Project Notification Form

Submitted Pursuant to Article 80 of the Boston Zoning Code

3368 WASHINGTON STREET

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

Submitted by:
Washington Pine LLC

c/o The Community Builders
185 Dartmouth Street
Boston, MA 02116

c/o Pine Street Inn, Inc.
444 Harrison Avenue
Boston, MA 02118

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

In Association with:
RODE Architects, Inc.
Klein Hornig LLP
Nitsch Engineering, Inc.

June 7, 2019

Epsilon
ASSOCIATES INC.

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Table of Contents

Table of Contents

Table of Contents (Continued)

Table of Contents (Continued)

Table of Contents (Continued)

List of Appendices

List of Figures

List of Figures (Continued)

List of Tables

List of Tables (Continued)

Chapter 1.0

Project Information

1.0 PROJECT INFORMATION

1.1 Introduction

Washington Pine LLC (the "Proponent), a joint venture between The Community Builders, Inc. (TCB) and Pine Street Inn, Inc. (PSI) proposes to redevelop the parcel owned by PSI at 3368 Washington Street in the Jamaica Plain neighborhood of Boston (the "Project site"). The Project site includes an existing office and warehouse building used by the Pine Street Inn to support their mission and properties in the Boston area.

The proposed development includes the demolition of the existing building and construction of a new mixed-use building with ground floor office and warehouse space for PSI and residential units on the upper floors (the "Project"). The residential portion will include Supportive Housing units for individuals served by PSI and low- and moderate-income residential units. TCB will be the Management Agent for all residential units on-site. In addition to the significant contribution to housing that the Project will provide, the redevelopment will improve the streetscape along the Project site with wider sidewalks and a new plaza area and will also provide a community room that will be available, by request, for use by the public.

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

About The Community Builders, Inc.

TCB is one of America's leading nonprofit housing organizations. Its mission is to build and sustain strong communities where people of all incomes can achieve their full potential. This mission is realized by developing, financing, and operating residential communities, neighborhood amenities and resident opportunity programs. Since 1964, TCB has constructed or preserved hundreds of affordable and mixed-income housing developments and pioneered the Community Life model for resident success. Over the last 50 years, TCB has completed or preserved over 30,000 homes. Today, anchored by offices in Boston, Chicago, Cincinnati, New York and Washington, D.C., TCB owns or manages 11,000 apartment homes in more than 14 states.

About Pine Street Inn, Inc.

Founded in 1969, PSI is the largest homeless services provider in New England, offering a comprehensive range of services to nearly 2,000 men and women each day, including permanent housing, workforce development, emergency shelter and street outreach. PSI's goal is to end homelessness by making permanent housing a reality for all, by supporting men and women in moving off the streets, out of shelter into a permanent home, reconnecting with the community and reaching their highest level of independence. PSI Inn has been developing, managing and providing supportive services in permanent housing since 1984.

Today, PSI supports more men and women in housing than in shelter, with over 850 tenants in 40 locations across Boston and in Brookline. PSI has housed thousands of men and women over the last 35 years. With a 90+% retention rate in housing, PSI Inn helps tenants become and remain stable.

1.2 Project Description

1.2.1 Project Site

The approximately 0.9-acre Project site is located at 3368 Washington Street in the Jamaica Plain neighborhood of Boston. The site is bound by Washington Street the west, commercial properties to the south and residential properties to the north and east. The site currently includes the existing Pine Street Inn office building, a storage warehouse and a surface parking lot. See Figure 1-1 for an aerial locus map and Figures 1-2 to 1-4 for the existing conditions of the Project site. Appendix A includes a site survey.

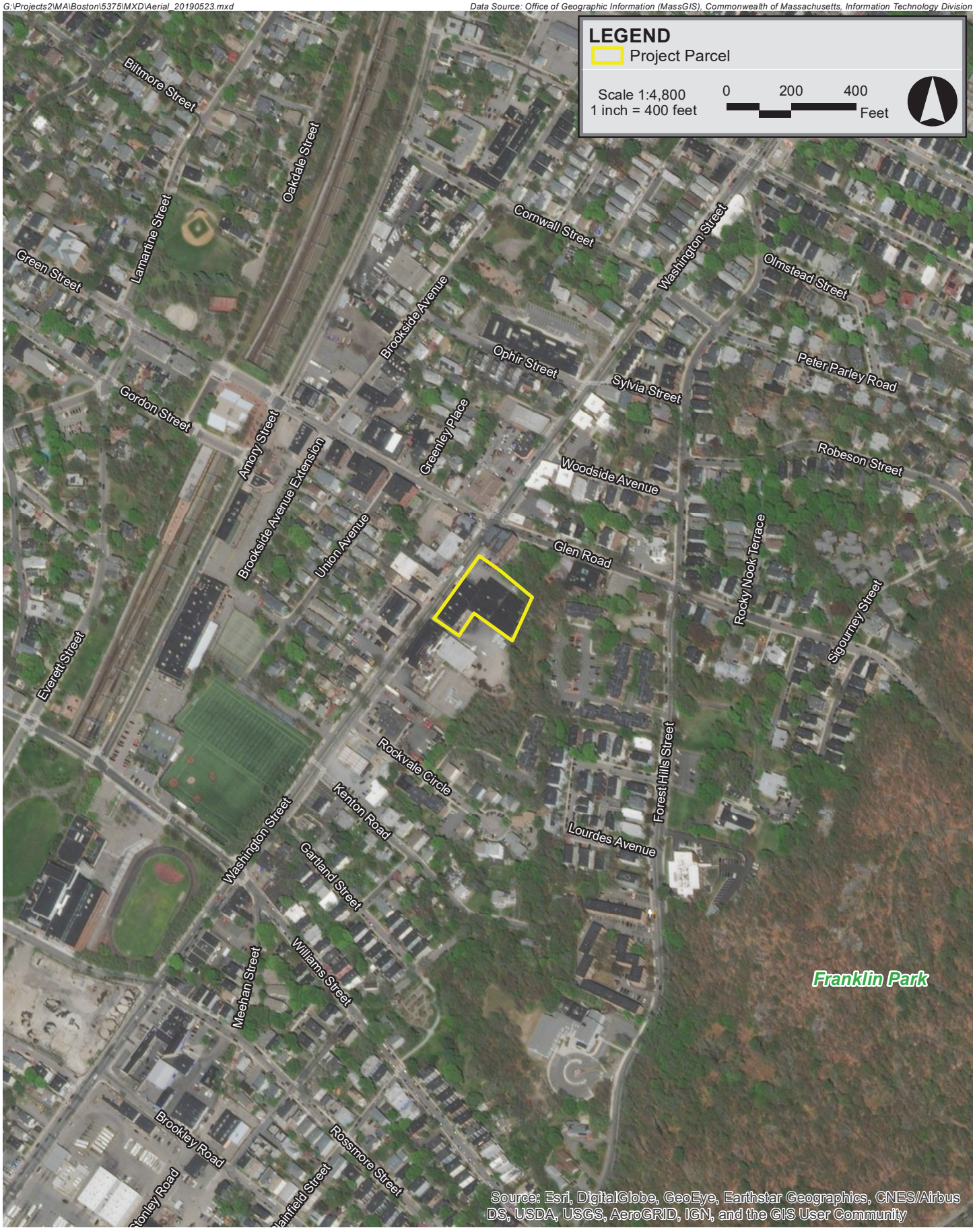
PSI currently owns the land on which the existing single-story approximately 27,000 square foot (sf) building is situated. The office/warehouse building is occupied by the organization's supply storage; facilities and maintenance staff and vehicles for all its scattered site properties; purchasing department staff; and a portion of its case management team. Some clients currently receive services at this location. In past years, the facility has also been home to several non-profit retail ventures run by PSI, including a carpentry training program and a thrift store.

The Project site is proximate to multiple Massachusetts Bay Transportation Authority (MBTA) bus stops and is approximately one-quarter mile from the MBTA Green Street station on the Orange Line.

1.2.2 Area Context

The area immediately surrounding the Project site includes a mixture of residential and commercial uses. The buildings around the site typically range in height from one to five stories tall and are surrounded by paved areas used for parking and storage. Residential neighborhoods with commercial uses are located to the north, west and south, and a vegetated lot is located to the east, with residential uses beyond. There is a prevalence of autobody and detailing shops, office, and food services along Washington Street immediately surrounding the site. Recreational facilities in the area include Johnson Park, William F. Flaherty Park, Minton Stable Community Garden, Franklin Park, Franklin Park Zoo, and the Arnold Arboretum of Harvard University.

The Project site is located within the study area of the PLAN: JP/ROX (the Plan) which was published in February 2017 by the BPDA. The Plan provides recommendations to shape new growth and development in the Jamaica Plain and Roxbury neighborhoods. The study area of the Plan encompasses the Forest Hills/Stonybrook neighborhood, Green Street, Jackson Square, and Egleston Square and is generally bound by Columbus Avenue, Amory Street and Washington Street.



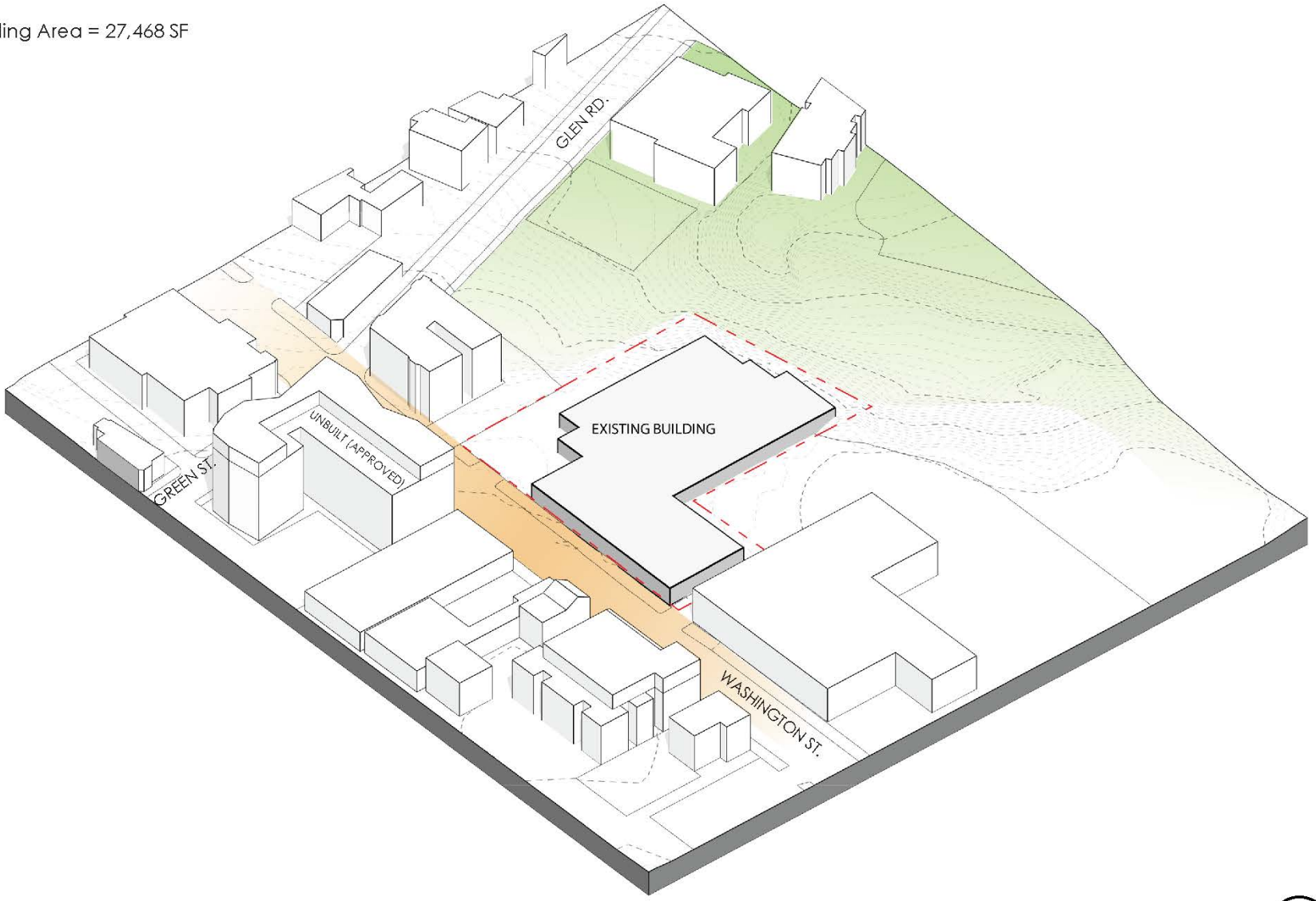
3368 Washington Street Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 1-1
Aerial Locus Map

EXISTING CONDITIONS

- Lot Size = 40,220 SF
- Building Area = 27,468 SF



3368 Washington Street Boston, Massachusetts

RODE

Figure 1-2
Existing Conditions

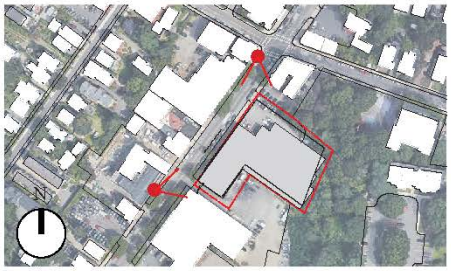


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Figure 1-3
Existing Site Conditions Photos

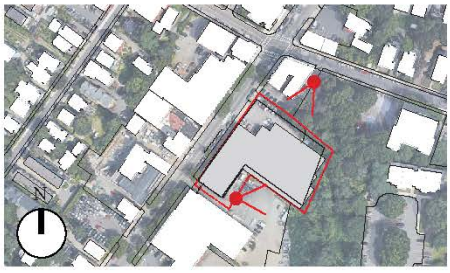

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Figure 1-4
Existing Site Conditions Photos

One of the main focuses of the Plan is to accelerate the production of affordable housing and to prevent displacement of low- and moderate-income residents. The Plan calls for expanding the supply of market rate and affordable housing to better meet growing demand. The Project will help achieve these goals through the transformation of the Project site to provide housing for low- and moderate-income residents, as well as for Boston residents who have been homeless and need additional support. The increased supply of multifamily housing will strengthen the community with quality housing and amenities and sustain diversity in the Jamaica Plain and Roxbury neighborhoods.

The Plan recommends improving existing connections, particularly for pedestrians and bicyclists, while safely and gradually decreasing vehicle usage without causing detrimental congestion. The Project site enjoys local and regional access due to its proximity to several MBTA bus, subway and commuter lines, such as the MBTA Orange Line at Green Street which is approximately one-quarter mile from the site. The site also proposes improved sidewalks along Washington Street, as well as ground floor uses that will create activity. See Figure 1-5 for the area's transportation context.

According to the Plan, the community vision's main goal is a balance between preserving the physical, social, and affordable aspects of the well-loved neighborhood while also focusing on new development to improve the neighborhood's quality of life and provide economic opportunities. The Project will serve the neighborhood with a quality, energy efficient building that provides affordable housing and an enhanced public realm along Washington Street. The site's proximity to public infrastructure provides local and regional connection to the Greater Boston area and will further improve the neighborhood's economic development.

1.2.3 Proposed Project

The Project includes the construction of a six-story, approximately 169,500 sf building containing approximately 221 residential units and approximately 23,000 sf of commercial space on the first floor consisting of offices, resident and community amenity spaces and a maintenance and storage warehouse. The residential units will be a mix of 141 units of Supportive Housing and 80 units of low- and moderate-income housing; 100% of the units will be affordable rental housing. The existing building will be demolished. See Figure 1-6 for the Project overview; see Figure 1-7 for a perspective showing the Project and see Figures 1-8 and 1-9 for building sections. Appendix B includes floor plans and elevations. Table 1-1 provides the Project details.

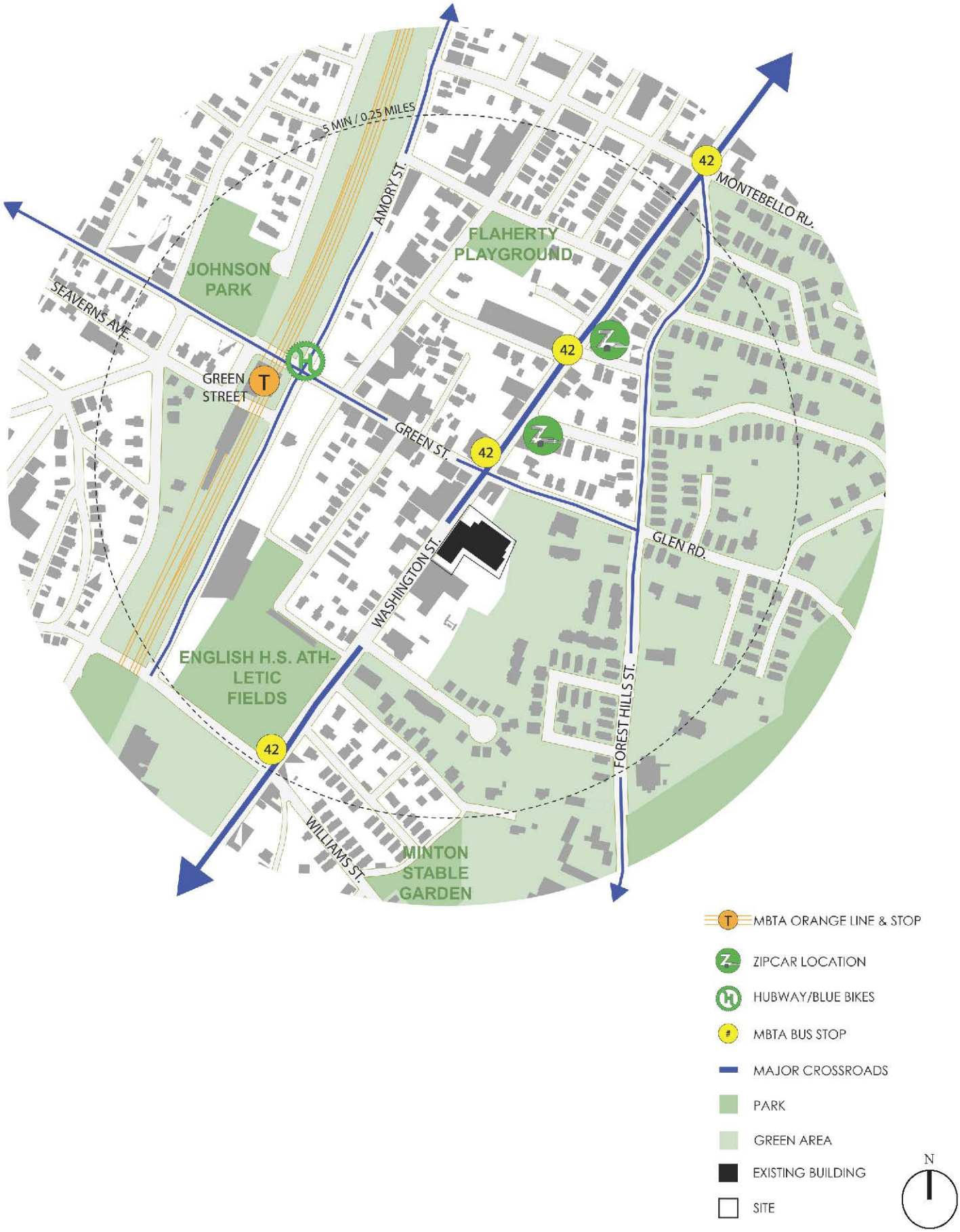

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Figure 1-5
Area Transportation Context

PROJECT OVERVIEW: 221 UNITS

- 141 Supportive Housing Studios (~28 units per floor, 29 on Level 2)
- 80 Low Mod Units (~17 units per floor)
  43% - Studio (34) / 30% - 1 Bed (24) / 21% - 2 Bed (17)/ 6% - 3 Bed (5)
- 12,898 SF Usable Outdoor space (including terraces)
- Approx. 58 Parking Spaces
  - 40 Residential
  - 18 Commercial
- Site Area = 40,220 SF
- Building GSF = 169,500 SF
- F.A.R. = 4.2

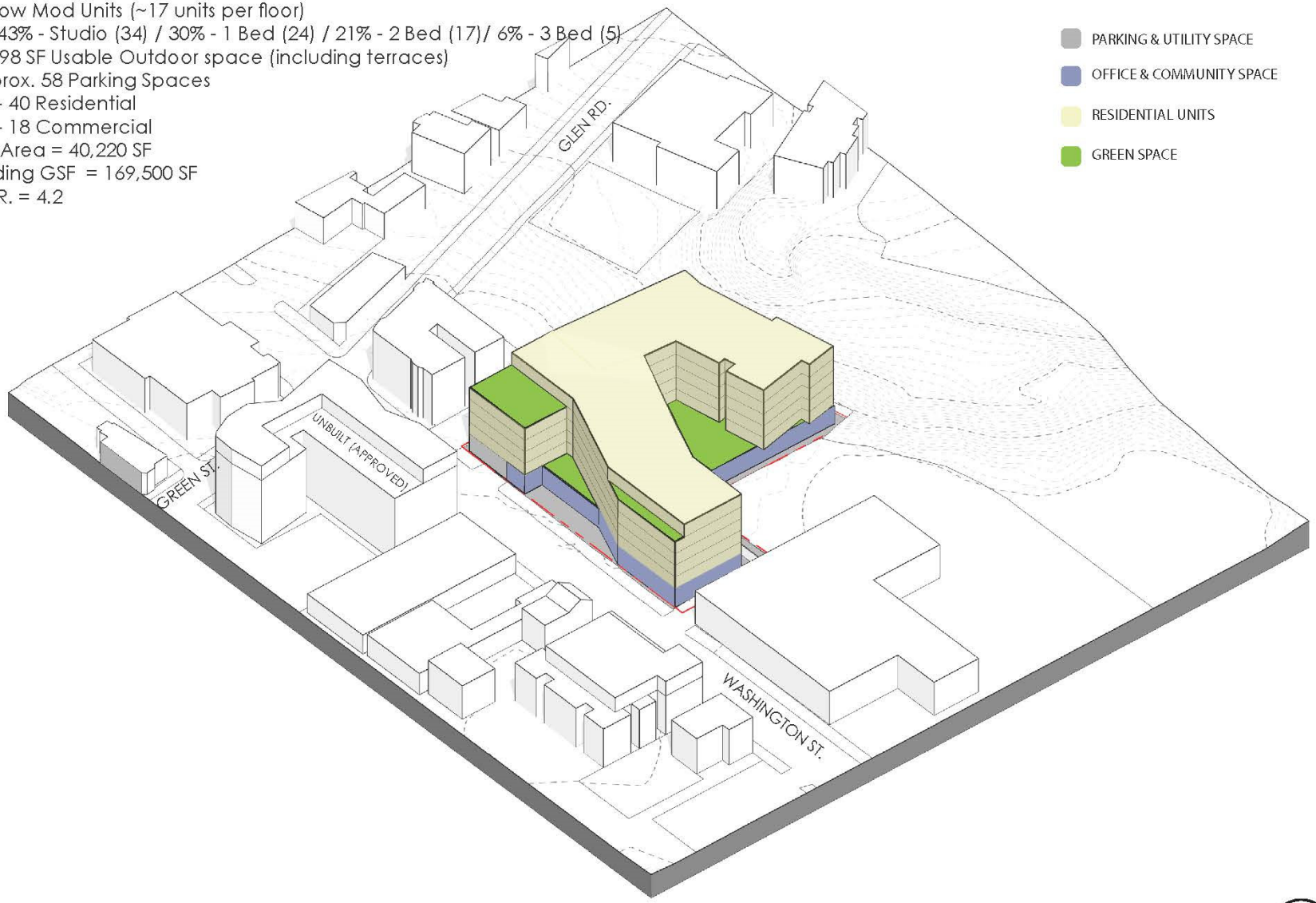

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Figure 1-6
Project Overview

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Figure 1-7
Birds Eye View – Washington Street

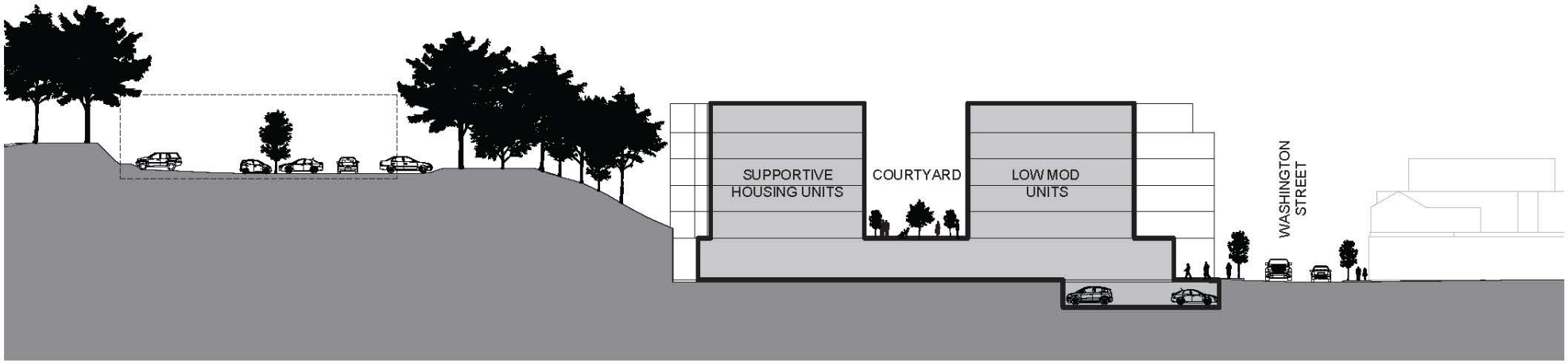

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Figure 1-8
Site Section

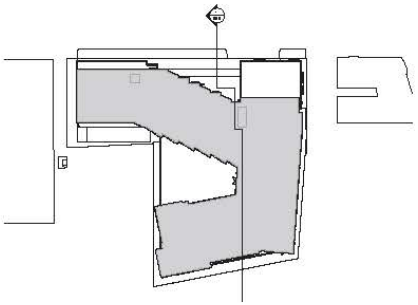

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Figure 1-9
Building Section

Table 1-1 Project Program

Project Element	Approximate Count / Dimension
Units	
Supportive	141
Low- and Moderate-Income	80
Office /Warehouse/Support	23,000 sf
Height (ft)	69'-11" ft
Parking Spaces	58
Total Square Footage	169,500 sf

The central portion of the building along Washington Street is set back to create an entrance plaza for the building (see Figure 1-10 for site plan). The southern side of the plaza includes the entrance to the TCB management office and the low- and moderate-income units above, while the northern side of the plaza includes the entrance to the PSI offices and maintenance and support space, which comprise the majority of the first floor, as well as the entrance to the Supportive Housing units above. Access to PSI spaces including the offices, a resident amenity space, mailboxes and the residential units will be through a secure entrance and check-in point. The first floor also includes a community room on Washington Street that, along with the building entrances and office space, will create activity along the street. The community room will be able available, by request, for use by the public.

Approximately 58 parking spaces will be split between two locations: approximately 18 parking spaces for the office space will be located on the first floor, while approximately 40 resident parking spaces will be located within a basement garage. Access to the basement garage will be via the driveway on the southern portion of the Project site to the ramp behind the building. Access to the first floor parking area and loading dock will occur from an entrance driveway on the northern side of the building. The Project will include space for approximately 144 bicycles within the parking areas. All loading activities are anticipated to occur within the building.

The Project will also have approximately 13,000 sf of open space for use by the building's occupants (see Figure 1-11 for a landscape plan). These spaces include the landscaped entrance plaza at the first floor, a courtyard on the second floor dedicated to the Supportive Housing tenants and a terrace on the sixth floor for use by the Low-Moderate income tenants.

1.3 Public Benefits

The Project will provide a number of benefits to the City of Boston, the main benefit inherent in the missions of both PSI and TCB, is the provision of new housing for the homeless and for low- and moderate-income individuals and households.

3368 Washington Street Boston, Massachusetts

RODE

Figure 1-10
Site Plan

3368 Washington Street Boston, Massachusetts

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Figure 1-11
Landscape Plan

Additional benefits include those related to urban design, jobs and economic development, including:

- Upgraded sidewalks, landscaping and other public amenities consistent with the Boston Transportation Department's (BTD's) Complete Streets Guidelines;
- New landscaped entrance plaza on Washington Street, along with a community room and offices along the front of the building to create activity at the street edge;
- Development of an underutilized parcel with new uses that meet the intent of PLAN: JP/ROX;
- Improved stormwater management on-site;
- Creation of approximately 480 full-time equivalent construction jobs and approximately 15 permanent jobs. The permanent jobs will be across property management and maintenance, case management and administrative support.

1.4 Legal Information

1.4.1 Legal Judgements Adverse to the Proposed Project

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

1.4.2 History of Tax Arrears on Property

The Proponent, Washington Pine LLC, does not own any property in Boston on which the property taxes are in arrears.

1.4.3 Site Control/Public Easements

PSI acquired the property in May 1997 pursuant to a deed recorded in the Suffolk County Registry of Deeds, and presently has site control of the parcel. The Proponent intends to acquire the Project site from PSI upon closing of the construction loan. There are no public easements which traverse or affect any portion of the Project site.

1.5 City of Boston Zoning

1.5.1 Site Zoning

The Project site is located within a Local Industrial Subdistrict of the Jamaica Plain Neighborhood District, and is not located within any overlay districts. The Project site is within the study area of Plan: JP/ROX. All residential uses are forbidden in this district, and therefore the residential portion of the Project will require a use variance.

The proposed commercial uses, including (i) administrative offices not exceeding in size 40% of the allowable gross floor area of the Project as a whole and (ii) the community room(s) (which is likely a "community center" use), are allowed as-of-right.

The maximum allowable floor area ratio (FAR) is 1.0. The proposed Project has a FAR of approximately 4.2, based on the lot size of 40,220 sf and proposed gross floor area of approximately 169,500 sf. A variance will be required. The maximum allowable building height is 35 feet. The proposed building is just under 70 feet in height. A variance will be required. There are no minimum requirements in this district for Lot Size or Lot Area per Dwelling Unit.

The Minimum Usable Open Space per dwelling unit in this district is 50 sf. Open space meeting this requirement must be at least 75% open to the sky, free of automotive traffic, parking, and undue hazard, and readily accessible by all those for whom it is required. As the proposed Project consists of 221 dwelling units, 11,050 sf of usable open space is required. The Project includes approximately 13,000 sf of usable open space, including open space in the entrance plaza, the setbacks, a second-floor courtyard and a sixth-floor terrace. The Project is compliant with this requirement. There is no minimum for Lot Width or Lot Frontage requirements in this district. There are no minimum front yard or side yard requirements in this district. The minimum rear yard requirement is a depth of 20 feet. The Project has a rear yard depth of approximately 10 feet. A variance will be required.

Screening and Buffering requirements will be determined through the Article 80 Large Project Review process. The proposed Project will incorporate screening and buffering components that are intended generally, but not entirely, to meet the requirements of underlying zoning, found in Section 55–38, which would otherwise be applicable outside the Article 80 context.

- The proposed Project will provide and maintain landscaping on the front lot line;
- There is no off-street surface parking or loading areas, so screening and buffering of parking and loading areas is inapplicable;
- There is no off-street surface parking or loading areas, so parking of vehicles in areas used for screening and buffering is inapplicable;
- Ground-mounted electrical transformer will be enclosed behind walls;
- Roof mounted mechanical equipment will be screened from view;
- Landscaping will be maintained by experienced personnel; and
- There will be no outside storage of materials, supplies or products within any landscaped areas.

Parking and loading requirements will be determined through the Article 80 Large Project Review process. The Project's proposed off-street parking and off-street loading facilities are described in Sections 2.4.2 and 2.4.3. A total of 58 structured garage parking spaces and one loading area (also within the garage) are proposed for the Project site.

In sum, the anticipated variances for the Project include residential use, FAR, building height and rear yard.

1.6 Anticipated Permits and Approvals

Table 1-2 represents a preliminary list of permits and approvals from governmental agencies that are expected to be required for the Project, based on currently available information. It is possible that only some of these permits or actions will be required, or that additional permits or actions will be required.

Table 1-2 Anticipated Permits and Approvals

Agency	*Permit / Approval*
Local	
Boston Planning & Development Agency	Review under Article 80, including Large Project Review, as required pursuant to Article 80B of the Code; Disclosure of Beneficial Interests in Large Projects; Cooperation Agreement; Other permits as may be identified
Boston Civic Design Commission	Design Review
Boston Employment Commission	Construction Employment Plan
Boston Fire Department	Approval of Fire Safety Equipment; Permit for Maintenance of Fire Protection Equipment; Permit for Safe Access to Site by Fire Department
Interagency Green Building Committee	Article 37 Compliance
Boston Transportation Department	Approval of Transportation Access Plan Agreement; Construction Management Agreement and Traffic Maintenance Plan Agreement
Public Improvements Commission	Street Sidewalk Specific Repair Plan; Maintenance Agreement Approval
Boston Department of Public Works	Street Opening Permit; Street/Sidewalk Occupancy Permit
Boston Water and Sewer Commission	Local Sewer and Water Tie-in; Site Plan Approval, if necessary
Boston Inspectional Services Department	Building Permit; Demolition Permit; Other construction-related permits; Certificate of Occupancy

Table 1-2 Anticipated Permits and Approvals (Continued)

Agency	*Permit / Approval*
State	
Massachusetts Department of Environmental Protection	Notification of Demolition and Construction
Massachusetts Historical Commission	Determination of No Adverse Impact by Massachusetts Historic Commission
Massachusetts Water Resources Authority	Construction Dewatering Permit (if required); Temporary Construction Dewatering Permit (if required); Sewer Use Discharge Permit (if required)
Federal	
Environmental Protection Agency	NPDES General Permit for Construction Stormwater; NPDES Remediation General Permit

1.7 Public Participation

The Project team has attended over twenty meetings as part of its community engagement strategy for the Project. As of May 2019, the Project team has attended the following meetings:

May 2019

- Continued informal meetings with neighborhood residents and abutters.
- Meeting with Washington Street Business Group.

April 2019

- Informal meetings with neighborhood residents and abutters.

March 2019

- DND and Fair Housing Commission staff.
- Community meeting with neighborhood associations attended by more than 40 residents, including leaders of Union Avenue Neighborhood Association, Keep it 100 Egleston, Brookside Neighborhood Association, Egleston Square Neighborhood Association, Egleston Square Main Street, and Boston Tenant Coalition.
- Informational meeting with Housing and Development Committee of the Jamaica Plain Neighborhood Council.

February 2019

- BPDA Staff.
- Informational meetings with neighborhood residents, business owners and abutters, including leadership of Union Avenue Neighborhood Association, Green Street Renters Association, and Egleston Square Neighborhood Association.

January 2019

- Mayor Martin J. Walsh and staff.
- BPDA Staff.
- Informal meetings with neighborhood residents and abutters.
- Building Trades Council.

December 2018

- Representative Elizabeth A. Malia (11th Suffolk District).
- Staff from Representative Sonia Chang-Diaz's Office (2nd Suffolk District).
- Councilor Annissa Essaibi-George (At-Large).
- Councilor Matt O'Malley (District 6).
- Staff from Councilor Michelle Wu's Office (At-Large).
- Staff from Councilor Kim Janey's Office (District 7).

November 2018

- Mayor Martin J. Walsh and staff.
- Director Sheila Dillon and DND staff.

1.8 Schedule

Construction is anticipated to start in the third quarter of 2020 with completion by the second quarter of 2022.

1.9 Project Identification and Team

Proponent:	Washington Pine LLC c/o The Community Builders, Inc. 185 Dartmouth Street Boston, MA 02116 (857) 221-8600 Andrew Waxman Lydia Scott c/o Pine Street Inn, Inc. 444 Harrison Avenue Boston, MA 02118 (617) 892-9100 Lyndia Downie Jan Griffin
Architect	RODE Architects, Inc. 535 Albany Street, Suite 405 Boston, MA 02118 (617) 422-0090 Eric Robinson Rashmi Ramaswamy
Permitting Consultant	Epsilon Associates, Inc. 3 Mill & Main Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Geoff Starsiak
Legal Counsel	Klein Hornig LLP 101 Arch Street, Suite 1101 Boston MA 02110 (617) 224-0600 Joseph Lieber
Transportation Consultant / Civil Engineer	Nitsch Engineering, Inc. 2 Center Plaza, Suite 430 Boston, MA 02108 (617) 338-0063 John Schmid Bryan Zimolka

Chapter 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

Nitsch Engineering prepared a qualitative assessment of safety, traffic circulation, and traffic access/egress associated with the proposed Project. This chapter describes the Project area, presents traffic counts, and analyzes existing and future traffic operations. The operational analysis in Section 2.6 shows that the Project will not have a substantial effect on study area intersections.

2.1.1 Project Description/Site Location

As described in detail in Chapter 1, the Project site is located in the Jamaica Plain neighborhood of Boston on Washington Street. Figure 2-1 represents the Locus Map showing the site and the surrounding roadway network. The Project includes approximately 221 total apartments, approximately 58 parking spaces, and ground floor offices. Access to the ground floor parking is proposed from a driveway on the northern side of the building. Access to the below-grade parking garage is proposed from a driveway on the southern side of the building. The loading and trash area will be access from the northern driveway. The supply meets the parking minimum required by the City.

2.1.2 Methodology

The traffic analysis herein is summarized in the following sections:

1. An inventory of existing transportation conditions, including roadway capacities, parking, transit, pedestrian and bicycle circulation, loading, and site conditions.

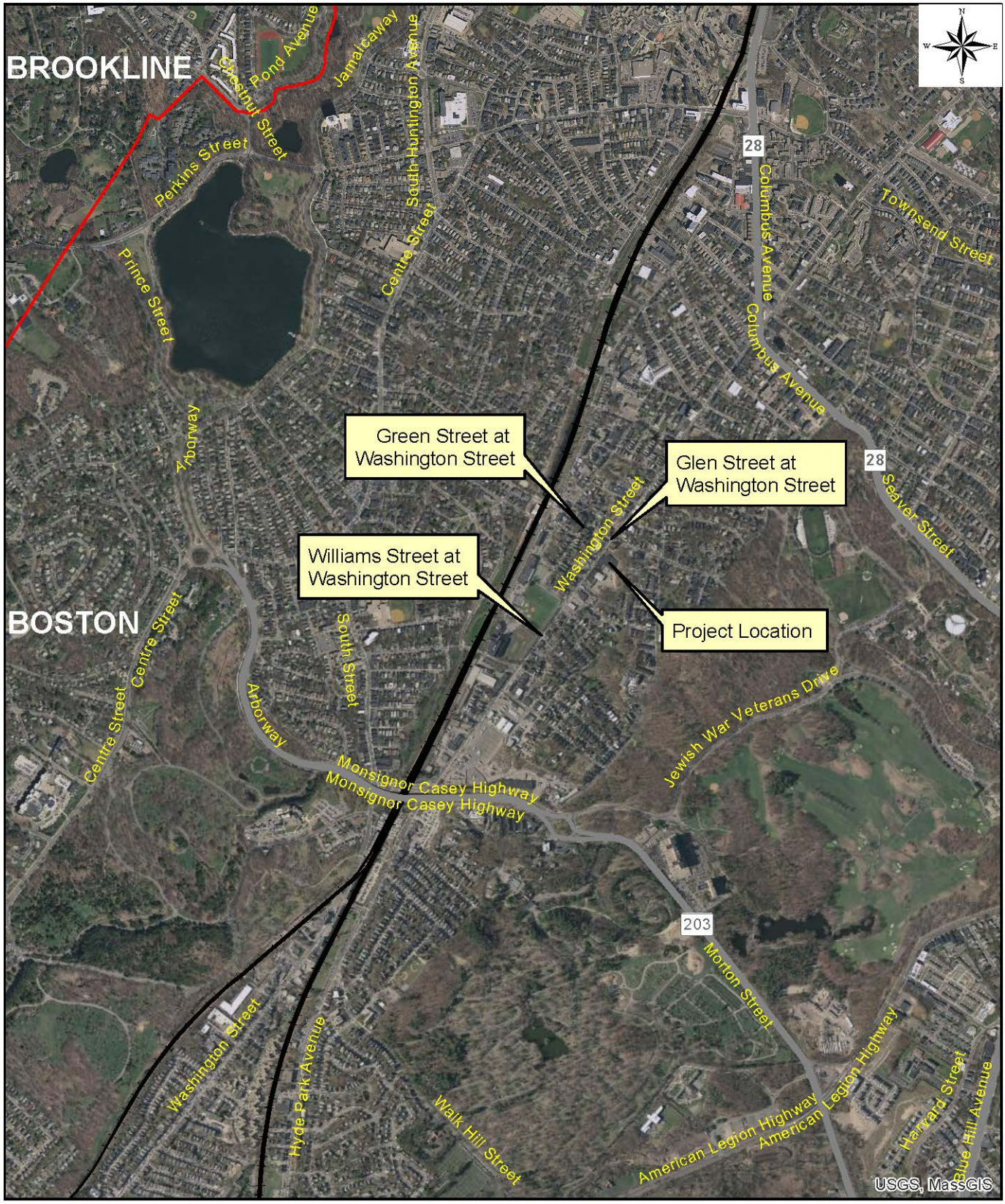
2. An evaluation of future transportation conditions and an assessment of potential traffic impacts associated with the Project and other neighboring projects. Long-term impacts are evaluated for the year 2024, based on a five-year horizon from the 2019 base year. Expected roadway, parking, transit, pedestrian, and loading conditions and deficiencies are identified. This section includes the following scenarios:

    a) The No-Build Scenario (2024) includes general background growth and additional vehicular traffic associated with specific proposed or planned developments and roadway changes near the Project site; and

    b) The Build Scenario (2024) includes specific travel demand forecasts for the Project.

3. An identification of appropriate measures to mitigate Project-related impacts identified in the previous phase.

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



3368 Washington Street Boston, Massachusetts

Nitsch Engineering

Figure 2-1
Locus Map

2.2 Existing Conditions

2.2.1 Field Reconnaissance

Nitsch Engineering conducted field reconnaissance on March 8, 2019 to observe traffic operations, geometric conditions, parking activity, pedestrian accommodations, signing, pavement markings, local site access and egress, and overall roadway and intersection conditions at the Project site.

2.2.2 Study Area

The study area includes the following roadways:

- Washington Street
- Glen Road/Green Street
- Williams Street

Washington Street

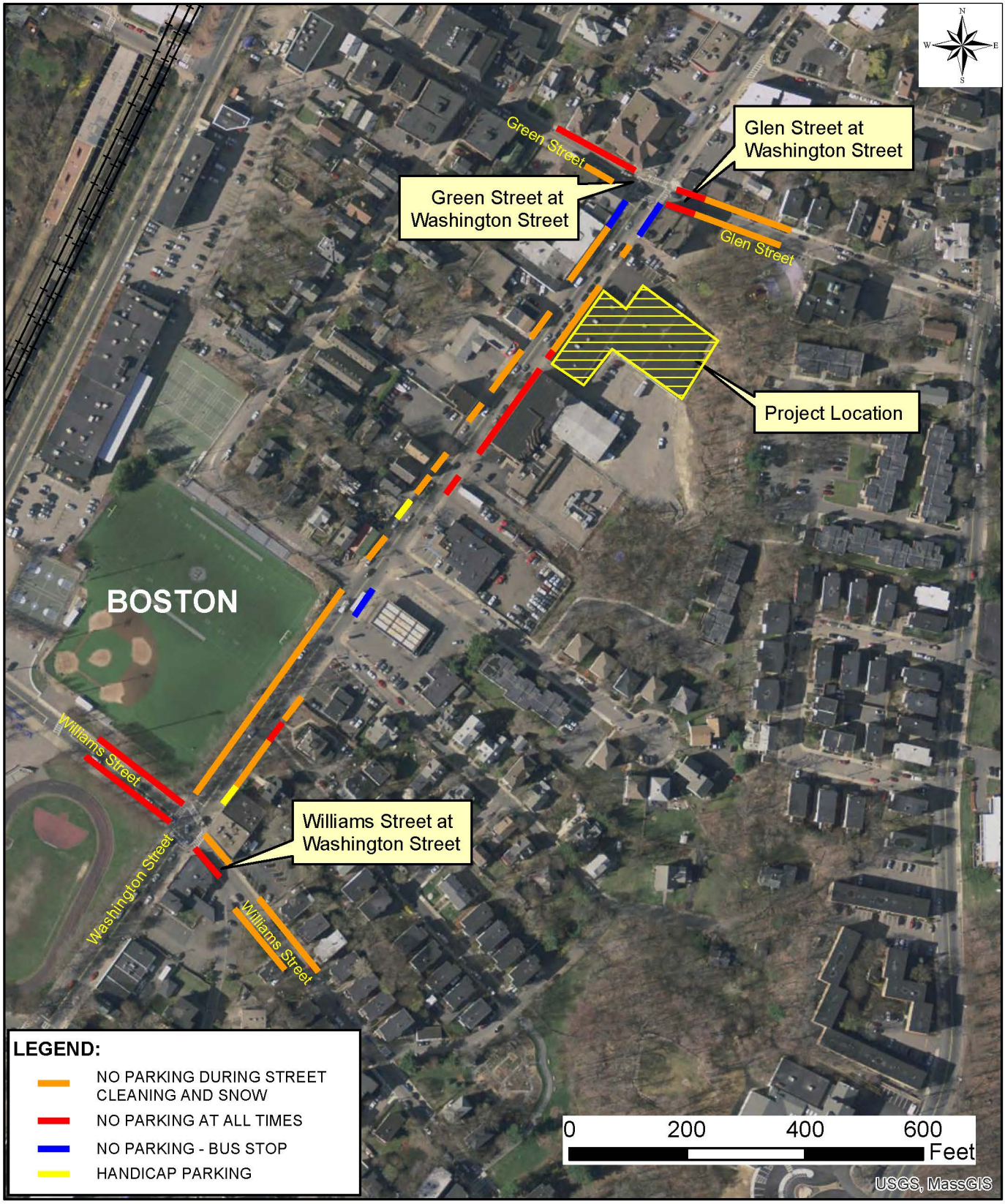
Washington Street is within the jurisdiction of the City of Boston and is classified by the Massachusetts Department of Transportation (MassDOT) as an urban principal arterial. The roadway runs in the north-south direction between Glen Road/Green Street and Williams Street in Jamaica Plain. In the Project vicinity, Washington Street has one travel lane in each direction and sidewalks are provided along both sides of the roadway. The speed limit is 30 miles per hour (MPH), and unrestricted parking is provided along both sides of the roadway apart from the MBTA bus stops.

Glen Road / Green Street

Glen Road turns into Green Street at Washington Street. Both roadways are within the jurisdiction of the City of Boston and are classified by MassDOT as urban collectors. The roadways run east-west and have one travel lane in each direction in the Project vicinity, and sidewalks are provided along both sides of the roadway. The speed limit is not posted. Unrestricted parking is provided along the westbound side of Glen Road and on the eastbound side of Green Street.

Williams Street

Williams Street is within the jurisdiction of the City of Boston and classified by MassDOT as a local road. Williams Street west of Washington Street runs east-west and has one travel lane in each direction in the Project vicinity. Sidewalks are provided, and parking is restricted along both sides of the roadway. Williams Street east of Washington Street is a one-way road that has one travel lane and runs eastbound. Sidewalks and unrestricted parking are provided along both sides of the roadway. Figure 2-2 represents the on-street parking classifications along the studied roadways.



3368 Washington Street Boston, Massachusetts

Nitsch Engineering

Figure 2-2
***P**arking Map*

2.2.3 Study Area Intersections

To examine the existing conditions, the following intersections were studied:

- Washington Street and Glen Road/Green Street; and
- Washington Street and Williams Street.

Washington Street and Glen Road / Green Street

This is a four-legged signalized intersection with four approaches, approximately 200 feet north of the Project site. The Washington Street northbound approach comprises one 11.5-foot wide bike-shared travel lane with adjacent on-street parking leading up to the #42 bus stop at the southeast corner of the intersection. The Washington Street southbound approach also comprises one 11.5-foot wide bike-shared travel lane with adjacent on-street parking. The Green Street eastbound approach comprises one 10.5-foot wide travel lane with adjacent parking provided along the eastbound side of the roadway. The Glen Road westbound approach comprises one 12-foot wide approach lane with restricted parking at the northeast corner. Crosswalks and stop lines are located at all approaches to the intersection with accessible pedestrian ramps at each corner.

The Actuated/Coordinated traffic signal operates in four phases: (1) Washington Street protected northbound; (2) Washington Street permissive northbound and southbound; (3) all-pedestrian phase; and, (4) Green Street permissive eastbound and Glen Road permissive westbound. Underground inductive loops are present at the Green Street and Glen Road approaches, and pedestrian push button actuation is provided at all the pedestrian ramps.

Washington Street and Williams Street

This is a four-legged signalized intersection with three approaches, approximately 1,000 feet south from the Project site. The Washington Street northbound approach comprises one 11.5-foot wide bike-shared travel lane with time restricted (7:00 a.m. – 9:30 a.m.) on-street parking at the southeast corner of the intersection. The Washington Street southbound approach comprises one 11.5-foot wide bike-shared travel lane with adjacent on-street parking. The Williams Street eastbound approach comprises one 12.5-foot wide travel lane with no parking provided at the intersection. Crosswalks and stop lines are located at all approaches to the intersection with accessible pedestrian ramps at each corner.

The Actuated/Coordinated traffic signal operates in four phases: (1) Washington Street protected northbound; (2) Washington Street permissive northbound and southbound; (3) all-pedestrian phase; and, (4) Williams Street permissive eastbound. Underground inductive loops are present at the Williams Street approach, and pedestrian push button actuation is provided at all the pedestrian ramps.

2.2.4 Bicycle Facilities

Washington Street is a bike-shared roadway indicated using shared-lane, or sharrow markings. In addition, there is a bike rental pickup and drop-off rack for 19 bikes along the eastbound side of Williams Street.

2.2.5 Pedestrian Mobility

Sidewalks in the study area are generally in good condition and are approximately nine feet wide, which provide adequate capacity. However, the presence of utility poles and street lights reduce the effective width of the sidewalk along Washington Street both opposite and adjacent to the Project site. Handicapped-accessible ramps and crosswalks are provided at the study area intersections.

2.2.6 Public Transportation

The study area is served by subway, commuter rail, and bus services.

Subway

The MBTA operates the Orange Line which extends from Oak Grove in Malden to Forest Hills, providing direct access to downtown Boston. The Green Street station is located less than 0.2 miles to the west along Green Street, and the Forest Hills Station is located less than 0.7 miles south along Washington Street.

Commuter Rail

The Forest Hills Station also services the MBTA Commuter Rail Needham Line which extends from Needham to South Station. The commuter rail makes a total of 32 stops at Forest Hills Station (16 inbound, 16 outbound) during a typical weekday.

Bus

The MBTA #42 Bus Route servicing Dudley Square and Forest Hills has bus stops in the northbound and southbound directions adjacent to the Project site.

Car Sharing

Car sharing, predominantly provided by Zipcar in the Boston area, provides access to vehicular transportation for those who do not own cars. Vehicles are rented hourly or daily and are checked out for a specific time period and returned to their original designated location. There is one Zipcar location within a one-quarter mile radius of the Project site, located on Rossmore Road at Washington Street.

Figure 2-3 represents the MBTA subway, bus, and commuter rail services as well as the Zipcar location proximate to the Project site.

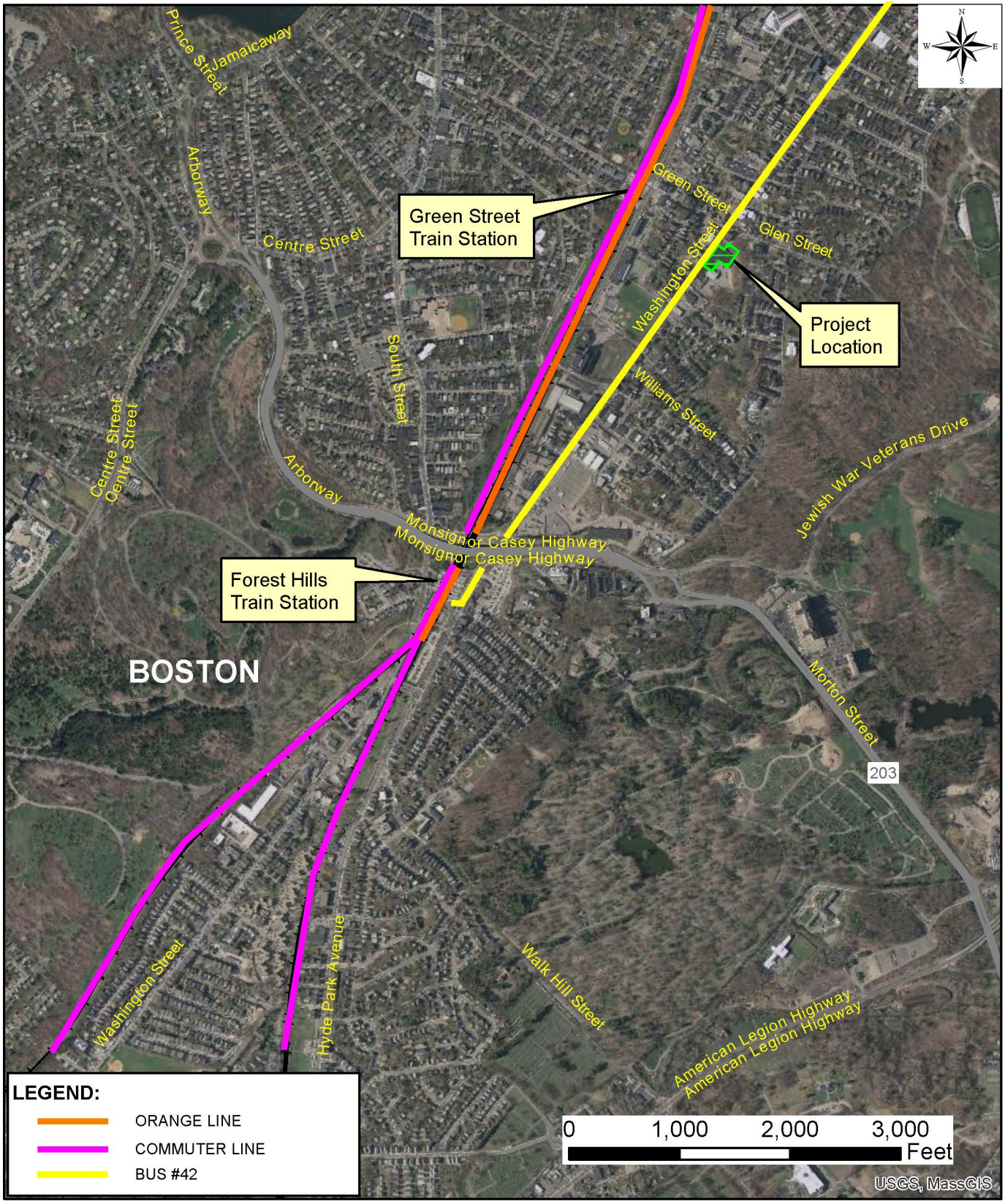


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Figure 2-3
MBTA Plan

2.3 Existing Traffic Conditions

2.3.1 Turning Movement Count (TMC) Data

Boston Traffic Data collected Turning Movement Count (TMC) data for the study area intersections on Wednesday, March 13, 2019 for 11 hours from 7:00 a.m. to 6:00 p.m. to capture the weekday commuter peaks, per the Boston Transportation Department (BTD) regulations. The TMC data included bicycle and pedestrian counts. The peak hours within the study area were calculated to be from 7:00 a.m. to 8:00 a.m. during the weekday morning period, and 4:00 p.m. to 5:00 p.m. during the weekday evening period. The 2019 existing traffic volumes for vehicles, pedestrians, and bicycles are shown on Figures 2-4, 2-5, and 2-6, respectively. The raw traffic counts are shown in Appendix C.

2.4 Future Conditions

2.4.1 2024 No-Build Condition Volumes

The No-Build Condition is a combination of existing 2019 trips inflated by a background growth rate and site-generated trips added from other land development projects near the Project site.

A background growth rate was applied to existing traffic volumes using a rate of 0.5% per year, which is consistent with the growth in an urban environment in eastern Massachusetts. To be more conservative, these project trips that passed through the study area were added to the 2024 No-Build Condition.

Two projects approved by the BPDA Board were identified in the surrounding area, as shown in Table 2-1.

Table 2-1 Forthcoming Projects near the Project Site

Location	Description
197-201 Green Street	11,736 sf Residential/Retail; Board approved.
3353 Washington Street	45 residential rental units; 2,000 sf retail space; Board approved.

The above referenced projects were only subjected to the Article 80 Small Project Review, therefore detailed traffic information is not provided. Since the projects will generate a relatively low number of trips, the additional trips are assumed to be captured by the applied background growth.

Figure 2-7 shows the No-Build Condition traffic volumes.

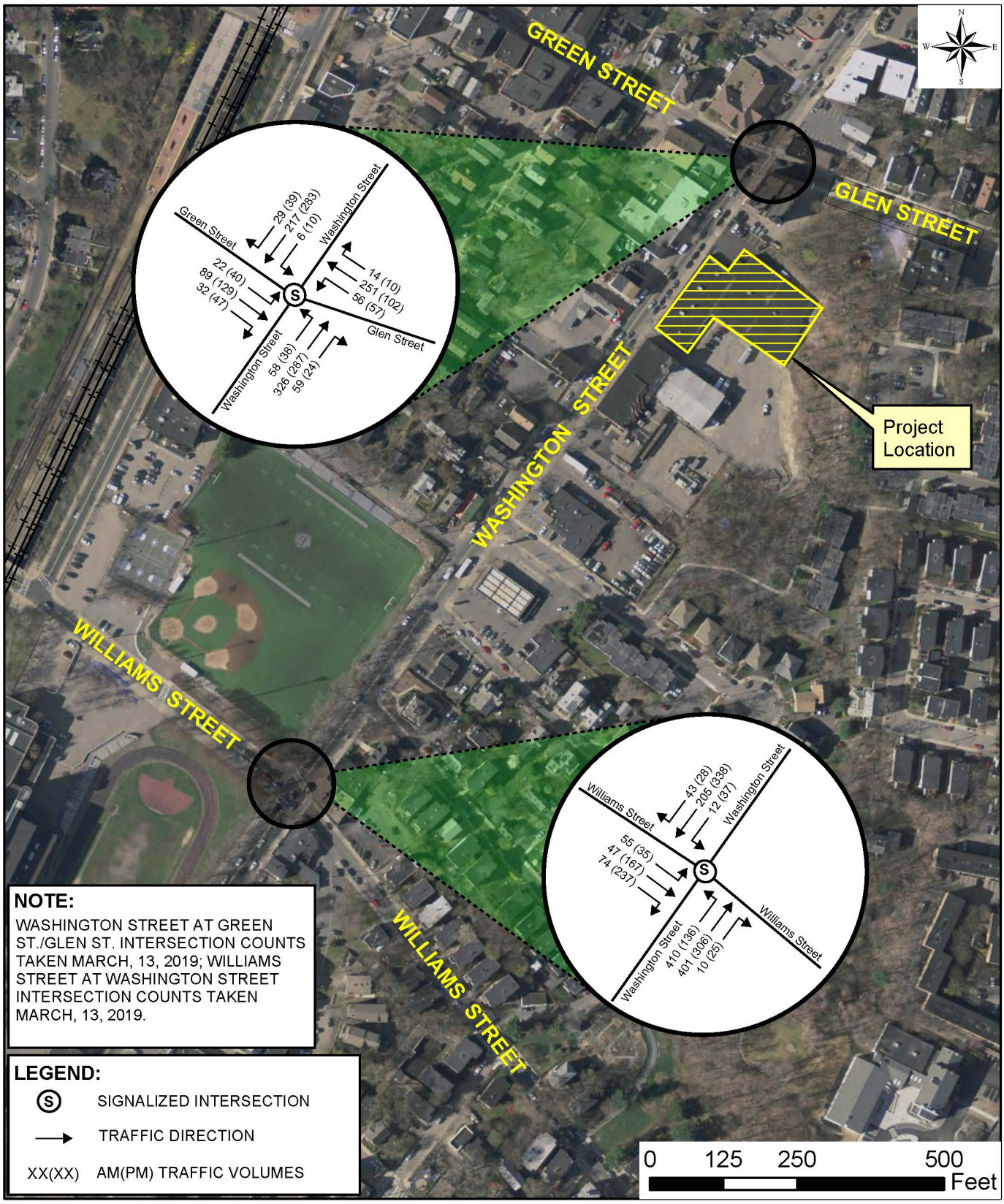

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Figure 2-4
Existing Traffic Volumes

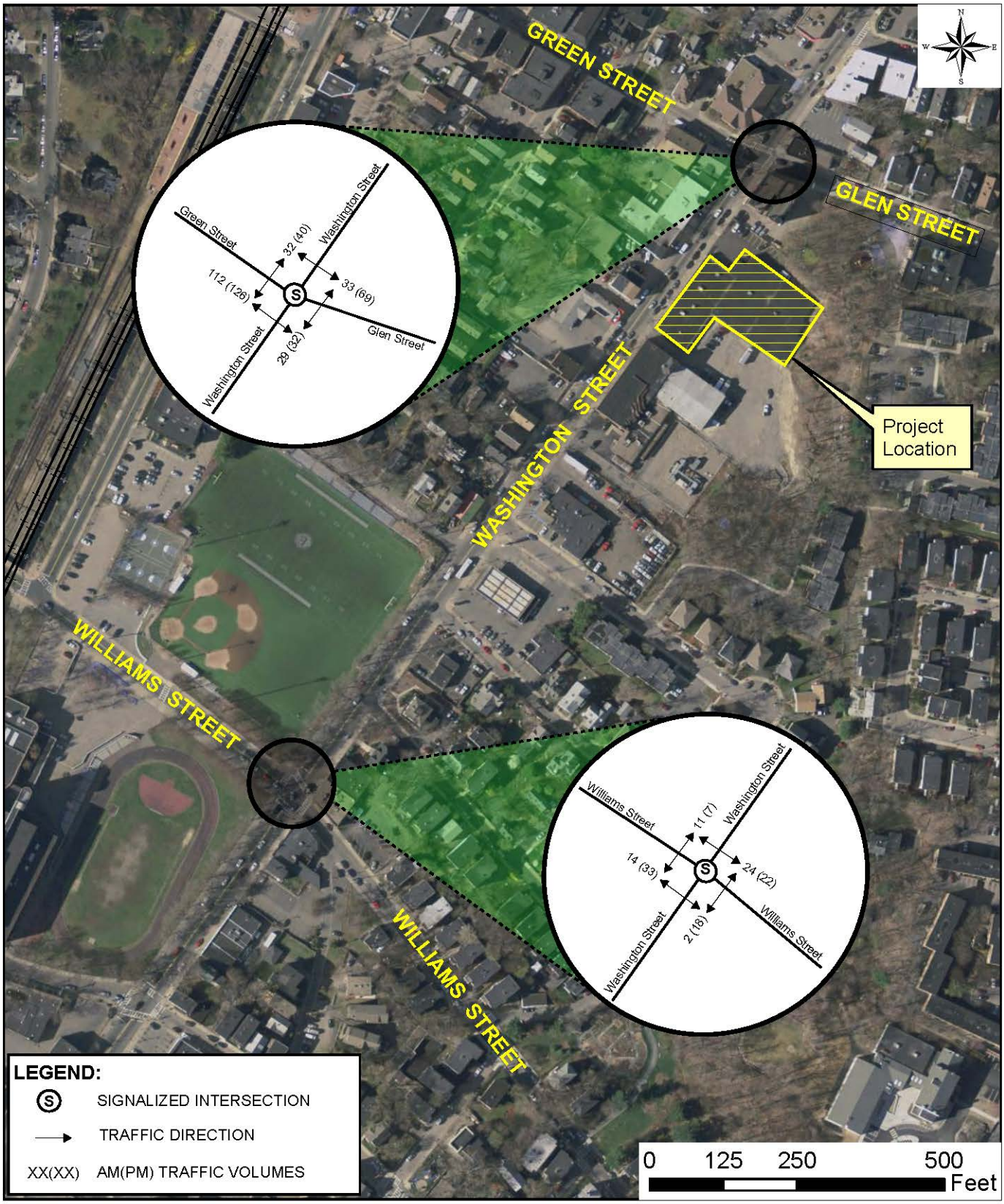

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Figure 2-5
Existing Pedestrian Volumes

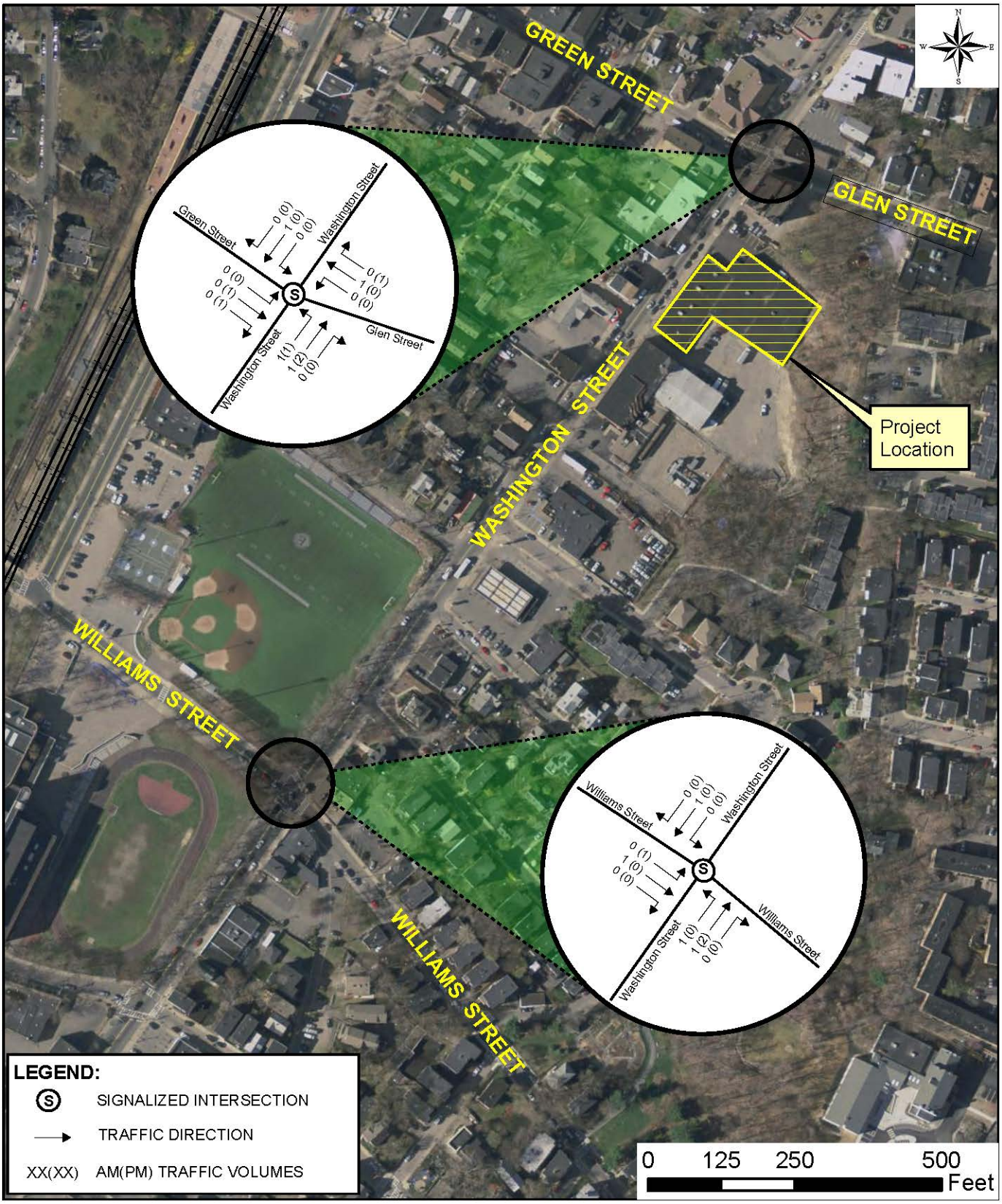

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Figure 2-6
Existing Bicycle Volumes

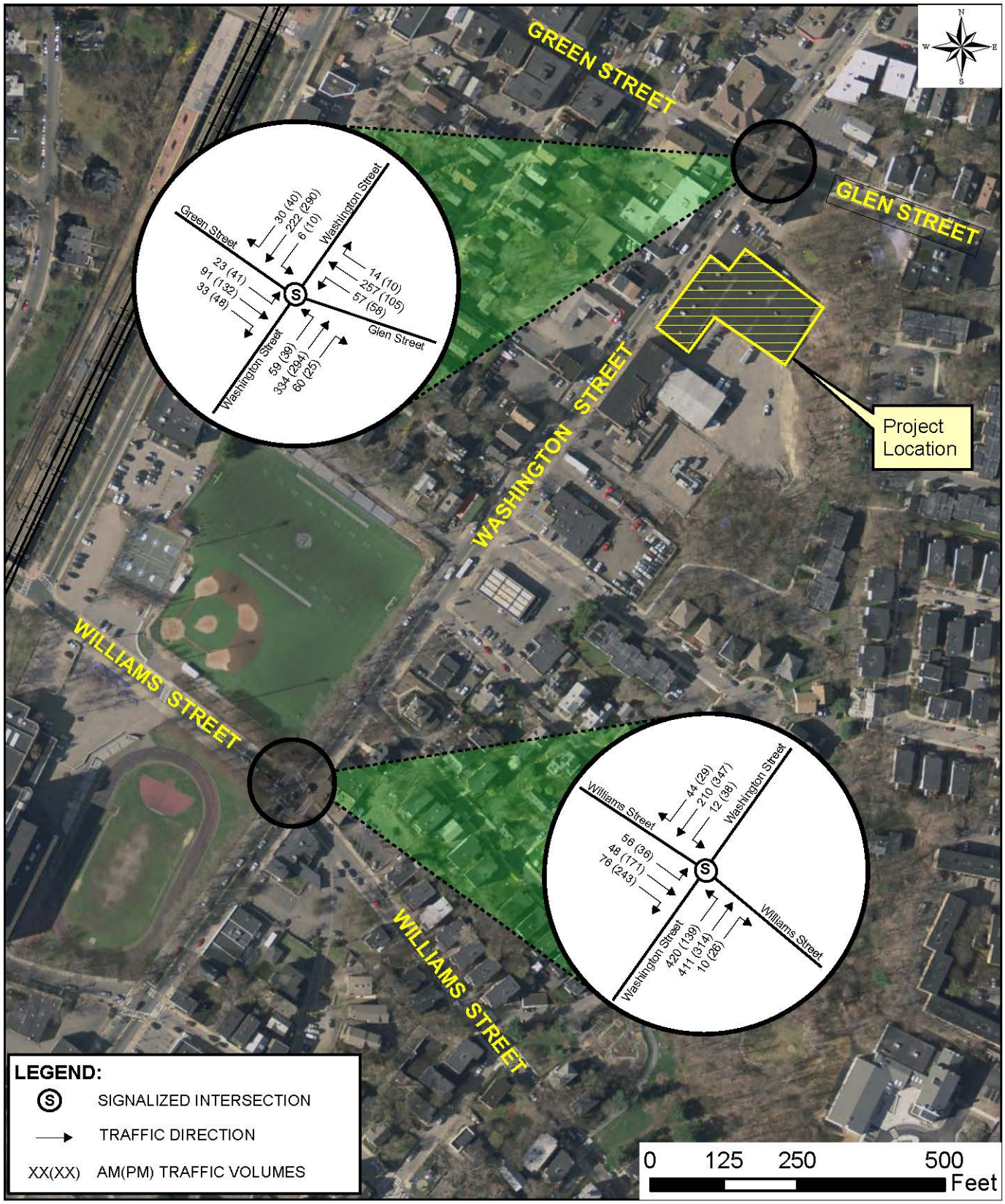

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Figure 2-7
2024 No Build Traffic Volumes

2.4.2 2024 Build Condition

Proposed Trip Generation

As directed in the BPDA Transportation Access Plan guidelines, Project-generated trips have been estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition.

Land use code (LUC) 221 (multifamily housing, mid-rise) was used to determine the number of Project-generated trips. ITE describes "mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and ten levels (floors)."

Two ITE independent variables – dwelling units and residents – were investigated to predict the number of weekday morning and evening peak hour trips that the Project will generate. ITE predicts trips using an average rate and, when available, a fitted curve equation that is often more statistically confident than the average rate. The results are provided in Table 2-2.

Table 2-2 Comparison of Peak Hour Trip Generation Data Sources

		Weekday Morning Peak Hour Trips		Weekday Evening Peak Hour Trips	
Land Use	Independent Variable	Average	Fitted Curve	Average	Fitted Curve
Residential, multi-family housing (mid-rise) LUC (231)	Dwelling Units	71	67	91	84
	Residents	52	51	49	51

Table 2-3 shows the peak hour trip generation from the Project, ranging from 71 to 67 trips for the weekday morning peak hour, and 91 to 84 trips for the weekday evening peak hour using the independent variable dwelling units. The independent value of residents' trips ranges from 52 to 51 trips during the weekday morning peak hour, and 49 to 51 trips during the weekday evening peak.

To be conservative, the average rate by dwelling unit was used to analyze the impacts of the Project. Project-generated peak hour trip generation estimates used for this analysis are shown in Table 2-3.

Table 2-3 Peak Hour Trip Generation Estimates

	Weekday Morning Peak Hour Trips	Weekday Evening Peak Hour Trips
Entering	19	54
Exiting	52	37
Total	71	91

Using the BTD mode share data for Zone 6 (see Appendix C), the model split was applied to the peak hour trip generation shown in Table 2-3 to obtain the site-generated vehicular trips. These volumes are represented in Table 2-4.

Table 2-4 Mode Split Trip Generation

	Weekday Morning Peak Hour Trips			Weekday Evening Peak Hour Trips		
	Vehicle	Transit	Walk	Vehicle	Transit	Walk
Entering	10	5	4	31	15	8
Exiting	24	21	7	24	7	6
Total	34	26	11	55	22	14

Project Trip Distribution and Assignment

The trips to and from the Project site were distributed and assigned for the weekday morning peak hour and weekday evening peak hour based on the existing travel patterns, logical travel routes, and the BTD mode share, which are based on the existing roadway network both within the City and the surrounding region. The trip distributions for the proposed study area are shown on Figures 2-8 and 2-9, respectively.

The existing traffic volumes during the weekday morning and weekday evening peak hours was examined. To distribute the site generation trips throughout the roadway network, the vehicular trips in Table 2-4 were multiplied by the trip distribution percentages in Figures 2-8 and 2-9 to assign the additional intersection volumes. The site-generated trips are shown on Figures 2-10 and 2-11 for the weekday morning and weekday evening peak hours, respectively.

2024 Build Condition Volumes

The Build Condition traffic volumes, shown in Figure 2-12, were calculated by combining the No-Build Condition traffic volumes with the site generated trip volumes.

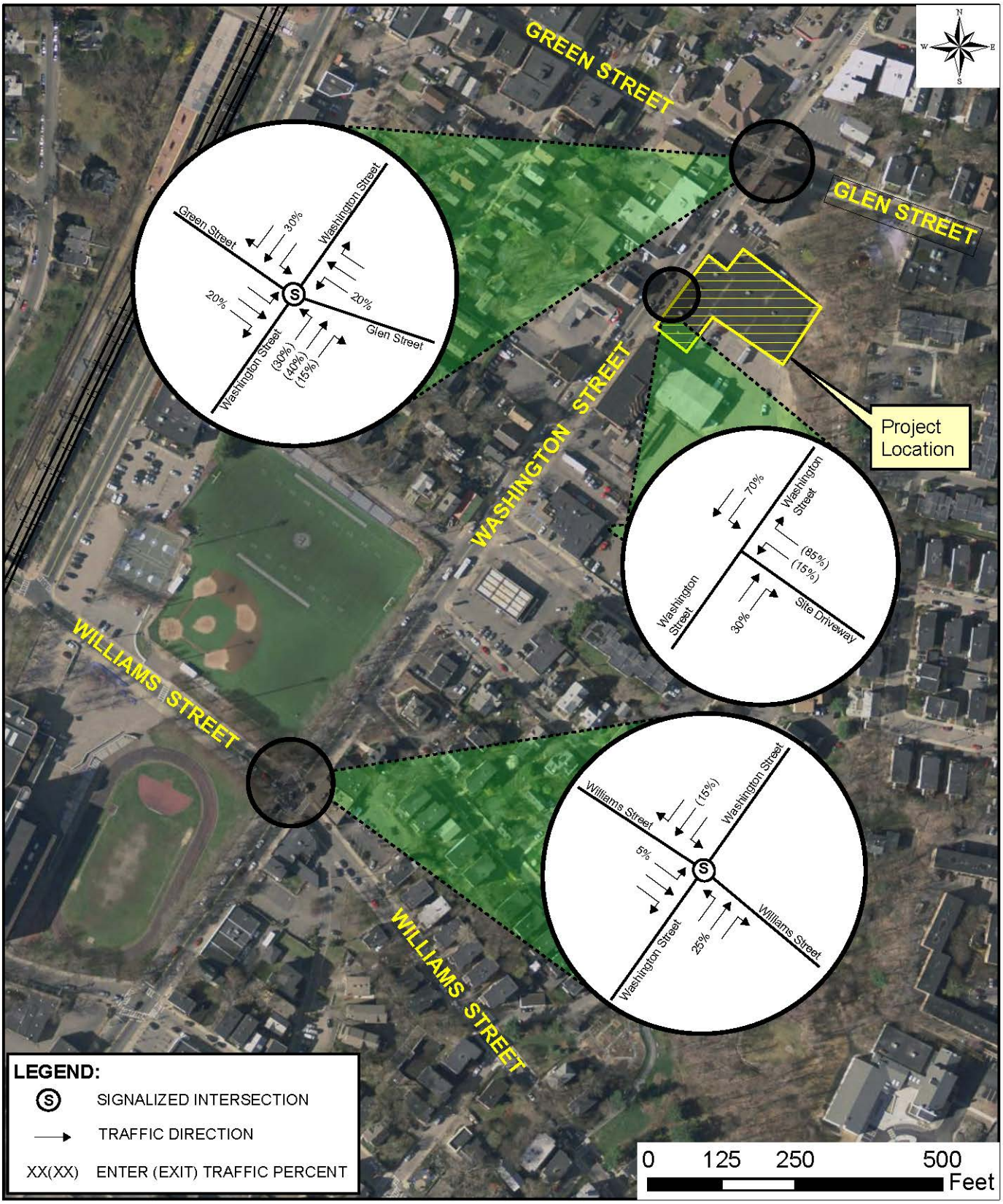

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Figure 2-8
Trip Distribution (Weekday Morning)

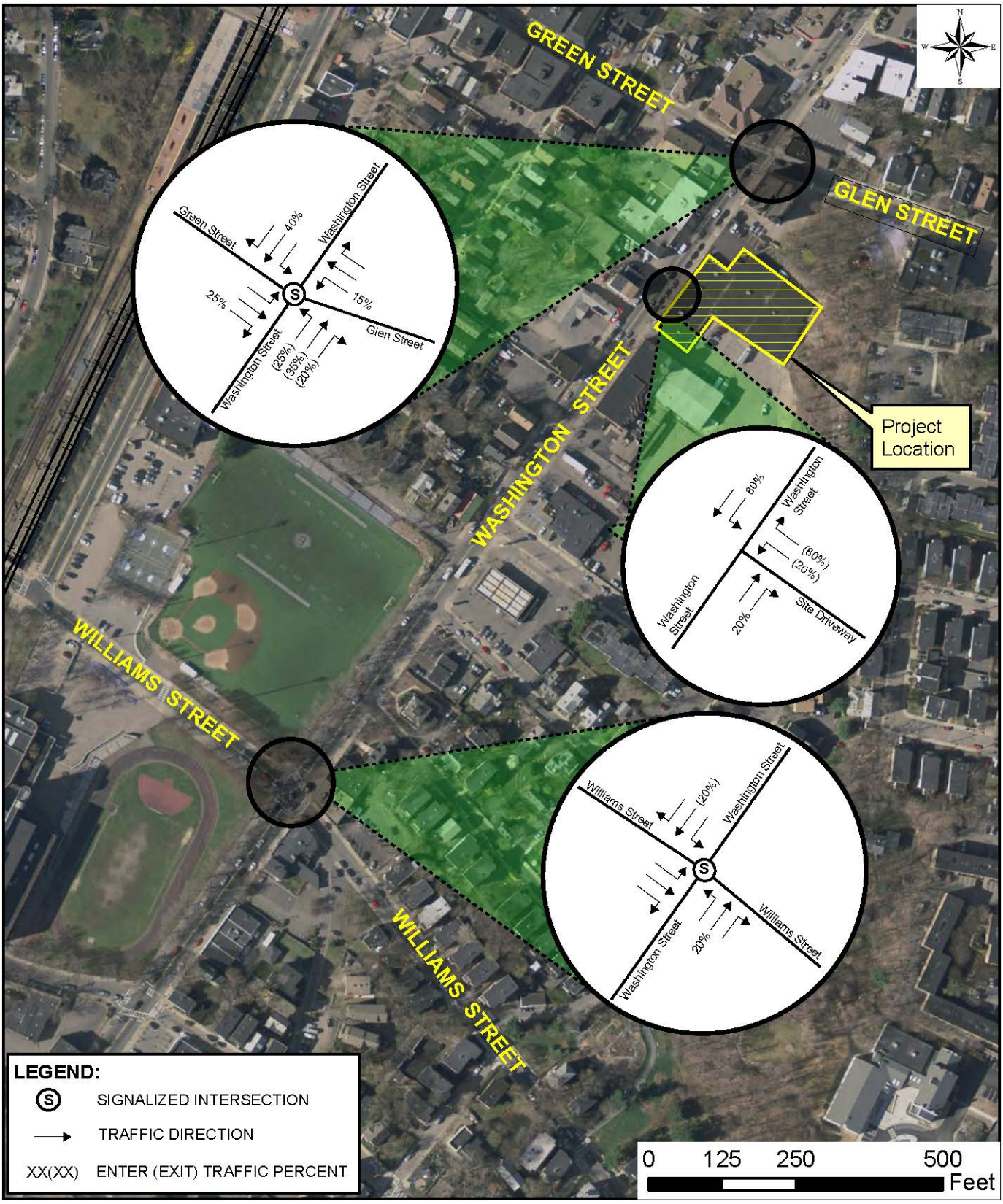

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Figure 2-9
Trip Distribution (Weekday Evening)

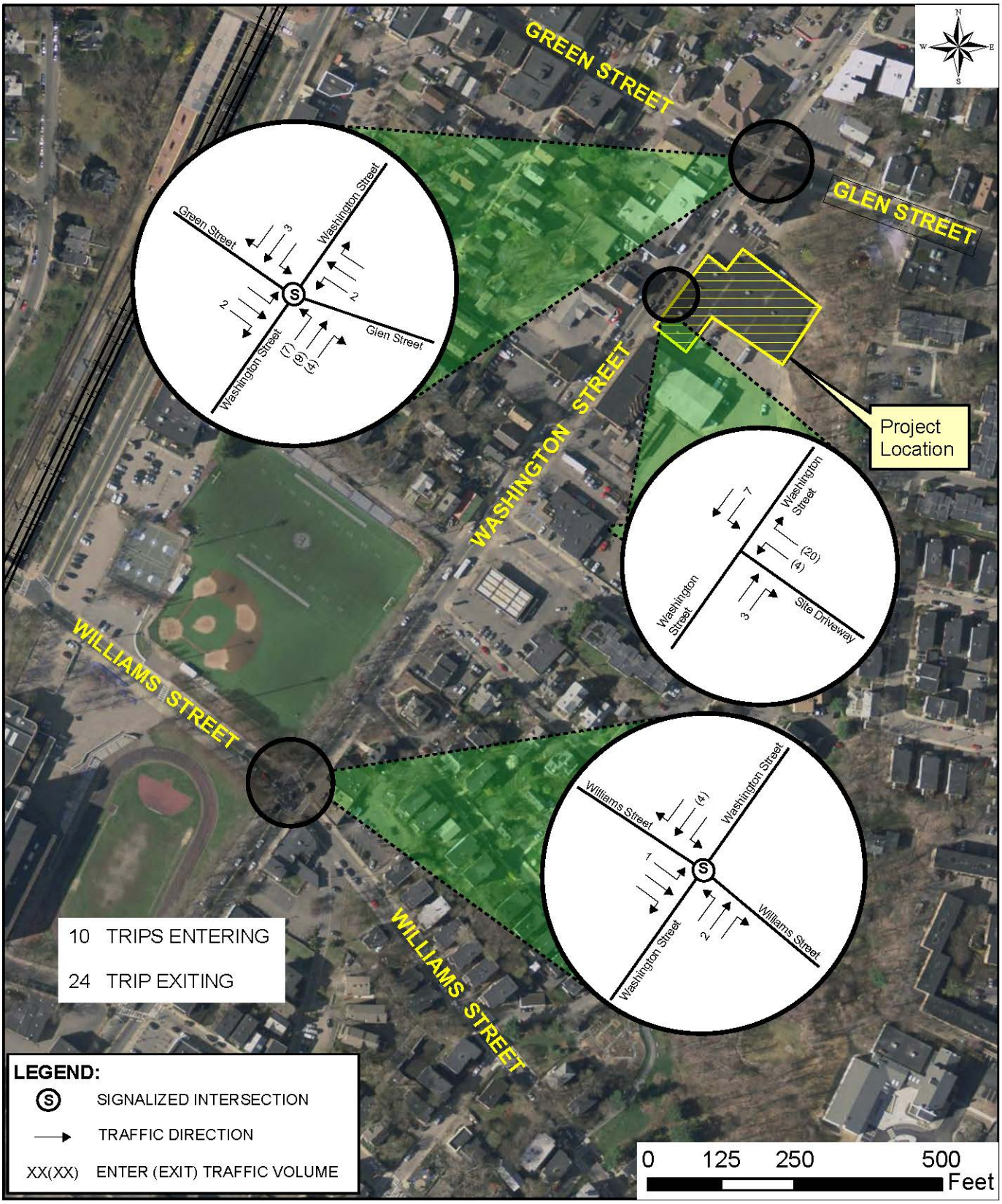

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Figure 2-10
Site-Generated Trips (Weekday Morning)

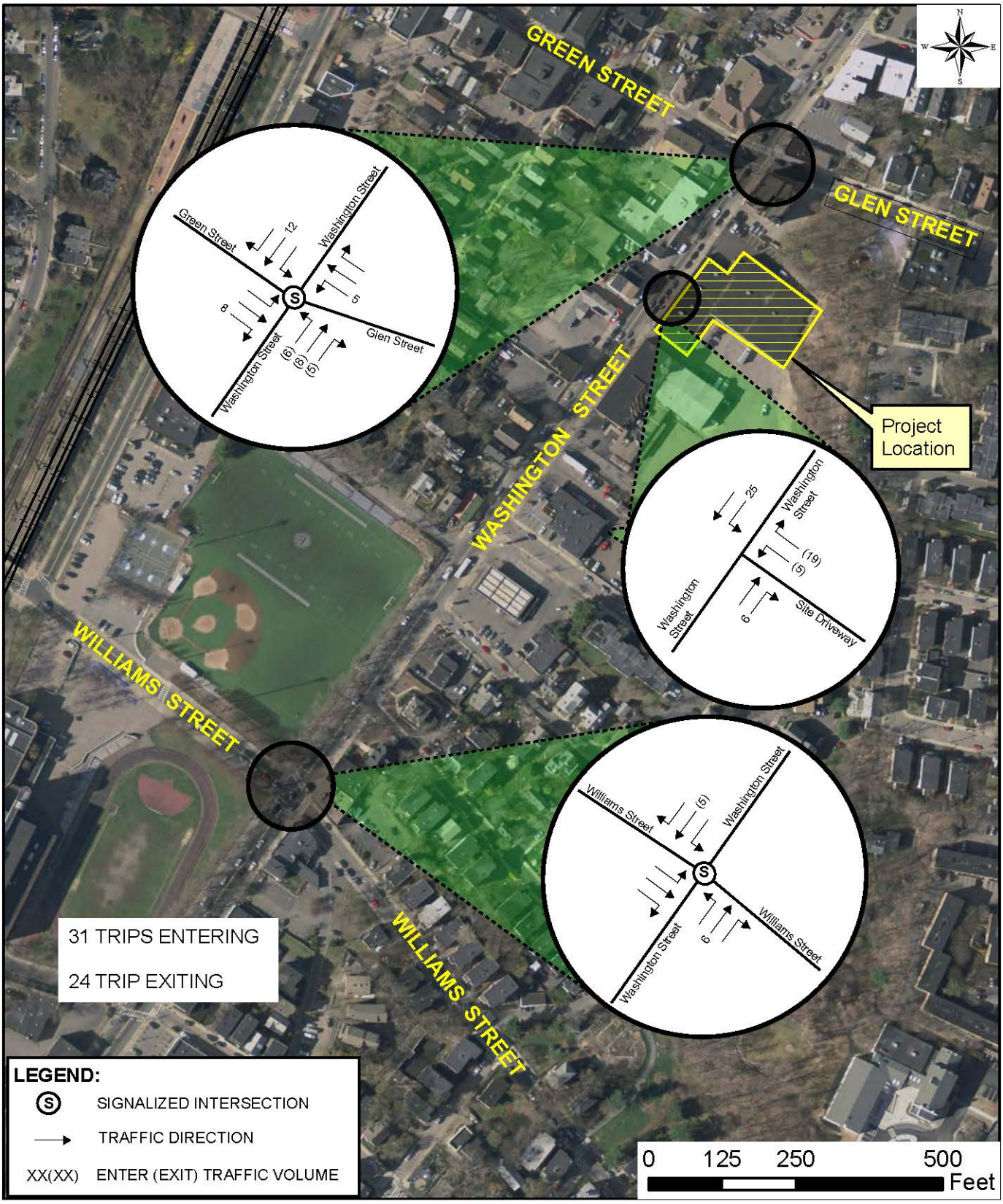

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Figure 2-11
Site-Generated Trips (Weekday Evening)

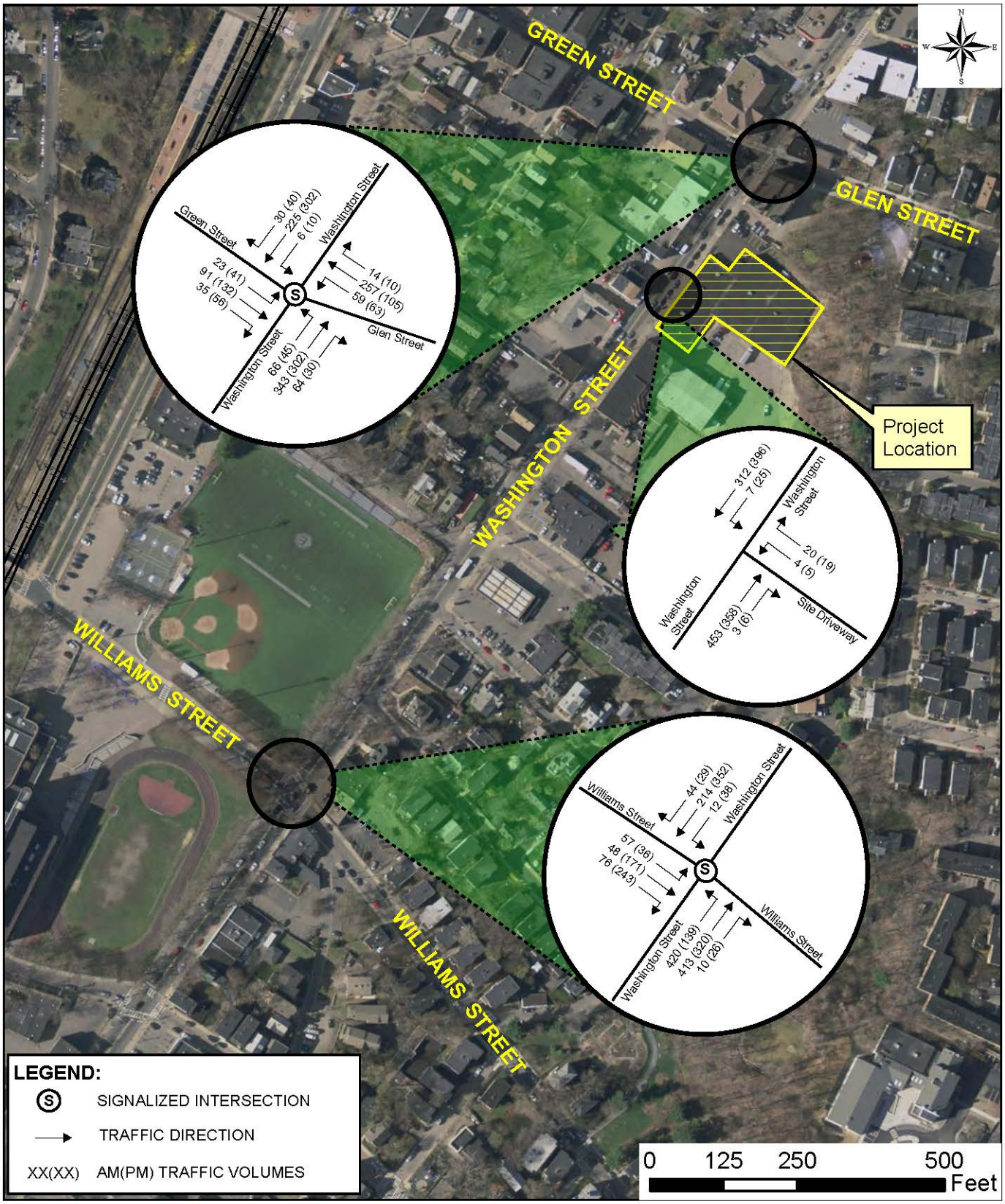

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Figure 2-12
2024 Build Traffic Volumes

2.5 Operational Analysis

2.5.1 Level of Service Criteria and Capacity Analysis

Level of Service (LOS) is a qualitative measure describing operational conditions within a traffic stream. Six LOS criteria are used to describe the quality of traffic flow for any type of facility controls. LOS A represents the best operating conditions, and LOS F represents the worst operating conditions. The LOS for signalized intersections was analyzed using Synchro 10 software, which is based on the traffic operational analysis methodology of the Highway Capacity Manual (HCM).

The methodology for signalized intersections assesses the effects of signal type, timing, phasing, progression, vehicle mix, and geometrics on control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table 2-5 summarizes the relationship between LOS and average control delay for signalized and unsignalized intersections.

Table 2-5 Level of Service Criteria

Signalized Intersection		Unsignalized Intersection		
Level of Service	Control Delay (seconds/vehicle)	Level of Service by Volume-to-Capacity (v/c) Ratio		Control Delay (seconds/vehicle)
		v/c ≤ 1.0	v/c > 1.0	
A	0 to 10	A	F	0 to 10
B	>10 to 20	B	F	>10 to 15
C	>20 to 35	C	F	>15 to 25
D	>35 to 55	D	F	>25 to 35
E	>55 to 80	E	F	>35 to 50
F	>80	F	F	>50
Source: 2010 Highway Capacity Manual, Transportation Research Board, Washington D.C. 2010				

Traffic operations for the 2019 Existing Conditions, 2024 No-Build Conditions and 2024 Build Conditions were analyzed during the weekday morning and weekday evening peak hours at the study intersections. The analyses depict the intersection maximum volume-to-capacity (v/c) ratio, vehicle delay, LOS, and queueing.

2.5.2 2019 Existing Condition Capacity Analysis

The 2019 Existing Condition traffic operations at the study area intersections were analyzed based on the existing traffic counts performed by Boston Traffic Data on 13, March 2019. The LOS Summary is shown in Table 2-6. The Synchro analysis worksheets are provided in Appendix C.

Table 2-6 Level of Service Summary – 2019 Existing Condition

Location	Direction / Movement	Weekday Morning Peak Hour Trips					Weekday Evening Peak Hour Trips				
		V/C[2]	DELAY[3]	LOS[4]	50th Q[5]	95th Q[6]	V/C[2]	DELAY[3]	LOS[4]	50th Q[5]	95th Q[6]
Washington Street at Glen Road/Green Street	Wash St NB - LTR	0.67	27.3	C	311	m280	0.46	31.0	C	178	m204
	Wash St SB - LTR	0.50	29.3	C	156	227	0.49	27.0	C	162	282
	Green St EB- LTR	0.42	32.3	C	92	132	0.80	52.5	D	169	195
	Glen Rd WB- LTR	0.90	60.0	E	218	#348	0.62	42.9	D	98	154
	Overall	0.90	37.6	D	-	-	0.80	36.9	D	-	-
Washington Street at Williams Street	Wash St NB- LTR	1.12	94.1	F	~574	#813	0.91	46.4	D	240	#522
	Wash St SB- LTR	0.99	92.8	F	~197	m#368	0.76	29.0	C	109	#394
	Williams St EB- LTR	0.91	82.4	F	104	#236	0.98	72.0	E	254	#458
	Overall	1.12	92.1	F	-	-	0.98	49.5	D	-	-

[1] NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, L = Left-turn, T = Through movement, R = Right-turn; [2] Volume to Capacity Ratio. Overall v/c is maximum v/c ratio of all approaches; [3] Vehicle Delay, measured in seconds; [4] Level Of Service; [5] 95th Percentile Queue, in feet; # = 95th percentile volume exceeds capacity, queue may be longer; ~ = Volume exceeds capacity, queue is theoretically infinite

The Washington Street intersection with Glen Road and Green Street currently operates at an overall intersection LOS D during the weekday morning and weekday evening peak hours. The maximum delay occurs at the Glen Road westbound approach which operates at LOS E with a delay of 60 seconds.

The Washington Street intersection with Williams Street currently operates at an overall intersection LOS F during the weekday morning peak hour and LOS D during the weekday evening peak hour. The maximum delay occurs at the Washington Street northbound approach which operates at LOS F with a delay of approximately 94 seconds.

2.5.3 2024 No-Build Condition Capacity Analysis

The 2024 No-Build Condition, which represents the 2019 Existing Condition plus background growth rate as described in Section 2.5.1, was analyzed. The LOS Summary is shown in Table 2-7. The Synchro analysis worksheets are provided in Appendix C.

Table 2-7 Level of Service Summary – 2024 No-Build Condition

Location	Direction / Movement	Weekday Morning Peak Hour Trips					Weekday Evening Peak Hour Trips				
		V/C[2]	DELAY[3]	LOS[4]	50th Q[5]	95th Q[6]	V/C[2]	DELAY[3]	LOS[4]	50th Q[5]	95th Q[6]
Washington Street at Glen Road/ Green Street	Wash St NB - LTR	0.70	28.1	C	321	m278	0.47	31.1	C	184	m202
	Wash St SB - LTR	0.51	29.8	C	160	233	0.50	27.5	C	168	290
	Green St EB- LTR	0.43	32.4	C	94	135	0.81	53.2	D	172	200
	Glen Rd WB- LTR	0.91	61.9	E	224	#361	0.63	43.3	D	100	158
	Overall	0.91	38.6	D	-	-	0.81	37.3	D	-	-
Washington Street at Williams Street	Wash St NB- LTR	1.16	109.1	F	~609	#848	0.94	52.4	D	~255	#545
	Wash St SB- LTR	1.01	99.3	F	~205	m#378	0.79	30.7	C	113	#415
	Williams St EB- LTR	0.93	84.9	F	107	#244	1.00	77.9	E	~266	#474
	Overall	1.16	103.6	F	-	-	1.00	54.1	D	-	-

[1] NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, L = Left-turn, T = Through movement, R = Right-turn; [2] Volume to Capacity Ratio. Overall v/c is maximum v/c ratio of all approaches; [3] Vehicle Delay, measured in seconds; [4] Level Of Service; [5] 95th Percentile Queue, in feet; # = 95th percentile volume exceeds capacity, queue may be longer; ~ = Volume exceeds capacity, queue is theoretically infinite

The Washington Street intersection with Glen Road and Green Street is projected to maintain the overall intersection LOS D during the weekday morning and weekday evening peak hours for the No-Build Condition, with the overall delay increasing only one second.

The Washington Street intersection with Williams Street is also projected to maintain the overall intersection LOS F during the weekday morning peak hour and LOS D during the weekday evening peak hour for the No-Build Condition. The increase in traffic due to the background growth causes a degradation in delay of approximately ten seconds from the Existing Condition to No-Build Condition during the weekday morning peak hour.

2.5.4 2024 Build Condition Capacity Analysis

The 2024 Build Condition traffic operations include the 2024 No-Build volumes plus the projected trips from the Project. The Build Condition assumes that no changes are made to study area intersections or traffic signal timing and sequence. The LOS summary is shown in Table 2-8. The Synchro analysis worksheets are provided in Appendix C.

Table 2-8 Level of Service Summary – 2024 Build Condition

Location	Direction / Movement[1]	Weekday Morning Peak Hour Trips					Weekday Evening Peak Hour Trips				
		V/C[2]	DELAY[3]	LOS[4]	50th Q[5]	95th Q[6]	V/C[2]	DELAY[3]	LOS[4]	50th Q[5]	95th Q[6]
Washington Street at Glen Road/ Green Street	Wash St NB - LTR	0.75	29.3	C	336	m296	0.51	31.2	C	192	m216
	Wash St SB - LTR	0.52	30.1	C	163	236	0.53	28.4	C	178	302
	Green St EB- LTR	0.28	32.3	C	95	135	0.82	53.9	D	178	208
	Glen Rd WB- LTR	0.91	62.3	E	226	#365	0.66	44.8	D	103	165
	Overall	0.91	39.1	D	-	-	0.83	37.9	D	-	-
Proposed Site Driveway	Wash St NB - TR	0.29	0.0	-	-	-	0.23	0.0	-	-	-
	Wash St SB - LT	0.01	0.3	A	-	-	0.02	0.7	A	-	-
	Wash St WB - LR	0.05	12.4	B	-	-	0.04	11.3	B	-	-
Washington Street at Williams Street	Wash St NB- LTR	1.17	111.8	F	~615	#853	0.96	55.4	E	~266	#554
	Wash St SB- LTR	1.03	102.5	F	~210	m#384	0.80	31.5	C	120	#424
	Williams St EB- LTR	0.94	87.2	F	108	#247	1.00	77.9	E	~266	#474
	Overall	1.17	106.3	F	-	-	1.00	55.4	E	-	-

[1] NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, L = Left-turn, T = Through movement, R = Right-turn; [2] Volume to Capacity Ratio. Overall v/c is maximum v/c ratio of all approaches; [3] Vehicle Delay, measured in seconds; [4] Level Of Service; [5] 95th Percentile Queue, in feet; # = 95th percentile volume exceeds capacity, queue may be longer; ~ = Volume exceeds capacity, queue is theoretically infinite

The Washington Street intersection with Glen Road and Green Street is projected to maintain the overall intersection LOS D during the weekday morning and weekday evening peak hours from the No-Build Condition to the Build Condition, with the overall delay increasing less than one second.

The Washington Street intersection with Williams Street is projected to degrade from an overall intersection LOS D during the weekday evening peak hour for the No-Build Condition to an overall LOS E for the Build Condition. As the degradation comprises approximately only one second of delay, it is determined that the Project will not have a significant impact on the existing roadway network, therefore mitigation is not recommended.

2.5.5 Conclusion

The operational analysis shows that the Project will not have a substantial effect on study area intersections, and therefore no modifications to the traffic signal and roadway network will be necessary as part of the Project.

2.6 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 numerous public transit alternatives.

On-site property management will keep a supply of transit information (schedules, maps, and fare information) to be made available to the residents 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 nonvehicular modes of travel. The TDM measures for the Project may include but are not limited to the following:

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

- ***Bicycle Accommodation:*** The Proponent will provide bicycle storage in secure, sheltered areas for residents. Subject to necessary approvals, public use bicycle racks for visitors will be placed near building entrances.

- ***Electric Vehicle Charging:*** The Proponent will explore the feasibility of providing electric vehicle charging stations within the garage.

- ***Shared-car Services:*** The Proponent will explore the feasibility of providing a shared car service (e.g., Zipcar) on-site to help reduce the need for residents to own a vehicle.

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

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

The Proponent will work with BTD to determine an appropriate TDM program and will formalize this program in a Transportation Access Plan Agreement (TAPA) for the Project.

2.7 Construction Management

During construction of the Project, it is expected that the frontage sidewalk and parking lane will be closed temporarily to provide enough room for construction staging. Due to the site location relative to subject intersections and the MBTA bus stops, it is not anticipated that further modifications will need to be made that would significantly affect traffic operations. No vehicular detours are expected.

To the extent possible, arrival and departure of construction vehicles will occur outside of the vehicle peak periods (from 9:00 a.m. to 3:30 p.m. and 7:00 p.m. to 5:00 a.m.). The developer will coordinate a construction entrance that is adequate width and meets the necessary sight distance requirements set forth by the American Association of State Highway and Transportation Officials (AASHTO).

During construction, pedestrian accessibility will be maintained to the extent feasible. If necessary, temporary crosswalks and ramps will be provided. All pedestrian accommodations will adhere to Massachusetts Architectural Access Board (MAAB) and Americans with Disabilities Act (ADA) guidelines.

As part of the Article 80 approval process, a Construction Management Plan will be submitted to BTD which will describe on-site logistics and off-site traffic mitigation measures throughout the construction process.

Chapter 3.0

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW COMPONENT

3.1 Wind

Major buildings, especially those that protrude above their surroundings, may cause increased local wind speeds at the pedestrian level. Typically, wind speeds increase with elevation above the ground surface, and taller buildings intercept these faster winds and deflect them down to the pedestrian level. The funneling of wind through gaps between buildings and the acceleration of wind around corners of buildings may also cause an increase in wind speed. Conversely, if a building is surrounded by others of equivalent height, it may be protected from the prevailing upper-level winds, resulting in no significant changes to the local pedestrian-level wind environment.

The Project site is located in a valley area with terrain to the east and west reaching heights more than 100 feet above the Project site. This terrain, in addition to trees and the varying heights of the surrounding buildings, is anticipated to generally shield the building from upper level winds. Therefore, the building is not anticipated to impact pedestrian-level winds in the surrounding area.

3.2 Shadow

3.2.1 Introduction and Methodology

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

The shadow analysis presents the existing shadow and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. The analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project site. It should be noted that the shadow graphics do not account for existing or proposed trees. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 3-1 to 3-14.

The results of the analysis show that new shadow from the Project will generally be limited to nearby streets and sidewalks. Of the 14 time periods studied, no new shadow will be cast onto existing open space or bus stops in the vicinity of the Project.

3.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow will be cast to the west onto Washington Street and its sidewalks. No new shadow will be case onto nearby bus stops or open space.

At 12:00 p.m., new shadow will be cast to the north across Washington Street and its southern sidewalk. No new shadow will be cast onto nearby bus stops or open space.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of the Project site. No new shadow will be cast onto nearby streets, sidewalks, bus stops or open space.

3.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow will be cast to the west across Washington Street and its sidewalks. No new shadow will be cast onto nearby bus stops or open space.

At 12:00 p.m., minimal new shadow will be cast to the north onto a minor portion of Washington Street and its southern sidewalk.

At 3:00 p.m., minimal new shadow will be cast to the northeast onto a portion of the Project site. No new shadow will be cast onto nearby streets, sidewalks, bus stops or open space.

At 6:00 p.m., new shadow will be cast to the southeast onto portions of the Project site. No new shadow will be cast onto nearby streets, sidewalks, bus stops or open space.

3.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, new shadow will be cast to the west onto Washington Street and its sidewalks. No new shadow will be cast onto nearby bus stops or open space.

At 12:00 p.m., new shadow will be cast to the north onto a minor portion of Washington Street and its southern sidewalk. No new shadow will be cast onto nearby bus stops or open space.

At 3:00 p.m., new shadow will be cast to the northeast onto a portion of the Project site. No new shadow will be cast onto nearby streets, bus stops or open space.

At 6:00 p.m., new shadow will be cast to the west onto the Project site and onto a sliver of Glen Road and its southern sidewalk. No new shadow will be cast onto nearby bus stops or open space.

3.2.5 Winter Solstice (December 21)

At 9:00 a.m. during the winter solstice, new shadow will be cast to the northwest onto a portion of Washington Street and its sidewalks. No new shadow will be cast onto nearby bus stops or open space.

At 12:00 p.m., new shadow will be cast to the will be cast to the north onto Washington Street and its sidewalks, and a minor portion of Green Street. No new shadow will be cast onto nearby bus stops or open space.

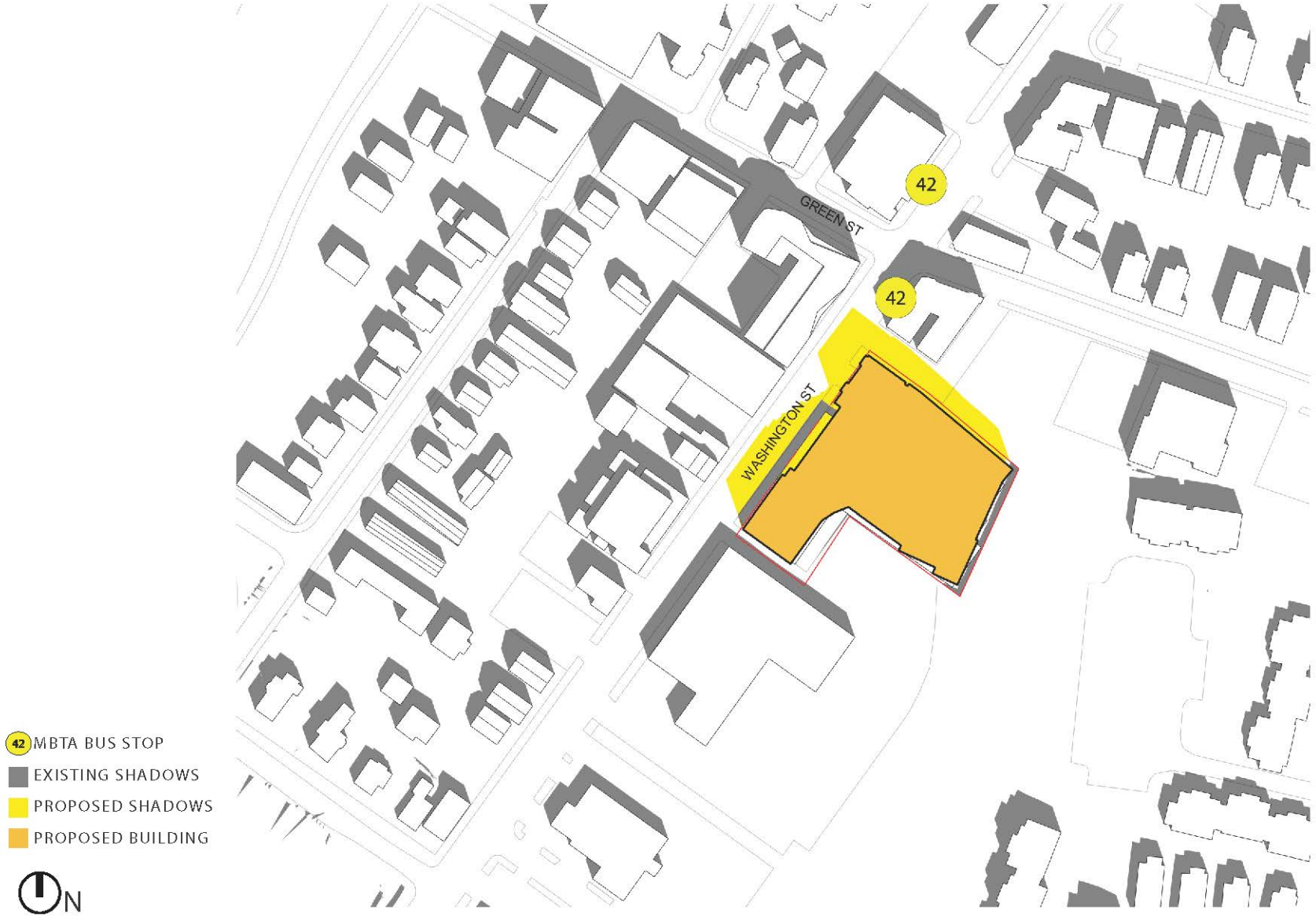
At 3:00 p.m., new shadow will be cast to the northeast onto Glen Road and its sidewalks. No new shadow will be cast onto nearby bus stops or open space.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-1

Shadow Study – March 21, 9:00 a.m.



3368 Washington Street Boston, Massachusetts

RODE

Figure 3-2

Shadow Study – March 21, 12:00 p.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-3

Shadow Study – March 21, 3:00 p.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-4
Shadow Study – June 21, 9:00 a.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-5

Shadow Study – June 21, 12:00 p.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-6
Shadow Study – June 21, 3:00 p.m.

3368 Washington Street Boston, Massachusetts

RODE

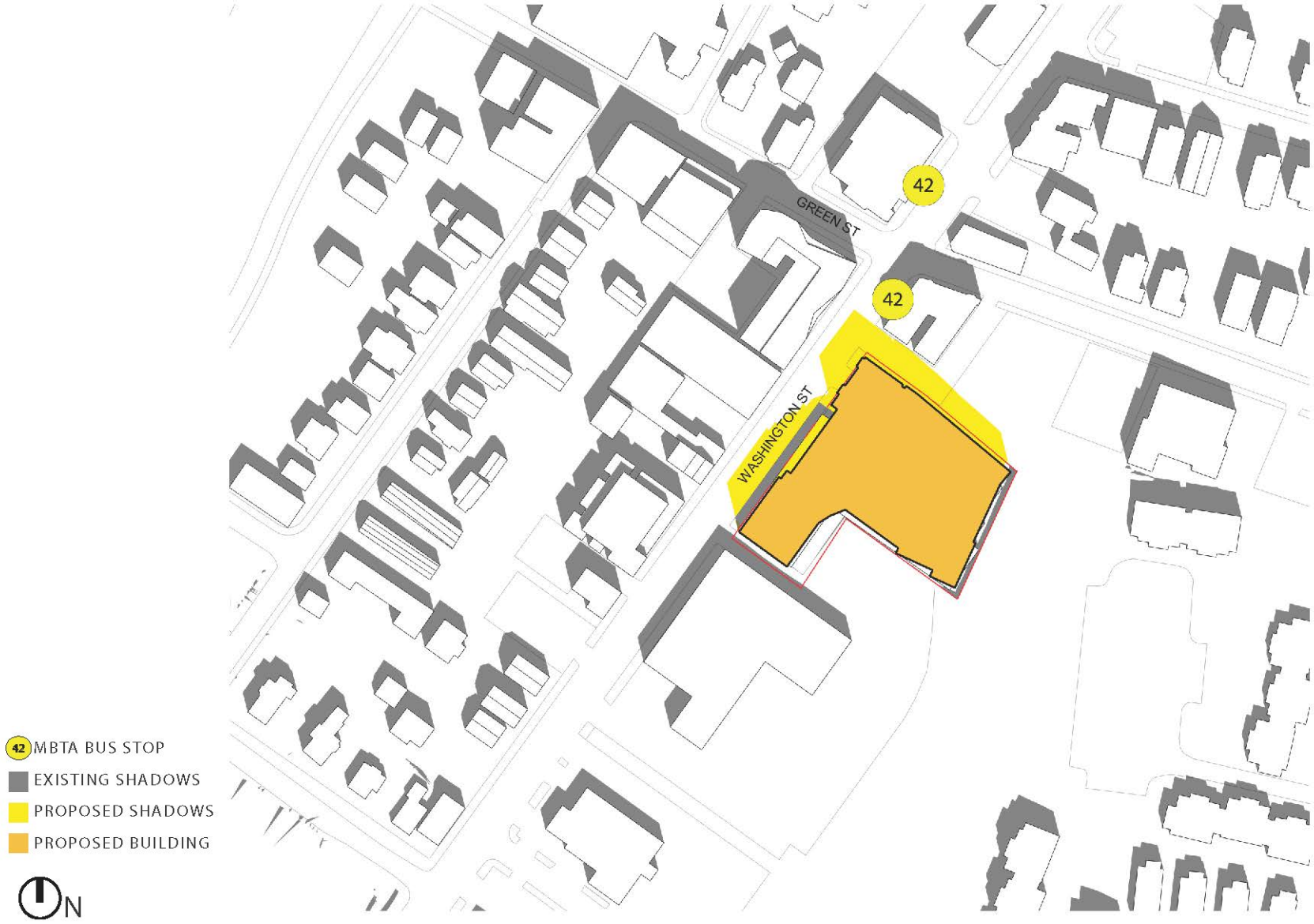
Figure 3-7
Shadow Study – June 21, 6:00 p.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-8

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



3368 Washington Street Boston, Massachusetts

RODE

Figure 3-9

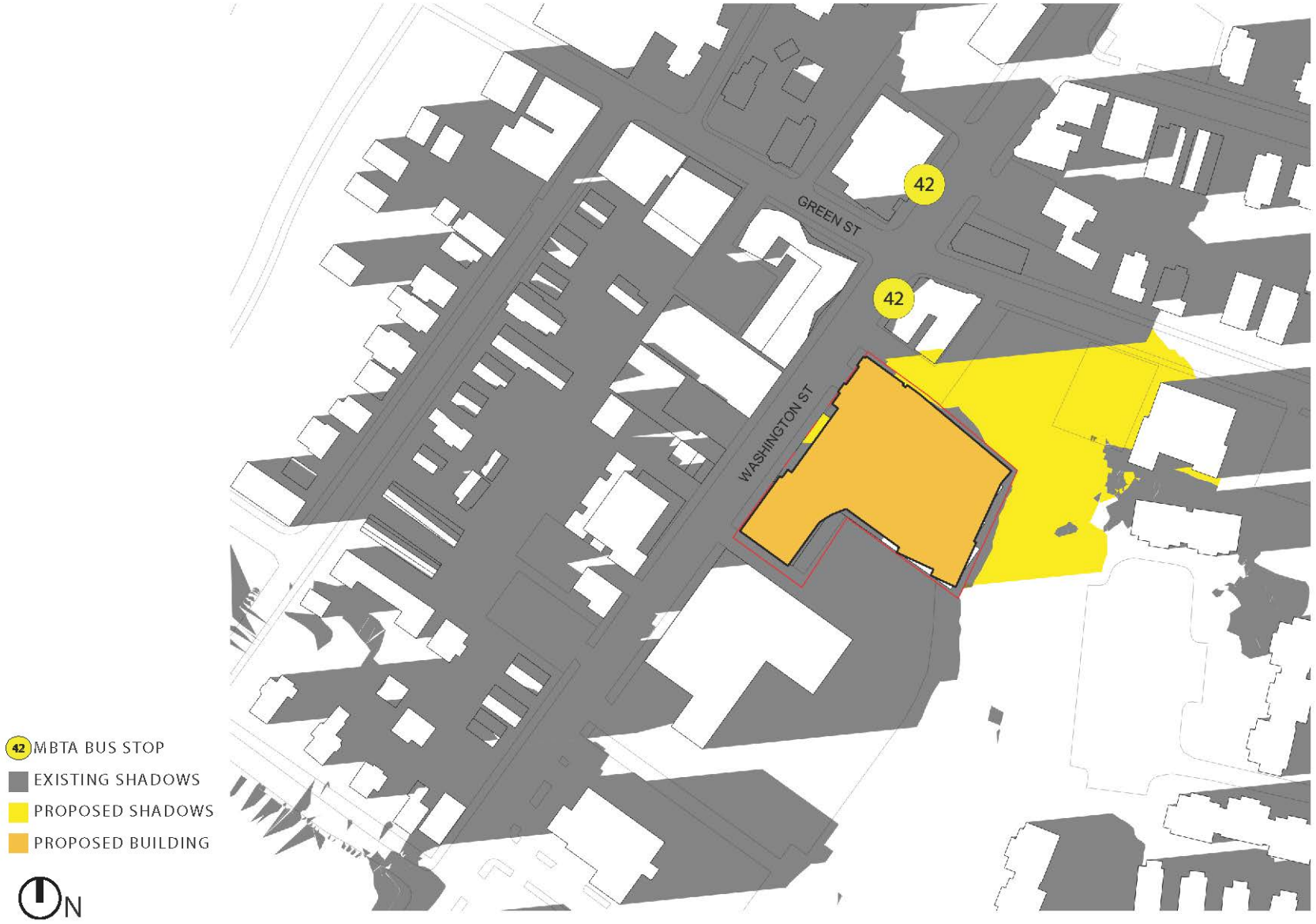
Shadow Study – September 21, 12:00 p.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-10

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

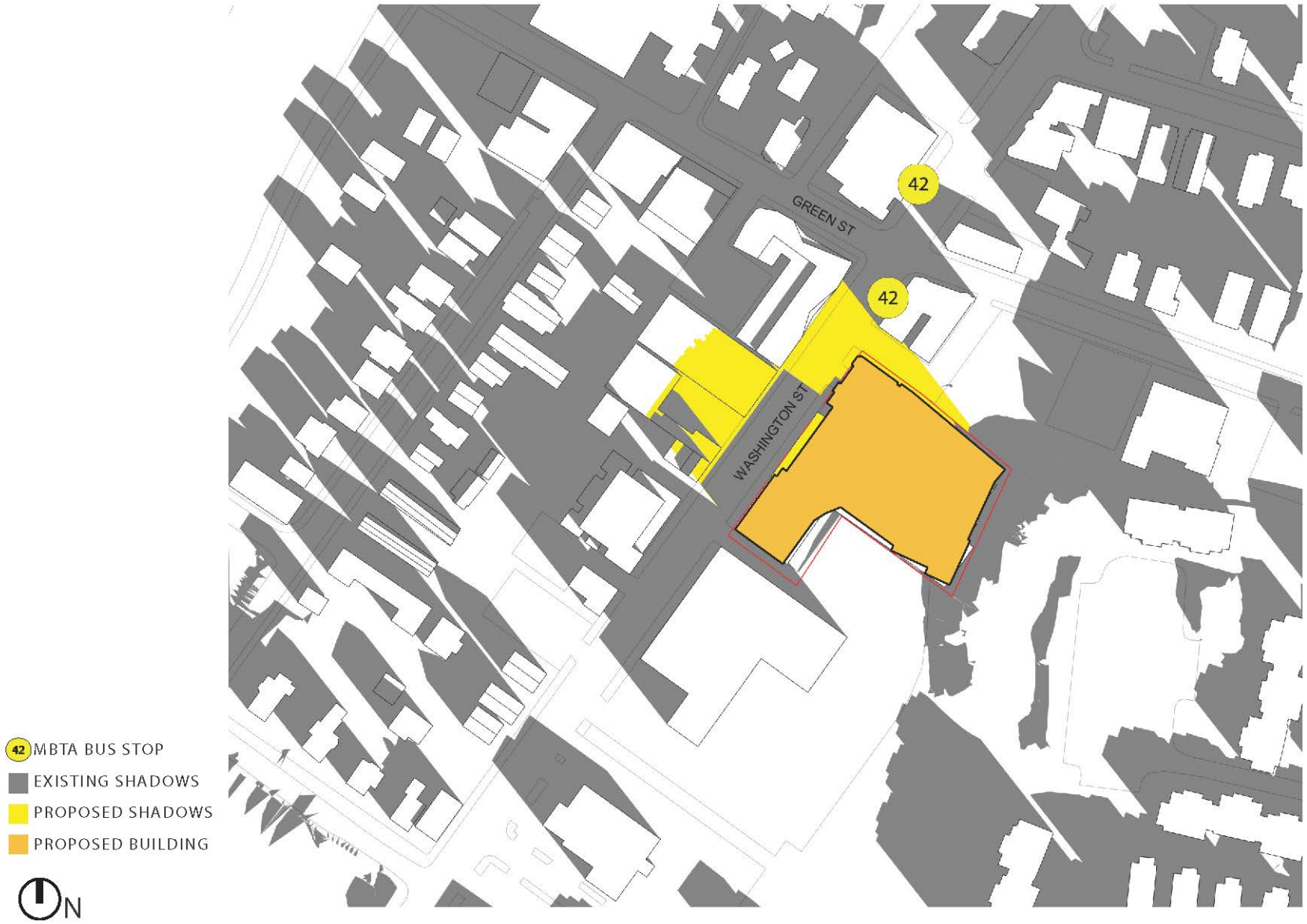


3368 Washington Street Boston, Massachusetts

RODE

Figure 3-11

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



3368 Washington Street Boston, Massachusetts

RODE

Figure 3-12

Shadow Study – December 21, 9:00 a.m.

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-13

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

3368 Washington Street Boston, Massachusetts

RODE

Figure 3-14

Shadow Study – December 21, 3:00 p.m.

3.2.6 Conclusions

The shadow impact analysis looked at net new shadow created by the Project during 14 time periods. New shadow will be limited to the Project site, and the surrounding streets and sidewalks. During all time periods studied, no new shadow will be cast onto nearby bus stops or open space.

3.3 Daylight Analysis

3.3.1 Introduction

The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in the immediate vicinity of a project site. The daylight analysis for the Project considers the existing and proposed conditions, as well as daylight obstruction values of the surrounding area.

Because the Project site currently consists of low-rise buildings and a surface parking lot, the proposed Project will increase daylight obstruction from the existing condition; however, the proposed building design will have multiple step-backs from the street, allowing for additional views to the sky. The proposed conditions will be similar to or lower than the daylight obstruction values within the surrounding area.

3.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program[1]. This program measures the percentage of "sky dome" that is obstructed by a project and is a useful tool in evaluating the net change in obstruction from existing to build conditions at a specific site.

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

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

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

One viewpoint was chosen to evaluate the daylight obstruction for the Existing and Proposed Conditions, since the Project site abuts only one public roadway. Three area context points were considered to provide a basis of comparison to existing conditions in the surrounding area. The viewpoint and area context viewpoints were taken in the following locations and are shown on Figure 3-15.

- **Viewpoint 1:** View from the center of Washington Street facing southeast toward the Project site.
- **Area Context Viewpoint AC1:** View from Washington Street facing southeast toward 3380-3390 Washington Street.
- **Area Context Viewpoint AC2:** View from Glen Road facing southerly toward 3348 Washington Street.
- **Area Context Viewpoint AC3:** View from Green Street facing southerly toward 191 Green Street.

3.3.3 Results

The results for each viewpoint are described in Table 3-1. Figures 3-16 through 3-18 illustrate the BRADA results for each analysis.

Table 3-1 Daylight Analysis Results

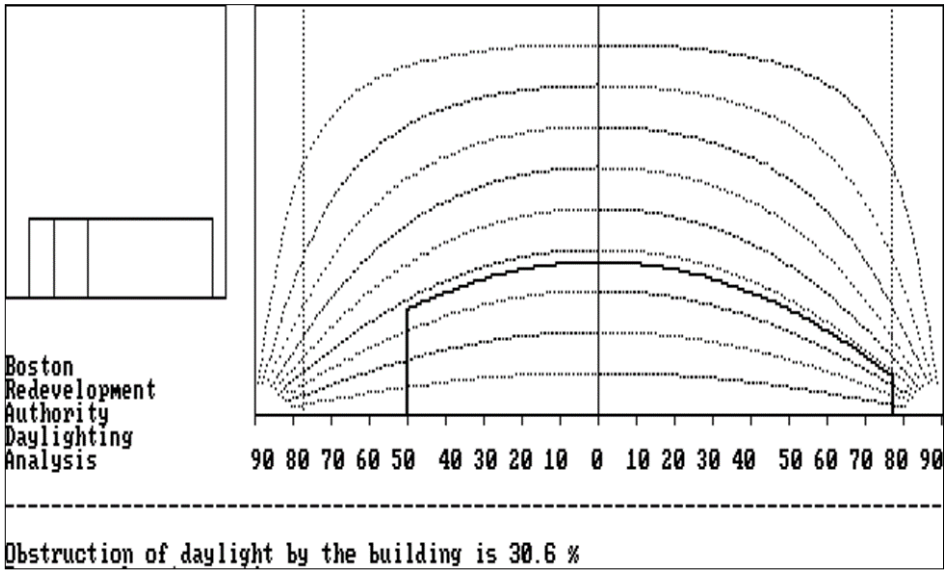
Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	View from the center of Washington Street facing southeast toward the Project site	30.6%	37.8%
Area Context Points			
AC1	View from Washington Street facing southeast toward 3380-3390 Washington Street	58.8%	N/A
AC2	View from Glen Road facing southerly toward 3348 Washington Street	66.1%	N/A
AC3	View from Green Street facing southerly toward 191 Green Street	40.9%	N/A

3368 Washington Street Boston, Massachusetts

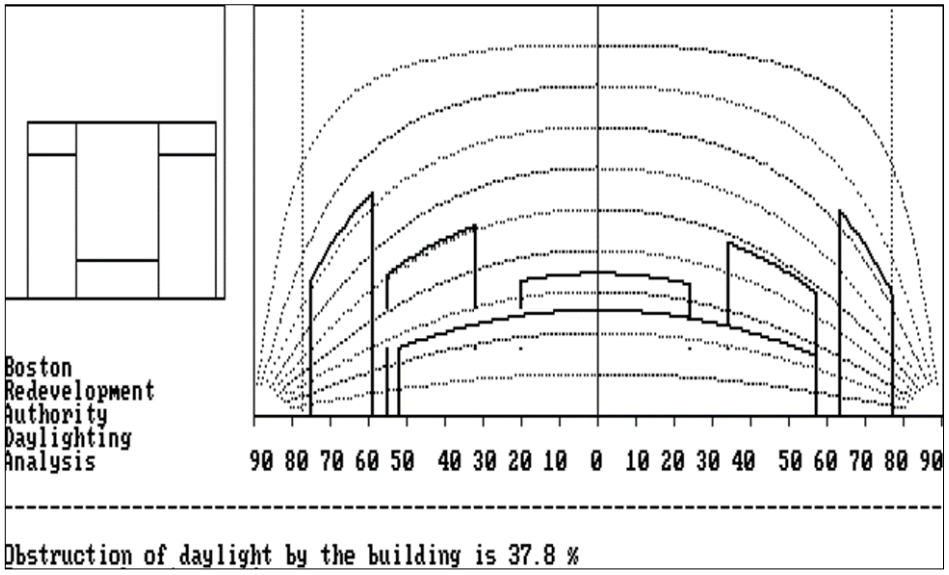
Epsilon ASSOCIATES INC.

Figure 3-15

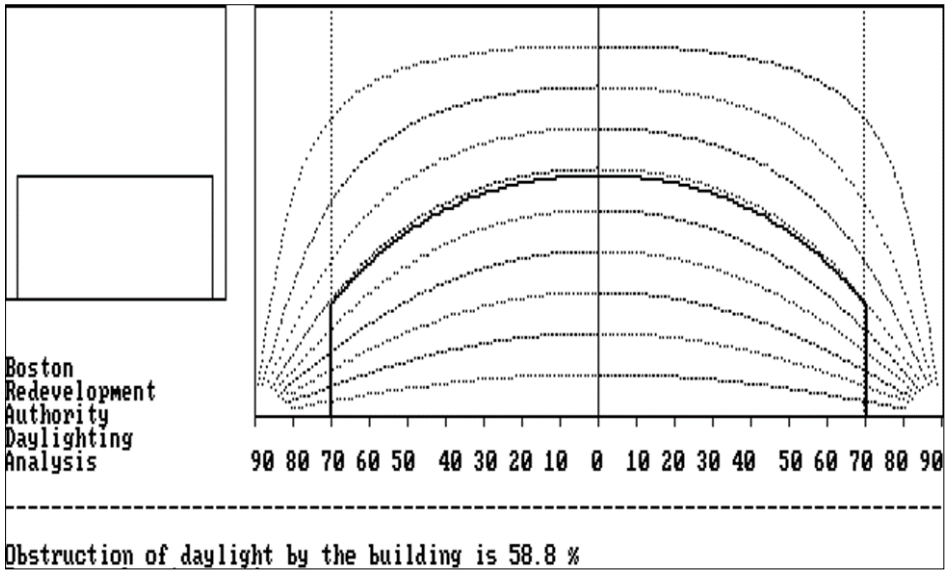
Viewpoint and Area Context Locations



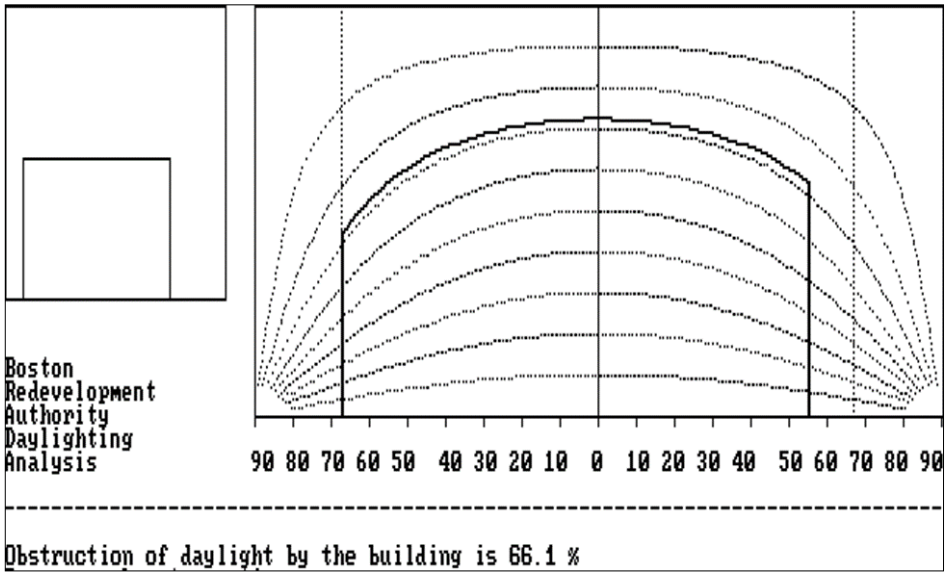
Viewpoint 1 (Existing): View from Washington Street facing southeast toward the site



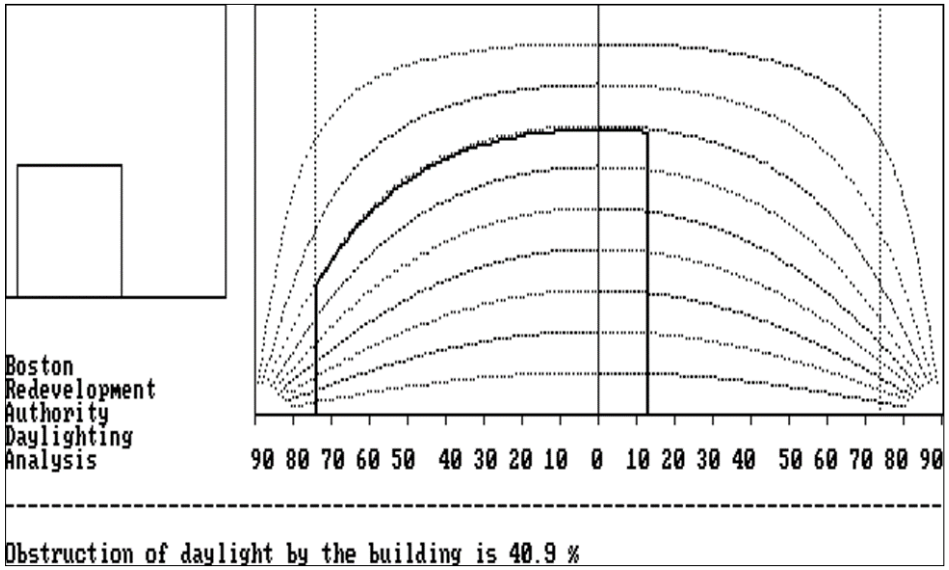
Viewpoint 1 (Proposed): View from Washington Street facing southeast toward the site



AC1: View from Washington Street facing southeast toward 3380-3390 Washington Street



AC2: View from Glen Road facing southerly toward 3348 Washington Street



AC3: View from Green Street facing southerly toward 191 Green Street

Washington Street – Viewpoint 1

Washington Street runs along the western edge of the Project site. Viewpoint 1 was taken from the center of Washington Street facing southeast toward the Project site. Since the site is currently occupied by a one-story building and a surface parking lot, the development of the Project would result in an increased daylight obstruction value of 37.8%. While this is an increase over existing conditions, the daylight obstruction value is similar to other areas in the vicinity, including the Area Context Viewpoints.

Area Context Views

The surrounding area around the Project site includes buildings varying in height and density. To provide a larger context for the comparison of daylight conditions, obstruction values were calculated for the three Area Context Viewpoints described above and shown in Figures 3-16 to 3-18. Buildings in the vicinity of the Project site vary in height and density and are typically situated close to the street with small frontages. The daylight obstruction values ranged from 40.9% for AC3 to 66.1% for AC2. Daylight obstruction values for the Project are similar or less than those found for similar buildings in the Project vicinity, including the Area Context values.

3.3.4 Conclusions

The daylight analysis conducted for the Project describes existing and proposed daylight obstruction conditions at the Project site and in the surrounding area. The results of the BRADA analysis indicate that while the development of the Project will result in increased daylight obstruction over existing conditions, the resulting conditions will be similar to the daylight obstruction values within the surrounding area and typical of similarly developed areas.

3.4 Solar Glare

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

3.5 Air Quality

3.5.1 Introduction

The BPDA requires that proposed projects evaluate the air quality in the local area, and assess any adverse air quality impacts attributable to a project. The BPDA guidelines state that impacts from stationary sources (boilers, engines) and mobile sources (vehicles) must be addressed.

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

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

3.5.2 National Ambient Air Quality Standards and Background Concentrations

Background air quality concentrations and federal air quality standards were utilized to conduct the microscale analysis mentioned above. Federal National Ambient Air Quality Standards (NAAQS) were developed by the U.S. Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety. The modeling methodologies were developed in accordance with the latest Massachusetts Department of Environmental Protection (MassDEP) modeling policies and Federal modeling guidelines.[2] The following sections outline the NAAQS standards and detail the sources of background air quality data.

3.5.2.1 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, EPA promulgated NAAQS for the following criteria pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM) (PM10 and PM2.5), carbon monoxide (CO), ozone (O_3), and lead (Pb). The NAAQS are listed in Table 3-2. Massachusetts Ambient Air Quality Standards (MAAQS) are typically identical to NAAQS (differences are highlighted in **bold** in Table 3-2).

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

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

[2] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

Table 3-2 National (NAAQS) and Massachusetts (MAAQS) Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS (µg/m³) Primary	NAAQS (µg/m³) Secondary	MAAQS (µg/m³) Primary	MAAQS (µg/m³) Secondary
NO_2	Annual (1)	100	Same	100	Same
	1-hour (2)	**188**	None	**None**	None
SO_2	Annual (1)(9)	80	None	80	None
	24-hour (3)(9)	365	None	365	None
	3-hour (3)	None	1300	None	1300
	1-hour (4)	**196**	None	**None**	None
PM2.5	Annual (1)	**12**	**15**	**None**	**None**
	24-hour (5)	**35**	**Same**	**None**	**None**
PM10	Annual (1)(6)	**None**	None	**50**	Same
	24-hour (3)(7)	150	Same	150	Same
CO	8-hour (3)	10,000	Same	10,000	Same
	1-hour (3)	40,000	Same	40,000	Same
Ozone	8-hour (8)	**147**	Same	**235**	Same
Pb	3-month (1)	1.5	Same	1.5	Same

Source: http://www.epa.gov/ttn/naaqs/criteria.html and 310 CMR 6.04
(1) Not to be exceeded.
(2) 98th percentile of one-hour daily maximum concentrations, averaged over three years.
(3) Not to be exceeded more than once per year.
(4) 99th percentile of one-hour daily maximum concentrations, averaged over three years.
(5) 98th percentile, averaged over three years.
(6) EPA revoked the annual PM10 NAAQS in 2006.
(7) Not to be exceeded more than once per year on average over three years.
(8) Annual fourth-highest daily maximum eight-hour concentration, averaged over three years.
(9) EPA revoked the annual and 24-hour SO_2 NAAQS in 2010. However, they remain in effect until one year after the area's initial attainment designation, unless designated as "nonattainment".

3.5.2.2 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports was obtained for 2015 to 2017. The three-hour and 24-hour SO_2 values are no longer reported in the annual reports. Data for these pollutant and averaging time combinations were obtained from the EPA's AirData website.

The Clean Air Act allows for one exceedance per year of the CO and SO_2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 µg/m³. For annual PM2.5 averages, the average of the highest yearly observations was used as the background concentration. To attain the one-hour NO_2 standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 µg/m³.

Background concentrations were determined from the closest available monitoring stations to the proposed development. All pollutants are not monitored at every station, so data from multiple locations are necessary. The closest monitor is at Harrison Avenue (1.8 miles northeast). A summary of the background air quality concentrations are presented in Table 3-3. MassDEP provided the values to be used.

Table 3-3 Observed Ambient Air Quality Concentrations and Selected Background Levels

POLLUTANT	AVG TIME	Form	Background Concentration (µg/m³)	NAAQS	Percent of NAAQS
SO_2 [1][5]	1-Hr [4]	99th %	15.8	196.0	8%
	3-Hr	H2H	32.2	1300.0	2%
	24-Hr	H2H	11.3	365.0	3%
	Annual	H	2.1	80.0	3%
PM_{10} [6]	24-Hr	H2H	27.0	150.0	18%
	Annual	H	11.7	50.0	23%
$PM_{2.5}$	24-Hr [4]	98th %	15.8	35.0	45%
	Annual [4]	H	6.6	12.0	55%
NO_2 [3]	1-Hr [4]	98th %	92.8	188.0	49%
	Annual	H	28.2	100.0	28%
CO [2]	1-Hr	H2H	2760.0	40000.0	7%
	8-Hr	H2H	1375.0	10000.0	14%

Notes:
From MassDEP, Email from G. Pacheco to V. Tino, March 12, 2019

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

3.5.3 Mobile Sources

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

3.5.3.1 Methodology

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

The microscale analysis typically examines ground-level CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. The NAAQS standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period, and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on current vehicles has reduced the occurrences of CO hotspots. Air quality modeling techniques (computer simulation programs) are typically used to predict CO levels for both existing and future conditions to evaluate compliance of the roadways with the standards. The microscale analysis has been conducted using the latest versions of EPA's MOVES and CAL3QHC programs to estimate CO concentrations at sidewalk receptor locations. Existing (2019) and future year (2024) emission factor data calculated from the MOVES model, along with traffic data, were input into the CAL3QHC program to determine CO concentrations due to traffic flowing through the selected intersections. The modeling methodology was developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[3]

Existing background values of CO at the nearest monitor location at Harrison Avenue were obtained from MassDEP. CAL3QHC results were then added to background CO values of 2.4 ppm (one-hour) and 1.2 ppm (eight-hour), as provided by MassDEP, to determine total air quality impacts due to the Project. These values were compared to the NAAQS for CO of 35 ppm (one-hour) and 9 ppm (eight-hour).

Intersection Selection

Two signalized intersections included in the traffic study meet the conditions described at the beginning of this section. The traffic volumes and LOS calculations provided in Chapter 2 form the basis of evaluating the traffic data versus the microscale thresholds. The following intersections were analyzed:

- Washington Street and Green Street/Glen Road; and
- Washington Street and Williams Street.

Microscale modeling was performed for these intersections based on the aforementioned methodology. The 2019 Existing and 2024 No-Build and Build conditions were each evaluated for both morning (a.m.) and afternoon (p.m.) peak.

It can be reasonably concluded that if the worst performing intersections (with respect to LOS) do not cause a condition of air pollution, then better performing intersections also do not cause a condition of air pollution.

[3] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005

Emissions Calculations (MOVES)

The EPA MOVES computer program was used to estimate motor vehicle emission factors on the roadway network. Emission factors calculated by the MOVES model are based on motor vehicle operations typical of daily periods. The Commonwealth's statewide annual Inspection and Maintenance (I&M) program was included, as well as the county specific vehicle age registration distribution, fleet mix, meteorology, and other inputs. The inputs for MOVES for the existing (2019) and future year (2024) are provided by MassDEP.

All link types for the modeled intersections were input into MOVES. Idle emission factors are obtained from factors for a link average speed of zero miles per hour (mph). Moving emissions are calculated based on speeds at which free-flowing vehicles travel through the intersection as stated in traffic modeling (Synchro) reports. A speed of 25 mph is used for all free-flow traffic, consistent with the City of Boston speed limit. Speeds of 10 and 15 mph were used for right (and U-turns, if necessary), and left turns, respectively. Roadway emissions factors were obtained from MOVES using EPA guidance.[4]

Winter CO emission factors are typically higher than summer. Therefore, January weekday emission factors were conservatively used in the microscale analysis. The emission factors are presented in Table 3-4.

Table 3-4 Observed Ambient Air Quality Concentrations and Selected Background Levels

Carbon Monoxide Only

		2019	2024
Free Flow	25 mph	2.992	2.227
Right Turns	10 mph	4.667	3.431
Left Turns	15 mph	4.021	2.991
Queues	Idle	10.463	5.644

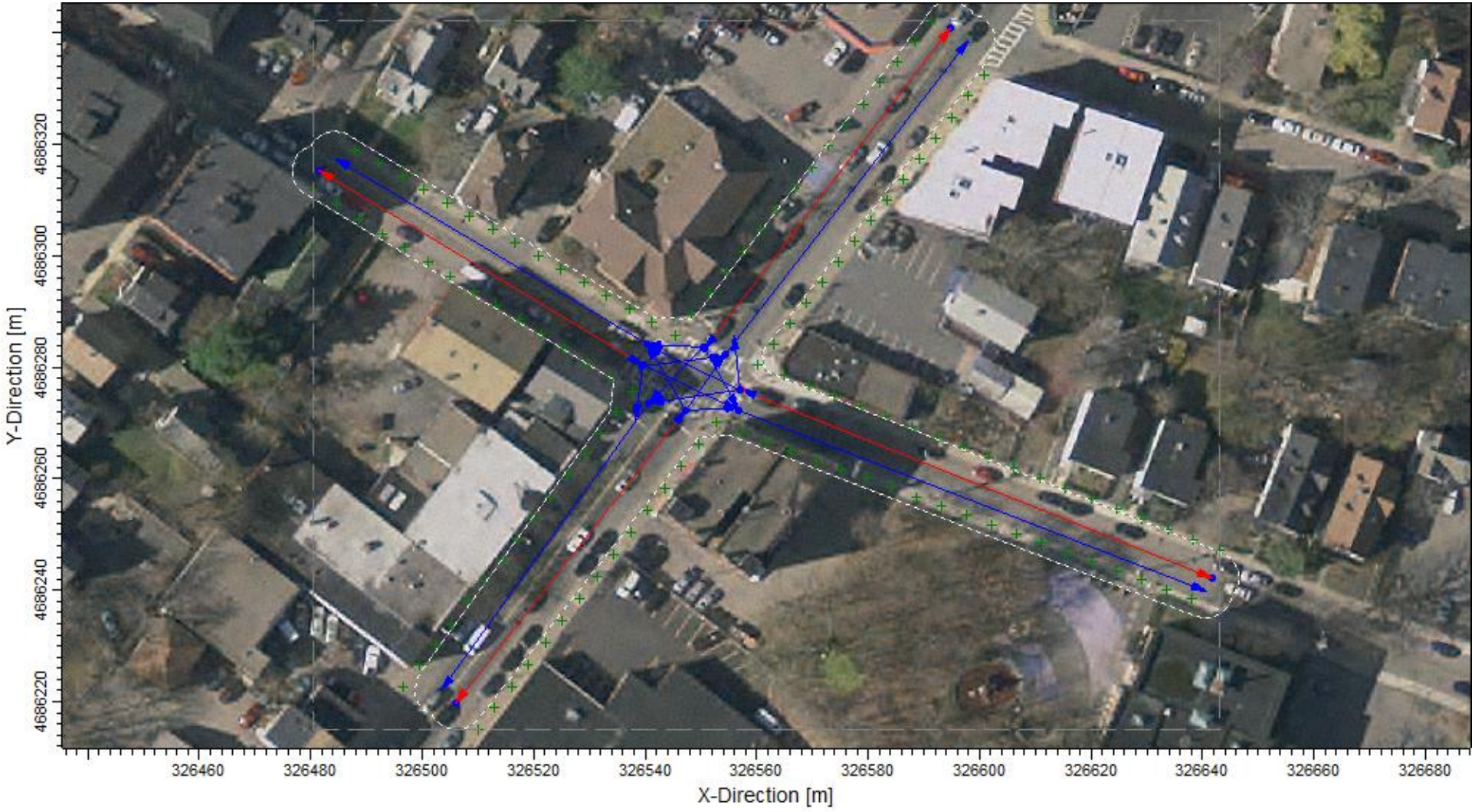
Notes: Winter CO emission factors are higher than summer and are conservatively used

Urban Unrestricted Roadway type used

Receptors & Meteorology Inputs

Sets of up to 184 receptors were placed in the vicinity of the modeled intersections. Receptors extended approximately 300 feet on the sidewalks along the roadways approaching the intersections. The roadway links and receptor locations of the modeled intersection are presented in Figures 3-19 and 3-20.

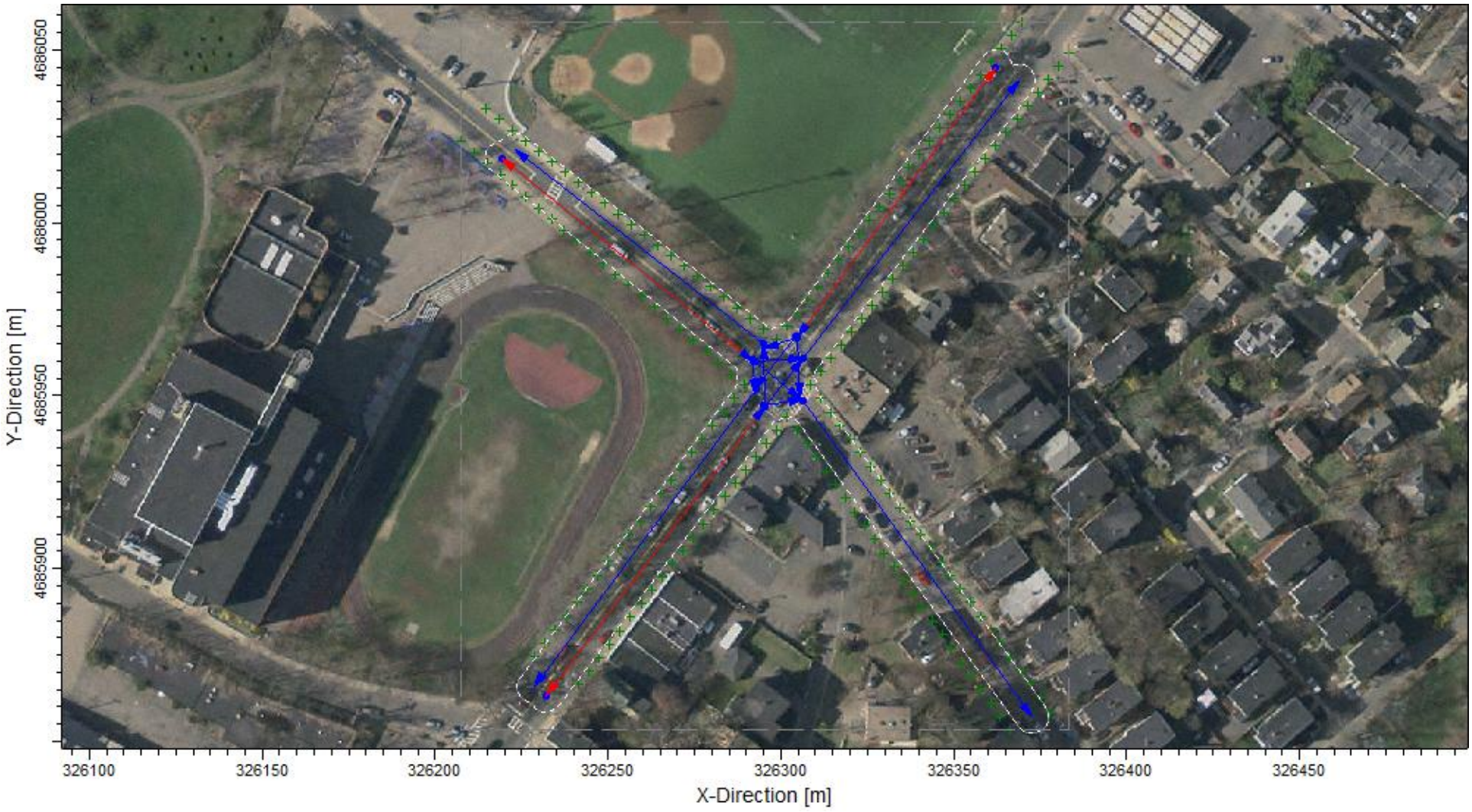
[4] U.S. EPA, 2010. Using MOVES in Project-Level Carbon Monoxide Analyses. EPA-420-B-10-041



3368 Washington Street Boston, MA

Figure 3-19

Intersection of Washington Street and Green Street/Glen Road



3368 Washington Street Boston, MA

Figure 3-20

Intersection of Washington Street and Williams Street

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[5], a wind speed of one meter per second, stability class D(4), and a mixing height of 1,000 meters were used. To account for the intersection geometry, wind directions from 0° to 350°, at every 10° were selected. A surface roughness length of 108 centimeters was selected and is consistent with the single-family residential environment near the Project.[6]

Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-links at signalized intersections, worst-case meteorological conditions, and traffic input data. The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling outputs.

For use in the microscale analysis, background concentrations of CO in ppm were required for the 2024 No-Build and Build scenarios. The corresponding maximum background concentrations in ppm were 2.4 ppm (2,760 $\mu g/m^3$) for one-hour and 1.2 ppm (1,375 $\mu g/m^3$) for eight-hour CO.

3.5.3.2 Air Quality Results

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3-5 through 3-7 for the 2019 Existing, 2024 No-Build and Build scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.9.[7]

The results of the one-hour and eight-hour maximum modeled CO ground-level concentrations from CAL3QHC were added to EPA supplied background levels for comparison to the NAAQS. These values represent the highest potential concentrations at the intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology. The highest one-hour traffic-related concentration predicted in the area of the Project for the future modeled conditions (0.2 ppm) plus background (2.4 ppm) is 2.6 ppm. The highest eight-hour traffic-related concentration predicted in the area of the Project for the future modeled conditions (0.2 ppm) plus background (1.2 ppm) is 1.4 ppm. All concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

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

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

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

3.5.3.3 Conclusions

Results of the microscale analysis show that all predicted CO concentrations are well below one-hour and eight-hour NAAQS. There is no discernable change to the modeled concentrations from the No-Build to Build cases. Therefore, it can be concluded that there are no anticipated adverse air quality impacts resulting from increased traffic from the Project.

Table 3-5 Summary of Microscale Modeling Analysis (Existing 2019)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Washington Street and Green Street/Glen Road	AM	0.2	2.4	2.6	35
	PM	0.2	2.4	2.6	35
Washington Street and Williams Street	AM	0.4	2.4	2.8	35
	PM	0.4	2.4	2.8	35
8-Hour					
Washington Street and Green Street/Glen Road	AM	0.2	1.3	1.5	9
	PM	0.2	1.3	1.5	9
Washington Street and Williams Street	AM	0.4	1.3	1.7	9
	PM	0.4	1.3	1.7	9

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

Table 3-6 Summary of Microscale Modeling Analysis (No-Build 2024)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Washington Street and Green Street/Glen Road	AM	0.1	2.4	2.5	35
	PM	0.1	2.4	2.5	35
Washington Street and Williams Street	AM	0.2	2.4	2.6	35
	PM	0.2	2.4	2.6	35
8-Hour					
Washington Street and Green Street/Glen Road	AM	0.1	1.2	1.3	9
	PM	0.1	1.2	1.3	9
Washington Street and Williams Street	AM	0.2	1.2	1.4	9
	PM	0.2	1.2	1.4	9
Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.					

Table 3-7 Summary of Microscale Modeling Analysis (Build 2024)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Washington Street and Green Street/Glen Road	AM	0.1	2.4	2.5	35
	PM	0.1	2.4	2.5	35
Washington Street and Williams Street	AM	0.2	2.4	2.6	35
	PM	0.2	2.4	2.6	35
8-Hour					
Washington Street and Green Street/Glen Road	AM	0.1	1.2	1.3	9
	PM	0.1	1.2	1.3	9
Washington Street and Williams Street	AM	0.2	1.2	1.4	9
	PM	0.2	1.2	1.4	9
Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.					

3.5.4 Stationary Sources

Stationary sources of air pollution are typically units that combust fuel. In this case, these sources likely consist of heating and hot water units and emergency electrical generators. Cooling towers, although not a combustion source, are a source of particulate emissions. There is a small underground garage which will be vented according to local building codes.

It is expected that the majority of stationary sources (boilers, engines, etc.) may be subject to the MassDEP's Environmental Results Program (ERP). The Proponent will complete the required applications and submittals for the equipment, as necessary.

3.6 Stormwater/Water Quality

Section 7.4 includes information on stormwater impacts.

3.7 Flood Hazard Zones/Wetlands

The most current version of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the Project site is Community Panel 25025C0086G, effective September 25, 2009, which indicates the FEMA Flood Zone Designation for the site area. The map shows the Project is located outside of the 0.2 percent annual change floodplain (commonly referred to as the 500-year flood limit) identifying it as an area of minimal flooding.

The Project site does not contain wetlands.

3.8 Geotechnical Impacts

Proceeding from the ground surface downward, the major soil layers at the Project site include granular fill, sand, silt and till. Bedrock was encountered at depths of approximately seven to 16 feet. The depth to groundwater ranges from approximately five to 17 feet. The proposed building may be supported on spread footings that bear directly on the natural sand or bedrock beneath the fill, or on compacted Structural Fill extending down to the natural sand or bedrock.

The Project is not located within the Groundwater Conservation Overlay District.

3.9 Solid and Hazardous Waste

3.9.1 Hazardous Waste

GEI Consultants, Inc. (GEI) performed Phase I and Phase II Environmental Site Assessments (ESAs) on behalf of TCB for the Project site. The ESAs were performed in general conformance with the scope and limitations of ASTM Standard E1903-11 and for the objective of evaluating the identified recognized environmental conditions (RECs) and whether releases of oil or hazardous material (OHM) to the environment from two abutting properties, the use of the Project site as a former machine shop, and the historic drycleaner located at 3371 Washington Street have affected the site.

GEI concluded that the appropriate environmental media were sampled from the appropriate locations and tested for the appropriate target analytes to meet the objective of the assessment. Soil samples did not show visual or olfactory evidence of contamination, and field screening of the samples did not indicate the presence of volatile organic compounds (VOCs).

Any material leaving the site will be transported in accordance with local, state and federal requirements. Any regulated soil conditions related to oil and hazardous materials will be managed in accordance with appropriate MassDEP regulatory requirements.

3.9.2 Operational Solid Waste and Recycling

The Project will generate solid waste typical of residential and office uses. Solid waste is expected to include wastepaper, cardboard, glass bottles and food. Recyclable materials will be recycled through a program implemented by building management. The Project will generate approximately 211 tons of solid waste per year. With the exception of household hazardous wastes typical of residential and office developments (*e.g.,* cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials.

3.10 Noise Impacts

The primary set of noise regulations relating to a potential increase in sound levels due to the Project is the City of Boston Zoning District Noise Standards (City of Boston Code – Ordinances: Section 16–26 Unreasonable Noise and City of Boston Air Pollution Control Commission Regulations for the Control of Noise in the City of Boston). Separate regulations within the Standards provide criteria to control different types of noise. Regulation 2 is applicable to the effects of the Project. Zoning District Standards are presented below in Table 3-8.

Table 3-8 City of Boston Zoning District Noise Standards, Maximum Allowable Sound Pressure Levels

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

Notes:
- Noise standards are extracted from Regulation 2.5, City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976.
- All standards apply at the property line of the receiving property.
- dB and dBA based on a reference sound pressure of 20 micropascals.
- 'Daytime' refers to the period between 7:00 a.m. and 6:00 p.m. daily, excluding Sunday.

Additionally, the MassDEP has the authority to regulate noise under 310 CMR 7.10, which is part of the Commonwealth's air pollution control regulations. According to MassDEP, "unnecessary" noise is considered an air contaminant and thus prohibited by 310 CMR 7.10. The MassDEP administers this regulation through Noise Policy DAQC 90-001 which limits a source to a 10-dBA increase above the L_{90} ambient sound level measured at the Project property line and at the

nearest residences. The MassDEP policy further prohibits "pure tone" conditions where the sound pressure level in one octave-band is three decibels or more than the sound levels in each of two adjacent bands.

While the details of the mechanical equipment associated with the Project have not yet been precisely determined, steady operational noise from stationary sources will primarily involve heating, cooling and ventilation equipment for the office and residential spaces.

During the final design phase of the Project, mechanical equipment and noise controls will be specified to meet the applicable City of Boston and MassDEP noise limits. Reasonable efforts will be made, if necessary, to minimize noise impacts from the Project using routinely employed methods of noise control, including:

- Selection of "low-noise" equipment models;
- Fitting of inlet and discharge vents with duct silencers;
- Installation of screening barriers to provide shielding where appropriate;
- Use of sound-attenuating enclosures, acoustical blankets, or both on continuously operating equipment with outdoor exposure; and
- Siting of noisy equipment at locations that protect sensitive receptors by shielding or with increased distance.

In summary, the Project, with appropriate noise control, is not expected to result in any adverse noise impacts at nearby sensitive receptors. Short-term, intermittent increases in noise levels will occur during Project construction. However, every reasonable effort will be made to minimize the noise impacts and ensure that the Project complies with the requirements of the City of Boston noise ordinance.

3.11 Construction Impacts

3.11.1 Introduction

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

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

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

The Proponent intends to follow the guidelines of the City of Boston and the MassDEP, which direct the evaluation and mitigation of construction impacts.

3.11.2 Construction Methodology / Public Safety

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

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

3.11.3 Construction Schedule

The Proponent anticipates that the Project will commence construction in the third quarter of 2020, with completion anticipated in the second quarter of 2022.

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

3.11.4 Construction Staging / Access

Access to the site and construction staging areas will be provided in the CMP.

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

3.11.5 Construction Mitigation

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

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

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

3.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 480 full-time equivalent construction jobs will be created. The Proponent will make reasonable good-faith efforts to have at least 51% of the total employee work hours completed by Boston residents, at least 40% of total employee work hours completed by minorities and at least 12% of the total employee work hours completed by women. The Proponent will enter into a jobs agreement with the City of Boston and other public lenders as required.

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

3.11.7 Construction Truck Routes and Deliveries

Truck traffic will vary throughout the construction period, depending on the activity. The construction team will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. Construction truck routes to and from the site for contractor personnel, supplies, materials, and removal of excavations required for the development will be coordinated with BTD. Traffic logistics and routing will be

planned to minimize community impacts. Truck access during construction will be determined by the BTD as part of the CMP. These routes will be mandated as a part of all subcontractors' contracts for the development. The construction team will provide subcontractors and vendors with Construction Vehicle & Delivery Truck Route Brochures in advance of construction activity.

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

3.11.8 Construction Air Quality

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

- Using wetting agents on areas of exposed soil on a scheduled basis;
- Using covered trucks;
- Minimizing spoils on the construction site;
- Monitoring of actual construction practices to ensure that unnecessary transfers and mechanical disturbances of loose materials are minimized;
- Minimizing storage of debris on site; and
- Periodic street and sidewalk cleaning with water to minimize dust accumulations.

3.11.9 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the Project. Increased community sound levels, however, are an inherent consequence of construction activities. Construction work will comply with the requirements of the City of Boston Noise Ordinance. Every reasonable effort will be made to minimize the noise impact of construction activities.

Mitigation measures are expected to include:

- Instituting a proactive program to ensure compliance with the City of Boston noise limitation policy;
- Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;

- Muffling enclosures on continuously running equipment, such as air compressors and welding generators;
- Replacing specific construction operations and techniques by less noisy ones where feasible;
- Selecting the quietest of alternative items of equipment where feasible;
- Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;
- Turning off idling equipment; and
- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

3.11.10 Construction Waste

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

3.11.11 Protection of Utilities

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

3.12 Rodent Control

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

3.13 Wildlife Habitat

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

Chapter 4.0

Sustainable Design and Climate Change Preparedness

4.0 SUSTAINABLE DESIGN / CLIMATE CHANGE PREPAREDNESS

4.1 Introduction

As required by Article 37 of the Code, the Project will show certifiability under the Leadership in Energy and Environmental Design (LEED) rating system, specifically LEED v4 for New Construction. The Project seeks to leverage the many benefits of the site location to minimize parking needs, encourage alternative forms of transportation, and seek construction and operating methods, and materials to minimize the Project's environmental impact and provide for a high-quality experience for residents and employees within the building. The Project will seek LEED Certification. A description of the Project's approach to showing compliance with LEED is provided in this section. The Project team is currently targeting 52 credits, which would achieve the Silver level if all identified credits are attained. The credits will continue to be evaluated as the design progresses, and some credits may be added, while others may be determined to be unachievable. The preliminary LEED scorecard is included in Section 4.2.

4.2 Green Building

The approach to achieve certifiability under the LEEDv4 BD+C rating system is described below.

Integrative Process

The proposed design was guided by a charrette meeting and advanced site analysis resulting in a better planned building which is expected to produce significant energy and water savings while reducing the initial construction costs and improving occupant comfort.

Location and Transportation

The Project is located on a previously developed site surrounded by buildings and infrastructure, providing easy access to multiple services (food, retail, services, education, restaurants, child care, cultural arts, medical and civic) and public transportation options (providing numerous daily weekday and weekend trips). Covered bicycle storage is provided for residents. Bicycle storage and the inclusion of shower and changing facilities for employees is being studied.

The Project is considering participating in the City of Boston's Compact Living Program, and therefore the proposed number of parking spaces is low. While providing limited parking, the Project will attempt to provide preferred parking spaces to the building occupants driving low-emitting and fuel-efficient vehicles, carpools or those who need an opportunity to re-charge their electric vehicle.

Sustainable Sites

Construction will meet all applicable federal, state and local environmental regulations. An Erosion and Sedimentation Control Plan will be implemented, monitored, and documented.

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

Project Checklist

Project Name: 3368 Washington Street

Date: 5/16/2019

Y	?	N			
1			Credit	Integrative Process	1

8	1	7	**Location and Transportation**		**16**
			Credit	LEED for Neighborhood Development Location	16
1			Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
2		3	Credit	Surrounding Density and Diverse Uses	5
3		2	Credit	Access to Quality Transit	5
	1		Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

6	2	2	**Sustainable Sites**		**10**
Y			Prereq	Construction Activity Pollution Prevention	Required
1			Credit	Site Assessment	1
		2	Credit	Site Development - Protect or Restore Habitat	2
	1		Credit	Open Space	1
3			Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

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

12	14	7	**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
	6		Credit	Enhanced Commissioning	6
9	5	4	Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
	1	1	Credit	Demand Response	2
	1	2	Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

4	1	8	**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
	1	1	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

10	3	3	**Indoor Environmental Quality**		**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
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
		3	Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

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

2	1	1	**Regional Priority**		**4**
1			Credit	Regional Priority: Rainwater management	1
	1		Credit	Regional Priority: Renewable energy production	1
1			Credit	Regional Priority: Optimize Energy Performance	1
		1	Credit	Regional Priority: Building life-cycle impact reduction	1

52	28	30	**TOTALS**	Possible Points:	**110**

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

The Project will meet the Proponent's Design Standards, as well as stormwater standards required by the City of Boston. A variety of stormwater storage, recharge, or infiltration approaches will be considered to reduce stormwater runoff from the site. Potential options include green roofs and the storage and possible reuse of rainwater.

The sidewalks and plazas will incorporate light-colored materials to reduce the heat island effect. Street and plaza trees will provide shade and a pleasant experience for pedestrians and cyclists. The building will be designed to reduce the heat island effect by providing landscaped areas and installing cool roof and green roofs on the building. Exterior lighting will preserve energy and prevent light pollution, while also providing on-site safety.

The building is proposed to include a new plaza along the Project's street frontage to create a welcoming environment and improve the pedestrian experience. In addition, the Project is proposed to include new landscaped rooftop amenity spaces for residents, providing places for relaxation when the weather allows.

Water Efficiency

All vegetation planned for the Project will be drought-resistant and native. Potable water demand will be reduced by using sustainable practices such as proper species selection, drip irrigation and/or moisture sensors.

The building will be designed with the goal of being at least 40% more efficient than the LEED water baseline. Water-efficient toilets will be specified, and all plumbing fixtures, including kitchen and bathroom faucets and showers, will be specified as ultra-low flow. Appliances that conserve water will be chosen for the Project.

Energy Efficiency

The Project will implement commissioning activities, including verification of systems submittals, equipment testing, and reporting back to the owner. The design will be energy efficient, featuring a building envelope with high performance glazing, high wall and roof R-values, and reduced infiltration. Building mechanical equipment will include efficient heating and cooling systems, energy saving domestic hot water solutions and reduced lighting power density. Energy Star rated and/or energy-efficient appliances are being considered. The Project will consult with local utility programs to learn more about available energy-saving opportunities. The new building will be designed to be least 20% more efficient than the LEED energy baseline (ASHRAE 90.1-2010) by cost. Renewable energy strategies are being explored including photovoltaics. The Project's design will consider connections to demand response programs once available.

All building heating, ventilation, air conditioning, and refrigeration (HVAC&R) systems will be free from chlorofluorocarbons. Additionally, the Project intends to procure renewable energy certificates and carbon offsets to further mitigate the environmental impact of the building and support renewable energy production.

Materials and Resources

At least 75% of demolition and construction waste and at least four material streams will be recycled, with the potential for a higher landfill diversion rate due to the Project location and experience of the construction team.

As the design progresses, the available solutions will be analyzed to fulfill the USGBC's requirements for Building Product Disclosure and Optimization, including sourcing of raw materials, environmental product declarations and material ingredients. The Project will consider LEED v4.1 credit substitutions where appropriate.

The Project will include dedicated areas to collect single-stream recycling items (including glass, plastic, metal/cans, paper, and cardboard), consistent with the City of Boston requirements. Additional waste management options will be provided for safe collection and disposal of batteries, mercury-containing lamps and electronic waste.

Indoor Environmental Quality

The Project will emphasize the selection of systems and material solutions that will provide superior indoor air quality for building occupants. To promote sustainability and energy efficiency, the Project will be mechanically ventilated and may meet the comfort requirements of 30% more fresh air than required by ASHRAE 62.1-2010 standards, which specify minimum ventilation rates and other measures intended to provide indoor air quality that is acceptable to human occupants and that minimizes adverse health effects. The ventilation strategy may consider demand controlled ventilation or dedicated outdoor air systems. Enhanced indoor quality strategies will include an entryway system, interior cross-contamination prevention, advanced filtration and/or carbon dioxide monitoring.

The finishes selection will include only zero and low volatile organic compound (VOC) products, including paints, coatings, adhesives, and sealants. Any selected flooring materials, including hardwood, laminate, and carpet will be non/low-emitting and tested or certified to the appropriate LEED-accepted standards. Finish cabinetry and millwork will not contain added urea formaldehyde and will be tested to ensure ultra-low formaldehyde emissions. Ceilings, walls thermal and acoustic insulation will be tested to comply with appropriate LEED emissions standards.

The general contractor will be required to implement an Indoor Air Quality Management Plan, including strategies such as protection of absorptive materials from moisture, appropriate storage of materials, good practices for construction scheduling, verification of selected finish materials, prevention of moisture/condensation and mold, elimination of dust from construction activities, and proper handling of any required HVAC equipment/ductwork. All proposed materials and finishes will be presented for verification and acceptance to the sustainability consultant to ensure compliance with LEED-requirements.

Upon the completion of construction, air quality testing may be conducted. Smoking will be prohibited during construction and post occupancy. To minimize and control the entry of pollutants into buildings and subsequent cross-contamination of regularly occupied areas, the buildings will feature walk off mats, local exhaust systems and self-closing doors where required. The Project will prohibit smoking in public spaces and residential units.

The building will feature windows designed for daylighting and views. Glare and excess heat gain will be controlled by use of external shading devices or architectural design. Appropriate, high performance glazing will be selected to maximize light, reduce heat gain and glare and provide unobstructed views. Daylight contributes to increased productivity and comfort, and reduces lighting and HVAC electricity use. The smart building design will allow for controllability of lighting and temperature, allowing building occupants to make adjustments suiting their needs.

Innovation in Design and Regional Priority

The Project may implement a number of Innovation in Design strategies including an Occupant Education Campaign, green cleaning, low Mercury lighting and/or potentially a few pilot credits, such as enhanced acoustical performance, green training for contractors, social equity within design and construction team. Numerous Exemplary Performance and Regional Priority credits are currently being researched and considered.

4.3 Climate Change Resilience

4.3.1 Introduction

Climate change conditions considered by the Project team and reviewed below include higher maximum and mean temperatures, more frequent and longer extreme heat events, more frequent and longer droughts and more severe rainfall events. Copies of the completed Climate Change Questionnaire is included in Appendix D. Preliminary energy model results are included in Appendix E.

4.3.2 Extreme Heat Events

According to "Climate Ready Boston," the City of Boston can expect that the number of days with temperatures greater than 90°F will increase. Between 1971 and 2000, Boston experienced an average of eleven days per year over 90 degrees and may experience between 25 and 90 days annually by 2070, depending on the extent of greenhouse gas emissions over the next several decades.[1] The Project design incorporates measures to minimize the impact of high temperature events, including:

- Inclusion of materials to minimize the heat island effect, including green roofs;

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

- New landscaping to provide shade;
- High efficiency building envelopes; and
- High performance HVAC equipment.

The Proponent continues to evaluate a additional measures, including Passive House design elements, that would help the building use less energy and maintain comfortable internal temperatures longer.

4.3.3 Rain Events

Because of climate change, New England is expected to experience an increased frequency of intense storms that generate significant volumes of precipitation. Such precipitation events have the potential to overwhelm existing stormwater infrastructure capacity and may result in inland flooding with the potential to damage buildings. Improper conveyance of stormwater during precipitation events may also cause overflows of combined sewer systems that allow wastewater from buildings connected to the combined sewer to discharge to local waterways, or that surcharge the system and cause overflow at other locations.

To mitigate the effects of extreme precipitation events, the Project's stormwater management system will be designed to reduce the existing peak rates and volumes of stormwater runoff from the Project site, which is currently mostly impervious, and promote groundwater recharge to the greatest extent practicable. The Project will strive to infiltrate at least 1.25 inches of stormwater runoff for the 24-hour storm event.

4.3.4 Drought Conditions

Under the high emissions scenario evaluated by Climate Ready Boston, the occurrence of droughts lasting one to three months could increase by as much as 75% over existing conditions by the end of the century. The Project will approach potential drought impacts by reducing the amount of water used both within the building and across the Project site for irrigation. To minimize the Project's susceptibility to drought conditions the landscape design is anticipated to incorporate native and adaptive plant materials. The Project will include low-flow fixtures and water conserving appliances to the extent feasible to minimize the amount of water used by the building's occupants.

4.4 Renewable Energy

The Proponent will evaluate the potential for a roof-mounted solar photovoltaic (PV) system, and the availability of grants and renewables funding. The design team has preliminarily set aside approximately 1,000 sf of roof area for a solar PV array; most of the other rooftop area will be devoted to mechanical equipment and a rooftop terrace. Assuming 12 watts per square foot, this allows for an approximately 11 kW array. In the location proposed, an installation of this solar array equals an annual generation of approximately 14.3 MW hours. The feasibility of installing a solar PV system will depend on the incentives at the time of construction.

Chapter 5.0

Urban Design

5.0 URBAN DESIGN

5.1 Neighborhood and Site Context

The Project site is located on Washington Street close to the intersection with Green Street and a few blocks from the MBTA Green Street station which services the Orange Line. The mixed-uses include businesses, health services, retail and residences which create a dynamic experience along Washington Street. The street has a lively visual presence with new and existing businesses co-existing with the residential buildings. English High School on the west side has a prominent presence, with its building, parking fields and courts. This active pedestrian experience continues along Green Street to the MBTA Orange Line Station at Amory Street.

The Project site is primarily surrounded by commercial and industrial uses to the north, south and west. However, there are several similarly scaled residential projects that have recently been constructed or approved by the BPDA. To the east is a wooded area along a steep grade with residential uses beyond.

The Project site is located within the Green Street section of the PLAN: JP/ROX. The community priorities identified in this Plan include housing affordability as well as diversity and retention of existing jobs and businesses that comprise the neighborhood's local economy. There is also interest in a mix of commercial and residential uses, greater density along commercial corridors such as the Washington/Green Street area, support for community events and an enhanced pedestrian experience. See Section 1.2.2 for more information about the Project's consistency with PLAN: JP/ROX.

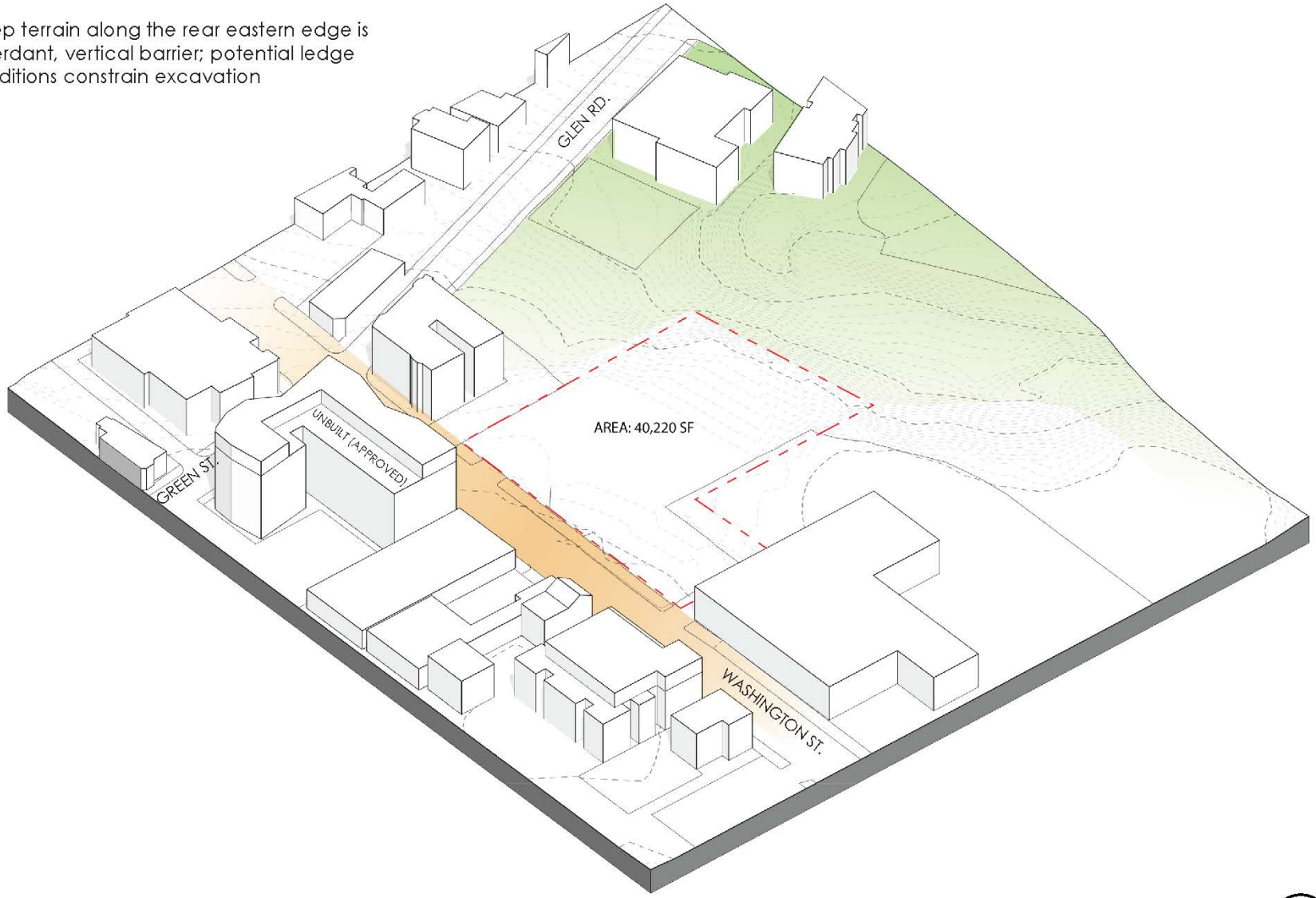
5.2 Building Scale

The design principles that inform the building mass include: breaking up the mass at the street edge, integrating into adjacent urban context, providing open/public landscaped areas, and working with the existing site topography.

The core design element is a south facing courtyard at the second floor located in the center of the site and surrounded on three sides by the building, which will provide natural light within the depth of the building and into the residential units wrapping around this open space. The massing strategy of the upper levels are further manipulated to break up the mass and create a streetscape of smaller volumes. See Figures 5-1 to 5-5 for the Project's massing strategy. The stepped façade along Washington Street and sculpting of the building form at the rear and at the courtyard further reduce the mass. An entrance zone step back at the first floor creates relief along the street edge, and the transparent façade of this level of the building will activate the street level and connect the entrance zone to interior activities. A community room at the northwest corner further provides connectivity for the public and neighbors. Finally, a planted roof at the second floor and an outdoor terrace at the sixth floor soften the building edge on Washington Street.

SITE BOUNDARIES & CONSTRAINTS

- Site frontage along Washington Street
- Steep terrain along the rear eastern edge is a verdant, vertical barrier; potential ledge conditions constrain excavation



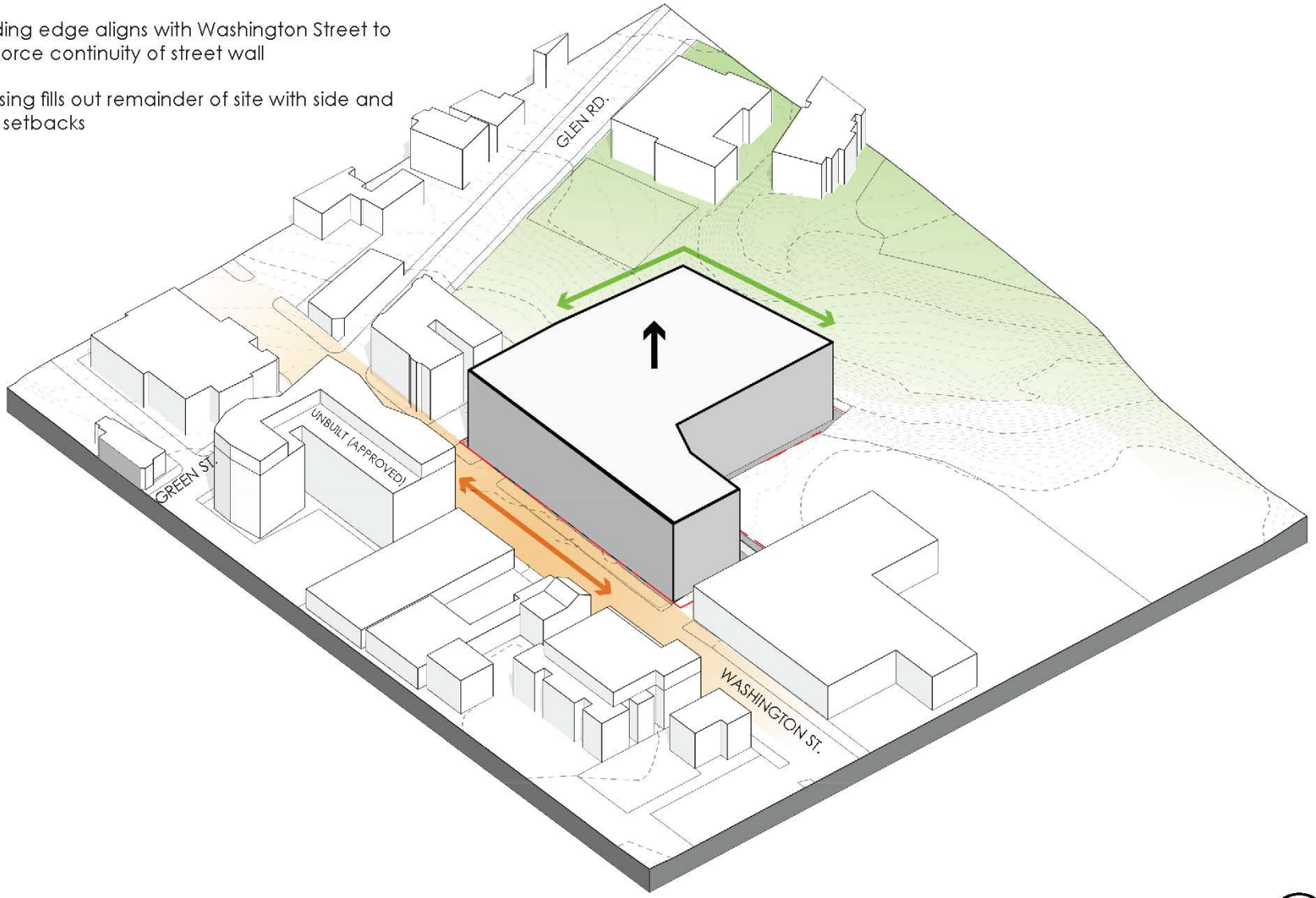
3368 Washington Street Boston, Massachusetts

RODE

Figure 5-1
Massing Step 1

SITE MASSING

- JP/Rox density bonus: 6 stories/ 65 FT
- Building edge aligns with Washington Street to reinforce continuity of street wall
- Massing fills out remainder of site with side and rear setbacks



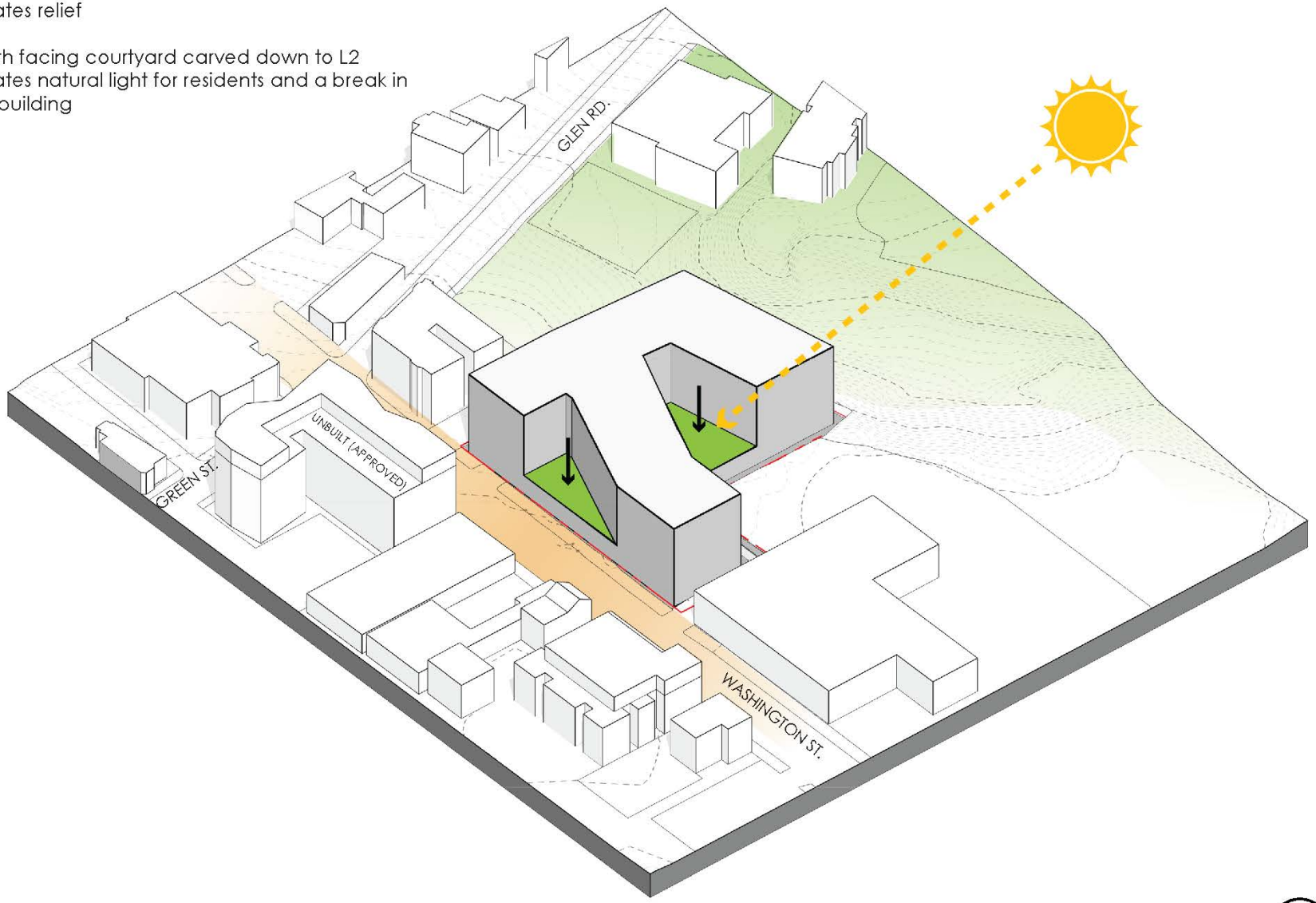
3368 Washington Street Boston, Massachusetts

RODE

Figure 5-2
Massing Step 2

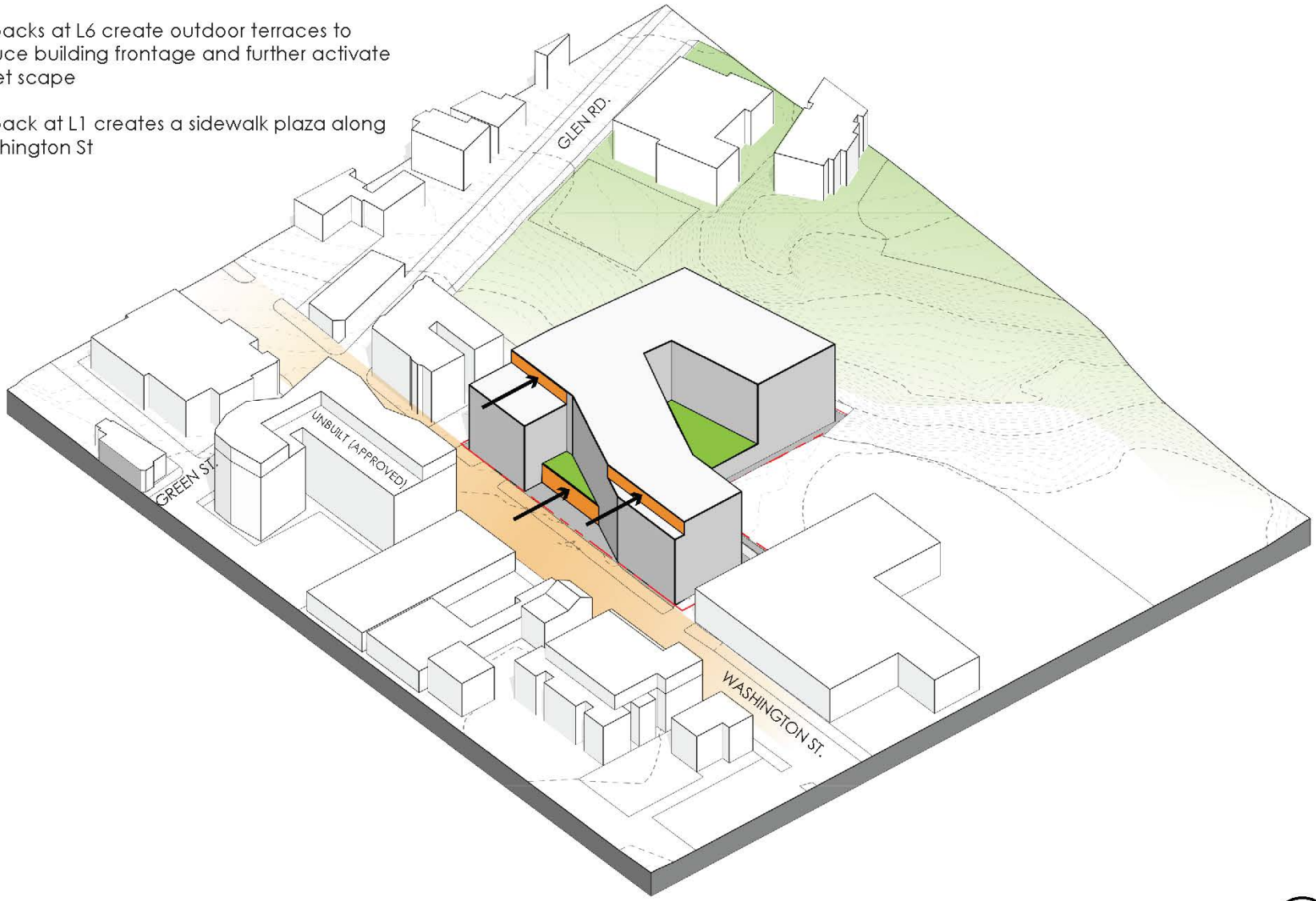
COURTYARDS & SOLAR ORIENTATION

- Exterior facing courtyard at Washington St creates relief
- South facing courtyard carved down to L2 creates natural light for residents and a break in the building



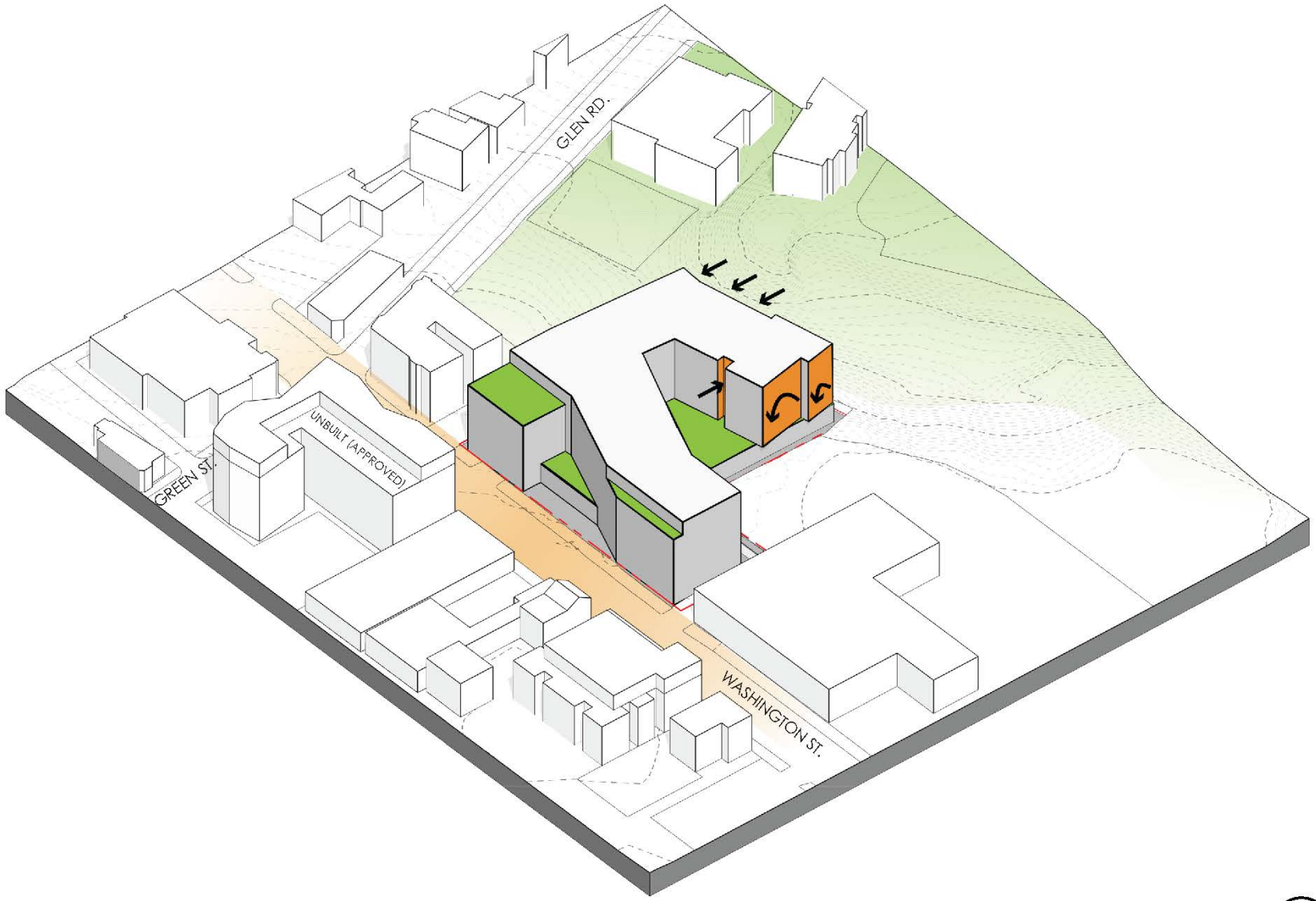
STREET ALIGNMENT & STREET SCAPE

- Building setbacks per intent of JP/Rox Plan
- Setbacks at L6 create outdoor terraces to reduce building frontage and further activate street scape
- Setback at L1 creates a sidewalk plaza along Washington St



SCULPTING SUPPORTIVE HOUSING UNITS

- Sculpting provides open corridor to bring in light



3368 Washington Street Boston, Massachusetts

RODE

Figure 5-5
Massing Step 5

PLAN: JP/ROX allows for a density bonus for a six-story building up to 65 feet in height and requires step-backs of five feet average depth for 80% of the façade at the fifth and sixth floors. The Project is generally consistent with these targets; although slightly taller than 65 feet, the step backs proposed are greater (13 feet average for 80% of the front façade) than stipulated by the Plan.

5.3 Architectural Program / Site Access

The building has two different tenant groups – those occupying the service-enriched Supportive Housing units, and those occupying the low- and moderate-income units. There are also management offices, supportive services and a large maintenance shop/warehouse on the first floor. Each residential component of the Project has its own entry, vertical access, lobby, amenity spaces, parking, and open space (see Figure 1-10 for a site plan and Appendix B for floor plans). This separation of spaces as described is based on extensive case study research and program development, and is required to provide adequate intensive case management services to the Supportive Housing tenants. However, there is a dedicated effort to design the spaces for both user groups in an equitable and non-hierarchical manner.

The two entrances are similar in character to each other, with any minor differences a product of the design aesthetics of the Project. The Supportive Housing lobby also provides access to the supportive services. The main entries and lobbies are located off the entrance plaza at the Washington Street edge of the site, and visually act as an organizing program element that activates the street. The entrance plaza at the first floor enhances connectivity with passers-by and pedestrians, creating an active and vibrant street edge and sidewalk. Open space recreational areas at the upper levels improve the quality of life for the residents. The open space for the Supportive Housing tenants is located in a second-floor courtyard, while the low- and moderate-income residents will have access to an outdoor terrace at the sixth floor.

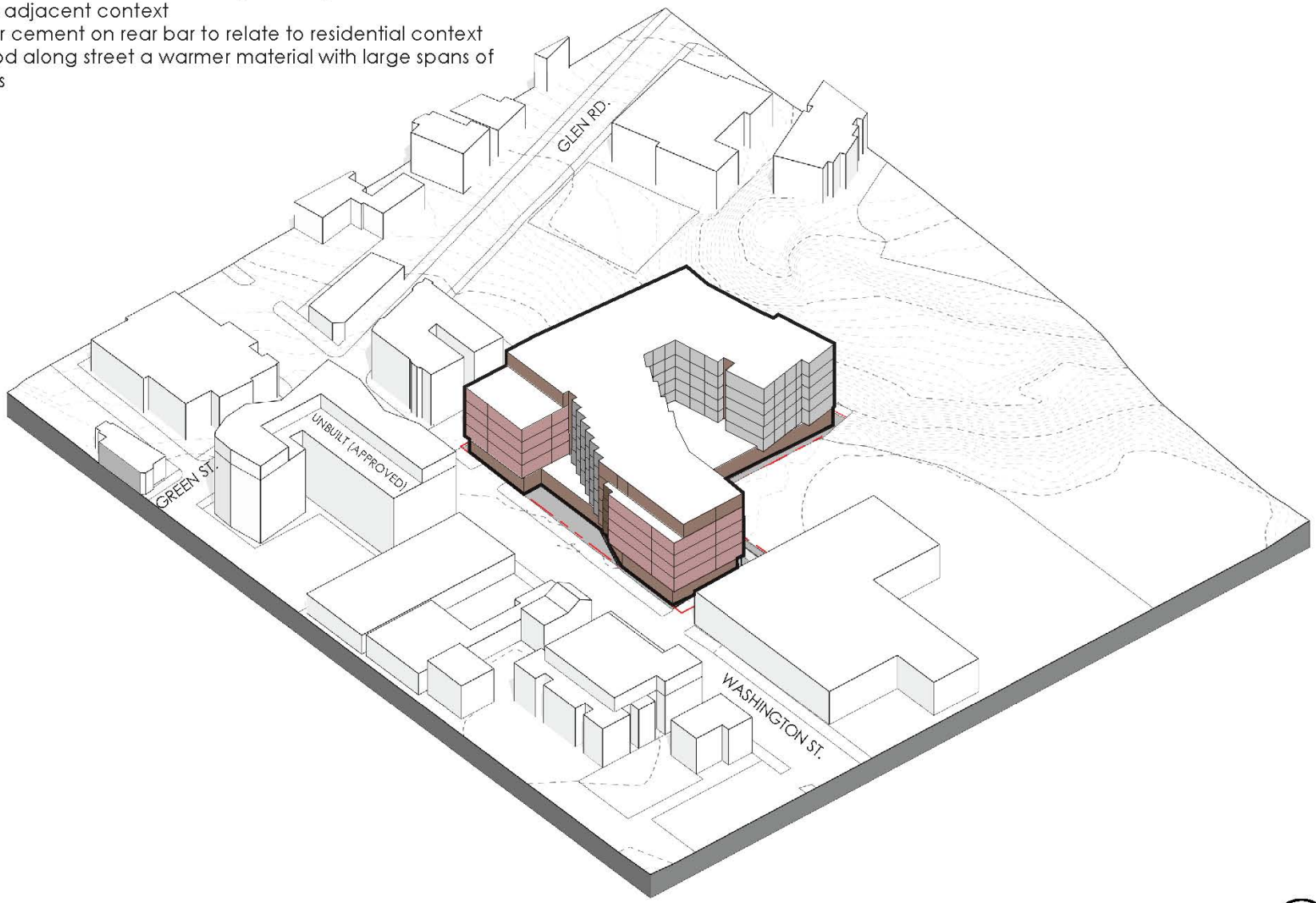
The parking garage is split between the first floor and basement levels, accommodating a total of 58 spaces. The existing topography and the bedrock and ledge at the rear of the site restrict the size of the basement as well as site access. As a result, a small number of parking spaces and a portion of the functions associated with loading, trash and back of house access are at the first floor, which results in additional height to accommodate a 30’ box truck and provide adequate turning radii. From a design standpoint, separating the parking into two levels provides more dynamic functions at the first floor and limits the quantity of parking at the street edge.

5.4 Exterior Materials

The building is designed to function cohesively in the interior, but the mass is broken down and a diverse palette of materials, windows, projecting bays and other elements that create a visually interesting residential streetscape responsive to the adjacent visual context. See Figures 5-6 for the preliminarily proposed façade breakdown of the Project and Figures 5-7 to 5-11 for design perspectives.

FACADE BREAKDOWN

- Brick veneer on volumes along Washington Street to blend with adjacent context
- Fiber cement on rear bar to relate to residential context
- Wood along street a warmer material with large spans of glass



3368 Washington Street Boston, Massachusetts

RODE

Figure 5-6
Façade Breakdown

3368 Washington Street Boston, Massachusetts

RODE

Figure 5-7
Birds Eye View – Washington Street

3368 Washington Street Boston, Massachusetts

RODE

Figure 5-8
Birds Eye View – Rear of Building

3368 Washington Street Boston, Massachusetts

RODE

Figure 5-9
Building Entries Perspective

3368 Washington Street Boston, Massachusetts

RODE

Figure 5-10
Washington Street/Green Street Perspective

3368 Washington Street Boston, Massachusetts

RODE

Figure 5-11
Washington Street Facing North

The selected materials for the exterior of the building are intended to celebrate the history and context of the site. A core element of the design is to provide large windows to create a sense of spaciousness within the smaller units in the building and to fit within the neighborhood. The large windows are broken down to a residential scale, further creating a visually interesting facade. The building was conceptualized as a response to the diverse materials that already exist in the neighborhood, while maintaining a quality and durability appropriate for a mid-rise building. The base of the building is proposed to be transparent, with a stone or precast component that meets the sidewalk. The upper levels of the building are proposed to be a dynamic mix of high-density fiber cement, brick veneer panels with metal and composite wood accents. The overall appearance aims to create transparency and variety, while simultaneously creating a unified and cohesive presence for the building.

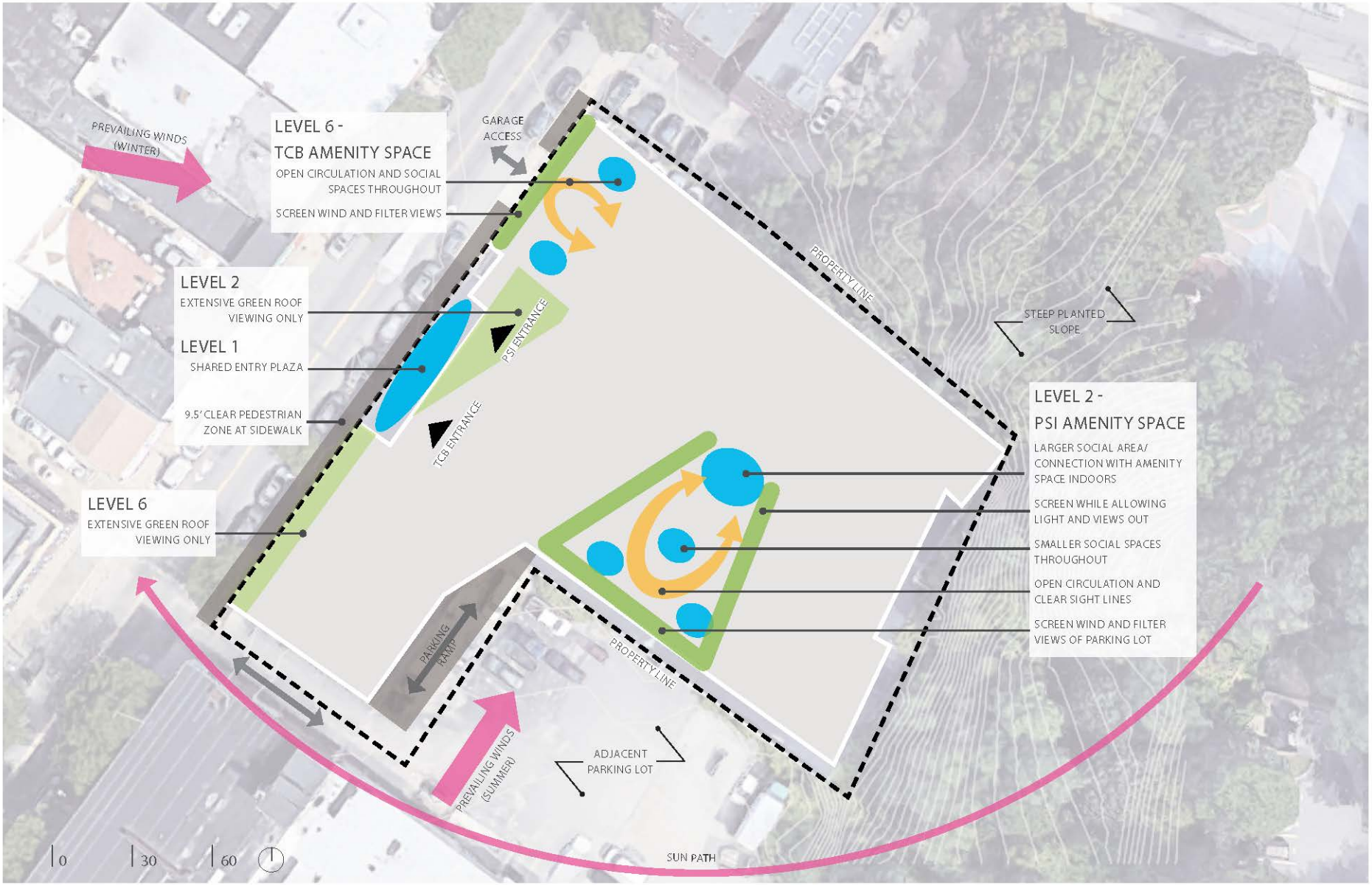
5.5 Landscape Strategy

The Project site has a significant grade change from the frontage on Washington Street to the southeast towards Forest Hills Street. The steep, vegetated landscape is common along the north/south swath of puddingstone outcrop in Jamaica Plain between Washington Street and streets to the east. The proposed building will anchor into the hillside maximizing the use of the buildable land area for the proposed program and mitigating the scale of the Project within the urban context. The north and eastern sides of the building will be embedded in the adjacent wooded space. The landscape design focuses on the streetscape along Washington Street, in the building courtyard towards the south and on the sixth-floor terrace facing west. The concept is to bring the wooded context in to the building courtyards and through to an urban context along the street. See Figure 5-12 for the landscape concept plan.

The landscape will improve the public experience along Washington Street with increased sidewalk width, canopy street trees and an expanded public realm at the building entry plaza. In compliance with Complete Streets and PLAN: JP/ROX, the depth of plaza has been studied to provide space for circulation at the entries, movement along the sidewalk and an amenity space for residents and staff with perennials and shrubs in raised planters with fixed seating. This dimensional relief along the street is countered by the amenity space across Washington Street at Turtle Swamp Brewing allowing for a more dynamic and inviting pedestrian experience in the frontage zone. See Figures 5-13 and 5-14 for landscape design precedents.

5.6 Landscape Design

In compliance with Complete Streets and PLAN: JP/ROX, the street front condition has a 9.5-foot pedestrian zone along the building face with a 3.5-foot greenscape/planting zone with street trees. The building steps back an additional 15 feet at the entries to break up the taller building faces at the street while creating a small plaza. The plaza combines the public realm with resident/staff amenities through the use of raised planters and fixed seating along the building face. These elements are visible and inviting from street level, yet feel that they are part of the interior program spaces.



3368 Washington Street Boston, Massachusetts

studio 2112
LANDSCAPE ARCHITECTURE

Figure 5-12
Landscape Concept Plan

3368 Washington Street Boston, Massachusetts

studio 2112
LANDSCAPE ARCHITECTURE

Figure 5-13
Landscape Precedents

3368 Washington Street Boston, Massachusetts

studio 2112
LANDSCAPE ARCHITECTURE

Figure 5-14
Landscape Precedents

The landscape amenity spaces at the upper building levels support the goals of the Proponent by providing an oasis in an urban context. The second level courtyard is designated for the Supporting Housing residents. Through planting and seating, this space is designed for both private restoration and community gatherings in a garden setting. The existing parking lot to the southwest will be screened with plant material bringing the focus of the courtyard inward. Plants will be native and durable with year-round appeal as the courtyard will be viewed from resident rooms above.

The sixth-floor roof terrace designated for low- and moderate-income residents. This space has an open feel and expansive views over Washington Street. The planters and fixed seating is installed at this level offer an outdoor space for small groups or individual residents.

Extensive green roof vegetation on other building levels will assist in stormwater management, heat island reduction and beautification as they will be seen from upper floors. See Figure 5-15 for the landscape plan.

3368 Washington Street Boston, Massachusetts

studio 2112
LANDSCAPE ARCHITECTURE

Figure 5-15
Landscape Plan

Chapter 6.0

Historic and Archaeological Resources

6.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

6.1 Introduction

This section identifies the historic and archaeological resources in the vicinity of the Project site, and discusses potential Project-related impacts. The Project is not anticipated to impact historic resources in the surrounding area.

6.2 Historic Resources in the Project Vicinity

6.2.1 Historic Resources of the Project Site

No historic resources listed in the State and National Registers of Historic Places or included in the Inventory of Historic and Archaeological Assets of the Commonwealth are within the Project site.

6.2.2 Historic Resources in the Vicinity of the Project Site

One historic district, Summer Hill Historic District, is located approximately one-quarter mile to the west of the Project site and is listed in the State and National Registers of Historic Places (see Figure 6-1). Summer Hill Historic District is roughly bounded by Seavern Avenue, Everett Street, Carolina Avenue, and Newbern Street. No other historic districts or properties listed in the State and National Register are located within one-quarter mile of the Project site.

6.3 Archaeological Resources Within the Project Site

A review of Massachusetts Historical Commission's online archaeological base maps was conducted on May 3, 2019. It found no known archeological sites within the Project site or the immediate vicinity. No impacts to archaeological resources are expected.

6.4 Impacts to Historic Resources

6.4.1 Demolition of Existing Buildings

The proposed Project will require the demolition of the existing building at the Project site. The building is not listed and has not been found to be eligible for listing on the National Register of Historic Places. Additionally, the building has been modified by numerous additions and alterations. The Boston Landmarks Commission (BLC) will be afforded the opportunity to review the proposed demolition through the Article 85 Demolition Delay review process.

6.4.2 Urban Design

The Project site is located along Washington Street in the Jamaica Plain neighborhood of Boston. The surrounding area includes a mix of uses including businesses, health services, retail and residences that create a dynamic experience along Washington Street. The street has a lively visual presence with new and existing businesses co-existing with the residential buildings. The site is zoned as a Light Industrial district, but the adjoining areas along Washington Street are

seeing a shift to residential uses and several similarly scaled projects have recently been constructed or have received approvals and are in the pipeline. The building mass is broken down and a diverse palette of materials, windows, projecting bays and other elements will create a visually interesting residential streetscape responsive to the adjacent visual context.

The selected materials for the exterior of the building is intended to celebrate the history and context of the site. A core element of the design is to provide large windows to create a sense of spaciousness within the smaller units in the building and to fit within the neighborhood. The large windows are broken down to a residential scale, further creating a visually interesting facade. The building was conceptualized as a response to the diverse materials that exist in the adjoining context, while maintaining a quality and durability appropriate for a mid-rise size building. The overall appearance is to create transparency and variety while at the same time creating a unified and cohesive presence for the building.

6.4.3 Shadow Impacts to Historic Resources

As described in greater detail in Section 3.2, shadow studies were conducted to investigate potential shadow impacts from the Project during three time periods (9:00 a.m., 12:00 noon, and 3:00 p.m.) during the vernal equinox (March 21), summer solstice (June 21), autumnal equinox (September 21), and winter solstice (December 21). In addition, shadow studies were conducted for the 6:00 p.m. time period during the summer solstice and autumnal equinox.

As illustrated in the shadow study diagrams (Figures 3-1 to 3-14), during isolated time periods the Project will cast minimal net new shadow primarily on areas north, west and east of the Project site. During the periods studied, there were no shadow impacts to any of the historic buildings within the Summer Hill Historic District.

6.4.4 Wind Impacts to Historic Resources

The proposed Project is approximately six stories tall and is surrounded by varied terrain and buildings that are anticipated to minimize the Project's impact on pedestrian-level winds. It is not anticipated that the Project will impact wind conditions near historic resources in the vicinity of the Project area.

6.5 Consistency with Other Historic Reviews

6.5.1 Boston Landmarks Commission Article 80 Review

The submission of this PNF initiates review of the Project by the BLC under the City's Article 80 Review process.

6.5.2 Boston Landmarks Commission Article 85 Review

The proposed demolition of the existing building on the Project site will be subject to review by the BLC Article 85 of the Boston Zoning Code. An Article 85 Application for the property will be submitted to the BLC.

6.5.3 Massachusetts Historical Commission

The Massachusetts Historical Commission (MHC) has review authority over projects requiring state funding, licensing, permitting and/or approvals that may have direct or indirect impacts to properties listed in the State Register of Historic Places. Since the Project will utilize state funding, the Project will be subject to review by the MHC in compliance with its State Register Review (Chapter 254) regulations. MHC review will be initiated with the filing of a MHC Project Notification Form. If federal permits, licenses or approvals are required, the Project would be subject to Section 106 of the National Historic Preservation Act.

Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

3368 Washington Street Boston, Massachusetts

Epsilon Associates Inc.

Figure 6-1
Historic Resources

Chapter 7.0

Infrastructure

7.0 INFRASTRUCTURE

7.1 Introduction

This Chapter outlines the existing utilities surrounding the Project site, the connections required to provide service to the Project, and any impacts on the existing utility systems that may result from the construction of the Project. The following utility systems are discussed herein:

- Sewer;
- Domestic water;
- Fire protection; and
- Drainage.

7.2 Wastewater

7.2.1 Sewer Infrastructure

There is an existing Boston Water and Sewer Commission (BWSC) dedicated sewer main located in Washington Street. The main is a 15-inch line which flows in a northerly direction before joining a 36-inch by 38-inch sewer main in Green Street.

The existing sewer system is illustrated in Figure 7-1.

7.2.2 Wastewater Generation

The Project's sewage generation rates were estimated using the Massachusetts Department of Environmental Protection 310 CMR 15.00 values for the existing and proposed building program (which are provided in detail in Section 1.2). 310 CMR 15.00 lists typical sewage generation values for the existing and proposed building uses, as shown in Table 7-1. Typical generation values are conservative values for estimating the sewage flows from new construction.

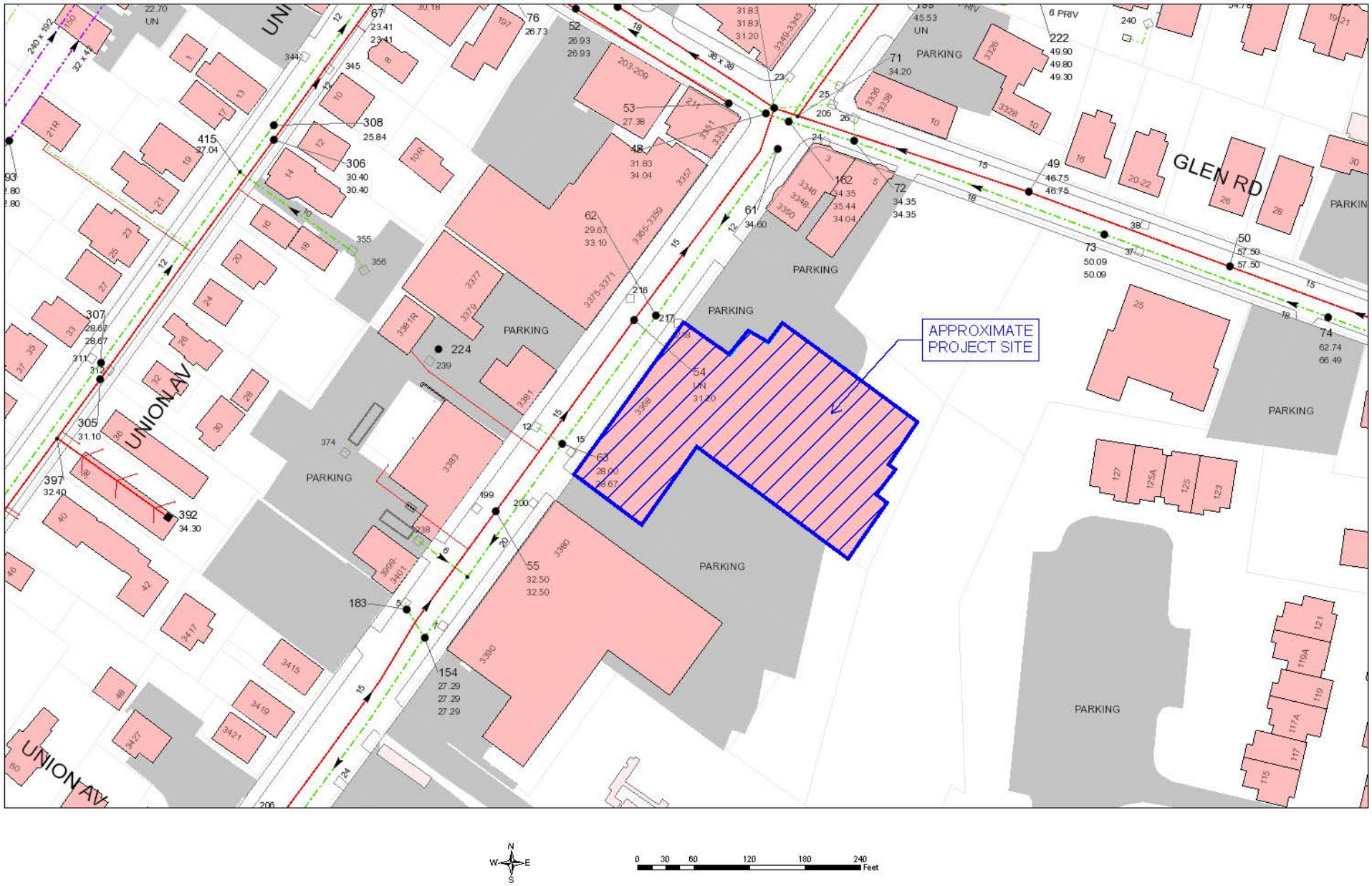


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Figure 7-1
Existing Sewer System

Table 7-1 Proposed Project Wastewater Generation

Use	Size/Unit	310 CMR Value (gpd/unit)	Total Flow (gpd)
Existing Building Program (using average 310 CMR values)			
Warehouse	10 people	15/person	150
		Total Existing Sewer Flows	**150**
Proposed Residential Building (using average 310 CMR values)			
Office Space	12,890 square feet	75/1,000 SF	967
Total Bedrooms	248 Bedrooms	110/bedroom	27,280
		Total Proposed Sewer Flows	**28,247**

Increase in Sewer Flows (gpd):	**28,097**

7.2.3 Sewage Capacity and Impacts

The Project's impact on the existing BWSC systems in Washington Street was analyzed. The existing sewer system capacity calculations are presented in Table 7-2.

Table 7-2 Sewer Hydraulic Capacity Analysis

Manhole (BWSC Number)	Distance (feet)	Invert Elevation (up)	Invert Elevation (down)	Slope (%)	Dia. (in)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
Washington Street								
55 to 54	196	32.50	31.20	0.7%	15	0.013	2.65	1.71
						Minimum Flow Analyzed:	2.65	1.71

Note:
1. Manhole numbers taken from BWSC Sewer system GIS Map received on April 5, 2019. Elevations refer to Boston City Base.
2. Flow Calculations based on Manning Equation

Table 7-2 indicates that the minimum hydraulic capacity of the existing 15-inch sewer main in Washington Street is 1.71 million gallons per day (MGD) or 2.65 cubic feet per second (CFS).

Based on an average daily flow estimate for the Project of 28,247 GPD or 0.028 MGD (an increase of 28,097 GPD or 0.028 MGD from the existing building), and with a factor of safety estimate of 10 (total estimate = 0.028 MGD x 10 = 0.031 MGD), no capacity problems are expected within the BWSC sewer system in Washington Street.

7.2.4 Proposed Conditions

Sewer services for the existing building will be cut and capped at the main. New sewer services resulting from the Project will connect to the existing sanitary sewer main in Washington Street. Improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's Site Plan Review process for the Project. This process will include a comprehensive design review of the existing and proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts.

7.3 Water Supply

7.3.1 Water Infrastructure

Water for the Project site will be provided by the BWSC. There are five water systems within the City, and these provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high.

There is an existing 12-inch cement lined ductile iron southern high BWSC water main in Washington Street. The existing water system is illustrated in Figure 7-2.

7.3.2 Water Consumption

The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described above. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 15.00 values to account for consumption, system losses and other usages to estimate an average daily water demand. The Project's estimated domestic water demand is 31,072 gpd. The water for the Project will be supplied by the BWSC system in Washington Street.

The existing building at the Project site has one existing BWSC water account. The historical water use for the service to the existing building is estimated to be between 171 gpd and 245 gpd. This estimate is based on the water meter billing history provided by BWSC for the existing account (Account #424787000) from April 2019 to May 2018, as summarized in Table 7-3.

Table 7-3 Existing Building Water Use

	Time Period	Water Use (cubic feet - cf)	Total Days Metered	Water Use (cf/day)	Water Use (gpd)
Minimum Water Use Recorded	January 2018	708	31	22.8	171
Maximum Water Use Recorded	August 2018	1014	31	32.7	245
Average Water Use for 2018	2018	10,410	365	28.5	213

Note: Billing History for Account #42478000 provided by BWSC record invoices

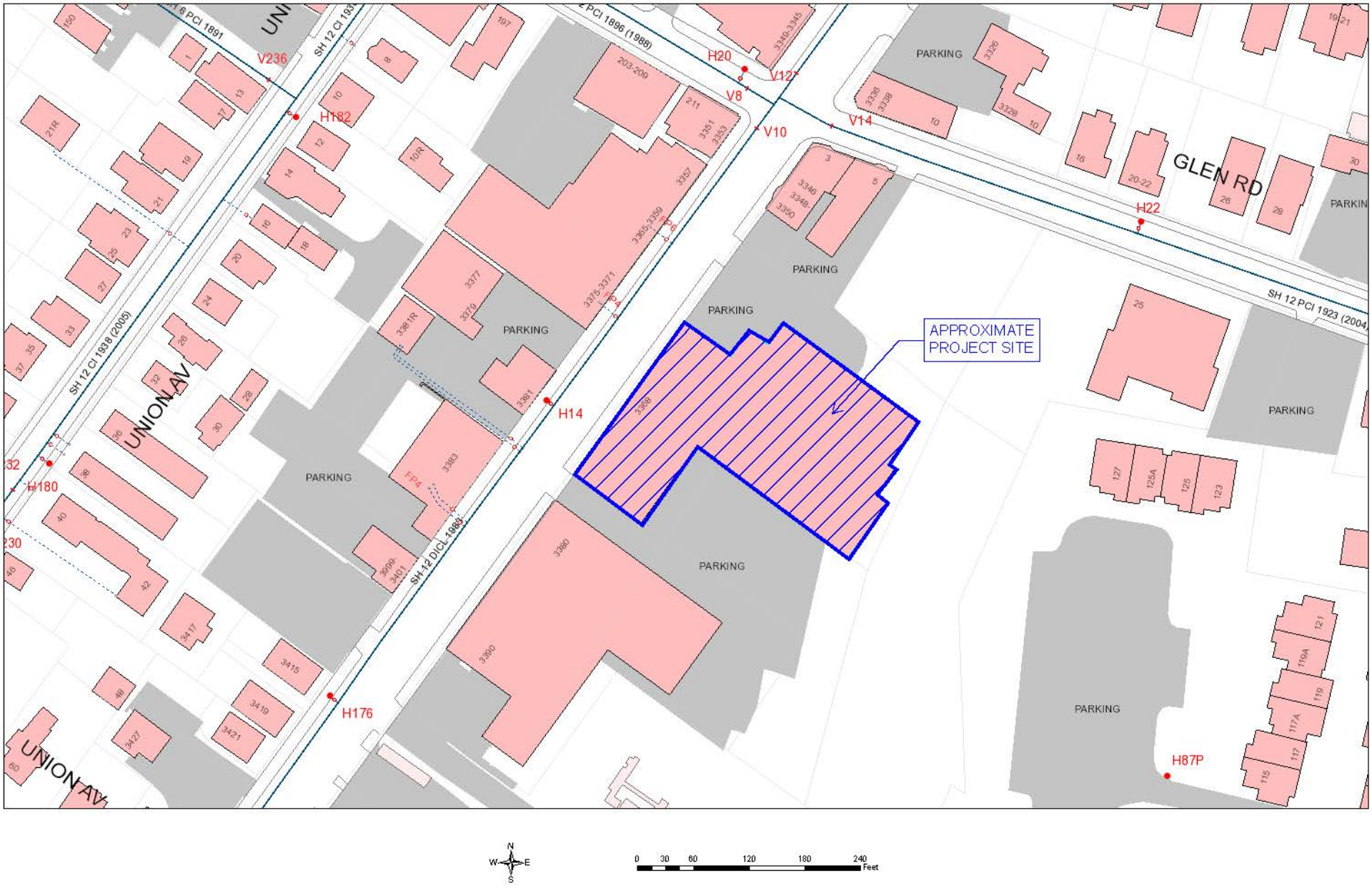

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Figure 7-2
Existing Water System

7.3.3 Existing Water Capacity and Impacts

BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the Project site was requested by the Proponent. Hydrant flow data was available for one hydrant near the Project site, as shown in Table 7-4.

Table 7-4 Existing Hydrant Flow Data

Flow Hydrant Number	Date of Test	Static Pressure (psi)	Residual Pressure (psi)	Total Flow (gpm)
H12 (Washington St)	11/27/2016	91	89	2,004

Note: Data provided by BWSC on February 20, 2019.

Water capacity problems are not anticipated within this system as a result of the Project's construction.

7.3.4 Proposed Conditions

New water services will connect to the existing BWSC water main in Washington Street and be installed in accordance with the latest local, state, and federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC's Automatic Meter Reading (AMR) system. The proposed Project's impacts to the existing water system will be reviewed as part of the BWSC's Site Plan Review process. This review will include sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and siamese connections that conform to BWSC and Boston Fire Department requirements.

The Project design will include fixtures that will conserve water. Aeration fixtures and appliances will be chosen for water conservation qualities. In public areas, sensor operated faucets and toilets will be installed.

7.4 Storm Drainage System

7.4.1 Existing Storm Drainage System

There is an existing 12-inch BWSC storm drain main that flows southwest in Washington Street adjacent to the Project site. In front of the Project site there is a manhole which at this point it transitions to a 20-inch drain line. The existing BWSC storm drain system is illustrated in Figure 7-1.

Stormwater at the site currently travels over land towards Washington Street where it is captured by the existing closed drainage system via catch basins in Washington Street.

7.4.2 Proposed Conditions

The Project site is comprised of one existing building and is nearly entirely impervious. The Project will meet or reduce the existing peak rates of stormwater discharge and volumes of stormwater runoff from the site. The Project will strive to infiltrate 1.25 inches of stormwater runoff from impervious areas into the ground to the greatest extent possible. Different approaches to stormwater recharge will be assessed. It is anticipated that the stormwater recharge systems will work to passively infiltrate runoff into the ground with a gravity recharge system or a combination of storage tanks in the building and pumps. The underground recharge system, and any required site closed drainage systems, will be designed so that there will be no increase in the peak rate of stormwater discharge from the Project site in the developed condition compared to the existing condition.

Improvements and connections to BWSC infrastructure will be reviewed as part of the BWSC's Site Plan Review process. The process will include a comprehensive design review of the proposed service connections and assessment of Project demands and system capacity.

7.4.3 Water Quality Impact

The Project will not affect the water quality of nearby water bodies. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales and/or crushed stone to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable Massachusetts Water Resources Authority (MWRA) and BWSC discharge permits. Once construction is complete, the Project will be in compliance with local and state stormwater management policies, as described below.

The BPDA also oversees the Smart Utilities Policy for Article 80 Development Review. Since the Project is above the threshold criteria of having at or above 100,000 sf of floor area, it is recommended that the Project retain, on site, a volume of runoff equal to 1.25 inches of rainfall across the portion of impervious area on site using Green Infrastructure. As mentioned above, the Project strive to infiltrate 1.25 inches of stormwater runoff from impervious areas into the ground to the greatest extent possible. The Smart Utilities Checklist is included as Appendix F.

The Project will result in no negative impact on groundwater levels within the lot in question or adjacent lots, subject to the terms of any (i) dewatering permit or (ii) cooperation agreement entered into by the Proponent and the BPDA, to the extent that such agreement provides standards for groundwater protection during construction.

7.4.4 MassDEP Stormwater Management Policy Standards

In March 1997, MassDEP adopted a Stormwater Management Policy to address non-point source pollution, and later that year MassDEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy, which was revised in February 2008. The Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40.

A brief explanation of each Policy Standard and the system compliance is provided below:

Standard #1: No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Compliance: The Project will comply with this Standard. The design will incorporate the appropriate stormwater treatment. No new untreated stormwater will be directly discharged to, nor will erosion be caused to, wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

Standard #2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR.

Compliance: The Project will comply with this Standard. The existing discharge rate will be met or decreased as a result of the improvements associated with the Project.

Standard #3: Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmental sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance: The Project will comply with this Standard to the maximum extent practicable.

Standard #4: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

a. *Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;*

b. *Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and*

c. *Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

Compliance: The Project will comply with this standard. Within the Project's limit of work, there will be mostly building roof, landscaped areas, and paved sidewalks. Runoff from paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded catch basins and conveyed through water quality units before discharging into the BWSC system.

Standard #5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Compliance: The Project will comply with this standard. The Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-6).

Standard #6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water

discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Compliance: The Project will comply with this Standard. The Project will not discharge untreated stormwater to a sensitive area or any other area.

Standard #7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Compliance: The proposed design will comply with this Standard. The Project complies with the Stormwater Management Standards as applicable to the redevelopment.

Standard #8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

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

Standard 9: A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance: The Project will comply with this Standard. An O&M Plan including long-term BMP operation requirements will be prepared for the Project and will assure proper maintenance and functioning of the stormwater management system.

Standard 10: All illicit discharges to the stormwater management system are prohibited.

Compliance: The Project will comply with this Standard. There will be no illicit connections associated with the Project.

7.5 Protection Proposed During Construction

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

The Proponent will continue to work and coordinate with the BWSC and the utility companies to ensure safe and coordinated utility operations in connection with the Project.

7.6 Conservation of Resources

The State Building Code requires the use of water-conserving fixtures. Water conservation measures such as low-flow toilets and restricted flow faucets will help reduce the domestic water demand on the existing distribution system. The installation of sensor-operated sinks with water conserving aerators and sensor-operated toilets in all non-residential restrooms will be incorporated into the design plans for the Project.

7.7 Groundwater Conservation Overlay District

The Project site does not fall within the City's defined Groundwater Conservation Overlay District. The proposed stormwater management system will be designed to comply with BWSC design requirements.

Chapter 8.0

Coordination with other Governmental Agencies

8.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

8.1 Architectural Access Board Requirements

The Project will comply with the requirements of the Massachusetts Architectural Access Board and will be designed to comply with the standards of the Americans with Disabilities Act. See Appendix G for the Accessibility Checklist.

8.2 Massachusetts Environmental Policy Act

The Proponent does not expect that the Project will require review by the Massachusetts Environmental Policy Act (MEPA) Office of the Massachusetts Executive Office of Energy and Environmental Affairs. The Project does not exceed any of the review thresholds for the filing of an Environmental Notification Form under MEPA.

8.3 Massachusetts Historical Commission

MHC has review authority over projects requiring state funding, licensing, permitting and/or approvals that may have direct or indirect impacts to properties listed in the State Register of Historic Places. Since the Project will utilize state funding, the Project will be subject to review by the MHC in compliance with its State Register Review (Chapter 254) regulations. MHC review will be initiated with the filing of a MHC Project Notification Form. If federal permits, licenses or approvals are required, the Project would be subject to Section 106 of the National Historic Preservation Act.

8.4 Boston Landmarks Commission (Article 85)

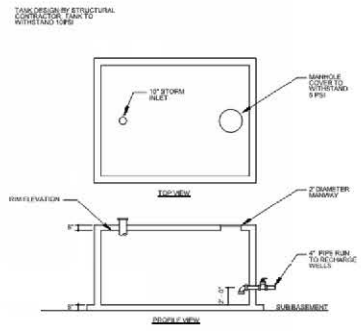
The proposed demolition of the existing building on the Project site will be subject to review by the BLC Article 85 of the Boston Zoning Code. An Article 85 Application for the property will be submitted to the BLC.

8.5 Boston Civic Design Commission

The Project will comply with the provisions of Article 28 of the Boston Zoning Code. This PNF will be submitted to the Boston Civic Design Commission by the BPDA as part of the Article 80 process.

Appendix A

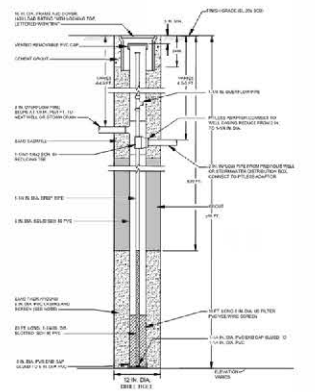
Site Survey



RAINWATER STORAGE TANK DETAIL

NOT TO SCALE

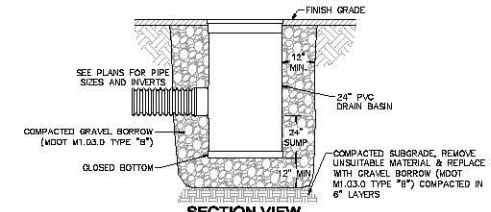
NOTE: SHOWN FOR COORDINATION ONLY. SEE PLUMBING PLANS.



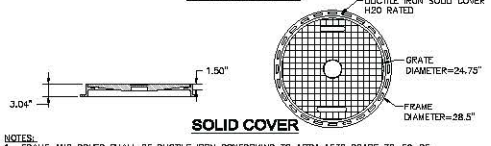
GROUNDWATER RECHARGE WELL DETAIL

NOT TO SCALE

NOTE: SHOWN FOR COORDINATION ONLY. GROUNDWATER RECHARGE WELL DESIGN BY THE GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER SHALL DETERMINE THE NUMBER OF ACTUAL WELLS FOR A 72 HOUR DRAW DOWN.



SECTION VIEW



SOLID COVER

NOTES:
1. FRAME AND COVER SHALL BE DUCTILE IRON CONFORMING TO ASTM A536 GRADE 70-50-05.
2. 24" ACCESS BASINS SHALL BE NYLOPLAST MODEL 2824 AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., OR APPROVED EQUAL.
3. ACCESS BASINS SHALL BE CUSTOM MANUFACTURED ACCORDING TO THE PLANS AND DETAIL.
4. CASTINGS SHALL BE FURNISHED WITH A BLACK PAINT.
5. SEE PLANS FOR LAYOUT AND ELEVATIONS OF DRAIN PIPES TO ACCESS BASINS.

24" ACCESS BASIN DETAIL

NOT TO SCALE

3368 Washington Street Boston, Massachusetts

Appendix B

Floor Plans and Elevations

3368 Washington Street Boston, Massachusetts

RODE

West Elevation

3368 Washington Street Boston, Massachusetts

RODE

North Elevation

3368 Washington Street Boston, Massachusetts

RODE

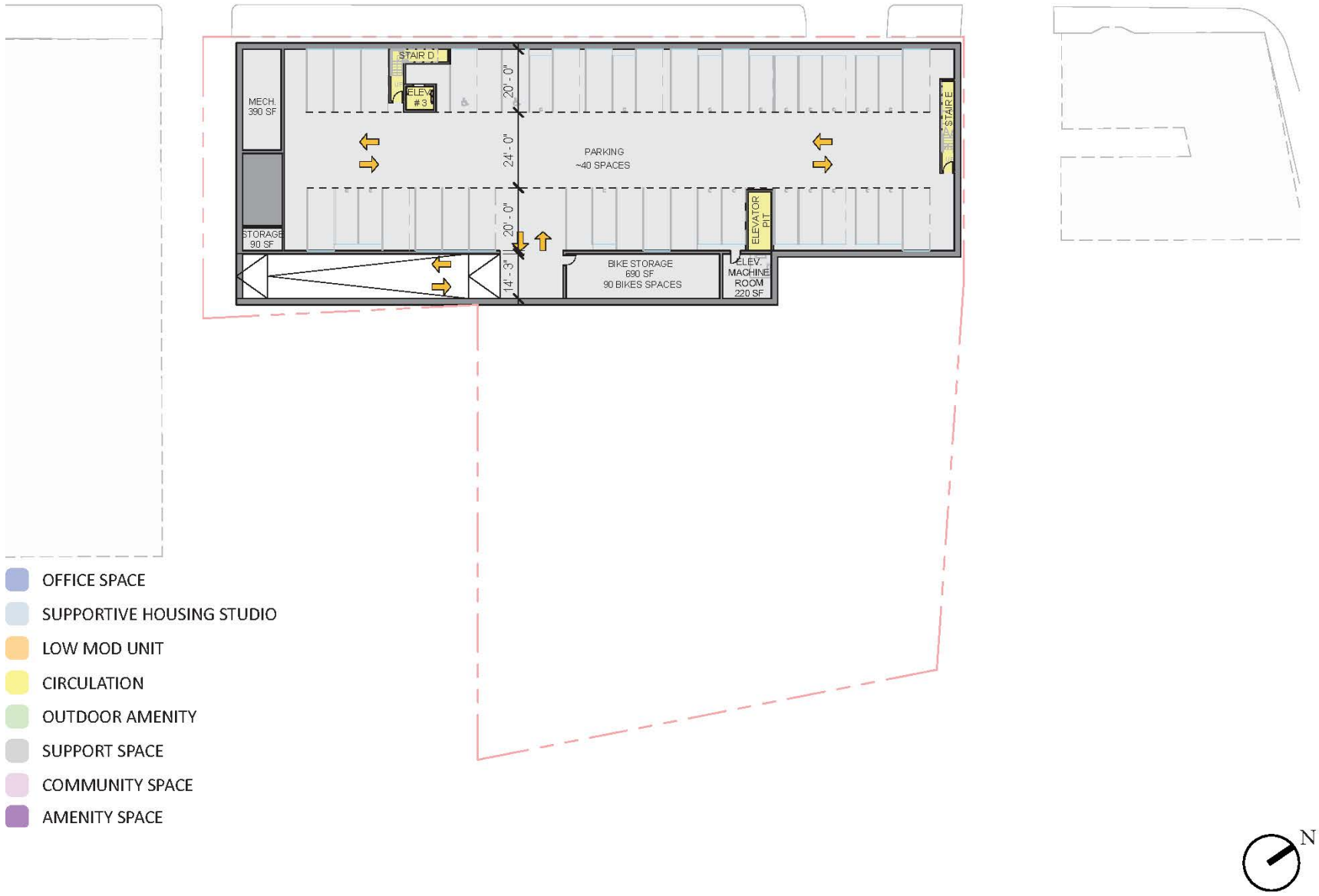
East Elevation

3368 Washington Street Boston, Massachusetts

RODE

South Elevation


MECHANICAL PENTHOUSE BEYOND
ROOF
69' - 11"
LEVEL 6
59' - 5"
LEVEL 5
48' - 0"
LEVEL 4
37' - 6"
LEVEL 3
27' - 0"
LEVEL 2
16' - 6"



3368 Washington Street Boston, Massachusetts

RODE

Basement Plan

3368 Washington Street Boston, Massachusetts

RODE

Site Plan

3368 Washington Street Boston, Massachusetts

RODE

Level 2 Plan

OFFICE SPACE

SUPPORTIVE HOUSING STUDIO

LOW MOD UNIT

CIRCULATION

OUTDOOR AMENITY

SUPPORT SPACE

COMMUNITY SPACE

AMENITY SPACE

* 10% ACCESSIBLE UNITS

** 2% HEARING IMPAIRED UNITS

3368 Washington Street   Boston, Massachusetts

RODE

Level 3 Plan


WASHINGTON STREET
2 BED**
2 BED
STAIR B
ELEV # 3
1 BED
AMENITY / SUPPORT 260 SF
3 BED *
STUDIO
STUDIO*
2 BED
STUDIO
1 BED
ELEV # 2
ELEV # 1
STAIR A
ELEC
TRASH
AMENITY / SUPPORT 360 SF
AMENITY/ SUPPORT 450 SF
W/D
STAIR C
OFFICE SPACE
SUPPORTIVE HOUSING STUDIO
LOW MOD UNIT
CIRCULATION
OUTDOOR AMENITY
SUPPORT SPACE
COMMUNITY SPACE
AMENITY SPACE
* 10% ACCESSIBLE UNITS
** 2% HEARING IMPAIRED UNITS
N

3368 Washington Street Boston, Massachusetts

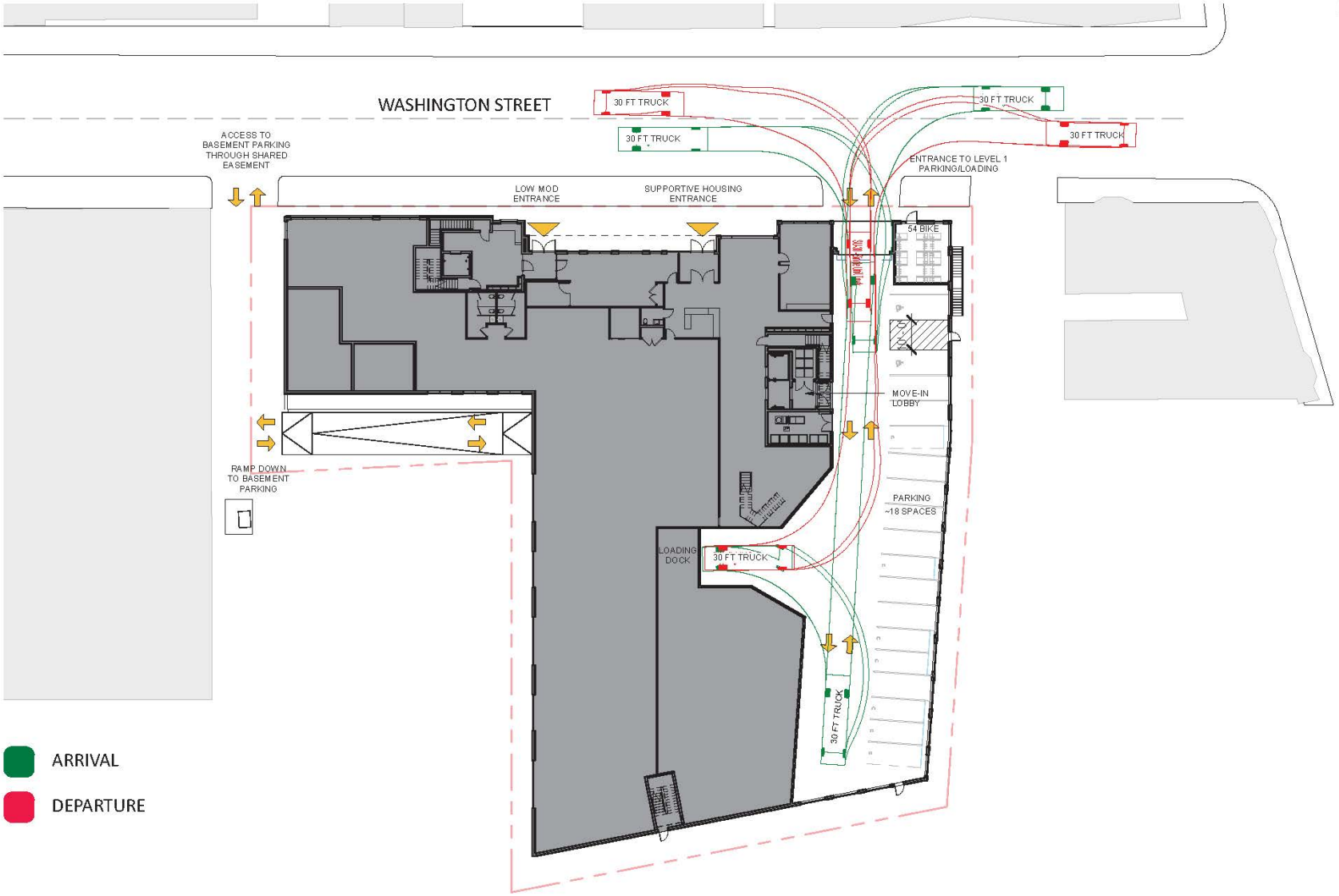
RODE

Level 5 Plan

3368 Washington Street Boston, Massachusetts

RODE

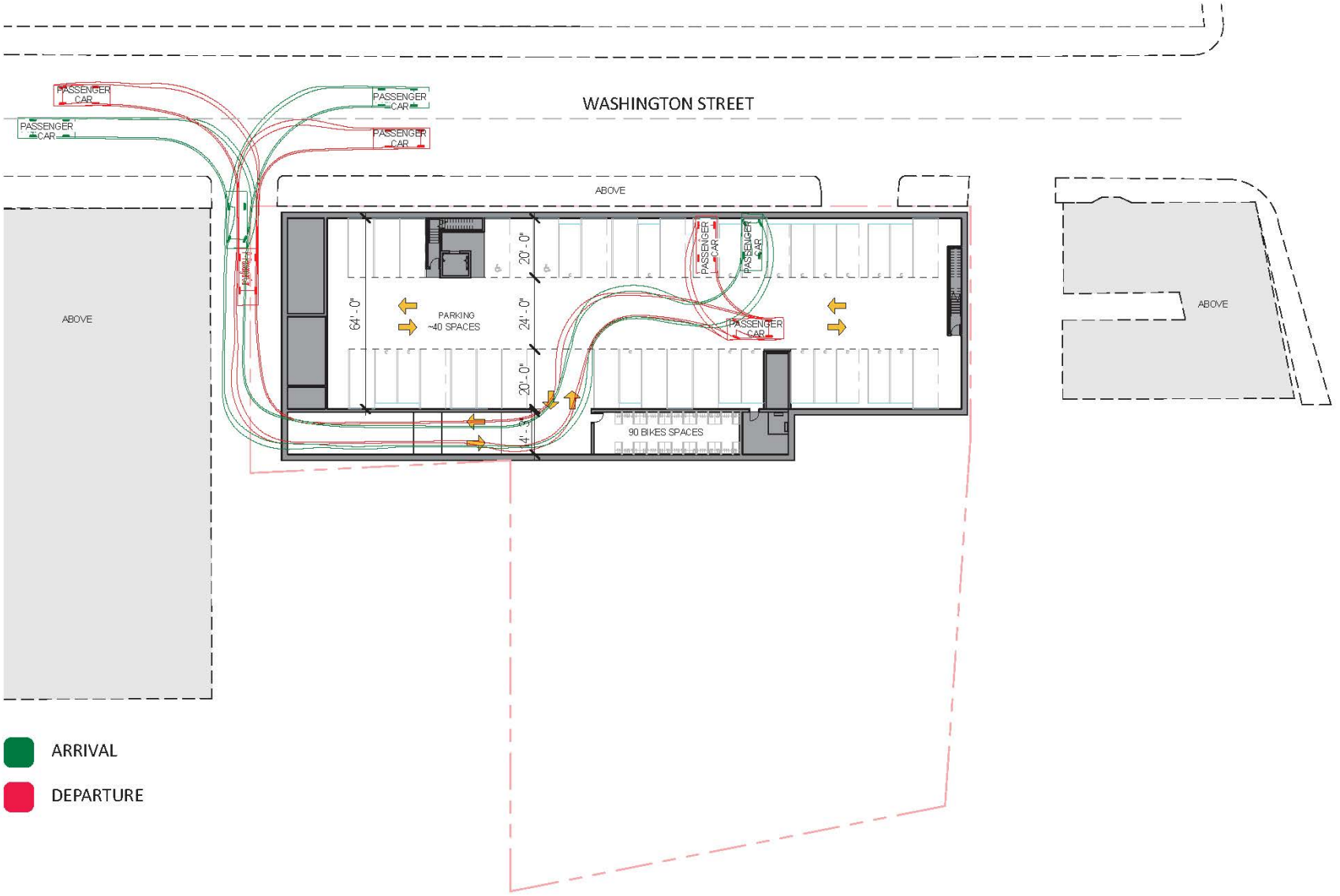
Level 6 Plan



3368 Washington Street Boston, Massachusetts

RODE

Ground Floor Traffic Plan



3368 Washington Street Boston, Massachusetts

RODE

Basement Traffic Plan

Appendix C

Transportation

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 1
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Green Street & Glen Road
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

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

TOTAL (CARS & TRUCKS)

	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road 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	15	79	12	0	1	47	5	0	6	32	7	0	14	61	3
7:15 AM	0	13	81	14	0	1	50	7	0	5	24	8	0	16	72	4
7:30 AM	0	14	84	16	0	2	57	8	0	4	16	8	0	14	64	3
7:45 AM	0	16	82	17	0	2	63	9	0	7	17	9	0	12	54	4
8:00 AM	0	15	80	18	0	3	54	6	0	11	19	8	0	13	52	3
8:15 AM	0	17	81	17	0	2	46	4	0	10	20	9	0	12	51	3
8:30 AM	0	20	82	16	0	2	49	3	0	9	21	10	0	10	43	4
8:45 AM	0	18	77	18	0	1	52	3	0	8	18	11	0	9	37	2
9:00 AM	0	17	72	19	0	2	54	2	0	7	15	10	0	8	32	3
9:15 AM	0	15	74	16	0	2	60	2	0	8	16	8	0	6	28	2
9:30 AM	0	12	77	13	0	1	59	2	0	7	15	9	0	7	26	3
9:45 AM	0	10	81	10	0	2	57	3	0	7	14	10	0	5	24	2
10:00 AM	0	7	86	7	0	2	56	4	0	8	16	9	0	6	22	3
10:15 AM	0	8	79	8	0	2	54	5	0	6	15	11	0	5	21	2
10:30 AM	0	8	74	6	0	1	52	4	0	7	15	12	0	8	20	2
10:45 AM	0	9	69	7	0	2	51	4	0	6	16	13	0	10	19	3
11:00 AM	0	10	67	5	0	2	50	3	0	5	14	15	0	12	17	3
11:15 AM	0	9	65	6	0	1	48	5	0	6	15	14	0	15	16	4
11:30 AM	0	11	64	6	0	2	53	6	0	5	13	15	0	14	15	3
11:45 AM	0	10	62	7	0	2	57	5	0	5	11	13	0	13	14	3
12:00 PM	0	12	61	7	0	2	61	5	0	4	12	16	0	12	15	4
12:15 PM	0	13	63	6	0	3	65	6	0	6	12	14	0	12	13	4
12:30 PM	0	14	62	5	0	2	64	5	0	8	13	12	0	11	16	3
12:45 PM	0	15	63	5	0	2	66	6	0	10	14	10	0	11	17	3
1:00 PM	0	17	64	4	0	3	65	6	0	13	12	8	0	12	19	2
1:15 PM	0	16	69	5	0	3	67	7	0	11	15	11	0	10	22	4
1:30 PM	0	15	73	6	0	2	64	5	0	12	17	12	0	11	23	3
1:45 PM	0	14	80	7	0	2	65	6	0	13	21	14	0	13	25	3
2:00 PM	0	13	89	8	0	2	68	6	0	11	25	16	0	13	26	2
2:15 PM	0	15	86	8	0	1	67	7	0	10	24	15	0	16	28	2
2:30 PM	0	14	83	7	0	1	71	8	0	10	26	17	0	14	26	3
2:45 PM	0	15	89	7	0	2	78	10	0	11	25	16	0	15	27	2
3:00 PM	0	16	77	8	0	2	82	9	0	9	27	16	0	13	26	2
3:15 PM	0	14	76	7	0	2	87	11	0	10	30	14	0	14	28	3
3:30 PM	0	12	75	7	0	3	81	9	0	11	35	15	0	13	27	2
3:45 PM	0	11	73	6	0	2	78	10	0	12	39	16	0	15	26	2
4:00 PM	0	8	74	7	0	2	73	8	0	13	43	14	0	14	25	3
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4:30 PM	0	10	71	5	0	2	70	10	0	9	28	11	0	14	27	2
4:45 PM	0	11	70	6	0	3	71	10	0	7	23	10	0	13	26	3
5:00 PM	0	12	69	4	0	3	72	9	0	5	17	8	0	12	27	3
5:15 PM	0	10	72	6	0	4	74	10	0	6	18	11	0	11	28	4
5:30 PM	0	11	76	8	0	2	71	9	0	8	19	13	0	11	25	4
5:45 PM	0	10	71	7	0	3	69	8	0	6	17	10	0	10	26	3

AM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
7:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	**0**	**58**	**326**	**59**	**0**	**6**	**217**	**29**	**0**	**22**	**89**	**32**	**0**	**56**	**251**	**14**
PHF		**0.96**				**0.85**				**0.79**				**0.87**		
HV %	**0.0%**	**3.4%**	**7.7%**	**0.0%**	**0.0%**	**0.0%**	**9.7%**	**0.0%**	**0.0%**	**9.1%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**	**0.0%**

MID PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
1:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	**0**	**62**	**286**	**22**	**0**	**10**	**261**	**24**	**0**	**49**	**65**	**45**	**0**	**46**	**89**	**12**
PHF		**0.92**				**0.96**				**0.83**				**0.90**		
HV %	**0.0%**	**1.6%**	**8.7%**	**0.0%**	**0.0%**	**10.0%**	**9.2%**	**0.0%**	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**

PM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
2:45 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
3:45 PM	**0**	**57**	**317**	**29**	**0**	**9**	**328**	**39**	**0**	**41**	**117**	**61**	**0**	**55**	**108**	**9**
PHF		**0.91**				**0.94**				**0.90**				**0.96**		
HV %	**0.0%**	**0.0%**	**5.7%**	**6.9%**	**0.0%**	**0.0%**	**6.4%**	**0.0%**	**0.0%**	**4.9%**	**1.7%**	**1.6%**	**0.0%**	**1.8%**	**0.0%**	**11.1%**

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 1
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Green Street & Glen Road
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

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

TRUCKS

	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road 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	6	0	0	0	5	0	0	0	2	0	0	0	0	0
7:15 AM	0	1	5	0	0	0	4	0	0	0	0	0	0	0	4	0
7:30 AM	0	0	9	0	0	0	7	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	5	0	0	0	5	0	0	2	0	0	0	0	2	0
8:00 AM	0	0	8	0	0	0	6	0	0	0	0	0	0	1	0	0
8:15 AM	0	0	7	0	0	0	5	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	10	0	0	0	8	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	6	0	0	0	6	2	0	0	1	0	0	1	2	0
9:00 AM	0	0	11	0	0	0	8	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	6	0	0	0	9	1	0	0	0	0	0	0	0	0
9:30 AM	0	0	7	0	0	0	8	0	0	0	0	0	0	0	1	0
9:45 AM	0	1	6	1	0	0	5	0	0	0	0	1	0	0	0	0
10:00 AM	0	0	8	0	0	0	7	0	0	0	0	1	0	0	0	0
10:15 AM	0	0	7	0	0	0	6	0	0	1	0	0	0	0	0	1
10:30 AM	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0
10:45 AM	0	1	4	1	0	1	7	0	0	0	1	0	0	0	0	0
11:00 AM	0	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	6	0	0	0	7	0	0	0	0	0	0	0	1	0
11:30 AM	0	0	5	0	0	0	8	0	0	0	0	0	0	0	0	0
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4:15 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	2	1	0	0	2	0	0	0	1	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
8:30 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
9:30 AM	**0**	**0**	**33**	**0**	**0**	**0**	**31**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**2**	**0**
PHF	**0.75**				**0.85**				**0.25**				**0.25**			

MID PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
10:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	**0**	**1**	**24**	**1**	**0**	**1**	**25**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**1**
PHF	**0.81**				**0.81**				**0.75**				**0.25**			

PM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
2:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
3:00 PM	**0**	**0**	**27**	**0**	**0**	**0**	**24**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**
PHF	**0.68**				**0.78**				**0.25**				**0.25**			

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 1
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Green Street & Glen Road
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

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

BICYCLES

	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road 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	0	0
7:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8:45 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
9:45 AM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
10:00 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00 PM	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0
1:15 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
3:15 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
4:45 PM	0	0	1	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	1	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	2	0	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0

MID PEAK HOUR 1:00 PM to 2:00 PM	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
	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	1	0	0	2	1	1	0	0	1	0

PM PEAK HOUR 2:45 PM to 3:45 PM	Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 1
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Green Street & Glen Road
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

BOSTON TRAFFIC DATA
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PEDESTRIANS

		Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound		
Start Time	-	PED (EB)	PED (WB)	-	-	PED (EB)	PED (WB)	-	-	PED (NB)	PED (SB)	-	-	PED (NB)	PED (SB)	-
7:00 AM	-	17	6	-	-	1	1	-	-	3	8	-	-	1	0	-
7:15 AM	-	13	16	-	-	5	8	-	-	2	5	-	-	1	2	-
7:30 AM	-	9	21	-	-	4	6	-	-	4	4	-	-	4	5	-
7:45 AM	-	5	25	-	-	3	5	-	-	5	1	-	-	9	7	-
8:00 AM	-	6	20	-	-	2	7	-	-	7	2	-	-	5	4	-
8:15 AM	-	4	18	-	-	3	9	-	-	6	3	-	-	3	5	-
8:30 AM	-	3	15	-	-	2	8	-	-	3	4	-	-	4	3	-
8:45 AM	-	2	16	-	-	1	11	-	-	4	3	-	-	1	1	-
9:00 AM	-	4	12	-	-	3	10	-	-	3	2	-	-	3	2	-
9:15 AM	-	5	10	-	-	2	8	-	-	5	3	-	-	2	1	-
9:30 AM	-	4	8	-	-	4	9	-	-	4	2	-	-	3	3	-
9:45 AM	-	7	5	-	-	3	7	-	-	3	2	-	-	4	5	-
10:00 AM	-	4	6	-	-	2	5	-	-	4	4	-	-	2	3	-
10:15 AM	-	3	5	-	-	3	6	-	-	2	2	-	-	5	2	-
10:30 AM	-	3	3	-	-	4	3	-	-	3	3	-	-	2	4	-
10:45 AM	-	1	4	-	-	6	1	-	-	1	1	-	-	1	5	-
11:00 AM	-	2	5	-	-	5	2	-	-	3	2	-	-	2	3	-
11:15 AM	-	1	3	-	-	3	4	-	-	2	1	-	-	1	6	-
11:30 AM	-	2	4	-	-	2	3	-	-	2	2	-	-	3	5	-
11:45 AM	-	1	5	-	-	2	5	-	-	1	1	-	-	4	4	-
12:00 PM	-	3	3	-	-	3	4	-	-	3	3	-	-	2	3	-
12:15 PM	-	3	2	-	-	2	6	-	-	1	4	-	-	5	4	-
12:30 PM	-	5	4	-	-	4	7	-	-	2	6	-	-	4	3	-
12:45 PM	-	4	3	-	-	3	4	-	-	4	3	-	-	3	2	-
1:00 PM	-	5	2	-	-	2	2	-	-	2	5	-	-	2	1	-
1:15 PM	-	4	4	-	-	4	3	-	-	2	4	-	-	5	3	-
1:30 PM	-	6	5	-	-	6	1	-	-	3	2	-	-	3	1	-
1:45 PM	-	8	6	-	-	4	4	-	-	5	3	-	-	4	2	-
2:00 PM	-	10	5	-	-	2	2	-	-	3	1	-	-	5	4	-
2:15 PM	-	9	4	-	-	3	3	-	-	6	2	-	-	2	3	-
2:30 PM	-	12	7	-	-	1	2	-	-	8	2	-	-	3	2	-
2:45 PM	-	10	9	-	-	4	4	-	-	5	3	-	-	4	3	-
3:00 PM	-	7	6	-	-	3	3	-	-	6	5	-	-	2	2	-
3:15 PM	-	8	5	-	-	2	6	-	-	4	3	-	-	3	4	-
3:30 PM	-	6	8	-	-	5	5	-	-	8	4	-	-	4	1	-
3:45 PM	-	7	11	-	-	4	4	-	-	5	4	-	-	3	3	-
4:00 PM	-	5	15	-	-	7	5	-	-	6	3	-	-	2	4	-
4:15 PM	-	6	20	-	-	11	6	-	-	4	4	-	-	3	5	-
4:30 PM	-	7	36	-	-	18	4	-	-	7	6	-	-	1	9	-
4:45 PM	-	9	28	-	-	12	6	-	-	5	5	-	-	2	6	-
5:00 PM	-	14	23	-	-	10	5	-	-	6	3	-	-	4	4	-
5:15 PM	-	17	12	-	-	8	7	-	-	4	7	-	-	5	4	-
5:30 PM	-	22	6	-	-	11	8	-	-	3	6	-	-	3	2	-
5:45 PM	-	16	7	-	-	10	6	-	-	5	4	-	-	3	3	-

AM PEAK HOUR		Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound		
7:00 AM																
to	-	PED (EB)	PED (WB)	-	-	PED (EB)	PED (WB)	-	-	PED (NB)	PED (SB)	-	-	PED (NB)	PED (SB)	-
8:00 AM	-	44	68	-	-	13	20	-	-	14	18	-	-	15	14	-

MID PEAK HOUR		Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound		
1:00 PM																
to	-	PED (EB)	PED (WB)	-	-	PED (EB)	PED (WB)	-	-	PED (NB)	PED (SB)	-	-	PED (NB)	PED (SB)	-
2:00 PM	-	23	17	-	-	16	10	-	-	12	14	-	-	14	7	-

PM PEAK HOUR		Washington Street Northbound				Washington Street Southbound				Green Street Eastbound				Glen Road Westbound		
2:45 PM																
to	-	PED (EB)	PED (WB)	-	-	PED (EB)	PED (WB)	-	-	PED (NB)	PED (SB)	-	-	PED (NB)	PED (SB)	-
3:45 PM	-	31	28	-	-	14	18	-	-	23	15	-	-	13	10	-

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 2
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Williams Street
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

BOSTON TRAFFIC DATA
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TOTAL (CARS & TRUCKS)

	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street 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	101	97	4	0	2	48	10	0	12	11	20	0	0	0	0
7:15 AM	0	105	99	3	0	2	50	11	0	13	11	18	0	0	0	0
7:30 AM	0	110	103	1	0	3	52	12	0	14	12	17	0	0	0	0
7:45 AM	0	94	102	2	0	5	55	10	0	16	13	19	0	0	0	0
8:00 AM	0	82	104	2	0	4	48	13	0	18	15	17	0	0	0	0
8:15 AM	0	84	98	3	0	5	43	18	0	16	16	18	0	0	0	0
8:30 AM	0	87	93	3	0	5	45	16	0	15	17	19	0	0	0	0
8:45 AM	0	90	87	4	0	4	44	14	0	13	20	20	0	0	0	0
9:00 AM	0	92	82	2	0	4	46	12	0	12	19	21	0	0	0	0
9:15 AM	0	79	83	3	0	5	45	10	0	9	18	22	0	0	0	0
9:30 AM	0	68	84	2	0	6	48	11	0	6	17	24	0	0	0	0
9:45 AM	0	56	87	2	0	5	51	11	0	5	15	26	0	0	0	0
10:00 AM	0	45	89	3	0	5	54	12	0	3	16	28	0	0	0	0
10:15 AM	0	43	85	4	0	6	59	10	0	4	17	26	0	0	0	0
10:30 AM	0	41	81	4	0	5	57	9	0	5	15	27	0	0	0	0
10:45 AM	0	39	79	5	0	6	58	8	0	6	16	29	0	0	0	0
11:00 AM	0	37	75	6	0	4	61	8	0	6	14	28	0	0	0	0
11:15 AM	0	34	76	8	0	7	59	7	0	5	15	30	0	0	0	0
11:30 AM	0	29	77	10	0	6	63	6	0	5	17	31	0	0	0	0
11:45 AM	0	25	75	12	0	5	66	5	0	5	19	33	0	0	0	0
12:00 PM	0	23	79	14	0	4	70	5	0	4	21	35	0	0	0	0
12:15 PM	0	29	76	12	0	3	75	4	0	4	20	32	0	0	0	0
12:30 PM	0	34	74	11	0	5	71	6	0	5	23	28	0	0	0	0
12:45 PM	0	41	73	10	0	6	69	5	0	5	25	25	0	0	0	0
1:00 PM	0	48	71	9	0	7	66	6	0	6	26	23	0	0	0	0
1:15 PM	0	46	80	7	0	9	64	7	0	4	24	26	0	0	0	0
1:30 PM	0	45	89	8	0	7	68	5	0	5	25	31	0	0	0	0
1:45 PM	0	44	98	6	0	8	72	7	0	5	27	35	0	0	0	0
2:00 PM	0	43	105	7	0	8	75	8	0	4	26	42	0	0	0	0
2:15 PM	0	45	101	5	0	7	80	6	0	6	25	40	0	0	0	0
2:30 PM	0	48	95	4	0	6	81	7	0	9	27	39	0	0	0	0
2:45 PM	0	41	87	3	0	5	83	9	0	10	26	38	0	0	0	0
3:00 PM	0	33	82	2	0	5	85	10	0	12	28	37	0	0	0	0
3:15 PM	0	34	84	3	0	4	87	12	0	10	30	42	0	0	0	0
3:30 PM	0	35	83	3	0	5	86	11	0	11	32	49	0	0	0	0
3:45 PM	0	36	86	4	0	6	85	9	0	11	34	55	0	0	0	0
4:00 PM	0	34	85	5	0	7	83	7	0	10	36	61	0	0	0	0
4:15 PM	0	35	79	6	0	9	84	6	0	8	40	60	0	0	0	0
4:30 PM	0	33	74	7	0	10	85	8	0	9	44	59	0	0	0	0
4:45 PM	0	34	68	7	0	11	86	7	0	8	47	57	0	0	0	0
5:00 PM	0	35	62	8	0	12	84	9	0	7	51	56	0	0	0	0
5:15 PM	0	32	63	7	0	13	87	8	0	8	49	53	0	0	0	0
5:30 PM	0	34	61	6	0	11	84	7	0	7	48	54	0	0	0	0
5:45 PM	0	31	62	6	0	10	81	6	0	6	46	52	0	0	0	0

AM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
7:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	**0**	**410**	**401**	**10**	**0**	**12**	**205**	**43**	**0**	**55**	**47**	**74**	**0**	**0**	**0**	**0**
PHF	**0.96**				**0.93**				**0.92**				**0.00**			
HV %	**0.0%**	**0.2%**	**5.7%**	**0.0%**	**0.0%**	**0.0%**	**9.3%**	**2.3%**	**0.0%**	**0.0%**	**4.3%**	**6.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

MID PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
1:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	**0**	**183**	**338**	**30**	**0**	**31**	**270**	**25**	**0**	**20**	**102**	**115**	**0**	**0**	**0**	**0**
PHF	**0.93**				**0.94**				**0.88**				**0.00**			
HV %	**0.0%**	**2.2%**	**8.9%**	**6.7%**	**0.0%**	**3.2%**	**8.1%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
3:45 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:45 PM	**0**	**138**	**324**	**22**	**0**	**32**	**337**	**30**	**0**	**38**	**154**	**235**	**0**	**0**	**0**	**0**
PHF	**0.96**				**0.97**				**0.95**				**0.00**			
HV %	**0.0%**	**2.9%**	**4.3%**	**0.0%**	**0.0%**	**0.0%**	**4.5%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 2
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Williams Street
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

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

TRUCKS

	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street 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	5	0	0	0	4	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	7	0	0	0	3	0	0	0	2	2	0	0	0	0
7:30 AM	0	1	7	0	0	0	5	1	0	0	0	2	0	0	0	0
7:45 AM	0	0	4	0	0	0	7	0	0	0	0	1	0	0	0	0
8:00 AM	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	9	0	0	0	6	0	0	1	0	0	0	0	0	0
8:45 AM	0	0	7	1	0	0	7	1	0	0	0	0	0	0	0	0
9:00 AM	0	3	9	0	0	0	4	0	0	1	0	1	0	0	0	0
9:15 AM	0	1	5	0	0	0	6	0	0	0	1	1	0	0	0	0
9:30 AM	0	0	9	0	0	0	11	0	0	1	0	3	0	0	0	0
9:45 AM	0	0	6	0	0	1	6	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	7	0	0	0	6	0	0	0	0	1	0	0	0	0
10:15 AM	0	0	9	1	0	0	3	0	0	0	0	0	0	0	0	0
10:30 AM	0	1	4	0	0	0	8	0	0	0	0	2	0	0	0	0
10:45 AM	0	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	4	1	0	0	6	0	0	0	0	1	0	0	0	0
11:15 AM	0	0	5	0	0	0	5	0	0	0	1	2	0	0	0	0
11:30 AM	0	1	5	0	0	0	7	0	0	0	0	2	0	0	0	0
11:45 AM	0	0	6	0	0	0	5	1	0	0	0	0	0	0	0	0
12:00 PM	0	0	5	1	0	0	6	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	6	0	0	0	6	0	0	0	0	1	0	0	0	0
12:30 PM	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	4	0	0	0	8	0	0	0	0	3	0	0	0	0
1:00 PM	0	1	7	1	0	0	5	0	0	0	1	0	0	0	0	0
1:15 PM	0	0	13	0	0	0	4	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0
1:45 PM	0	3	4	1	0	1	7	0	0	0	0	2	0	0	0	0
2:00 PM	0	2	8	0	0	0	5	0	0	0	2	0	0	0	0	0
2:15 PM	0	0	5	0	0	0	4	0	0	0	0	1	0	0	0	0
2:30 PM	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0
2:45 PM	0	5	5	0	0	0	7	0	0	0	0	1	0	0	0	0
3:00 PM	0	1	4	0	0	0	6	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	3	0	0	0	8	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0
3:45 PM	0	2	3	0	0	0	3	0	0	0	1	3	0	0	0	0
4:00 PM	0	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0
4:30 PM	0	2	3	0	0	0	3	0	0	0	1	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
8:45 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
9:45 AM	**0**	**4**	**30**	**1**	**0**	**0**	**28**	**1**	**0**	**2**	**1**	**5**	**0**	**0**	**0**	**0**
PHF	**0.73**				**0.66**				**0.50**				**0.00**			

MID PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
1:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	**0**	**4**	**30**	**2**	**0**	**1**	**22**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**
PHF	**0.69**				**0.72**				**0.38**				**0.00**			

PM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
2:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
3:00 PM	**0**	**7**	**24**	**0**	**0**	**0**	**22**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**
PHF	**0.78**				**0.79**				**0.50**				**0.00**			

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 2
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Williams Street
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

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BICYCLES

	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street 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	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	0
8:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
9:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
11:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4:45 PM	0	0	1	0	0	0	0	0	0	1	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	1	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	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	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
7:00 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	0	1	1	0	0	0	1	0	0	0	1	0	0	0	7	0

MID PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
1:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
2:00 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0

PM PEAK HOUR	Washington Street Northbound				Washington Street Southbound				Williams Street Eastbound				Williams Street Westbound			
3:45 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:45 PM	0	0	1	0	0	0	1	0	0	0	1	1	0	0	2	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Bryan Zimolka, P.E
Project #:	340_0101_NE
BTD #:	Location 2
Location:	Jamaica Plain, Boston, MA
Street 1:	Washington Street
Street 2:	Williams Street
Count Date:	3/13/2019
Day of Week:	Wednesday
Weather:	Mostly Sunny, 42°F

BOSTON TRAFFIC DATA
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PEDESTRIANS

	Washington Street Northbound			Washington Street Southbound			Williams Street Eastbound			Williams Street Westbound		
Start Time	PED (EB)	PED (WB)	-	PED (EB)	PED (WB)	-	PED (NB)	PED (SB)	-	PED (NB)	PED (SB)	-
7:00 AM	0	1	-	0	2	-	0	0	-	0	0	-
7:15 AM	1	2	-	1	3	-	1	1	-	0	0	-
7:30 AM	2	5	-	1	6	-	1	4	-	0	1	-
7:45 AM	0	3	-	2	9	-	2	2	-	1	0	-
8:00 AM	1	4	-	0	7	-	0	0	-	0	2	-
8:15 AM	2	2	-	1	10	-	1	1	-	1	0	-
8:30 AM	1	4	-	1	12	-	3	2	-	2	1	-
8:45 AM	2	3	-	3	7	-	2	0	-	0	1	-
9:00 AM	1	1	-	2	8	-	1	1	-	1	0	-
9:15 AM	3	2	-	2	3	-	1	0	-	0	0	-
9:30 AM	1	6	-	1	4	-	1	1	-	2	1	-
9:45 AM	1	3	-	1	5	-	0	0	-	1	0	-
10:00 AM	0	2	-	2	2	-	2	1	-	0	0	-
10:15 AM	2	3	-	1	3	-	3	0	-	1	2	-
10:30 AM	1	2	-	3	4	-	1	2	-	2	1	-
10:45 AM	1	1	-	1	2	-	2	0	-	0	1	-
11:00 AM	3	2	-	0	4	-	0	1	-	1	0	-
11:15 AM	1	4	-	2	3	-	1	0	-	1	0	-
11:30 AM	2	2	-	3	1	-	1	0	-	0	1	-
11:45 AM	0	1	-	1	0	-	0	1	-	0	0	-
12:00 PM	1	3	-	2	2	-	0	0	-	1	1	-
12:15 PM	0	2	-	2	1	-	1	0	-	1	0	-
12:30 PM	2	1	-	1	3	-	2	1	-	0	1	-
12:45 PM	1	2	-	1	2	-	1	2	-	2	0	-
1:00 PM	0	1	-	2	1	-	0	1	-	0	2	-
1:15 PM	1	3	-	0	2	-	1	0	-	0	0	-
1:30 PM	3	1	-	3	4	-	0	0	-	3	0	-
1:45 PM	4	4	-	1	2	-	1	2	-	1	1	-
2:00 PM	3	5	-	2	1	-	1	1	-	0	2	-
2:15 PM	6	7	-	1	2	-	0	1	-	2	0	-
2:30 PM	22	14	-	1	1	-	2	0	-	0	1	-
2:45 PM	6	23	-	3	3	-	1	0	-	1	0	-
3:00 PM	7	10	-	2	2	-	0	1	-	1	1	-
3:15 PM	9	4	-	1	4	-	1	2	-	0	1	-
3:30 PM	10	5	-	2	1	-	0	0	-	1	0	-
3:45 PM	12	2	-	1	2	-	2	0	-	3	2	-
4:00 PM	8	3	-	2	3	-	0	1	-	0	1	-
4:15 PM	6	4	-	3	2	-	0	0	-	0	3	-
4:30 PM	3	3	-	4	1	-	1	3	-	2	9	-
4:45 PM	4	2	-	5	2	-	0	2	-	1	2	-
5:00 PM	5	4	-	7	1	-	3	0	-	0	3	-
5:15 PM	7	6	-	6	3	-	1	1	-	3	4	-
5:30 PM	9	2	-	15	1	-	2	0	-	1	7	-
5:45 PM	5	4	-	10	2	-	0	1	-	0	3	-

AM PEAK HOUR 7:00 AM to 8:00 AM	Washington Street Northbound			Washington Street Southbound			Williams Street Eastbound			Williams Street Westbound		
	PED (EB)	PED (WB)	-	PED (EB)	PED (WB)	-	PED (NB)	PED (SB)	-	PED (NB)	PED (SB)	-
	3	11	-	4	20	-	4	7	-	1	1	-

MID PEAK HOUR 1:00 PM to 2:00 PM	Washington Street Northbound			Washington Street Southbound			Williams Street Eastbound			Williams Street Westbound		
	PED (EB)	PED (WB)	-	PED (EB)	PED (WB)	-	PED (NB)	PED (SB)	-	PED (NB)	PED (SB)	-
	8	9	-	6	9	-	2	3	-	4	3	-

PM PEAK HOUR 3:45 PM to 4:45 PM	Washington Street Northbound			Washington Street Southbound			Williams Street Eastbound			Williams Street Westbound		
	PED (EB)	PED (WB)	-	PED (EB)	PED (WB)	-	PED (NB)	PED (SB)	-	PED (NB)	PED (SB)	-
	29	12	-	10	8	-	3	4	-	5	15	-

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Crash Number	Crash Date	Crash Time	City/Town	Crash Severity	Roadway	Near Intersection Roadway	Landmark	Police Agency
4063618	3/20/2015	8:34 AM	BOSTON	Non-fatal injury	GREEN STREET / WASHINGTON STREET			Local police
This data was manually selected from the map.								

Crash Number	Crash Date	Crash Time	City/Town	Crash Severity	Roadway	Near Intersection Roadway	Landmark	Police Agency
4148113	12/12/2015	7:40 PM	BOSTON	Not Reported	WASHINGTON STREET / WILLIAMS STREET			Local police
This data was manually selected from the map.								

Distribution and Mode Share by Transportation Zone For AM & PM Peak

AM Peak Period Trips (6-9AM)

Trips Starting in Zone 6

To/From ZONE	Mode Shares			Geographical Distribution of Trips			
	Auto	Transit	Walk	Total	Auto	Transit	Walk
1	35.3	64.7	0.0	1.9	1.5	2.9	0.0
2	15.9	84.1	0.0	10.8	3.9	21.5	0.0
3	18.8	81.2	0.0	4.0	1.7	7.8	0.0
4	26.7	73.3	0.0	11.8	7.1	20.6	0.0
5	31.1	56.3	12.6	10.3	7.2	13.8	10.0
6	34.0	6.0	60.0	17.4	13.2	2.5	80.0
7	22.7	77.3	0.0	0.5	0.3	1.0	0.0
8	83.2	16.8	0.0	1.5	2.8	0.6	0.0
9	86.3	13.7	0.0	1.4	2.7	0.4	0.0
10	76.1	23.9	0.0	1.2	2.1	0.7	0.0
11	21.5	78.5	0.0	0.9	0.4	1.6	0.0
12	37.6	62.4	0.0	1.4	1.2	2.1	0.0
13	72.3	27.7	0.0	0.9	1.5	0.6	0.0
14	78.9	21.1	0.0	1.9	3.3	0.9	0.0
15	50.7	41.9	7.4	6.8	7.7	6.8	3.9
16	62.7	22.9	14.5	0.8	1.2	0.4	0.9
17	56.9	43.1	0.0	0.9	1.2	0.9	0.0
18	84.6	15.4	0.0	0.6	1.2	0.2	0.0
19	54.6	23.7	21.7	3.2	3.9	1.8	5.2
20	26.5	73.5	0.0	0.5	0.3	0.8	0.0
RBO	66.9	33.1	0.0	1.5	2.2	1.1	0.0
RGR	52.5	47.5	0.0	5.3	6.2	5.9	0.0
RCD	89.8	10.2	0.0	4.9	9.8	1.2	0.0
RMR	62.3	37.7	0.0	2.0	2.8	1.8	0.0
BNE	50.6	49.4	0.0	0.4	0.4	0.4	0.0
BNO	64.3	35.7	0.0	0.5	0.8	0.5	0.0
BNW	87.8	12.2	0.0	1.5	2.9	0.4	0.0
CN	100.0	0.0	0.0	0.5	1.1	0.0	0.0
CW	96.9	3.1	0.0	1.5	3.3	0.1	0.0
CSW	89.0	11.0	0.0	2.4	4.7	0.6	0.0
CSE	100.0	0.0	0.0	0.8	1.7	0.0	0.0
TOTAL	44.7	42.2	13.1	100.0	100.0	100.0	100.0

Trips Ending in Zone 6

Mode Shares			Geographical Distribution of Trips			
Auto	Transit	Walk	Total	Auto	Transit	Walk
25.6	74.4	0.0	1.1	0.5	3.0	0.0
62.9	37.1	0.0	0.8	0.9	1.1	0.0
32.0	68.0	0.0	0.7	0.4	1.9	0.0
58.8	41.2	0.0	2.6	2.9	4.2	0.0
37.2	33.9	28.9	6.9	4.8	9.0	10.0
34.0	6.0	60.0	26.7	16.8	6.2	80.0
54.2	45.8	0.0	0.3	0.3	0.5	0.0
53.7	46.3	0.0	1.5	1.5	2.6	0.0
63.3	36.7	0.0	3.9	4.5	5.4	0.0
84.4	15.6	0.0	1.6	2.5	0.9	0.0
43.7	56.3	0.0	0.2	0.2	0.5	0.0
44.5	55.5	0.0	2.6	2.2	5.6	0.0
72.6	27.4	0.0	0.4	0.5	0.4	0.0
46.4	53.6	0.0	6.9	5.9	14.2	0.0
41.0	50.8	8.2	9.5	7.2	18.5	3.9
49.3	42.9	7.8	2.4	2.2	3.9	0.9
74.3	25.7	0.0	0.6	0.8	0.6	0.0
100.0	0.0	0.0	0.6	1.2	0.0	0.0
56.6	19.9	23.5	4.5	4.7	3.4	5.2
100.0	0.0	0.0	0.1	0.2	0.0	0.0
45.4	54.6	0.0	3.3	2.8	7.0	0.0
60.2	39.8	0.0	3.1	3.4	4.7	0.0
92.9	7.1	0.0	4.5	7.7	1.2	0.0
98.6	1.4	0.0	2.0	3.6	0.1	0.0
66.5	33.5	0.0	0.6	0.7	0.7	0.0
82.7	17.3	0.0	0.6	1.0	0.4	0.0
80.5	19.5	0.0	1.5	2.2	1.1	0.0
88.0	12.0	0.0	1.5	2.5	0.7	0.0
97.1	2.9	0.0	2.2	4.0	0.2	0.0
93.5	6.5	0.0	4.2	7.2	1.0	0.0
92.0	8.0	0.0	3.0	5.0	0.9	0.0
54.0	26.0	20.0	100.0	100.0	100.0	100.0

PM Peak Period Trips (3-6PM)

Trips Starting in Zone 6

To/From ZONE	Mode Shares			Geographical Distribution of Trips			
	Auto	Transit	Walk	Total	Auto	Transit	Walk
1	68.4	31.6	0.0	0.6	0.6	0.9	0.0
2	41.4	58.6	0.0	1.4	0.9	4.3	0.0
3	29.4	70.6	0.0	1.1	0.5	4.1	0.0
4	41.5	58.5	0.0	5.8	3.8	17.6	0.0
5	41.4	34.5	24.1	7.2	4.7	13.1	10.0
6	37.1	5.7	57.2	24.5	14.3	7.3	80.0
7	68.7	31.3	0.0	0.3	0.3	0.5	0.0
8	74.8	25.2	0.0	1.7	2.0	2.2	0.0
9	74.1	25.9	0.0	4.2	4.9	5.7	0.0
10	91.9	8.1	0.0	2.1	3.1	0.9	0.0
11	55.5	44.5	0.0	0.3	0.3	0.7	0.0
12	59.5	40.5	0.0	1.6	1.5	3.4	0.0
13	79.6	20.4	0.0	0.5	0.7	0.6	0.0
14	75.0	25.0	0.0	4.7	5.5	6.1	0.0
15	66.4	24.4	9.2	7.4	7.8	9.5	3.9
16	65.6	22.8	11.7	1.4	1.4	1.7	0.9
17	83.0	17.0	0.0	0.8	1.1	0.7	0.0
18	98.5	1.5	0.0	1.1	1.7	0.1	0.0
19	56.0	23.0	21.0	4.4	3.9	5.3	5.2
20	100.0	0.0	0.0	0.1	0.2	0.0	0.0
RBO	78.2	21.8	0.0	3.4	4.2	3.9	0.0
RGR	76.5	23.5	0.0	4.2	5.1	5.2	0.0
RCD	95.5	4.5	0.0	6.3	9.5	1.5	0.0
RMR	94.0	6.0	0.0	2.0	3.0	0.6	0.0
BNE	81.1	18.9	0.0	0.5	0.7	0.5	0.0
BNO	91.7	8.3	0.0	0.6	0.9	0.3	0.0
BNW	92.2	7.8	0.0	1.5	2.2	0.6	0.0
CN	92.5	7.5	0.0	1.6	2.3	0.6	0.0
CW	96.3	3.7	0.0	2.4	3.7	0.5	0.0
CSW	95.4	4.6	0.0	3.9	5.9	0.9	0.0
CSE	94.0	6.0	0.0	2.4	3.5	0.7	0.0
TOTAL	63.4	19.1	17.5	100.0	100.0	100.0	100.0

Trips Ending in Zone 6

Mode Shares			Geographical Distribution of Trips			
Auto	Transit	Walk	Total	Auto	Transit	Walk
40.6	59.4	0.0	1.4	1.0	2.9	0.0
16.4	83.6	0.0	7.4	2.2	21.5	0.0
18.9	81.1	0.0	2.8	0.9	8.0	0.0
34.4	65.6	0.0	9.3	5.6	21.0	0.0
37.7	46.4	15.9	9.0	6.0	14.4	10.0
37.1	5.7	57.2	20.1	13.2	4.0	80.0
56.6	43.4	0.0	0.3	0.3	0.4	0.0
84.1	15.9	0.0	1.8	2.6	1.0	0.0
91.7	8.3	0.0	2.5	4.1	0.7	0.0
87.5	12.5	0.0	1.9	2.9	0.8	0.0
40.4	59.6	0.0	0.5	0.3	1.0	0.0
85.3	14.7	0.0	0.9	1.3	0.4	0.0
82.7	17.3	0.0	0.8	1.1	0.5	0.0
80.9	19.1	0.0	3.1	4.4	2.0	0.0
71.7	19.6	8.7	6.4	8.2	4.4	3.9
60.7	27.5	11.8	1.1	1.2	1.1	0.9
68.1	31.9	0.0	1.1	1.3	1.2	0.0
95.4	4.6	0.0	1.0	1.7	0.2	0.0
58.6	21.7	19.7	3.8	4.0	2.9	5.2
35.0	65.0	0.0	0.2	0.1	0.4	0.0
89.6	10.4	0.0	2.2	3.5	0.8	0.0
71.4	28.6	0.0	5.1	6.5	5.1	0.0
96.9	3.1	0.0	5.8	9.9	0.6	0.0
80.5	19.5	0.0	2.0	2.8	1.3	0.0
70.7	29.3	0.0	0.4	0.5	0.4	0.0
84.4	15.6	0.0	0.5	0.8	0.3	0.0
91.8	8.2	0.0	1.5	2.4	0.4	0.0
93.7	6.3	0.0	1.0	1.6	0.2	0.0
93.1	6.9	0.0	1.9	3.1	0.5	0.0
85.7	14.3	0.0	2.9	4.5	1.5	0.0
90.9	9.1	0.0	1.3	2.1	0.4	0.0
56.6	29.0	14.4	100.0	100.0	100.0	100.0

Mode Share by Purpose* and Time of Day

Trips Beginning in Zone 6

Daily avg. mode shares	All Purposes	Home	Work	Other
Auto	61%	61%	58%	61%
Transit	23%	25%	35%	15%
Walk	16%	14%	7%	24%
AM peak mode shares				
Auto	45%	44%	38%	48%
Transit	42%	44%	56%	28%
Walk	13%	12%	6%	24%
Rest of day mode shares				
Auto	65%	68%	59%	62%
Transit	19%	18%	34%	14%
Walk	16%	14%	7%	24%
PM peak mode shares				
Auto	54%	56%	53%	54%
Transit	26%	26%	38%	15%
Walk	20%	18%	9%	31%

Trips Ending in Zone 6

Daily avg. mode shares	All Purposes	Home	Work	Other
Auto	61%	61%	58%	61%
Transit	23%	25%	35%	15%
Walk	16%	14%	7%	24%
AM peak mode shares				
Auto	54%	56%	53%	54%
Transit	26%	26%	38%	15%
Walk	20%	18%	9%	31%
Rest of day mode shares				
Auto	62%	62%	62%	63%
Transit	23%	25%	33%	14%
Walk	15%	13%	5%	23%
PM peak mode shares				
Auto	45%	44%	38%	48%
Transit	42%	44%	56%	28%
Walk	13%	12%	6%	24%

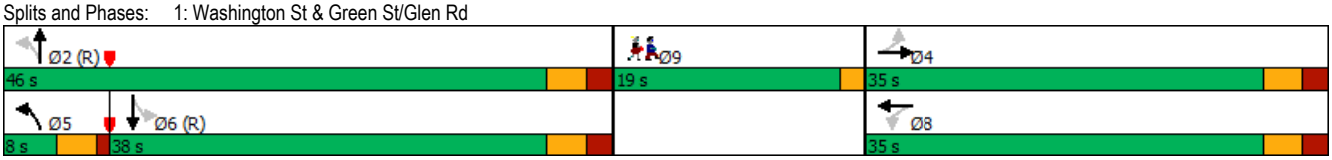
**Purpose refers to the activity that occurs in Zone 6.*

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	22	89	32	56	251	14	58	326	59	6	217	29	
Future Volume (vph)	22	89	32	56	251	14	58	326	59	6	217	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor					1.00			1.00			1.00		
Frt		0.970			0.994			0.982			0.984		
Flt Protected		0.992			0.991			0.994			0.999		
Satd. Flow (prot)	0	1781	0	0	1648	0	0	1557	0	0	1535	0	
Flt Permitted		0.879			0.903			0.918			0.989		
Satd. Flow (perm)	0	1579	0	0	1501	0	0	1438	0	0	1520	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		492			562			939			680		
Travel Time (s)		13.4			15.3			25.6			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)						1			1			1	
Peak Hour Factor	0.79	0.79	0.79	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	9%	2%	0%	0%	2%	0%	3%	8%	0%	0%	10%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				1	1	1	1	1	1	1	1	1	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	28	113	41	64	289	16	60	340	61	7	255	34	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	182	0	0	369	0	0	461	0	0	296	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA		
Protected Phases		4			8		5	2			6		9
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0		13.0	13.0		8.0	13.0		13.0	13.0		19.0
Total Split (s)	35.0	35.0		35.0	35.0		8.0	46.0		38.0	38.0		19.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		8.0%	46.0%		38.0%	38.0%		19%
Maximum Green (s)	30.0	30.0		30.0	30.0		4.0	41.0		33.0	33.0		17.0
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)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None		None	None		Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		27.5			27.5			47.3			39.3		
Actuated g/C Ratio		0.28			0.28			0.47			0.39		
v/c Ratio		0.42			0.90			0.67			0.50		
Control Delay		32.3			60.0			27.3			29.3		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		32.3			60.0			27.3			29.3		
LOS		C			E			C			C		
Approach Delay		32.3			60.0			27.3			29.3		
Approach LOS		C			E			C			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		92			218			311			156		
Queue Length 95th (ft)		132			#348			m280			227		
Internal Link Dist (ft)		412			482			859			600		
Turn Bay Length (ft)													
Base Capacity (vph)		473			450			684			597		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.38			0.82			0.67			0.50		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 8 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 37.6		Intersection LOS: D	
Intersection Capacity Utilization 73.9%		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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Washington St & Green St/Glen Rd

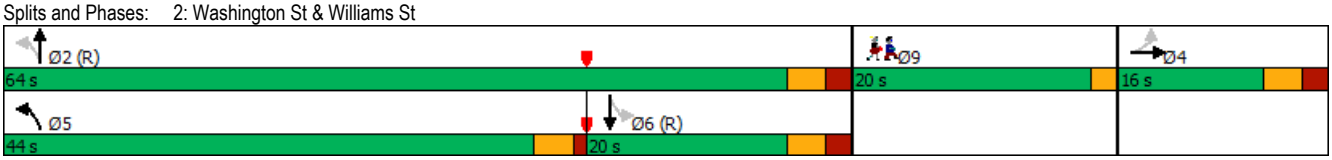


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	55	47	74	0	0	0	410	401	10	12	205	43	
Future Volume (vph)	55	47	74	0	0	0	410	401	10	12	205	43	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00			1.00		
Frt		0.943						0.998			0.978		
Flt Protected		0.985						0.976			0.998		
Satd. Flow (prot)	0	1680	0	0	0	0	0	1609	0	0	1539	0	
Flt Permitted		0.985						0.336			0.940		
Satd. Flow (perm)	0	1680	0	0	0	0	0	554	0	0	1450	0	
Right Turn on Red			Yes			Yes			No			Yes	
Satd. Flow (RTOR)		29									8		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		589			552			722			939		
Travel Time (s)		16.1			15.1			19.7			25.6		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1			7			1			1	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.96	0.96	0.96	0.93	0.93	0.93	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	4%	7%	0%	0%	0%	0%	6%	0%	0%	9%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				0	0	0	0	1	0	0	1	0	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	60	51	80	0	0	0	427	418	10	13	220	46	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	191	0	0	0	0	0	855	0	0	279	0	
Turn Type	Perm	NA					pm+pt	NA		Perm	NA		
Protected Phases		4					5	2			6		9
Permitted Phases	4						2			6			
Detector Phase	4	4					5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0					3.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0					7.0	13.0		13.0	13.0		20.0
Total Split (s)	16.0	16.0					44.0	64.0		20.0	20.0		20.0
Total Split (%)	16.0%	16.0%					44.0%	64.0%		20.0%	20.0%		20%
Maximum Green (s)	11.0	11.0					40.0	59.0		15.0	15.0		18.0
Yellow Time (s)	3.0	3.0					3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0					1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Minimum Gap (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None					Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													11.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		10.9						63.1			19.1		
Actuated g/C Ratio		0.11						0.63			0.19		
v/c Ratio		0.91						1.12			0.99		
Control Delay		82.4						94.1			92.8		
Queue Delay		0.0						0.0			0.0		
Total Delay		82.4						94.1			92.8		
LOS		F						F			F		
Approach Delay		82.4						94.1			92.8		
Approach LOS		F						F			F		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		104						~574			~197		
Queue Length 95th (ft)		#236						#813			m#368		
Internal Link Dist (ft)		509			472			642			859		
Turn Bay Length (ft)													
Base Capacity (vph)		210						761			283		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.91						1.12			0.99		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 86 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 92.1		Intersection LOS: F	
Intersection Capacity Utilization 81.0%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Washington St & Williams St

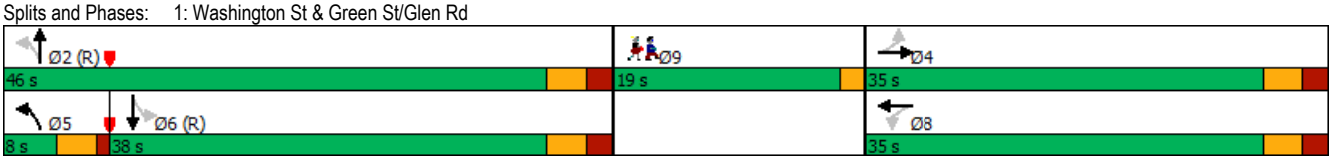


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	23	91	33	57	257	14	59	334	60	6	222	30	
Future Volume (vph)	23	91	33	57	257	14	59	334	60	6	222	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor					1.00			1.00			1.00		
Frt		0.970			0.994			0.982			0.984		
Flt Protected		0.992			0.991			0.994			0.999		
Satd. Flow (prot)	0	1781	0	0	1648	0	0	1557	0	0	1535	0	
Flt Permitted		0.873			0.899			0.913			0.989		
Satd. Flow (perm)	0	1568	0	0	1495	0	0	1430	0	0	1520	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		492			562			939			680		
Travel Time (s)		13.4			15.3			25.6			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)						1			1			1	
Peak Hour Factor	0.79	0.79	0.79	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	9%	2%	0%	0%	2%	0%	3%	8%	0%	0%	10%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				1	1	1	1	1	1	1	1	1	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	29	115	42	66	295	16	61	348	63	7	261	35	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	186	0	0	377	0	0	472	0	0	303	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA		
Protected Phases		4			8		5	2			6		9
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0		13.0	13.0		8.0	13.0		13.0	13.0		19.0
Total Split (s)	35.0	35.0		35.0	35.0		8.0	46.0		38.0	38.0		19.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		8.0%	46.0%		38.0%	38.0%		19%
Maximum Green (s)	30.0	30.0		30.0	30.0		4.0	41.0		33.0	33.0		17.0
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)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None		None	None		Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		27.8			27.8			47.0			39.0		
Actuated g/C Ratio		0.28			0.28			0.47			0.39		
v/c Ratio		0.43			0.91			0.70			0.51		
Control Delay		32.4			61.9			28.1			29.8		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		32.4			61.9			28.1			29.8		
LOS		C			E			C			C		
Approach Delay		32.4			61.9			28.1			29.8		
Approach LOS		C			E			C			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		94			224			321			160		
Queue Length 95th (ft)		135			#361			m278			233		
Internal Link Dist (ft)		412			482			859			600		
Turn Bay Length (ft)													
Base Capacity (vph)		470			448			676			593		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.40			0.84			0.70			0.51		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 8 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 38.6		Intersection LOS: D	
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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Washington St & Green St/Glen Rd

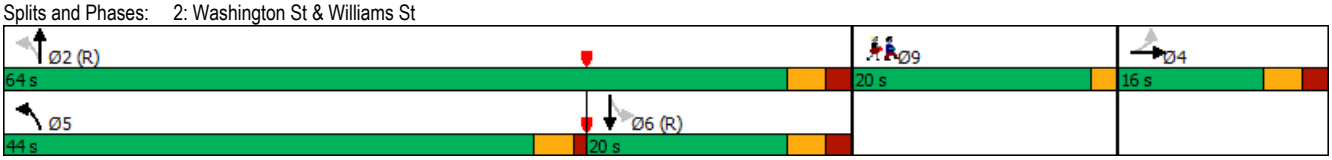


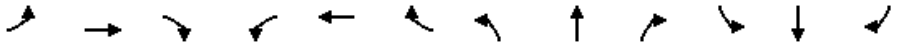
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	56	48	76	0	0	0	420	411	10	12	210	44	
Future Volume (vph)	56	48	76	0	0	0	420	411	10	12	210	44	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00			1.00		
Frt		0.943						0.998			0.978		
Flt Protected		0.985						0.976			0.998		
Satd. Flow (prot)	0	1680	0	0	0	0	0	1609	0	0	1539	0	
Flt Permitted		0.985						0.322			0.940		
Satd. Flow (perm)	0	1680	0	0	0	0	0	531	0	0	1450	0	
Right Turn on Red			Yes			Yes			No			Yes	
Satd. Flow (RTOR)		30									8		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		589			552			722			939		
Travel Time (s)		16.1			15.1			19.7			25.6		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1			7			1			1	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.96	0.96	0.96	0.93	0.93	0.93	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	4%	7%	0%	0%	0%	0%	6%	0%	0%	9%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				0	0	0	0	1	0	0	1	0	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	61	52	83	0	0	0	438	428	10	13	226	47	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	196	0	0	0	0	0	876	0	0	286	0	
Turn Type	Perm	NA					pm+pt	NA		Perm	NA		
Protected Phases		4					5	2			6		9
Permitted Phases	4						2			6			
Detector Phase	4	4					5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0					3.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0					7.0	13.0		13.0	13.0		20.0
Total Split (s)	16.0	16.0					44.0	64.0		20.0	20.0		20.0
Total Split (%)	16.0%	16.0%					44.0%	64.0%		20.0%	20.0%		20%
Maximum Green (s)	11.0	11.0					40.0	59.0		15.0	15.0		18.0
Yellow Time (s)	3.0	3.0					3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0					1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Minimum Gap (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None					Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													11.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		11.0						63.0			19.0		
Actuated g/C Ratio		0.11						0.63			0.19		
v/c Ratio		0.93						1.16			1.01		
Control Delay		84.9						109.1			99.3		
Queue Delay		0.0						0.0			0.0		
Total Delay		84.9						109.1			99.3		
LOS		F						F			F		
Approach Delay		84.9						109.1			99.3		
Approach LOS		F						F			F		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		107						~609			~205		
Queue Length 95th (ft)		#244						#848			m#378		
Internal Link Dist (ft)		509			472			642			859		
Turn Bay Length (ft)													
Base Capacity (vph)		211						754			282		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.93						1.16			1.01		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 86 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 103.6		Intersection LOS: F	
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Washington St & Williams St



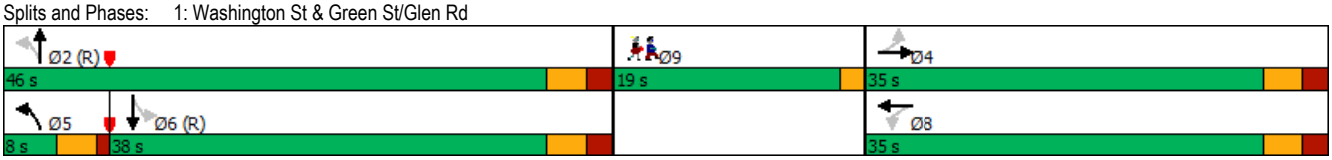


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (vph)	23	91	35	59	257	14	66	343	64	6	225	30	
Future Volume (vph)	23	91	35	59	257	14	66	343	64	6	225	30	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor					1.00			1.00			1.00		
Frt		0.968			0.994			0.982			0.985		
Flt Protected		0.992			0.991			0.993			0.999		
Satd. Flow (prot)	0	1778	0	0	1648	0	0	1557	0	0	1537	0	
Flt Permitted		0.875			0.894			0.891			0.989		
Satd. Flow (perm)	0	1568	0	0	1487	0	0	1397	0	0	1521	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		492			562			260			680		
Travel Time (s)		13.4			15.3			7.1			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)						1			1			1	
Peak Hour Factor	0.79	0.79	0.79	0.87	0.87	0.87	0.96	0.96	0.96	0.85	0.85	0.85	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	9%	2%	0%	0%	2%	0%	3%	8%	0%	0%	10%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				1	1	1	1	1	1	1	1	1	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	29	115	44	68	295	16	69	357	67	7	265	35	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	188	0	0	379	0	0	493	0	0	307	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA		
Protected Phases		4			8		5	2			6		9
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0		13.0	13.0		8.0	13.0		13.0	13.0		19.0
Total Split (s)	35.0	35.0		35.0	35.0		8.0	46.0		38.0	38.0		19.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		8.0%	46.0%		38.0%	38.0%		19%
Maximum Green (s)	30.0	30.0		30.0	30.0		4.0	41.0		33.0	33.0		17.0
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)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None		None	None		Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		27.9			27.9			46.9			38.9		
Actuated g/C Ratio		0.28			0.28			0.47			0.39		
v/c Ratio		0.43			0.91			0.75			0.52		
Control Delay		32.3			62.3			29.3			30.1		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		32.3			62.3			29.3			30.1		
LOS		C			E			C			C		
Approach Delay		32.3			62.3			29.3			30.1		
Approach LOS		C			E			C			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		95			226			336			163		
Queue Length 95th (ft)		135			#365			m296			236		
Internal Link Dist (ft)		412			482			180			600		
Turn Bay Length (ft)													
Base Capacity (vph)		470			446			659			590		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.40			0.85			0.75			0.52		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 8 (8%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 39.1		Intersection LOS: D	
Intersection Capacity Utilization 76.9%		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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Washington St & Green St/Glen Rd

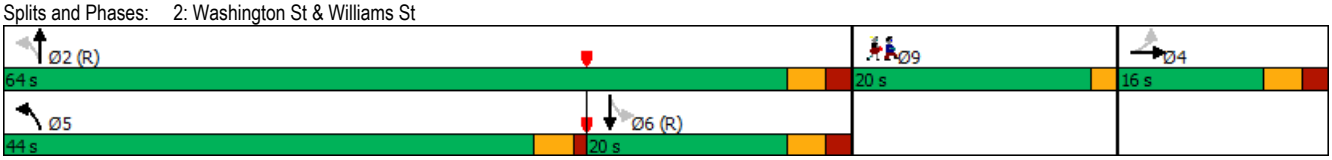


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	57	48	76	0	0	0	420	413	10	12	214	44	
Future Volume (vph)	57	48	76	0	0	0	420	413	10	12	214	44	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00			1.00		
Frt		0.943						0.998			0.978		
Flt Protected		0.985						0.976			0.998		
Satd. Flow (prot)	0	1680	0	0	0	0	0	1609	0	0	1539	0	
Flt Permitted		0.985						0.316			0.940		
Satd. Flow (perm)	0	1680	0	0	0	0	0	521	0	0	1449	0	
Right Turn on Red			Yes			Yes			No			Yes	
Satd. Flow (RTOR)		29									8		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		589			552			722			680		
Travel Time (s)		16.1			15.1			19.7			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1			7			1			1	
Peak Hour Factor	0.92	0.92	0.92	0.25	0.25	0.25	0.96	0.96	0.96	0.93	0.93	0.93	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	4%	7%	0%	0%	0%	0%	6%	0%	0%	9%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				0	0	0	0	1	0	0	1	0	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	62	52	83	0	0	0	438	430	10	13	230	47	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	197	0	0	0	0	0	878	0	0	290	0	
Turn Type	Perm	NA					pm+pt	NA		Perm	NA		
Protected Phases		4					5	2			6		9
Permitted Phases	4						2			6			
Detector Phase	4	4					5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0					3.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0					7.0	13.0		13.0	13.0		20.0
Total Split (s)	16.0	16.0					44.0	64.0		20.0	20.0		20.0
Total Split (%)	16.0%	16.0%					44.0%	64.0%		20.0%	20.0%		20%
Maximum Green (s)	11.0	11.0					40.0	59.0		15.0	15.0		18.0
Yellow Time (s)	3.0	3.0					3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0					1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Minimum Gap (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None					Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													11.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		11.0						63.0			19.0		
Actuated g/C Ratio		0.11						0.63			0.19		
v/c Ratio		0.94						1.17			1.03		
Control Delay		87.2						111.8			102.5		
Queue Delay		0.0						0.0			0.0		
Total Delay		87.2						111.8			102.5		
LOS		F						F			F		
Approach Delay		87.2						111.8			102.5		
Approach LOS		F						F			F		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		108						~615			~210		
Queue Length 95th (ft)		#247						#853			m#384		
Internal Link Dist (ft)		509			472			642			600		
Turn Bay Length (ft)													
Base Capacity (vph)		210						752			282		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.94						1.17			1.03		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 86 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 106.3		Intersection LOS: F	
Intersection Capacity Utilization 83.0%		ICU Level of Service E	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Washington St & Williams St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	20	453	3	7	312
Future Volume (Veh/h)	4	20	453	3	7	312
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	22	492	3	8	339
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			680			260
pX, platoon unblocked	0.88					
vC, conflicting volume	848	494			495	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	762	494			495	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			99	
cM capacity (veh/h)	327	576			1069	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	495	347
Volume Left	4	0	8
Volume Right	22	3	0
cSH	515	1700	1069
Volume to Capacity	0.05	0.29	0.01
Queue Length 95th (ft)	4	0	1
Control Delay (s)	12.4	0.0	0.3
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	0.3
Approach LOS	B		

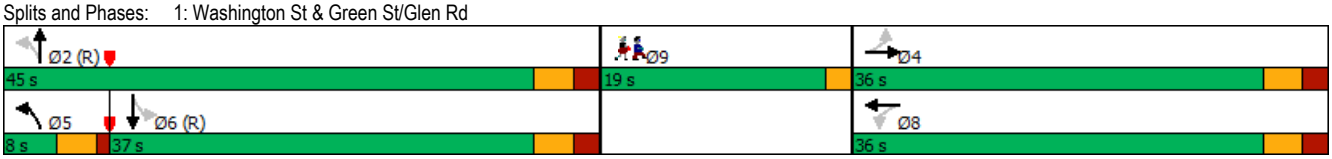
Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		34.0%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	40	129	47	57	102	10	38	287	24	10	283	39	
Future Volume (vph)	40	129	47	57	102	10	38	287	24	10	283	39	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00						1.00					
Frt		0.971			0.992			0.991			0.984		
Flt Protected		0.991			0.983			0.995			0.999		
Satd. Flow (prot)	0	1619	0	0	1658	0	0	1617	0	0	1616	0	
Flt Permitted		0.905			0.697			0.937			0.987		
Satd. Flow (perm)	0	1479	0	0	1176	0	0	1522	0	0	1597	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		492			562			939			680		
Travel Time (s)		13.4			15.3			25.6			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1						2				
Peak Hour Factor	0.77	0.77	0.77	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	4%	4%	0%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	52	168	61	58	104	10	39	293	24	10	286	39	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	281	0	0	172	0	0	356	0	0	335	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA		
Protected Phases		4			8		5	2			6		9
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0		13.0	13.0		8.0	13.0		13.0	13.0		19.0
Total Split (s)	36.0	36.0		36.0	36.0		8.0	45.0		37.0	37.0		19.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		8.0%	45.0%		37.0%	37.0%		19%
Maximum Green (s)	31.0	31.0		31.0	31.0		4.0	40.0		32.0	32.0		17.0
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)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None		None	None		Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		23.7			23.7			51.1			43.1		
Actuated g/C Ratio		0.24			0.24			0.51			0.43		
v/c Ratio		0.80			0.62			0.46			0.49		
Control Delay		52.5			42.9			31.0			27.0		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		52.5			42.9			31.0			27.0		
LOS		D			D			C			C		
Approach Delay		52.5			42.9			31.0			27.0		
Approach LOS		D			D			C			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		169			98			178			162		
Queue Length 95th (ft)		195			154			m204			282		
Internal Link Dist (ft)		412			482			859			600		
Turn Bay Length (ft)													
Base Capacity (vph)		458			364			780			688		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.61			0.47			0.46			0.49		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 36.9		Intersection LOS: D	
Intersection Capacity Utilization 58.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Washington St & Green St/Glen Rd



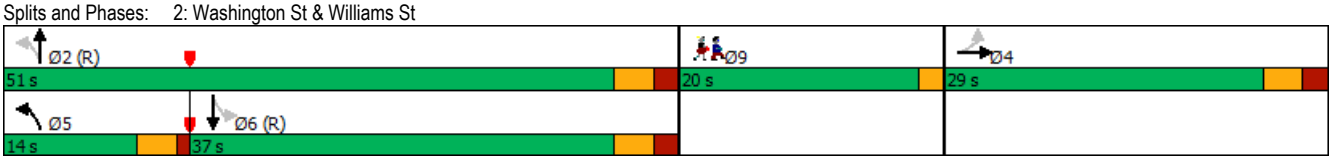
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	35	167	237	0	0	0	136	306	25	37	338	28	
Future Volume (vph)	35	167	237	0	0	0	136	306	25	37	338	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00					
Frt		0.927						0.993			0.991		
Flt Protected		0.996						0.986			0.995		
Satd. Flow (prot)	0	1727	0	0	0	0	0	1611	0	0	1622	0	
Flt Permitted		0.996						0.603			0.923		
Satd. Flow (perm)	0	1727	0	0	0	0	0	985	0	0	1505	0	
Right Turn on Red			Yes			Yes			No			Yes	
Satd. Flow (RTOR)		56									4		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		589			552			722			939		
Travel Time (s)		16.1			15.1			19.7			25.6		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1			1			2				
Peak Hour Factor	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	4%	0%	0%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				0	0	0	0	1	0	0	1	0	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	36	170	242	0	0	0	145	326	27	38	348	29	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	448	0	0	0	0	0	498	0	0	415	0	
Turn Type	Perm	NA					pm+pt	NA		Perm	NA		
Protected Phases		4					5	2			6		9
Permitted Phases	4						2			6			
Detector Phase	4	4					5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0					3.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0					7.0	13.0		13.0	13.0		20.0
Total Split (s)	29.0	29.0					14.0	51.0		37.0	37.0		20.0
Total Split (%)	29.0%	29.0%					14.0%	51.0%		37.0%	37.0%		20%
Maximum Green (s)	24.0	24.0					10.0	46.0		32.0	32.0		18.0
Yellow Time (s)	3.0	3.0					3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0					1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Minimum Gap (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None					Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													11.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		24.0						50.0			36.0		
Actuated g/C Ratio		0.24						0.50			0.36		
v/c Ratio		0.98						0.91			0.76		
Control Delay		72.0						46.4			29.0		
Queue Delay		0.0						0.0			0.0		
Total Delay		72.0						46.4			29.0		
LOS		E						D			C		
Approach Delay		72.0						46.4			29.0		
Approach LOS		E						D			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		254						240			109		
Queue Length 95th (ft)		#458						#522			#394		
Internal Link Dist (ft)		509			472			642			859		
Turn Bay Length (ft)													
Base Capacity (vph)		457						548			544		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		0.98						0.91			0.76		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 54 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 49.5		Intersection LOS: D	
Intersection Capacity Utilization 84.4%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 2: Washington St & Williams St

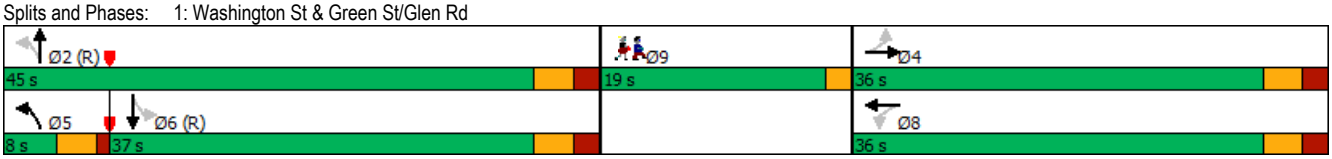


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	41	132	48	58	105	10	39	294	25	10	290	40	
Future Volume (vph)	41	132	48	58	105	10	39	294	25	10	290	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00						1.00					
Frt		0.971			0.992			0.990			0.984		
Flt Protected		0.991			0.984			0.995			0.999		
Satd. Flow (prot)	0	1619	0	0	1660	0	0	1615	0	0	1616	0	
Flt Permitted		0.902			0.695			0.936			0.987		
Satd. Flow (perm)	0	1474	0	0	1172	0	0	1519	0	0	1597	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		492			562			939			680		
Travel Time (s)		13.4			15.3			25.6			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1						2				
Peak Hour Factor	0.77	0.77	0.77	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	4%	4%	0%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	53	171	62	59	107	10	40	300	26	10	293	40	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	286	0	0	176	0	0	366	0	0	343	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA		
Protected Phases		4			8		5	2			6		9
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0		13.0	13.0		8.0	13.0		13.0	13.0		19.0
Total Split (s)	36.0	36.0		36.0	36.0		8.0	45.0		37.0	37.0		19.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		8.0%	45.0%		37.0%	37.0%		19%
Maximum Green (s)	31.0	31.0		31.0	31.0		4.0	40.0		32.0	32.0		17.0
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)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None		None	None		Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		24.0			24.0			50.8			42.8		
Actuated g/C Ratio		0.24			0.24			0.51			0.43		
v/c Ratio		0.81			0.63			0.47			0.50		
Control Delay		53.2			43.3			31.1			27.5		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		53.2			43.3			31.1			27.5		
LOS		D			D			C			C		
Approach Delay		53.2			43.3			31.1			27.5		
Approach LOS		D			D			C			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		172			100			184			168		
Queue Length 95th (ft)		200			158			m202			290		
Internal Link Dist (ft)		412			482			859			600		
Turn Bay Length (ft)													
Base Capacity (vph)		456			363			774			684		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.63			0.48			0.47			0.50		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 37.3		Intersection LOS: D	
Intersection Capacity Utilization 59.9%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Washington St & Green St/Glen Rd

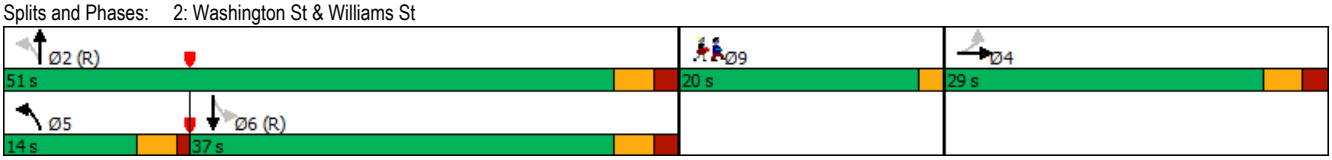


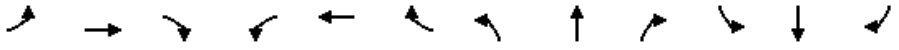
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	36	171	243	0	0	0	139	314	26	38	347	29	
Future Volume (vph)	36	171	243	0	0	0	139	314	26	38	347	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00					
Frt		0.927						0.993			0.991		
Flt Protected		0.996						0.986			0.995		
Satd. Flow (prot)	0	1727	0	0	0	0	0	1611	0	0	1622	0	
Flt Permitted		0.996						0.592			0.921		
Satd. Flow (perm)	0	1727	0	0	0	0	0	968	0	0	1502	0	
Right Turn on Red			Yes			Yes			No			Yes	
Satd. Flow (RTOR)		56									4		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		589			552			722			939		
Travel Time (s)		16.1			15.1			19.7			25.6		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1			1			2				
Peak Hour Factor	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	4%	0%	0%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				0	0	0	0	1	0	0	1	0	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	37	174	248	0	0	0	148	334	28	39	358	30	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	459	0	0	0	0	0	510	0	0	427	0	
Turn Type	Perm	NA					pm+pt	NA		Perm	NA		
Protected Phases		4					5	2			6		9
Permitted Phases	4						2			6			
Detector Phase	4	4					5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0					3.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0					7.0	13.0		13.0	13.0		20.0
Total Split (s)	29.0	29.0					14.0	51.0		37.0	37.0		20.0
Total Split (%)	29.0%	29.0%					14.0%	51.0%		37.0%	37.0%		20%
Maximum Green (s)	24.0	24.0					10.0	46.0		32.0	32.0		18.0
Yellow Time (s)	3.0	3.0					3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0					1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Minimum Gap (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None					Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													11.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		24.0						50.0			36.0		
Actuated g/C Ratio		0.24						0.50			0.36		
v/c Ratio		1.00						0.94			0.79		
Control Delay		77.9						52.4			30.7		
Queue Delay		0.0						0.0			0.0		
Total Delay		77.9						52.4			30.7		
LOS		E						D			C		
Approach Delay		77.9						52.4			30.7		
Approach LOS		E						D			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		~266						~255			113		
Queue Length 95th (ft)		#474						#545			#415		
Internal Link Dist (ft)		509			472			642			859		
Turn Bay Length (ft)													
Base Capacity (vph)		457						542			543		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		1.00						0.94			0.79		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 54 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 54.1		Intersection LOS: D	
Intersection Capacity Utilization 86.3%		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: 2: Washington St & Williams St



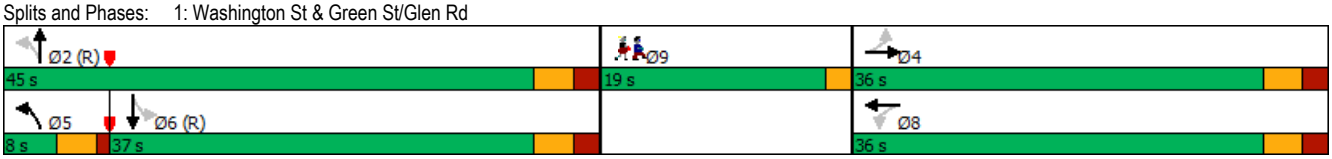


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	41	132	56	63	105	10	45	302	30	10	302	40	
Future Volume (vph)	41	132	56	63	105	10	45	302	30	10	302	40	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00					
Frt		0.967			0.993			0.989			0.985		
Flt Protected		0.991			0.983			0.994			0.999		
Satd. Flow (prot)	0	1612	0	0	1660	0	0	1612	0	0	1618	0	
Flt Permitted		0.906			0.667			0.929			0.987		
Satd. Flow (perm)	0	1474	0	0	1126	0	0	1507	0	0	1598	0	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		492			562			260			680		
Travel Time (s)		13.4			15.3			7.1			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1						2				
Peak Hour Factor	0.77	0.77	0.77	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	4%	4%	0%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)	1	1	1	1	1	1	1	1	1	1	1	1	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	53	171	73	64	107	10	46	308	31	10	305	40	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	297	0	0	181	0	0	385	0	0	355	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA		
Protected Phases		4			8		5	2			6		9
Permitted Phases	4			8			2			6			
Detector Phase	4	4		8	8		5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		4.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0		13.0	13.0		8.0	13.0		13.0	13.0		19.0
Total Split (s)	36.0	36.0		36.0	36.0		8.0	45.0		37.0	37.0		19.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		8.0%	45.0%		37.0%	37.0%		19%
Maximum Green (s)	31.0	31.0		31.0	31.0		4.0	40.0		32.0	32.0		17.0
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)	2.0	2.0		2.0	2.0		1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Minimum Gap (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0		0.2
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None		None	None		Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		24.5			24.5			50.3			42.3		
Actuated g/C Ratio		0.24			0.24			0.50			0.42		
v/c Ratio		0.82			0.66			0.51			0.53		
Control Delay		53.9			44.8			31.2			28.4		
Queue Delay		0.0			0.0			0.0			0.0		
Total Delay		53.9			44.8			31.2			28.4		
LOS		D			D			C			C		
Approach Delay		53.9			44.8			31.2			28.4		
Approach LOS		D			D			C			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		178			103			192			178		
Queue Length 95th (ft)		208			165			m216			302		
Internal Link Dist (ft)		412			482			180			600		
Turn Bay Length (ft)													
Base Capacity (vph)		456			349			760			675		
Starvation Cap Reductn		0			0			0			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.65			0.52			0.51			0.53		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 40 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 37.9		Intersection LOS: D	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Washington St & Green St/Glen Rd

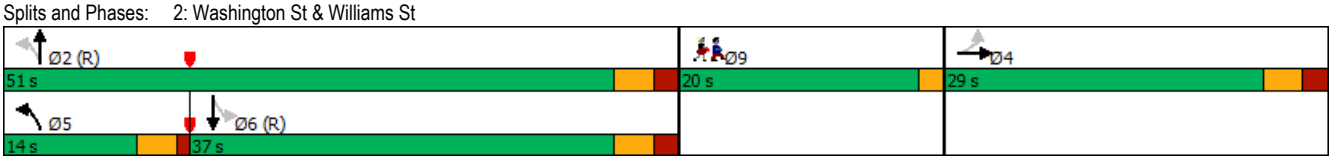


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Lane Configurations													
Traffic Volume (vph)	36	171	243	0	0	0	139	320	26	38	352	29	
Future Volume (vph)	36	171	243	0	0	0	139	320	26	38	352	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	
Grade (%)		0%			0%			0%			0%		
Storage Length (ft)	0		0	0		0	0		0	0		0	
Storage Lanes	0		0	0		0	0		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		0.99						1.00					
Frt		0.927						0.993			0.991		
Flt Protected		0.996						0.986			0.996		
Satd. Flow (prot)	0	1727	0	0	0	0	0	1611	0	0	1624	0	
Flt Permitted		0.996						0.590			0.921		
Satd. Flow (perm)	0	1727	0	0	0	0	0	964	0	0	1502	0	
Right Turn on Red			Yes			Yes			No			Yes	
Satd. Flow (RTOR)		56									4		
Link Speed (mph)		25			25			25			25		
Link Distance (ft)		589			552			722			680		
Travel Time (s)		16.1			15.1			19.7			18.5		
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)			1			1			2				
Peak Hour Factor	0.98	0.98	0.98	0.25	0.25	0.25	0.94	0.94	0.94	0.97	0.97	0.97	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	2%	4%	0%	0%	4%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	
Parking (#/hr)				0	0	0	0	1	0	0	1	0	
Mid-Block Traffic (%)		0%			0%			0%			0%		
Adj. Flow (vph)	37	174	248	0	0	0	148	340	28	39	363	30	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	459	0	0	0	0	0	516	0	0	432	0	
Turn Type	Perm	NA					pm+pt	NA		Perm	NA		
Protected Phases		4					5	2			6		9
Permitted Phases	4						2			6			
Detector Phase	4	4					5	2		6	6		
Switch Phase													
Minimum Initial (s)	8.0	8.0					3.0	8.0		8.0	8.0		5.0
Minimum Split (s)	13.0	13.0					7.0	13.0		13.0	13.0		20.0
Total Split (s)	29.0	29.0					14.0	51.0		37.0	37.0		20.0
Total Split (%)	29.0%	29.0%					14.0%	51.0%		37.0%	37.0%		20%
Maximum Green (s)	24.0	24.0					10.0	46.0		32.0	32.0		18.0
Yellow Time (s)	3.0	3.0					3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0					1.0	2.0		2.0	2.0		0.0
Lost Time Adjust (s)		0.0						0.0			0.0		
Total Lost Time (s)		5.0						5.0			5.0		
Lead/Lag							Lead			Lag	Lag		
Lead-Lag Optimize?							Yes			Yes	Yes		
Vehicle Extension (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Minimum Gap (s)	2.0	2.0					2.0	2.0		2.0	2.0		2.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0		0.0	0.0		0.0
Recall Mode	None	None					Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													11.0
Pedestrian Calls (#/hr)													100
Act Effct Green (s)		24.0						50.0			36.0		
Actuated g/C Ratio		0.24						0.50			0.36		
v/c Ratio		1.00						0.96			0.80		
Control Delay		77.9						55.4			31.5		
Queue Delay		0.0						0.0			0.0		
Total Delay		77.9						55.4			31.5		
LOS		E						E			C		
Approach Delay		77.9						55.4			31.5		
Approach LOS		E						E			C		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø9
Queue Length 50th (ft)		~266						~266			120		
Queue Length 95th (ft)		#474						#554			#424		
Internal Link Dist (ft)		509			472			642			600		
Turn Bay Length (ft)													
Base Capacity (vph)		457						540			543		
Starvation Cap Reductn		0						0			0		
Spillback Cap Reductn		0						0			0		
Storage Cap Reductn		0						0			0		
Reduced v/c Ratio		1.00						0.96			0.80		

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 54 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 55.4		Intersection LOS: E	
Intersection Capacity Utilization 86.9%		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: 2: Washington St & Williams St



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	19	358	6	25	396
Future Volume (Veh/h)	5	19	358	6	25	396
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	21	389	7	27	430
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			680			260
pX, platoon unblocked	0.90	0.92			0.92	
vC, conflicting volume	876	392			396	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	611	300			304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	97			98	
cM capacity (veh/h)	400	682			1160	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	396	457
Volume Left	5	0	27
Volume Right	21	7	0
cSH	601	1700	1160
Volume to Capacity	0.04	0.23	0.02
Queue Length 95th (ft)	3	0	2
Control Delay (s)	11.3	0.0	0.7
Lane LOS	B		A
Approach Delay (s)	11.3	0.0	0.7
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		51.3%	ICU Level of Service A
Analysis Period (min)		15	

Appendix D

Climate Resiliency Checklist

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

Submitted: 06/05/2019 10:59:16

A.1 - Project Information

Project Name:	3368 Washington Street			
Project Address:	3368 Washington Street			
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)			
Filing Contact:	Geoff Starsiak	Epsilon Associates	gstarsiak@epsilonassociates.com	978-897-7100
Is MEPA approval required?	No	MEPA date:		

A.2 - Project Team

Owner / Developer:	Washington Pine LLC
Architect:	RODE Architects
Engineer:	Cosentini
Sustainability / LEED:	VvS Architects & Consultants
Permitting:	Epsilon Associates
Construction Management:	

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Office, Residential
List the First Floor Uses:	Office, Lobbies, Parking
List any Critical Site Infrastructure and or Building Uses:	

Site and Building:

Site Area (SF):	40220	Building Area (SF):	169500
Building Height (Ft):	69	Building Height (Stories):	6
Existing Site Elevation – Low (Ft BCB):	39	Existing Site Elevation – High (Ft BCB):	61
Proposed Site Elevation – Low (Ft BCB):	39	Proposed Site Elevation – High (Ft BCB):	61
Proposed First Floor Elevation (Ft BCB):	40.4	Below grade spaces/levels (#):	1

Article 37 Green Building:

LEED Version - Rating System:	LEED v4 BD+C	LEED Certification:	No
Proposed LEED rating:	Silver	Proposed LEED point score (Pts.):	52

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

Building Envelope:

When reporting R values, differentiate between R discontinuous and R continuous. For example, use "R13" to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

Roof:	40	Exposed Floor :	16.7
Foundation Wall:	7.5	Slab Edge (at or below grade):	10-15

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:		Wall & Spandrel Assembly Value:	0.044
Area of Framed & Insulated / Standard Wall:	75	Wall Value:	20
Area of Vision Window:	25	Window Glazing Assembly Value:	0.36
		Window Glazing SHGC:	0.32
Area of Doors:	<1	Door Assembly Value :	0.77

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Whole building energy simulation with 8,760 hour bin weather data		
Annual Electric (kWh):	1100000	Peak Electric (kW):	1500
Annual Heating (MMbtu/hr):	1200	Peak Heating (MMbtu):	3.2
Annual Cooling (Tons/hr):	200000	Peak Cooling (Tons):	350
Energy Use - Below ASHRAE 90.1 - 2013 (%):	30	Have the local utilities reviewed the building energy performance?:	No
Energy Use - Below Mass. Code (%):	30	Energy Use Intensity (kBtu/SF):	30.5

Back-up / Emergency Power System

Electrical Generation Output (kW):	750	Number of Power Units:	1
System Type (kW):	Combustion engine	Fuel Source:	fuel oil

Emergency and Critical System Loads (in the event of a service interruption)

Electric (kW):	750	Heating (MMbtu/hr):	2
		Cooling (Tons/hr):	0

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing greenhouse gas emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon-neutrality by 2050 the performance of new buildings will need to progressively improve to carbon net zero and net positive.

B.1 – GHG Emissions - Design Conditions

For this filing - Annual Building GHG Emissions (Tons): 881

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

The energy model, following ASHRAE App G, has been used as a design tool to test various design options for envelope, glazing, lighting & HVAC considerations.

Describe building specific passive energy efficiency measures including orientation, massing, building envelop, and systems:

High performance building envelope, access to outdoor spaces, compact massing.

Describe building specific active energy efficiency measures including high performance equipment, controls, fixtures, and systems:

High performance HVAC plant, lighting controls, LPD reductions, and DHW savings.

Describe building specific load reduction strategies including on-site renewable energy, clean energy, and storage systems:

The proponent is studying the incorporation of solar PV.

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

No area or district scale energy systems are available at the Project site.

Describe any energy efficiency assistance or support provided or to be provided to the project:

The Project will work with Eversource to determine what programs and incentives will be available for the Project.

B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

The Project will include space to allow for building mechanical systems to be swapped in the future as more efficient equipment is designed and when the systems installed during construction need to be replaced. In addition, the project will have a high performance building envelope to reduce the need to mechanical equipment, and the design team is studying Passive House design measures than can be incorporated. Additional measures, such as full electrification, are being studied for feasibility.

C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low (Deg.):	7	Temperature Range - High (Deg.):	91
Annual Heating Degree Days:	5621	Annual Cooling Degree Days	2938

What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90° (#):	60	Days - Above 100° (#):	30
Number of Heatwaves / Year (#):	6	Average Duration of Heatwave (Days):	5

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

The building will include high-albedo rooftops and green roofs.

C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

HVAC systems have been sized to design weather factors with safety factors included.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

High performance building envelope. Access to exterior spaces.

D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25”. There is a significant probability that this will increase to at least 6” by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

Boston Planning & Development Agency

Climate Resiliency Report Summary

boston planning & development agency

D.1 – Extreme Precipitation - Design Conditions

What is the project design precipitation level? (In. / 24 Hours)	6

Describe all building and site measures for reducing storm water run-off:

The project includes green roofs and will include measures to strive to infiltrate 1.25" of stormwater from a 24-hour storm event.

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

The project includes green roofs and will include measures to strive to infiltrate 1.25" of stormwater from a 24-hour storm event.

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA Special Flood Hazard Area?	No	What Zone:	
What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)?			
Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see SLR-FHA online map)?	No		

If you answered YES to either of the above questions, please complete the following questions.
Otherwise you have completed the questionnaire; thank you!

E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

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Climate Resiliency Report Summary

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What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)?

What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)?

First Floor Elevation (Ft BCB):

What are the Site Elevations at Building (Ft BCB)?

What is the Accessible Route Elevation (Ft BCB)?

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

Thank you for completing the Boston Climate Change Checklist!

For questions or comments about this checklist or Climate Change best practices, please contact: John.Dalzell@boston.gov

Appendix E

Preliminary Energy Model Results

APPENDIX E PRELIMINARY ENERGY MODEL RESULTS

Preliminary Energy Conservation/GHG Emissions Reduction Approach

The Project will target a 15% improvement in the proposed building performance rating for new buildings compared with the baseline building performance rating, which surpasses the 10% that will be required by the revised Stretch Code under Appendix AA 103.2. The baseline performance rating was calculated according to the building performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2013 (with errata but without addenda 1) through a computer simulation model which included every building on the Project site.

Preliminary Energy Model

Appendix G of Standard 90.1-2013 requires that the energy analysis completed for the project's performance rating method include all energy costs associated with the building project. The Project team has also made provisions to comply with all the mandatory requirements of ASHRAE 90.1 – 2013, namely Sections 5.4, 6.4, 7.4, 8.4, 9.4, and 10.4), which is a prerequisite to complying via the modeling protocol for both energy code compliance and LEED certification.

The 15% energy reduction target will be met by evaluating materials to create a high performing building envelope, efficient mechanical and ventilation equipment, and a lighting design with high efficacy.

The whole building design as evaluated through the parameters listed below is projected to reduce energy usage from the baseline by 36%, or 369 tons of CO_2.

Energy Efficiency Measures

A list of inputs to the energy model has been provided in Table 1 below.

Thermal Envelope

The thermal envelope will be designed to exceed the prescriptive requirements for Climate Zone 5A (Boston) of ASHRAE 90.1-2013 in order to reduce solar gains and reduce heat loss. Proper envelope detailing will ensure the mechanical equipment is properly sized for the expected loads.

Roof insulation was evaluated to perform at R-40, or 8 inches of rigid insulation for all space types. Soffit and exposed floors will also input with R-35 insulation. Both the roof and floor targets exceed the baseline of R-30.

Wall insulation will be applied continuously to reduce thermal bridging from material penetrations or high conductivity materials. Additional interior stud back up will enable batt insulation to supplement the exterior cladding. In this iteration of the energy model, R-20 continuous insulation was applied throughout the Project.

Glazing can be a source of both high solar gains and heat loss. The proposed glazing percentage of 25% does not exceed the code baseline of 40%. Energy use is further mitigated through the use of high efficiency glazing and framing. A U-value of 0.36 exceeds the baseline of 0.42, and an SHGC of 0.32 reduces solar gain from the baseline value of 0.40.

Heating, Ventilating, and Air Conditioning

All mechanical systems will be selected to exceed the minimum efficiency requirements of ASHRAE 90.1-2013 Section 6. Heat recovery will be employed wherever possible to reduce the energy required to condition the ventilation air.

In the residential units, high efficiency variable speed electric screw chillers with condensing gas fired boilers will be utilized to heat and cool via 4-pipe fan coils. Condensing domestic water heaters will supply the domestic hot water. In addition, all domestic hot water fixtures can be specified to be at least 20% below the LEED baseline flowrates. Ventilation will be provided through a central energy recovery ventilator equipped with a 75% efficient total energy recovery wheel that preheats and precools the entering outdoor air with toilet exhaust.

Commercial spaces will be served by variable air volume units and back of house spaces by fan coils. The commercial spaces will be provided valved and capped connections, but the tenants will be responsible for distribution systems.

Interior and Exterior Lighting

All common and amenity spaces will be designed to include daylight photocell sensors wherever possible. Vacancy sensors will automatically shut off lighting to spaces within 20 minutes of occupants leaving a common space with enclosed partitions. In addition, high efficacy fixtures will be selected to reduce the connected load by at least 20% in common spaces.

HVAC Alternates: Central Condenser System and Passive House

An alternate HVAC system design with a central condenser water plant was proposed, but would not reduce GHG emissions as significantly as the chilled water plant. In addition, a VRF option can be studied to implement with a Passive House compliant envelope design. VRF technology enables the Project to offset all electric demand via renewable energy sources. In addition to the system selection, lighting loads would need to be reduced to 0.30 W/SF, and triple glazing would be installed. A highly insulated and sealed thermal envelope is a requisite feature, however, the first cost of these features is much higher and has reduced payback.

Table 1 Energy Modeling Inputs

Input Summary	Baseline Case (ASHRAE 90.1-2013, App. G)	Proposed Design
Roof Insulation	R-30 c.i. U-0.032 per Table A2.2.3	R-40 c.i. (all construction types) U-0.025 per Table A2.2.3
Wall Insulation	R-13 + R-10 c.i (metal stud) U-0.055 per Table A3.3.3.1	R-20 ci (all construction types) U-0.044 per Table A3.3.3.1
Windows / Glazing	U-0.42 (fixed) U-0.50 (operable) SHGC-0.40 (both)	U-0.36 (assembly, all construction types) SHGC-0.32 (all construction types)
Window-to-Wall Ratio	same as proposed (residential) 6% (Boathouse)	25%
Temperature Setpoints	Cooling: 75°F Heating: 70°F	Cooling: 75°F Heating: 70°F
Corridor HVAC System	DX RTU with Gas-Fired Furnace and heat recovery (50% Eff.)	DX RTU with Gas-Fired Furnace and heat recovery (75% Eff.)
Corridor Cooling Efficiency	10.8 EER	12 EER
Corridor Heating Efficiency	80% Et Gas Fired Furnace	80% Et Gas Fired Furnace
Residential HVAC System	PTAC - DX with hot water coil	4 pipe fan coil
Residential Cooling Efficiency	9.3 EER	6.1 COP
Residential Heating Efficiency	82% Ec Boiler	95% Ec Boiler
Retail HVAC System	Air Cooled Packaged VAV w/ Hot Water Coils	Air Cooled Packaged VAV w/ Hot Water Coils
Retail Cooling Efficiency	12.2 EER	13 EER
Retail Heating Efficiency	82% Ec Boiler	95% Ec Boiler

Table 1 Energy Modeling Inputs (Continued)

Input Summary	Baseline Case (ASHRAE 90.1-2013, App. G)	Proposed Design
Domestic Hot Water	80% Et Boiler	95% Et Boiler (combi/central system)
Lighting LPD (Space by Space)	0.51 x 90% = 0.46 W/SF (Residential) 0.66 x 90% = 0.594 W/SF (Corridor) 0.69 x 90% = 0.621 W/SF (Stairwell) 1.44 W/SF (Retail) 0.19 x 90% = 0.171 W/SF (Parking) 0.42 (Mechanical) *Vacancy sensors in common spaces *Dimming panels	0.41 W/SF (Residential) 0.45 W/SF (Corridor) 0.60 W/SF (Stairwell) 1.44 W/SF (Retail) 0.095 W/SF (Parking) 0.32 (Mechanical) *Vacancy sensors in common spaces *Dimming panels
Appliances	Standard Efficiency	Energy Star Rated
Bathroom Fans	N/A - exhaust fans included in total system fan energy	N/A - exhaust fans included in total system fan energy
Elevators	same as proposed	Regenerative Drive
Whole Building Energy Model Results		
Electricity Cost [kWh]	$0.185	$0.185
Natural Gas Cost	$1.000	$1.000
Energy Reduction from Baseline	**9,063 MMBTU**	**36.4%**

Clean and Renewable Energy Analysis

The Proponent evaluated the following clean and renewable energy sources as described below: photovoltaic panels; combined heat and power; wind; transpired solar collectors; and solar thermal systems.

Photovoltaic Panels

There are many long-term benefits to photovoltaic panels beyond just reduced electric demand during times of production, or demand shaving when combined with battery storage. Solar energy provides an inexhaustible and import independent energy source. The extensive roof area enables significant solar production. Tradeoffs in terms of area allocation with solar thermal collectors and/or vertical axis wind turbines need to be studied further.

Combined Heat and Power

Cogeneration, or combined heat and power, provides a unique opportunity to reduce electric demand and provide useful heating at the same time. Residential occupancies are conducive to the domestic hot water and thermal patterns that are required to maximize return on investment. Based on the Project's network connection and constant base load, a unit sized at 75 kW would be anticipated. The base load includes, but is not limited to, lighting in corridors and stairwells, supply and exhaust fans for ventilation, and compressors to temper make up air. Thermal energy produced by the system, i.e., lower temperature heat would be utilized to offset the residential domestic hot water load.

In the CHP options, the condensing domestic hot water heaters are supplemented with a CHP system that can provide the entire domestic hot water load. Right sizing is critical for an effective CHP operation to utilize all the waste heat.

For this analysis, cogen units with 55% thermal efficiency and 33% electric production efficiency were studied. Utility costs and maintenance were included in the payback analysis.

If CHP were implemented, the payback is expected to be 9 years as shown in the following table. The network capabilities also need to be confirmed – Eversource has placed minimum threshold limits on other network locations. This would affect operational hours. The shared thermal recovery in a central 4 pipe system could also be problematic in terms of lease and utility structure. As there is only one cogeneration unit provided, it would not be feasible to eliminate or downsize equipment as there is no redundancy.

3368 Washington Street	
Building Area	160,000
Gas Rate ($/Therm)	1.00
CHP Gas Rate	1.00
Electric Rate ($/kWh)	0.185
CHP Capacity (kW)	75.00
CHP Thermal Eff (%)	0.55
Full Load Hours	5,049
Building DHW Load (MMBTU)	1,466
Building DWH Load (Therms)	14,660
Annual DHW Cost without CHP	$(17,878.05)
With CHP Unit	
Annual Gas Consumption (Therms)	42,633
Annual Cost	$(42,633.07)
Annual Heat Recovery (Therms)	23,448
Annual Savings (DWH Cost Avoided)	$17,878.05
Annual Electric Production (kWh)	378,638
Annual Savings	$70,047.94
Net Utility Savings	$45,292.92
Annual Maintenance Cost ($)	$(11,359.13)
Annual AEC Benefit	-
Annual Net Savings	$33,933.79

Annual Net Savings $/SF	0.21
Unit Cost	$300,000.00
Unit Incentive	-
Net Unit Cost	$300,000.00
Simple Payback (years)	**9**

Wind

Small scale vertical axis wind turbines would not need to be oriented towards the prevailing winds. The feasibility of generating electricity from wind sources was assessed and rejected for the following reasons:

There are competing programs for the roof area – mechanical equipment, vegetated roofs, and amenities are all planned. The wind speed in Boston is too low for cost-effective electricity generation. In addition, small vertical axis wind turbines provide insignificant electricity generation relative to total building demand.

Transpired Solar Collectors

Available roof area could be utilized to offset ventilation loads through the implementation of transpired solar collectors. The feasibility of using solar energy to preheat ventilation air was assessed and rejected for the following reasons:

The Project already includes energy recovery wheels to preheat outside air. The energy recovery wheels capture thermal energy, both sensible and latent, from building exhaust that would otherwise be wasted.

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- BEPS Building Energy Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	1727.0	0.0	1443.0	0.0	794.0	0.0	14.0	1012.0	0.0	0.0	0.0	0.0	4990.6
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	1741.0	0.0	0.0	0.0	0.0	0.0	0.0	2331.0	0.0	4072.5
MBTU	1727.0	0.0	1443.0	1741.0	794.0	0.0	14.0	1012.0	0.0	0.0	2331.0	0.0	9063.1

TOTAL SITE ENERGY 9063.06 MBTU 47.9 KBTU/SQFT-YR GROSS-AREA 47.9 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 19044.30 MBTU 100.7 KBTU/SQFT-YR GROSS-AREA 100.7 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.56
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 224
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- BEPU Building Utility Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
KWH	506106.	0.	422854.	0.	232641.	0.	4115.	296529.	0.	0.	0.	0.	1462245.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	17412.	0.	0.	0.	0.	0.	0.	23312.	0.	40725.

TOTAL ELECTRICITY	1462245. KWH	7.731 KWH	/SQFT-YR GROSS-AREA	7.731 KWH	/SQFT-YR NET-AREA
TOTAL NATURAL-GAS	40725. THERM	0.215 THERM	/SQFT-YR GROSS-AREA	0.215 THERM	/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 2.56
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 224
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 0

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	42984.	0.	35909.	0.	0.	0.	745.	24361.	0.	0.	0.	0.	103999.
MAX KW	95.682	0.000	118.845	0.000	0.000	0.000	1.194	35.981	0.000	0.000	0.000	0.000	247.171
DAY/HR	1/21	0/ 0	2/21	0/ 0	0/ 0	0/ 0	31/ 8	2/ 8	0/ 0	0/ 0	0/ 0	0/ 0	31/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	0.000	0.000	1.015	31.630	0.000	0.000	0.000	0.000	
PEAK PCT	38.7	0.0	48.1	0.0	0.0	0.0	0.4	12.8	0.0	0.0	0.0	0.0	
FEB													
KWH	38825.	0.	32425.	0.	0.	0.	658.	22034.	0.	0.	0.	0.	93942.
MAX KW	95.682	0.000	118.845	0.000	0.000	0.000	1.221	35.975	0.000	0.000	0.000	0.000	247.117
DAY/HR	1/21	0/ 0	1/21	0/ 0	0/ 0	0/ 0	2/ 6	25/14	0/ 0	0/ 0	0/ 0	0/ 0	6/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	0.000	0.000	0.959	31.632	0.000	0.000	0.000	0.000	
PEAK PCT	38.7	0.0	48.1	0.0	0.0	0.0	0.4	12.8	0.0	0.0	0.0	0.0	
MAR													
KWH	42984.	0.	35870.	0.	14.	0.	705.	24499.	0.	0.	0.	0.	104072.
MAX KW	95.682	0.000	118.845	0.000	5.272	0.000	1.137	37.147	0.000	0.000	0.000	0.000	247.165
DAY/HR	1/21	0/ 0	1/21	0/ 0	27/18	0/ 0	18/ 7	27/19	0/ 0	0/ 0	0/ 0	0/ 0	27/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	0.102	0.000	0.910	31.627	0.000	0.000	0.000	0.000	
PEAK PCT	38.7	0.0	48.1	0.0	0.0	0.0	0.4	12.8	0.0	0.0	0.0	0.0	
APR													
KWH	41598.	0.	34833.	0.	852.	0.	639.	24108.	0.	0.	0.	0.	102029.
MAX KW	95.682	0.000	118.845	0.000	64.991	0.000	1.018	38.478	0.000	0.000	0.000	0.000	302.964
DAY/HR	1/21	0/ 0	1/21	0/ 0	18/19	0/ 0	5/ 5	18/14	0/ 0	0/ 0	0/ 0	0/ 0	18/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	56.815	0.000	0.000	31.623	0.000	0.000	0.000	0.000	
PEAK PCT	31.6	0.0	39.2	0.0	18.8	0.0	0.0	10.4	0.0	0.0	0.0	0.0	
MAY													
KWH	42984.	0.	35960.	0.	23468.	0.	55.	25536.	0.	0.	0.	0.	128004.
MAX KW	95.682	0.000	118.845	0.000	134.927	0.000	0.910	40.062	0.000	0.000	0.000	0.000	343.286
DAY/HR	1/21	0/ 0	1/21	0/ 0	29/16	0/ 0	1/ 2	22/19	0/ 0	0/ 0	0/ 0	0/ 0	29/20
PEAK ENDUSE	75.096	0.000	107.533	0.000	120.954	0.000	0.000	39.703	0.000	0.000	0.000	0.000	
PEAK PCT	21.9	0.0	31.3	0.0	35.2	0.0	0.0	11.6	0.0	0.0	0.0	0.0	
JUN													
KWH	41598.	0.	34703.	0.	43661.	0.	0.	25062.	0.	0.	0.	0.	145024.
MAX KW	95.682	0.000	118.845	0.000	147.326	0.000	0.000	40.894	0.000	0.000	0.000	0.000	363.326
DAY/HR	1/21	0/ 0	3/21	0/ 0	3/16	0/ 0	0/ 0	3/16	0/ 0	0/ 0	0/ 0	0/ 0	11/20
PEAK ENDUSE	75.096	0.000	107.533	0.000	140.351	0.000	0.000	40.346	0.000	0.000	0.000	0.000	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

PEAK PCT	20.7	0.0	29.6	0.0	38.6	0.0	0.0	11.1	0.0	0.0	0.0	0.0	
JUL													
KWH	42984.	0.	35960.	0.	61432.	0.	0.	26305.	0.	0.	0.	0.	166681.
MAX KW	95.682	0.000	118.845	0.000	142.076	0.000	0.000	41.956	0.000	0.000	0.000	0.000	361.986
DAY/HR	1/21	0/ 0	1/21	0/ 0	24/19	0/ 0	0/ 0	8/ 8	0/ 0	0/ 0	0/ 0	0/ 0	19/20
PEAK ENDUSE	75.096	0.000	107.533	0.000	139.315	0.000	0.000	40.042	0.000	0.000	0.000	0.000	
PEAK PCT	20.7	0.0	29.7	0.0	38.5	0.0	0.0	11.1	0.0	0.0	0.0	0.0	
AUG													
KWH	42984.	0.	35943.	0.	54643.	0.	0.	26133.	0.	0.	0.	0.	159704.
MAX KW	95.682	0.000	118.845	0.000	138.680	0.000	0.000	42.529	0.000	0.000	0.000	0.000	364.142
DAY/HR	1/21	0/ 0	1/21	0/ 0	26/11	0/ 0	0/ 0	26/ 8	0/ 0	0/ 0	0/ 0	0/ 0	25/21
PEAK ENDUSE	95.682	0.000	107.533	0.000	125.014	0.000	0.000	35.912	0.000	0.000	0.000	0.000	
PEAK PCT	26.3	0.0	29.5	0.0	34.3	0.0	0.0	9.9	0.0	0.0	0.0	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2
(CONTINUED)

SEP													
KWH	41598.	0.	34720.	0.	37153.	0.	0.	24935.	0.	0.	0.	0.	138406.
MAX KW	95.682	0.000	118.845	0.000	128.311	0.000	0.000	39.900	0.000	0.000	0.000	0.000	333.545
DAY/HR	1/21	0/ 0	3/21	0/ 0	14/16	0/ 0	0/ 0	16/ 8	0/ 0	0/ 0	0/ 0	0/ 0	1/21
PEAK ENDUSE	95.682	0.000	107.533	0.000	94.960	0.000	0.000	35.369	0.000	0.000	0.000	0.000	
PEAK PCT	28.7	0.0	32.2	0.0	28.5	0.0	0.0	10.6	0.0	0.0	0.0	0.0	
OCT													
KWH	42984.	0.	35960.	0.	11228.	0.	51.	25266.	0.	0.	0.	0.	115489.
MAX KW	95.682	0.000	118.845	0.000	80.373	0.000	0.910	39.304	0.000	0.000	0.000	0.000	309.953
DAY/HR	1/21	0/ 0	1/21	0/ 0	3/12	0/ 0	4/12	18/16	0/ 0	0/ 0	0/ 0	0/ 0	7/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	63.803	0.000	0.000	31.623	0.000	0.000	0.000	0.000	
PEAK PCT	30.9	0.0	38.3	0.0	20.6	0.0	0.0	10.2	0.0	0.0	0.0	0.0	
NOV													
KWH	41598.	0.	34663.	0.	167.	0.	563.	23794.	0.	0.	0.	0.	100784.
MAX KW	95.682	0.000	118.845	0.000	15.773	0.000	1.120	36.932	0.000	0.000	0.000	0.000	261.922
DAY/HR	1/21	0/ 0	1/21	0/ 0	1/21	0/ 0	20/ 7	4/ 8	0/ 0	0/ 0	0/ 0	0/ 0	1/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	15.773	0.000	0.000	31.623	0.000	0.000	0.000	0.000	
PEAK PCT	36.5	0.0	45.4	0.0	6.0	0.0	0.0	12.1	0.0	0.0	0.0	0.0	
DEC													
KWH	42984.	0.	35909.	0.	24.	0.	700.	24493.	0.	0.	0.	0.	104110.
MAX KW	95.682	0.000	118.845	0.000	4.812	0.000	1.295	37.053	0.000	0.000	0.000	0.000	247.192
DAY/HR	1/21	0/ 0	2/21	0/ 0	15/14	0/ 0	25/ 5	16/ 8	0/ 0	0/ 0	0/ 0	0/ 0	19/21
PEAK ENDUSE	95.682	0.000	118.845	0.000	0.000	0.000	1.042	31.623	0.000	0.000	0.000	0.000	
PEAK PCT	38.7	0.0	48.1	0.0	0.0	0.0	0.4	12.8	0.0	0.0	0.0	0.0	
KWH	506106.	0.	422854.	0.	232641.	0.	4115.	296529.	0.	0.	0.	0.	1462245.
MAX KW	95.682	0.000	118.845	0.000	147.326	0.000	1.295	42.529	0.000	0.000	0.000	0.000	364.142
MON/DY	1/ 1	0/ 0	1/ 2	0/ 0	6/ 3	0/ 0	12/25	8/26	0/ 0	0/ 0	0/ 0	0/ 0	8/25
PEAK ENDUSE	95.682	0.000	107.533	0.000	125.014	0.000	0.000	35.912	0.000	0.000	0.000	0.000	
PEAK PCT	26.3	0.0	29.5	0.0	34.3	0.0	0.0	9.9	0.0	0.0	0.0	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	4884.	0.	0.	0.	0.	0.	0.	2147.	0.	7032.
MAX THERM/HR	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	18.5
DAY/HR	0/ 0	0/ 0	0/ 0	6/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 8	0/ 0	31/ 8
PEAK ENDUSE	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	
PEAK PCT	0.0	0.0	0.0	74.7	0.0	0.0	0.0	0.0	0.0	0.0	25.3	0.0	
FEB													
THERM	0.	0.	0.	3728.	0.	0.	0.	0.	0.	0.	1996.	0.	5724.
MAX THERM/HR	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	17.4
DAY/HR	0/ 0	0/ 0	0/ 0	2/ 6	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 8	0/ 0	1/ 8
PEAK ENDUSE	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	
PEAK PCT	0.0	0.0	0.0	72.2	0.0	0.0	0.0	0.0	0.0	0.0	27.8	0.0	
MAR													
THERM	0.	0.	0.	2603.	0.	0.	0.	0.	0.	0.	2211.	0.	4815.
MAX THERM/HR	0.0	0.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	15.6
DAY/HR	0/ 0	0/ 0	0/ 0	18/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 8	0/ 0	18/ 8
PEAK ENDUSE	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	
PEAK PCT	0.0	0.0	0.0	69.0	0.0	0.0	0.0	0.0	0.0	0.0	31.0	0.0	
APR													
THERM	0.	0.	0.	558.	0.	0.	0.	0.	0.	0.	2105.	0.	2664.
MAX THERM/HR	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	9.9
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 8	0/ 0	5/ 8
PEAK ENDUSE	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	
PEAK PCT	0.0	0.0	0.0	51.8	0.0	0.0	0.0	0.0	0.0	0.0	48.2	0.0	
MAY													
THERM	0.	0.	0.	17.	0.	0.	0.	0.	0.	0.	2046.	0.	2063.
MAX THERM/HR	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	6.5
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 8	0/ 0	17/ 8
PEAK ENDUSE	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	
PEAK PCT	0.0	0.0	0.0	32.0	0.0	0.0	0.0	0.0	0.0	0.0	68.0	0.0	
JUN													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1858.	0.	1858.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	4.1
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	7/ 8	0/ 0	7/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1812.	0.	1812.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	3.9
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 8	0/ 0	2/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1748.	0.	1748.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	3.7
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	16/ 8	0/ 0	16/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2
(CONTINUED)

SEP													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1689.	0.	1689.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	3.7
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	29/ 8	0/ 0	29/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
OCT													
THERM	0.	0.	0.	20.	0.	0.	0.	0.	0.	0.	1806.	0.	1826.
MAX THERM/HR	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	6.1
DAY/HR	0/ 0	0/ 0	0/ 0	30/ 8	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	27/ 8	0/ 0	30/ 8
PEAK ENDUSE	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	
PEAK PCT	0.0	0.0	0.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0	63.4	0.0	
NOV													
THERM	0.	0.	0.	1718.	0.	0.	0.	0.	0.	0.	1854.	0.	3572.
MAX THERM/HR	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	14.7
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 7	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	20/ 8	0/ 0	20/ 8
PEAK ENDUSE	0.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	
PEAK PCT	0.0	0.0	0.0	71.9	0.0	0.0	0.0	0.0	0.0	0.0	28.1	0.0	
DEC													
THERM	0.	0.	0.	3884.	0.	0.	0.	0.	0.	0.	2038.	0.	5921.
MAX THERM/HR	0.0	0.0	0.0	17.5	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	20.7
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 8	0/ 0	24/ 8
PEAK ENDUSE	0.0	0.0	0.0	16.3	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	
PEAK PCT	0.0	0.0	0.0	78.7	0.0	0.0	0.0	0.0	0.0	0.0	21.3	0.0	
THERM	0.	0.	0.	17412.	0.	0.	0.	0.	0.	0.	23312.	0.	40725.
MAX THERM/HR	0.0	0.0	0.0	17.5	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	20.7
MON/DY	0/ 0	0/ 0	0/ 0	12/20	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	3/18	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	16.3	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0	
PEAK PCT	0.0	0.0	0.0	78.7	0.0	0.0	0.0	0.0	0.0	0.0	21.3	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- BEPS Building Energy Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
MBTU	1218.0	0.0	1443.0	6.2	272.4	4.9	208.3	578.4	0.0	0.0	0.0	0.0	3731.8
FM1 NATURAL-GAS													
MBTU	0.0	0.0	0.0	563.8	0.0	0.0	0.0	0.0	0.0	0.0	1466.0	0.0	2029.9
MBTU	1218.0	0.0	1443.0	570.0	272.4	4.9	208.3	578.4	0.0	0.0	1466.0	0.0	5761.8

TOTAL SITE ENERGY 5761.75 MBTU 30.5 KBTU/SQFT-YR GROSS-AREA 30.5 KBTU/SQFT-YR NET-AREA
TOTAL SOURCE ENERGY 13225.50 MBTU 69.9 KBTU/SQFT-YR GROSS-AREA 69.9 KBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.07
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 133
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 136

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- BEPU Building Utility Performance WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
EM1 ELECTRICITY													
KWH	357013.	0.	422854.	1827.	79820.	1427.	61027.	169462.	0.	0.	0.	0.	1093432.
FM1 NATURAL-GAS													
THERM	0.	0.	0.	5638.	0.	0.	0.	0.	0.	0.	14661.	0.	20299.

TOTAL ELECTRICITY	1093432.	KWH	5.781	KWH /SQFT-YR	GROSS-AREA	5.781 KWH /SQFT-YR NET-AREA
TOTAL NATURAL-GAS	20299.	THERM	0.107	THERM /SQFT-YR	GROSS-AREA	0.107 THERM /SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 3.07
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 133
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 136

NOTE: ENERGY IS APPORTIONED HOURLY TO ALL END-USE CATEGORIES.

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
KWH	30322.	0.	35909.	463.	0.	0.	239.	13652.	0.	0.	0.	0.	80586.
MAX KW	71.706	0.000	118.845	0.850	0.000	0.000	15.950	24.317	0.000	0.000	0.000	0.000	206.875
DAY/HR	1/21	0/ 0	2/21	31/18	11/13	0/ 0	11/18	31/18	0/ 0	0/ 0	0/ 0	0/ 0	31/21
PEAK ENDUSE	71.706	0.000	118.845	0.499	0.000	0.000	0.120	15.705	0.000	0.000	0.000	0.000	
PEAK PCT	34.7	0.0	57.4	0.2	0.0	0.0	0.1	7.6	0.0	0.0	0.0	0.0	
FEB													
KWH	27387.	0.	32425.	357.	0.	0.	94.	12050.	0.	0.	0.	0.	72313.
MAX KW	71.706	0.000	118.845	0.840	0.000	0.000	0.414	23.991	0.000	0.000	0.000	0.000	206.024
DAY/HR	1/21	0/ 0	1/21	1/ 5	0/ 0	0/ 0	24/18	1/ 7	0/ 0	0/ 0	0/ 0	0/ 0	1/21
PEAK ENDUSE	71.706	0.000	118.845	0.329	0.000	0.000	0.088	15.057	0.000	0.000	0.000	0.000	
PEAK PCT	34.8	0.0	57.7	0.2	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0	
MAR													
KWH	30322.	0.	35870.	281.	20.	0.	568.	12837.	0.	0.	0.	0.	79897.
MAX KW	71.706	0.000	118.845	0.825	3.633	0.000	15.795	23.197	0.000	0.000	0.000	0.000	205.359
DAY/HR	1/21	0/ 0	1/21	11/ 5	27/13	0/ 0	7/12	11/ 7	0/ 0	0/ 0	0/ 0	0/ 0	8/21
PEAK ENDUSE	71.706	0.000	118.845	0.214	0.000	0.000	0.070	14.524	0.000	0.000	0.000	0.000	
PEAK PCT	34.9	0.0	57.9	0.1	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	
APR													
KWH	29344.	0.	34833.	96.	211.	1.	1647.	12009.	0.	0.	0.	0.	78142.
MAX KW	71.706	0.000	118.845	0.585	11.178	0.230	15.801	22.355	0.000	0.000	0.000	0.000	228.782
DAY/HR	1/21	0/ 0	1/21	5/ 5	18/20	18/20	19/18	18/20	0/ 0	0/ 0	0/ 0	0/ 0	18/21
PEAK ENDUSE	71.706	0.000	118.845	0.000	7.252	0.038	13.616	17.326	0.000	0.000	0.000	0.000	
PEAK PCT	31.3	0.0	51.9	0.0	3.2	0.0	6.0	7.6	0.0	0.0	0.0	0.0	
MAY													
KWH	30322.	0.	35960.	13.	6997.	107.	8672.	14218.	0.	0.	0.	0.	96287.
MAX KW	71.706	0.000	118.845	0.434	67.482	1.150	15.882	33.037	0.000	0.000	0.000	0.000	276.111
DAY/HR	1/21	0/ 0	1/21	6/ 4	29/16	29/20	13/23	29/20	0/ 0	0/ 0	0/ 0	0/ 0	29/21
PEAK ENDUSE	71.706	0.000	118.845	0.000	45.763	0.682	13.638	25.478	0.000	0.000	0.000	0.000	
PEAK PCT	26.0	0.0	43.0	0.0	16.6	0.2	4.9	9.2	0.0	0.0	0.0	0.0	
JUN													
KWH	29344.	0.	34703.	3.	14337.	266.	9869.	15766.	0.	0.	0.	0.	104288.
MAX KW	71.706	0.000	118.845	0.306	79.163	1.426	15.885	35.670	0.000	0.000	0.000	0.000	287.362
DAY/HR	1/21	0/ 0	3/21	7/ 8	3/16	3/16	6/20	3/16	0/ 0	0/ 0	0/ 0	0/ 0	11/20
PEAK ENDUSE	55.192	0.000	107.533	0.000	74.421	1.358	13.936	34.923	0.000	0.000	0.000	0.000	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

PEAK PCT	19.2	0.0	37.4	0.0	25.9	0.5	4.8	12.2	0.0	0.0	0.0	0.0	
JUL													
KWH	30322.	0.	35960.	0.	24272.	447.	10322.	18028.	0.	0.	0.	0.	119352.
MAX KW	71.706	0.000	118.845	0.000	79.092	1.423	15.295	36.075	0.000	0.000	0.000	0.000	293.249
DAY/HR	1/21	0/ 0	1/21	0/ 0	8/20	8/20	31/ 7	8/14	0/ 0	0/ 0	0/ 0	0/ 0	8/20
PEAK ENDUSE	55.192	0.000	107.533	0.000	79.092	1.423	14.156	35.853	0.000	0.000	0.000	0.000	
PEAK PCT	18.8	0.0	36.7	0.0	27.0	0.5	4.8	12.2	0.0	0.0	0.0	0.0	
AUG													
KWH	30322.	0.	35943.	0.	20509.	372.	10268.	17365.	0.	0.	0.	0.	114778.
MAX KW	71.706	0.000	118.845	0.000	75.911	1.316	15.849	37.007	0.000	0.000	0.000	0.000	279.765
DAY/HR	1/21	0/ 0	1/21	0/ 0	26/11	26/11	5/ 3	26/11	0/ 0	0/ 0	0/ 0	0/ 0	13/21
PEAK ENDUSE	71.706	0.000	118.845	0.000	48.812	0.708	13.619	26.074	0.000	0.000	0.000	0.000	
PEAK PCT	25.6	0.0	42.5	0.0	17.4	0.3	4.9	9.3	0.0	0.0	0.0	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for EM1 WEATHER FILE- Boston MA TMY2
(CONTINUED)

SEP													
KWH	29344.	0.	34720.	0.	11275.	204.	10002.	15023.	0.	0.	0.	0.	100567.
MAX KW	71.706	0.000	118.845	0.000	55.359	0.877	15.877	31.321	0.000	0.000	0.000	0.000	267.230
DAY/HR	1/21	0/ 0	3/21	0/ 0	13/17	13/20	24/22	16/ 9	0/ 0	0/ 0	0/ 0	0/ 0	13/21
PEAK ENDUSE	71.706	0.000	118.845	0.000	38.120	0.581	13.634	24.345	0.000	0.000	0.000	0.000	
PEAK PCT	26.8	0.0	44.5	0.0	14.3	0.2	5.1	9.1	0.0	0.0	0.0	0.0	
OCT													
KWH	30322.	0.	35960.	18.	2122.	30.	8003.	13025.	0.	0.	0.	0.	89481.
MAX KW	71.706	0.000	118.845	0.430	28.597	0.571	15.876	26.020	0.000	0.000	0.000	0.000	241.320
DAY/HR	1/21	0/ 0	1/21	13/ 3	3/12	3/ 9	8/21	7/20	0/ 0	0/ 0	0/ 0	0/ 0	7/21
PEAK ENDUSE	71.706	0.000	118.845	0.000	16.499	0.571	13.663	20.037	0.000	0.000	0.000	0.000	
PEAK PCT	29.7	0.0	49.2	0.0	6.8	0.2	5.7	8.3	0.0	0.0	0.0	0.0	
NOV													
KWH	29344.	0.	34663.	217.	63.	0.	951.	12140.	0.	0.	0.	0.	77377.
MAX KW	71.706	0.000	118.845	0.826	4.414	0.000	15.955	23.132	0.000	0.000	0.000	0.000	220.921
DAY/HR	1/21	0/ 0	1/21	20/ 5	26/20	0/ 0	26/18	20/ 7	0/ 0	0/ 0	0/ 0	0/ 0	1/21
PEAK ENDUSE	71.706	0.000	118.845	0.000	2.140	0.000	13.534	14.697	0.000	0.000	0.000	0.000	
PEAK PCT	32.5	0.0	53.8	0.0	1.0	0.0	6.1	6.7	0.0	0.0	0.0	0.0	
DEC													
KWH	30322.	0.	35909.	379.	13.	0.	393.	13348.	0.	0.	0.	0.	80364.
MAX KW	71.706	0.000	118.845	0.851	3.610	0.000	15.859	24.920	0.000	0.000	0.000	0.000	207.170
DAY/HR	1/21	0/ 0	2/21	20/ 5	6/12	0/ 0	26/17	24/ 7	0/ 0	0/ 0	0/ 0	0/ 0	19/21
PEAK ENDUSE	71.706	0.000	118.845	0.564	0.000	0.000	0.114	15.940	0.000	0.000	0.000	0.000	
PEAK PCT	34.6	0.0	57.4	0.3	0.0	0.0	0.1	7.7	0.0	0.0	0.0	0.0	
KWH	357013.	0.	422854.	1827.	79820.	1427.	61027.	169462.	0.	0.	0.	0.	1093432.
MAX KW	71.706	0.000	118.845	0.851	79.163	1.426	15.955	37.007	0.000	0.000	0.000	0.000	293.249
MON/DY	1/ 1	0/ 0	1/ 2	12/20	6/ 3	6/ 3	11/26	8/26	0/ 0	0/ 0	0/ 0	0/ 0	7/ 8
PEAK ENDUSE	55.192	0.000	107.533	0.000	79.092	1.423	14.156	35.853	0.000	0.000	0.000	0.000	
PEAK PCT	18.8	0.0	36.7	0.0	27.0	0.5	4.8	12.2	0.0	0.0	0.0	0.0	

YEARLY TRANSFORMER LOSSES = 0.0 KWH

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2

	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL
JAN													
THERM	0.	0.	0.	1482.	0.	0.	0.	0.	0.	0.	1344.	0.	2826.
MAX THERM/HR	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	7.7
DAY/HR	0/ 0	0/ 0	0/ 0	31/18	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	31/ 8	0/ 0	31/18
PEAK ENDUSE	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	
PEAK PCT	0.0	0.0	0.0	63.4	0.0	0.0	0.0	0.0	0.0	0.0	36.6	0.0	
FEB													
THERM	0.	0.	0.	1132.	0.	0.	0.	0.	0.	0.	1246.	0.	2379.
MAX THERM/HR	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	7.2
DAY/HR	0/ 0	0/ 0	0/ 0	1/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 8	0/ 0	1/ 8
PEAK ENDUSE	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	
PEAK PCT	0.0	0.0	0.0	59.7	0.0	0.0	0.0	0.0	0.0	0.0	40.3	0.0	
MAR													
THERM	0.	0.	0.	820.	0.	0.	0.	0.	0.	0.	1380.	0.	2200.
MAX THERM/HR	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	5.8
DAY/HR	0/ 0	0/ 0	0/ 0	11/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	18/ 8	0/ 0	18/ 8
PEAK ENDUSE	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	
PEAK PCT	0.0	0.0	0.0	49.6	0.0	0.0	0.0	0.0	0.0	0.0	50.4	0.0	
APR													
THERM	0.	0.	0.	269.	0.	0.	0.	0.	0.	0.	1314.	0.	1583.
MAX THERM/HR	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	4.5
DAY/HR	0/ 0	0/ 0	0/ 0	5/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	5/ 8	0/ 0	5/ 8
PEAK ENDUSE	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	
PEAK PCT	0.0	0.0	0.0	35.5	0.0	0.0	0.0	0.0	0.0	0.0	64.5	0.0	
MAY													
THERM	0.	0.	0.	35.	0.	0.	0.	0.	0.	0.	1282.	0.	1317.
MAX THERM/HR	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	3.8
DAY/HR	0/ 0	0/ 0	0/ 0	6/ 4	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 8	0/ 0	16/ 8
PEAK ENDUSE	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	
PEAK PCT	0.0	0.0	0.0	29.1	0.0	0.0	0.0	0.0	0.0	0.0	70.9	0.0	
JUN													
THERM	0.	0.	0.	9.	0.	0.	0.	0.	0.	0.	1170.	0.	1178.
MAX THERM/HR	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	3.4
DAY/HR	0/ 0	0/ 0	0/ 0	7/ 8	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	7/ 8	0/ 0	7/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	
PEAK PCT	0.0	0.0	0.0	25.2	0.0	0.0	0.0	0.0	0.0	0.0	74.8	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

JUL													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1146.	0.	1146.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	2.4
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	2/ 8	0/ 0	2/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
AUG													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1109.	0.	1109.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	2.3
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	16/ 8	0/ 0	16/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	

Baseline Pages 1 - 8
Proposed Pages 9 - 16

REPORT- PS-F Energy End-Use Summary for FM1 WEATHER FILE- Boston MA TMY2
(CONTINUED)

SEP													
THERM	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1073.	0.	1073.
MAX THERM/HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	2.3
DAY/HR	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	29/ 8	0/ 0	29/ 8
PEAK ENDUSE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	
PEAK PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	
OCT													
THERM	0.	0.	0.	50.	0.	0.	0.	0.	0.	0.	1145.	0.	1195.
MAX THERM/HR	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	3.5
DAY/HR	0/ 0	0/ 0	0/ 0	13/ 3	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	27/ 8	0/ 0	30/ 8
PEAK ENDUSE	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	
PEAK PCT	0.0	0.0	0.0	32.0	0.0	0.0	0.0	0.0	0.0	0.0	68.0	0.0	
NOV													
THERM	0.	0.	0.	611.	0.	0.	0.	0.	0.	0.	1171.	0.	1782.
MAX THERM/HR	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	5.6
DAY/HR	0/ 0	0/ 0	0/ 0	20/ 5	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	20/ 8	0/ 0	20/ 8
PEAK ENDUSE	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	
PEAK PCT	0.0	0.0	0.0	55.1	0.0	0.0	0.0	0.0	0.0	0.0	44.9	0.0	
DEC													
THERM	0.	0.	0.	1230.	0.	0.	0.	0.	0.	0.	1281.	0.	2511.
MAX THERM/HR	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	8.1
DAY/HR	0/ 0	0/ 0	0/ 0	24/ 8	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	25/ 8	0/ 0	24/ 8
PEAK ENDUSE	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	
PEAK PCT	0.0	0.0	0.0	67.0	0.0	0.0	0.0	0.0	0.0	0.0	33.0	0.0	
THERM	0.	0.	0.	5638.	0.	0.	0.	0.	0.	0.	14661.	0.	20299.
MAX THERM/HR	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	8.1
MON/DY	0/ 0	0/ 0	0/ 0	12/24	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	3/18	0/ 0	12/24
PEAK ENDUSE	0.0	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	
PEAK PCT	0.0	0.0	0.0	67.0	0.0	0.0	0.0	0.0	0.0	0.0	33.0	0.0	

Appendix F

Smart Utilities Checklist

Boston Smart Utilities Checklist

Date Submitted:	<<Timestamp>>
Submitted by:	<<Email Address>>

Background

The Smart Utilities Checklist will facilitate the Boston Smart Utilities Steering Committee's review of:

a) compliance with the Smart Utilities Policy for Article 80 Development Review, which calls for the integration of five (5) Smart Utility Technologies (SUTs) into Article 80 developments

b) integration of the Smart Utility Standards

More information about the Boston Smart Utilities Vision project, including the Smart Utilities Policy and Smart Utility Standards, is available at: www.http://bostonplans.org/smart-utilities

Note: Any documents submitted via email to manuel.esquivel@boston.gov will not be attached to the pdf form generated after submission, but are available upon request.

Part 1 - General Project Information

1.1 Project Name	3368 Washington Street
1.2 Project Address	3368 Washington Street, Jamaica Plain
1.3 Building Size (square feet) **For a multi-building development, enter total development size (square feet)*	169,500
1.4 Filing Stage	PNF
1.5 Filing Contact Information	
1.5a Name	Lydia Scott
1.5b Company	The Community Builders

Boston Smart Utilities Checklist

1.5c E-mail	lydia.scott@TCBINC.ORG
1.5d Phone Number	(617) 695-9595

1.6 Project Team

1.6a Project Owner/Developer	Washington Pine LLC
1.6b Architect	RODE Architects, LLC
1.6c Permitting	Epsilon Associates, Inc.
1.6d Construction Management	TBD

Part 2 - District Energy Microgrids

Fill out this section if the proposed project's total development size is equal to or greater than 1.5 million square feet.

Note on submission requirements timeline:

Feasibility Assessment Part A should be submitted with PNF or any other initial filing.

Feasibility Assessment Part B should be submitted with any major filing during the Development Review stage (i.e., DPIR)

District Energy Microgrid Master Plan Part A should be submitted before submission of the Draft Board Memorandum by the BPDA Project Manager (Note: Draft Board Memorandums are due one month ahead of the BPDA Board meetings)

District Energy Microgrid Master Plan Part B should be submitted before applying for a Building Permit

Please email submission to manuel.esquivel@boston.gov

2.1 Consultant Assessing/Designing District Energy Microgrid (if applicable)	<<2.1 Consultant Assessing/Designing District Energy Microgrid (if applicable)>>
2.2 Latest document submitted	<<2.2 Latest document submitted>>
2.3 Date of latest submission	<<2.3 Date of latest submission>>

Boston Smart Utilities Checklist

2.4 Which of the following have you had engagement/review meetings with regarding District Energy Microgrids? (select all that apply)	<<2.4 Which of the following have you had engagement/review meetings with regarding District Energy Microgrids? (select all that apply)>>
2.5 What engagement meetings have you had with utilities and/or other agencies (i.e., MA DOER, MassCEC) regarding District Energy Microgrids? (Optional: include dates)	<<2.5 What engagement meetings have you had with utilities and/or other agencies (i.e., MA DOER, MassCEC) regarding District Energy Microgrids? (Optional: include dates)>>

Part 3 - Telecommunications Utilidor

Fill out this section if the proposed project's total development size is equal to or greater than 1.5 million square feet OR if the project will include the construction of roadways equal to or greater than 0.5 miles in length.

Please submit a map/diagram highlighting the sections of the roads on the development area where a Telecom Utilidor will be installed, including access points to the Telcom Utilidor (i.e., manholes)

Please email submission to manuel.esquivel@boston.gov

3.1 Consultant Assessing/Designing Telecom Utilidor (if applicable)	<<3.1 Consultant Assessing/Designing Telecom Utilidor (if applicable)>>
3.2 Date Telecom Utilidor Map/Diagram was submitted	<<3.2 Date Telecom Utilidor Map/Diagram was submitted>>
3.3 Dimensions of Telecom Utilidor (include units)	
3.3a Cross-section (i.e., diameter, width X height)	<<3.3a Cross-section (i.e., diameter, width X height)>>
3.3b Length	<<3.3b Length>>

Boston Smart Utilities Checklist

3.4 Capacity of Telecom Utilidor (i.e., number of interducts, 2 inch (ID) pipes, etc.)	<<3.4 Capacity of Telecom Utilidor (i.e., number of interducts, 2 inch (ID) pipes, etc.)>>
3.5 Which of the following have you had engagement/review meetings with regarding the Telecom Utilidor? (select all that apply)	<<3.5 Which of the following have you had engagement/review meetings with regarding the Telecom Utilidor? (select all that apply)>>
3.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding the Telecom Utilidor? (Optional: include dates)	<<3.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding the Telecom Utilidor? (Optional: include dates)>>

Part 4 - Green Infrastructure

Fill out this section if the proposed project's total development size is equal to or greater than 100,000 square feet.

Please submit a map/diagram highlighting where on the development Green Infrastructure will be installed.

Please email submission to manuel.esquivel@boston.gov

4.1 Consultant Assessing/Designing Green Infrastructure (if applicable)	Nitsch Engineering
4.2 Date Green Infrastructure Map/Diagram was submitted	
4.3 Types of Green Infrastructure included in the project (select all that apply)	Permeable Pavers Recharge
4.4 Total impervious area of the development (in square inches)	5791665

Boston Smart Utilities Checklist

4.5 Volume of stormwater that will be retained (in cubic inches)* **Note: Should equal to at least "Total impervious area (entered in section 4.4)" times "1.25 inches"*	7239580
4.6 Which of the following have you had engagement/review meetings with regarding Green Infrastructure? (select all that apply)	
4.7 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Green Infrastructure? (Optional: include dates)	None to date

Part 5 - Adaptive Signal Technology (AST)

Fill out this section if as part of your project BTD will require you to install new traffic signals or make significant improvements to the existing signal system.

Please submit a map/diagram highlighting the context of AST around the proposed development area, as well as any areas within the development where new traffic signals will be installed or where significant improvements to traffic signals will be made.

Please email submission to manuel.esquivel@boston.gov

5.1 Consultant Assessing/Designing Adaptive Signal Technology (if applicable)	<<5.1 Consultant Assessing/Designing Adaptive Signal Technology (if applicable)>>
5.2 Date AST Map/Diagram was submitted	<<5.2 Date AST Map/Diagram was submitted>>
5.3 Describe how the AST system will benefit/impact the following transportation modes	
5.3a Pedestrians	<<5.3a Pedestrians>>

Boston Smart Utilities Checklist

5.3b Bicycles	<<5.3b Bicycles>>
5.3c Buses and other Public Transportation	<<5.3c Buses and other Public Transportation>>
5.3d Other Motorized Vehicles	<<5.3d Other Motorized Vehicles>>

5.4 Describe the components of the AST system (including system design and components)	<<5.4 Describe the components of the AST system (including system design and components)>>
5.5 Which of the following have you had engagement/review meetings with regarding AST? (select all that apply)	<<5.5 Which of the following have you had engagement/review meetings with regarding AST? (select all that apply)>>
5.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding AST? (Optional: include dates)	<<5.6 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding AST? (Optional: include dates)>>

Part 6 - Smart Street Lights

Fill out this section if as part of your project PWD and PIC will require you to install new street lights or make significant improvements to the existing street light system.

Please submit a map/diagram highlighting where new street lights will be installed or where improvements to street lights will be made.

Please email submission to manuel.esquivel@boston.gov

6.1 Consultant Assessing/Designing Smart Street Lights (if applicable)	<<6.1 Consultant Assessing/Designing Smart Street Lights (if applicable)>>
6.2 Date Smart Street Lights Map/Diagram was submitted	<<6.2 Date Smart Street Lights Map/Diagram was submitted>>
6.3 Which of the following have you had	<<6.3 Which of the following have you had

Boston Smart Utilities Checklist

engagement/review meetings with regarding Smart Street Lights? (select all that apply)	engagement/review meetings with regarding Smart Street Lights? (select all that apply)**>>**
6.4 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Smart Street Lights? (Optional: include dates)	**<<**6.4 What engagement meetings have you had with utilities and/or other agencies (i.e., State agencies) regarding Smart Street Lights? (Optional: include dates)**>>**

Part 7 - Smart Utility Standards

The Smart Utility Standards set forth guidelines for planning and integration of SUTs with existing utility infrastructure in existing or new streets, including cross-section, lateral, and intersection diagrams. The Smart Utility Standards are intended to serve as guidelines for developers, architects, engineers, and utility providers for planning, designing, and locating utilities. The Smart Utility Standards will serve as the baseline for discussions on any deviations from the standards needed/proposed for any given utility infrastructure.

Please submit typical below and above grade cross section diagrams of all utility infrastructure in the proposed development area (including infrastructure related to the applicable SUTs).

Please submit typical below and above grade lateral diagrams of all utility infrastructure in the proposed development area (including infrastructure related to the applicable SUTs).

Please email submission to manuel.esquivel@boston.gov

7.1 Date Cross Section Diagram(s) was submitted	6/6/2019
7.2 Date Lateral Diagram(s) was submitted	6/6/2019

Appendix G

Accessibility Checklist

Article 80 – Accessibility Checklist

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

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

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

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

Accessibility Analysis Information Sources:

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

Glossary of Terms:

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

1. Project Information:

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

Project Name:	**3368 Washington Street**
Primary Project Address:	**3368 Washington Street, Jamaica Plain, MA**
Total Number of Phases/Buildings:	**1 Building**
Primary Contact (Name / Title / Company / Email / Phone):	**Lydia Scott/Development Project Manager/The Community Builders/Lydia.scott@tcbinc.org/857-221-8796**
Owner / Developer:	**Washington Pine LLC**
Architect:	**RODE Architects, LLC**
Civil Engineer:	**Nitsch Engineering, Inc.**
Landscape Architect:	**Studio 2112**
Permitting:	**Epsilon Associates, Inc.**
Construction Management:	

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

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

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	Yes. - Use (Residential Use) - Floor Area Ratio (FAR – 1.0 allowed, 4.0 actual) - Building Height (35' allowed, 69'-11" actual) - Rear Yard (20' required, 10' actual)

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:	*40,220 SF*	Building Area:	*169,500 GSF*
Building Height:	*69'-11" FT.*	Number of Stories:	*6 Flrs.*
First Floor Elevation:	40.4+/- BCB	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:	Administrative Offices, Community Meeting rooms, Resident Amenities, Parking, Storage/Warehouse, Trash			

3. Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	The site is located on Washington Street in the Jamaica Plain neighborhood. The topography across the site varies from 61.46 BCB at the northeast corner of the site to 39.01 BCB at the southwest corner of the site. There are large portions of exposed ledge visible at the rear lot line, indicating rock at the elevation transition locations. Along the existing sidewalk the site slopes approximately 3.7 feet (1.4% slope) from the high point (42.13 BCB) in the southwest direction along Washington Street.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	• MBTA Subway – Orange Line: Green Street Station (accessible). 0.2 miles away; two blocks west along Green Avenue to the intersection with Amory Street. • MBTA Bus lines: Route 42 follows Washington Street, 0.1 miles from the site. All MBTA Bus Routes are accessible
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	**Affordable/Public Housing:** Forestvale Apartments Franklin Park Village Senior Co-op Boston Housing Authority, 29 Pond Street Boston Housing Authority, 125 Amory Street Boston Housing Authority, 25 South Street **Low Income Elderly and Disabled Housing:** Farnsworth House, 90 South St **School:** Boston Public School Community Academy, 2 min (0.1 mile) Match Charter Public School 9 min (0.4 mile) English High School 7 min (0.3 mile) **Police:** Boston Police District E-13, Station 1 min (285 ft) **Fire:** District 9; Engine Co.'s 24 & 42 **Hospitals:** Laurel Hills Rehab and Skilled Nursing Center (0.3 mile), Lemeul Shattuck Hospital (1.3 miles), Dimock Community Health Center (1.1 miles)
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	**Recreation/Open Space:** William F. Flaherty Playground park (0.3 mile)/Johnson Park (0.4 mile)/ Scagnoli Nihill Athletic Campus & Fields (0.3 mile)/Minton-Stable Community Garden (0.3 mile) **Public Library:** Boston Public Library Jamaica Plain Branch – 0.7miles Egleston Square Branch – 0.8 miles (more easily accessible by transit)

	Community Center: Scagnoli Nihill Athletic Campus (0.3 mile)/Curtis hall Community Center (0.5 mile **Transit:** Site is located a 4 min walk (0.2 miles) to the Green Street Orange Line MBTA station/Bus # 42 (Washington & Glen)
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:	The Project site is not located within a 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, existing clear sidewalk widths vary from 10'-2". There are existing tree pits with a width of 4'-6" and an approximately 6" curb. Along the existing sidewalk the site slopes approximately 3.7 feet (1.4% slope) from the high point 42.13' BCB along Washington Street. The existing slope along Washington Street meets accessibility requirements.
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	No, existing sidewalks and pedestrian ramps are to remain.
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.	The proposed sidewalk complies with the Boston Complete Streets Guidelines and will fall under the Neighborhood Main Street Type. The streetscape will focus on pedestrian safety, street trees, and well-defined connections to public transportation and public parks and amenities.

What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	The total dimension of the proposed sidewalk is 13' (an increase over the existing 10.1' sidewalk). The Pedestrian Zone will be 9.5' and the Greenscape/Furnishing Zone is 3.5' wide plus a 6" curb. In addition, there is a 15' Frontage zone at building entrances. The slope of the sidewalks will follow the grade of the existing sidewalk.
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 Pedestrian Zone will be concrete. The Greenscape/Furnishing Zone will also be concrete. The proposed materials will be on the City of Boston pedestrian right-of-way. Frontage zone at building entrances will be unit pavers and will be located on private property.
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?	N/A
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	No, a five-foot minimum sidewalk will be provided in the public right-of-way.
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	Yes, the Project will require an Earth Retention System License, and Specific Repair Plans and Details. Projections and awnings will be within the property line and not in the pedestrian right of way.
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?	58 spaces. Parking is located within the building. There are 18 spaces on Level 1 and 40 spaces in the basement.
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?	There are 3 accessible spaces based on 521 CMR requirements. One of the spaces is Van accessible.
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the	All accessible parking requirements are met on site.

Commission for Persons with Disabilities regarding this need?	
Where is the accessible visitor parking located?	Accessible parking spaces are located in the parking garage, closest to the elevator core. These parking spaces can be designated for visitors as required.
Has a drop-off area been identified? ***If yes,*** will it be accessible?	An accessible drop-off is planned at Washington Street , subject to review and approval by PIC.
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. Site has about 3.5 feet in topographic changes across the front lot line along Washington Street. There is a rock outcropping at the rear property line, with exposed ledge, with an elevation change of approximately 9 feet. Additionally, there is a 3-foot change in elevation between the front and rear of the building along the east property line. Each entryway is flush with the exterior and they are connected indoors by interior corridors on Level 1. Additionally, accessible circulation routes are being provided across the exterior of the site, with exceptions at the ledge outcropping at the rear lot line.
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no,*** what is the reason?	Yes, all standard entrances are accessible.
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	Wayfinding signage will be provided at basement, Level 1 and upper levels as needed to indicate accessible routes and pathways from entrances, parking, elevators and community/resident amenities to the rest of the building. 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?	221 total housing 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	100% of the units are to be Rental 100% of all units are to be deed restricted affordable

(Inclusionary Development Policy) units?	
If a residential development, how many accessible Group 2 units are being proposed?	10% (23) of the 221 units will be provided in full compliance with MAAB Group-2A regulations.
If a residential development, how many accessible Group 2 units will also be IDP units? ***If none***, describe reason.	100%
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.	N/A
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.	The standard units will not have any barriers that would prevent entry or use by persons with mobility impairments
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? ***If yes***, describe:	Three interior elevators are provided for access to separate floors.
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?	100% of the units in the building will be affordable, which is of benefit to the community and identified as one of the goals of PLAN: JP/ROX. Additionally, the building contains a community room in the storefront adjacent to Washington Street that will be made available for use by community members.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs	All amenity spaces will be fully accessible, with all accessible controls and appliances and will accommodate accessible seating, and accessible amenity bathrooms.

in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	
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
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?	Proposed plan has been discussed with accessibility team at BPDA pre-file review. There were no objections to the design as proposed.
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?	Project has not yet been presented to the Disability Advisory Board.

10. Attachments

Include a list of all documents you are submitting with this Checklist. This may include drawings, diagrams, photos, or any other material that describes the accessible and inclusive elements of this project.

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances.

Provide a diagram of the accessible route connections through the site, including distances.

Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable)

Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry.

Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project.

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-
-
-

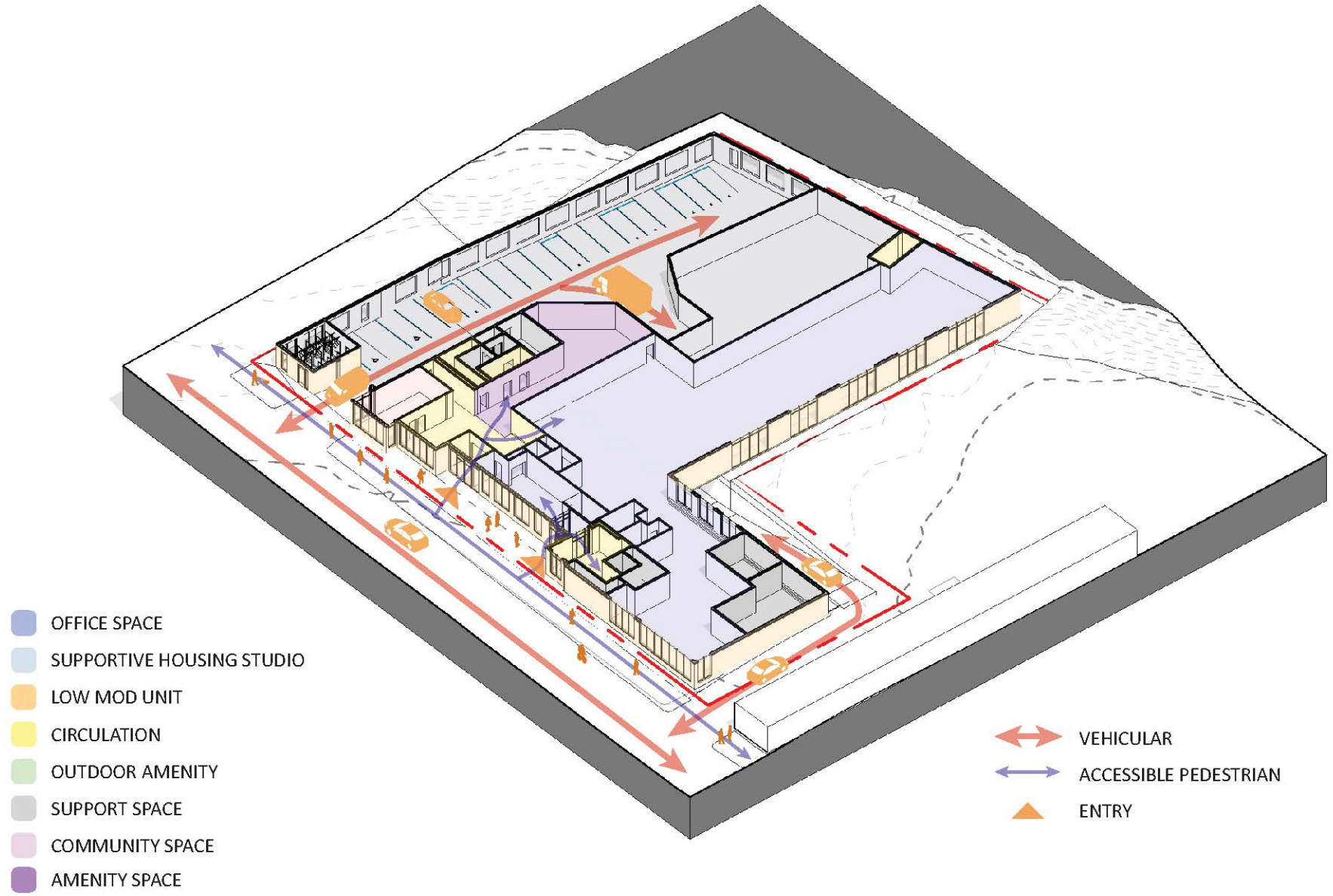
This completes the Article 80 Accessibility Checklist required for your project. Prior to and during the review process, Commission staff are able to provide technical assistance and design review, in order to help achieve ideal accessibility and to ensure that all buildings, sidewalks, parks, and open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

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

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

Architectural Access staff can be reached at:

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



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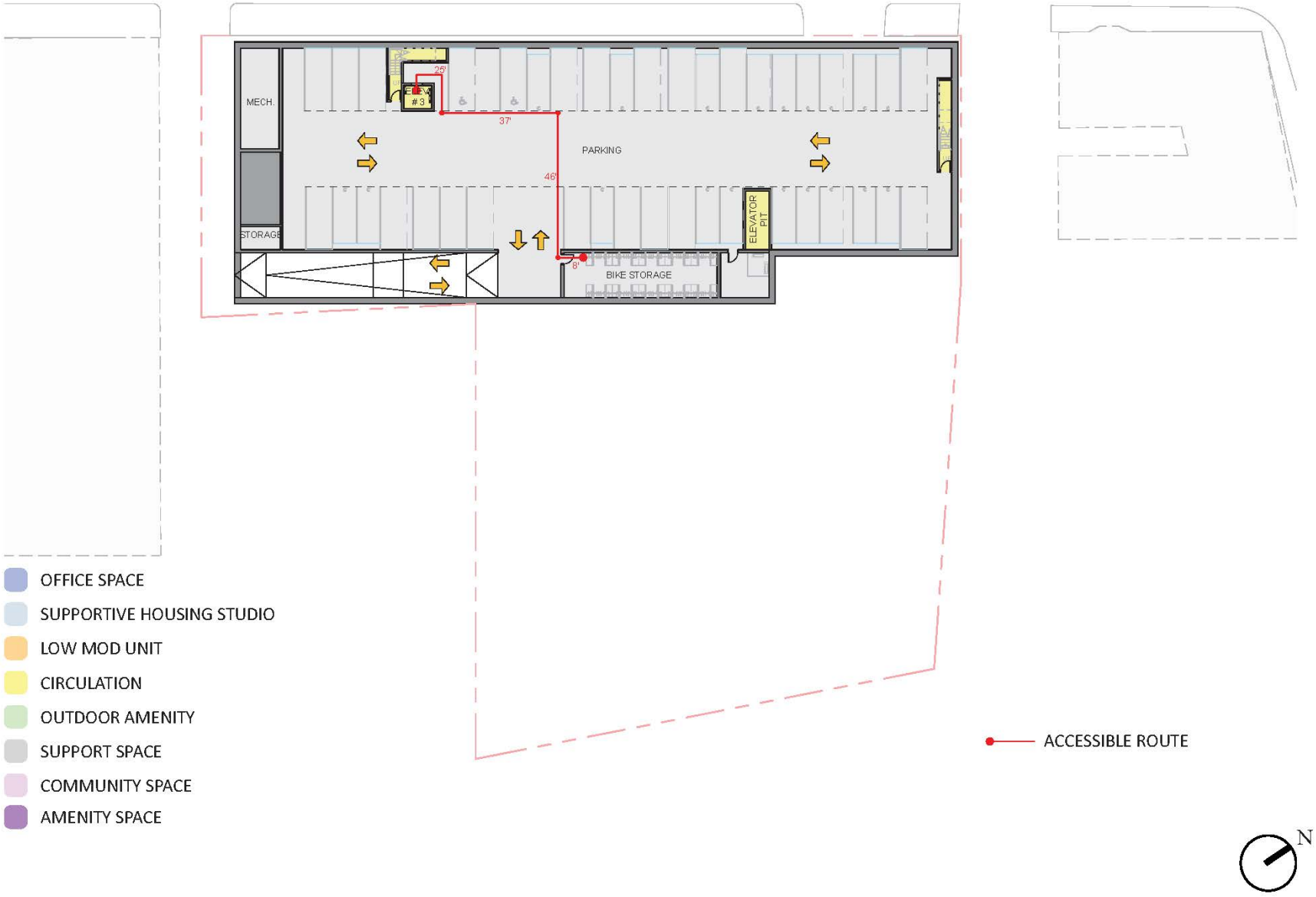
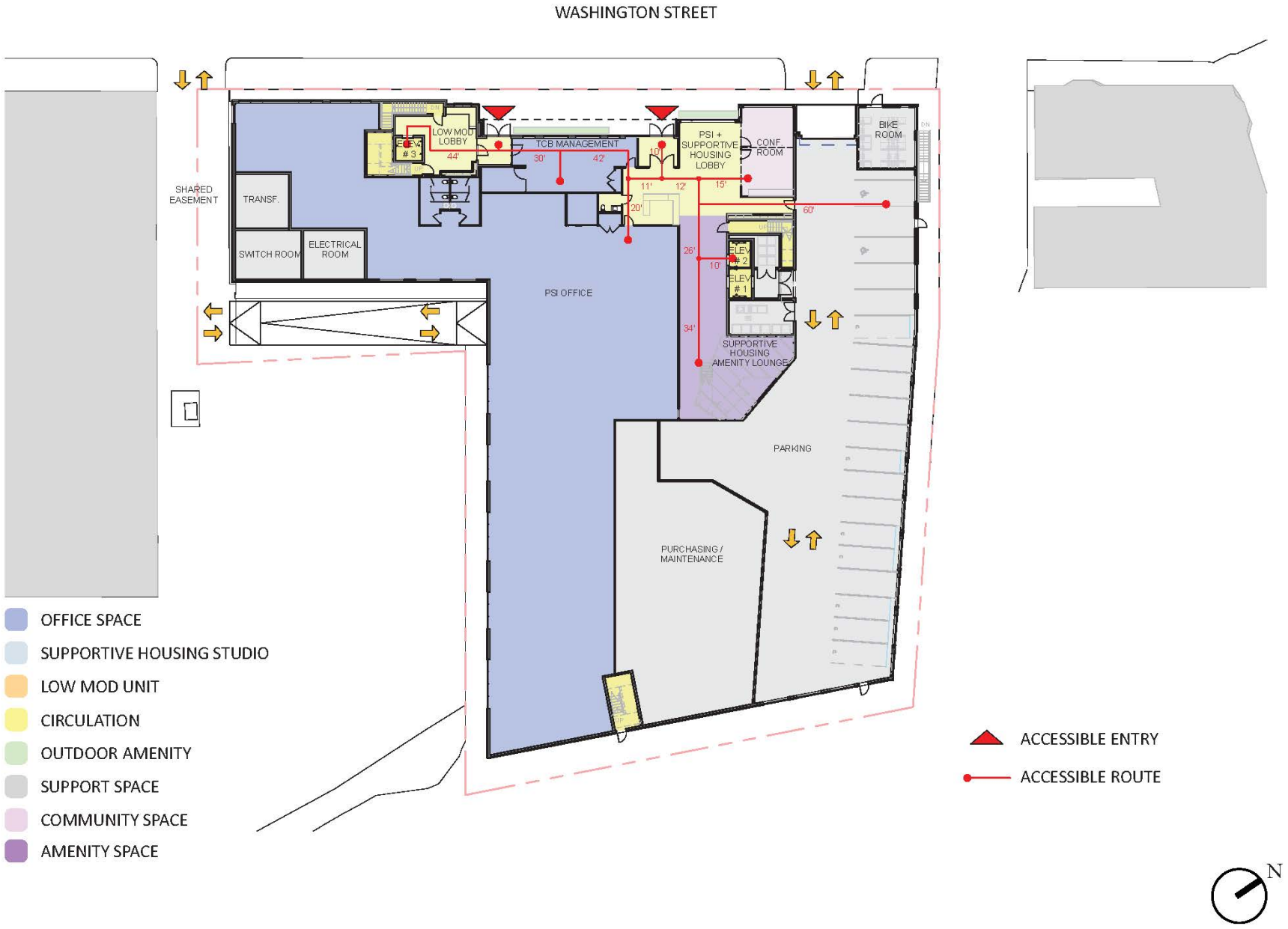


3368 Washington Street Boston, Massachusetts

RODE

Accessibility – Basement Plan



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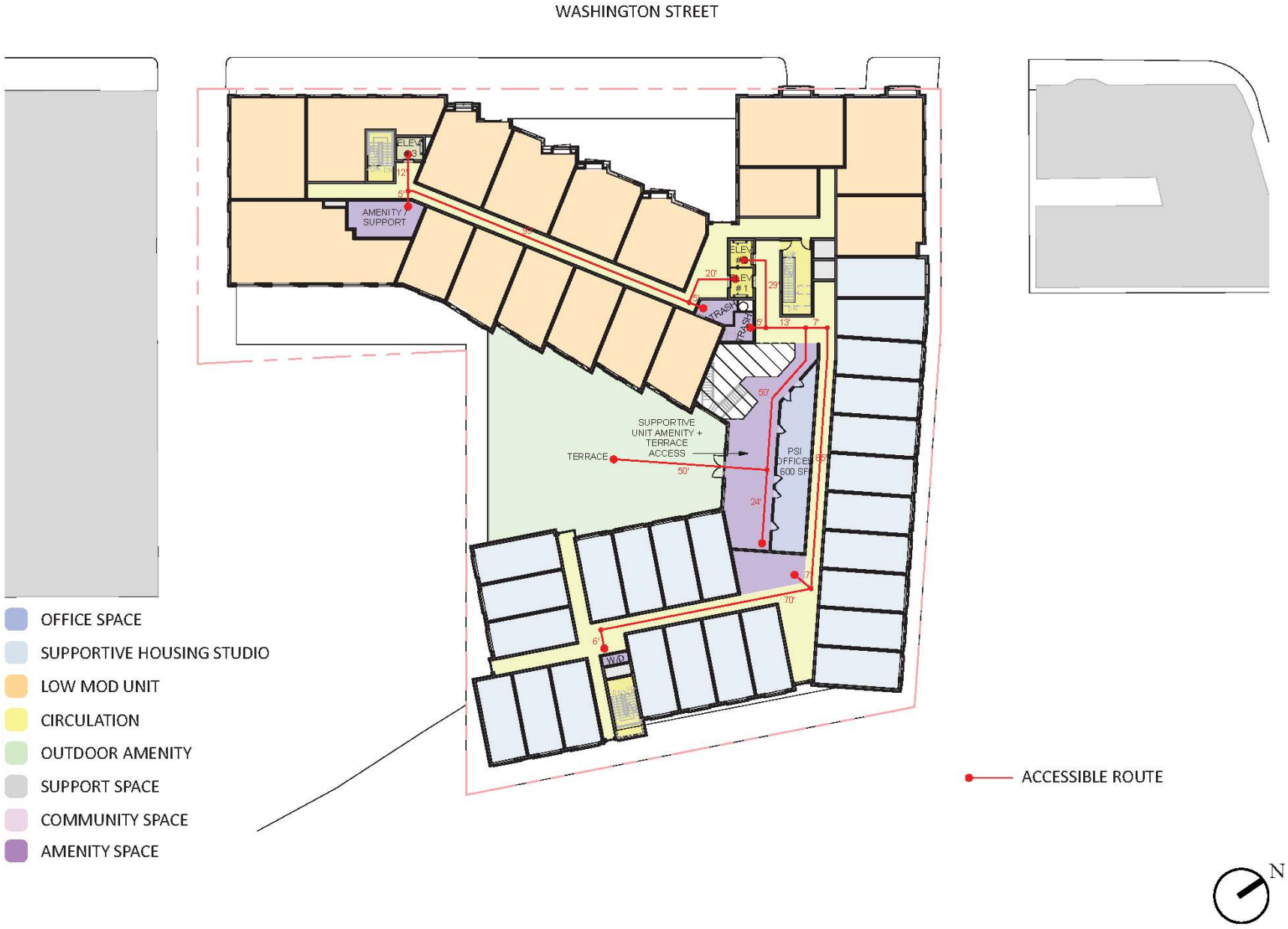
Accessibility – Level 1 Plan



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Accessibility – Level 2 Plan


WASHINGTON STREET
AMENITY / SUPPORT
ELEV. #3
ELEV. #2
ELEV. #1
TRASH
AMENITY / SUPPORT
AMENITY / SUPPORT
W/D
OFFICE SPACE
SUPPORTIVE HOUSING STUDIO
LOW MOD UNIT
CIRCULATION
OUTDOOR AMENITY
SUPPORT SPACE
COMMUNITY SPACE
AMENITY SPACE
ACCESSIBLE ROUTE
N

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Accessibility – Level 6 Plan