purchase of the property.

Additional samples that will be needed to meet disposal facility requirements may be collected close to the date of excavation.

In addition, the Project Proponent may 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. The Phase I Environmental Site Assessment report is available upon request.

4.6 Geotechnical/Groundwater Impacts Analysis

KMM Geotechnical Consultants, LLC, completed a "Geotechnical Summary Report" for the Proposed Project on November 13, 2017. The existing site uses include 2-3 story brick buildings with some paved parking to the rear. Existing buildings and associated construction are to be razed to accommodate the proposed new construction. Based on the proposed site plan, grades across the property vary from elevation 60 feet along West Broadway dropping to about elevation 50-52 feet along Silver Street to the rear.

The Project includes a five-story, steel and wood framed mixed use residential building with approximately 15,500 sf in footprint, occupying most of the lot. First floor level retail and entry will be provided along West Broadway. A full basement level (11-12 feet) will be provided below the retail space with garage drive-out access to the rear. There is approximately 10 feet of elevation change from the front to the rear of the property. A stacked vehicular car parking garage system will also be embedded below grade with access from Silver Street to the rear. This system is reported to extend an additional 6-7 feet below the basement level. The construction methodology is intended to support the building on a conventional spread footing foundation.

Based on the results of the explorations performed at the project site, urban fill was encountered to depths of approximately 3-6 feet below grade. The fill varied in composition but generally included a brown to black, silty Sand, little gravel. Trace amounts of brick, rubble, ash, clay, organic, slag and other insert matter are embedded in the Fill. The Fill was typically loose suggesting variable compaction. The predominant overburden consisted of a dense Glacial Till.

Groundwater was encountered in the test holes selected at depths of approximately 9 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 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. Given a basement floor elevation near elevation 48 feet, an under-slab drain system is expected to also be necessary given expected seasonal groundwater impact.

The Geotechnical engineer has recommended that a qualified engineer or representative should be retained to review earthwork activities such as the preparation of the foundation bearing subgrade, the placement/compaction of Structural Fill and to observe compliance with the Project's design concepts. 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 1st Quarter 2019 and reaching completion in the 4th Quarter 2020. 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.

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 existing onsite buildings 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 identification of historic resources in the Project vicinity).

5.2 Historic Districts and Resources

The Dorchester Heights Historic District is the only historic resource or district within an eighth to quarter mile of the Project Site that is listed on the National Register of Historic Places.

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

Project Site

.25 mi Radius

Historic Inventory Areas

Properties included in the Massachusetts Inventory of Historic and Archaelogical Assets

Figure 5-1. Historic Resources

MLF CONSULTING LLC

Table 5-1. Historic Resources in the Vicinity of the Project Site

Key to Historic Resources in Figure 5-1	Historic Resource	Source of Listing
Properties Included the MA Inventory of Historical and Archaeological Assets		
A	Dorchester Heights Historic District	NRDIS
Properties Included the MA Inventory of Historical and Archaeological Assets		
1	Morse, Albert House	MHC Inventory
2	South Boston Community Health Center	MHC Inventory
3	Boston Engine House #1 & Municipal District Court	MHC Inventory
4	Boston Hook and Ladder Fire House #5	MHC Inventory
5	James, Francis Row House	MHC Inventory
6	Howard, Samuel Row House	MHC Inventory
7	Brown, Solon F. Row House	MHC Inventory
8	Smith, Freeman Row House	MHC Inventory
9	James, Benjamin Row House	MHC Inventory
10	Atwood, Charles House	MHC Inventory
11	Pond, Adams and Basco Row House	MHC Inventory
12	Pond, Adams and Basco Row House	MHC Inventory
13	Gifford, Moses S. – Goodwin Nathaniel Row House	MHC Inventory
14	Gifford, Moses S. - Goodwin Nathaniel Row House	MHC Inventory
15	Gifford, Goodwin and Baker Row House	MHC Inventory
16	Gifford, Goodwin and Baker Row House	MHC Inventory
17	Bethesda Hall - Baker Building	MHC Inventory
18	U. S. Post Office - South Boston Branch	MHC Inventory
19	South Boston Savings Bank	MHC Inventory
20	South Boston Market	MHC Inventory
21	James, Francis Row House	MHC Inventory
22	McCarthy, Ellen House	MHC Inventory
23	Souther, Henry P. Row House	MHC Inventory
24	Souther, Henry P. Row House	MHC Inventory
25	Souther, Henry P. Row House	MHC Inventory
26	Souther, Henry P. Row House	MHC Inventory

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.

6.0 INFRASTRUCTURE SYSTEMS COMPONENT

6.1 Introduction

The existing infrastructure surrounding the site of 457-469A 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 20 x 24-inch combined sewer located in West Broadway to the north of the Project site. There is also an existing 12 x 16 inch combined sewer to the south of the site in Silver Street.

The existing 457-469A West Broadway site includes three buildings with 8 total operating businesses. The total sewer flow from the existing site is estimated at 3,206 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.**

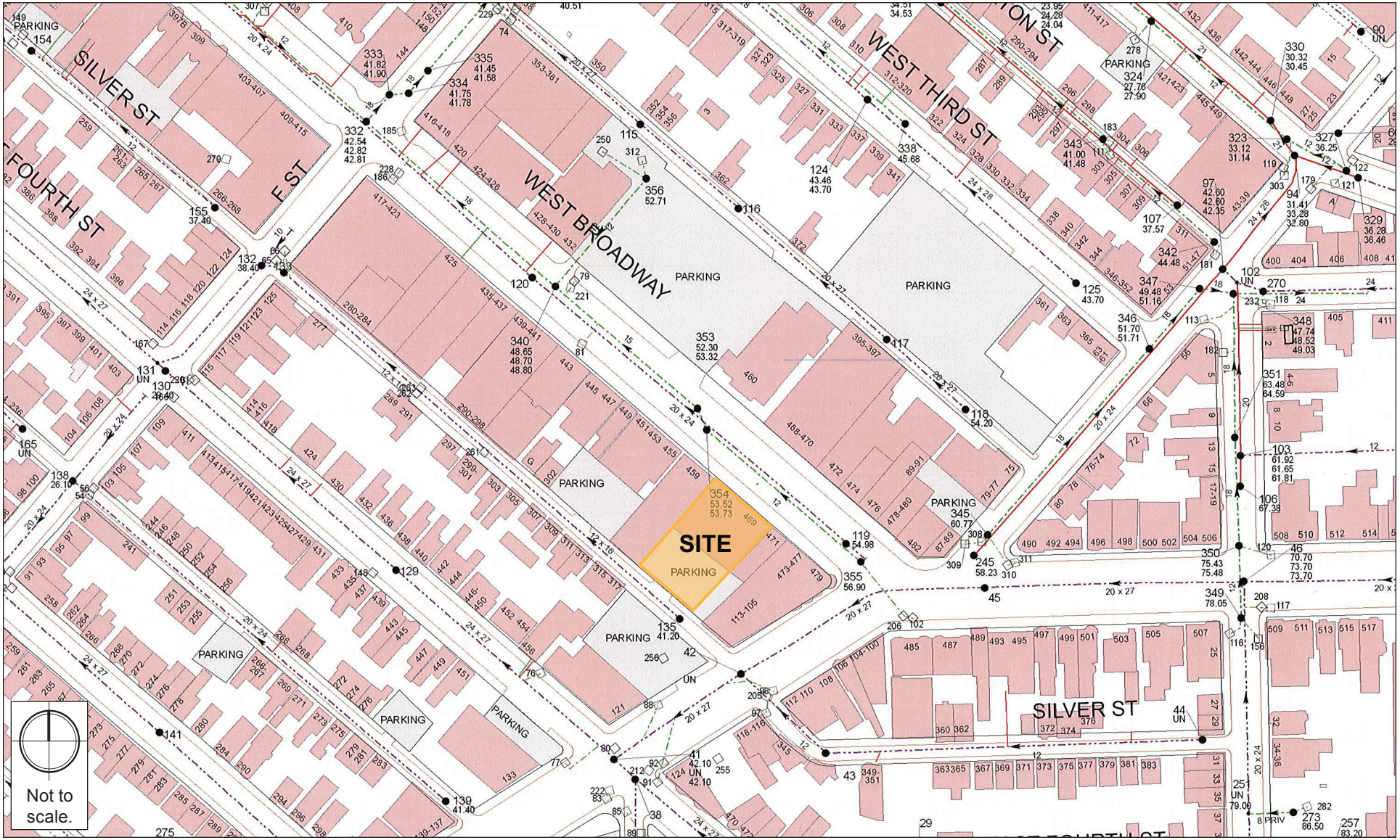


Figure 6-1
BWSC Sanitary Sewer Map

Table 6-1. Existing Sanitary Sewer Flows

Address	Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
457 W B "The Spot"	Retail	1,260	50 gpd/1,000 sf	200
459 W B "Family Dollar"	Retail	4,120	50 gpd/1,000 sf	206
463 W B "Metro PCS"	Retail	1,020	50 gpd/1,000 sf	200
465 W B "Nanning Wok"	Restaurant	16 Seats	35 gpd/seat	1,000
467 W B "Nick's Pizza"	Restaurant	16 Seats	35 gpd/seat	1,000
469A W B "Natural Nails& Skin Salon"	Beauty Salon	6 Chairs	100 gpd/chair	600
			Total	**3,206 gpd**

6.2.2 Project-Generated Sanitary Sewer Flow

The Project will generate an estimated 8,595 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 5,389 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	13,500 sf	50 gpd/1,000sf	675 gpd
Residential	72 bedrooms	110 gpd/bedroom	7,920 gpd
		Total	**8,595 gpd**

6.2.3 Sanitary Sewer Connection

It is anticipated that the sanitary services for the Project will tie into the 20 x 24-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 12-inch ductile iron concrete lined distribution line located in West Broadway to the north of the Project site. There is also an 8-inch ductile iron line in Silver Street to the south of the Project site.

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 east of the site on West Broadway (H168). Hydrant (H140) is located north of the site on West Broadway. Another hydrant is located northwest of the site on Silver Street (H170). 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 9,455 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.

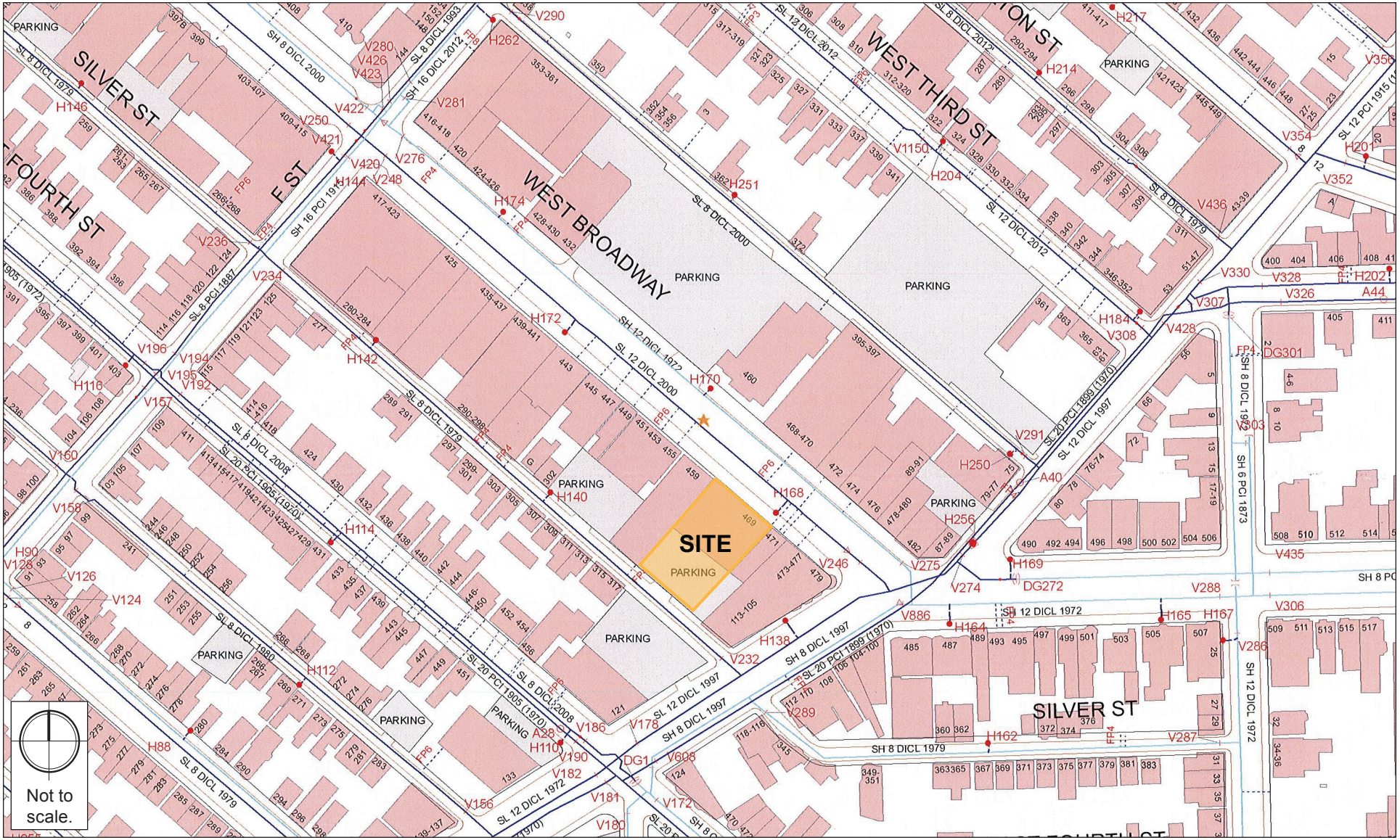


Figure 6-2
BWSC Water Supply Map

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 12-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.

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 12-inch storm drain in West Broadway to the northeast of the Project site.

There are three existing buildings that occupy the majority of the site. Rooftop runoff from the existing buildings discharge directly to the surrounding municipal storm drain system. Runoff from the parking lot sheet flows to Silver Street where it is collected by catch basins. 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. Stormwater infiltration opportunities will be proposed under the parking garage. 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 and a 3-inch gas main in Silver 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 proposed redevelopment to be located at 457-469A West Broadway (the "Project" and/or "Site"), in Boston's South Boston neighborhood. This transportation study adheres to the Boston Transportation Department's (BTD) Transportation Access Plan Guidelines and the Boston Planning and Development Agency (BPDA) 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 is not expected to have a significant impact on the existing neighborhood.

7.2 Project Description

The Project site is located at 457-469A West Broadway on the south side of West Broadway between Dorchester Street and the F Street. The site currently consists of three brick buildings consisting of several different retail stores including a Family Dollar Store.

The Project will include the construction of approximately 44 residential units and approximately 13,500 square feet (sf) of ground floor retail space, supplemented by approximately 50 parking spaces in the garage. Vehicular access will be provided along Silver Street to the south of the Project.

7.2.1 Study Area

The transportation study area is generally bounded by Dorchester Street to the east, F Street to the west, Broadway to the north, and Silver Street to the south. The study area includes the following four intersections:

- West Broadway/East Broadway/Dorchester Street (signalized);
- West Broadway/F Street (unsignalized);
- Dorchester Street/Silver Street (unsignalized); and
- F Street/Silver Street (unsignalized).

The study area is shown in **Figure 7-1**.

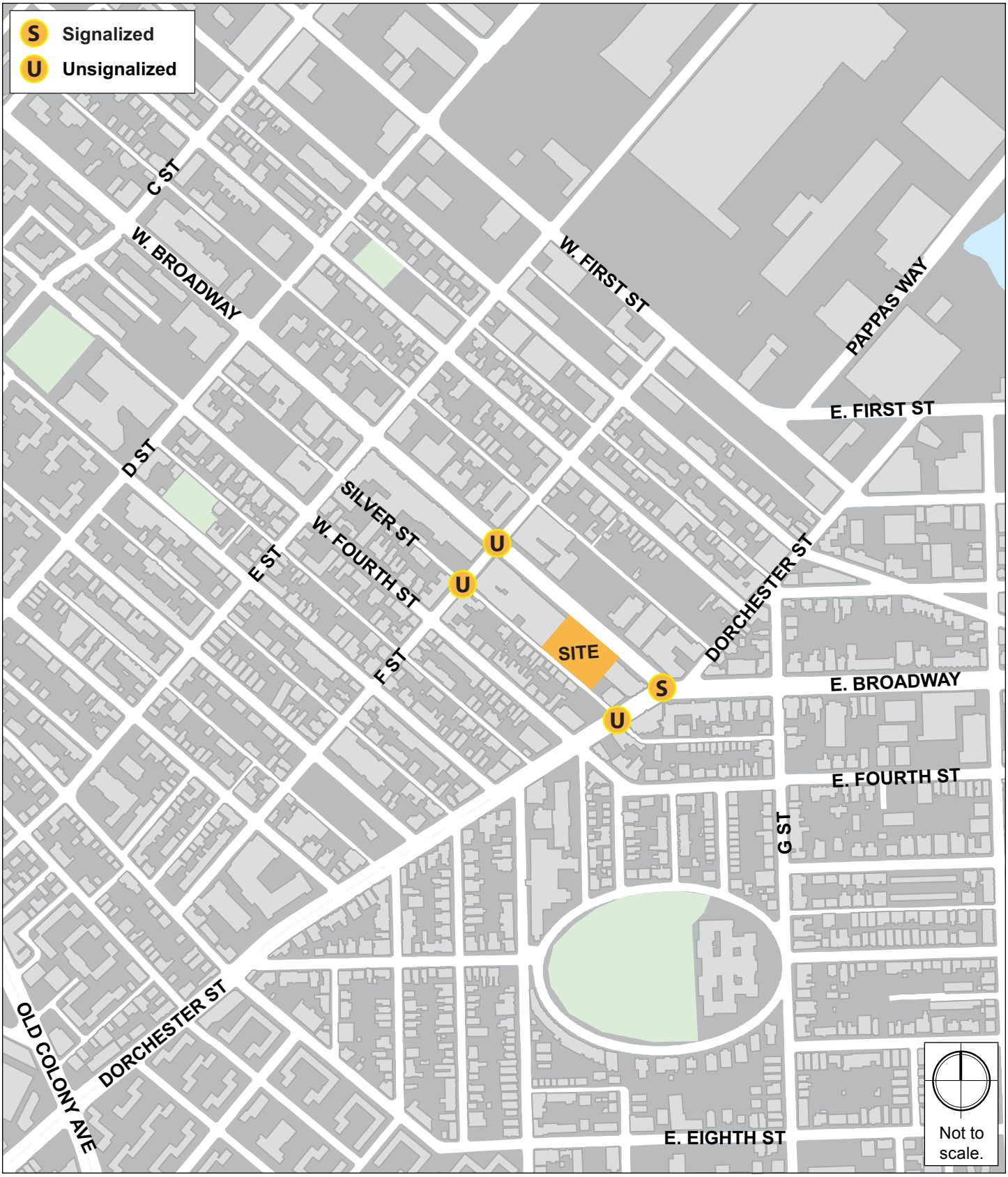


Figure 7-1.
Study Area Intersections

7.2.2 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. The 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.

7.3 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.

7.3.1 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:

Dorchester Street is a two-way, four-lane roadway located to the southeast of the Project site. Dorchester Street is classified as a minor arterial roadway under the City of Boston's jurisdiction and runs in a northeast-southwest direction between Dorchester Avenue to the southwest and East First Street to the northeast. North of Broadway, Dorchester Street is becomes a two-lane roadway. Sidewalks and on-street parking are provided along both sides of the roadway.

West Broadway is a two-way, two-lane roadway located adjacent to the north of the Project site. West Broadway is classified as minor arterial roadway under the City of Boston's jurisdiction and runs in a northwest-southeast direction between Dorchester Avenue to the northwest and Dorchester Street to the southeast. Sidewalks and on-street parking are provided along both sides of the roadway.

East Broadway is a two-way, four-lane roadway located to the east of the Project site. East Broadway is classified as a minor arterial roadway under the City of Boston's jurisdiction and runs in an east-west direction between William J Day Boulevard to the east and Dorchester Street to the west. Sidewalks and on-street parking are provided along both sides of the roadway.

F Street is a one-way, one-lane roadway located to the west of the Project Site. North of West Broadway, F Street becomes a two-way, two lane roadway. F Street is classified as local roadway under the City of Boston's jurisdiction and runs in a northeast-southwest direction between West First Street to the northeast and West Eighth Street to the southwest. Sidewalks and on-street parking are provided along both sides of the roadway.

Silver Street is a one-way, one-lane roadway located adjacent to the south of the Project site. Silver Street is classified as a local roadway under the City of Boston's jurisdiction and runs in a northwest-southwest direction between D Street to the northwest and G Street to the southeast. Sidewalks are provided along both sides of the roadway, and on-street parking is restricted along both sides of the roadway.

7.3.2 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.

Dorchester Street/West Broadway/East Broadway is a four-legged, signalized intersection located to the southeast of the Project site. The West Broadway eastbound approach consists of one shared left-turn/through/right-turn lane and a bus stop. The East Broadway westbound approach consists of two lanes, an exclusive left-turn lane and a shared through/right-turn lane, and an on-street parking lane. The Dorchester Street northbound approach consists of two lanes, an exclusive left-turn lane and a shared through/right-turn lane, and a bus stop. The Dorchester Street southbound approach consists of one shared left-turn/through/right-turn lane and an on-street parking lane. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all the legs of the intersection.

F Street/West Broadway is a four-legged, unsignalized intersection located to the northwest of the Project site. The West Broadway eastbound approach consists of a shared left-turn/through lane and a bus stop. The West Broadway westbound approach consists of a shared through/right-turn lane and an on-street parking lane. The F Street one-way northbound approach is stop

controlled and consists of a shared left-turn/through/right-turn lane and an on-street parking lane. The F Street southbound approach is stop controlled and consists of a shared left-turn/right-turn lane. Crosswalks and wheelchair ramps are provided across all legs of the intersection.

Dorchester Street/Silver Street is a four-legged, unsignalized intersection with three approaches located to the southeast of the Project site. The Silver Street one-way westbound approach is stop controlled and consists of a shared left-turn/through/right-turn lane. The Dorchester Street northbound approach consists of two lanes, a shared left-turn/through lane and a through lane, and an on-street parking lane. The Dorchester Street southbound approach consists of two lanes, a through lane and a shared through/right-turn lane, and an on-street parking lane. Crosswalks and wheelchair ramps are provided across the east and west legs of the intersection.

F Street/Silver Street is a four-legged unsignalized intersection with two approaches located to the northwest of the Project site. The Silver Street one-way westbound approach consists of a shared through/right-turn lane. The F Street one-way northbound approach consists of a shared left-turn/through lane and an on-street parking lane. Crosswalks are not provided; however, wheelchair ramps are provided on all four corners of the intersection.

7.3.3 Existing Parking and Curb Use

An inventory of the on-street parking and curb-use in the vicinity of the Project was collected. On-street parking generally consists of two-hour parking and resident only parking. Other curb uses include loading zones and MBTA bus stops. The on-street parking and curb-use regulations within the study area are shown in **Figure 7-2**.

7.3.4 Car Sharing Services

Car sharing enables easy access to short-term vehicular transportation. Vehicles are rented on an hourly or daily basis, and all vehicle costs (gas, maintenance, insurance, and parking) are included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location.

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 walking distance of the Project site are shown in **Figure 7-3.**

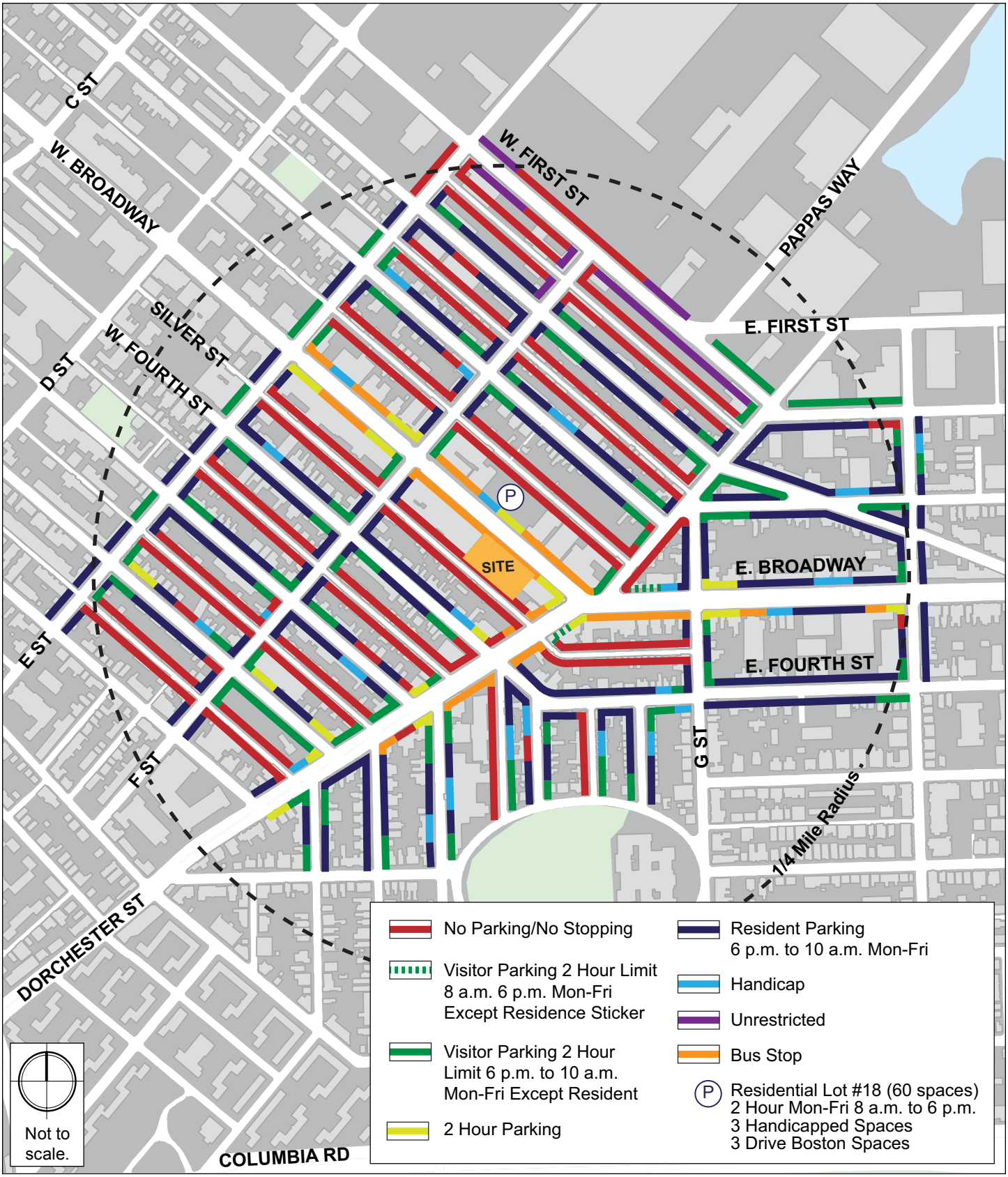


Figure 7-2.
On-street Parking Regulations

Figure 7-3.
Car Sharing Locations

7.3.5 Existing Traffic Data

Traffic volume data was collected in the study area intersections in September 2017. Turning Movement Counts (TMCs) were conducted during the weekday a.m. and weekday p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) at the study area intersections. The TMCs collected vehicle classification including car, heavy vehicle, pedestrian, and bicycle movements. Based on the TMC data, the vehicular traffic peak hours for the study area intersection are generally 7:45 a.m. – 8:45 a.m. and 4:30 p.m. – 5:30 p.m. 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 September 2017 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6 – Urban Arterials) during the month of September is 0.93. This indicates that average month traffic volumes are approximately 7% 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 conservative analysis consistent with the peak season traffic volumes. The MassDOT 2011 Weekday Seasonal Factors table is provided in **Appendix D**.

7.3.6 Existing (2015) Traffic Volumes

Existing traffic volumes were balanced to develop the Existing (2017) Condition vehicular traffic volumes. The Existing (2017) Condition weekday a.m. and p.m. peak hour traffic volumes are shown in **Figure 7-4** and **Figure 7-5**, respectively.

7.3.7 Existing Pedestrian Conditions

In general, the sidewalks provided along nearby roadways are in good condition. The sidewalk along West Broadway, in front of the Project site, exceeds 10 feet wide and has street trees. The sidewalks along Silver Street to the rear of the Project site are narrow measuring 4 – 5 feet wide. Silver Street functions more as a back alley. Crosswalks and curb bump-outs are provided at most major intersections and pedestrian signal equipment is provided at all crosswalks located at a signalized 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. and p.m. peak hour pedestrian volumes are presented in **Figure 7-6**.

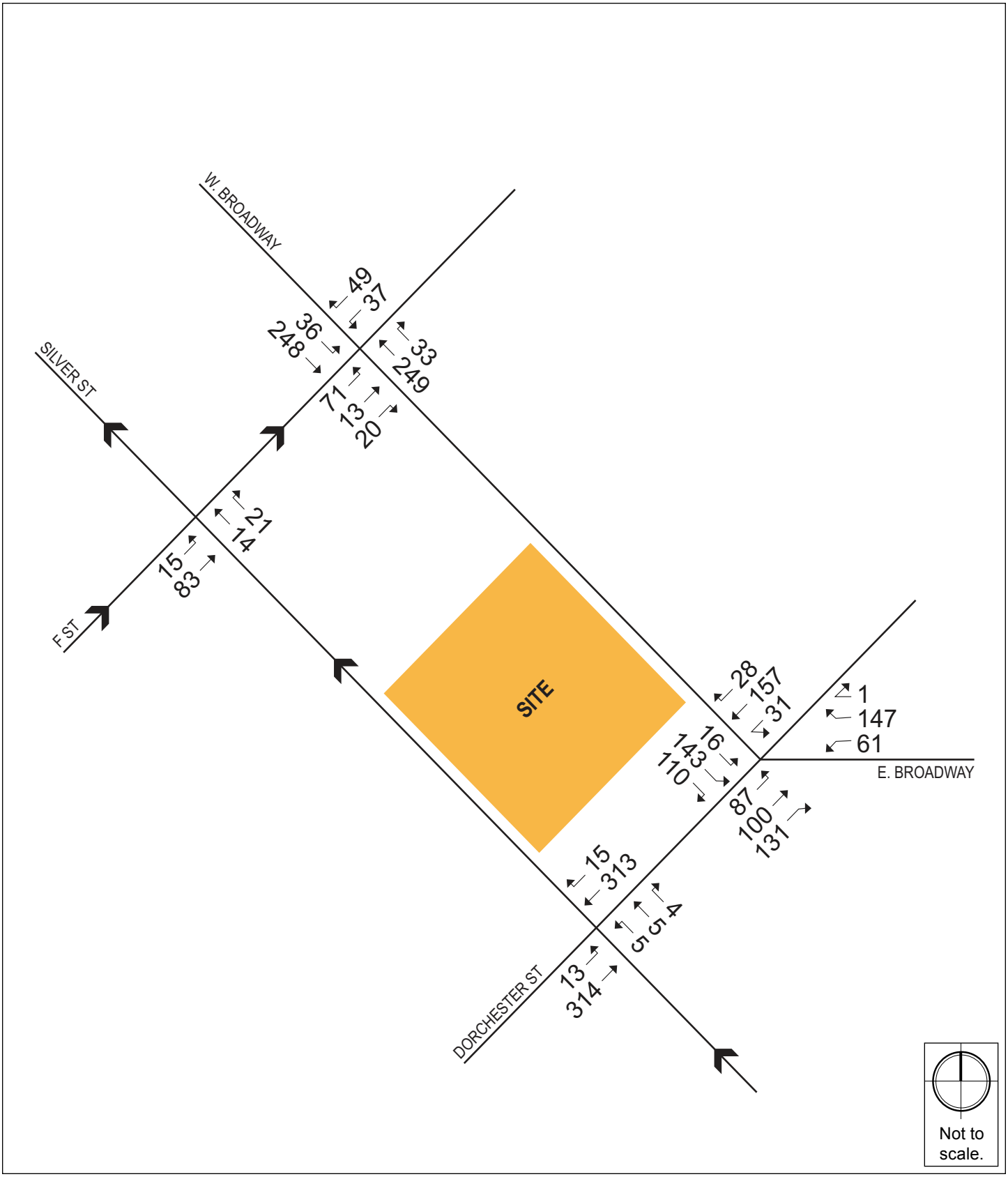


Figure 7-4.
Existing (2017) Condition Traffic Volumes, Weekday a.m. Peak Hour

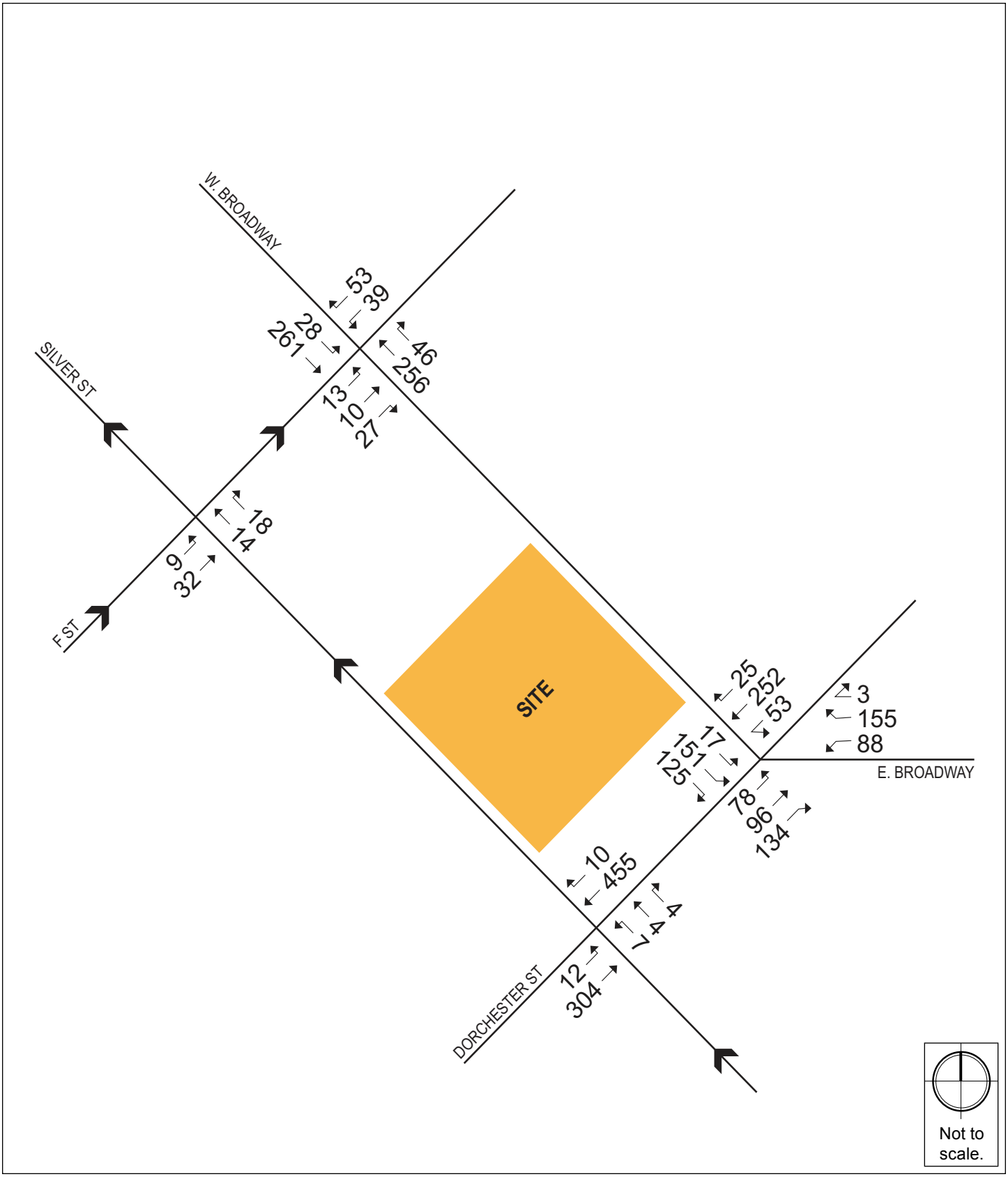


Figure 7-5.
Existing (2017) Condition Traffic Volumes, Weekday p.m. Peak Hour

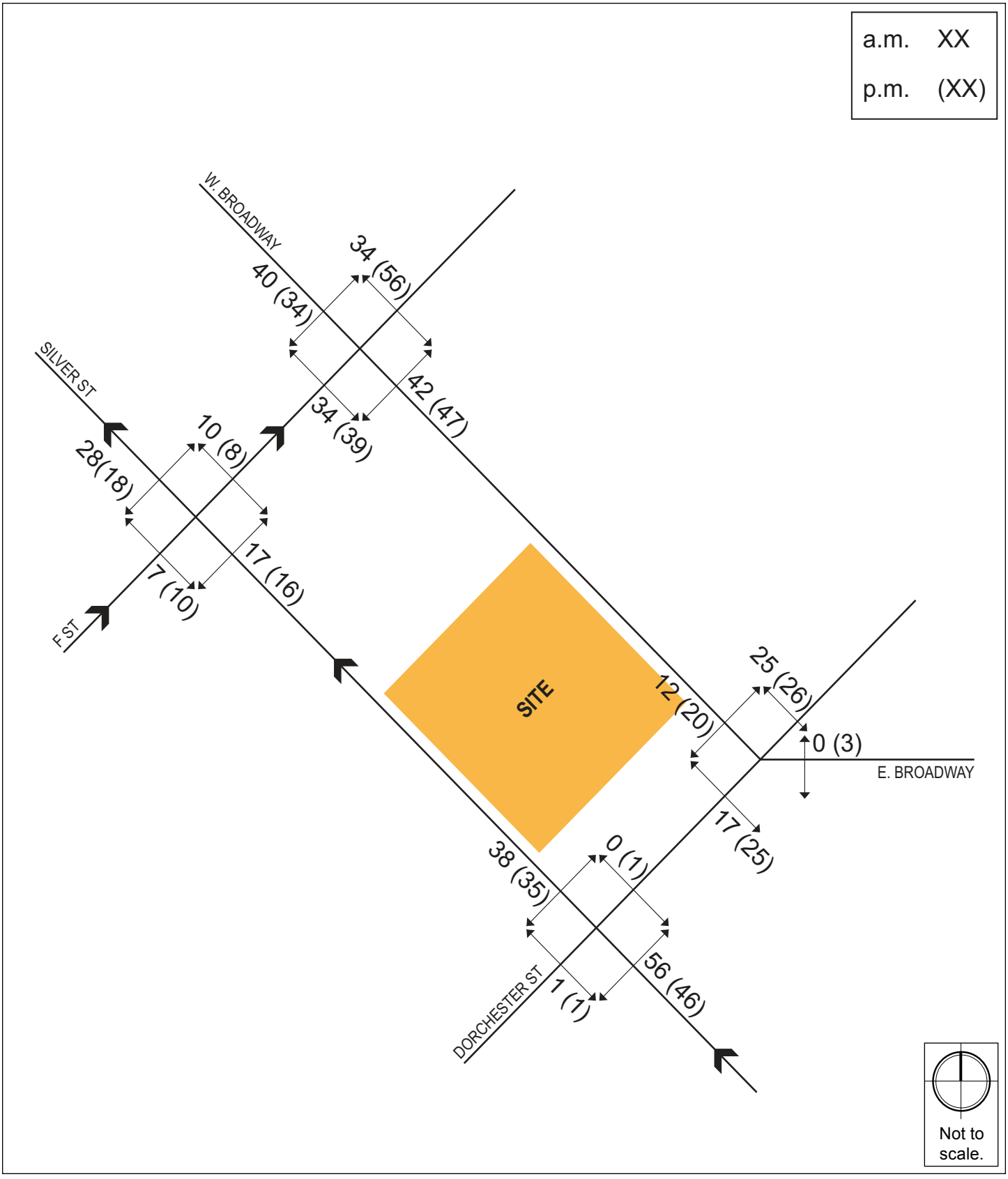


Figure 7-6.
Existing (2017) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hours

7.3.9 Existing Bicycle Conditions

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located near several bicycle facilities. The City of Boston's "Bike Routes of Boston" map, updated in August 2013, indicates that The Harbor Walk Park is designated as a beginner route, suitable for all riders including new cyclists with no on-road experience. West First Street, West Second Street, West Fourth Street, D Street, and East Broadway are designated as intermediate routes suitable for riders with some on-road experience. West Broadway is designated as an advanced route suitable for traffic-confident riders. Bike lanes or sharrows are provided on D Street.

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

7.3.10 Bicycle Sharing Services

The site is also located in proximity to bicycle sharing stations provided by Hubway. Hubway is the bicycle sharing system in the Boston area, which was launched in 2011 and consists of over 185 stations and 1,800 bicycles in four municipalities. The nearby Hubway locations within one-quarter mile of the Project site are shown in **Figure 7-8**.

7.3.11 Existing Public Transportation

The Project is located in Boston's South Boston neighborhood with several public transportation opportunities. The Project is close to several MBTA bus routes, including the 5 bus, the 9 bus, the 10 bus, and the 11 bus. 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**.

Table 7-1. Existing Public Transportation

Route	Description	Peak-hour Headway (in minutes)*	Weekday Service Duration
Local Bus Routes			
Red Line	Alewife Station – Braintree Station	4-5	5:15 a.m. to 12:17 a.m.
	Alewife Station – Ashmont Station	4-5	5:16 a.m. to 12:30 a.m.
Local Bus Routes			
5	City Point – McCormack Housing	60	9:05 a.m. – 3:24 p.m.
9	City Point – Copley Square	5	5:13 a.m. – 1:13 a.m.
10	City Point – Copley Square	20	4:55 a.m. –1:31 a.m.
11	City Point – Downtown	12	5:11 a.m. – 1:24 a.m.

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

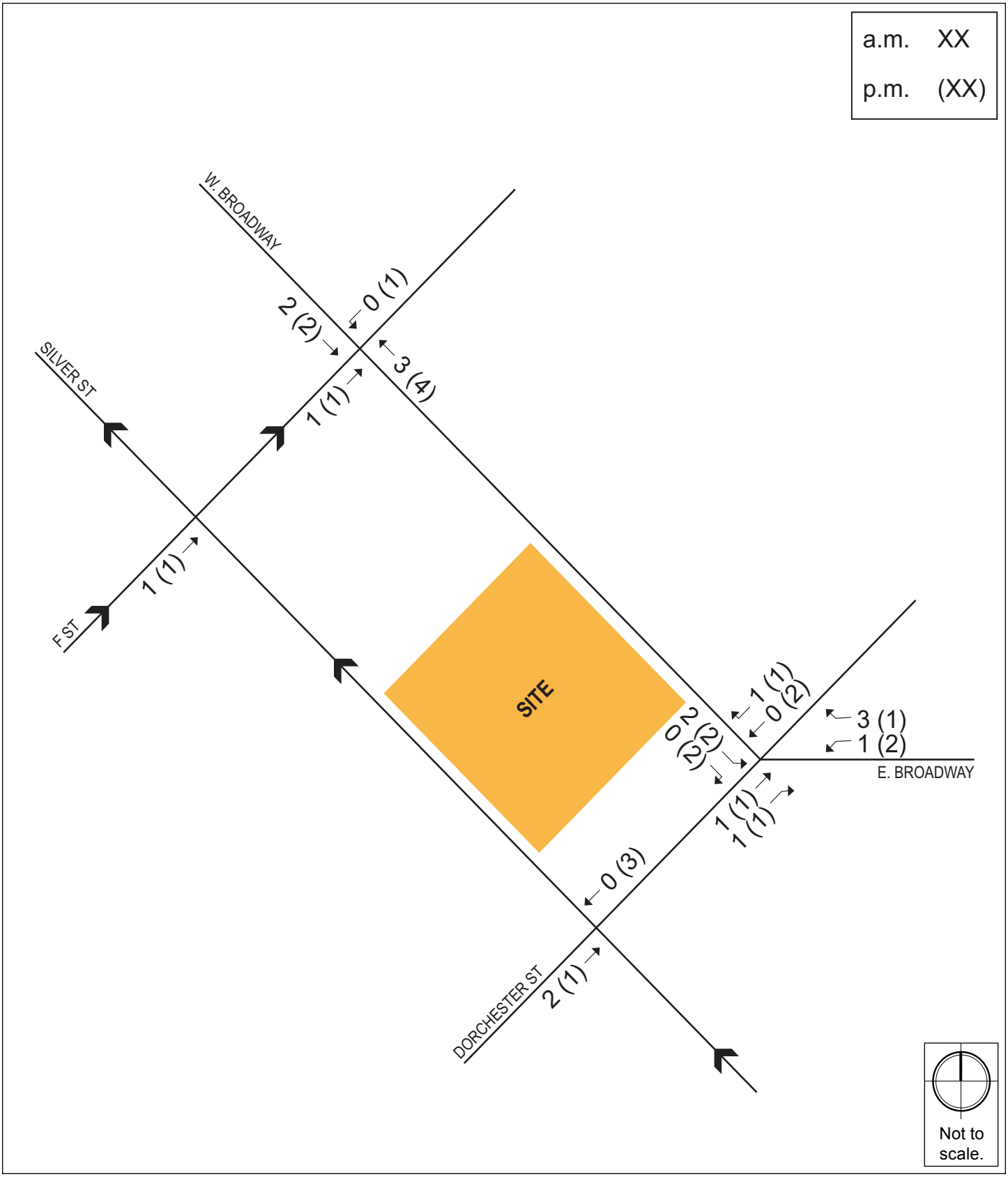


Figure 7-7.
Existing (2017) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hours

Figure 7-8.
Bicycle Sharing Locations

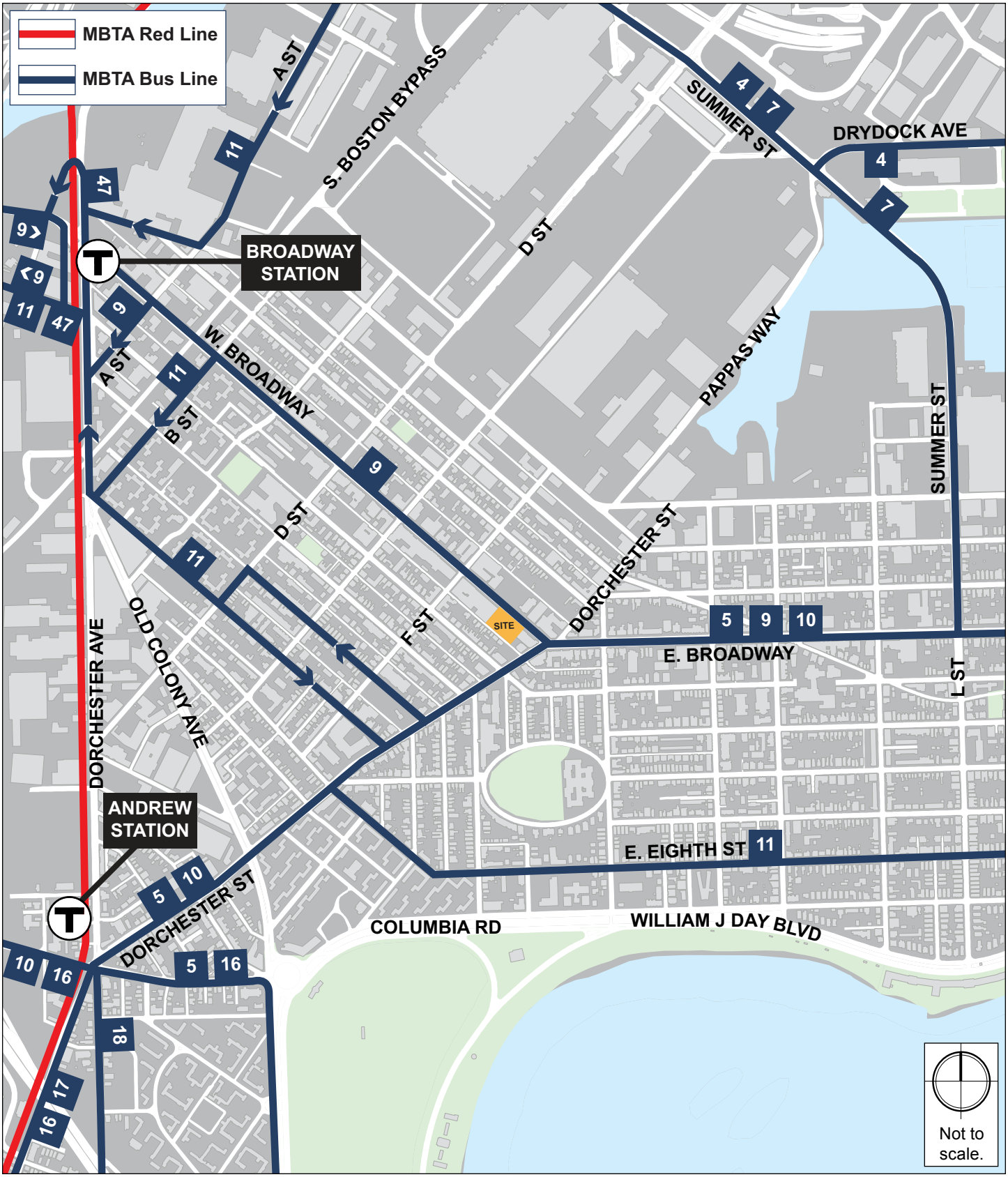


Figure 7-9.
Public Transportation

7.3.12 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 2010 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: 2010 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 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.

7.3.13 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. and p.m. peak hours, respectively. The detailed analysis of the Synchro results is provided in **Appendix D.**

As shown in **Table 7-3** and **Table 7-4**, the study area intersections and approaches operate below capacity (v/c ratio below 1.00) and at acceptable levels of delay (LOS D or better) under the Existing (2017) Condition. The following locations were shown to have movements at capacity (v/c ratio or 1.00 or higher) or operating at high delays (LOS E or LOS F).

- At the signalized intersection at Dorchester Street/West Broadway/East Broadway, the West Broadway eastbound approach operates at LOS E during both the weekday a.m. and p.m. peak hours. The West Broadway eastbound approach, operates at LOS E during both the a.m. and p.m. peak hours, the East Broadway westbound left and thru/right approaches operate at LOS E during the p.m. peak hour, the Dorchester Street northbound left and thru/right approaches operate at LOS E during the a.m. peak hours and the Dorchester Street southbound approach operates at LOS F during both the a.m. and p.m. peak hours. During the a.m. peak hour, the longest queue length occurs at the West Broadway eastbound approach ranging from approximately 221 feet (9 vehicles) during the 50th percentile volume to approximately 343 feet (14 vehicles during the 95th percentile volume. During the p.m. peak hour, the longest queue length occurs at the West Broadway southbound approach ranging from approximately 294 feet (12 vehicles) during the 50th percentile volume to approximately 490 feet (20 vehicles during the 95th percentile volume. This is due to the high volume of traffic traveling through the approach, the long cycle length, the split phasing of the eastbound and westbound movements, and the exclusive pedestrian phase.

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					
Dorchester Street/West Broadway/East Broadway	**E**	**75.2**	**-**	**-**	**-**
West Broadway EB left/thru/right	E	62.9	0.76	221	#343
East Broadway WB left	D	44.9	0.15	46	94
East Broadway WB thru/right	D	46.3	0.33	116	198
Dorchester Street NB left	E	78.2	0.71	71	128
Dorchester Street NB thru/right	E	67.2	0.78	191	268
Dorchester Street SB left/thru/right	F	125.7	1.06	~210	#318
Unsignalized Intersections					
F Street/West Broadway	**-**	**-**	**-**	**-**	**-**
West Broadway EB left/thru	A	1.3	0.03	-	2
West Broadway WB thru/right	A	0.0	0.17	-	0
F Street NB left/thru/right	C	22.7	0.36	-	40
F Street SB left/right	C	15.8	0.23	-	22
Dorchester Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	B	14.4	0.05	-	4
Dorchester Street NB left/thru | thru	A	1.0	0.13	-	1
Dorchester Street SB thru | thru/right	A	0.0	0.13	-	0
F Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB thru/right	A	9.6	0.05	-	4
F Street NB left/thru	A	1.2	0.01	-	1

~ - 50th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.

– 95th percentile volume exceeds capacity. 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					
Dorchester Street/West Broadway/East Broadway	**E**	**65.7**	**-**	**-**	**-**
West Broadway EB left/thru/right	E	58.5	0.74	235	342
East Broadway WB left	E	56.0	0.32	74	132
East Broadway WB thru/right	E	60.0	0.53	135	#244
Dorchester Street NB left	D	52.7	0.49	57	113
Dorchester Street NB thru/right	D	47.0	0.54	172	259
Dorchester Street SB left/thru/right	F	92.5	0.99	294	#490
Unsignalized Intersections					
F Street/West Broadway	**-**	**-**	**-**	**-**	**-**
West Broadway EB left/thru	A	1.0	0.02	-	2
West Broadway WB thru/right	A	0.0	0.18	-	0
F Street NB left/thru/right	C	15.2	0.13	-	11
F Street SB left/right	C	17.3	0.26	-	26
Dorchester Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	C	15.2	0.05	-	4
Dorchester Street NB left/thru | thru	A	1.0	0.12	-	1
Dorchester Street SB thru | thru/right	A	0.0	0.18	-	0
F Street/Silver Street			**-**	**-**	**-**
Silver Street WB thru/right	A	9.3	0.05	-	4
F Street NB left/thru	A	1.6	0.01	-	1

– 95th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.

Grey shading indicates LOS E or F.

7.4 No-Build (2024) Condition

The No-build (2024) Condition reflects a future scenario that incorporates any anticipated traffic volume changes independent of the Project, and any planned infrastructure improvements that will affect travel patterns throughout the study area. Infrastructure improvements include roadway, public transportation, or pedestrian and bicycle improvements. The methodology to account for future traffic growth, independent of the Project consists of two factors: an annual growth rate and vehicles associated with specific developments near the Project. The No-build (2024) Condition does not include the impact of the Project.

7.4.1 Background Traffic Growth

The first part of the methodology accounts for general future background traffic growth, independent of large development projects. The background traffic growth rate 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-half percent per year annual traffic growth rate was used.

7.4.2 Nearby Development Traffic Growth

The second part of the methodology identifies specific planned developments that are expected to be constructed within the future analysis time horizon. **Table 7-5** shows all of the nearby development projects in the vicinity of the Project site. Two projects have been identified as large projects and were specifically accounted for in the future traffic. The remaining 18 projects have been identified as small projects that were not specifically accounted for in the future traffic, however can be included as part of the background traffic growth. The nearby development projects are shown in **Figure 7-10**.

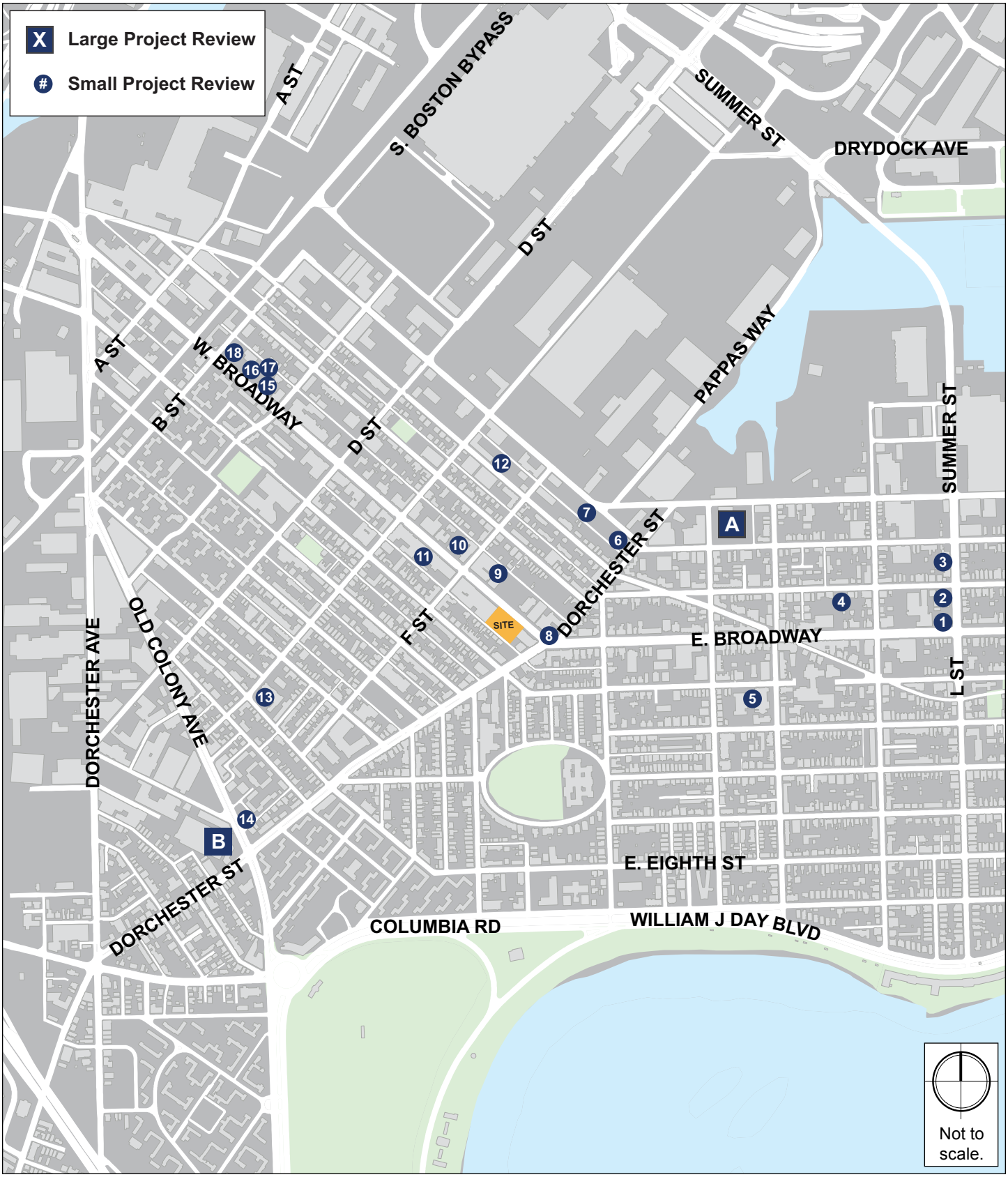


Figure 7-10.
Nearby Development Projects

Table 7-5. Nearby Development Projects

Reference #	Project	Program Description	Status
Specific Development Projects			
A	2 H Street	135 residential units, 206 parking spaces, 1600 SF of retail	Board Approved
B	235 Old Colony Avenue (Washington Village)	656 residential units, 8 new buildings on 6 city blocks	Board Approved
Background Development Projects			
1	728 E Broadway	18 residential units, 34 parking spaces, 6400 SF of commercial space	Under Construction
2	57 L Street	13 residential units, 21 parking spaces	Under Construction
3	45 L Street	30 residential units, 32 parking spaces, commercial space	Under Construction
4	545 E Third Street	18 condo units, 22 parking spaces	Board Approved
5	609 E Fourth Street Condominiums	26 condo units, 40 surface parking spaces	Board Approved
6	11 Dorchester Street	30 residential units, 54 parking spaces, 2230 SF of ground floor restaurant space	Under Construction
7	377 West First Street	9 residential units, 15 parking spaces, commercial space	Board Approved
8	480-482 West Broadway	18 condo units, 21 parking spaces, 4190 SF of commercial space	Board Approved
9	420 West Broadway	42 residential spaces. 42 parking spaces	Board Approved
10	410 West Broadway	24 condo units, 28 parking spaces, 3350 SF of retail space	Under Construction
11	395 West Broadway	24 rental units, 20 parking spaces, ground floor commercial space	Board Approved
12	340 West Second Street Development	29 residential units, 43 parking spaces, 1000 SF of commercial space	Board Approved
13	The Residences on E at 205 E Street	38 residential units, 63 parking spaces	Board Approved
14	232 Old Colony Avenue	24 residential units, 29 parking spaces	Under Construction
15	206 West Broadway	16 income restricted residential units, 1000 SF of ground floor commercial space	Board Approved
16	170 West Broadway	33 condo units, 39 parking spaces, 4283 SF of ground floor retail/restaurant space	Board Approved
17	135 Athens	15 residential units	Under Construction
18	150 West Broadway	24 condo units, 32 parking spaces, commercial retail space	Under Construction

7.4.3 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby improvement projects in the vicinity of the study area. Based on this review, no planned infrastructure improvements in the area are expected.

7.4.4 No-Build (2024) Condition Traffic Volumes

The one-half 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. and p.m. peak hour traffic volumes are shown on **Figure 7-11** and **Figure 7-12**, respectively.

7.4.5 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 shaded cells in the tables indicate a worsening in LOS between the Existing (2017) Condition and the No-build (2024) Condition. The detailed analysis sheets are provided in **Appendix D**.

As shown in **Table 7-6** and **Table 7-7**, the study area intersections and approaches continue to operate below capacity (v/c ratio below 1.00) and at acceptable levels of delay (LOS D or better) under the No-build (2024) Condition. The following locations were shown to have movements at capacity (v/c ratio or 1.00 or higher) or operating at high delays (LOS E or LOS F).

- The signalized intersection of Dorchester Street/West Broadway/East Broadway decreases from LOS E to LOS F during the p.m. peak hour. The Dorchester Street northbound left-turn approach decreases from LOS D to LOS E during the weekday p.m. peak hour. This decrease is due to the added vehicles from the background growth and specific development projects.

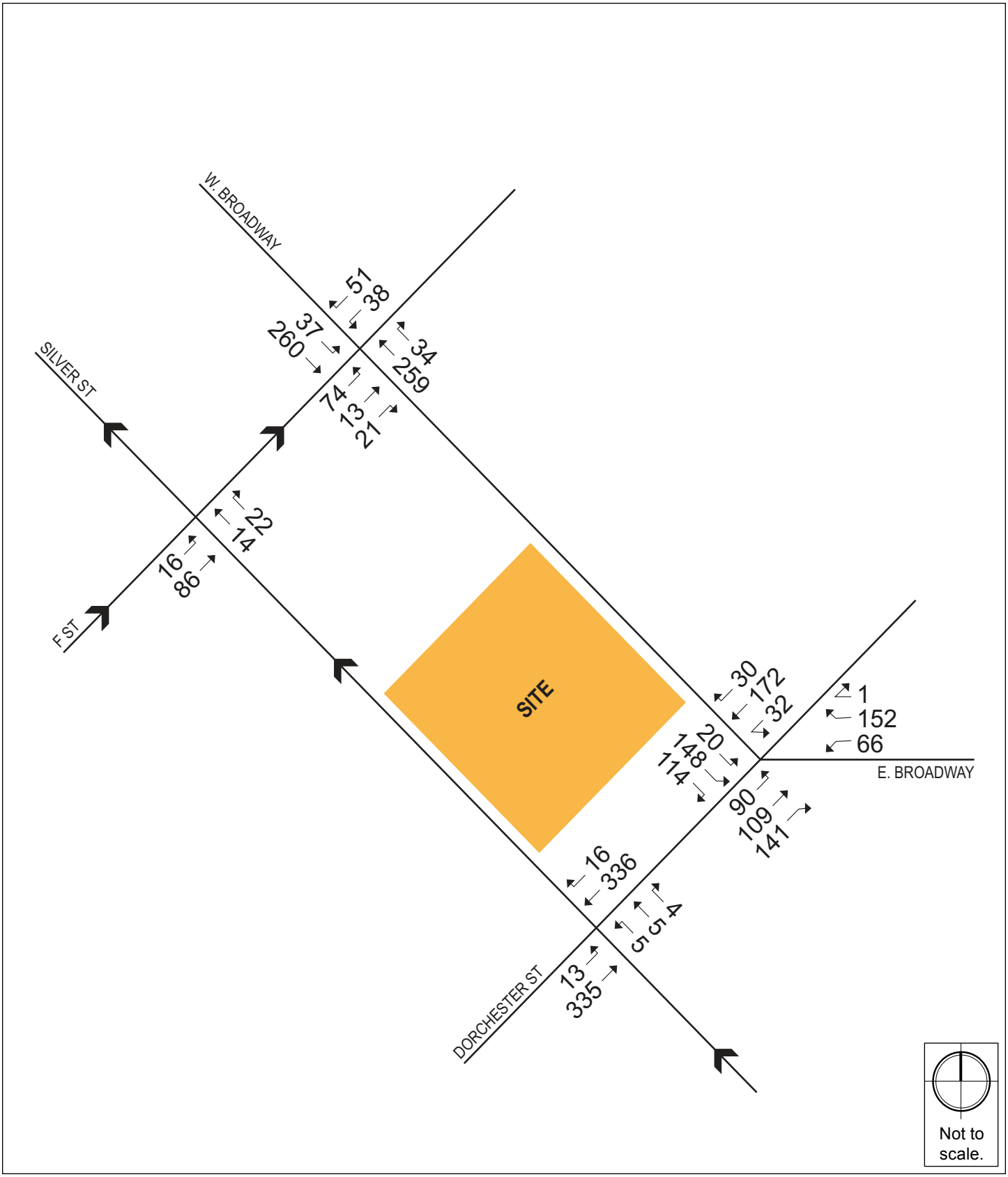


Figure 7-11.
No-build (2017) Condition Traffic Volumes, Weekday a.m. Peak Hour

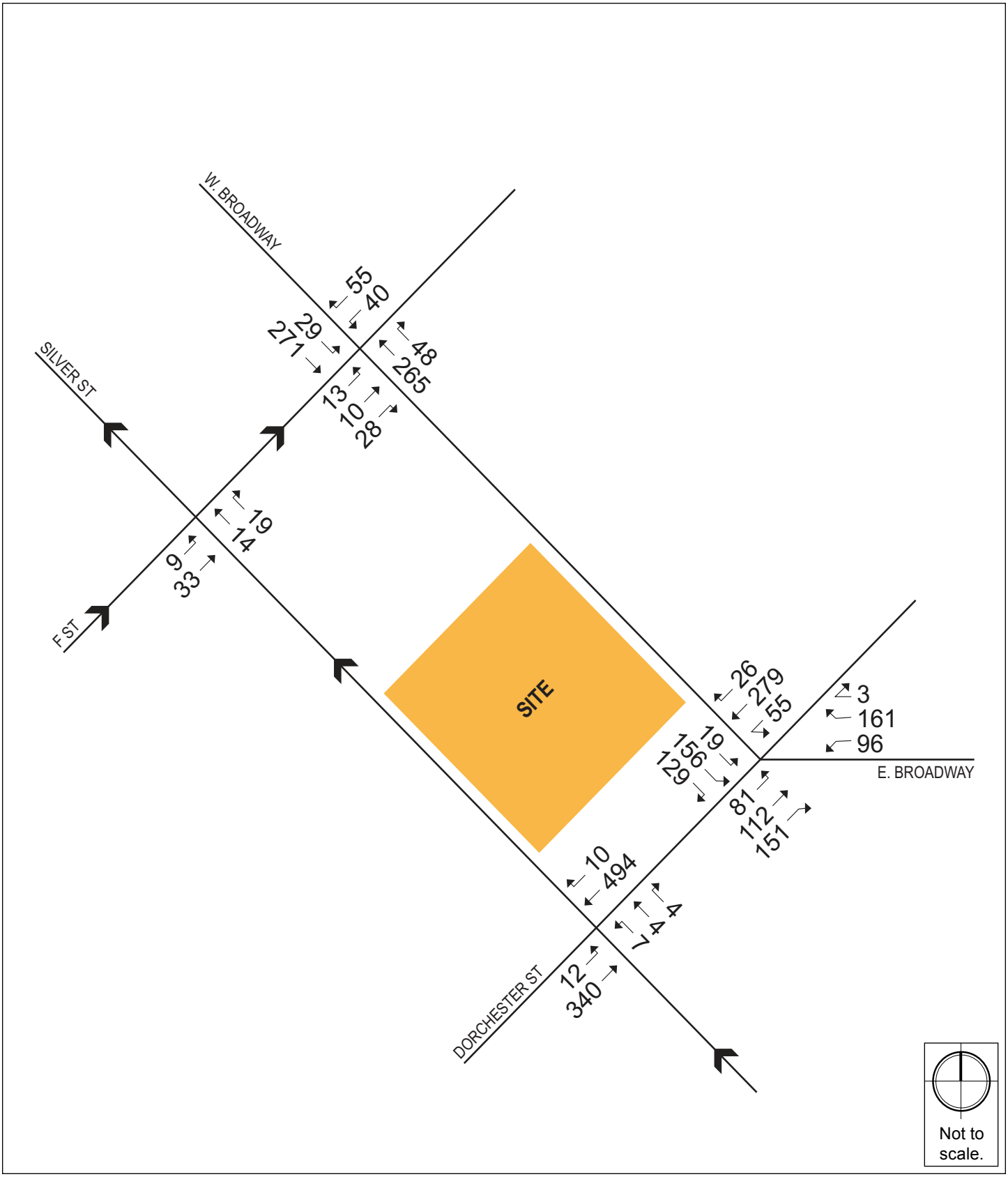


Figure 7-12.
No-build (2017) Condition Traffic Volumes, Weekday p.m. Peak Hour

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Dorchester Street/West Broadway/East Broadway	**E**	**72.8**	**-**	**-**	**-**
West Broadway EB left/thru/right	E	66.4	0.80	236	#375
East Broadway WB left	D	46.7	0.18	51	101
East Broadway WB thru/right	D	48.6	0.37	125	205
Dorchester Street NB left	E	71.1	0.67	71	133
Dorchester Street NB thru/right	E	63.8	0.76	201	290
Dorchester Street SB left/thru/right	F	113.6	1.02	209	#352
Unsignalized Intersections					
F Street/West Broadway	**-**	**-**	**-**	**-**	**-**
West Broadway EB left/thru	A	1.3	0.03	-	2
West Broadway WB thru/right	A	0.0	0.18	-	0
F Street NB left/thru/right	C	24.3	0.39	-	45
F Street SB left/right	C	16.3	0.25	-	24
Dorchester Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	B	14.9	0.05	-	4
Dorchester Street NB left/thru | thru	A	0.9	0.13	-	1
Dorchester Street SB thru | thru/right	A	0.0	0.14	-	0
F Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB thru/right	A	9.6	0.05	-	4
F Street NB left/thru	A	1.2	0.01	-	1

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

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Dorchester Street/West Broadway/East Broadway	**F**	**81.7**	**-**	**-**	**-**
West Broadway EB left/thru/right	E	60.3	0.77	246	#373
East Broadway WB left	E	59.6	0.36	80	141
East Broadway WB thru/right	E	61.7	0.57	142	#258
Dorchester Street NB left	E	56.6	0.55	61	123
Dorchester Street NB thru/right	D	48.9	0.61	201	298
Dorchester Street SB left/thru/right	F	143.1	1.16	~382	#584
Unsignalized Intersections					
F Street/West Broadway	**-**	**-**	**-**	**-**	**-**
West Broadway EB left/thru	A	1.0	0.03	-	2
West Broadway WB thru/right	A	0.0	0.19	-	0
F Street NB left/thru/right	C	15.6	0.14	-	12
F Street SB left/right	C	17.9	0.28	-	28
Dorchester Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	C	16.2	0.06	-	4
Dorchester Street NB left/thru | thru	A	0.9	0.14	-	1
Dorchester Street SB thru | thru/right	A	0.0	0.20	-	0
F Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB thru/right	A	9.3	0.05	-	4
F Street NB left/thru	A	1.6	0.01	-	1

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

Gray shading indicates decrease in LOS from Existing Condition below LOS E or LOS F.

7.5 Build (2024) Condition

As previously summarized, the Project will include the construction of approximately 44 residential units and 13,500 sf of ground floor retail space, with approximately 50 underground parking spaces in the garage. Vehicular access will be provided via Silver Street to the south of the Project site.

7.5.1 Site Access and Circulation

Vehicular access and egress will be provided by one full access curb cut along Silver Street. Silver Street is a one-way westbound roadway, therefore all entering traffic will come from Dorchester Street to the east. The primary pedestrian access to the building lobby and the three commercial entrances will be along West Broadway. Due to the grade change in the site, the West Broadway ground floor is one story higher than the Silver Street basement level. The site plan for both floors is shown in **Figure 7-13**.

7.5.2 Parking

This section presents the Project's parking supply and an evaluation of the Project's parking demand. As previously mentioned, the Project will include 50 parking spaces. Mechanical lifts will be provided by CityLift for 48 of the parking spaces. Residents will have a key card for their vehicle and the mechanical puzzle will bring their car to them. Each lift will be able to hold 16 vehicles and will be three vehicles high, with the lowest level underneath the garage in the pit, and two vehicles long. The remaining two parking spaces will be handicapped accessible spaces and be located in that garage.

This results in a parking ratio of approximately 1.14 parking spaces per residential unit. The parking ratio is consistent with the BTD maximum parking goals in the South Boston residential neighborhood of a maximum of 1.0 – 1.5 parking spaces per residential unit in a residential building distant from an MBTA station (greater than a ten-minute walk).

7.5.3 Loading and Service Accommodations

Residential units primarily generate delivery trips related to small packages and prepared food on a daily basis whereas commercial land uses primarily generate more frequent deliveries from smaller trucks. Residential units also generate move-in/move-out activity, although less frequently. Loading and service operations will occur in the garage's drive aisle adjacent to the freight elevator. The garage's drive aisle measures 21 feet wide and can accommodate a delivery truck and one travel lane for vehicles entering or exiting the garage. Deliveries planning to occupy this area will be scheduled to have a minimal effect on the residents of the building.

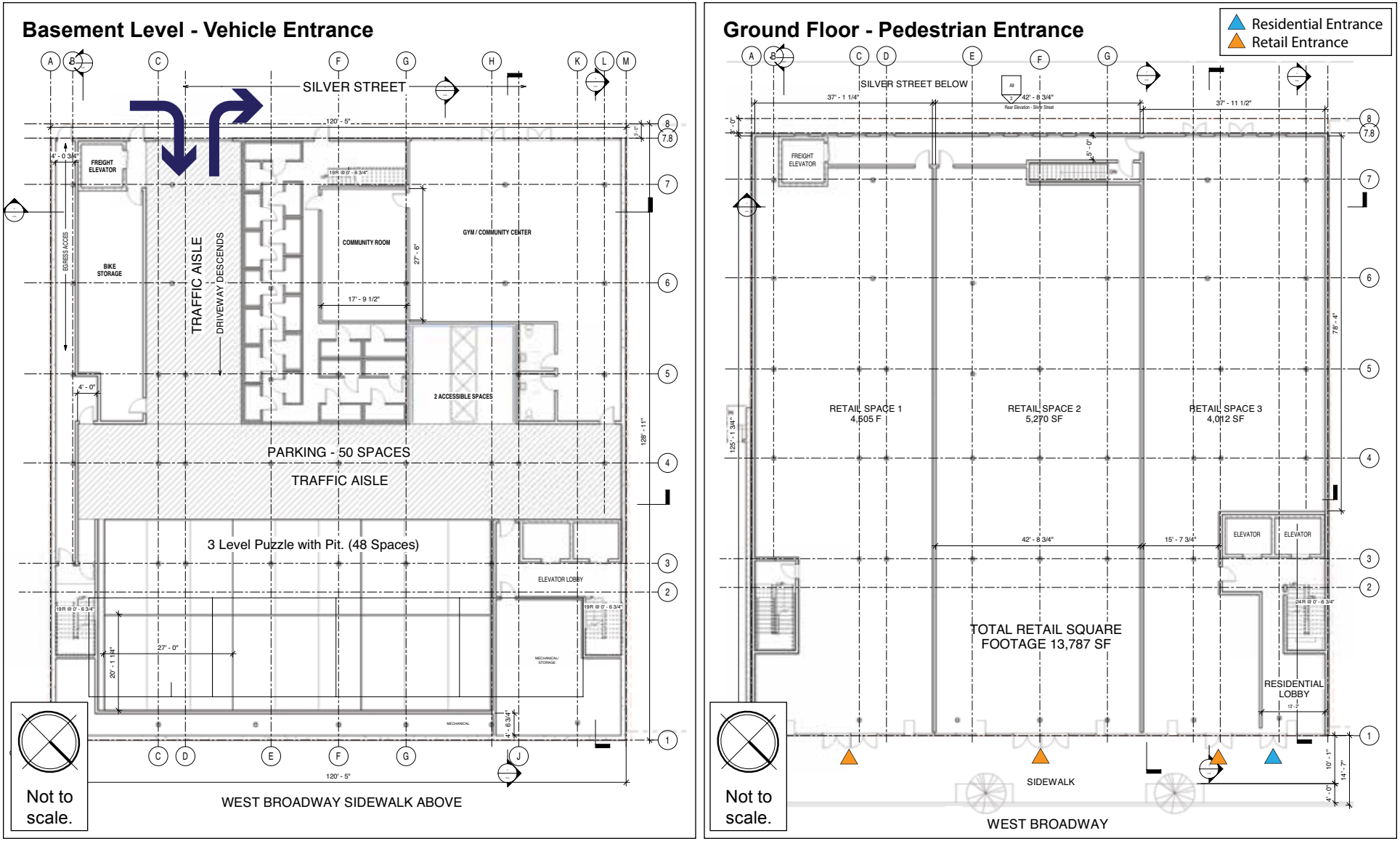


Figure 7-13.
Site Access Plan

7.5.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and employees, as well as short-term bicycle racks for visitors. Based on BTD guidelines, the Project will supply a minimum of 48 secure bicycle parking/storage spaces within the parking garage, 44 bicycle parking spaces for residents (one per unit) and 4 spaces for retail employees (0.3 per 1,000 sf of retail). The Project will also supply five public bicycle racks along West Broadway, parking for ten bicycles.

7.5.5 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*[4] 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:

Land Use Code 220 – Apartment. The Apartment land use code is defined as a rental unit that has at least three total rental units within the same building structure. The trip generation estimates are based on average vehicular rates per residential unit.

Land Use Code 230 – Residential Condominium/Townhouse. The residential condominium/ townhouse land use code is defined as an ownership unit that has at least one other owned unit within the same building structure. The trip generation estimates are based on average vehicular rates per residential unit.

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

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

7.5.6 Mode Share

BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. The Project is located within designated Area 13 – South Boston, which includes areas in South Boston and the Seaport District approximately one quarter mile to the east of the Red Line. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[5]. The person trips were then distributed to different modes according to the mode shares shown in **Table 7-8**.

Table 7-8. Travel Mode Shares

Land Use		*Walk/Bicycle Share[1]*	*Transit Share[1]*	*Auto Share[1]*	*Private Vehicle Occupancy Rate[2]*
Daily					
Residential	In	34%	19%	47%	1.13
	Out	34%	19%	47%	1.13
Commercial	In	43%	5%	52%	1.78
	Out	43%	5%	52%	1.78
a.m. Peak					
Residential	In	36%	16%	48%	1.13
	Out	42%	24%	34%	1.13
Commercial	In	43%	4%	53%	1.78
	Out	54%	6%	40%	1.78
p.m. Peak					
Residential	In	42%	24%	34%	1.13
	Out	36%	16%	48%	1.13
Commercial	In	54%	6%	40%	1.78
	Out	43%	4%	53%	1.78

1. Based on rates published by the Boston Transportation Department for Area 13 – South Boston.
2. 2009 National Household Travel Survey.

7.5.7 Trip Generation

To account for the future impact of the Project, the existing land use on the site was taken into consideration. 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 for the existing site as well as the proposed Project. The detailed trip generation information for the existing and proposed site is provided in **Appendix D**.

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

Existing Site Trip Generation

The trip generation estimates for the existing uses are presented in **Table 7-9**.

Table 7-9. Existing Site Trip Generation Summary

Land Use		*Walk/Bicycle Trips*[1]	*Transit Trips*[1]	*Auto Trips*[1]
Daily				
Residential[1]	In	9	5	11
	Out	9	5	11
	Total	18	10	22
Commercial[2]	In	176	20	120
	Out	176	20	120
	Total	352	40	140
Total	**In**	**185**	**25**	**131**
	Out	**185**	**25**	**131**
	Total	**370**	**50**	**262**
a.m. Peak Hour				
Residential[1]	In	0	0	1
	Out	1	1	1
	Total	1	1	2
Commercial[2]	In	5	0	3
	Out	4	0	2
	Total	9	0	5
Total	**In**	**5**	**0**	**4**
	Out	**5**	**1**	**3**
	Total	**10**	**1**	**7**
p.m. Peak Hour				
Residential[1]	In	1	1	1
	Out	1	0	1
	Total	2	1	2
Commercial[2]	In	18	2	8
	Out	16	1	11
	Total	34	3	19
Total	**In**	**19**	**3**	**9**
	Out	**17**	**1**	**12**
	Total	**36**	**4**	**21**

1. Based on ITE LUC 220 – Apartment; 7 units, average rate.
2. Based on ITE LUC 820 – Shopping Center; 10,771 sf, average rate.

As shown in **Table 7-9**, the existing site currently generates approximately 262 vehicular trips on a daily basis, with 7 vehicular trips during the weekday a.m. peak hour and 21 vehicular trips during the weekday p.m. peak hour.

Project Site Trip Generation

The trip generation estimates for the proposed Project are presented in **Table 7-10**.

Table 7-10. Proposed Trip Generation Summary

Land Use		*Walk/Bicycle Trips*[1]	*Transit Trips*[1]	*Auto Trips*[1]
Daily				
Residential[1]	In	53	30	65
	Out	53	30	65
	Total	106	60	130
Commercial[2]	In	253	29	172
	Out	253	29	172
	Total	506	58	344
Total	**In**	**306**	**59**	**237**
	Out	**306**	**59**	**237**
	Total	**612**	**118**	**474**
a.m. Peak Hour				
Residential[1]	In	2	1	2
	Out	8	5	6
	Total	10	6	8
Commercial[2]	In	7	1	4
	Out	6	1	2
	Total	13	2	6
Total	**In**	**9**	**2**	**6**
	Out	**14**	**6**	**8**
	Total	**23**	**8**	**14**
p.m. Peak Hour				
Residential[1]	In	8	5	5
	Out	3	1	4
	Total	11	6	9
Commercial[2]	In	27	3	11
	Out	23	2	16
	Total	50	5	27
Total	**In**	**35**	**8**	**16**
	Out	**26**	**3**	**20**
	Total	**61**	**11**	**36**

1. Based on ITE LUC 230 – Residential Condominium/Townhouse; 48 units, average rate.
2. Based on ITE LUC 85 – Shopping Center; 15,525 sf, average rate.

As shown in **Table 7-10**, the existing uses on the site generate approximately 474 vehicular trips on a daily basis, with 14 vehicular trips during the weekday a.m. peak hour and 36 vehicular trips during the weekday p.m. peak hour.

Net New Trip Generation

The net new trips calculation subtracts the trips generated by the existing land uses on-site from the trips generated by the proposed land uses. The net new transit, walk/bike, and vehicle trips for the Project are presented in **Table 7-11**.

Table 7-11. Net New Trip Generation Summary

Land Use		*Walk/Bicycle Trips*[1]	*Transit Trips*[1]	*Auto Trips*[1]
Daily				
Residential[1]	In	44	25	54
	Out	44	25	54
	Total	88	50	108
Commercial[2]	In	77	9	52
	Out	77	9	52
	Total	154	18	104
Total	**In**	**121**	**34**	**106**
	Out	**121**	**34**	**106**
	Total	**242**	**68**	**212**
a.m. Peak Hour				
Residential[1]	In	2	1	1
	Out	7	4	5
	Total	9	5	6
Commercial[2]	In	2	1	1
	Out	2	1	0
	Total	4	2	1
Total	**In**	**4**	**2**	**2**
	Out	**9**	**5**	**5**
	Total	**13**	**7**	**7**
p.m. Peak Hour				
Residential[1]	In	7	4	4
	Out	2	1	3
	Total	9	5	7
Commercial[2]	In	9	1	3
	Out	7	1	5
	Total	16	2	8
Total	**In**	**16**	**5**	**7**
	Out	**9**	**2**	**8**
	Total	**25**	**7**	**15**

1. Based on 7 residential units and 10,771 sf of commercial space.
2. Based on 48 residential units and 15,525 sf of commercial space.

As shown in **Table 7-11**, the Project will generate approximately 212 new daily vehicle trips (106 entering and 106 exiting), with 7 new vehicle trips during the a.m. peak hour (2 entering and 5 exiting) and 15 new vehicle trips during the p.m. peak hour (7 entering and 8 exiting). This corresponds to an increase of approximately one vehicle trip every eight minutes during the a.m.

peak hour and one vehicle trips every four minutes during the p.m. peak hour on adjacent roadway network during the peak periods.

7.5.8 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 13 – South Boston and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in **Figure 7-14**.

7.5.9 Build (2024) Traffic Volumes

The residential vehicle trips were distributed through the study area based on the trip distribution shown in **Figure 7-14** to the buildings garage driveway along Silver Street. The retail trips were distributed to the public on-street parking spaces along West Broadway between Dorchester Street and F Street or the public parking lot (Residential Lot #18) adjacent to the post office. The project-generated trips for the weekday a.m. and p.m. peak hours are shown in **Figure 7-15** and **Figure 7-16**, respectively. The project generated trips 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. and p.m. peak hour traffic volumes are shown on **Figure 7-17** and **Figure 7-18**, respectively.

7.5.10 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 7-12** and **Table 7-13** present the Build (2024) Condition capacity analysis for the weekday a.m. and p.m. peak hour, respectively. The shaded cells in the tables indicate a worsening of LOS between the No-build (2024) Condition and the Build (2024) Condition. The detailed analysis sheets are provided in **Appendix D**.

As shown in **Table 7-12** and **Table 7-13**, all the study area intersections and approaches continue to operate below capacity (v/c ratio below 1.00) and at acceptable levels of delay (LOS D or better) under the No-Build (2024) Condition.

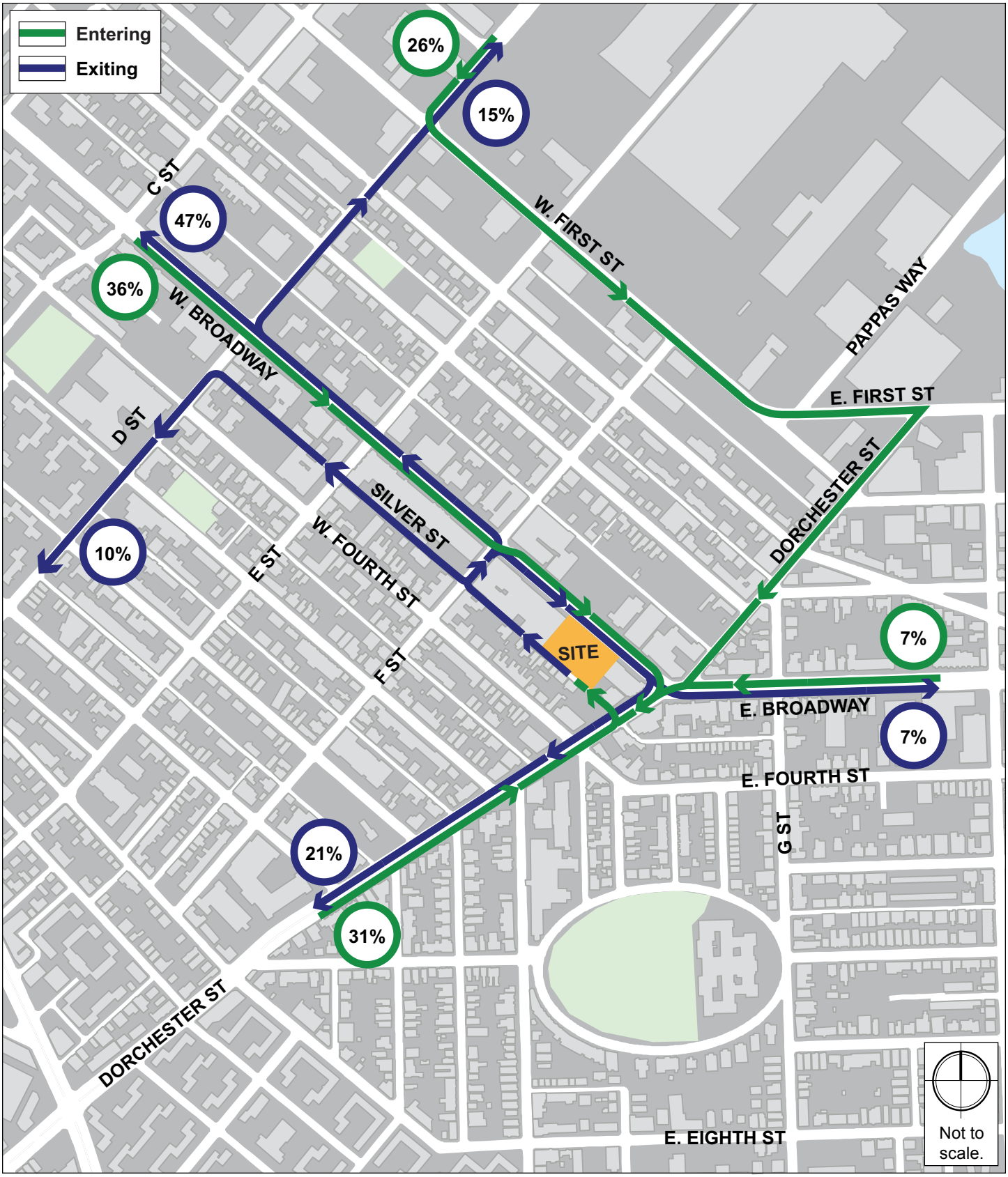


Figure 7-14.
Trip Distribution

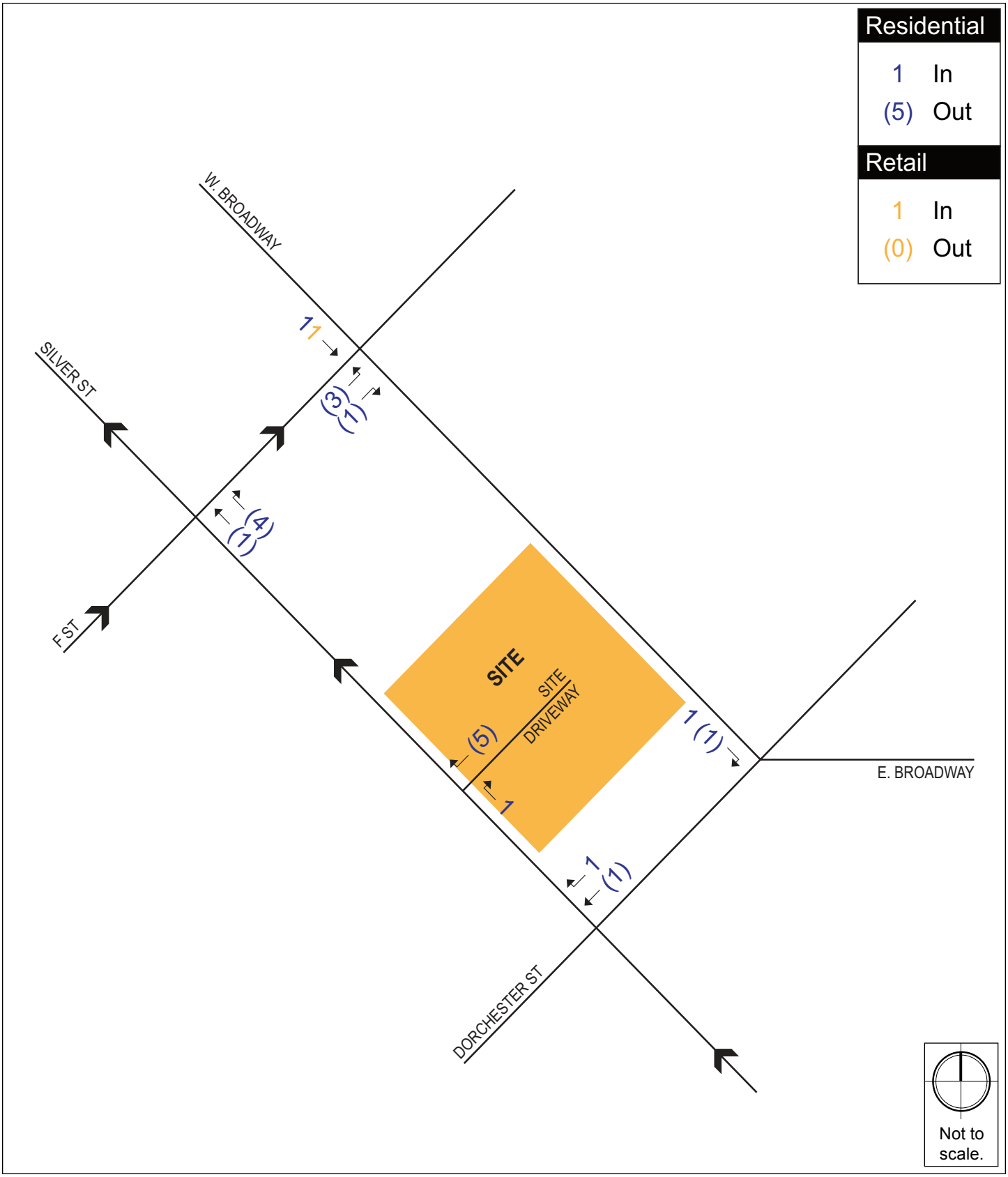


Figure 7-15.
Project-generated Vehicle Trips, Weekday a.m. Peak Hour

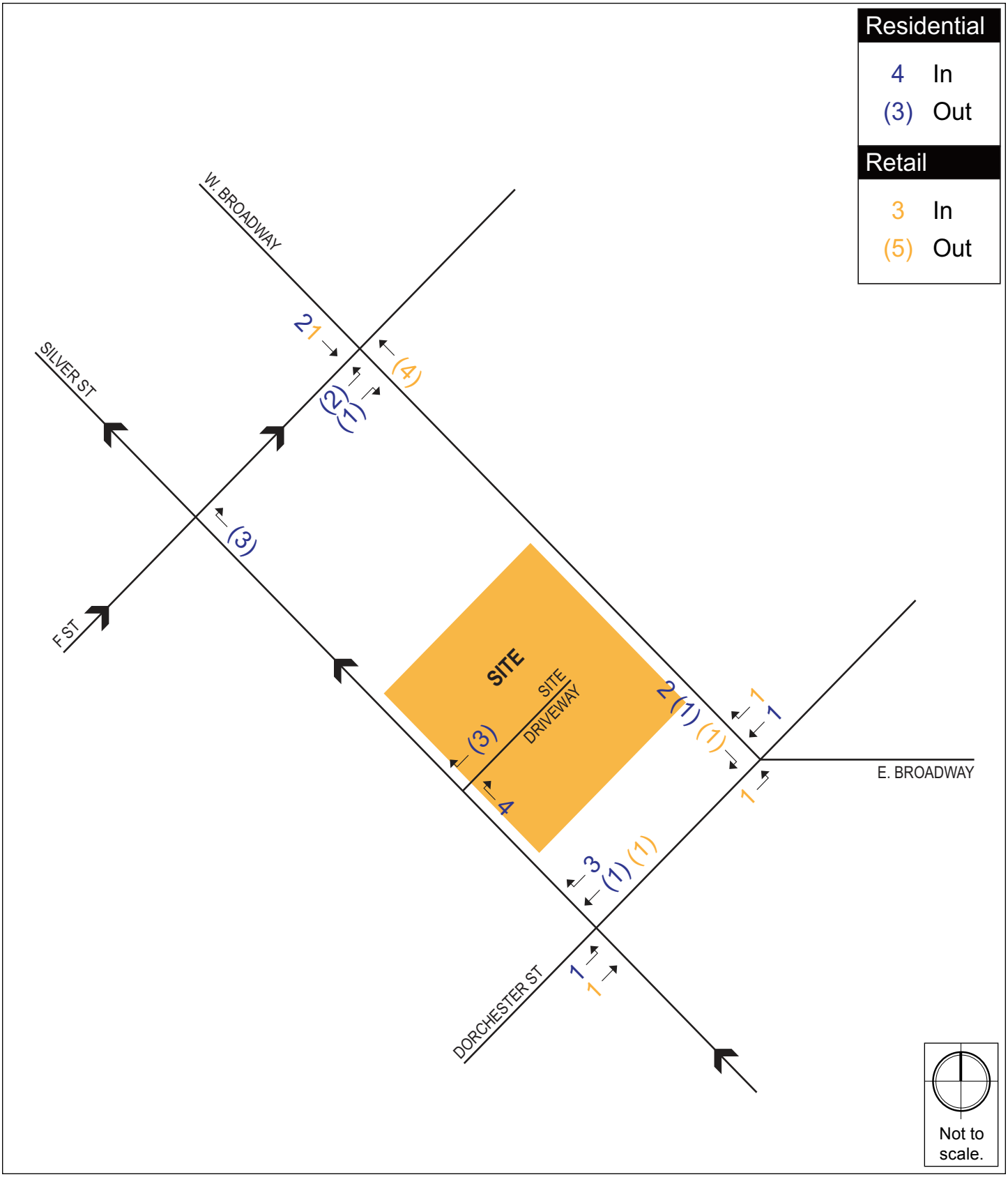


Figure 7-16.
Project-generated Vehicle Trips, Weekday p.m. Peak Hour

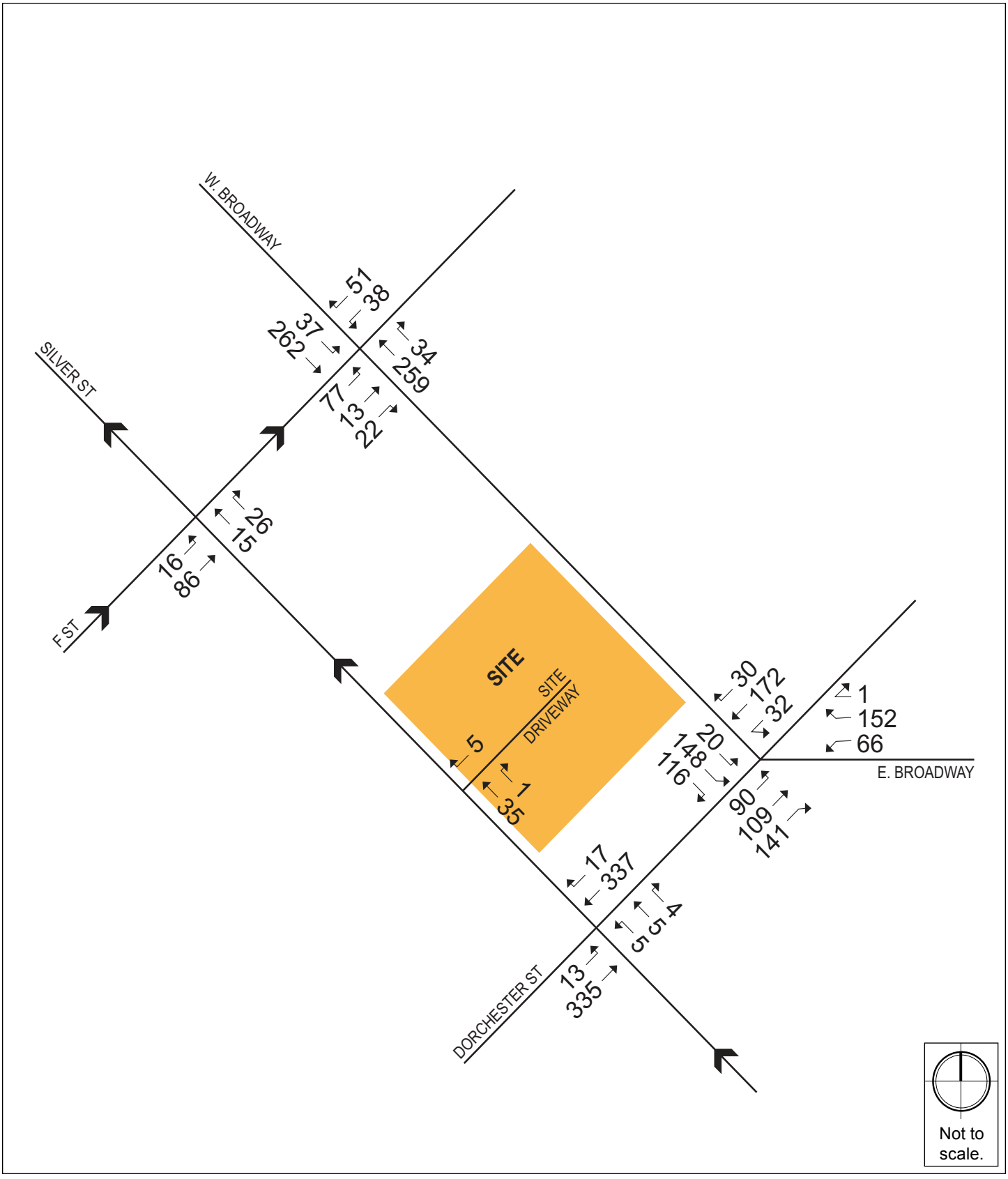


Figure 7-17.
Build (2024) Condition Traffic Volumes, Weekday a.m. Peak Hour

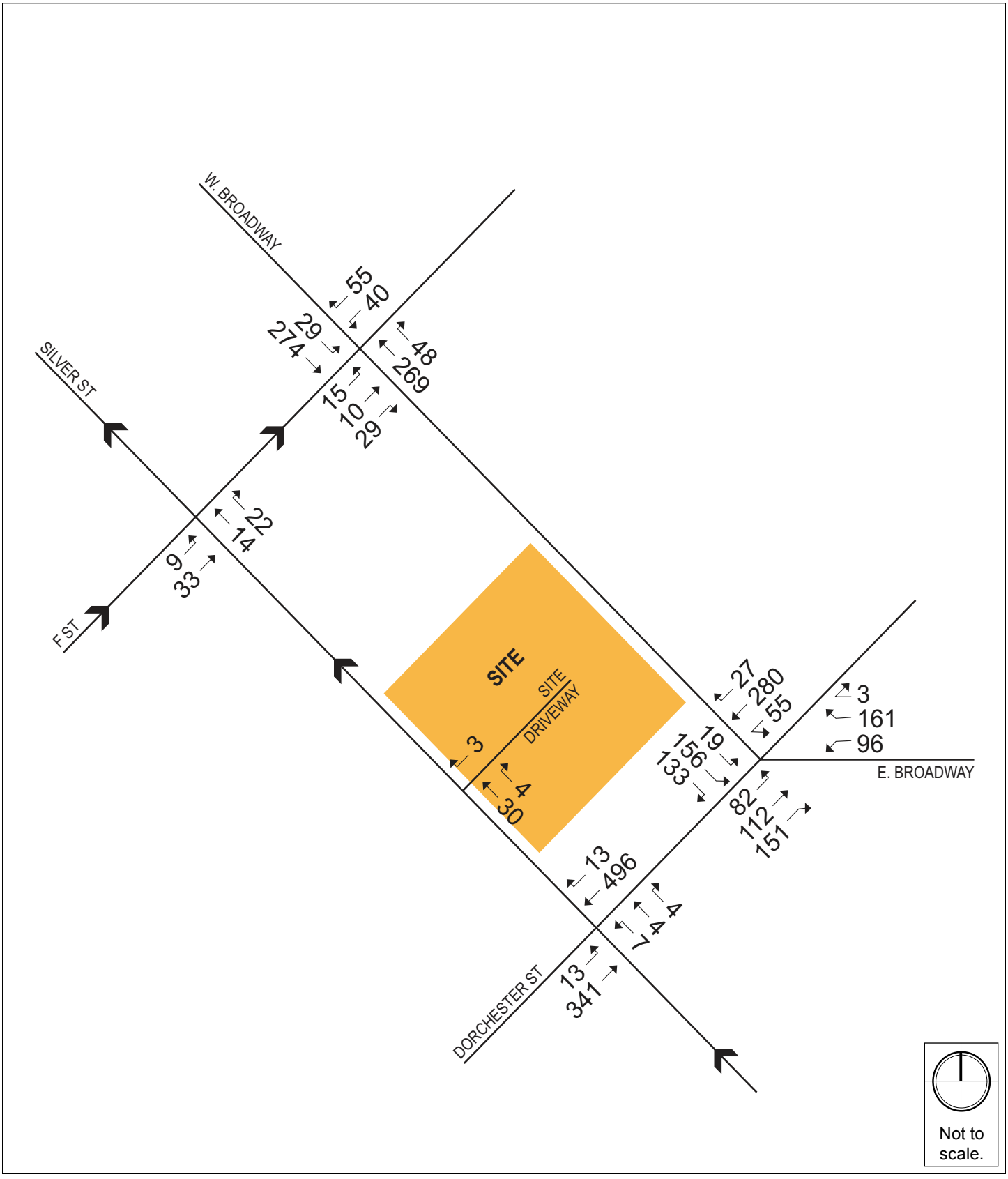


Figure 7-18.
Build (2024) Condition Traffic Volumes, Weekday p.m. Peak Hour

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Dorchester Street/West Broadway/East Broadway	**E**	**73.0**	**-**	**-**	**-**
West Broadway EB left/thru/right	E	66.9	0.81	238	#378
East Broadway WB left	D	46.9	0.18	51	101
East Broadway WB thru/right	D	48.6	0.37	125	205
Dorchester Street NB left	E	71.1	0.67	71	133
Dorchester Street NB thru/right	E	63.8	0.76	201	290
Dorchester Street SB left/thru/right	F	113.6	1.02	209	#352
Unsignalized Intersections					
F Street/West Broadway	**-**	**-**	**-**	**-**	**-**
West Broadway EB left/thru	A	1.3	0.03	-	2
West Broadway WB thru/right	A	0.0	0.18	-	0
F Street NB left/thru/right	C	25.0	0.41	-	48
F Street SB left/right	C	16.4	0.25	-	24
Dorchester Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	B	15.0	0.05	-	4
Dorchester Street NB left/thru | thru	A	0.9	0.13	-	1
Dorchester Street SB thru | thru/right	A	0.0	0.14	-	0
F Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB thru/right	A	9.6	0.06	-	4
F Street NB left/thru	A	1.2	0.01	-	1
Silver Street/Site Driveway	-	-	-	-	-
Silver Street WB thru/right	A	0.0	0.02	-	0
Site Driveway SB right	A	8.5	0.00	-	0

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

Table 7-13. Build (2024) Condition Capacity Summary, Weekday p.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
Dorchester Street/West Broadway/East Broadway	**F**	**82.6**	**-**	**-**	**-**
West Broadway EB left/thru/right	E	61.1	0.78	250	#380
East Broadway WB left	E	56.9	0.36	80	141
East Broadway WB thru/right	E	61.7	0.57	142	#258
Dorchester Street NB left	E	57.3	0.56	62	125
Dorchester Street NB thru/right	D	48.9	0.61	201	298
Dorchester Street SB left/thru/right	F	145.2	1.17	~386	#586
Unsignalized Intersections					
F Street/West Broadway	**-**	**-**	**-**	**-**	**-**
West Broadway EB left/thru	A	1.0	0.03	-	2
West Broadway WB thru/right	A	0.0	0.19	-	0
F Street NB left/thru/right	C	15.9	0.15	-	13
F Street SB left/right	C	18.1	0.28	-	29
Dorchester Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB left/thru/right	C	16.3	0.06	-	4
Dorchester Street NB left/thru | thru	A	1.0	0.14	-	1
Dorchester Street SB thru | thru/right	A	0.0	0.20	-	0
F Street/Silver Street	**-**	**-**	**-**	**-**	**-**
Silver Street WB thru/right	A	9.2	0.05	-	4
F Street NB left/thru	A	1.6	0.01	-	1
Silver Street/Site Driveway	-	-	-	-	-
Silver Street WB thru/right	A	0.0	0.02	-	0
Site Driveway SB right	A	8.5	0.00	-	0

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

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

7.6 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 several 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:

- **Transportation Coordinator**: The Proponent will encourage the 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, walking, car sharing, and bike sharing opportunities in the area.
- **Orientation Packets**: The Proponent will be encouraged to 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.
- **Annual Newsletter**: The proponent will be encouraged to provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options.
- **Real Time Transportation**: Provide real time information on travel alternatives for residents, 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.

7.7 Transportation Mitigation Measures

While the traffic impacts associated with the new trips are minimal, 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.

7.8 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 Requirement

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. Two handicap accessible spaces will be provided inside the garage near the elevators.

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 is not expected 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.

463 West Broadway LLC

Michael Moore

Signature of Proponent

12/01/17

Date

Mitchell L. Fischman ("MLF") Consulting LLC

Mitchell L. Fischman

Signature of Preparer
Mitchell L. Fischman, Principal

12/01/17

Date

APPENDIX A – LETTER OF INTENT (LOI) TO FILE PNF, SEPTEMBER 6, 2017

A&M Adams & Morancy
COUNSELORS - AT - LAW

September 6, 2017

Mr. Brian Golden, Director
Boston Planning and Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201
Attn: Raul Duverge, Project Manager

RE: Letter of Intent to File Project Notification - Article 80 Large Project Review
457 – 469A West Broadway, South Boston

Dear Director Golden:

This office represents 463 West Broadway, LLC (the "Proponent"), a Massachusetts limited liability company and proposed owner-developer of the real property located at 457-469A West Broadway in South Boston (the "Site"). The purpose of this letter is to notify the Boston Planning and Development Agency (the "BPDA") of our client's intent to file an Expanded Project Notification Form (the "PNF") with the BPDA pursuant to Article 80B, Large Project Review, of the Boston Zoning Code (the "Code").

The Proponent's project contemplates the construction of a new mixed-use building of approximately 68,434 square feet of gross floor area, to contain a planned 44 residential units and approximately 13,690 square feet of ground-floor commercial space, 5,707 square feet of basement residential amenity space, served by 48 basement-level 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 15,612 square feet and is bounded to the north by West Broadway, to the south by Silver Street, to the east by a mixed-use building at 471 West Broadway, and to the west by 451-455 West Broadway, a local bank branch. The Site is currently occupied by three connected commercial buildings, ranging from one to three stories, containing various commercial uses, with vehicular access by means of a curb cut on Silver Street. All structures would be demolished to allow for the completion of the Proposed Project.

The surrounding neighborhood is a mix of retail, office, restaurant, and other local service uses, as well as upper-story residential condominium units and apartments. MBTA buses run on routes 9 and 11 on both West Broadway and nearby Dorchester Street and West Sixth

Street. As the site is surrounded by several abutting and nearby mixed-use structures of comparable massing, with numerous five-story structures punctuating West Broadway, 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 will require relief from the terms of the Boston Zoning Code. It should be noted that the BPDA intends to soon begin the process, with City officials and neighborhood participants, of reviewing and likely updating the existing zoning of both East Broadway and West Broadway, and that the Proposed Project was designed taking into consideration anticipated new building height, density, and massing limitations on West Broadway expected to be proposed by the BPDA.

The size of the Proposed Project 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 contained in a Draft Project Impact Report, including a transportation analysis, air and noise impacts, shadow effects, infrastructure, historic resources, and other environmental evaluations, all of which will help explain potential impacts arising from the Proposed Project, as well as any needed mitigation measures to reduce those impacts.

Prior to submitting this Letter of Intent, the project team conducted extensive preliminary community outreach to seek initial input and support for the Proposed Project, including presentations on March 21, 2017 to the St. Vincent/Lower End Neighborhood Association, and on April 4, 2017 to the West Broadway Neighborhood Association. The project team also presented details of the Proposed Project to a meeting of South Boston's elected officials, held at Boston City Hall on March 23, 2017. Since those initial meetings, our team has continued to work cooperatively with BPDA staff to further refine the details and design of the Proposed Project.

We wish to thank you and BPDA staff for your time and attention to this matter. Our team looks forward to continuing to work closely with your staff, other City agencies, elected officials, and with abutters and other neighbors in order to arrive at a final project that will be met with considerable public support.

Very truly yours,

George Morancy, Esq.

350 West Broadway, South Boston, MA 02127-1971
Tel.: 617-269-5800 • Fax: 617-269-5923

Attachment: Figure 1, Project Locus

cc: Jonathan Greeley, BPDA
Raul Duverge, BPDA
John Allison, Mayor's Office of Neighborhood Services
City Councilor Michael F. Flaherty
City Councilor Bill Linehan
Senator Linda Dorcena Forry
Representative Nick Collins

350 West Broadway, South Boston, MA 02127-1971
Tel.: 617-269-5800 • Fax: 617-269-5923

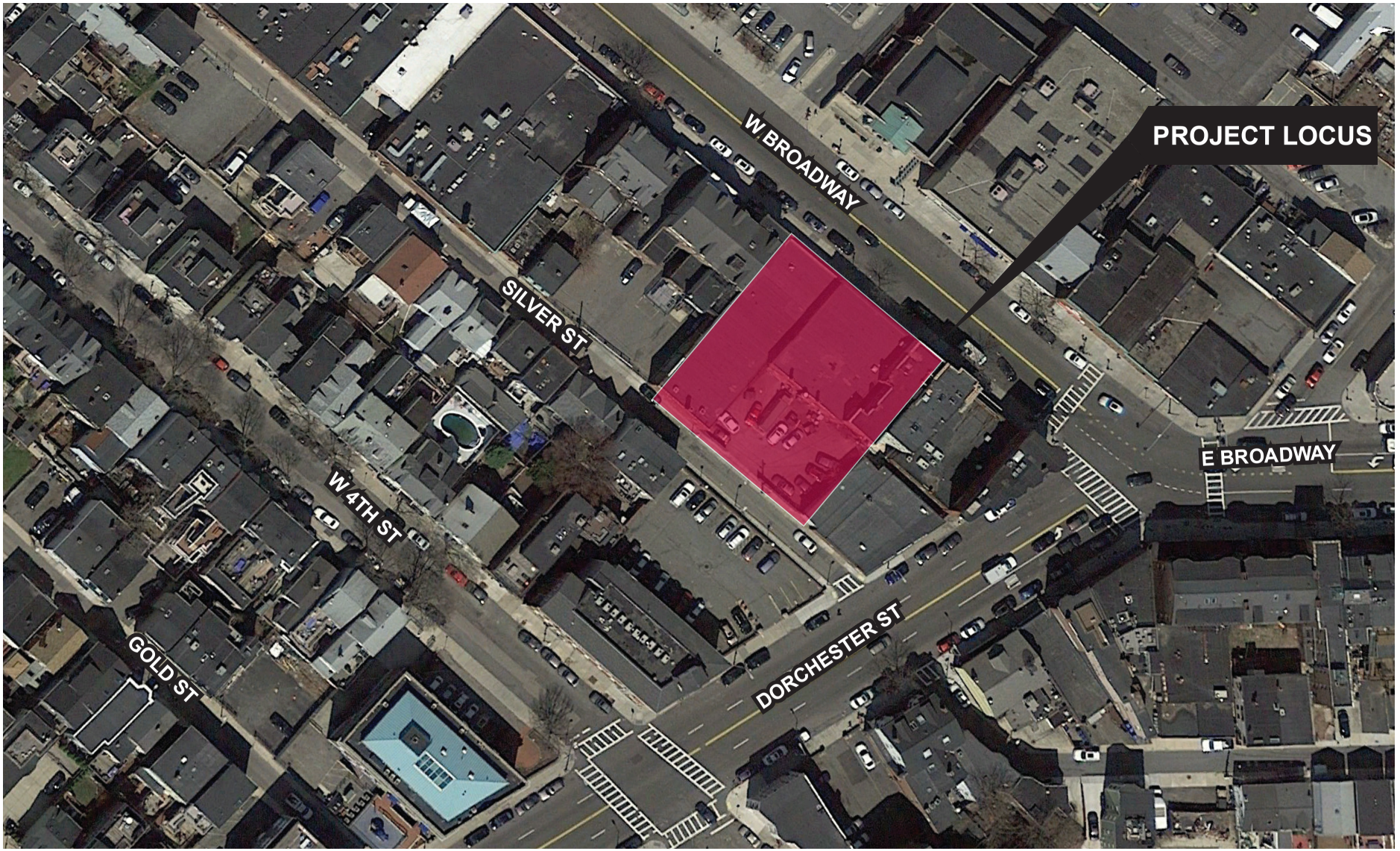


Figure 1 - Project Locus

Figure 1. Project Locus
457-469A West Broadway, So. Boston, MA

APPENDIX B – AIR QUALITY APPENDIX

APPENDIX B
AIR QUALITY

457-469A WEST BROADWAY
PROJECT NOTIFICATION FORM

 *** MODELOPTs: NonDFAULT CONC FLAT 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 =   22159.0 ; 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 Assumes No 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   571 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 line(s)

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

 **The AERMET Input Meteorological Data Version Date: 16126

 **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 = 3.6 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\4269\CO_5yrs_CO.SUM

*** AERMOD - VERSION 16216r *** *** 457 W. Broadway *** 10/13/17
*** AERMET - VERSION 16126 *** *** CO 1-Hour Screening Modeling *** 12:49:10
PAGE 2
*** MODELOPTs: NonDFAULT CONC FLAT NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

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

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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,

*** AERMOD - VERSION 16216r *** *** 457 W. Broadway *** 10/13/17
*** AERMET - VERSION 16126 *** *** CO 1-Hour Screening Modeling *** 12:49:10
PAGE 3
*** MODELOPTs: NonDFAULT CONC FLAT NOCHKD SCREEN NODRYDPLT NOWETDPLT URBAN

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

Surface file: Urban.sfc Met Version: 16126
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)
 *** AERMOD - VERSION 16216r ***   *** 457 W. Broadway                                                    ***        10/13/17
 *** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                       ***        12:49:10
                                                                                                                   PAGE   4
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN

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


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

                                                    DATE                                                                NETWORK
GROUP ID                          AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL      HIGH   1ST HIGH VALUE IS       0.08165  ON 10020102: AT (  237400.00,   898400.00,     5.00,     5.00,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION 16216r ***   *** 457 W. Broadway                                                    ***        10/13/17
 *** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                       ***        12:49:10
                                                                                                                   PAGE   5
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  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            1 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: 457 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:	7	VEH/HOUR
CO RATE:	2.976	GRAMS CO/MILE
SPEED IN GARAGE:	5.0	M.P.H.
VENT CFM:	23,869	CFM

TOTAL CO EMISSIONS = 0.012 GRAMS/MIN = 0.00020 GRAMS/SEC
TOTAL VENTILATION = 302 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 0.034 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	0.034	6	5	CO	2.976
5	0.034	7	5	CO	2.976

APPENDIX C – NOISE APPENDIX

APPENDIX C
NOISE

457-469A WEST BROADWAY
PROJECT NOTIFICATION FORM

Page Contents

FIGURE 1
Sound Monitoring & Modeling Receptor Locations
457-469 West Broadway
Boston, MA

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Cadna Noise Modeling Results

City of Boston Noise Ordinance Analysis

Name	M.	ID	Level Lr		Octave Band Day										Height	Coordinates		
			Day	Night	Night	31	63	125	250	500	1000	2000	4000	8000		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(m)	(m)	(m)	(m)
313 Silver St		Receptor	31.2	31.2	0	40.6	40.5	36.4	29.1	26.6	24.9	24.5	20.7	12.4	8.5	237350.45	898435.68	21.98
479 W Broadway		Receptor	23.6	23.6	0	32.7	34	31.3	24.2	21.2	17.1	13.8	6.2	-5.5	12	237427.72	898432.92	29.04
472 W Broadway		Receptor	34	34	0	35	37.5	37.1	32.5	31.5	28.8	26.5	19.7	6.1	7	237421.09	898465.41	24.01
451 W Broadway		Receptor	34	34	0	41.8	43.7	41.8	34.7	31.5	27.4	24.3	17.7	8.1	10	237368.5	898477.61	25.32
309 Silver St		Receptor	38.6	38.6	0	40.7	42.9	41.2	36.2	35.6	33.4	31.6	25.7	13.3	3	237319.24	898461.34	15.95

MassDEP Noise Policy Analysis

Nighttime					
Name	**ID**	**Project Level (dBA)**	**Background Level (dBA)**	**Total New Level (dBA)**	**Increase Over Existing (dBA)**
313 Silver St	Top_Floor	31.2	53.2	53.2	0.0
309 Silver St	Top_Floor	31.2	53.2	53.2	0.0
479 W Broadway	Top_Floor	23.6	52.3	52.3	0.0
472 W Broadway	Top_Floor	34	52.3	52.4	0.1
451 W Broadway	Top_Floor	34	52.8	52.9	0.1
Daytime					
Name	**ID**	**Project Level (dBA)**	**Background Level (dBA)**	**Total New Level (dBA)**	**Increase Over Existing (dBA)**
313 Silver St	Top_Floor	31.2	52.6	52.6	0.0
309 Silver St	Top_Floor	23.6	52.6	52.6	0.0
479 W Broadway	Top_Floor	34	61.2	61.2	0.0
472 W Broadway	Top_Floor	34	60.5	60.5	0.0
451 W Broadway	Top_Floor	38.6	60.5	60.5	0.0

APPENDIX D – TRANSPORTATION APPENDIX

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 1
Location:	South Boston, MA
Street 1:	West Broadway/East Broadway
Street 2:	Dorchester Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

TOTAL (CARS & TRUCKS)

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	27	25	22	0	4	29	8	0	3	33	23	0	12	34	0
7:15 AM	0	23	28	24	0	3	28	9	0	4	34	24	0	16	36	0
7:30 AM	0	25	27	25	0	5	32	9	0	4	33	25	0	17	38	0
7:45 AM	0	21	28	31	0	6	35	8	0	3	35	28	0	14	37	0
8:00 AM	0	19	25	35	0	8	39	7	0	4	38	27	0	17	39	1
8:15 AM	0	23	24	34	0	9	42	6	0	5	36	28	0	15	36	0
8:30 AM	0	24	23	31	0	8	40	7	0	4	34	27	0	16	35	0
8:45 AM	0	23	22	29	0	7	36	7	0	3	29	24	0	17	33	0

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	21	15	32	0	14	62	3	0	2	39	29	0	21	31	0
4:15 PM	0	19	18	35	0	16	65	4	0	3	40	32	0	24	33	0
4:30 PM	0	18	21	34	0	15	66	7	0	4	37	33	0	22	37	1
4:45 PM	0	19	24	35	0	14	63	5	0	5	38	32	0	21	38	0
5:00 PM	0	20	26	32	0	13	62	6	0	4	39	31	0	23	41	1
5:15 PM	0	21	25	33	0	11	61	7	0	4	37	29	0	24	39	1
5:30 PM	0	22	23	30	0	12	63	7	0	4	35	27	0	20	38	1
5:45 PM	0	20	22	29	0	10	58	6	0	2	31	26	0	22	36	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**87**	**100**	**131**	**0**	**31**	**156**	**28**	**0**	**16**	**143**	**110**	**0**	**61**	**147**	**1**
PHF	**0.98**				**0.94**				**0.97**				**0.93**			
HV %	**0.0%**	**1.1%**	**2.0%**	**3.8%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**2.1%**	**0.9%**	**0.0%**	**4.8%**	**2.7%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**78**	**96**	**134**	**0**	**53**	**252**	**25**	**0**	**17**	**151**	**125**	**0**	**88**	**155**	**3**
PHF	**0.97**				**0.94**				**0.98**				**0.96**			
HV %	**0.0%**	**1.3%**	**1.0%**	**0.7%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.8%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 1
Location:	South Boston, MA
Street 1:	West Broadway/East Broadway
Street 2:	Dorchester Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
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TRUCKS

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0
7:30 AM	0	0	0	2	0	0	1	0	0	0	2	0	0	0	1	0
7:45 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	2	2	0
8:00 AM	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	0
8:15 AM	0	1	0	2	0	0	0	0	0	0	1	0	0	0	1	0
8:30 AM	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
5:15 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:30 AM to 8:30 AM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**1**	**6**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**1**	**0**	**3**	**4**	**0**
PHF	**0.67**				**0.25**				**0.75**				**0.44**			

PM PEAK HOUR 4:15 PM to 5:15 PM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				West Broadway Southeastbound				East Broadway Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**2**	**0**
PHF	**0.75**				**0.25**				**0.50**				**0.38**			

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 1
Location:	South Boston, MA
Street 1:	West Broadway/East Broadway
Street 2:	Dorchester Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	Dorchester Street Northeastbound					Dorchester Street Southwestbound					West Broadway Southeastbound					East Broadway Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	3		0	0	0	6		0	0	0	2		0	1	0	0	
7:15 AM	0	0	0	5		0	1	0	5		0	0	0	2		0	0	0	0	
7:30 AM	0	0	1	4		0	0	1	6		0	1	0	4		1	0	0	1	
7:45 AM	0	0	0	5		0	0	0	7		0	0	0	2		0	2	0	0	
8:00 AM	0	1	0	3		0	0	0	5		0	1	0	3		0	0	0	0	
8:15 AM	0	0	1	5		0	0	1	7		0	1	0	4		1	0	0	0	
8:30 AM	0	0	0	4		0	0	0	6		0	0	0	3		0	1	0	0	
8:45 AM	0	0	0	5		0	0	0	5		0	0	0	3		0	0	0	0	

	Dorchester Street Northeastbound					Dorchester Street Southwestbound					West Broadway Southeastbound					East Broadway Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	4		0	0	0	6		0	0	0	4		0	0	0	0	
4:15 PM	0	0	0	5		0	0	0	5		0	1	0	3		0	1	0	0	
4:30 PM	0	0	0	7		0	1	0	7		0	1	1	5		1	0	0	1	
4:45 PM	0	0	1	6		0	0	0	6		0	0	0	6		0	0	0	0	
5:00 PM	0	0	0	5		0	1	1	5		0	1	0	4		1	1	0	2	
5:15 PM	0	1	0	7		0	0	0	8		0	0	1	5		0	0	0	0	
5:30 PM	0	0	0	6		0	0	1	7		0	0	0	6		0	1	0	0	
5:45 PM	0	0	0	6		0	0	0	6		0	0	0	5		0	0	0	0	

AM PEAK HOUR[1]	Dorchester Street Northeastbound					Dorchester Street Southwestbound					West Broadway Southeastbound					East Broadway Westbound				
7:45 AM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:45 AM	0	1	1	17		0	0	1	25		0	2	0	12		1	3	0	0	

PM PEAK HOUR[1]	Dorchester Street Northeastbound					Dorchester Street Southwestbound					West Broadway Southeastbound					East Broadway Westbound				
4:30 PM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
5:30 PM	0	1	1	25		0	2	1	26		0	2	2	20		2	1	0	3	

[1] *Peak hours corresponds to vehicular peak hours.*

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 2
Location:	South Boston, MA
Street 1:	West Broadway
Street 2:	F Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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TOTAL (CARS & TRUCKS)

	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	11	2	2	0	3	0	6	0	5	51	0	0	0	64	5
7:15 AM	0	14	3	3	0	3	0	7	0	5	53	0	0	0	66	6
7:30 AM	0	16	3	4	0	5	0	9	0	7	59	0	0	0	65	7
7:45 AM	0	18	4	5	0	7	0	10	0	8	62	0	0	0	64	8
8:00 AM	0	20	3	6	0	9	0	12	0	9	64	0	0	0	62	9
8:15 AM	0	18	4	4	0	11	0	14	0	10	63	0	0	0	63	8
8:30 AM	0	15	2	5	0	10	0	13	0	9	59	0	0	0	60	8
8:45 AM	0	12	2	4	0	8	0	11	0	7	53	0	0	0	58	7

	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	4	2	4	0	6	0	7	0	7	61	0	2	0	56	9
4:15 PM	0	5	2	5	0	7	0	6	0	8	64	0	0	0	61	11
4:30 PM	0	5	3	5	0	8	0	9	0	9	66	0	0	0	63	10
4:45 PM	0	4	3	7	0	9	0	11	0	7	65	0	1	0	66	11
5:00 PM	0	3	2	8	0	10	0	13	0	8	64	0	2	0	65	12
5:15 PM	0	4	2	7	0	11	0	15	0	6	67	0	0	0	64	11
5:30 PM	0	3	3	6	0	9	0	14	0	7	65	0	1	0	61	12
5:45 PM	0	3	2	5	0	10	0	13	0	6	62	0	0	0	59	10

AM PEAK HOUR 7:45 AM to 8:45 AM	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**71**	**13**	**20**	**0**	**37**	**0**	**49**	**0**	**36**	**248**	**0**	**0**	**0**	**249**	**33**
PHF	**0.90**				**0.86**				**0.97**				**0.98**			
HV %	**0.0%**	**0.0%**	**0.0%**	**5.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**

PM PEAK HOUR 4:45 PM to 5:45 PM	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**14**	**10**	**28**	**0**	**39**	**0**	**53**	**0**	**28**	**261**	**0**	**4**	**0**	**256**	**46**
PHF	**0.93**				**0.88**				**0.99**				**0.97**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 2
Location:	South Boston, MA
Street 1:	West Broadway
Street 2:	F Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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TRUCKS

	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0
8:00 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**3**	**0**
PHF	**0.50**				**0.00**				**0.63**				**0.38**			

PM PEAK HOUR 4:00 PM to 5:00 PM	F Street Northeastbound				F Street Southwestbound				West Broadway Southeastbound				West Broadway Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**
PHF	**0.25**				**0.00**				**0.25**				**0.50**			

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 2
Location:	South Boston, MA
Street 1:	West Broadway
Street 2:	F Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	F Street Northeastbound					F Street Southwestbound					West Broadway Southeastbound					West Broadway Northwestbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	6		0	0	0	5		0	0	0	7		0	1	0	6	
7:15 AM	0	0	0	8		0	0	0	7		0	0	0	10		0	1	0	8	
7:30 AM	0	0	0	7		0	0	0	8		0	1	0	9		0	0	0	9	
7:45 AM	0	0	0	9		0	0	0	7		0	0	0	11		0	2	0	11	
8:00 AM	0	1	0	10		0	0	0	9		0	1	0	8		0	0	0	9	
8:15 AM	0	0	0	7		0	0	0	10		0	1	0	12		0	1	0	10	
8:30 AM	0	0	0	8		0	0	0	8		0	0	0	9		0	0	0	12	
8:45 AM	0	0	0	9		0	0	0	7		0	0	0	8		0	1	0	9	

	F Street Northeastbound					F Street Southwestbound					West Broadway Southeastbound					West Broadway Northwestbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	8		0	0	0	9		0	0	0	7		0	0	0	6	
4:15 PM	0	0	0	10		0	0	0	10		0	1	0	9		0	1	0	8	
4:30 PM	0	0	1	11		0	0	0	11		0	2	0	12		0	0	0	12	
4:45 PM	0	0	0	9		0	0	0	13		0	0	0	8		0	1	0	11	
5:00 PM	0	0	0	12		1	0	0	15		0	1	0	10		0	2	0	14	
5:15 PM	0	1	0	10		0	0	0	16		0	0	0	9		0	0	0	12	
5:30 PM	0	0	0	8		0	0	0	12		0	1	0	7		0	1	0	10	
5:45 PM	0	0	0	8		0	0	0	10		0	0	0	8		0	0	0	11	

AM PEAK HOUR[1]	F Street Northeastbound					F Street Southwestbound					West Broadway Southeastbound					West Broadway Northwestbound				
7:45 AM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:45 AM	0	1	0	34		0	0	0	34		0	2	0	40		0	3	0	42	

PM PEAK HOUR[1]	F Street Northeastbound					F Street Southwestbound					West Broadway Southeastbound					West Broadway Northwestbound				
4:45 PM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
5:45 PM	0	1	0	39		1	0	0	56		0	2	0	34		0	4	0	47	

[1] *Peak hours corresponds to vehicular peak hours.*

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 3
Location:	South Boston, MA
Street 1:	Dorchester Street
Street 2:	Silver Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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TOTAL (CARS & TRUCKS)

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	73	0	0	0	63	1	0	0	0	0	0	0	1	1
7:15 AM	0	3	75	0	1	0	66	2	0	0	0	0	0	1	0	0
7:30 AM	0	3	76	0	0	0	70	4	0	0	0	0	0	0	0	1
7:45 AM	0	2	78	0	0	0	72	5	0	0	0	0	0	1	1	2
8:00 AM	0	4	79	0	0	0	79	4	0	0	0	0	0	1	1	0
8:15 AM	0	3	80	0	0	0	82	3	0	0	0	0	0	2	2	1
8:30 AM	0	4	77	0	0	0	80	3	0	0	0	0	0	1	1	1
8:45 AM	0	3	74	0	0	0	75	2	0	0	0	0	0	1	0	0

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	1	4	66	0	0	0	109	3	0	0	0	0	0	2	1	2
4:15 PM	0	4	70	0	0	0	117	4	0	0	0	0	0	2	1	2
4:30 PM	0	3	71	0	0	0	118	3	0	0	0	0	0	1	2	0
4:45 PM	0	3	74	0	0	0	114	2	0	0	0	0	0	2	1	1
5:00 PM	0	2	75	0	0	0	115	1	0	0	0	0	0	2	0	1
5:15 PM	0	3	77	0	2	0	112	2	0	0	0	0	0	1	1	0
5:30 PM	0	3	73	0	0	0	109	1	0	0	0	0	0	0	1	1
5:45 PM	0	2	71	0	0	0	104	2	0	0	0	0	0	1	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**13**	**314**	**0**	**0**	**0**	**313**	**15**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**4**
PHF	**0.98**				**0.96**				**0.00**				**0.70**			
HV %	**0.0%**	**0.0%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**12**	**290**	**0**	**0**	**0**	**464**	**10**	**0**	**0**	**0**	**0**	**0**	**7**	**4**	**4**
PHF	**0.98**				**0.98**				**0.00**				**0.75**			
HV %	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 3
Location:	South Boston, MA
Street 1:	Dorchester Street
Street 2:	Silver Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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TRUCKS

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**7**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.58**				**0.50**				**0.00**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Dorchester Street Northeastbound				Dorchester Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.25**				**0.50**				**0.00**				**0.00**			

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 3
Location:	South Boston, MA
Street 1:	Dorchester Street
Street 2:	Silver Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	Dorchester Street Northeastbound					Dorchester Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	0		0	0	0	0		0	0	0	2		0	0	0	8	
7:15 AM	0	0	0	0		0	1	0	0		0	0	0	4		0	0	0	9	
7:30 AM	0	1	0	0		0	0	0	1		0	0	0	6		0	0	0	12	
7:45 AM	0	0	0	0		0	0	0	0		0	0	0	9		0	0	0	14	
8:00 AM	0	1	0	1		0	0	0	0		0	0	0	11		0	0	0	17	
8:15 AM	0	1	0	0		0	0	0	0		0	0	0	8		0	0	0	12	
8:30 AM	0	0	0	0		0	0	0	0		0	0	0	10		0	0	0	13	
8:45 AM	0	0	0	0		0	0	0	0		0	0	0	9		0	0	0	10	

	Dorchester Street Northeastbound					Dorchester Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	0		0	0	0	2		0	0	0	7		0	0	0	14	
4:15 PM	0	0	0	0		0	0	0	0		0	0	0	8		0	0	0	12	
4:30 PM	0	0	0	1		0	1	0	0		0	0	0	10		0	0	0	15	
4:45 PM	0	1	0	0		0	0	0	1		0	0	0	9		0	0	0	11	
5:00 PM	0	0	0	0		0	2	0	0		0	0	0	8		0	0	0	8	
5:15 PM	0	1	0	0		0	0	0	0		0	0	0	12		0	0	0	10	
5:30 PM	0	0	0	1		0	1	0	0		0	0	0	10		0	0	0	9	
5:45 PM	0	0	0	0		0	0	0	0		0	0	0	8		0	0	0	10	

AM PEAK HOUR[1]	Dorchester Street Northeastbound					Dorchester Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
7:45 AM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:45 AM	0	2	0	1		0	0	0	0		0	0	0	38		0	0	0	56	

PM PEAK HOUR[1]	Dorchester Street Northeastbound					Dorchester Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
4:15 PM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
5:15 PM	0	1	0	1		0	3	0	1		0	0	0	35		0	0	0	46	

[1] *Peak hours corresponds to vehicular peak hours.*

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 4
Location:	South Boston, MA
Street 1:	F Street
Street 2:	Silver Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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TOTAL (CARS & TRUCKS)

	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	4	11	0	0	0	0	0	0	0	0	0	0	0	0	4
7:15 AM	0	4	15	0	0	0	0	0	0	0	0	0	0	0	1	5
7:30 AM	0	3	18	0	0	0	0	0	0	0	0	0	0	0	2	5
7:45 AM	0	4	20	0	0	0	0	0	0	0	0	0	0	0	3	6
8:00 AM	0	3	23	0	0	0	0	0	0	0	0	0	0	0	4	6
8:15 AM	0	4	21	0	0	0	0	0	0	0	0	0	0	0	4	5
8:30 AM	0	4	19	0	0	0	0	0	0	0	0	0	0	0	3	4
8:45 AM	0	3	15	0	0	0	0	0	0	0	0	0	0	0	2	3

	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	2	4	0	0	0	0	0	0	0	0	0	0	0	4	6
4:15 PM	0	3	7	0	0	0	0	0	0	0	0	0	0	0	3	5
4:30 PM	0	2	9	0	0	0	0	0	0	0	0	0	0	0	3	4
4:45 PM	0	2	10	0	0	0	0	0	0	0	0	0	0	0	4	3
5:00 PM	0	1	12	0	0	0	0	0	0	0	0	0	0	0	2	1
5:15 PM	0	2	11	0	0	0	0	0	0	0	0	0	0	0	3	2
5:30 PM	0	1	9	0	0	0	0	0	0	0	0	0	0	0	2	3
5:45 PM	0	2	8	0	0	0	0	0	0	0	0	0	0	0	1	2

AM PEAK HOUR 7:45 AM to 8:45 AM	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**15**	**83**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**21**
PHF	**0.94**				**0.00**				**0.00**				**0.88**			
HV %	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**9**	**30**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**18**
PHF	**0.81**				**0.00**				**0.00**				**0.80**			
HV %	**0.0%**	**0.0%**	**3.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 4
Location:	South Boston, MA
Street 1:	F Street
Street 2:	Silver Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

TRUCKS

	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.50**				**0.00**				**0.00**				**0.00**			

PM PEAK HOUR 4:00 PM to 5:00 PM	F Street Northeastbound				F Street Southwestbound				Silver Street Southeastbound				Silver Street Northwestbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.25**				**0.00**				**0.00**				**0.00**			

Client:	Michael Littman
Project #:	98_034_HSH_South Boston
BTD #:	Location 4
Location:	South Boston, MA
Street 1:	F Street
Street 2:	Silver Street
Count Date:	9/12/2017
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	F Street Northeastbound					F Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	0		0	0	0	1		0	0	0	2		0	0	0	2	
7:15 AM	0	0	0	1		0	0	0	2		0	0	0	4		0	0	0	2	
7:30 AM	0	0	0	2		0	0	0	3		0	0	0	6		0	0	0	4	
7:45 AM	0	0	0	1		0	0	0	2		0	0	0	8		0	0	0	5	
8:00 AM	0	1	0	3		0	0	0	3		0	0	0	9		0	0	0	3	
8:15 AM	0	0	0	2		0	0	0	2		0	0	0	7		0	0	0	4	
8:30 AM	0	0	0	1		0	0	0	3		0	0	0	4		0	0	0	5	
8:45 AM	0	0	0	2		0	0	0	2		0	0	0	5		0	0	0	4	

	F Street Northeastbound					F Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	2		0	0	0	2		0	0	0	4		0	0	0	4	
4:15 PM	0	0	0	3		0	0	0	1		0	0	0	3		0	0	0	3	
4:30 PM	0	1	0	2		0	0	0	2		0	0	0	5		0	0	0	5	
4:45 PM	0	0	0	3		0	0	0	3		0	0	0	6		0	0	0	4	
5:00 PM	0	0	0	5		0	0	0	2		0	0	0	5		0	0	0	5	
5:15 PM	0	1	0	2		0	0	0	1		0	0	0	4		0	0	0	3	
5:30 PM	0	0	0	3		0	0	0	2		0	0	0	6		0	0	0	4	
5:45 PM	0	0	0	3		0	0	0	2		0	0	0	5		0	0	0	3	

AM PEAK HOUR[1]	F Street Northeastbound					F Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
7:45 AM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:45 AM	0	1	0	7		0	0	0	10		0	0	0	28		0	0	0	17	

PM PEAK HOUR[1]	F Street Northeastbound					F Street Southwestbound					Silver Street Southeastbound					Silver Street Northwestbound				
4:00 PM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
5:00 PM	0	1	0	10		0	0	0	8		0	0	0	18		0	0	0	16	

[1] *Peak hours corresponds to vehicular peak hours.*

MASSACHUSETTS HIGHWAY DEPARTMENT - STATEWIDE TRAFFIC DATA COLLECTION

2011 WEEKDAY SEASONAL FACTORS *

* Note: These are weekday factors. The average of the factors for the year will not equal 1, as weekend data are not considered.

FACTOR GROUP	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
GROUP 1 - WEST INTERSTATE	0.98	0.93	0.90	0.89	0.90	0.88	0.91	0.90	0.89	0.89	0.93	0.95
Use group 2 for R5, R6, & R0 GROUP 2 - **RURAL MAJOR COLLECTOR (R-5)**	1.12	1.12	1.07	0.99	0.91	0.90	0.86	0.86	0.92	0.93	1.01	1.05
GROUP 3A - RECREATIONAL **(1-4) See below	1.26	1.25	1.20	1.06	0.96	0.89	0.76	0.76	0.92	0.99	1.08	1.14
GROUP 3B - RECREATIONAL ***(5) See below	1.22	1.26	1.22	1.06	0.96	0.90	0.72	0.74	0.97	1.02	1.14	1.15
GROUP 4 - I-495 INTERSTATE	1.02	1.00	1.00	0.96	0.92	0.89	0.85	0.83	0.93	0.96	1.01	1.03
GROUP 5 - EAST INTERSTATE	1.04	1.00	0.96	0.93	0.92	0.91	0.91	0.89	0.93	0.93	0.96	1.01
GROUP 6: Use group 6 for U2, U3, U5, U6, U0, R2, & R3 **URBAN ARTERIALS, COLLECTORS & RURAL ARTERIALS (R-2, R-3)**	1.03	1.01	0.96	0.92	0.91	0.90	0.92	0.92	0.93	0.92	0.97	0.97
GROUP 7 - I-84 PROXIMITY (STA. 17, 3921)	1.24	1.24	1.15	1.04	0.99	1.00	0.93	0.89	1.05	1.05	1.05	1.12
GROUP 8 - I-295 PROXIMITY (STA. 6590)	1.00	0.99	0.95	0.92	0.94	0.91	0.93	0.92	0.95	0.94	0.97	0.95
GROUP 9 - I-195 PROXIMITY (STA. 7)	1.13	1.05	1.03	0.95	0.89	0.87	0.86	0.79	0.88	0.91	0.99	1.03

RECREATIONAL: (ALL YEARS)

**GROUP 3A:

1. CAPE COD (ALL TOWNS)

2.PLYMOUTH(SOUTH OF RTE.3A)

7014, 7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108,7178

3.MARTHA'S VINEYARD

4.NANTUCKET

***GROUP 3B:

5.PERMANENTS 2 & 189

1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,

1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,

1105,1106,1107,1108,1113,1114,1116,2196,2197,2198

2011 AXLE CORRECTION FACTORS

ROAD INVENTORY FUNCTIONAL CLASSIFICATION	AXLE CORRECTION FACTOR
RURAL	
1	0.95
2	0.97
3	0.98
0,5,6	0.98
URBAN	
1	0.96
2,3	0.98
5	0.98
0,6	0.99
I-84	0.90

ROUND OFF

0 - 999.....10

> 1,000.....100

Apply I-84 factor to stations:

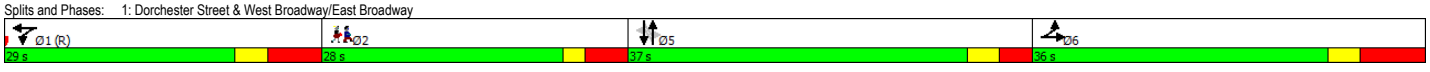
3290, 3921, 3929

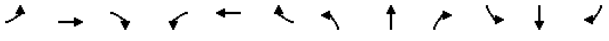
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	16	143	110	61	147	1	87	100	131	31	157	28	
Future Volume (vph)	16	143	110	61	147	1	87	100	131	31	157	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	11	12	12	11	12	12	12	12	12	
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		0.99			1.00			0.99					
Frt		0.945			0.999			0.915			0.982		
Flt Protected		0.997		0.950			0.950				0.993		
Satd. Flow (prot)	0	1754	0	1662	1843	0	1728	1673	0	0	1839	0	
Flt Permitted		0.997		0.950			0.379				0.649		
Satd. Flow (perm)	0	1754	0	1662	1843	0	689	1673	0	0	1202	0	
Right Turn on Red			No			Yes			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		750			419			191			334		
Travel Time (s)		17.0			9.5			4.3			7.6		
Confl. Bikes (#/hr)			2			4			1				
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.98	0.98	0.98	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	2%	1%	5%	3%	0%	1%	2%	4%	0%	1%	0%	
Adj. Flow (vph)	16	147	113	66	158	1	89	102	134	33	167	30	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	276	0	66	159	0	89	236	0	0	230	0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	6	6		1	1			5			5		2
Permitted Phases							5			5			
Detector Phase	6	6		1	1		5	5		5	5		
Switch Phase													
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		5.0
Minimum Split (s)	14.0	14.0		13.0	13.0		11.0	11.0		11.0	11.0		28.0
Total Split (s)	36.0	36.0		29.0	29.0		37.0	37.0		37.0	37.0		28.0
Total Split (%)	27.7%	27.7%		22.3%	22.3%		28.5%	28.5%		28.5%	28.5%		22%
Maximum Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	6.0	6.0		5.0	5.0		3.0	3.0		3.0	3.0		4.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0		
Total Lost Time (s)		9.0		8.0	8.0		6.0	6.0			6.0		
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		C-Max	C-Max		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													54
Act Effct Green (s)		27.0		33.9	33.9		23.7	23.7			23.7		
Actuated g/C Ratio		0.21		0.26	0.26		0.18	0.18			0.18		
v/c Ratio		0.76		0.15	0.33		0.71	0.78			1.06		
Control Delay		62.9		44.9	46.3		78.2	67.2			125.7		
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0		
Total Delay		62.9		44.9	46.3		78.2	67.2			125.7		
LOS		E		D	D		E	E			F		
Approach Delay		62.9			45.9			70.2			125.7		
Approach LOS		E			D			E			F		
90th %ile Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
90th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
70th %ile Green (s)	27.0	27.0		23.9	23.9		28.1	28.1		28.1	28.1		22.0
70th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
50th %ile Green (s)	27.0	27.0		28.2	28.2		23.8	23.8		23.8	23.8		22.0
50th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
30th %ile Green (s)	27.0	27.0		31.7	31.7		20.3	20.3		20.3	20.3		22.0
30th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
10th %ile Green (s)	27.0	27.0		64.8	64.8		15.2	15.2		15.2	15.2		0.0
10th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Skip
Queue Length 50th (ft)		221		46	116		71	191			~210		
Queue Length 95th (ft)		#343		94	198		128	268			#318		
Internal Link Dist (ft)		670			339			111			254		
Turn Bay Length (ft)													
Base Capacity (vph)		364		433	480		164	398			286		
Starvation Cap Reductn		0		0	0		0	0			0		
Spillback Cap Reductn		0		0	0		0	0			0		
Storage Cap Reductn		0		0	0		0	0			0		
Reduced v/c Ratio		0.76		0.15	0.33		0.54	0.59			0.80		

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:WBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 75.2 Intersection LOS: E
Intersection Capacity Utilization 70.6% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Dorchester Street & West Broadway/East Broadway

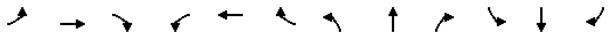




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	248	0	0	249	33	71	13	20	37	0	49
Future Volume (Veh/h)	36	248	0	0	249	33	71	13	20	37	0	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.98	0.98	0.98	0.90	0.90	0.90	0.86	0.86	0.86
Hourly flow rate (vph)	37	256	0	0	254	34	79	14	22	43	0	57
Pedestrians		40			42			34			34	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			4			3			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					750							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	322			290			732	686	332	706	669	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			290			672	623	332	644	604	255
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			71	96	97	85	100	92
cM capacity (veh/h)	1212			1242			274	341	653	291	349	681

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	293	288	115	100
Volume Left	37	0	79	43
Volume Right	0	34	22	57
cSH	1212	1700	316	432
Volume to Capacity	0.03	0.17	0.36	0.23
Queue Length 95th (ft)	2	0	40	22
Control Delay (s)	1.3	0.0	22.7	15.8
Lane LOS	A		C	C
Approach Delay (s)	1.3	0.0	22.7	15.8
Approach LOS			C	C

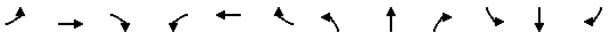
Intersection Summary					
Average Delay			5.7		
Intersection Capacity Utilization			53.0%	ICU Level of Service	A
Analysis Period (min)			15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	5	5	4	13	314	0	0	313	15
Future Volume (Veh/h)	0	0	0	5	5	4	13	314	0	0	313	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.70	0.70	0.70	0.98	0.98	0.98	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	7	7	6	13	320	0	0	326	16
Pedestrians		38			56			1				
Lane Width (ft)		0.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		0			5			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											191	
pX, platoon unblocked												
vC, conflicting volume	568	774	210	566	782	216	380			376		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568	774	210	566	782	216	380			376		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	98	99	99			100		
cM capacity (veh/h)	381	311	801	370	307	752	1190			1130		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	120	213	217	125
Volume Left	7	13	0	0	0
Volume Right	6	0	0	0	16
cSH	403	1190	1700	1700	1700
Volume to Capacity	0.05	0.01	0.13	0.13	0.07
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	14.4	1.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	14.4	0.3		0.0	
Approach LOS	B				

Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	28.2%	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)	0	0	0	0	14	21	15	83	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	14	21	15	83	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	16	24	16	88	0	0	0	0
Pedestrians		28			17			7			10	
Lane Width (ft)		0.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			2			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	190	165	35	144	165	115	28			105		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190	165	35	144	165	115	28			105		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	97	99			100		
cM capacity (veh/h)	727	712	1037	795	712	928	1599			1475		

Direction, Lane #	WB 1	NB 1
Volume Total	40	104
Volume Left	0	16
Volume Right	24	0
cSH	828	1599
Volume to Capacity	0.05	0.01
Queue Length 95th (ft)	4	1
Control Delay (s)	9.6	1.2
Lane LOS	A	A
Approach Delay (s)	9.6	1.2
Approach LOS	A	

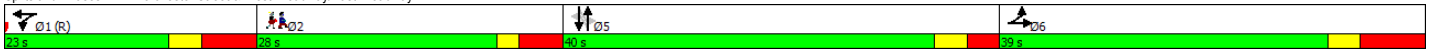
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A	
Analysis Period (min)	15			

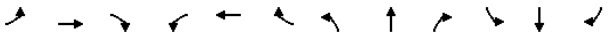
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	17	151	125	88	155	3	78	96	134	53	252	25	
Future Volume (vph)	17	151	125	88	155	3	78	96	134	53	252	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	11	12	12	11	12	12	12	12	12	
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		0.99			1.00			0.99			1.00		
Frt		0.942			0.997			0.913			0.990		
Flt Protected		0.997		0.950			0.950				0.992		
Satd. Flow (prot)	0	1757	0	1745	1875	0	1728	1705	0	0	1863	0	
Flt Permitted		0.997		0.950			0.349				0.741		
Satd. Flow (perm)	0	1757	0	1745	1875	0	635	1705	0	0	1391	0	
Right Turn on Red			No			Yes			No			No	
Satd. Flow (RTOR)					1								
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		750			419			191			334		
Travel Time (s)		17.0			9.5			4.3			7.6		
Confl. Bikes (#/hr)			2			3			1			2	
Peak Hour Factor	0.98	0.98	0.98	0.96	0.96	0.96	0.97	0.97	0.97	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	1%	1%	0%	0%	0%	
Adj. Flow (vph)	17	154	128	92	161	3	80	99	138	56	268	27	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	299	0	92	164	0	80	237	0	0	351	0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	6	6		1	1			5			5		2
Permitted Phases							5			5			
Detector Phase	6	6		1	1		5	5		5	5		
Switch Phase													
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		5.0
Minimum Split (s)	14.0	14.0		13.0	13.0		11.0	11.0		11.0	11.0		28.0
Total Split (s)	39.0	39.0		23.0	23.0		40.0	40.0		40.0	40.0		28.0
Total Split (%)	30.0%	30.0%		17.7%	17.7%		30.8%	30.8%		30.8%	30.8%		22%
Maximum Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	6.0	6.0		5.0	5.0		3.0	3.0		3.0	3.0		4.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0		
Total Lost Time (s)		9.0		8.0	8.0		6.0	6.0			6.0		
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		C-Max	C-Max		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													74
Act Effct Green (s)		30.0		21.3	21.3		33.3	33.3			33.3		
Actuated g/C Ratio		0.23		0.16	0.16		0.26	0.26			0.26		
v/c Ratio		0.74		0.32	0.53		0.49	0.54			0.99		
Control Delay		58.5		56.0	60.0		52.7	47.0			92.5		
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0		
Total Delay		58.5		56.0	60.0		52.7	47.0			92.5		
LOS		E		E	E		D	D			F		
Approach Delay		58.5			58.5			48.4			92.5		
Approach LOS		E			E			D			F		
90th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
90th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
70th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
70th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
50th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
50th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
30th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
30th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
10th %ile Green (s)	30.0	30.0		46.4	46.4		30.6	30.6		30.6	30.6		0.0
10th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Skip
Queue Length 50th (ft)		235		74	135		57	172			294		
Queue Length 95th (ft)		342		132	#244		113	259			#490		
Internal Link Dist (ft)		670			339			111			254		
Turn Bay Length (ft)													
Base Capacity (vph)		405		285	307		166	445			363		
Starvation Cap Reductn		0		0	0		0	0			0		
Spillback Cap Reductn		0		0	0		0	0			0		
Storage Cap Reductn		0		0	0		0	0			0		
Reduced v/c Ratio		0.74		0.32	0.53		0.48	0.53			0.97		

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:WBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 65.7 Intersection LOS: E
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Dorchester Street & West Broadway/East Broadway

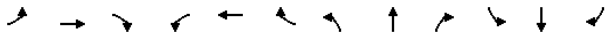




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	261	0	0	256	46	13	10	27	39	0	53
Future Volume (Veh/h)	28	261	0	0	256	46	13	10	27	39	0	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.97	0.97	0.97	0.93	0.93	0.93	0.88	0.88	0.88
Hourly flow rate (vph)	28	264	0	0	264	47	14	11	29	44	0	60
Pedestrians		34			47			39			56	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		3			4			4			5	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					750							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	367			303			740	726	350	745	702	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280			303			682	666	350	687	641	291
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			95	97	95	83	100	91
cM capacity (veh/h)	1138			1222			263	316	642	260	326	640

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	292	311	54	104
Volume Left	28	0	14	44
Volume Right	0	47	29	60
cSH	1138	1700	405	395
Volume to Capacity	0.02	0.18	0.13	0.26
Queue Length 95th (ft)	2	0	11	26
Control Delay (s)	1.0	0.0	15.2	17.3
Lane LOS	A		C	C
Approach Delay (s)	1.0	0.0	15.2	17.3
Approach LOS			C	C

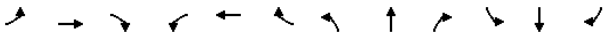
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	7	4	4	12	304	0	0	455	10
Future Volume (Veh/h)	0	0	0	7	4	4	12	304	0	0	455	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	9	5	5	12	310	0	0	464	10
Pedestrians		35			46			1			1	
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)											191	
pX, platoon unblocked												
vC, conflicting volume	692	884	273	613	889	202	509			356		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	692	884	273	613	889	202	509			356		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	98	99	99			100		
cM capacity (veh/h)	314	271	730	349	269	775	1066			1161		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	115	207	309	165
Volume Left	9	12	0	0	0
Volume Right	5	0	0	0	10
cSH	374	1066	1700	1700	1700
Volume to Capacity	0.05	0.01	0.12	0.18	0.10
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	15.2	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.2	0.3		0.0	
Approach LOS	C				

Intersection Summary					
Average Delay	0.5				
Intersection Capacity Utilization	27.5%	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)	0	0	0	0	14	18	9	32	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	14	18	9	32	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	18	23	11	40	0	0	0	0
Pedestrians		18			16			10			8	
Lane Width (ft)		0.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			2			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	120	96	28	88	96	64	18			56		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120	96	28	88	96	64	18			56		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	98	99			100		
cM capacity (veh/h)	812	780	1043	865	780	991	1612			1538		

Direction, Lane #	WB 1	NB 1
Volume Total	41	51
Volume Left	0	11
Volume Right	23	0
cSH	886	1612
Volume to Capacity	0.05	0.01
Queue Length 95th (ft)	4	1
Control Delay (s)	9.3	1.6
Lane LOS	A	A
Approach Delay (s)	9.3	1.6
Approach LOS	A	

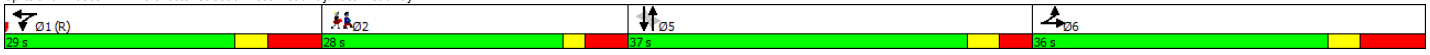
Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A	
Analysis Period (min)	15			

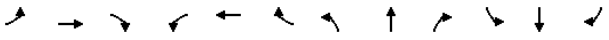
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	20	148	114	66	152	1	90	109	141	32	172	30	
Future Volume (vph)	20	148	114	66	152	1	90	109	141	32	172	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	11	12	12	11	12	12	12	12	12	
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		0.99			1.00			0.99					
Frt		0.945			0.999			0.915			0.983		
Flt Protected		0.996		0.950			0.950				0.993		
Satd. Flow (prot)	0	1753	0	1662	1843	0	1728	1673	0	0	1841	0	
Flt Permitted		0.996		0.950			0.378				0.660		
Satd. Flow (perm)	0	1753	0	1662	1843	0	687	1673	0	0	1224	0	
Right Turn on Red			No			Yes			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		750			419			191			334		
Travel Time (s)		17.0			9.5			4.3			7.6		
Confl. Bikes (#/hr)			2			4			1				
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.98	0.98	0.98	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	2%	1%	5%	3%	0%	1%	2%	4%	0%	1%	0%	
Adj. Flow (vph)	21	153	118	71	163	1	92	111	144	34	183	32	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	292	0	71	164	0	92	255	0	0	249	0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	6	6		1	1			5			5		2
Permitted Phases							5			5			
Detector Phase	6	6		1	1		5	5		5	5		
Switch Phase													
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		5.0
Minimum Split (s)	14.0	14.0		13.0	13.0		11.0	11.0		11.0	11.0		28.0
Total Split (s)	36.0	36.0		29.0	29.0		37.0	37.0		37.0	37.0		28.0
Total Split (%)	27.7%	27.7%		22.3%	22.3%		28.5%	28.5%		28.5%	28.5%		22%
Maximum Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	6.0	6.0		5.0	5.0		3.0	3.0		3.0	3.0		4.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0		
Total Lost Time (s)		9.0		8.0	8.0		6.0	6.0			6.0		
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		C-Max	C-Max		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													54
Act Effct Green (s)		27.0		31.6	31.6		26.0	26.0			26.0		
Actuated g/C Ratio		0.21		0.24	0.24		0.20	0.20			0.20		
v/c Ratio		0.80		0.18	0.37		0.67	0.76			1.02		
Control Delay		66.4		46.7	48.6		71.1	63.8			113.6		
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0		
Total Delay		66.4		46.7	48.6		71.1	63.8			113.6		
LOS		E		D	D		E	E			F		
Approach Delay		66.4			48.0			65.7			113.6		
Approach LOS		E			D			E			F		
90th %ile Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
90th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
70th %ile Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
70th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
50th %ile Green (s)	27.0	27.0		24.4	24.4		27.6	27.6		27.6	27.6		22.0
50th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
30th %ile Green (s)	27.0	27.0		29.1	29.1		22.9	22.9		22.9	22.9		22.0
30th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
10th %ile Green (s)	27.0	27.0		62.6	62.6		17.4	17.4		17.4	17.4		0.0
10th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Skip
Queue Length 50th (ft)		236		51	125		71	201			209		
Queue Length 95th (ft)		#375		101	205		133	290			#352		
Internal Link Dist (ft)		670			339			111			254		
Turn Bay Length (ft)													
Base Capacity (vph)		364		404	448		163	398			291		
Starvation Cap Reductn		0		0	0		0	0			0		
Spillback Cap Reductn		0		0	0		0	0			0		
Storage Cap Reductn		0		0	0		0	0			0		
Reduced v/c Ratio		0.80		0.18	0.37		0.56	0.64			0.86		

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:WBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 72.8 Intersection LOS: E
Intersection Capacity Utilization 75.1% 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: Dorchester Street & West Broadway/East Broadway

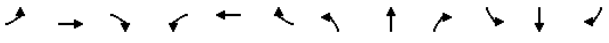




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	260	0	0	259	34	74	13	21	38	0	51
Future Volume (Veh/h)	37	260	0	0	259	34	74	13	21	38	0	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.98	0.98	0.98	0.90	0.90	0.90	0.86	0.86	0.86
Hourly flow rate (vph)	38	268	0	0	264	35	82	14	23	44	0	59
Pedestrians		40			42			34			34	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			4			3			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					750							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	333			302			758	711	344	732	694	356
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			302			695	644	344	666	625	258
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			69	96	96	84	100	91
cM capacity (veh/h)	1200			1229			261	329	643	279	338	674

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	306	299	119	103
Volume Left	38	0	82	44
Volume Right	0	35	23	59
cSH	1200	1700	303	420
Volume to Capacity	0.03	0.18	0.39	0.25
Queue Length 95th (ft)	2	0	45	24
Control Delay (s)	1.3	0.0	24.3	16.3
Lane LOS	A		C	C
Approach Delay (s)	1.3	0.0	24.3	16.3
Approach LOS			C	C

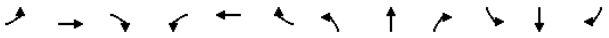
Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	5	5	4	13	335	0	0	336	16
Future Volume (Veh/h)	0	0	0	5	5	4	13	335	0	0	336	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.70	0.70	0.70	0.98	0.98	0.98	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	7	7	6	13	342	0	0	350	17
Pedestrians		38			56			1				
Lane Width (ft)		0.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		0			5			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											191	
pX, platoon unblocked												
vC, conflicting volume	603	820	222	600	829	227	405			398		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	603	820	222	600	829	227	405			398		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	98	99	99			100		
cM capacity (veh/h)	358	292	787	350	289	740	1165			1109		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	127	228	233	134
Volume Left	7	13	0	0	0
Volume Right	6	0	0	0	17
cSH	382	1165	1700	1700	1700
Volume to Capacity	0.05	0.01	0.13	0.14	0.08
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	14.9	0.9	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	14.9	0.3		0.0	
Approach LOS	B				

Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	28.8%	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)	0	0	0	0	14	22	16	86	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	14	22	16	86	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	16	25	17	91	0	0	0	0
Pedestrians		28			17			7			10	
Lane Width (ft)		0.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			2			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	196	170	35	149	170	118	28			108		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	196	170	35	149	170	118	28			108		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	97	99			100		
cM capacity (veh/h)	719	707	1037	788	707	924	1599			1471		

Direction, Lane #	WB 1	NB 1
Volume Total	41	108
Volume Left	0	17
Volume Right	25	0
cSH	825	1599
Volume to Capacity	0.05	0.01
Queue Length 95th (ft)	4	1
Control Delay (s)	9.6	1.2
Lane LOS	A	A
Approach Delay (s)	9.6	1.2
Approach LOS	A	

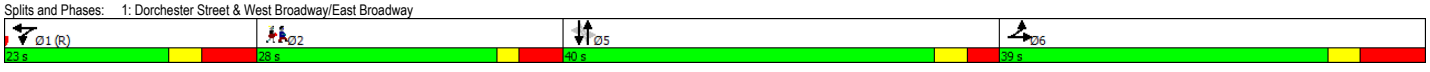
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	21.7%	ICU Level of Service	A	
Analysis Period (min)	15			

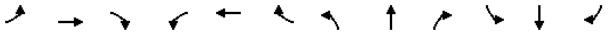
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	19	156	129	96	161	3	81	112	151	55	279	26	
Future Volume (vph)	19	156	129	96	161	3	81	112	151	55	279	26	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	11	12	12	11	12	12	12	12	12	
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		0.99			1.00			0.99			1.00		
Frt		0.943			0.997			0.914			0.990		
Flt Protected		0.997		0.950			0.950				0.992		
Satd. Flow (prot)	0	1759	0	1745	1875	0	1728	1707	0	0	1863	0	
Flt Permitted		0.997		0.950			0.324				0.674		
Satd. Flow (perm)	0	1759	0	1745	1875	0	589	1707	0	0	1266	0	
Right Turn on Red			No			Yes			No			No	
Satd. Flow (RTOR)					1								
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		750			419			191			334		
Travel Time (s)		17.0			9.5			4.3			7.6		
Confl. Bikes (#/hr)			2			3			1			2	
Peak Hour Factor	0.98	0.98	0.98	0.96	0.96	0.96	0.97	0.97	0.97	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	1%	1%	0%	0%	0%	
Adj. Flow (vph)	19	159	132	100	168	3	84	115	156	59	297	28	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	310	0	100	171	0	84	271	0	0	384	0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	6	6		1	1			5			5		2
Permitted Phases							5			5			
Detector Phase	6	6		1	1		5	5		5	5		
Switch Phase													
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		5.0
Minimum Split (s)	14.0	14.0		13.0	13.0		11.0	11.0		11.0	11.0		28.0
Total Split (s)	39.0	39.0		23.0	23.0		40.0	40.0		40.0	40.0		28.0
Total Split (%)	30.0%	30.0%		17.7%	17.7%		30.8%	30.8%		30.8%	30.8%		22%
Maximum Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	6.0	6.0		5.0	5.0		3.0	3.0		3.0	3.0		4.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0		
Total Lost Time (s)		9.0		8.0	8.0		6.0	6.0			6.0		
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		C-Max	C-Max		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													74
Act Effct Green (s)		30.0		20.6	20.6		34.0	34.0			34.0		
Actuated g/C Ratio		0.23		0.16	0.16		0.26	0.26			0.26		
v/c Ratio		0.77		0.36	0.57		0.55	0.61			1.16		
Control Delay		60.3		56.9	61.7		56.6	48.9			143.1		
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0		
Total Delay		60.3		56.9	61.7		56.6	48.9			143.1		
LOS		E		E	E		E	D			F		
Approach Delay		60.3			59.9			50.7			143.1		
Approach LOS		E			E			D			F		
90th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
90th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
70th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
70th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
50th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
50th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
30th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
30th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
10th %ile Green (s)	30.0	30.0		43.0	43.0		34.0	34.0		34.0	34.0		0.0
10th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Skip
Queue Length 50th (ft)		246		80	142		61	201			~382		
Queue Length 95th (ft)		#373		141	#258		123	298			#584		
Internal Link Dist (ft)		670			339			111			254		
Turn Bay Length (ft)													
Base Capacity (vph)		405		276	298		154	446			331		
Starvation Cap Reductn		0		0	0		0	0			0		
Spillback Cap Reductn		0		0	0		0	0			0		
Storage Cap Reductn		0		0	0		0	0			0		
Reduced v/c Ratio		0.77		0.36	0.57		0.55	0.61			1.16		

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:WBTL, Start of Green, Master Intersection
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 81.7 Intersection LOS: F
Intersection Capacity Utilization 84.4% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Dorchester Street & West Broadway/East Broadway

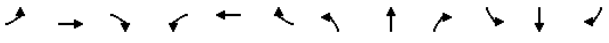




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	271	0	0	265	48	13	10	28	40	0	55
Future Volume (Veh/h)	29	271	0	0	265	48	13	10	28	40	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.97	0.97	0.97	0.93	0.93	0.93	0.88	0.88	0.88
Hourly flow rate (vph)	29	274	0	0	273	49	14	11	30	45	0	63
Pedestrians		34			47			39			56	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		3			4			4			5	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					750							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	378			313			766	749	360	768	724	388
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	281			313			702	684	360	705	657	291
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			94	96	95	82	100	90
cM capacity (veh/h)	1127			1212			251	305	634	250	316	635

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	303	322	55	108
Volume Left	29	0	14	45
Volume Right	0	49	30	63
cSH	1127	1700	395	386
Volume to Capacity	0.03	0.19	0.14	0.28
Queue Length 95th (ft)	2	0	12	28
Control Delay (s)	1.0	0.0	15.6	17.9
Lane LOS	A		C	C
Approach Delay (s)	1.0	0.0	15.6	17.9
Approach LOS			C	C

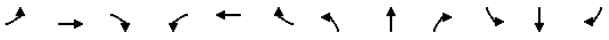
Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	7	4	4	12	340	0	0	494	10
Future Volume (Veh/h)	0	0	0	7	4	4	12	340	0	0	494	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	9	5	5	12	347	0	0	504	10
Pedestrians		35			46			1			1	
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)											191	
pX, platoon unblocked												
vC, conflicting volume	750	961	293	670	966	220	549			393		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	750	961	293	670	966	220	549			393		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	98	99	99			100		
cM capacity (veh/h)	284	244	709	317	242	754	1031			1125		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	128	231	336	178
Volume Left	9	12	0	0	0
Volume Right	5	0	0	0	10
cSH	342	1031	1700	1700	1700
Volume to Capacity	0.06	0.01	0.14	0.20	0.10
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	16.2	0.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	16.2	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	28.5%	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)	0	0	0	0	14	19	9	33	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	14	19	9	33	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	18	24	11	41	0	0	0	0
Pedestrians		18			16			10			8	
Lane Width (ft)		0.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			2			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	122	97	28	89	97	65	18			57		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122	97	28	89	97	65	18			57		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	98	99			100		
cM capacity (veh/h)	808	779	1043	864	779	989	1612			1537		

Direction, Lane #	WB 1	NB 1
Volume Total	42	52
Volume Left	0	11
Volume Right	24	0
cSH	887	1612
Volume to Capacity	0.05	0.01
Queue Length 95th (ft)	4	1
Control Delay (s)	9.3	1.6
Lane LOS	A	A
Approach Delay (s)	9.3	1.6
Approach LOS	A	

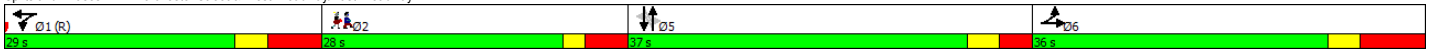
Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A	
Analysis Period (min)	15			

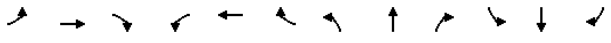
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	20	148	116	66	152	1	90	109	141	32	172	30	
Future Volume (vph)	20	148	116	66	152	1	90	109	141	32	172	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	11	12	12	11	12	12	12	12	12	
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		0.99			1.00			0.99					
Frt		0.945			0.999			0.915			0.983		
Flt Protected		0.996		0.950			0.950				0.993		
Satd. Flow (prot)	0	1753	0	1662	1843	0	1728	1673	0	0	1841	0	
Flt Permitted		0.996		0.950			0.378				0.660		
Satd. Flow (perm)	0	1753	0	1662	1843	0	687	1673	0	0	1224	0	
Right Turn on Red			No			Yes			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		750			419			191			334		
Travel Time (s)		17.0			9.5			4.3			7.6		
Confl. Bikes (#/hr)			2			4			1				
Peak Hour Factor	0.97	0.97	0.97	0.93	0.93	0.93	0.98	0.98	0.98	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	2%	1%	5%	3%	0%	1%	2%	4%	0%	1%	0%	
Adj. Flow (vph)	21	153	120	71	163	1	92	111	144	34	183	32	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	294	0	71	164	0	92	255	0	0	249	0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	6	6		1	1			5			5		2
Permitted Phases							5			5			
Detector Phase	6	6		1	1		5	5		5	5		
Switch Phase													
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		5.0
Minimum Split (s)	14.0	14.0		13.0	13.0		11.0	11.0		11.0	11.0		28.0
Total Split (s)	36.0	36.0		29.0	29.0		37.0	37.0		37.0	37.0		28.0
Total Split (%)	27.7%	27.7%		22.3%	22.3%		28.5%	28.5%		28.5%	28.5%		22%
Maximum Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	6.0	6.0		5.0	5.0		3.0	3.0		3.0	3.0		4.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0		
Total Lost Time (s)		9.0		8.0	8.0		6.0	6.0			6.0		
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		C-Max	C-Max		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													54
Act Effct Green (s)		27.0		31.6	31.6		26.0	26.0			26.0		
Actuated g/C Ratio		0.21		0.24	0.24		0.20	0.20			0.20		
v/c Ratio		0.81		0.18	0.37		0.67	0.76			1.02		
Control Delay		66.9		46.7	48.6		71.1	63.8			113.6		
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0		
Total Delay		66.9		46.7	48.6		71.1	63.8			113.6		
LOS		E		D	D		E	E			F		
Approach Delay		66.9			48.0			65.7			113.6		
Approach LOS		E			D			E			F		
90th %ile Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
90th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
70th %ile Green (s)	27.0	27.0		21.0	21.0		31.0	31.0		31.0	31.0		22.0
70th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
50th %ile Green (s)	27.0	27.0		24.4	24.4		27.6	27.6		27.6	27.6		22.0
50th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
30th %ile Green (s)	27.0	27.0		29.1	29.1		22.9	22.9		22.9	22.9		22.0
30th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Ped
10th %ile Green (s)	27.0	27.0		62.6	62.6		17.4	17.4		17.4	17.4		0.0
10th %ile Term Code	MaxR	MaxR		Coord	Coord		Gap	Gap		Gap	Gap		Skip
Queue Length 50th (ft)		238		51	125		71	201			209		
Queue Length 95th (ft)		#378		101	205		133	290			#352		
Internal Link Dist (ft)		670			339			111			254		
Turn Bay Length (ft)													
Base Capacity (vph)		364		404	448		163	398			291		
Starvation Cap Reductn		0		0	0		0	0			0		
Spillback Cap Reductn		0		0	0		0	0			0		
Storage Cap Reductn		0		0	0		0	0			0		
Reduced v/c Ratio		0.81		0.18	0.37		0.56	0.64			0.86		

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:WBTL, Start of Green, Master Intersection
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 73.0 Intersection LOS: E
Intersection Capacity Utilization 75.2% 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: Dorchester Street & West Broadway/East Broadway

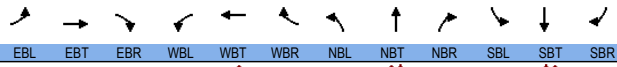




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	262	0	0	259	34	77	13	22	38	0	51
Future Volume (Veh/h)	37	262	0	0	259	34	77	13	22	38	0	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.98	0.98	0.98	0.90	0.90	0.90	0.86	0.86	0.86
Hourly flow rate (vph)	38	270	0	0	264	35	86	14	24	44	0	59
Pedestrians		40			42			34			34	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			4			3			3	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					750							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	333			304			760	713	346	734	696	356
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			304			698	646	346	669	627	258
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			67	96	96	84	100	91
cM capacity (veh/h)	1200			1227			260	328	641	277	337	674

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	308	299	124	103
Volume Left	38	0	86	44
Volume Right	0	35	24	59
cSH	1200	1700	302	418
Volume to Capacity	0.03	0.18	0.41	0.25
Queue Length 95th (ft)	2	0	48	24
Control Delay (s)	1.3	0.0	25.0	16.4
Lane LOS	A		C	C
Approach Delay (s)	1.3	0.0	25.0	16.4
Approach LOS			C	C

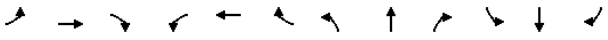
Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	5	5	4	13	335	0	0	337	17
Future Volume (Veh/h)	0	0	0	5	5	4	13	335	0	0	337	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.70	0.70	0.70	0.98	0.98	0.98	0.96	0.96	0.96
Hourly flow rate (vph)	0	0	0	7	7	6	13	342	0	0	351	18
Pedestrians		38			56			1				
Lane Width (ft)		0.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		0			5			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											191	
pX, platoon unblocked												
vC, conflicting volume	604	822	224	600	831	227	407			398		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	604	822	224	600	831	227	407			398		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	98	99	99			100		
cM capacity (veh/h)	358	291	785	350	288	740	1163			1109		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	127	228	234	135
Volume Left	7	13	0	0	0
Volume Right	6	0	0	0	18
cSH	381	1163	1700	1700	1700
Volume to Capacity	0.05	0.01	0.13	0.14	0.08
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	15.0	0.9	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	15.0	0.3		0.0	
Approach LOS	B				

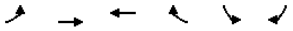
Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	28.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	15	26	16	86	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	15	26	16	86	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.94	0.94	0.94	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	17	30	17	91	0	0	0	0
Pedestrians		28			17			7			10	
Lane Width (ft)		0.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			2			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	202	170	35	149	170	118	28			108		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202	170	35	149	170	118	28			108		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	97	99			100		
cM capacity (veh/h)	708	707	1037	788	707	924	1599			1471		

Direction, Lane #	WB 1	NB 1
Volume Total	47	108
Volume Left	0	17
Volume Right	30	0
cSH	832	1599
Volume to Capacity	0.06	0.01
Queue Length 95th (ft)	4	1
Control Delay (s)	9.6	1.2
Lane LOS	A	A
Approach Delay (s)	9.6	1.2
Approach LOS	A	

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	21.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	35	1	0	5
Future Volume (Veh/h)	0	0	35	1	0	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	38	1	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	39				38	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				38	38
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1571				973	1033

Direction, Lane #	WB 1	SB 1
Volume Total	39	5
Volume Left	0	0
Volume Right	1	5
cSH	1700	1033
Volume to Capacity	0.02	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	8.5
Lane LOS		A
Approach Delay (s)	0.0	8.5
Approach LOS		A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	19	156	133	96	161	3	82	112	151	55	280	27	
Future Volume (vph)	19	156	133	96	161	3	82	112	151	55	280	27	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	11	12	12	11	12	12	12	12	12	
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		0.99			1.00			0.99			1.00		
Frt		0.942			0.997			0.914			0.990		
Flt Protected		0.997		0.950			0.950				0.992		
Satd. Flow (prot)	0	1757	0	1745	1875	0	1728	1707	0	0	1863	0	
Flt Permitted		0.997		0.950			0.322				0.674		
Satd. Flow (perm)	0	1757	0	1745	1875	0	586	1707	0	0	1266	0	
Right Turn on Red			No			Yes			No			No	
Satd. Flow (RTOR)					1								
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		750			419			191			334		
Travel Time (s)		17.0			9.5			4.3			7.6		
Confl. Bikes (#/hr)			2			3			1			2	
Peak Hour Factor	0.98	0.98	0.98	0.96	0.96	0.96	0.97	0.97	0.97	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	1%	1%	0%	0%	0%	
Adj. Flow (vph)	19	159	136	100	168	3	85	115	156	59	298	29	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	314	0	100	171	0	85	271	0	0	386	0	
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA		
Protected Phases	6	6		1	1			5			5		2
Permitted Phases							5			5			
Detector Phase	6	6		1	1		5	5		5	5		
Switch Phase													
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		5.0
Minimum Split (s)	14.0	14.0		13.0	13.0		11.0	11.0		11.0	11.0		28.0
Total Split (s)	39.0	39.0		23.0	23.0		40.0	40.0		40.0	40.0		28.0
Total Split (%)	30.0%	30.0%		17.7%	17.7%		30.8%	30.8%		30.8%	30.8%		22%
Maximum Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	6.0	6.0		5.0	5.0		3.0	3.0		3.0	3.0		4.0
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0		
Total Lost Time (s)		9.0		8.0	8.0		6.0	6.0			6.0		
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		C-Max	C-Max		None	None		None	None		None
Walk Time (s)													7.0
Flash Dont Walk (s)													15.0
Pedestrian Calls (#/hr)													74
Act Effct Green (s)		30.0		20.6	20.6		34.0	34.0			34.0		
Actuated g/C Ratio		0.23		0.16	0.16		0.26	0.26			0.26		
v/c Ratio		0.78		0.36	0.57		0.56	0.61			1.17		
Control Delay		61.1		56.9	61.7		57.3	48.9			145.2		
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0		
Total Delay		61.1		56.9	61.7		57.3	48.9			145.2		
LOS		E		E	E		E	D			F		
Approach Delay		61.1			59.9			50.9			145.2		
Approach LOS		E			E			D			F		
90th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
90th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
70th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
70th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
50th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
50th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
30th %ile Green (s)	30.0	30.0		15.0	15.0		34.0	34.0		34.0	34.0		22.0
30th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Ped
10th %ile Green (s)	30.0	30.0		43.0	43.0		34.0	34.0		34.0	34.0		0.0
10th %ile Term Code	MaxR	MaxR		Coord	Coord		Max	Max		Max	Max		Skip
Queue Length 50th (ft)		250		80	142		62	201			~386		
Queue Length 95th (ft)		#380		141	#258		125	298			#586		
Internal Link Dist (ft)		670			339			111			254		
Turn Bay Length (ft)													
Base Capacity (vph)		405		276	298		153	446			331		
Starvation Cap Reductn		0		0	0		0	0			0		
Spillback Cap Reductn		0		0	0		0	0			0		
Storage Cap Reductn		0		0	0		0	0			0		
Reduced v/c Ratio		0.78		0.36	0.57		0.56	0.61			1.17		

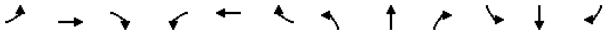
Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 1:WBTL, Start of Green, Master Intersection
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 82.6 Intersection LOS: F
Intersection Capacity Utilization 84.8% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

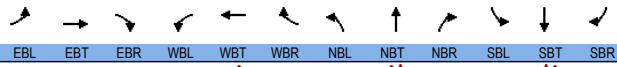
Splits and Phases: 1: Dorchester Street & West Broadway/East Broadway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	274	0	0	269	48	15	10	29	40	0	55
Future Volume (Veh/h)	29	274	0	0	269	48	15	10	29	40	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.97	0.97	0.97	0.93	0.93	0.93	0.88	0.88	0.88
Hourly flow rate (vph)	29	277	0	0	277	49	16	11	31	45	0	63
Pedestrians		34			47			39			56	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		3			4			4			5	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					750							
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	382			316			772	756	363	776	732	392
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284			316			709	691	363	713	664	294
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			94	96	95	82	100	90
cM capacity (veh/h)	1123			1209			248	302	631	246	313	631

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	306	326	58	108
Volume Left	29	0	16	45
Volume Right	0	49	31	63
cSH	1123	1700	387	382
Volume to Capacity	0.03	0.19	0.15	0.28
Queue Length 95th (ft)	2	0	13	29
Control Delay (s)	1.0	0.0	15.9	18.1
Lane LOS	A		C	C
Approach Delay (s)	1.0	0.0	15.9	18.1
Approach LOS			C	C

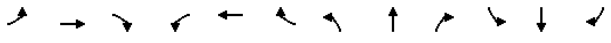
Intersection Summary					
Average Delay			4.0		
Intersection Capacity Utilization			56.2%	ICU Level of Service	B
Analysis Period (min)			15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	7	4	4	13	341	0	0	496	13
Future Volume (Veh/h)	0	0	0	7	4	4	13	341	0	0	496	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.75	0.75	0.75	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	9	5	5	13	348	0	0	506	13
Pedestrians		35			46			1			1	
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)											191	
pX, platoon unblocked												
vC, conflicting volume	756	968	296	674	974	221	554			394		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	756	968	296	674	974	221	554			394		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	98	99	99			100		
cM capacity (veh/h)	281	242	706	315	240	754	1026			1124		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	129	232	337	182
Volume Left	9	13	0	0	0
Volume Right	5	0	0	0	13
cSH	339	1026	1700	1700	1700
Volume to Capacity	0.06	0.01	0.14	0.20	0.11
Queue Length 95th (ft)	4	1	0	0	0
Control Delay (s)	16.3	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	16.3	0.3		0.0	
Approach LOS	C				

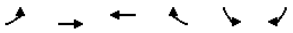
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	29.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	14	22	9	33	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	14	22	9	33	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.81	0.81	0.81	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	18	28	11	41	0	0	0	0
Pedestrians		18			16			10			8	
Lane Width (ft)		0.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			2			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	126	97	28	89	97	65	18			57		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126	97	28	89	97	65	18			57		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	98	97	99			100		
cM capacity (veh/h)	800	779	1043	864	779	989	1612			1537		

Direction, Lane #	WB 1	NB 1
Volume Total	46	52
Volume Left	0	11
Volume Right	28	0
cSH	895	1612
Volume to Capacity	0.05	0.01
Queue Length 95th (ft)	4	1
Control Delay (s)	9.2	1.6
Lane LOS	A	A
Approach Delay (s)	9.2	1.6
Approach LOS	A	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	30	4	0	3
Future Volume (Veh/h)	0	0	30	4	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	33	4	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	37				35	35
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	37				35	35
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1574				978	1038

Direction, Lane #	WB 1	SB 1
Volume Total	37	3
Volume Left	0	0
Volume Right	4	3
cSH	1700	1038
Volume to Capacity	0.02	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	8.5
Lane LOS		A
Approach Delay (s)	0.0	8.5
Approach LOS		A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

457 West Broadway

Existing Site Trip Generation Assessment

HOWARD STEIN HUDSON
12-Sep-2017

xx HARD CODED TO BALANCE

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Transit Share[3]	Transit Person-Trips	Walk/Bike/ Other Share[3]	Walk/ Bike/ Other Trips	Auto Share[3]	Auto Person-Trips	Assumed Local Auto Occupancy Rate[4]	Total Adjusted Auto Trips
Daily Peak Hour															
Apartment[5]	7	Total		6.650	46	1.13	**52**	19%	**10**	34%	**18**	47%	**24**	1.13	**22**
	units	In	50%	3.325	23	1.13	**26**	19%	**5**	34%	**9**	47%	**12**	1.13	**11**
		Out	50%	3.325	23	1.13	**26**	19%	**5**	34%	**9**	47%	**12**	1.13	**11**
Shopping Center[6]	10.771	Total		42.700	460	1.78	**818**	5%	**40**	43%	**352**	52%	**426**	1.78	**240**
	KSF	In	50%	21.350	230	1.78	**409**	5%	**20**	43%	**176**	52%	**213**	1.78	**120**
		Out	50%	21.350	230	1.78	**409**	5%	**20**	43%	**176**	52%	**213**	1.78	**120**
Total		Total			**506**		**870**		**50**		**370**		**450**		**262**
		In			**253**		**435**		**25**		**185**		**225**		**131**
		Out			**253**		**435**		**25**		**185**		**225**		**131**
AM Peak Hour															
Condominium[5]	7	Total		0.51	4	1.13	**4**		**1**		**1**		**2**	1.13	**2**
	units	In	20%	0.102	1	1.13	**1**	16%	**0**	36%	**0**	48%	**1**	1.13	**1**
		Out	80%	0.408	3	1.13	**3**	24%	**1**	42%	**1**	34%	**1**	1.13	**1**
Shopping Center[6]	10.771	Total		0.96	10	1.78	**18**		**0**		**9**		**9**	1.78	**5**
	KSF	In	62%	0.595	6	1.78	**11**	4%	**0**	43%	**5**	53%	**6**	1.78	**3**
		Out	38%	0.365	4	1.78	**7**	6%	**0**	54%	**4**	40%	**3**	1.78	**2**
Total		Total			**14**		**22**		**1**		**10**		**11**		**7**
		In			**7**		**12**		**0**		**5**		**7**		**4**
		Out			**7**		**10**		**1**		**5**		**4**		**3**
PM Peak Hour															
Condominium[5]	7	Total		0.62	5	1.13	**5**		**1**		**2**		**2**	1.13	**2**
	units	In	65%	0.403	3	1.13	**3**	24%	**1**	42%	**1**	34%	**1**	1.13	**1**
		Out	35%	0.217	2	1.13	**2**	16%	**0**	36%	**1**	48%	**1**	1.13	**1**
Shopping Center[6]	10.771	Total		3.71	40	1.78	**71**		**3**		**34**		**34**	1.78	**19**
	KSF	In	48%	1.781	19	1.78	**34**	6%	**2**	54%	**18**	40%	**14**	1.78	**8**
		Out	52%	1.929	21	1.78	**37**	4%	**1**	43%	**16**	53%	**20**	1.78	**11**
Total		Total			**45**		**76**		**4**		**36**		**36**		**21**
		In			**22**		**37**		**3**		**19**		**15**		**9**
		Out			**23**		**39**		**1**		**17**		**21**		**12**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Based on ITE Trip Generation Handbook, 3rd Edition method
3. Mode shares based on peak-hour BTD Data for Area 13
4. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates
5. ITE Trip Generation Manual, 9th Edition, LUC 220 (Apartment), average rate
6. ITE Trip Generation Manual, 9th Edition, LUC 820 (Shopping Center), average rate

457 West Broadway

Proposed Site Trip Generation Assessment

HOWARD STEIN HUDSON
12-Sep-2017

xx HARD CODED TO BALANCE

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Transit Share[3]	Transit Person-Trips	Walk/Bike/ Other Share[3]	Walk/ Bike/ Other Trips	Auto Share[3]	Auto Person-Trips	Assumed Local Auto Occupancy Rate[4]	Total Adjusted Auto Trips
Daily Peak Hour															
Condominium[5]	48	Total		5.810	278	1.13	**314**	19%	**60**	34%	**106**	47%	**148**	1.13	**130**
	units	In	50%	2.905	139	1.13	**157**	19%	**30**	34%	**53**	47%	**74**	1.13	**65**
		Out	50%	2.905	139	1.13	**157**	19%	**30**	34%	**53**	47%	**74**	1.13	**65**
Shopping Center[6]	15.525	Total		42.700	662	1.78	**1,178**	5%	**58**	43%	**506**	52%	**614**	1.78	**344**
	KSF	In	50%	21.350	331	1.78	**589**	5%	**29**	43%	**253**	52%	**307**	1.78	**172**
		Out	50%	21.350	331	1.78	**589**	5%	**29**	43%	**253**	52%	**307**	1.78	**172**
Total		Total			**940**		**1,492**		**118**		**612**		**762**		**474**
		In			**470**		**746**		**59**		**306**		**381**		**237**
		Out			**470**		**746**		**59**		**306**		**381**		**237**
AM Peak Hour															
Condominium[5]	48	Total		0.44	22	1.13	**25**		**6**		**10**		**9**	1.13	**8**
	units	In	17%	0.075	4	1.13	**5**	16%	**1**	36%	**2**	48%	**2**	1.13	**2**
		Out	83%	0.365	18	1.13	**20**	24%	**5**	42%	**8**	34%	**7**	1.13	**6**
Shopping Center[6]	15.525	Total		0.96	15	1.78	**27**		**2**		**13**		**12**	1.78	**6**
	KSF	In	62%	0.595	9	1.78	**16**	4%	**1**	43%	**7**	53%	**8**	1.78	**4**
		Out	38%	0.365	6	1.78	**11**	6%	**1**	54%	**6**	40%	**4**	1.78	**2**
Total		Total			**37**		**52**		**8**		**23**		**21**		**14**
		In			**13**		**21**		**2**		**9**		**10**		**6**
		Out			**24**		**31**		**6**		**14**		**11**		**8**
PM Peak Hour															
Condominium[5]	48	Total		0.52	25	1.13	**28**		**6**		**11**		**11**	1.13	**9**
	units	In	67%	0.348	17	1.13	**19**	24%	**5**	42%	**8**	34%	**6**	1.13	**5**
		Out	33%	0.172	8	1.13	**9**	16%	**1**	36%	**3**	48%	**5**	1.13	**4**
Shopping Center[6]	15.525	Total		3.71	58	1.78	**103**		**5**		**50**		**48**	1.78	**27**
	KSF	In	48%	1.781	28	1.78	**50**	6%	**3**	54%	**27**	40%	**20**	1.78	**11**
		Out	52%	1.929	30	1.78	**53**	4%	**2**	43%	**23**	53%	**28**	1.78	**16**
Total		Total			**83**		**131**		**11**		**61**		**59**		**36**
		In			**45**		**69**		**8**		**35**		**26**		**16**
		Out			**38**		**62**		**3**		**26**		**33**		**20**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Based on ITE Trip Generation Handbook, 3rd Edition method
3. Mode shares based on peak-hour BTD Data for Area 13
4. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates
5. ITE Trip Generation Manual, 9th Edition, LUC 220 (Apartment), average rate
6. ITE Trip Generation Manual, 9th Edition, LUC 820 (Shopping Center), average rate

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.

Climate Change Resiliency and Preparedness Checklist

A.1 - Project Information

Project Name:	457-469A West Broadway
Project Address Primary:	457-469A 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:	463 West Broadway, 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 Corporation
Sustainability / LEED:	Soden Sustainability Consulting
Permitting:	Mitchell L. Fischman Consulting ("MLF Consulting") LLC mitchfischman@gmail.com
Construction Management:	Brenco Construction
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:	*15,628 SF*	Building Area:	*64,711 SF*
Building Height:	*55.5 Ft.*	Number of Stories:	*5 Flrs.*
First Floor Elevation (reference Boston City Base):	*Elev 60.0'*	Are there below grade spaces/levels, if yes how many:	*Yes One Level*

A.5 - Green Building

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

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

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

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

A.6 - Building Energy-

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

Electric:	*(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:	***26%***
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

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

Roof:	*R = 49*	Walls / Curtain Wall Assembly:	*R = 20 +R3.8ci*
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	☐ Buried utilities	☐ Hazard removal	☐ Soft &

	building structure & elements	& hardened infrastructure	& protective landscapes	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. Ft58.0/60.0' (Ft.)*
Building Proximity to Water:	*1,885 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?

1885 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

Article 80 – Accessibility Checklist

A requirement of the Boston Planning & Development Agency (BPDA)
Article 80 Development Review Process

The Mayor's Commission for Persons with Disabilities strives to reduce architectural, procedural, attitudinal, and communication barriers that affect persons with disabilities in the City of Boston. In 2009, a Disability Advisory Board was appointed by the Mayor to work alongside the Commission in creating universal access throughout the city's built environment. The Disability Advisory Board is made up of 13 volunteer Boston residents with disabilities who have been tasked with representing the accessibility needs of their neighborhoods and increasing inclusion of people with disabilities.

In conformance with this directive, the BDPA has instituted this Accessibility Checklist as a tool to encourage developers to begin thinking about access and inclusion at the beginning of development projects, and strive to go beyond meeting only minimum MAAB / ADAAG compliance requirements. Instead, our goal is for developers to create ideal design for accessibility which will ensure that the built environment provides equitable experiences for all people, regardless of their abilities. As such, any project subject to Boston Zoning Article 80 Small or Large Project Review, including Institutional Master Plan modifications and updates, must complete this Accessibility Checklist thoroughly to provide specific detail about accessibility and inclusion, including descriptions, diagrams, and data.

For more information on compliance requirements, advancing best practices, and learning about progressive approaches to expand accessibility throughout Boston's built environment. Proponents are highly encouraged to meet with Commission staff, prior to filing.

Accessibility Analysis Information Sources:

1. Americans with Disabilities Act – 2010 ADA Standards for Accessible Design
   http://www.ada.gov/2010ADAstandards_index.htm
2. Massachusetts Architectural Access Board 521 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/aab/aab-rules-and-regulations-pdf.html
3. Massachusetts State Building Code 780 CMR
   http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/csl/building-codebbrs.html
4. Massachusetts Office of Disability – Disabled Parking Regulations
   http://www.mass.gov/anf/docs/mod/hp-parking-regulations-summary-mod.pdf
5. MBTA Fixed Route Accessible Transit Stations
   http://www.mbta.com/riding_the_t/accessible_services/
6. City of Boston – Complete Street Guidelines
   http://bostoncompletestreets.org/
7. City of Boston – Mayor's Commission for Persons with Disabilities Advisory Board
   www.boston.gov/disability
8. City of Boston – Public Works Sidewalk Reconstruction Policy
   http://www.cityofboston.gov/images_documents/sidewalk%20policy%200114_tcm3-41668.pdf
9. City of Boston – Public Improvement Commission Sidewalk Café Policy
   http://www.cityofboston.gov/images_documents/Sidewalk_cafes_tcm3-1845.pdf

Glossary of Terms:

1. ***Accessible Route*** – A continuous and unobstructed path of travel that meets or exceeds the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 20
2. ***Accessible Group 2 Units*** – Residential units with additional floor space that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 9.4
3. ***Accessible Guestrooms*** – Guestrooms with additional floor space, that meet or exceed the dimensional and inclusionary requirements set forth by MAAB 521 CMR: Section 8.4
4. ***Inclusionary Development Policy (IDP)*** – Program run by the BPDA that preserves access to affordable housing opportunities, in the City. For more information visit: http://www.bostonplans.org/housing/overview
5. ***Public Improvement Commission (PIC)*** – The regulatory body in charge of managing the public right of way. For more information visit: https://www.boston.gov/pic
6. ***Visitability*** – A place's ability to be accessed and visited by persons with disabilities that cause functional limitations; where architectural barriers do not inhibit access to entrances/doors and bathrooms.

1. Project Information:

If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.

Project Name:	**457–469A West Broadway, South Boston**
Primary Project Address:	**457–469A West Broadway, South Boston**
Total Number of Phases/Buildings:	**1**
Primary Contact (Name / Title / Company / Email / Phone):	**Oranmore Enterprises LLC** 36 Central Avenue, Unit C-2 Milton, MA 02186
Owner / Developer:	**463 West Broadway LLC**
Architect:	**Stefanov Architects Inc.**
Civil Engineer:	**Howard Stein Hudson**
Landscape Architect:	**BSC Group**
Permitting:	**MLF Consulting LLC**
Construction Management:	**Oranmore Enterprises LLC**

At what stage is the project at time of this questionnaire? Select below:

☑PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
BPDA Design Approved	Under Construction	Construction Completed:

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	Yes, The proposed mechanical parking structure which would provide more cars than would be on one level would generate more on-grade accessible parking requiring a variance.

2. Building Classification and Description:

This section identifies preliminary construction information about the project including size and uses.

What are the dimensions of the project?				
Site Area:	*15,612 SF*	Building Area:		*65,247 GSF*
Building Height:	*55.5 FT.*	Number of Stories:		*5 Flrs.*
First Floor Elevation:	12 FT	Is there below grade space:		*Yes*
What is the Construction Type? (Select most appropriate type)				
	☑Wood Frame	Masonry	Steel Frame	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	☑Residential - Multi-unit, Four +	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	*Retail Use, Entrance Lobby for Residences above*			

3. Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	457- 469A West Broadway is bounded to the north by West Broadway, to the south by Silver Street, to the west by Mt. Washington Bank and to the east by a 4-story Mixed-Use Building. West Broadway is a commercial corridor filled with banks, parking lots, retail stores, restaurants, both large and smaller take out types. The site naturally slopes up Dorchester Street as it continues to the east and down from West Broadway on the front to Silver Street at the back.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	Right outside the building are bus routes 9 and 11 which connects from City Point – Downtown. Redline Broadway MBTA Station (0.7 miles away) provides connection to South Station and downtown Boston. On the corner is the 10 Route from City Point to Back Bay.

List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	**Affordable/Public Housing:** Boston Housing Authority West Broadway Development located on West Broadway and D Street **School:** JF Condon School **Police:** C-6 Police Station **Fire:** Engine 39 located on 272 D Street **Hospitals:** South Boston Community Health Center, Boston Medical Center
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	**Public Library:** Boston Public Library (South Boston Branch) **Community Center:** Condon Community Center
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? ***If yes,*** identify which district:	MLF Consulting is not aware of the project site being located within an historic district.
Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Yes, an existing sidewalk abuts the project site to the North and South along West Broadway and Silver Street. The existing sidewalk material is concrete with granite curbing. The physical condition of the existing concrete sidewalk and pedestrian ramps is good.
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	Yes, with modifications for new driveway entrance into the property along Silver Street. 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.

5. Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes (pending confirmation of existing cross slopes and clearances). Neighborhood Connector
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	Along West Broadway, the existing sidewalk width of approximately 15'-6" will be maintained. Concrete walkway paving will include a 11' clear width pedestrian zone, a 4' greenscape/ site furnishing zone and a 6" curb.
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 pedestrian zone will be poured in place concrete. The majority of the pedestrian zone will reuse the existing concrete sidewalk and is in the City of Boston right-of-way.
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	Site furnishing zone will provide two tree planting areas (4'x12' each). Bike racks will also be installed in the greenscape/ site furnishing zone to accommodate 10 bicycles.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	Not Applicable

Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	Yes, We will be adding a Marque at the residential entrance.
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*.	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	50 Parking Spaces inside the building, 48 using a mechanical parking machine.
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle?	2 accessible spaces in the Garage and 1 van accessible space for drop-off.
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No
Where is the accessible visitor parking located?	Accessible visitor parking can be access from the main rear garage entry off Silver Street to the accessible drop-off area.
Has a drop-off area been identified? ***If yes,*** will it be accessible?	Yes
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors*.	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	Flush Condition at most if not all entryway locations. Ramps to be added where/if needed. The ground floor access will be flush with the street grade. 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.

Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no,*** what is the reason?	Yes. The ground floor access will be flush with the street grade.
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	All future way finding signage will be developed to meet Building Code and Accessibility Board Requirements
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	44 Residential Units
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	44 apartment units; it has not been determined at this time whether the units will be rental or for sale. At this time, 39 market rate units of which 6 will be affordable units
If a residential development, how many accessible Group 2 units are being proposed?	2 units
If a residential development, how many accessible Group 2 units will also be IDP units? ***If none***, describe reason.	It will be a mix of affordable and market rate units. Final combination to be determined.
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? ***If yes,*** provide amount and location of equipment.	Not Applicable

Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes,*** provide reason.	No
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? ***If yes,*** describe:	Yes, elevators are provided to access each floor and roof decks.
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.*	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	Two tree planting areas are provided in the greenscape/ site furnishing area in the front of the building and bicycle parking on the sidewalk.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	Yes the entire building is accessible including the common landscaped deck on the second floor and the landscaped roof deck
Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? ***If no***, explain why not.	Yes in the lower level (Gym/ community room) They are planned to be single stall ADA compliant unisex restrooms.

Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments?	Not at this time. This will be done during the review period for the PNF.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible?	Not at this time. This will be done during the review period for the PNF.
10. Attachments *Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.* **See Figures AD 1.01 thru AD 1.05.**	
Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances.	
Provide a diagram of the accessible route connections through the site, including distances.	
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable)	
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry.	
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. **See Figures AD 1.01 thru AD 1.05.**	

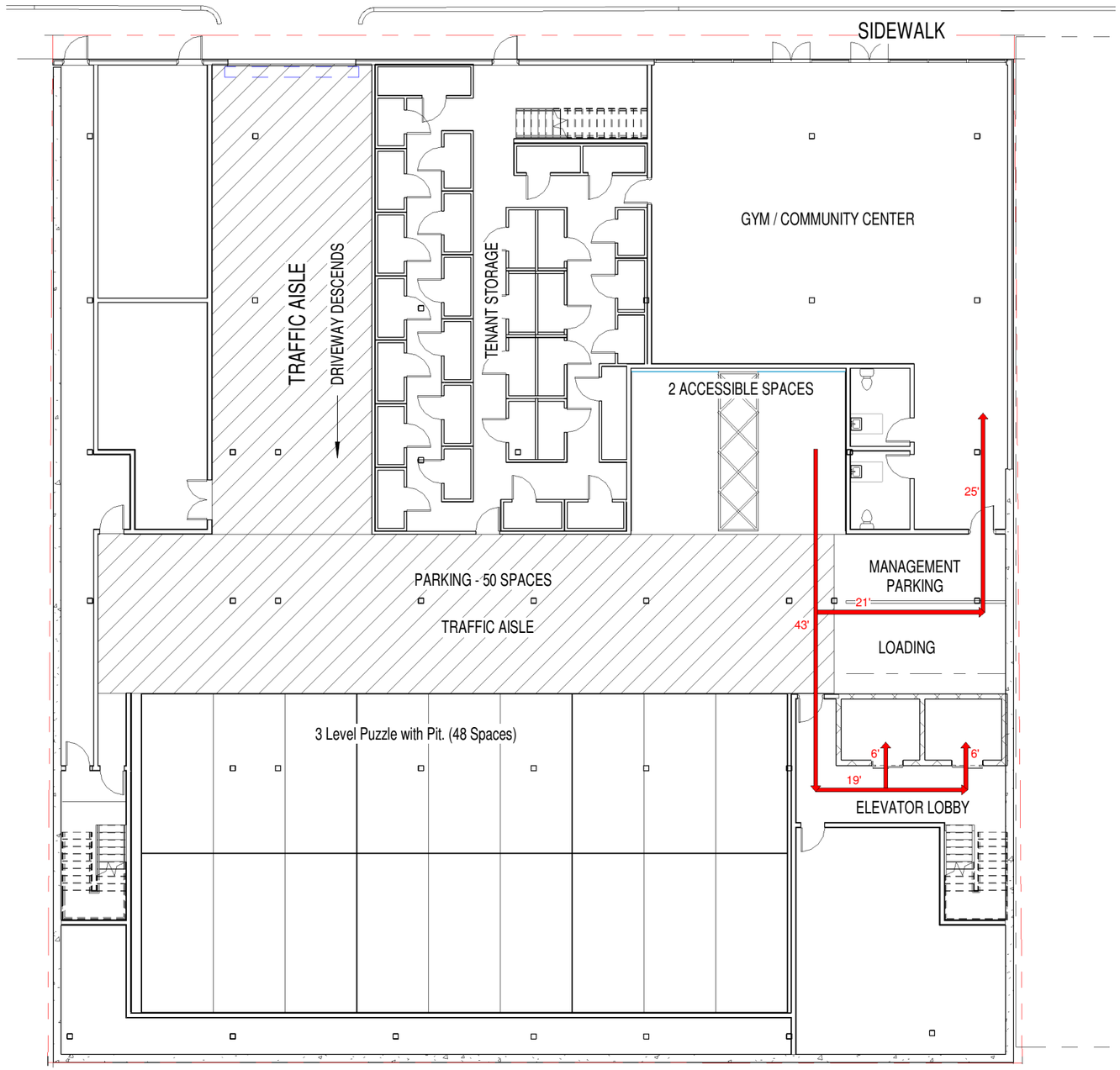
This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open spaces are usable and welcoming to Boston's diverse residents and visitors, including those with physical, sensory, and other disabilities.

For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

The Mayor's Commission for Persons with Disabilities
1 City Hall Square, Room 967,
Boston MA 02201.

Architectural Access staff can be reached at:

accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682



1 Proposed Basement Accessibility
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

457-469A West Broadway, South Boston

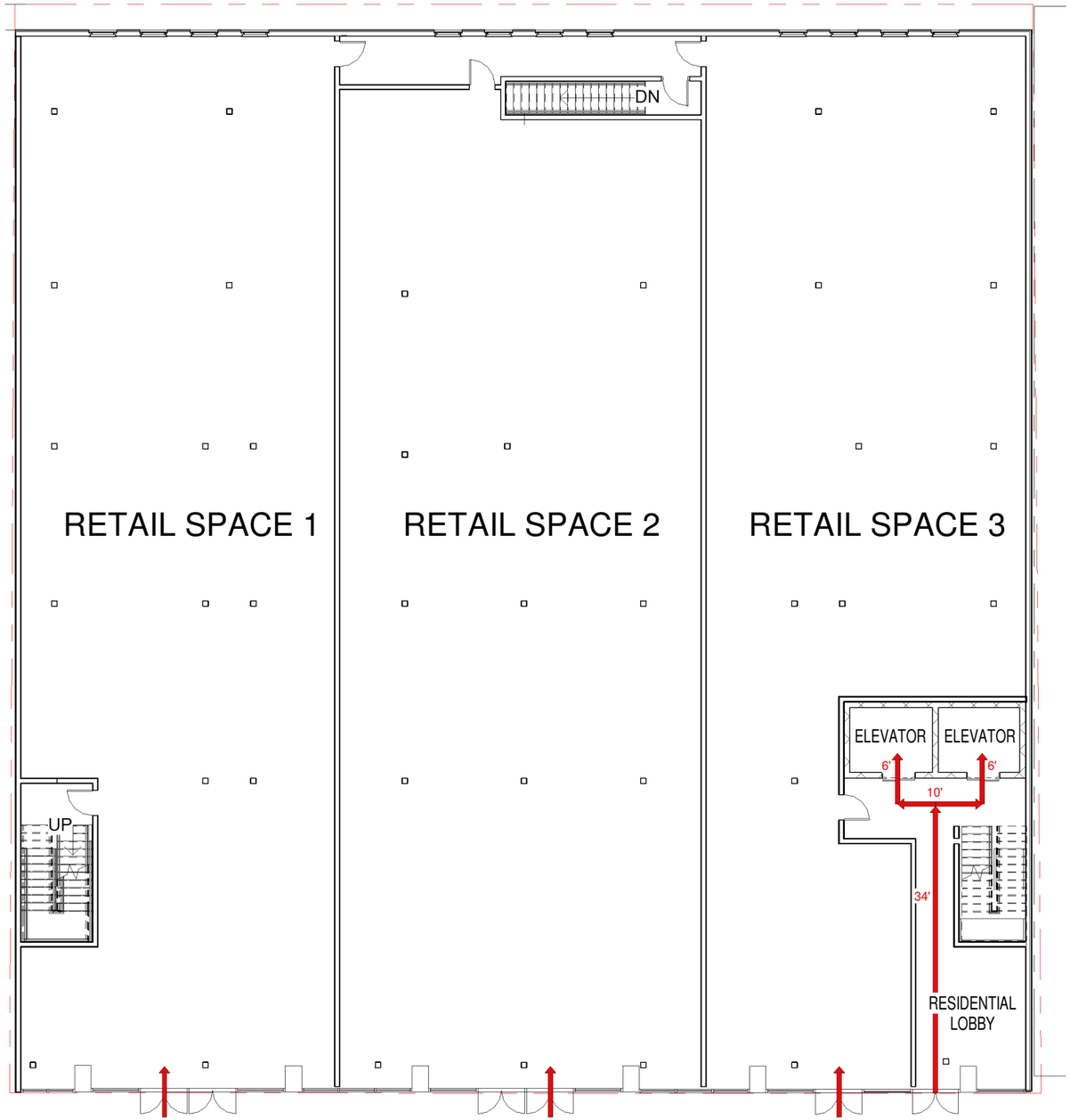
Proposed Basement Accessibility

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.01

Date 2017-11-20

Scale 1/16" = 1'-0"



1 Proposed 1st Floor Accessibility
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

457-469A West Broadway, South Boston

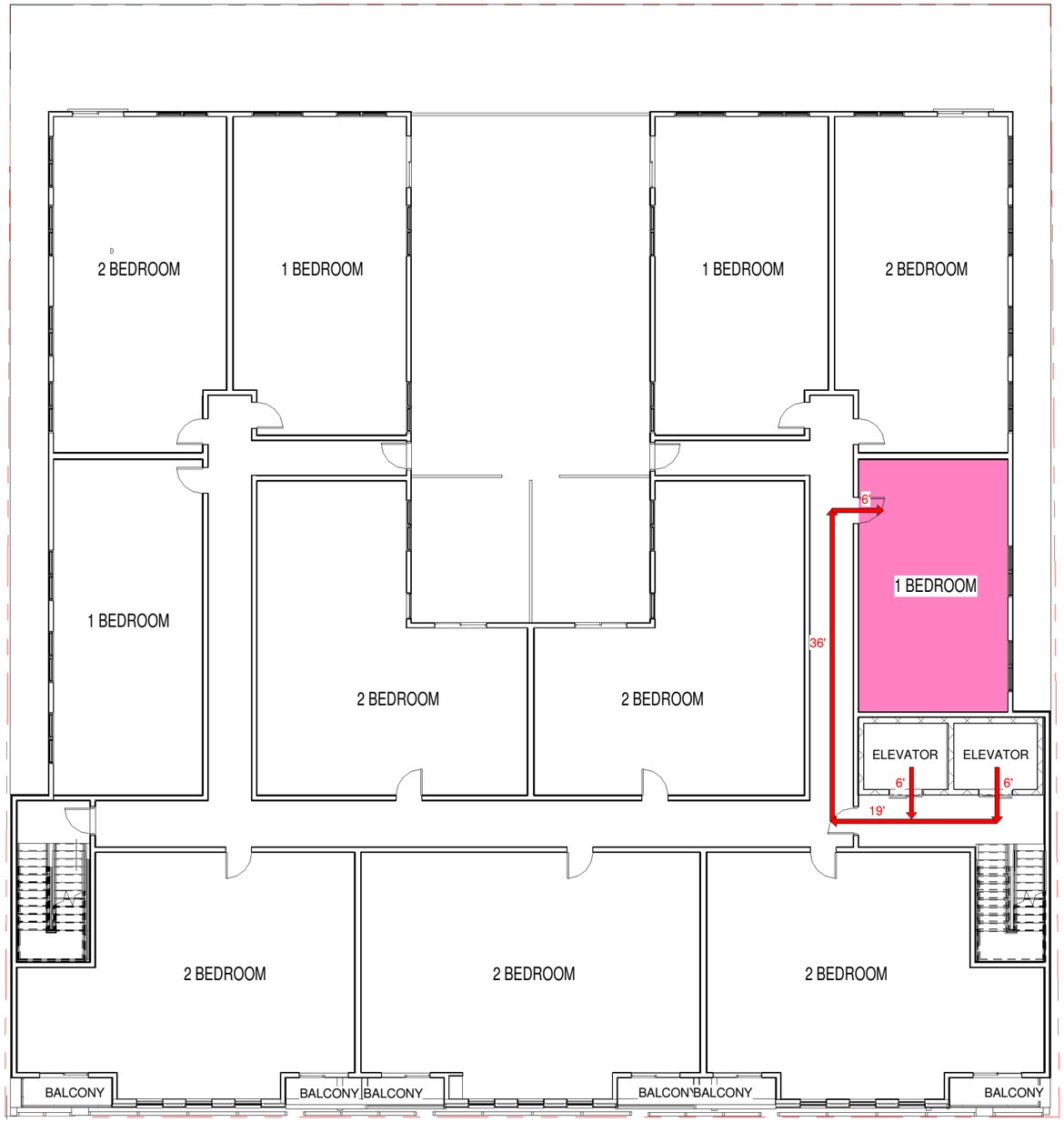
Proposed First Floor / Site Accessibility

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.02

Date 2017-11-20

Scale 1/16" = 1'-0"



1 Proposed 2nd Floor Accessibility
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

ACCESSIBLE UNIT

457-469A West Broadway, South Boston

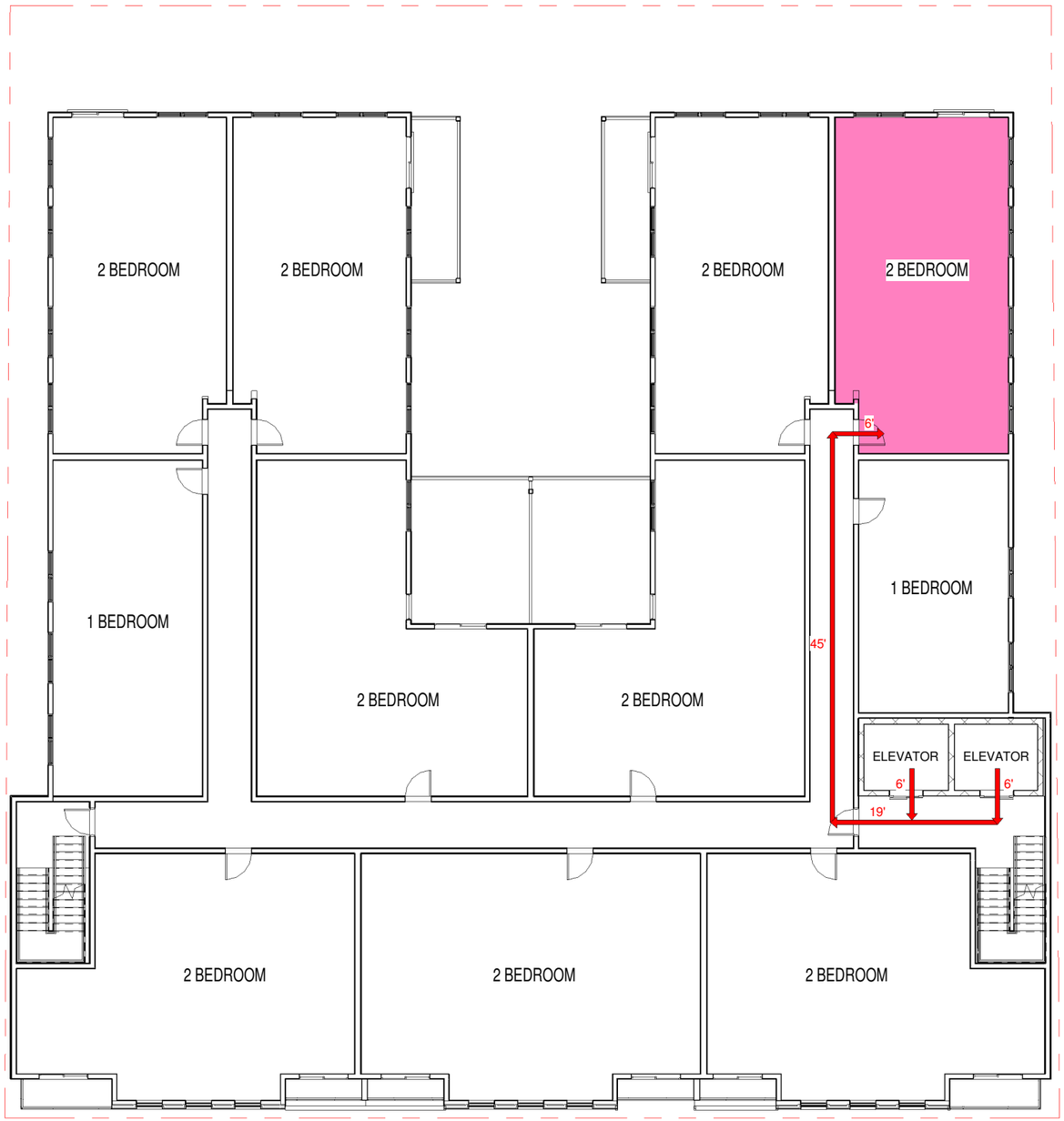
Proposed Second Floor Accessibility (1 BR)

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.03

Date 2017-11-20

Scale 1/16" = 1'-0"



1 Proposed Typical Floor Accessibility
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

ACCESSIBLE UNIT

457-469A West Broadway, South Boston

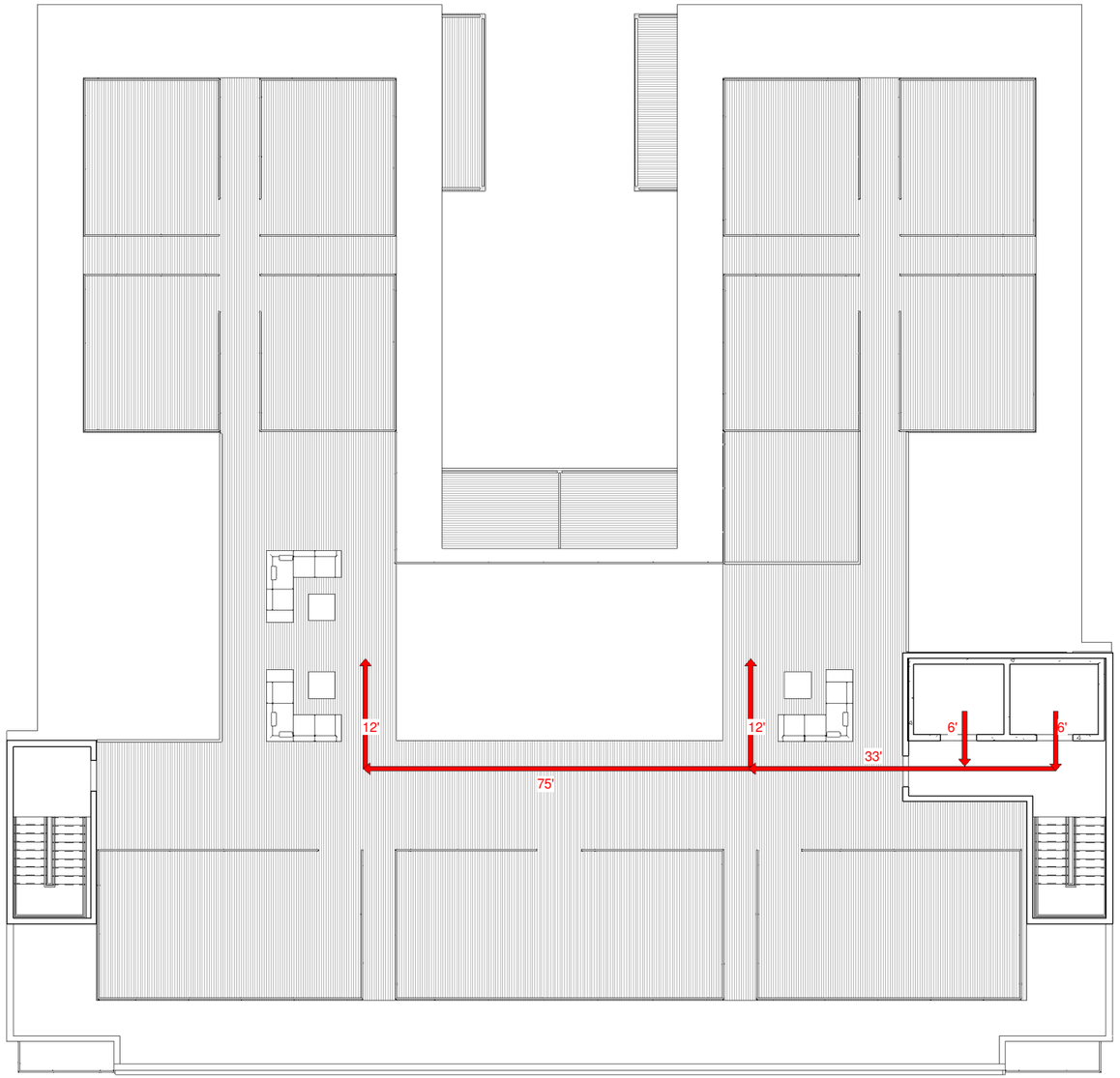
Proposed Typical Floor Accessibility (2 BR)

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.04

Date 2017-11-20

Scale 1/16" = 1'-0"



1 Proposed Roof Accessibility
1/16" = 1'-0"

LEGEND

ACCESSIBLE ROUTE

457-469A West Broadway, South Boston

Proposed Roof Accessibility

STEFANOV ARCHITECTS
423 WEST BROADWAY, SUITE 404
BOSTON, MA 02127
617.765.0543

AD 1.05

Date 2017-11-20

Scale 1/16" = 1'-0"

457- 469A West Broadway, South Boston, MA

MLF
CONSULTING LLC

STEFANOV ARCHITECTS