EXPANDED PROJECT NOTIFICATION FORM

WASHINGTON VILLAGE

Submitted to:
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

Submitted by:
DJ Properties LLC
c/o Core Investments, Inc.
41 West Street, Suite 800
Boston, MA 02111

Prepared by:
Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250
Maynard, MA 01754

In Association with:
Prellwitz Chilinski Associates Inc.
McDermott Quilty& Miller
Colliers International
Howard Stein Hudson
Nitsch Engineering
Omni Environmental Group
Northeast Geotechnical, Inc.

October 20, 2015

Epsilon ASSOCIATES INC.

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Chapter 1.0

Introduction / Project Description

1.0 INTRODUCTION/ PROJECT DESCRIPTION

1.1 Introduction

DJ Properties LLC (the Proponent) proposes the redevelopment of an approximately 4.89-acre site in the South Boston neighborhood. The redevelopment, known as Washington Village, will include eight new residential buildings, some with parking and most with ground floor retail, as well as new streets, plazas and green spaces (the Project). Overall, the Project will include approximately 656 residential units, approximately 98,600 square feet (sf) of retail space, approximately 560 parking spaces, and approximately 42,500 sf of new open space, and a total of approximately 2.4 acres of new public realm. The development site is generally bound by Dorchester Avenue to the west, Dorchester Street and Old Colony Avenue to the east, Damrell Street to the north, and Tuckerman Street, Middle Street, and residential and commercial properties to the south.

Furthering the policy goals of Boston Mayor Martin J. Walsh's 2030 Housing Plan and consistent with the community's vision, as outlined in Andrew Square Civic Association's 2005 Andrew Square Master Plan, the Project will transform a mostly vacant, underutilized site into a vibrant mixed-use village that will be a natural extension of the surrounding South Boston neighborhood. The nature of the Project will improve the quality of life for existing residents by providing a variety of neighborhood retail stores and a range of complementary housing options. The Project's housing component is intended to provide a diversity of options for a variety of income levels, including local residents seeking to downsize but stay within the South Boston neighborhood as well as new renters and/or buyers seeking to establish roots and be a part of the Andrew Square community.

To achieve this community vision, the housing program will include both home ownership and rental housing options at market-rate, mid-market, and affordable price points to serve all elements of the City's expanding workforce. The Site's proximity to the Massachusetts Bay Transportation Authority's (MBTA) Andrew Station has also informed the vision and design of the Project since many residents will not need a vehicle to travel to their jobs or other destinations around Boston. The Project is anticipated to provide everyday services and goods available on-site, minimizing the need for residents to travel elsewhere to meet their basic needs (e.g., grocery shopping, pharmacy, etc.). In addition to the site's future residents, the development will also be a destination for shoppers from the surrounding area, offering services and retail shops, mixed with outdoor dining, pedestrian plazas, and landscaped open spaces. This introduction of major community-oriented retail opportunities will allow existing nearby residents to walk to retail stores that do not currently exist within walking distance, reducing the surrounding neighborhood's dependence on vehicular travel to access basic retail services such as grocery shopping.

This Expanded Project Notification Form (PNF) is being submitted to the BRA to initiate review of the Project under Article 80B, Large Project Review, of the Boston Zoning Code.

1.2 Project Identification

Name/Address/Location:	Washington Village 235 Old Colony Avenue, South Boston
Developer:	DJ Properties, LLC c/o Core Investments, Inc. 41 West Street, Suite 800 Boston, MA 02111 (617) 428-8000 David Pogorelc Jan Steenbrugge Tim Mackie
Architect:	Prellwitz Chilinski Associates 221 Hampshire Street Cambridge, MA 02139 (617) 547-8120 David Chilinski Rob Hagan
Landscape Architect:	Halvorson Design Partnership, Inc. 25 Kingston Street, 5th Floor Boston, MA 02111 (617) 536-0380 Bob Uhlig Monique Hall
Legal Counsel:	McDermott, Quilty & Miller, LLP 131 Oliver Street, 5th Floor Boston, MA 02110 (617) 946-4600 Joseph Hanley
Permitting Consultants:	Epsilon Associates, Inc. 3 Clock Tower Place, Suite 250 Maynard, MA 01754 (978) 897-7100 Peggy Briggs Geoff Starsiak

Transportation and Parking Consultant:	Howard Stein Hudson 11 Beacon Street, Suite 1010 Boston, MA 02108 (617) 482-7080 Michael Santos
Civil Engineer:	Nitsch Engineering 2 Center Plaza, Suite 430 Boston, MA 02108 (617) 338-0063 John Schmid
MEP Engineer:	Cosentini Associates - A Tetra Tech Company 101 Federal Street, Suite 600 Boston, MA 02110 (617) 748-7800 Robert Leber
Environmental Consultant:	Omni Environmental Group 14 Fletcher Street, Suite 7 Chelmsford, MA 01824 (978) 256-6766 Gregory Morand
Geotechnical Consultant:	Northeast Geotechnical, Inc. 6 Hart Circle Georgetown, MA 01833 (508) 598-3510 Mark Zambernardi

1.3 Project Description

1.3.1 Project Site

The approximately 4.89-acre Project site is located in the South Boston neighborhood of the City of Boston, and is generally bound by Dorchester Avenue to the west, Dorchester Street and Old Colony Avenue to the east, Damrell Street to the north, and Tuckerman Street, Middle Street, and residential and commercial properties to the south (see Figure 1-1). The Project includes surface parking, one to two story industrial and commercial buildings, and vacant site area. Most of the existing building space is vacant, with a portion used for storage, office space and a paint supply store. Appendix A includes a survey of the site.

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division - Data Obtained October 2014

Washington Village **Boston, Massachusetts**

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Figure 1-1

Aerial Locus Map

1.3.2 Area Context

The area surrounding the Project site includes a mix of industrial, commercial and residential uses. Industrial and commercial uses, as well as vacant lots, are located to the north and west of the site. These areas include buildings generally one to two stories tall surrounded by paved areas used for parking and storage. Residential neighborhoods with commercial uses along major roadways, are located to the south, east, and northeast. These areas include one to three story buildings, typical of South Boston. Across Dorchester Street from the site is the Old Colony housing development, which is currently undergoing redevelopment in phases, with Phases 1, 2A and 2B complete.

The Project site is located within the bounds of the South Boston Dorchester Avenue Corridor Planning area being undertaken by the BRA. The study seeks to guide the future of the area and create new zoning compatible with the future vision. The Proponent will be an active participant as the planning study moves forward.

1.3.3 Proposed Project

The Project includes approximately 894,600 sf within eight new buildings, identified as Buildings A through H. In total, the Project will include approximately 98,600 sf of retail space, approximately 656 residential units (approximately 638,900 sf) and approximately 560 parking spaces, including approximately 70 on-street spaces within the site boundaries, as well as new streets, pedestrian paths, plazas, and landscaped open spaces. Retail spaces are anticipated to include a grocery store, neighborhood convenience retail such as a pharmacy, and full-service restaurant and café uses with outdoor seating. The program will be allocated to buildings A through H as shown in Table 1-1 and described below. Figures 1-2 to 1-25 show floor plans, a site plan, elevations, sections and perspectives.

Table 1-1 Project Program – Approximate Dimensions

Building	Retail	Retail Circ.	Residential	Parking	Height
Building A	25,800 sf	2,250 sf	60,200 sf / 64 units	None	69’8″
Building B	11,300 sf	0 sf	64,850 sf / 60 units	None	69’8″
Building C	19,000 sf	0 sf	207,150 sf / 205 units	100,900 sf / 290 spaces	214’
Building D	0 sf	0 sf	232,250 sf / 249 units	50,700 sf / 150 spaces	278’
Building E	36,000 sf	3,250 sf	42,100 sf / 46 units	None	48’8″
Building F	2,900 sf	0 sf	7,450 sf / 8 units	None	37’8″
Building G	0 sf	0 sf	6,400 sf / 6 units	7 spaces	37’8″
Building H	3,600 sf	0 sf	18,500 sf / 18 units	None	48’8″
Total	**98,600 sf**	**5,500 sf**	**638,900 sf / 656 units**	**151,600 sf / 440 garage spaces + 120 surface spaces**	

Building A: Located at the intersection of Dorchester Street and Old Colony Avenue, this six story building will include retail on the first and second floors and approximately 64 residential units above. On the south side of the building will be a new landscaped open space, referred to as "The Green" that will provide for recreational opportunities and a pleasant environment for outdoor dining, events, and other community programming that will be a nexus of the Andrew Square neighborhood. To the west of the building will be a courtyard, also able to include areas for sidewalk dining, and pedestrian pathway that will connection Old Colony Avenue to Alger Street and Tuckerman Street.

Building B: Located immediately west of Building A and separated by the pedestrian path and additional public open space, this building will also include ground floor retail and five floors with approximately 60 residential units above.

Building C: Located to the west of Building B along Damrell Street and separated from Building B by a new roadway, this building will include ground floor retail space suitable for a retail anchor such as a grocery store, four levels of parking above the retail, and approximately 205 residential units located above the parking levels.

Building D: Located to the west of Building C along Damrell Street and separated from Building C by a pedestrian plaza, this building will include ground floor parking serving the retail anchor in Building C with three levels of structured parking above. Above the structured parking will be 20 levels of residential units containing approximately 249 dwelling units.

Building E: Located south of Buildings B and C across Alger Street, this building will include retail on the first and second floors and two floors of residential above with approximately 46 units. To the south of the building on the east side will be a landscaped open space, "The Yard", that provides a transition between Tuckerman Street and the Project site.

Building F: Located to the east, across a pedestrian plaza, from Building E, this building will include ground floor retail and two floors above with approximately 8 residential units.

Building G: Located south of Building E and fronting Middle Street, this building will include ground floor parking with three levels of residential space with approximately 6 units above.

Building H: Located north of Old Colony Avenue across from Building A, this building will include ground floor retail and three floors with approximately 18 residential units above. This building is not contiguous with the rest of the development.

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Figure 1-2

Basement Plan

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Figure 1-3

Ground Floor and Site Plan

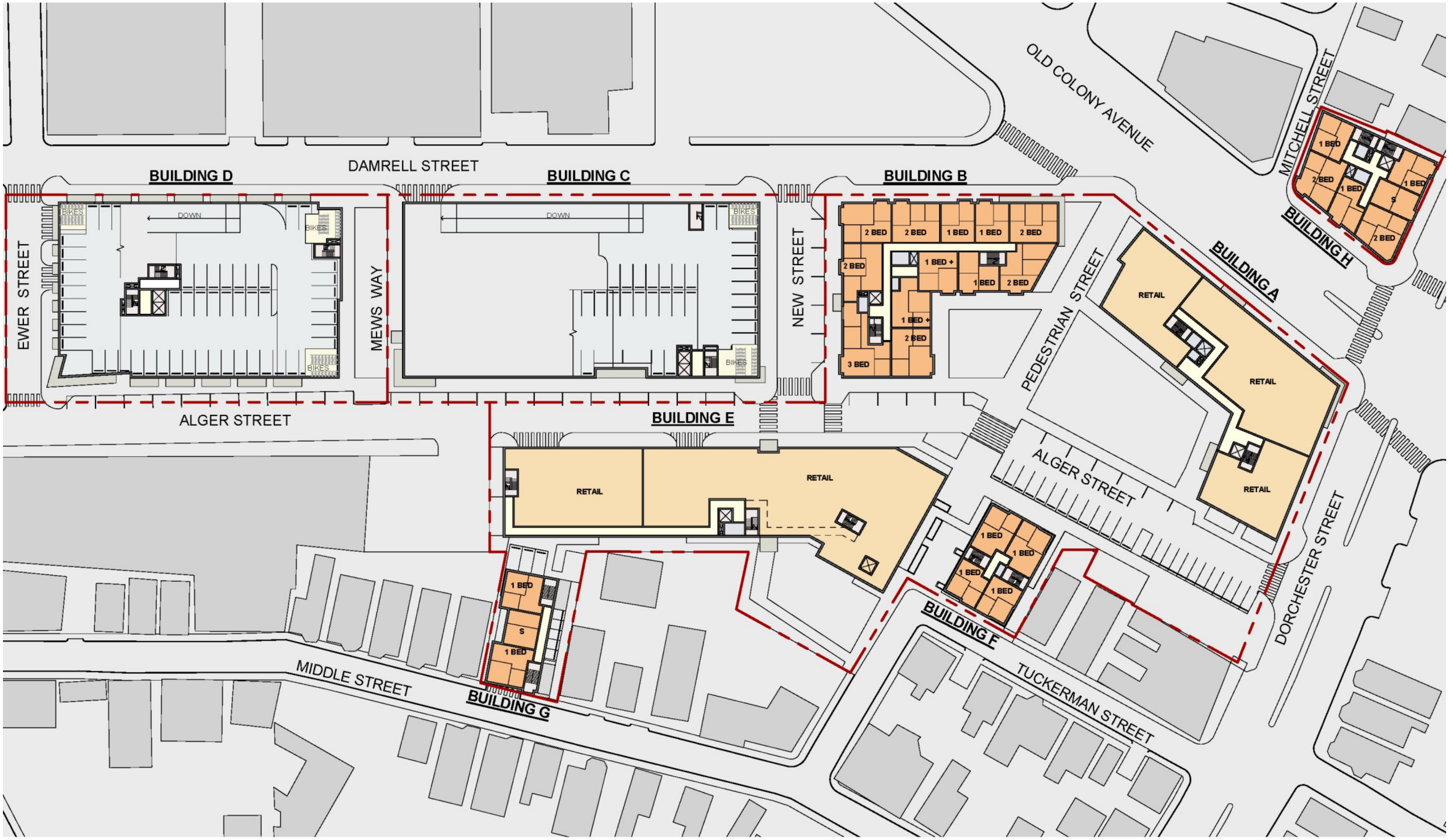

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Figure 1-4
Second Floor Plan

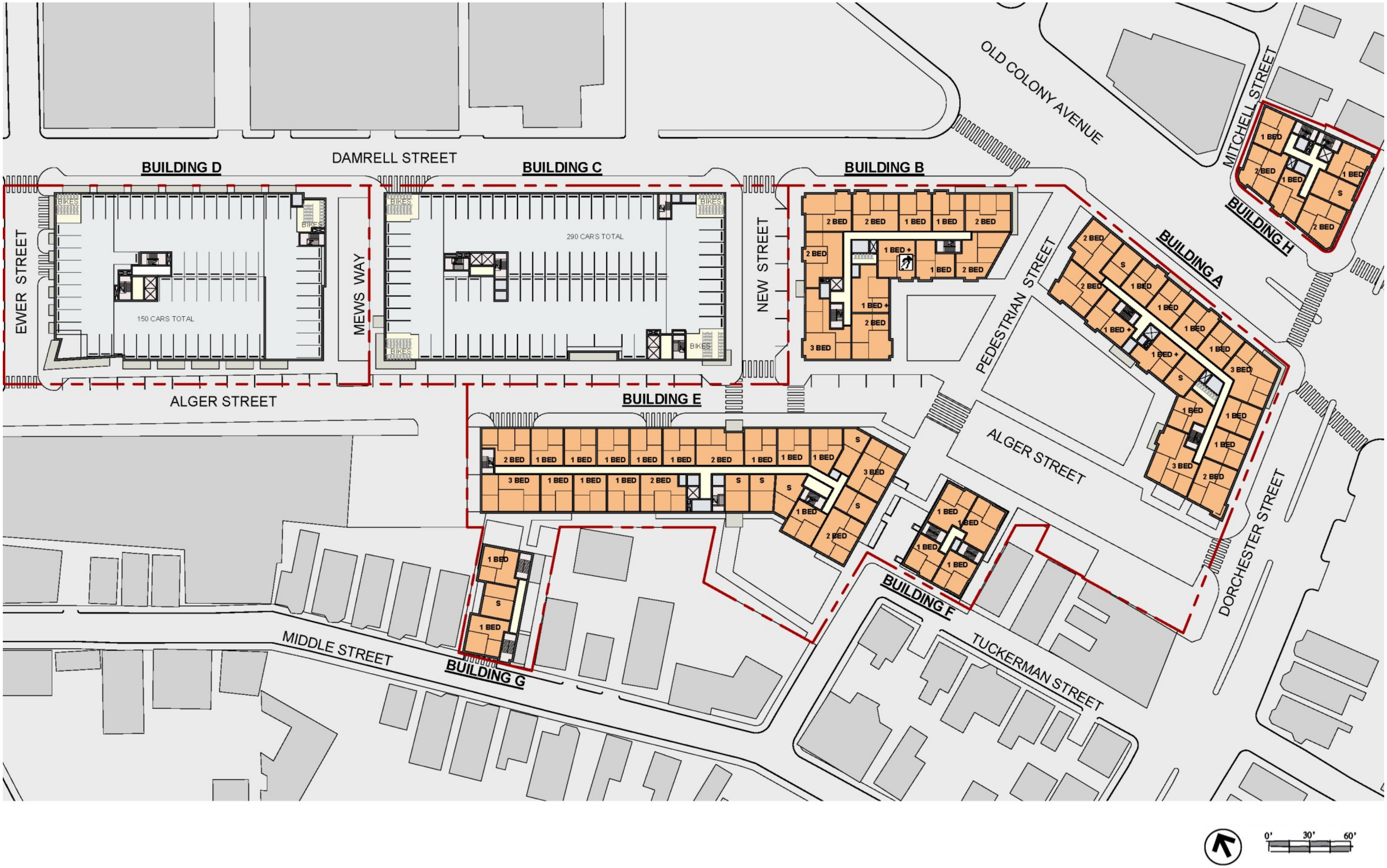

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Figure 1-5

Typical Garage Level Plan

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Figure 1-6

Typical Residential Level Plan

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Figure 1-7

Amenity Level Plan

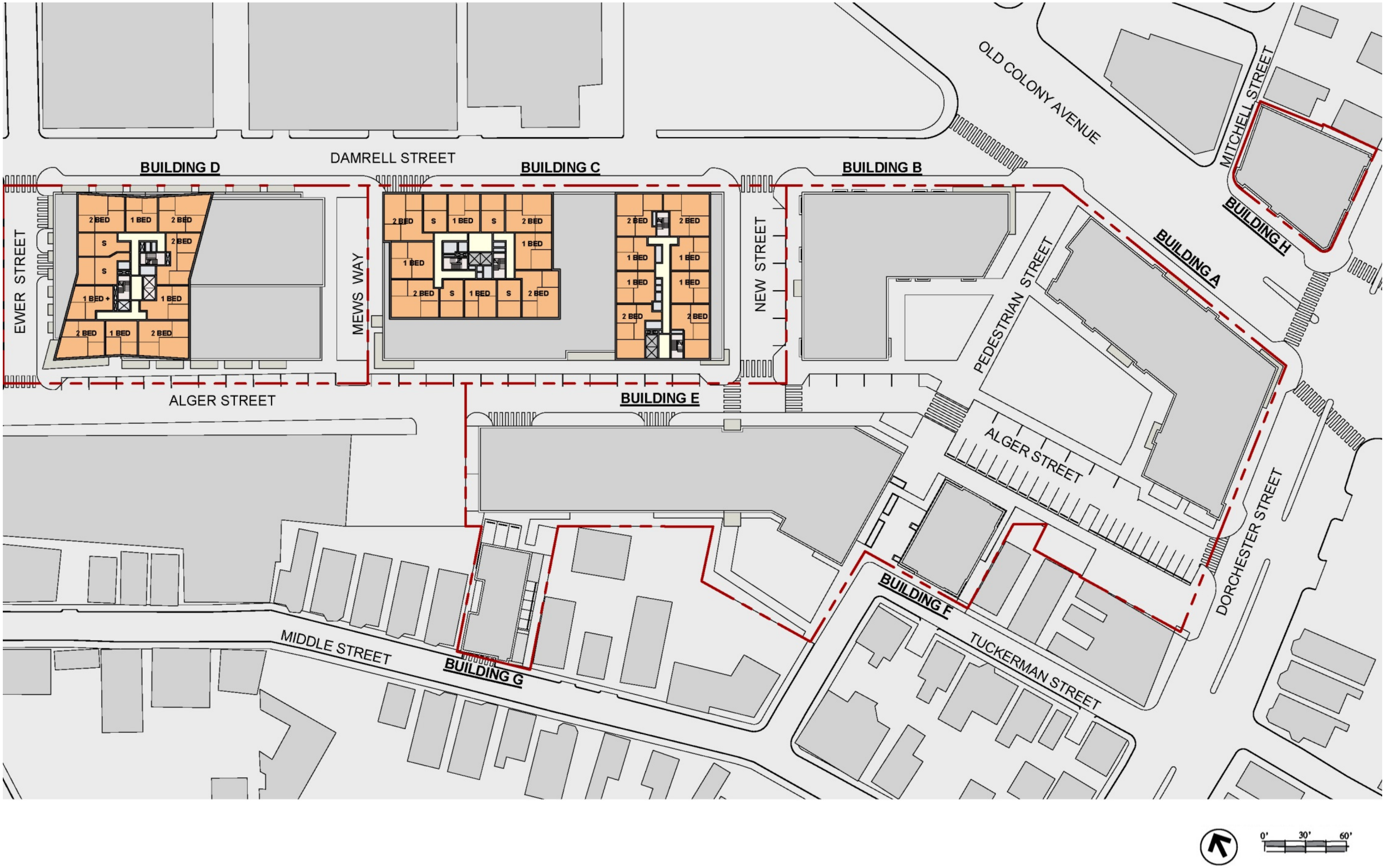

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Figure 1-8

Typical Residential Upper Level Plan

BLDG A - Old Colony Avenue Elevation

BLDG A - Pedestrian Street/ Green Street Elevation

BLDG A - Alger Street Elevation

BLDG A - Dorchester Street Elevation

BLDG B - Cafe Court/ Plaza Elevation

BLDG B - Damrell Street Elevation

BLDG B - New Street Elevation

BLDG B - Alger Street Elevation

Figure 1-9

Buildings A and B Elevations

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Figure 1-10

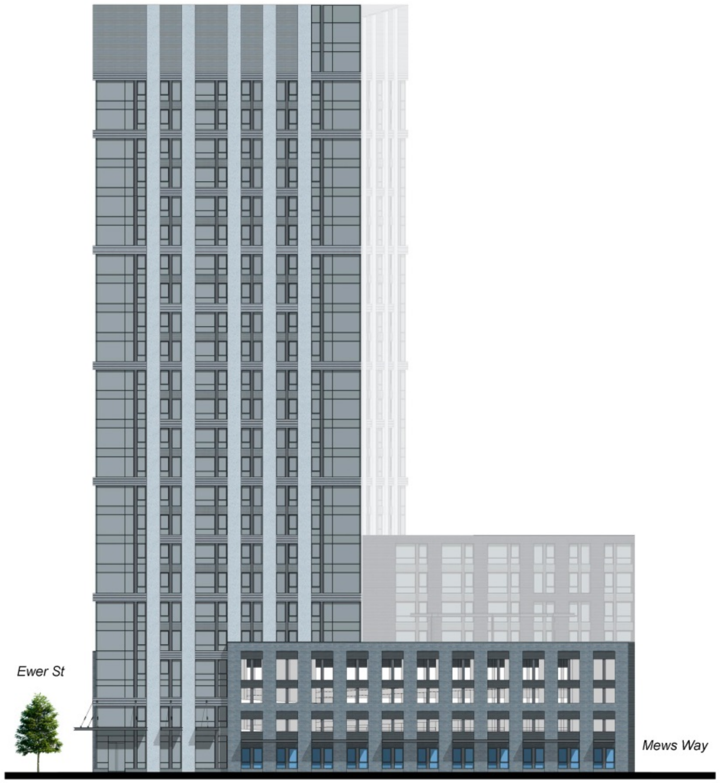
Buildings E, F, G, and H Elevations

BLDG D - Damrell Street Elevation

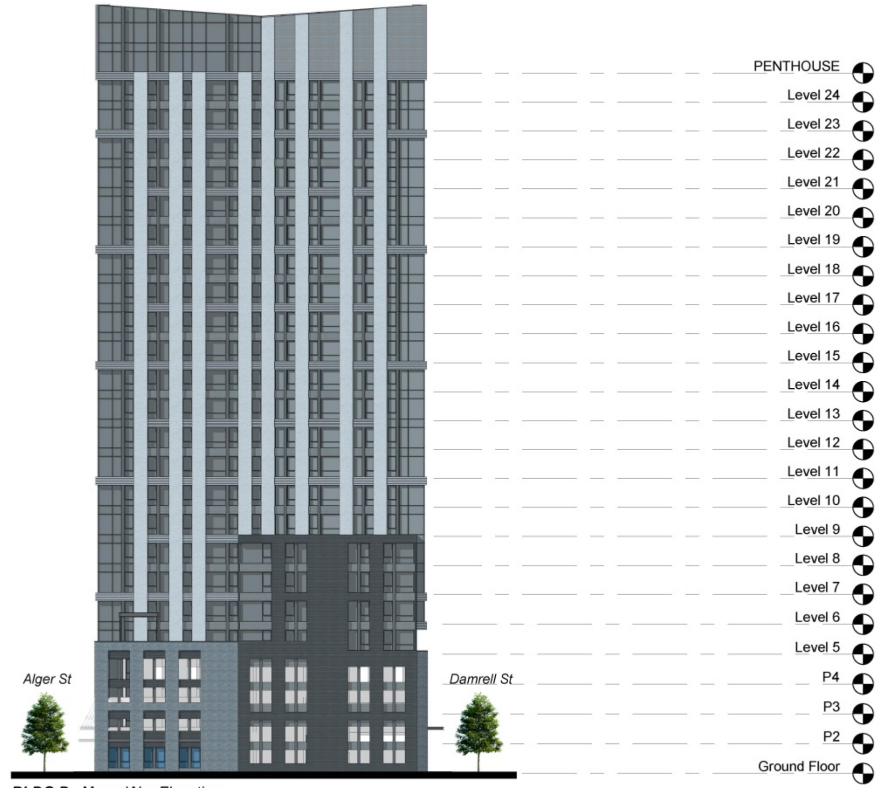
BLDG D - Ewer Street Elevation

Figure 1-11

Building D – Damrell Street and Ewer Street Elevations



BLDG D - Alger Street Elevation



BLDG D - Mews Way Elevation

Figure 1-12

Building D – Alger Street and Mews Way Elevations

BLDG C - Mews Way Elevation

BLDG C - Alger Street Elevation

Figure 1-13

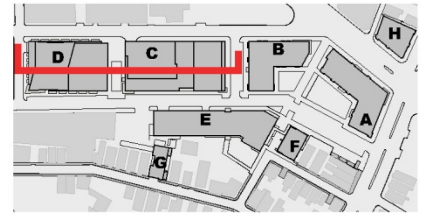
Building C – Mews Way and Alger Street Elevations

BLDG C - New Street Elevation

BLDG C - Damrell Street Elevation

Figure 1-14

Building C – New Street and Damrell Street Elevations



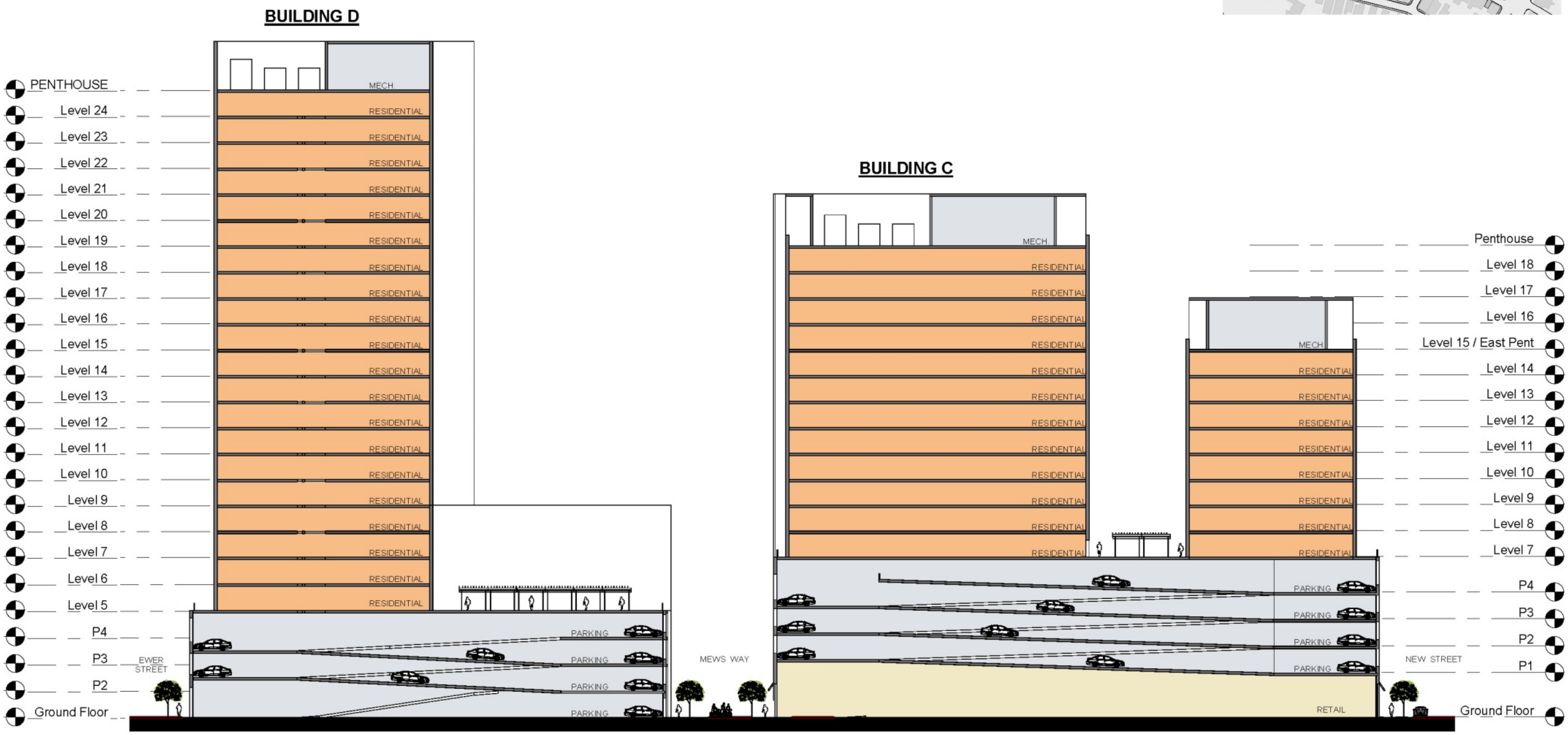


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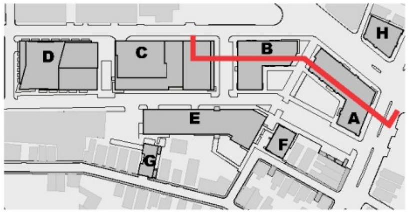
Figure 1-15

Sections - Buildings C and D



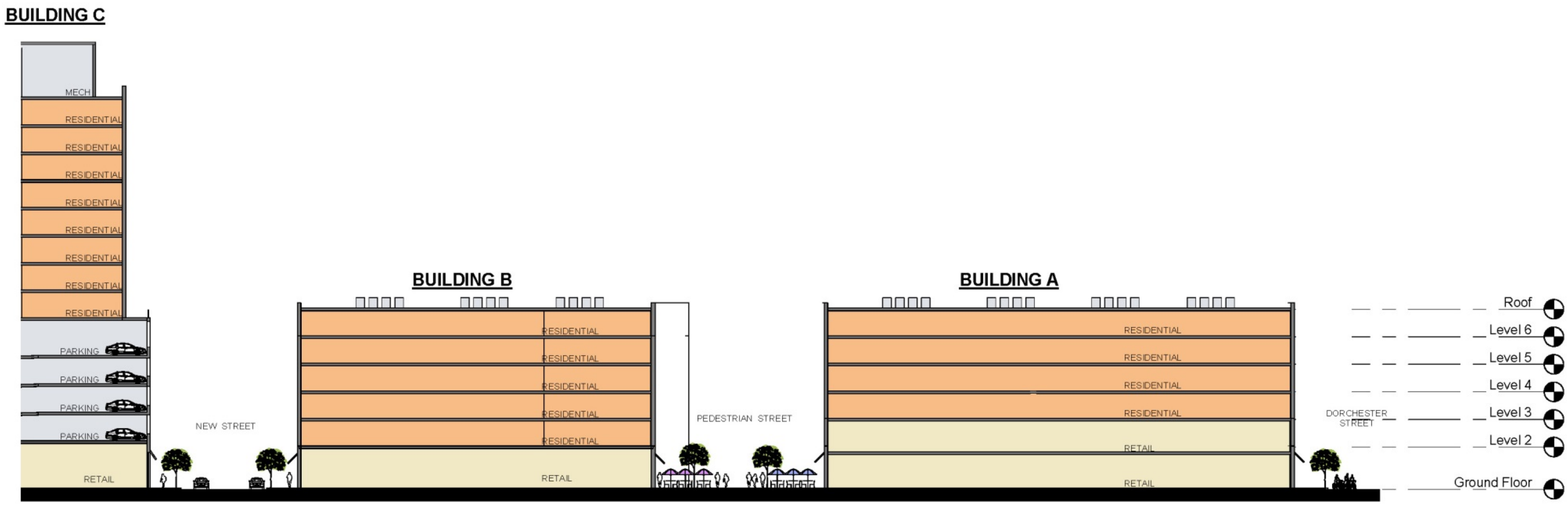


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Figure 1-16

Sections - Buildings A, B, and C

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Figure 1-17

Aerial Perspective Looking South

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Figure 1-18

Aerial Perspective Looking North

Figure 1-19

View of the Green

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Figure 1-20

View from Old Colony Avenue

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Figure 1-21

View of the Pedestrian Walk

Figure 1-22

View of the Café Courtyard

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Figure 1-23

View from Alger Street

Figure 1-24

View from the Plaza

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Figure 1-25

View from Old Colony Avenue and Dorchester Street Intersection

1.4 Public Benefits

The Project will redevelop an underused site with a vibrant mixed-use village that will be a natural extension of the surrounding South Boston neighborhood. The redevelopment will transform the mostly decrepit and impervious site into a mix of modern buildings, plazas, streets and green spaces. The Project will include numerous benefits to the neighborhood and the City of Boston, including the following:

- The redevelopment of an underutilized former industrial site into a mix of uses compatible with and contributory to the surrounding South Boston/Andrews Square neighborhood;
- New streets to break up the "superblock", including the extension of Alger Street, which will be maintained by the Proponent, through the site to Dorchester Avenue;
- New neighborhood retail to serve the community and provide active street edges with wide sidewalks that promote walking trips;
- Almost a mile of new active sidewalks with increased widths per Boston Transportation Department's Complete Streets Program;
- New pedestrian plazas and paths providing access to and through the site;
- Public realm comprising roughly half the site area that will be maintained by the Proponent;
- Creation of a designated programmable open space (The Green) to be an amenity for the entire neighborhood with shared street zone for expandable public events to promote and enhance community connectivity and pedestrian orientation;
- New open space along Tuckerman Street to provide a transition between the existing homes and the Project site.
- More than 130 new street trees and green space to mitigate the heat island effect;
- Housing proximate to the MBTA for middle income residents, as well as affordable housing in compliance with the City of Boston Inclusionary Development Policy to promote the Commonwealth's Transit-Oriented Development policy goals;
- Myriad stormwater management strategies and infrastructure that will significantly improve the quality and decrease the quantity of stormwater generated by the site when compared with existing conditions; and
- New construction and permanent jobs.

1.5 City of Boston Zoning

This section describes how the Project, as it is described above in Section 1.3, will comply with the City of Boston Zoning Code (the "Code" or "Zoning Code").

The Project site includes land areas that are located in three existing zoning subdistricts (M-2/H-1-50/L-1) within the South Boston Neighborhood Zoning District. The Project site and the Project are regulated pursuant to the Underlying Zoning of the Code. The vast majority of the Project site is situated in a Manufacturing 2 Zoning Subdistrict (M-2), whereas a second smaller portion along Middle Street is located within the H-1-50 Zoning Subdistrict, and a third portion along Dorchester Street is located in the L-1 Zoning Subdistrict.

The Project site is also situated within the Restricted Parking Overlay District (RPOD) established by Article 3-1Ac of the Code. The definition of a RPOD in the Code states that "[i]n a restricted parking district, off-street parking facilities, including parking lots, parking garages, and parking accessory or ancillary to any use other than Use Items numbered 1 through 15, shall be Conditional Uses which may be granted only in conformance with the provisions of Section 6-3A as well as Sections 6-2, 6-3 and 6-4." However, parking will be determined as part of the Article 80B Large Project Review process and further delineated in the Planned Development Area (PDA) Development Plan as detailed below.

The Project site is also located within an area in which PDA designations are allowed under the Underlying Zoning of the Zoning Code, pursuant to Article 3-1A.a of the Zoning Code, which states the whole or any part of a subdistrict may be established as a PDA if such area contains not less than one acre and the commission has received and approved a development plan from the BRA.

The Proponent will file a PDA Development Plan separately, pursuant to Article 3-1A.a of the Zoning Code. The Plan will set forth the zoning for the Project for the PDA site. To the extent that the Project does not comply with the use, dimensional or other zoning regulations applicable thereto, the PDA Development Plan, and any subsequently filed PDA Amendments, will supersede all such zoning requirements.

The Project is also subject to Articles 28, 37, 80B and 85 of the Code. The Project will be reviewed by the Boston Civic Design Commission, as required by Article 28. As described in Chapter 4, the Project will be LEED certifiable, as required by Article 37. This Expanded PNF is being submitted as required under Article 80B. Finally, the Project site includes buildings older than 50 years old that will be demolished. The Proponent will file an Article 85 (Demolition Delay) application with the Boston Landmarks Commission.

1.6 Legal Information

1.6.1 Legal Judgments Adverse to the Proposed Project

The Proponent is not aware of any legal judgments or pending actions against the proposed Project.

1.6.2 History of Tax Arrears on Property

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

1.6.3 Site Control/ Public Easements

The Proponent owns the parcels that make up the Project site. The Proponent is not aware of any public easements on the Project site.

1.7 Anticipated Permits

Table 1-2 presents 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 Redevelopment Authority	Article 80B Large Project Review and Execution of Related Agreements; Article 80C Planned Development Area Review; BRA Board Authorization; Section 80B-6 Certificate of Compliance
Boston Zoning Commission	Adoption/Approval of Planned Development Area; Article 80C Planned Development Area Review
Boston Civic Design Commission	Design Review
Boston Department of Public Works/Public Improvement Commission	Curb Cut Permit(s); Street Opening Permit; Street/Sidewalk Occupancy Permit; Sidewalk Improvements; Temporary Earth Retention Permit; Specific Repairs Permit; New Street Trees Permit; Discontinuances

Table 1-2 Anticipated Permits and Approvals (cont'd)

Agency	Permit / Approval
Boston Water and Sewer Commission	Water and Sewer Connection Permits; Construction Site Dewatering Permit; Storm Drainage; Site Plan Review
Boston Fire Department	Flammable Storage Permit; Approval of Fire Safety Equipment
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Inspectional Services Department	Building Permits; Certificates of Occupancy; Site Cleanliness Permit; Other Construction-Related Permits
Boston Landmarks Commission	Article 85 Demolition Delay Review
Boston Public Safety Commission	Permit to Erect and Maintain a Parking Structure
Boston Air Pollution Control Commission	Application for Exempt Spaces (if required)
State	
Executive Office of Energy and Environmental Affairs (EEA)	Massachusetts Environmental Policy Act (MEPA) Review
Executive Office of Transportation and Construction	Letter of consent pursuant to MGL Ch40 §54A
Massachusetts Water Resources Authority	Temporary Construction Dewatering Discharge Permit; Sewer Use Discharge Permit
Federal	
Federal Aviation Administration	Determination of No Hazard to Air Navigation
U.S. Environmental Protection Agency	NPDES Notice of Intent for Construction

1.8 Public Participation

Since 2014, the Proponent has had more than 25 meetings with elected officials, members of the community, community groups, the Impact Advisory Group, and City agencies. The Project team will continue to meet with the community as the Project moves forward.

1.9 Schedule

It is anticipated that construction activities will start in the second quarter of 2016, with completion by the second quarter of 2021. The Project is proposed to be built in three phases. Phase 1 includes the construction of Buildings A, B, C and F. Phase 2 will include the construction of Buildings E, G and H. Phase 3 will include the construction of Building D. This phasing is subject to change and may evolve over time to meet the demands of a dynamic real estate market and the capital markets.

Chapter 2.0

Transportation

2.0 TRANSPORTATION

2.1 Introduction

Howard Stein Hudson (HSH) has conducted an evaluation of the transportation impacts of the proposed mixed-use development containing residential and retail uses to be located at 235 Old Colony Avenue in South Boston. This transportation study adheres to the Boston Transportation Department (BTD) *Transportation Access Plan Guidelines* and Article 80 development review process. This study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, loading operations, transit services, and pedestrian and bicycle activity.

2.1.1 Project Description

The Washington Village project site is located at 235 Old Colony Avenue in South Boston and is generally bounded by Damrell Street to the north, Old Colony Avenue and Dorchester Street to the east, and residential and commercial properties to the south as shown in Figure 1-3. The Project site is situated less than a quarter mile from Andrew Station, providing convenient access to multiple transit opportunities including the Massachusetts Bay Transportation Authority (MBTA) Red Line and several MBTA bus routes. The site is also near a bicycle sharing station provided by Hubway, and is in proximity to on-street bicycle facilities. The nearby transit opportunities and bicycle facilities will provide residents and visitors of the Project with alternative non-vehicular modes of transportation that will reduce the vehicular related impacts of the Project. The site is also proximate to car-sharing opportunities.

The site currently contains several buildings that include industrial and commercial uses including approximately 8,500 sf of occupied office space, approximately 12,500 sf of an occupied paint store, and some self-storage space. The Project will replace the existing building and uses with approximately 656 residential units and approximately 98,600 sf of retail space currently anticipated to include general retail, pharmacy, and grocery store uses. A total of approximately 560 parking spaces will be provided on-site, with approximately 440 parking spaces in two garages and approximately 120 parking spaces dispersed in surface lots and on-street spaces internal to the site. The parking will be provided for the residents, visitors, patrons and guests of the Project. On-site storage will also be provided for approximately 656 bicycles. Loading and service activity will occur on-site.

The Project also includes the construction of a new roadway network within the site that creates several new blocks. Alger Street will be upgraded and extended eastward to intersect with Dorchester Street, creating the primary internal street on the site. Alger Street will operate as a right-in/right-out driveway at the intersection with Dorchester Street. Vehicular access to the proposed grocery store and the residential uses will be provided by new streets that will be constructed between Damrell Street and Alger Street. A driveway connection to Middle Street will be provided to access an eight-space parking lot that will serve the six residential units in Building G. Pedestrian facilities will also be constructed and upgraded as part of the Project. A network of sidewalks and pedestrian-only areas will provide connections to Damrell Street, Old Colony Avenue, Dorchester Street, Tuckerman Street, and Middle Street. Primary pedestrian access to the residential buildings will be provided off of Alger Street (except for Buildings G and H which will have access from Old Colony Avenue/Dorchester Street and Middle Street, respectively). Pedestrian access to the commercial spaces will be provided along Alger Street, Old Colony Avenue, Damrell Street, and Dorchester Street.

2.1.2 Study Methodology

This transportation study and supporting analyses were conducted in accordance with BTD guidelines and is described below.

The Existing Condition analyses includes an inventory of the existing (2015) transportation conditions such as traffic characteristics, parking and curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site conditions. Existing counts for vehicles, bicycles, and pedestrians were collected at the study area intersections on December 11, 2013, December 09, 2014, and June 16, 2015. The traffic counts form the basis for the transportation analysis conducted as part of this evaluation.

The future transportation condition analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2020, based on a five-year horizon from the year of the filing of the traffic study. Expected roadway, parking, transit, pedestrian, bicycle accommodation, and loading capabilities and deficiencies are identified. This section includes the following scenarios:

- The 2020 No-Build Condition scenario includes both general background traffic growth and traffic growth associated with specific developments and transportation improvements that are planned in the vicinity of the Project site.

- The 2020 Build Condition scenario includes Project-generated traffic volume estimates added to the traffic volumes developed as part of the 2020 No-Build Condition scenario.

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

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

2.1.3 Study Area

The study area consists of the following eleven intersections, also shown on Figure 2-1:

- Old Colony Avenue/Dorchester Street (signalized);
- Old Colony Avenue/Damrell Street/Gustin Street (unsignalized);
- Old Colony Avenue/D Street (signalized);
- Dorchester Avenue/Dorchester Street/Southampton Street/Boston Street/Preble Street (Andrew Square, signalized);
- Dorchester Street/Middle Street/Vinton Street (unsignalized);
- Dorchester Street/Tuckerman Street/Jenkins Street (unsignalized);
- Dorchester Street/West Eighth Street/East Eighth Street (signalized);
- Dorchester Avenue/Middle Street (unsignalized);
- Dorchester Avenue/Alger Street (unsignalized);
- Dorchester Avenue/Damrell Street (unsignalized);
- Dorchester Avenue/D Street (signalized);
- Dorchester Avenue/Old Colony Avenue/Milhender Place (signalized);
- Southampton Street/I-93 NB Frontage Road/I-93 NB Off-Ramp (signalized);
- Southampton Street/South Bay Shopping Center Driveway/Southampton Street Extension (signalized); and
- Old Colony Avenue/Columbia Road/Preble Street/Vinton Street (unsignalized rotary).

2.2 Existing Conditions

2.2.1 Existing Roadway Conditions

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

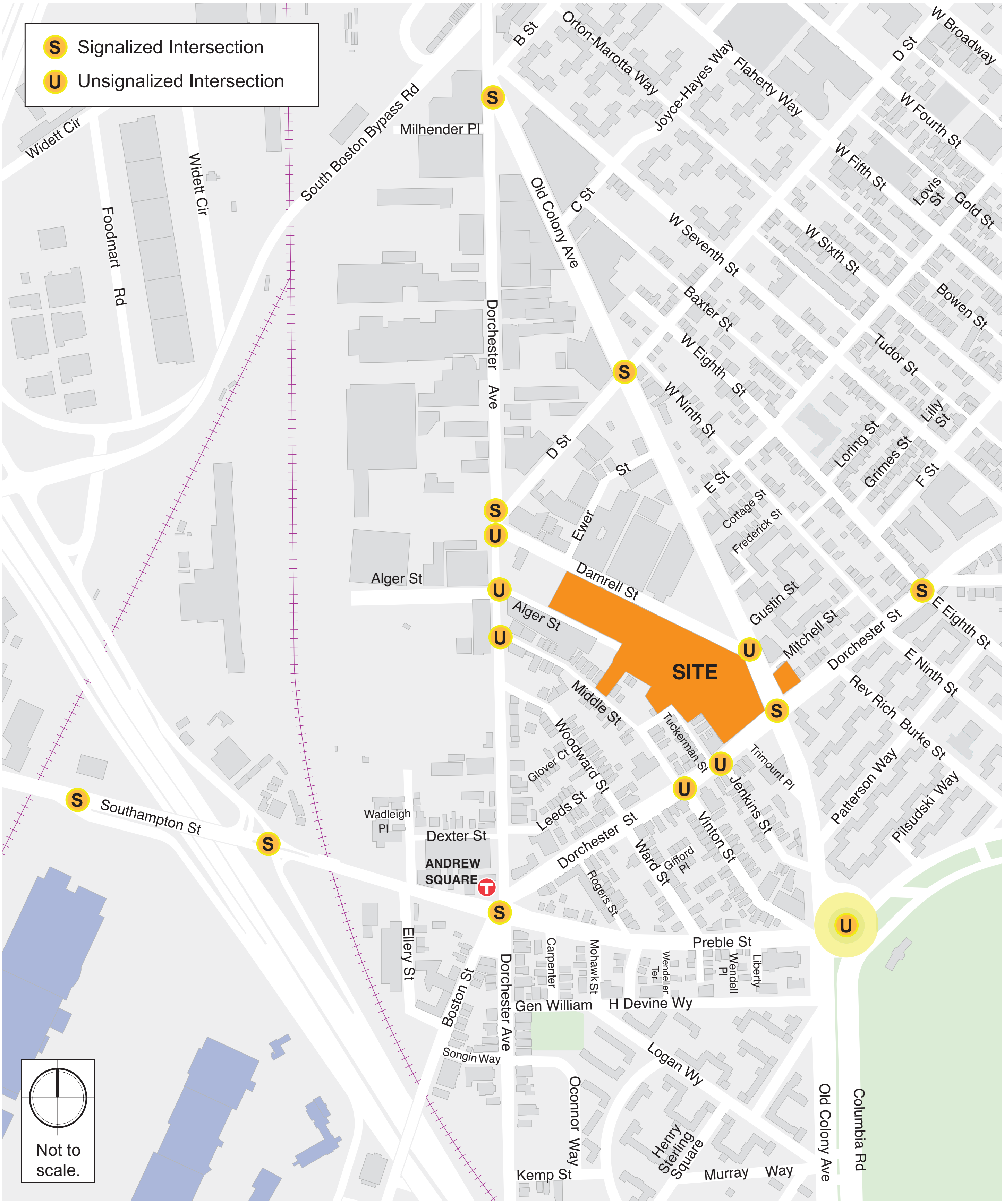

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Figure 2-1
Study Area Intersections

Old Colony Avenue is a two-way, four lane roadway adjacent to the east side of the Project site. Old Colony Avenue is classified as an urban principal arterial roadway generally under BTD jurisdiction and generally runs in a north-south direction between Dorchester Avenue to the north and Columbia Road to the south. Old Colony Avenue, south of Preble Street, is under the jurisdiction of the Department of Conservation and Recreation (DCR). Within the study area, the directions of travel are separated by a raised/cobble median, on-street parking is provided along both sides of the roadway, and sidewalks are provided along both sides of the roadway.

Dorchester Street is a two-way, four lane roadway adjacent to the south side of the Project site. Dorchester Street is classified as an urban minor arterial roadway under BTD jurisdiction and generally runs in an east-west direction between East First Street to the west and Dorchester Avenue to the east. Within the study area, the directions of travel are separated by a painted median, on-street parking is provided on both sides of the roadway, and sidewalks are provided along both sides of the roadway.

Damrell Street is a two-way, two lane roadway adjacent to the north of the Project site. Damrell Street is classified as a local roadway under BTD jurisdiction and generally runs in an east-west direction between Old Colony Avenue to the east and Dorchester Avenue to the west. Within the study area, on-street parking is provided along the north side of the roadway and sidewalks are provided along both sides of the roadway.

D Street is a two-way, two lane roadway located to the north of the Project site. D Street is classified as an urban minor arterial roadway under BTD jurisdiction and runs in a northeast-southwest direction between Dorchester Avenue to the southwest and Northern Avenue to the northeast. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

Dorchester Avenue is a two-way, two lane roadway located west of the Project site. Dorchester Avenue is classified as an urban minor arterial roadway under BTD jurisdiction and runs in a north-south direction between Congress Street to the north and Adams Street to the south. Within the study area, on-street parking and sidewalks are provided on both sides of the roadway.

Southampton Street is a two-way, four lane roadway located west of the Project site. Southampton Street is classified as an urban principal arterial roadway generally under BTD jurisdiction and runs in an east-west direction between Massachusetts Avenue to the west and Dorchester Avenue to the east. The ramps that connect Southampton Street to Interstate 93 are under MassDOT jurisdiction. Within the study area, on-street parking is restricted on both sides of the roadway and sidewalks are provided along both sides of the roadway.

Boston Street is a two-way, two lane roadway located to the south of the Project site. Boston Street is classified as an urban minor arterial roadway under BTD jurisdiction and generally runs in a north-south direction between Dorchester Street to the north and Columbia Road to the south. Within the study area, on-street parking and sidewalks are provided along both sides of the roadway.

Preble Street is a two-way, two lane roadway located south of the Project site. Preble Street is classified as an urban principal arterial roadway under BTD jurisdiction and generally runs in an east-west direction between Southampton Street to the west and Old Colony Avenue to the east. Within the study area, on-street parking and sidewalks are provided on both sides of the roadway.

Middle Street is a one-way, one lane roadway and runs in a northbound direction located south of the Project site. Middle Street is classified as a local roadway under BTD jurisdiction. Middle Street runs between Dorchester Street to the south and Dorchester Avenue to the north. Within the study area, on-street parking is provided along the east side of the roadway and sidewalks are provided along both sides of the roadway.

Tuckerman Street is a one-way, one lane roadway and generally runs in the southbound direction, located adjacent to the south portion of the Project site. Tuckerman Street is classified as a local roadway under BTD jurisdiction. Tuckerman Street runs between Middle Street to the south and Dorchester Street to the east. Within the study area, on-street parking is provided along the east side of the roadway and sidewalks are provided along both sides of the roadway.

Alger Street is a two-way, two lane roadway and currently provides access to the Project site from Dorchester Avenue to the west. Alger Street currently has no outlet from the Project site and provides access to loading docks and parking areas for some existing uses on the site and for the adjacent land uses. Alger Street is classified as a local street and is under private ownership. On-street parking and sidewalks are not currently provided along Alger Street.

2.2.2 Existing Intersection Conditions

Existing conditions at each of the study area intersections are described below.

Old Colony Avenue/Dorchester Street is a four-legged, signalized intersection with four approaches and is under BTD jurisdiction. This intersection is located adjacent to the site and is a key location in providing access to the Project. The Dorchester Street eastbound and westbound approaches both consist of a left-turn/through lane and a through/right-turn lane. The Old Colony Avenue northbound and southbound approaches both consist of a left-turn/through lane and a through/right-turn lane. The directions of travel along Old Colony Avenue are separated by a cobblestone median. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided for all pedestrian crossings at the intersection.

Old Colony Avenue/Damrell Street/Gustin Street is a four-legged, unsignalized intersection under BTD jurisdiction with four approaches and is under BTD jurisdiction. This intersection is adjacent to the Project in the vicinity of the northeast portion of the site. The Damrell Street eastbound and the Gustin Street westbound approaches each consist of a single travel lane under STOP control. The Old Colony Avenue northbound and southbound approaches each consist of a left-turn/through and a through/right-turn lane. The directions of travel along Old Colony Avenue are separated by a cobblestone median. Crosswalks are not provided at the intersection. Wheelchair ramps are provided across the Damrell Street and Gustin Street approaches.

Old Colony Avenue/D Street is a four-legged, signalized intersection with four approaches and is under BTD jurisdiction. The D Street eastbound and westbound approaches each consist of a single travel lane. The Old Colony Avenue northbound and southbound approaches each consist of a left-turn/through lane and a through/right-turn lane. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided for all pedestrian crossings at the intersection.

Dorchester Avenue/Dorchester Street/Southampton Street/Boston Street/Preble Street (Andrew Square) is a six-legged, signalized intersection with six approaches and is under BTD jurisdiction. The Southampton Street eastbound approach consists of a left-turn lane and a through/right-turn lane. The Preble Street westbound approach consists of a left-turn/through lane and a through/right-turn lane. The Dorchester Avenue northbound and southbound approaches each consist of a left-turn/through lane and a through/right-turn lane. The directions of travel along Dorchester Avenue are separated by a raised median. The Boston Street northeastbound and Dorchester Street southwestbound approaches each consist of a left-turn/through lane and a through/right-turn lane. The directions of travel along Boston Street and Dorchester Street are separated by a raised median. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided for all crossings at the intersection.

Dorchester Street/Middle Street/Vinton Street is a four-legged, unsignalized intersection, with two approaches and is under BTD jurisdiction. The Dorchester Street eastbound and westbound approaches each consist of a left-turn/through lane and a through/right-turn lane. The directions of travel along Dorchester Street are separated by a raised median. Middle Street is one-way in the northbound direction departing the intersection and Vinton Street is one-way in the southbound direction departing the intersection. Both streets consist of a single travel lane. Crosswalks and wheelchair ramps are provided for all crossings at the intersection.

Dorchester Street/Tuckerman Street/Jenkins Street is a four-legged, unsignalized intersection with three approaches and is under BTD jurisdiction. The Dorchester Street eastbound approach consists of a through travel lane and a shared through/right-turn lane. The Dorchester Street westbound approach consists of a left-turn/through lane and a through travel lane. The Tuckerman Street southbound approach consists of a single travel lane under STOP control. Jenkins Street is one-way in the southbound direction departing the intersection and consists of a single travel lane. Crosswalks are not provided at the intersection and wheelchair ramps are provided at Tuckerman Street and Jenkins Street.

Dorchester Street/West Eighth Street/East Eighth Street is a four-legged, signalized intersection with three approaches and is under BTD jurisdiction. The Dorchester Street eastbound and westbound approaches each consist of a left-turn/through lane and a through/right-turn lane. The East Eighth Street westbound approach consists of a single travel lane. The West Eighth Street leg of the intersection is one-way westbound departing the intersection. Crosswalks and wheelchair ramps are provided across all legs of the intersection. Pedestrian signal equipment is also provided at the intersection.

Dorchester Avenue/Middle Street is a three-legged, unsignalized intersection with three approaches and is under BTD jurisdiction. The Middle Street westbound approach consists of a single travel lane under STOP control. Middle Street is one-way entering the intersection. The Dorchester Avenue northbound and southbound approaches each consist of a single travel lane in each direction. Crosswalks are not provided at the intersection. Wheelchair ramps are provided to cross the Middle Street approach.

Dorchester Avenue/Alger Street is a four-legged, unsignalized intersection, with four approaches and is under BTD jurisdiction. The Alger Street eastbound and westbound approaches each consist of a single travel lane under STOP control. The Dorchester Avenue northbound and southbound approaches each consist of a single travel lane. Crosswalks and wheelchair ramps are not provided at the intersection.

Dorchester Avenue/Damrell Street is a three-legged, unsignalized intersection with three approaches and is under BTD jurisdiction. The Damrell Street westbound approach consists of a single travel lane under STOP control. The Dorchester Avenue northbound and southbound approaches each consist of a single travel lane. Crosswalks are not provided at the intersection. Wheelchair ramps are provided to cross the Damrell Street approach. The intersection is located immediately south of the traffic signal at the intersection of Dorchester Avenue/D Street.

Dorchester Avenue/D Street is a three-legged, signalized intersection with three approaches and is under BTD jurisdiction. The D Street eastbound approach consists of a single travel lane. The Dorchester Avenue northbound and southbound approaches each consist of a single travel lane. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided on the D Street and Dorchester Avenue southbound approaches.

Dorchester Avenue/Old Colony Avenue/Milhender Place is a four-legged, signalized intersection with four approaches and is under BTD jurisdiction. The Milhender Place eastbound approach consists of a single travel lane. The Dorchester Avenue northbound approach consists of a single travel lane. The Dorchester Avenue southbound approach consists of an exclusive left-turn lane and a through/right-turn lane. The northwestbound Old Colony Avenue approach consists of a through travel lane and a through/right-turn lane. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across the Dorchester Avenue northbound and Old Colony Avenue northwestbound approaches.

Southampton Street/I-93 NB Frontage Road/I-93 NB Off-Ramp is a four-legged, signalized intersection with four approaches and is under MassDOT jurisdiction. The Southampton Street eastbound approach consists of an exclusive left-turn lane and a left-turn/through lane. The Southampton Street westbound approach consists of two through travel lanes and an exclusive right-turn lane. The I-93 Off-Ramp northbound approach consists of an exclusive left-turn lane and a left-turn/through/right-turn lane. The I-93 NB Frontage Road southbound approach consists of an exclusive right-turn only lane. Crosswalks and wheelchair ramps are provided across the I-93 NB Off-Ramp and I-93 Frontage Road approaches. Pedestrian signal equipment is not provided at the intersection.

Southampton Street/South Bay Shopping Center Driveway/Southampton Street Extension is a four-legged, signalized intersection with three approaches and is under MassDOT jurisdiction. The Southampton Street eastbound approach consists of a through lane and a shared through/right-turn lane. The Southampton Street westbound approach consists of a left-turn/through lane and a through lane. The South Bay Shopping Center Driveway northbound approach consists of an exclusive left-turn lane and an exclusive right-turn lane. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across the northbound and westbound approaches.

Old Colony Avenue/Columbia Road/Preble Street/Vinton Street forms a rotary that operates as a series of four unsignalized intersections and is under BTD jurisdiction. The Old Colony Avenue southbound and Columbia Road westbound approaches consist of two travel lanes, the Old Colony Avenue northbound approach consists of three travel lanes, and the Preble Street eastbound approach consists of a single travel lane entering the rotary. Each approach to the rotary is under STOP control and operates as an independent unsignalized intersection. Vinton Street is one-way in the eastbound direction and intersects Preble Street immediately west of the rotary. Each leg of the rotary also has a departure leg, allowing for two-way travel along all intersecting roadways. Marked crosswalks are provided across all legs to the rotary.

2.2.3 Existing Traffic Conditions

Traffic movement data was collected at the study area intersections on December 11, 2013, December 09, 2014, and June 16, 2015. Manual turning movement counts (TMCs) and vehicle classification counts were conducted during the weekday a.m. and p.m. peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m., respectively) for the study area intersections.

The vehicle classification counts included car, truck, pedestrian, and bicycle movements. Based on the TMCs, the peak hours of vehicular traffic throughout the study area are generally 7:45-8:45 a.m. and 4:30-5:30 p.m. The 2013 and 2014 TMCs were adjusted upward by the growth rate of 0.5 percent to reflect 2015 conditions. A detailed discussion of the traffic growth rate is provided later in this chapter. The detailed traffic counts are provided in Appendix B.

2.2.3.1 Seasonal Adjustment

In order to account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the December 2013 and 2014 TMCs. The 2011 seasonal adjustment factor for December for roadways similar to the study area is 0.97, which indicates that average month traffic volumes are approximately three percent lower than typical December traffic volumes. The traffic counts were not adjusted downward to reflect average month conditions in order to provide a more conservative analysis. The Existing (2015) Condition weekday a.m. and p.m. peak hour traffic volumes are shown in Figure 2-2 and 2-3, respectively.

2.2.4 Existing Traffic Operations

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay experienced by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 8) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM). Field observations were performed by HSH to collect intersection geometry such as number of turning lanes, lane length, and lane width that were then incorporated into the operations analysis.

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. Table 2-1 displays the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition.

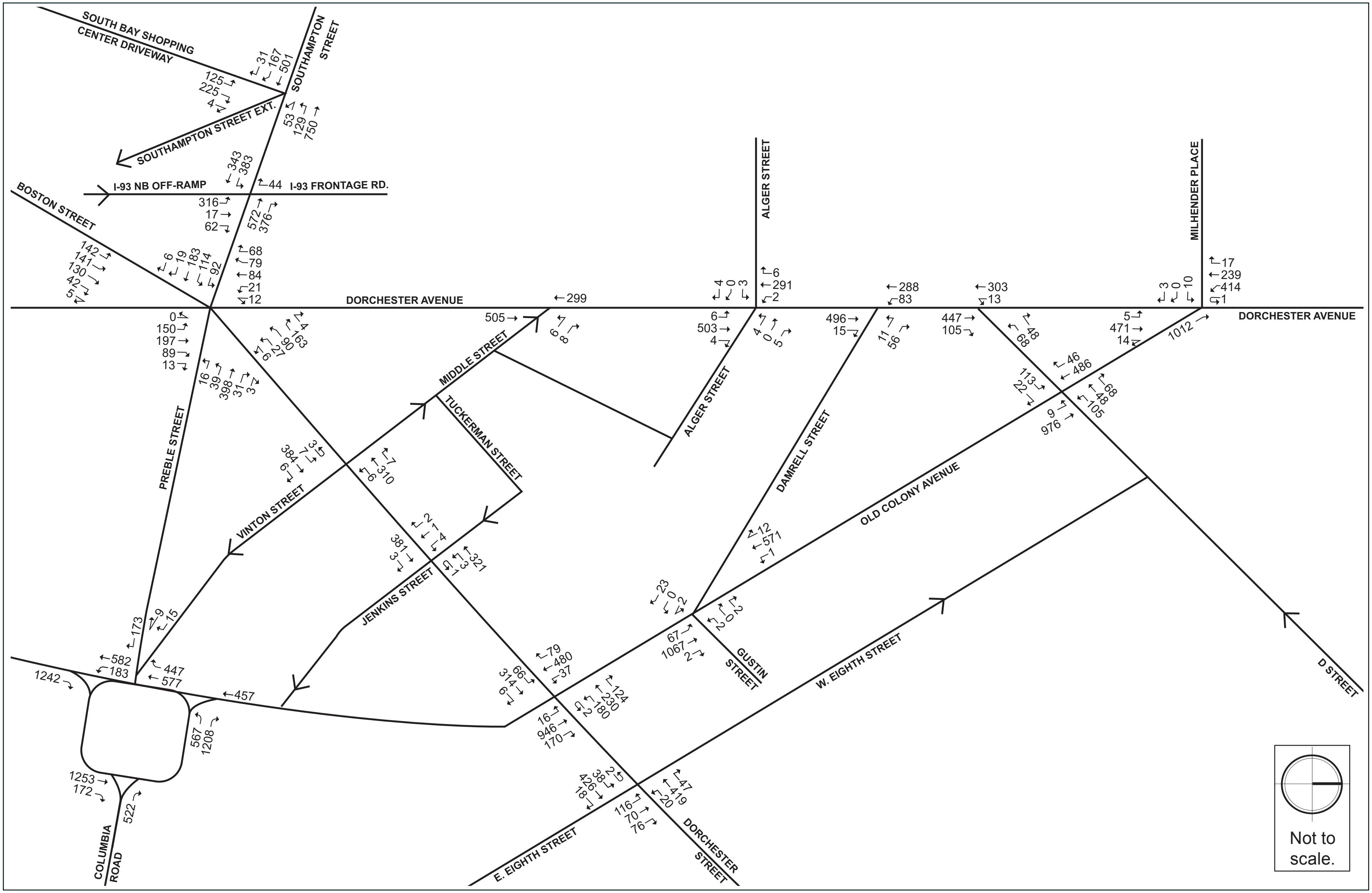

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Figure 2-2

Existing (2015) Condition Traffic Volumes, a.m. Peak Hour (7:45-8:45 a.m.)

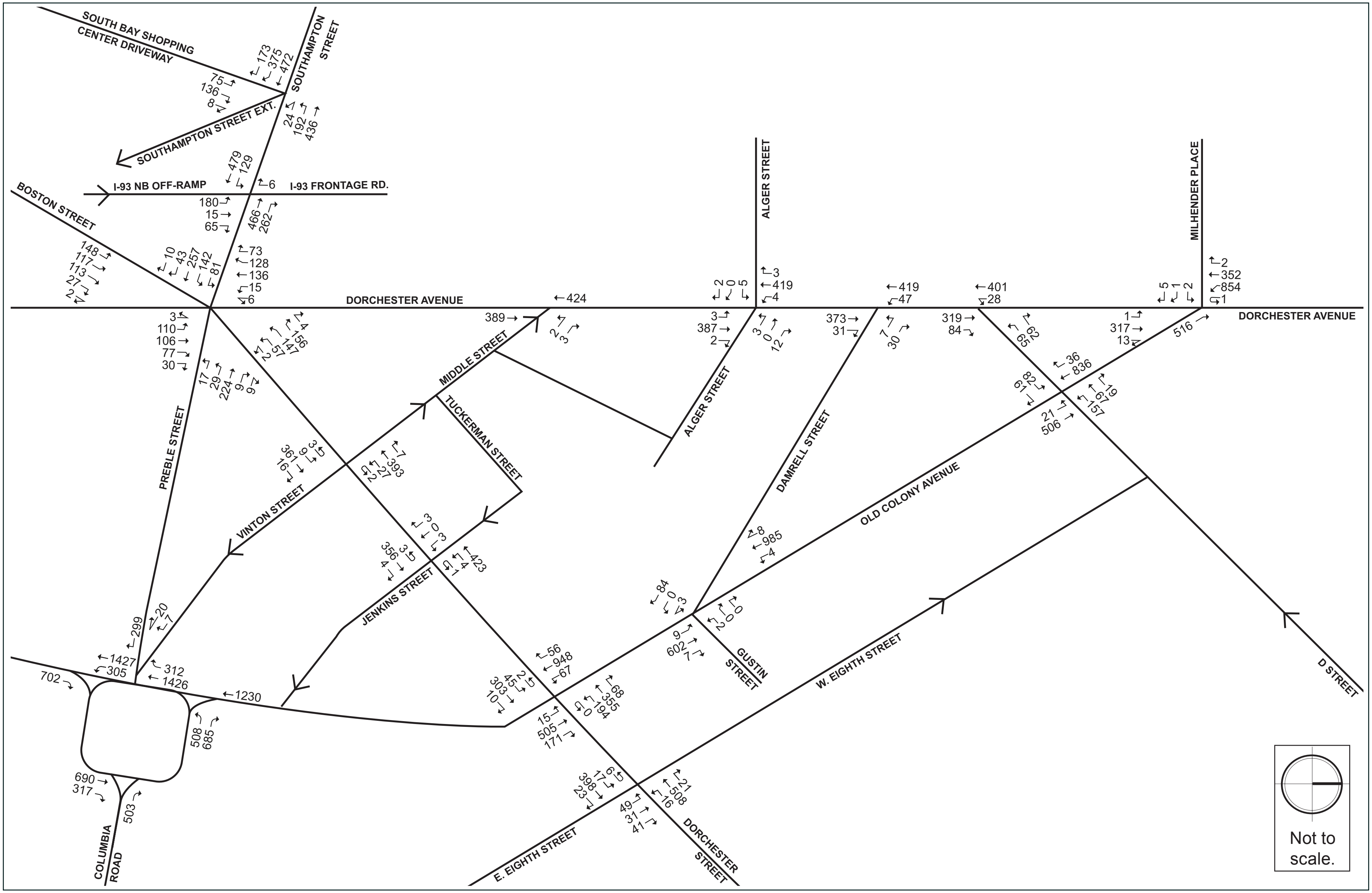

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Figure 2-3

Existing (2015) Condition Traffic Volumes, p.m. Peak Hour (4:30-5:30 p.m.)

Table 2-1 Level of Service Criteria

Level of Service	Average Stopped Delay (sec./veh.)	
	Signalized Intersections	Unsignalized Intersections
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50
Source: 2000 Highway Capacity Manual, Transportation Research Board.		

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

The volume-to-capacity (v/c) ratio is a measure of congestion at an intersection approach. A v/c ratio below one indicates that the intersection approach has available capacity to process the arriving traffic volumes over the course of an hour. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity during the peak 15 minute period.

The 50th percentile queue length, measured in feet, represents the maximum queue length during a cycle of the traffic signal with typical (or median) entering traffic volumes and is only used for analysis of signalized intersections.

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

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

Table 2-2 Existing (2015) Condition, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized					
Old Colony Avenue at Dorchester Street	**F**	**>80.0**	-	-	-
Dorchester Street EB left/thru | thru/right	F	>80.0	>1.00	~153	#246
Dorchester Street WB left/thru | thru/right	F	>80.0	>1.00	~172	#304
Old Colony Avenue NB left/thru | thru/right	F	>80.0	>1.00	~440	#571
Old Colony Avenue SB left/thru | thru/right	F	>80.0	>1.00	~233	#316
Old Colony Avenue at D Street	**E**	**55.5**	-	-	-
D Street EB left	E	65.3	0.76	59	#145
D Street EB right	A	1.0	0.11	0	0
D Street WB left/thru/right	F	>80.0	>1.00	~169	#285
Old Colony Avenue NB left/thru | thru	C	24.6	0.72	250	#381
Old Colony Avenue SB thru | thru/right	B	17.6	0.44	127	164
Dorchester Avenue at Dorchester Street/ Southampton Street/Preble Street/Boston Street	**F**	**>80.0**	-	-	-
Southampton Street EB left/thru | thru/right	F	>80.0	>1.00dl	~258	#388
Preble Street WB left/thru | thru/right	F	>80.0	>1.00	~417	#524
Dorchester Avenue NB left/thru | thru/right	F	>80.0	>1.00	~349	#398
Dorchester Avenue SB left/thru | thru/right	E	58.8	0.74	164	184
Boston Street NEB left/thru | thru/right	E	68.9	0.96dl	239	305
Dorchester Street SWB left/thru | thru/right	F	>80.0	>1.00dr	~210	#268
Dorchester Avenue at D Street	**B**	**11.3**	-	-	-
D Street WB left/right	D	39.6	0.60	72	97
Dorchester Avenue NB thru/right	A	7.7	0.54	108	231
Dorchester Avenue SB left/thru	A	5.5	0.32	52	110
Old Colony Avenue at Dorchester Avenue	**C**	**24.9**	-	-	-
Milhender Place EB left/right	A	0.6	0.09	0	0
Dorchester Avenue NB left/thru | thru/right	C	27.3	0.61	148	149
Dorchester Avenue SB left | left	B	19.7	0.33	60	175
Dorchester Avenue SB thru/right	A	2.5	0.22	0	77
Old Colony Avenue NWB right | right	C	33.2	0.85	206	#693

Table 2-2 Existing (2015) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Southampton Street at Southampton Street Extension / South Bay Shopping Center Ring Road	**D**	**48.9**	-	-	-
Southampton Street EB thru | thru/right	D	44.6	0.76	335	420
Southampton Street WB left/thru | thru	D	45.6	0.93	~393	#546
South Bay Shopping Center NB left	D	50.2	0.43	104	186
South Bay Shopping Center NB slight right/right	E	73.9	0.84	214	#385
Southampton Street at I-93 NB Frontage Road/I-93 NB Off-Ramp	**C**	**32.2**	-	-	-
Southampton Street EB left	C	21.1	0.60	90	176
Southampton Street EB left/thru	D	38.2	0.90	209	#385
Southampton Street WB thru | thru	D	40.5	0.74	183	247
Southampton Street WB right	C	32.5	0.80	129	#287
I-93 NB Off-Ramp NB left	C	31.9	0.61	179	276
I-93 NB Off-Ramp NB thru	C	21.2	0.04	8	24
I-93 NB Off-Ramp NB right	A	0.4	0.12	0	1
I-93 Frontage Road SB right	A	0.6	0.15	0	0
Dorchester Street at East 8th Street/West 8th Street	**D**	**37.7**	-	-	-
Dorchester Street EB left/thru|thru/right	B	13.7	0.38	83	120
Dorchester Street WB left/thru|thru/right	B	12.8	0.34	72	106
East 8th Street NB left/thru/right	F	>80.0	>1.00	~162	#309
Unsignalized					
Old Colony Avenue at Damrell Street/Gustin Street	-	-	-	-	-
Damrell Street EB left/thru/right	B	12.0	0.07	-	6
Gustin Street WB left/thru/right	C	21.2	0.03	-	3
Old Colony Avenue NB left/thru | thru/right	A	1.9	0.32	-	6
Old Colony Avenue SB left/thru | thru/right	A	0.0	0.19	-	0
Dorchester Street at Middle Street/Vinton Street	-	-	-	-	-
Dorchester Street EB left/thru | thru/right	A	0.3	0.12	-	0
Dorchester Street WB left/thru | thru/right	A	0.4	0.11	-	0
Dorchester Street at Tuckerman Street/ Jenkins Street	-	-	-	-	-
Dorchester Street EB thru | thru/right	A	0.0	0.16	-	0
Dorchester Street WB left/thru | thru	A	0.2	0.14	-	0
Tuckerman Street SB left/thru/right	B	14.9	0.03	-	2

Table 2-2 Existing (2015) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Dorchester Avenue at Middle Street	-	-	-	-	-
Middle Street WB left/right	C	15.1	0.06	-	5
Dorchester Avenue NB thru	A	0.0	0.32	-	0
Dorchester Avenue SB thru	A	0.0	0.21	-	0
Dorchester Avenue at Alger Street	-	-	-	-	-
Alger Street EB left/thru/right	C	15.7	0.03	-	3
Alger Street WB left/thru/right	C	16.2	0.04	-	3
Dorchester Avenue NB left/thru/right	A	0.2	0.01	-	0
Dorchester Avenue SB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue at Damrell Street	-	-	-	-	-
Damrell Street WB left/right	C	15.8	0.23	-	22
Dorchester Avenue NB thru/right	A	0.0	0.33	-	0
Dorchester Avenue SB left/thru	A	2.8	0.10	-	8
Old Colony Avenue at Columbia Road/Preble Street (Rotary)	-	-	-	-	-
Preble Street EB right	C	16.7	0.40	-	48
Columbia Road EB right	E	36.7	0.74	-	145
Old Colony Avenue NB right	B	12.8	0.50	-	71
Old Colony Avenue SB right	B	14.5	0.41	-	50

~ 50th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
dr Defacto right-turn lane
dl Defacto left-turn lane
Grey indicates LOS E or F

Table 2-3 Existing (2015) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized					
Old Colony Avenue at Dorchester Street	F	>80.0	-	-	-
Dorchester Street EB left/thru | thru/right	D	51.6	0.80	122	#196
Dorchester Street WB left/thru | thru/right	F	>80.0	>1.00	~265	#391
Old Colony Avenue NB left/thru | thru/right	C	32.5	0.79	211	290
Old Colony Avenue SB left/thru | thru/right	F	>80.0	>1.00	~487	#622

Table 2-3 Existing (2015) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Old Colony Avenue at D Street	**C**	**24.8**	-	-	-
D Street EB left	D	50.8	0.51	57	100
D Street EB right	B	11.7	0.30	0	32
D Street WB left/thru/right	E	61.0	0.83	152	#270
Old Colony Avenue NB left/thru | thru	C	23.4	0.37	187	m214
Old Colony Avenue SB thru | thru/right	B	13.8	0.48	175	255
Dorchester Avenue at Dorchester Street/ Southampton Street/Preble Street/Boston Street	**F**	**>80.0**	-	-	-
Southampton Street EB left/thru | thru/right	F	>80.0	>1.00dl	~460	#505
Preble Street WB left/thru | thru/right	F	>80.0	>1.00	~173	#277
Dorchester Avenue NB left/thru | thru/right	F	>80.0	>1.00	~248	#274
Dorchester Avenue SB left/thru | thru/right	D	53.3	0.66	185	248
Boston Street NEB left/thru | thru/right	E	68.7	1.00dl	217	278
Dorchester Street SWB left/thru | thru/right	F	>80.0	>1.00	~236	#348
Dorchester Avenue at D Street	**A**	**7.3**	-	-	-
D Street WB left/right	C	26.0	0.55	32	80
Dorchester Avenue NB thru/right	A	4.2	0.36	45	113
Dorchester Avenue SB left/thru	A	5.0	0.41	59	135
Old Colony Avenue at Dorchester Avenue	**B**	**13.1**	-	-	-
Milhender Place EB left/right	A	0.5	0.07	0	0
Dorchester Avenue NB left/thru | thru/right	D	36.5	0.61	96	131
Dorchester Avenue SB left | left	B	10.6	0.44	86	231
Dorchester Avenue SB thru/right	A	1.8	0.26	0	63
Old Colony Avenue NWB right | right	B	10.3	0.39	65	158
Southampton Street at Southampton Street Extension / South Bay Shopping Center Ring Road	**D**	**44.0**	-	-	-
Southampton Street EB thru | thru/right	D	53.4	0.98dr	~525	#767
Southampton Street WB left/thru | thru	C	21.3	0.62	185	272
South Bay Shopping Center NB left	D	54.1	0.35	66	118
South Bay Shopping Center NB slight right/right	E	72.0	0.72	137	217
Southampton Street at I-93 NB Frontage Road/I-93 NB Off-Ramp	**C**	**23.3**	-	-	-
Southampton Street EB left	B	12.7	0.29	41	74
Southampton Street EB left/thru	B	18.7	0.61	210	322
Southampton Street WB thru | thru	D	36.2	0.60	143	197
Southampton Street WB right	B	19.3	0.58	61	148
I-93 NB Off-Ramp NB left	C	25.6	0.35	91	151
I-93 NB Off-Ramp NB thru	C	21.1	0.03	7	21
I-93 NB Off-Ramp NB right	A	0.7	0.12	0	3
I-93 Frontage Road SB right	A	0.0	0.02	0	0

Table 2-3 Existing (2015) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Dorchester Street at East 8th Street/West 8th Street	**B**	**15.3**	-	-	-
Dorchester Street EB left/thru|thru/right	B	11.1	0.29	67	98
Dorchester Street WB left/thru|thru/right	B	11.7	0.35	88	125
East 8th Street NB left/thru/right	D	47.5	0.70	50	#119
Unsignalized					
Old Colony Avenue at Damrell Street/Gustin Street	-	-	-	-	-
Damrell Street EB left/thru/right	B	11.5	0.17	-	15
Gustin Street WB left/thru/right	C	16.9	0.03	-	2
Old Colony Avenue NB left/thru | thru/right	A	0.5	0.19	-	1
Old Colony Avenue SB left/thru | thru/right	A	0.1	0.32	-	0
Dorchester Street at Middle Street/Vinton Street	-	-	-	-	-
Dorchester Street EB left/thru | thru/right	A	0.5	0.13	-	1
Dorchester Street WB left/thru | thru/right	A	1.2	0.14	-	2
Dorchester Street at Tuckerman Street/ Jenkins Street	-	-	-	-	-
Dorchester Street EB thru | thru/right	A	0.0	0.16	-	0
Dorchester Street WB left/thru | thru	A	0.3	0.19	-	0
Tuckerman Street SB left/thru/right	C	16.7	0.05	-	4
Dorchester Avenue at Middle Street	-	-	-	-	-
Middle Street WB left/right	B	13.5	0.02	-	1
Dorchester Avenue NB thru	A	0.0	0.24	-	0
Dorchester Avenue SB thru	A	0.0	0.26	-	0
Dorchester Avenue at Alger Street	-	-	-	-	-
Alger Street EB left/thru/right	C	17.1	0.05	-	4
Alger Street WB left/thru/right	B	12.8	0.05	-	4
Dorchester Avenue NB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue SB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue at Damrell Street	-	-	-	-	-
Damrell Street WB left/right	B	13.2	0.12	-	10
Dorchester Avenue NB thru/right	A	0.0	0.25	-	0
Dorchester Avenue SB left/thru	A	1.3	0.04	-	3
Old Colony Avenue at Columbia Road/Preble Street (Rotary)	-	-	-	-	-
Preble Street EB right	F	>50.0	0.92	-	245
Columbia Road EB right	C	15.3	0.43	-	53
Old Colony Avenue NB right	B	11.2	0.31	-	34
Old Colony Avenue SB right	E	41.2	0.92	-	312

~ 50th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
\# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
dr Defacto right-turn lane
dl Defacto left-turn lane
Grey indicates LOS E or F

The signalized intersection of **Old Colony Avenue/Dorchester Street** currently operates at LOS F during both the weekday a.m. and p.m. peak hours, with all approaches over capacity during the a.m. peak hour and the Dorchester Street westbound and Old Colony Avenue southbound approaches operating over capacity during the p.m. peak hour. The longest queues currently occur along the Old Colony Avenue northbound approach during the a.m. peak hour, and along the Old Colony Avenue southbound approach during the p.m. peak hour.

The signalized intersection of **Old Colony Avenue/D Street** currently operates at LOS E during the weekday a.m. peak hour and LOS C during the weekday p.m. peak hour. The D Street eastbound left-turn approach currently operates at LOS E and the D Street westbound approach operates at LOS F during the a.m. peak hour. The D Street westbound approach currently operates at LOS E during the p.m. peak hour. The longest queues currently occur along the Old Colony Avenue northbound approach during the a.m. peak hour and along the D Street westbound approach during the p.m. peak hour. The D Street westbound approach operates over capacity during the a.m. peak hour. All other movements at the intersection operate under capacity during the peak hours.

The signalized intersection of **Dorchester Avenue/Dorchester Street/Southampton Street/Preble Street/Boston Street (Andrew Square)** currently operates at LOS F during both the weekday a.m. and p.m. peak hours, with most approaches operating over capacity. Due to the traffic signal operating with six legs, vehicular delays are high for each approach. The longest queues currently occur in the Preble Street westbound approach during the a.m. peak hour, and in the Southampton Street eastbound approach during the p.m. peak hour.

The signalized intersection of **Dorchester Avenue/D Street** currently operates at LOS B during the weekday a.m. peak hour and LOS A during the weekday p.m. peak hour. The longest queues currently occur along the Dorchester Avenue northbound approach during the a.m. peak hour and along the Dorchester Avenue southbound approach during the p.m. peak hour. The intersection currently operates under capacity during the peak hours.

The signalized intersection of **Old Colony Avenue/Dorchester Avenue** currently operates at LOS C during the weekday a.m. peak hour, and LOS B during the weekday p.m. peak hour. The longest queues currently occur along the Old Colony Avenue northwestbound right-turn approach during the a.m. peak hour, and along the Dorchester Avenue southbound left-turn approach during the p.m. peak hour. The intersection currently operates under capacity during the peak hours.

The signalized intersection of **Southampton Street/South Bay Shopping Center Ring Road** currently operates at LOS D during both the weekday a.m. and p.m. peak hours under the Existing Condition. The South Bay Shopping Center northbound right turn approach currently operates at LOS E during both the a.m. and p.m. peak hours. The longest queues currently occur along the Southampton Street westbound approach during the a.m. peak hour, and along the Southampton Street eastbound approach during the p.m. peak hour. The intersection currently operates under capacity during the peak hours.

The signalized intersection of **Southampton Street/I-93 Northbound Frontage Road/I-93 Northbound Off-Ramp** currently operates at LOS C during both the weekday a.m. and p.m. peak hours. The longest queues currently occur along the Southampton Street eastbound left-turn/through approach during both the a.m. and p.m. peak hours. The intersection currently operates under capacity during the peak hours.

The signalized intersection of **Dorchester Street/East Eighth Street/West Eighth Street** currently operates at LOS D during the a.m. peak hour and LOS B during the p.m. peak hour. The East Eighth Street northbound approach currently operates over capacity and at LOS F during the a.m. peak hour. All other movements at the intersection operate under capacity during the peak hours. The longest queues at the intersection currently occur along the East Eighth Street northbound approach during the a.m. peak hour and along the Dorchester Street westbound approach during the p.m. peak hour.

With the exception of the intersections that comprise the rotary at **Old Colony Avenue/Columbia Road/Preble Street/Vinton Street**, all of the movements at the unsignalized intersections currently operate at LOS D or better during both the weekday a.m. and p.m. peak hours. The Columbia Road westbound approach to the rotary currently operates at LOS E during the a.m. peak hour, the Preble Street eastbound approach to the rotary currently operates at LOS F during the p.m. peak hour, and the Old Colony Avenue southbound approach to the rotary currently operates at LOS E during the p.m. peak hour.

2.2.5 Existing Parking and Curb Usage

On-street parking surrounding the Project Site generally consists of unrestricted parking, no parking, and South Boston residential parking. Dorchester Street, adjacent to the Site, currently consists mostly of unrestricted and residential parking. Parking is currently prohibited along the southern side of Damrell Street, adjacent to the site, and unregulated along the northern side. Parking along Old Colony Avenue in the vicinity of the site is mostly unrestricted. The on-street parking regulations within the study area are shown on Figure 2-14.

2.2.6 Existing Public Transportation

The Project site is located in the vicinity of the MBTA's Andrew Station and several MBTA bus routes. Andrew Station provides access to the MBTA Red Line and several MBTA bus routes. Table 2-4 describes each public transportation route located in the vicinity of the Project site, with a map of the nearby public transportation services shown in Figure 2-5.

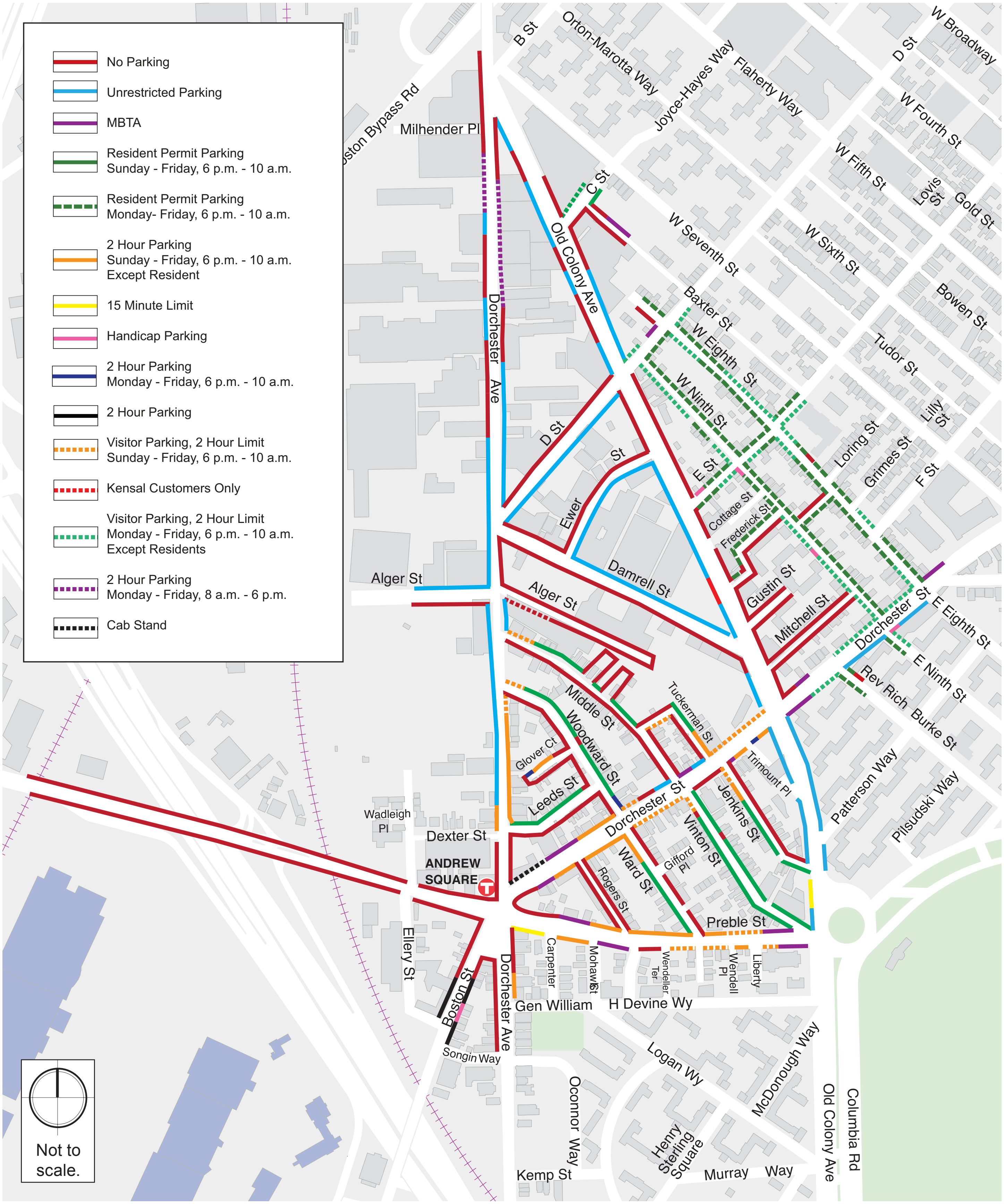

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Figure 2-4
On-Street Parking

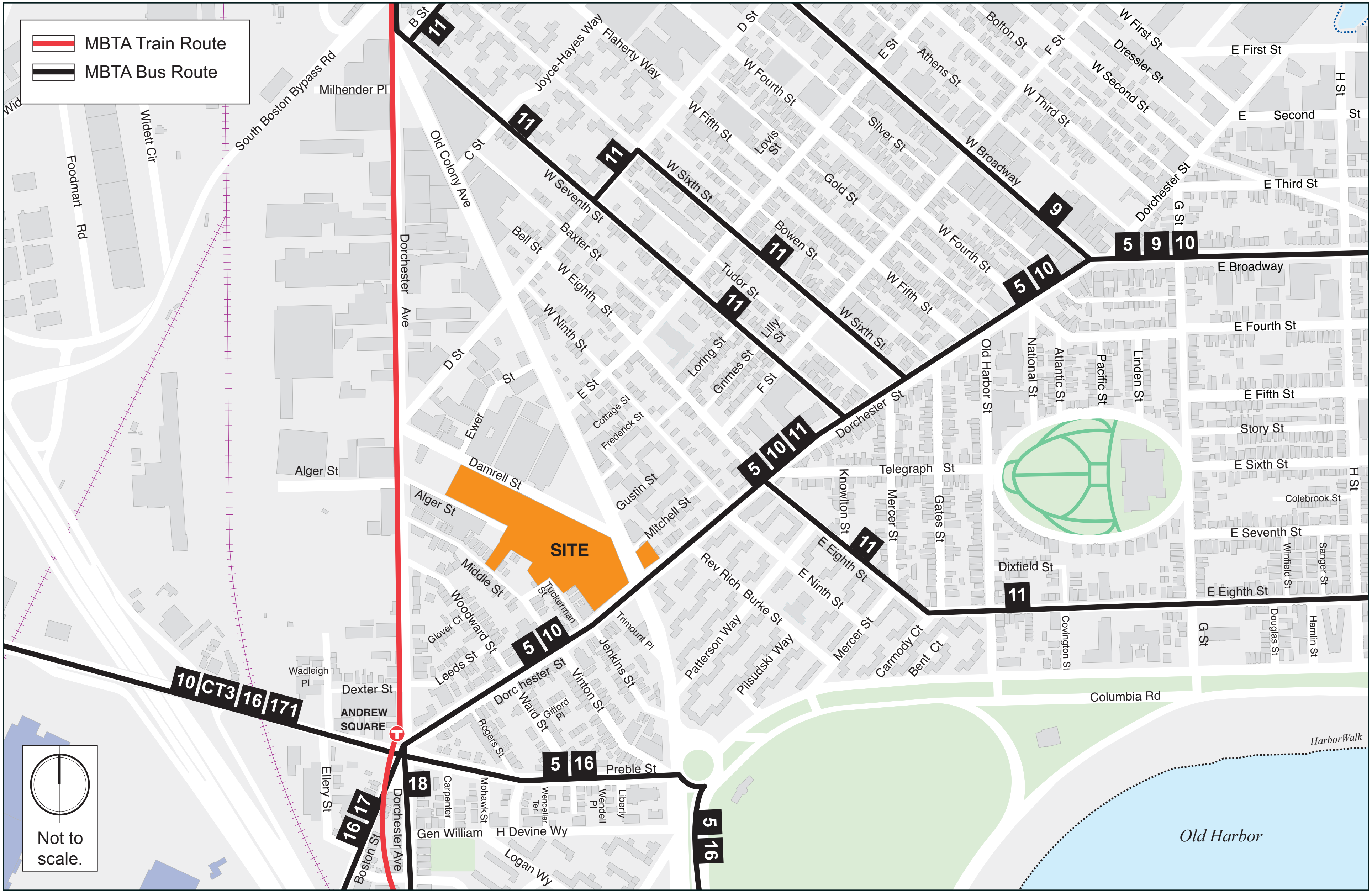

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Figure 2-5
Public Transportation

Table 2-4 Public Transportation Services

MBTA Transit Service	Description	Peak-Hour Headway (minutes)
Red Line	Alewife – Ashmont/Braintree	9
Bus Route 5	City Point – McCormack Housing	60
Bus Route 9	City Point – Copley Square	5
Bus Route 10	City Point – Copley Square	20
Bus Route 11	City Point – Downtown	10
Bus Route 16	Forrest Hills Station – Andrew Station or UMass	15
Bus Route 17	Fields Corner – Andrew Station	14
Bus Route 171	Dudley Station – Logan Airport via Andrew Station	NA
Bus Route CT3	Beth Israel Deaconess or BU Medical Campus – Andrew Station	20

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

2.2.7 Existing Pedestrian Conditions

The Project site is located adjacent to Old Colony Avenue, Dorchester Street, and Damrell Street in South Boston. Sidewalks are provided along most streets within the study area, with the exception of Alger Street. The sidewalks along Old Colony Avenue, Dorchester Street and Dorchester Avenue are generally in good condition with few cracks and steep grades. Crosswalks are provided at most of the study area signalized intersections. The section of Dorchester Street between Andrew Square and Old Colony Avenue is also a popular pedestrian route for school-aged children during the morning peak hour.

To estimate the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersections and are presented in Figure 2-6. The pedestrian activity within the study area is heaviest in the vicinity of Andrew Square and along Dorchester Street. It is anticipated that residents, patrons, guests, and visitors of the site will primarily use Dorchester Street to walk to the public transportation and commercial businesses at Andrew Station.

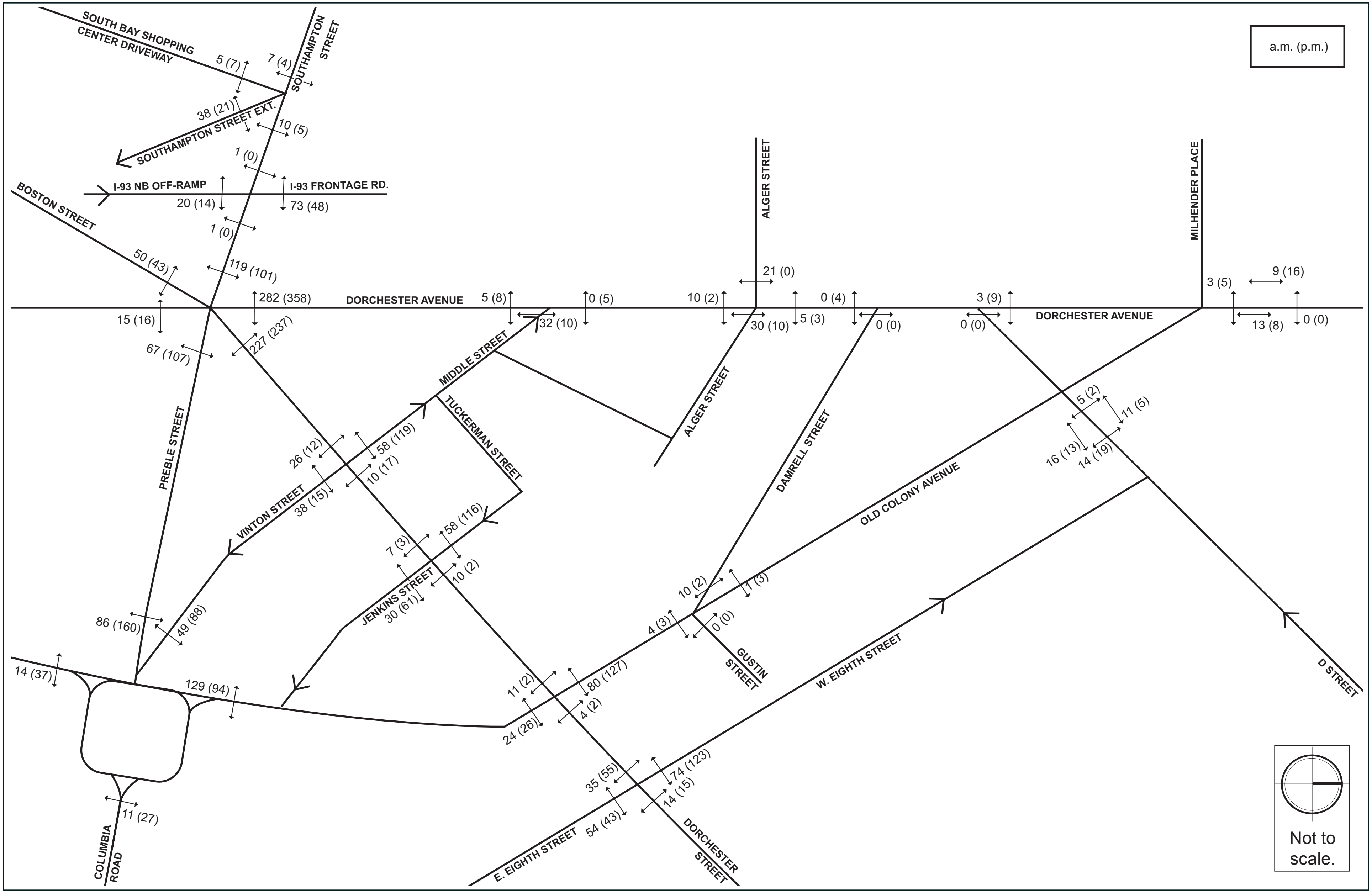

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Figure 2-6
Existing (2015) Condition Pedestrian Volumes, a.m. and p.m. Peak Hour

2.2.8 *Existing Bicycle Facilities*

In recent years, bicycle use has increased dramatically throughout the City of Boston. The South Bay Harbor Trail is located to the west of the Project site and is a multi-use path that will ultimately connect the Fort Point district of Boston to the Southwest Corridor Park. Along with the South Bay Harbor Trail, the following roadways within the study area are designated bicycle routes on the City of Boston's "Bike Routes of Boston" map:

- **Southampton Street** is designated as advanced route suitable for traffic-confident cyclists with on-road experience.

- **Old Colony Avenue, Preble Street, Dorchester Avenue, and D Street** are designated as intermediate routes suitable for riders with some on-road experience. Bicycle lanes are provided along both sides of Dorchester Avenue within the study area.

Bicycle counts were conducted concurrent with the vehicular TMCs and are presented in Figure 2-7. The heaviest bicycle movements are along Dorchester Avenue, D Street, and Old Colony Avenue. It is also important to note that the majority of the traffic counts were conducted in December when bicycling activity is typically lower than it is during the spring and summer months.

2.2.9 *Car and Bicycle Sharing Services*

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

There are currently five car sharing locations in proximity to the Project site which are listed below:

- Ellery Street/Dexter Street

- Preble Street/Rogers Street

- 11 Damrell Street

- West Eighth Street/F Street

- Dorchester Avenue/B Street

The nearby car sharing locations are shown in Figure 2-8.

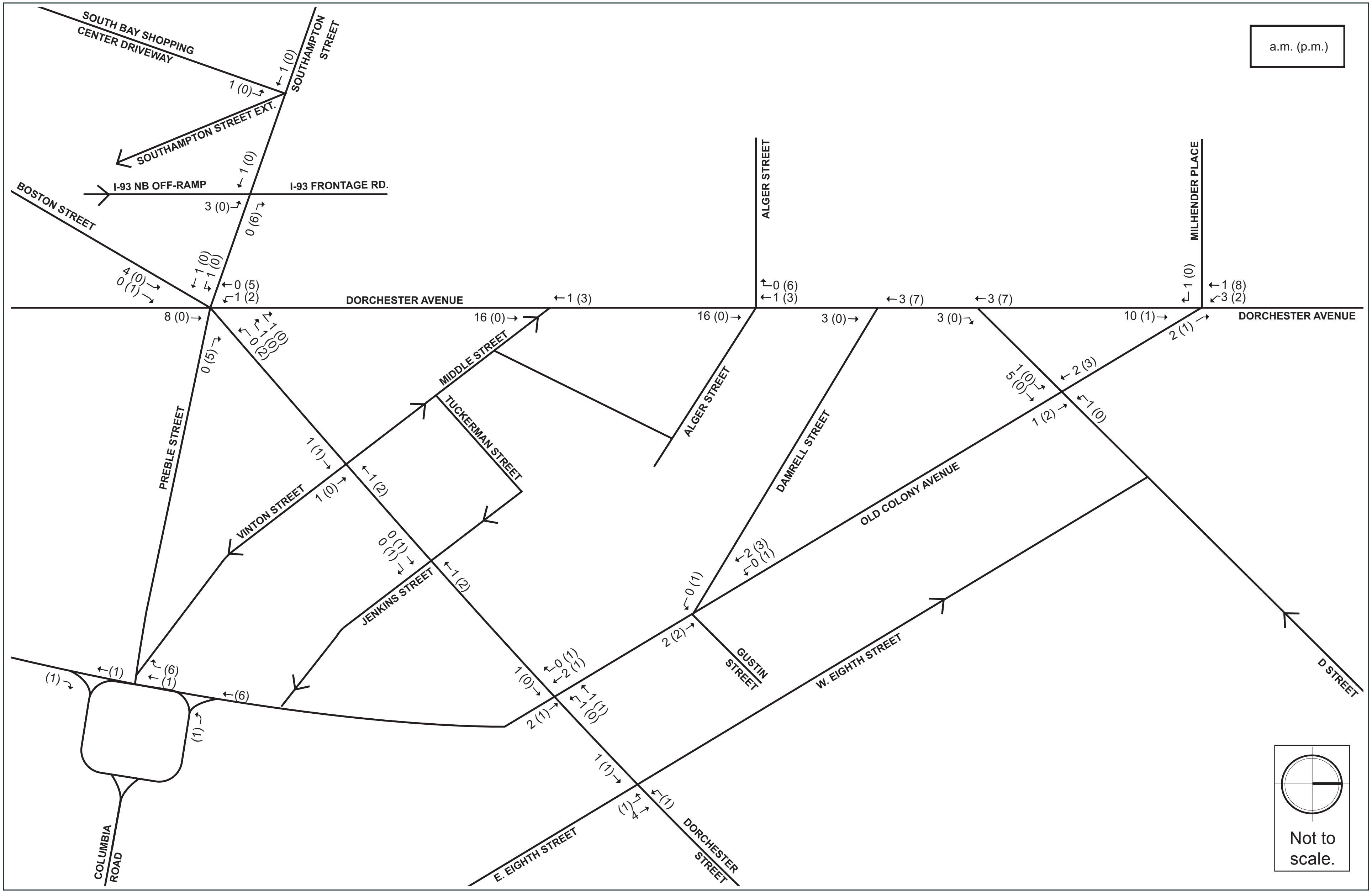

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Figure 2-7

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

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Figure 2-8
Car and Bicycle Sharing Services

Launched in 2011, Hubway is a bicycle sharing system in the Boston area and consists of over 140 stations and 1,300 bicycles. As shown in Figure 2-8, there is one Hubway station in close proximity to the Project site at Andrew Station.

2.3 Future Conditions

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

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

2.3.1 No-Build Condition

The No-Build Condition reflects a future scenario that incorporates any anticipated traffic volume changes independent of the Project, and any planned infrastructure improvements that will affect travel patterns throughout the study area. Infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements. The methodology to account for future traffic growth, independent of the Project, consists of two factors: an annual growth rate and vehicle trips associated with specific developments near the Project.

2.3.1.1 Background Traffic Growth

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

2.3.1.2 Background Projects

The second part of the methodology identifies specific planned developments that are expected to be constructed within the future analysis time horizon. Table 2-5 lists the development projects located in the vicinity of the study area. Traffic volumes from the listed developments were added to the study area, where appropriate.

Table 2-5 Background Development Projects

Name	Building Program	Status
11 West Broadway	8,000 sf Retail / 50 Apartment Units	Construction Complete
148-152 Dorchester Avenue Phase II	1 Commercial Unit / 30 Condo Units / 30 Parking Spaces	Under Construction
181-185 West First & 184,190, and 206 West Second Street	4,000 sf Retail / 97 Apartment Units / 115 Parking Spaces	Board Approved
411 D Street	197 Apartment Units / 129 Parking Spaces	Construction Complete
45 West Third Street	3,000 sf Retail / 105 Apartment Units / 115 Parking Spaces	Board Approved
D Street Developments	26,300 sf Retail / 500-Room Hotel /1,350 Parking Spaces	Under Construction
Old Colony Phase II	170 Apartment Units	Construction Complete
One Channel Center	525,000 sf Office / 970 Parking Spaces / 7,800 sf Open Space	Construction Complete
South Boston Boutique Hotel	6,208 sf Restaurant / 156-Room Hotel	Under Construction
West Square	259 Apartment Units / 143 Parking Spaces	Construction Complete
22-26 West Broadway	3,834 sf Retail / 31 Apartment Units / 18 Parking Spaces	Under Construction
339 D Street	24 Apartment Units / 30 Parking Spaces	Construction Complete
Patriot Homes	24 Apartment Units	Under Construction
333-339 West Broadway	1 Commercial Unit / 15 Condo Units / 23 Parking Spaces	Construction Complete
340 West Second Street	29 residential units / 43 Parking Spaces / 1,000 sf commercial	Construction Complete
360 West Second Street	25 Apartment Units / 25 Parking Spaces	Construction Complete
395 West Broadway	Retail / 24 Apartment Units / 20 Parking Spaces	Board Approved
401 West First Street	45 Apartment Units / 68 Parking Spaces	Under Construction
488 Dorchester Avenue	2,091 sf Commercial / 33 Condo Units / 33 Parking Spaces	Under Construction
274 Southampton Street	82,500 sf Self Storage	Under Review
30B Street	32 Condo Units / 28 Parking Spaces	Under Construction
14 West Broadway	3,400 sf Office / 5,500 sf Restaurant / 47 Condo Units / 76 Parking Spaces	Board Approved
248 Dorchester Avenue	4,134 sf Retail / 33 Apartment Units / 33 Parking Spaces	Board Approved
150 West Broadway	5,785 sf Commercial / 31 Apartment Units / 33 Parking Spaces	Board Approved

Table 2-5 Background Development Projects (cont'd)

Name	Building Program	Status
135 Athens Street	15 Condo Units / 20 Parking Spaces	Board Approved
170 West Broadway	4,283 sf Commercial / 33 Condo Units / 39 parking spaces	Under Construction
Residences at Dahlgren Hall	18 Apartment Units / 20 Parking Spaces	Construction Complete
Residences on E at 205 E Street	38 Condo Units / 63 Parking Spaces	Board Approved
Residences at Saint Augustine	29 Condo Units / 27 Parking Spaces	Under Construction

The half-percent per year annual growth rate was applied to the Existing (2015) Condition traffic volumes and volumes associated with the background development projects were added to develop the No-Build (2020) Condition traffic volumes. The No-Build (2020) Condition a.m. and p.m. peak hour traffic volumes are shown on Figure 2-9 and Figure 2-10, respectively.

2.3.1.3 Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby projects in the vicinity of the study area. Based on this review, the following improvements were identified as part of the South Boston Waterfront Sustainable Transportation Plan:

- **Old Colony Avenue at D Street** – Consider opportunities for neckdowns. Address sight line issue to crosswalk across the D Street northbound approach. Implement concurrent phasing on Old Colony Avenue.

- **Old Colony Avenue at Dorchester Street** – Relocate center median, modify intersection geometry, and pedestrian operations at traffic signal.

The recommendations in the transportation plan are not currently proposed and are mid- to long-term transportation solutions throughout the South Boston area between Andrew Square and the Seaport District. These improvements were not included in the future conditions scenario analyses.

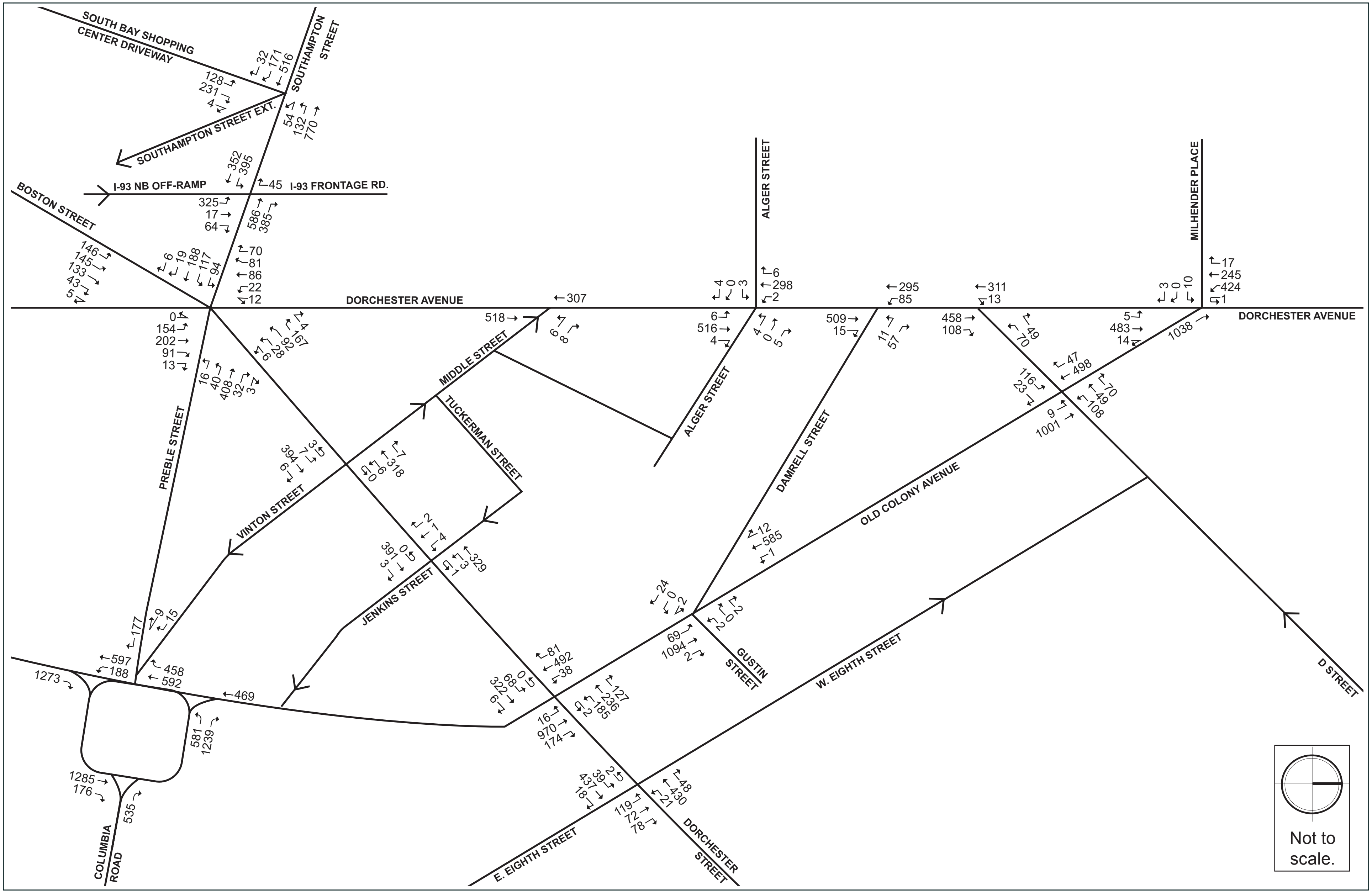

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Figure 2-9

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

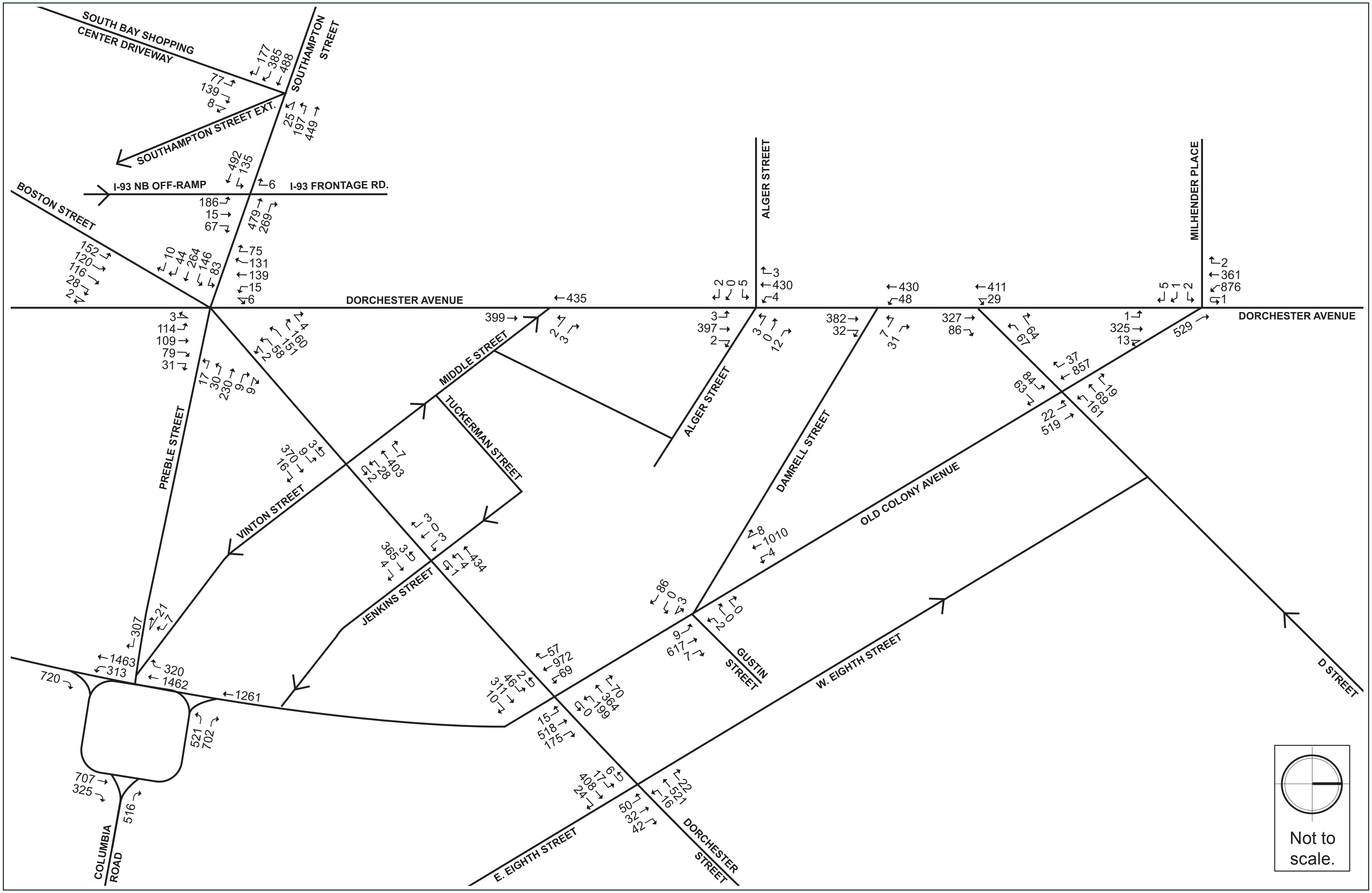

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Figure 2-10
No-Build (2020) Condition Traffic Volumes, p.m. Peak Hour

2.3.1.4 No-Build Condition Traffic Operations

The No-Build (2020) Condition capacity analysis summary uses the same methodology as used for the Existing (2015) Condition capacity. Table 2-6 and Table 2-7 present the No-Build (2020) Condition capacity analysis summary for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in Appendix B.

Table 2-6 No-Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized					
Old Colony Avenue at Dorchester Street	**F**	**>80.0**	-	-	-
Dorchester Street EB left/thru | thru/right	F	>80.0	>1.00	~162	#256
Dorchester Street WB left/thru | thru/right	F	>80.0	>1.00	~183	#315
Old Colony Avenue NB left/thru | thru/right	F	>80.0	>1.00	~458	#591
Old Colony Avenue SB left/thru | thru/right	F	>80.0	>1.00	~249	#332
Old Colony Avenue at D Street	**E**	**58.2**	-	-	-
D Street EB left	E	67.7	0.78	60	#149
D Street EB right	A	1.0	0.11	0	0
D Street WB left/thru/right	F	>80.0	>1.00	~177	#294
Old Colony Avenue NB left/thru | thru	C	25.3	0.73	259	#396
Old Colony Avenue SB thru | thru/right	B	17.8	0.45	131	168
Dorchester Avenue at Dorchester Street/ Southampton Street/Preble Street/Boston Street	**F**	**>80.0**	-	-	-
Southampton Street EB left/thru | thru/right	F	>80.0	>1.00dl	~272	#400
Preble Street WB left/thru | thru/right	F	>80.0	>1.00	~435	#543
Dorchester Avenue NB left/thru | thru/right	F	>80.0	>1.00	~368	#413
Dorchester Avenue SB left/thru | thru/right	E	61.7	0.78	172	192
Boston Street NEB left/thru | thru/right	E	69.6	0.98dl	245	314
Dorchester Street SWB left/thru | thru/right	F	>80.0	>1.00dr	~220	#279
Dorchester Avenue at D Street	**B**	**11.5**	-	-	-
D Street WB left/right	D	39.7	0.61	74	99
Dorchester Avenue NB thru/right	A	8.1	0.56	114	244
Dorchester Avenue SB left/thru	A	5.6	0.33	54	114

Table 2-6 No-Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Old Colony Avenue at Dorchester Avenue	**C**	**25.8**	-	-	-
Milhender Place EB left/right	A	0.6	0.09	0	0
Dorchester Avenue NB left/thru | thru/right	C	27.4	0.62	152	153
Dorchester Avenue SB left | left	B	20.0	0.34	62	179
Dorchester Avenue SB thru/right	A	2.6	0.23	0	80
Old Colony Avenue NWB right | right	D	35.1	0.88	219	#713
Southampton Street at Southampton Street Extension / South Bay Shopping Center Ring Road	**D**	**52.2**	-	-	-
Southampton Street EB thru | thru/right	D	45.5	0.78	352	435
Southampton Street WB left/thru | thru	D	51.6	0.97	~436	#590
South Bay Shopping Center NB left	D	50.7	0.44	109	191
South Bay Shopping Center NB slight right/right	E	75.4	0.85	225	#401
Southampton Street at I-93 NB Frontage Road/I-93 NB Off-Ramp	**D**	**35.1**	-	-	-
Southampton Street EB left	C	22.2	0.62	92	183
Southampton Street EB left/thru	D	47.9	0.96	221	#436
Southampton Street WB thru | thru	D	41.2	0.76	188	254
Southampton Street WB right	C	34.4	0.82	136	#302
I-93 NB Off-Ramp NB left	C	32.5	0.63	186	285
I-93 NB Off-Ramp NB thru	C	21.2	0.04	8	24
I-93 NB Off-Ramp NB right	A	0.6	0.12	0	3
I-93 Frontage Road SB right	A	0.6	0.16	0	0
Dorchester Street at East 8th Street/West 8th Street	**D**	**40.4**	-	-	-
Dorchester Street EB left/thru|thru/right	B	13.8	0.39	85	123
Dorchester Street WB left/thru|thru/right	B	12.9	0.34	74	108
East 8th Street NB left/thru/right	F	>80.0	>1.00	~172	#321
Unsignalized					
Old Colony Avenue at Damrell Street/Gustin Street	-	-	-	-	-
Damrell Street EB left/thru/right	B	12.2	0.08	-	6
Gustin Street WB left/thru/right	C	22.8	0.04	-	3
Old Colony Avenue NB left/thru | thru/right	A	2.0	0.33	-	6
Old Colony Avenue SB left/thru | thru/right	A	0.0	0.20	-	0

Table 2-6 No-Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Dorchester Street at Middle Street/Vinton Street	-	-	-	-	-
Dorchester Street EB left/thru | thru/right	A	0.3	0.12	-	0
Dorchester Street WB left/thru | thru/right	A	0.4	0.11	-	0
Dorchester Street at Tuckerman Street/ Jenkins Street	-	-	-	-	-
Dorchester Street EB thru | thru/right	A	0.0	0.16	-	0
Dorchester Street WB left/thru | thru	A	0.2	0.15	-	0
Tuckerman Street SB left/thru/right	C	15.1	0.03	-	3
Dorchester Avenue at Middle Street	-	-	-	-	-
Middle Street WB left/right	C	15.4	0.07	-	5
Dorchester Avenue NB thru	A	0.0	0.33	-	0
Dorchester Avenue SB thru	A	0.0	0.21	-	0
Dorchester Avenue at Alger Street	-	-	-	-	-
Alger Street EB left/thru/right	C	15.9	0.04	-	3
Alger Street WB left/thru/right	C	16.4	0.04	-	3
Dorchester Avenue NB left/thru/right	A	0.2	0.01	-	0
Dorchester Avenue SB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue at Damrell Street	-	-	-	-	-
Damrell Street WB left/right	C	16.1	0.24	-	23
Dorchester Avenue NB thru/right	A	0.0	0.34	-	0
Dorchester Avenue SB left/thru	A	2.9	0.10	-	8
Old Colony Avenue at Columbia Road/Preble Street (Rotary)	-	-	-	-	-
Preble Street EB right	C	17.3	0.42	-	52
Columbia Road EB right	E	41.3	0.78	-	162
Old Colony Avenue NB right	B	13.1	0.51	-	75
Old Colony Avenue SB right	B	14.9	0.43	-	53

~ 50th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
dr Defacto right-turn lane
dl Defacto left-turn lane

Table 2-7 No-Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized					
Old Colony Avenue at Dorchester Street	**F**	**>80.0**	-	-	-
Dorchester Street EB left/thru | thru/right	E	55.6	0.85	126	#208
Dorchester Street WB left/thru | thru/right	F	>80.0	>1.00	~285	#408
Old Colony Avenue NB left/thru | thru/right	C	34.5	0.82	220	303
Old Colony Avenue SB left/thru | thru/right	F	>80.0	>1.00	~513	#649
Old Colony Avenue at D Street	**C**	**25.9**	-	-	-
D Street EB left	D	50.8	0.51	58	102
D Street EB right	B	12.3	0.31	0	35
D Street WB left/thru/right	E	62.2	0.84	156	#280
Old Colony Avenue NB left/thru | thru	C	24.8	0.40	193	m218
Old Colony Avenue SB thru | thru/right	B	14.9	0.51	183	264
Dorchester Avenue at Dorchester Street/ Southampton Street/Preble Street/Boston Street	**F**	**>80.0**	-	-	-
Southampton Street EB left/thru | thru/right	F	>80.0	>1.00dl	~480	#523
Preble Street WB left/thru | thru/right	F	>80.0	>1.00dl	~186	#291
Dorchester Avenue NB left/thru | thru/right	F	>80.0	>1.00	~265	#287
Dorchester Avenue SB left/thru | thru/right	D	54.3	0.68	190	254
Boston Street NEB left/thru | thru/right	E	69.3	>1.00dl	222	286
Dorchester Street SWB left/thru | thru/right	F	>80.0	>1.00	~248	#361
Dorchester Avenue at D Street	**A**	**7.6**	-	-	-
D Street WB left/right	C	26.7	0.56	35	83
Dorchester Avenue NB thru/right	A	4.4	0.37	48	120
Dorchester Avenue SB left/thru	A	5.3	0.43	63	144
Old Colony Avenue at Dorchester Avenue	**B**	**13.2**	-	-	-
Milhender Place EB left/right	A	0.5	0.07	0	0
Dorchester Avenue NB left/thru | thru/right	D	36.4	0.62	98	133
Dorchester Avenue SB left | left	B	10.9	0.45	91	240
Dorchester Avenue SB thru/right	A	1.8	0.26	0	65
Old Colony Avenue NWB right | right	B	10.6	0.40	68	164
Southampton Street at Southampton Street Extension / South Bay Shopping Center Ring Road	**D**	**47.0**	-	-	-
Southampton Street EB thru | thru/right	E	58.5	1.01dr	~578	#806
Southampton Street WB left/thru | thru	C	22.1	0.87dl	194	285
South Bay Shopping Center NB left	D	54.0	0.36	69	121
South Bay Shopping Center NB slight right/right	E	72.1	0.73	141	223

Table 2-7 No-Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Southampton Street at I-93 NB Frontage Road/I-93 NB Off-Ramp	**C**	**23.7**	-	-	-
Southampton Street EB left	B	12.9	0.30	44	77
Southampton Street EB left/thru	B	19.1	0.63	218	335
Southampton Street WB thru | thru	D	36.6	0.62	147	203
Southampton Street WB right	C	20.2	0.60	66	156
I-93 NB Off-Ramp NB left	C	25.8	0.36	94	156
I-93 NB Off-Ramp NB thru	C	21.1	0.03	7	21
I-93 NB Off-Ramp NB right	A	1.0	0.13	0	5
I-93 Frontage Road SB right	A	0.0	0.02	0	0
Dorchester Street at East 8th Street/West 8th Street	**B**	**15.5**	-	-	-
Dorchester Street EB left/thru|thru/right	B	11.2	0.30	69	100
Dorchester Street WB left/thru|thru/right	B	11.8	0.36	92	128
East 8th Street NB left/thru/right	D	48.5	0.71	52	#124
Unsignalized					
Old Colony Avenue at Damrell Street/Gustin Street	-	-	-	-	-
Damrell Street EB left/thru/right	B	11.3	0.17	-	15
Gustin Street WB left/thru/right	C	16.1	0.02	-	2
Old Colony Avenue NB left/thru | thru/right	A	0.4	0.20	-	1
Old Colony Avenue SB left/thru | thru/right	A	0.1	0.32	-	0
Dorchester Street at Middle Street/Vinton Street	-	-	-	-	-
Dorchester Street EB left/thru | thru/right	A	0.5	0.13	-	1
Dorchester Street WB left/thru | thru/right	A	1.2	0.14	-	2
Dorchester Street at Tuckerman Street/ Jenkins Street	-	-	-	-	-
Dorchester Street EB thru | thru/right	A	0.0	0.16	-	0
Dorchester Street WB left/thru | thru	A	0.3	0.20	-	0
Tuckerman Street SB left/thru/right	C	17.0	0.05	-	4
Dorchester Avenue at Middle Street	-	-	-	-	-
Middle Street WB left/right	B	13.7	0.02	-	1
Dorchester Avenue NB thru	A	0.0	0.25	-	0
Dorchester Avenue SB thru	A	0.0	0.26	-	0
Dorchester Avenue at Alger Street	-	-	-	-	-
Alger Street EB left/thru/right	C	17.5	0.05	-	4
Alger Street WB left/thru/right	B	13.0	0.05	-	4
Dorchester Avenue NB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue SB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue at Damrell Street	-	-	-	-	-
Damrell Street WB left/right	B	13.4	0.13	-	11
Dorchester Avenue NB thru/right	A	0.0	0.26	-	0
Dorchester Avenue SB left/thru	A	1.3	0.05	-	4

Table 2-7 No-Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Old Colony Avenue at Columbia Road/Preble Street (Rotary)	-	-	-	-	-
Preble Street EB right	F	>50.0	0.97	-	276
Columbia Road EB right	C	15.7	0.44	-	57
Old Colony Avenue NB right	B	11.3	0.32	-	35
Old Colony Avenue SB right	E	47.6	0.95	-	348

~ 50th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
\# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
dr Defacto right-turn lane
dl Defacto left-turn lane
Grey indicates change to LOS E or F from Existing Condition.

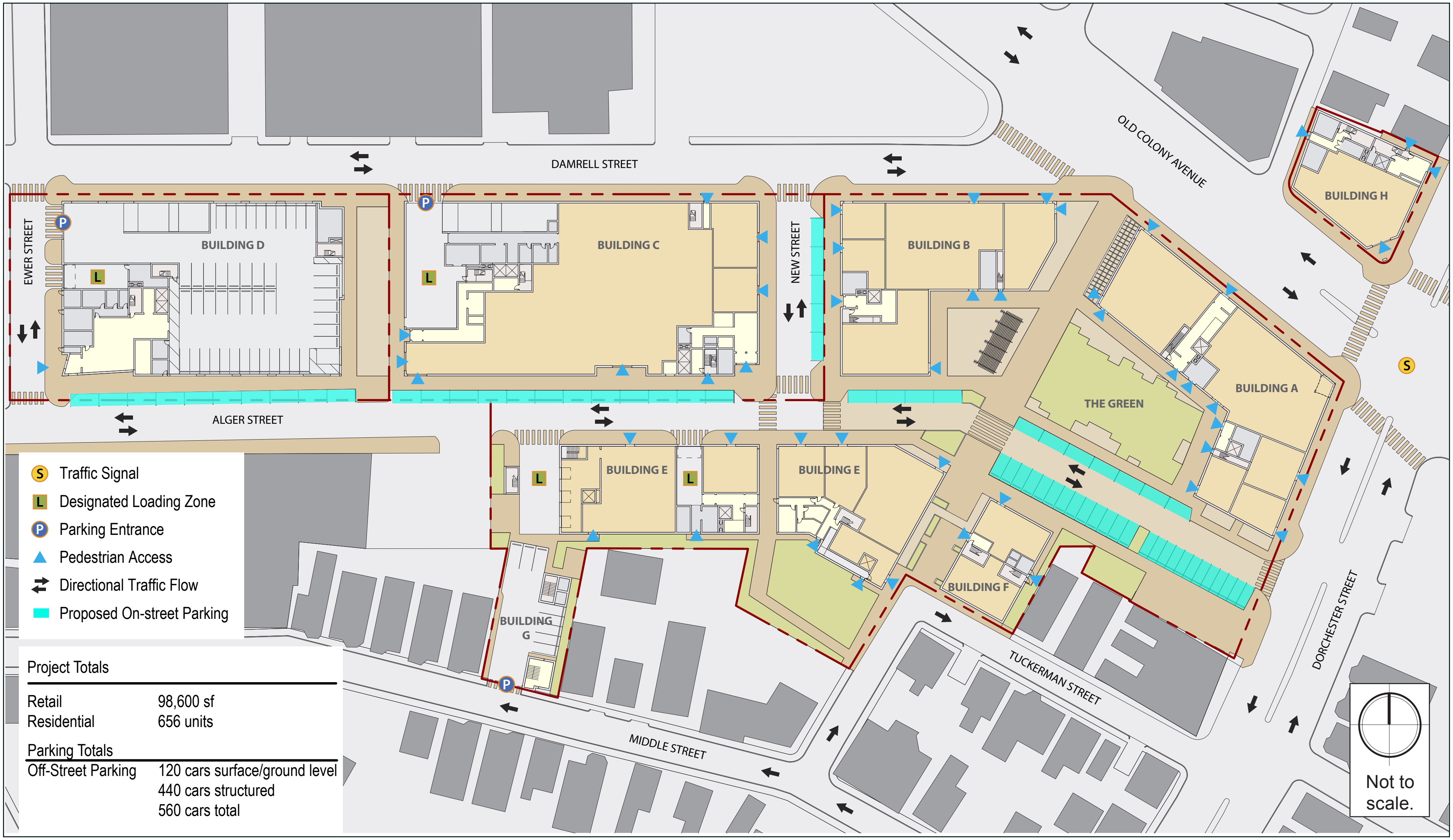
With the additional traffic from projected background growth and nearby developments, No-Build (2020) Condition operations are not expected to change significantly as compared to the Existing (2015) Condition scenario.

2.3.2 Build Conditions

As previously summarized, the Project will consist of approximately 656 residential units and approximately 98,600 sf of retail space anticipated to include general retail, pharmacy, and grocery store uses. A total of approximately 560 parking spaces will be provided on-site with approximately 440 parking spaces in two garages and approximately 120 parking spaces dispersed in surface lots and on-street spaces internal to the site. The parking will be provided for the residents, visitors, patrons, and guests of the Project. On-site storage will also be provided for approximately 656 bicycles, with additional bicycle racks located throughout the site for visitors. Loading will be provided on-site for SU-36 (36-foot long single unit box trucks) and WB-50 trucks (trucks with 40 to 45-foor long trailers).

2.3.2.1 Site Access and Circulation

The Project site plan is shown in Figure 2-11 and will include the construction of a new roadway network within the site to create several new blocks. Alger Street will be upgraded and extended eastward to intersect with Dorchester Street, creating the primary internal street on the site. Alger Street will operate as a right-in/right-out driveway at the intersection with Dorchester Street. Vehicular access to the proposed grocery store and the residential uses will be provided by new streets that will be constructed between Damrell Street and Alger Street. A driveway connection to Middle Street will be provided to access an eight-space parking lot that will serve the six residential units in Building G.



Project Totals

Retail	98,600 sf
Residential	656 units

Parking Totals

Off-Street Parking	120 cars surface/ground level 440 cars structured 560 cars total

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Figure 2-11
Proposed Site Access Plan

Pedestrian facilities will also be constructed and upgraded as part of the Project. A network of sidewalks and pedestrian-only areas will provide connections to Damrell Street, Old Colony Avenue, Dorchester Street, Tuckerman Street, and Middle Street. Primary pedestrian access to the residential buildings will be provided via Alger Street. Pedestrian access to the commercial spaces will be provided along Alger Street, Old Colony Avenue, Damrell Street, and Dorchester Street.

2.3.2.2 Trip Generation Methodology

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

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*[1] were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

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

LUC 220 – Apartment. The apartment land use is defined as rental dwellings located within the same building with at least three other dwelling units. Trip generation estimates are based on average vehicle rates per unit. It is expected that the residential units on the site will be a mix of condominiums and apartments. The apartment LUC was used for all units due to slightly higher trip generation rates to provide a "worst case scenario" analysis.

LUC 820 – Shopping Center. The shopping center land use is defined as an integrated group of commercial establishments that is planned, developed, owned and managed as one unit. Trip generation estimates are based on average vehicular rates per 1,000 sf of gross leasable area.

LUC 850 – Supermarket. Supermarkets are free-standing retail stores selling a complete assortment of food, food preparation and wrapping materials, and household cleaning items. Trip generation estimates are based on average vehicle rates per 1,000 sf of leasable area.

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

LUC 880 – Pharmacy/Drugstore without Drive-Through Window. The Pharmacy/Drugstore land use is defined as a retail facility that primarily sells prescriptions and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products, and general merchandise. Trip generation estimates are based on average vehicle rates per 1,000 sf of leasable area.

Internally Captured Trips. A key characteristic of large multi-use developments such as the Project is that trips among the various land uses can be made on site and these internal trips are not made on the surrounding roadway network. For example, somebody living on the site may choose to shop on the site, reducing the potential for trips to be made throughout the surrounding roadway network. These internal trips are typically walk trips in urban areas. The number of internally captured person trips were calculated using the methodology outlined in the *Trip Generation Handbook*[2].

2.3.2.3 Mode Share

The BTD publishes vehicle, transit, and walking/bicycling travel mode share rates for different areas of Boston. The Project is located within BTD's designated Area 8. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[3]. The BTD's travel mode share data for Area 8 are shown in Table 2-8.

Table 2-8 Travel Mode Shares

Land Use	Direction	Walk/ Bicycle Share	Transit Share	Auto Share	Vehicle Occupancy Rate
Daily					
Residential[1]	In	24%	23%	53%	1.13
	Out	24%	23%	53%	1.13
Other[2]	In	29%	11%	60%	1.78
	Out	29%	11%	60%	1.78
a.m. Peak Hour					
Residential[1]	In	22%	29%	49%	1.13
	Out	30%	26%	44%	1.13
Other[2]	In	27%	14%	59%	1.78
	Out	36%	12%	52%	1.78

2 *Trip Generation Handbook, 3rd Edition – An ITE Proposed Recommendation Practice*; Institute of Transportation Engineers; Washington, D.C.; August 2014.

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

Table 2-8 Travel Mode Shares (cont'd)

Land Use	Direction	Walk/ Bicycle Share	Transit Share	Auto Share	Vehicle Occupancy Rate
p.m. Peak Hour					
Residential[1]	In	30%	26%	44%	1.13
	Out	22%	29%	49%	1.13
Other[2]	In	36%	12%	52%	1.78
	Out	27%	14%	59%	1.78

1 LUC 220 Apartment
2 LUC 820 Shopping Center, LUC 850 Supermarket, and LUC 880 Pharmacy

2.3.2.4 Trip Generation

The mode share percentages shown in Table 2-8 were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates. The existing uses on the Project site currently generate minimal traffic volumes and were not accounted for in the trip generation estimates. The daily trip generation for the Project by travel mode is shown in Table 2-9. The trips shown in the table include the removal of the internally captured trips that will remain on the site. The detailed trip generation information is provided in Appendix B.

Table 2-9 Project Trip Generation by Travel Model

Land Use	Direction	Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Daily				
Residential *656 units*	In	463	444	905
	Out	463	444	905
Retail - General *65,500 sf*	In	650	247	755
	Out	650	247	755
Supermarket *19,000 sf*	In	451	171	524
	Out	451	171	524
Pharmacy *14,100 sf*	In	295	112	343
	Out	295	112	343
Total	In	1,859	974	2,527
	Out	1,859	974	2,527
a.m. Peak Hour				
Residential *656 units*	In	16	21	32
	Out	90	78	117
Retail - General *65,500 sf*	In	18	10	23
	Out	15	5	12

Table 2-9 Project Trip Generation (cont'd)

Land Use	Direction	Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Supermarket *19,000 sf*	In Out	19 16	10 5	23 13
Pharmacy *14,100 sf*	In Out	13 9	7 3	16 7
Total	In Out	66 130	48 91	94 149
		p.m. Peak Hour		
Apartments *700 units*	In Out	52 25	45 32	67 49
Shopping Center *39,600 sf*	In Out	67 45	22 23	55 55
Supermarket *23,000 sf*	In Out	53 31	18 16	43 38
Pharmacy *14,100 sf*	In Out	33 21	11 11	27 26
Total	In Out	205 122	96 82	192 168

2.3.2.5 Vehicle Trip Generation

The Project generated vehicle trips by land use are summarized in Table 2-10, with the detailed trip generation information provided in Appendix B.

Table 2-10 Project Vehicle Trips by Land Use

Time Period	Direction	Residential[1]	Retail[2]	Supermarket[3]	Pharmacy[4]	Total
Daily	In Out Total	905 905 1,810	755 755 1,510	524 524 1,048	343 343 686	2,527 2,527 5,054
a.m. Peak Hour	In Out Total	32 117 149	23 12 35	23 13 36	16 7 23	94 149 243
p.m. Peak Hour	In Out Total	67 49 116	55 55 110	43 38 81	27 26 53	192 168 360

1 Based on ITE LUC 220 – Apartments for 656 units.
2 Based on ITE LUC 820 – Shopping Center for 65,500 sf.
3 Based on ITE LUC 850 – Supermarket for 19,000 sf.
4 Based on ITE LUC 230 – Pharmacy for 14,100 sf.

As shown in Table 2-10, the Project is expected to generate approximately 5,054 new daily vehicle trips (2,527 entering and 2,527 exiting), with 243 new vehicle trips during the a.m. peak hour (94 entering and 149 exiting) and 360 new vehicle trips during the p.m. peak hour (192 entering and 168 exiting).

2.3.2.6 Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the residential component of the Project were based on BTD's origin-destination data for Area 8 and trip distribution patterns presented in traffic studies for nearby projects and are shown in Figure 2-12. Trips associated with the commercial components of the Project are expected to be mostly local in nature and should follow existing traffic volume patterns throughout the perimeter of the study area. Trip distribution patterns for the commercial components of the Project site are based on existing traffic volumes entering and exiting the study area network and are shown on Figure 2-13. Additional trip assignment figures for each specific component of the Project are provided in Appendix B.

The Project-generated vehicle trips were assigned to the study area roadway network based on the trip distribution patterns shown in Figure 2-12 and Figure 2-13, and are shown in Figure 2-14 and Figure 2-15 for the a.m. and p.m. peak hours, respectively. The Project-generated trips were added to the No-Build (2020) Condition traffic volumes to develop the Build (2020) Condition peak hour traffic volume networks, and are shown in Figure 2-16 and Figure 2-17 for the a.m. and p.m. peak hours, respectively.

2.3.2.7 Build Condition Traffic Operations

The Build (2020) Condition capacity analysis summary uses the same methodology as the Existing (2015) Condition and the No-Build (2020) Condition capacity analysis summary. Table 2-11 and Table 2-12 present the Build (2020) Condition capacity analysis summary for the a.m. and p.m. peak hours. The newly created intersections and all site driveways are also included in the Build (2020) Condition analysis. The detailed analysis sheets are provided in Appendix B.

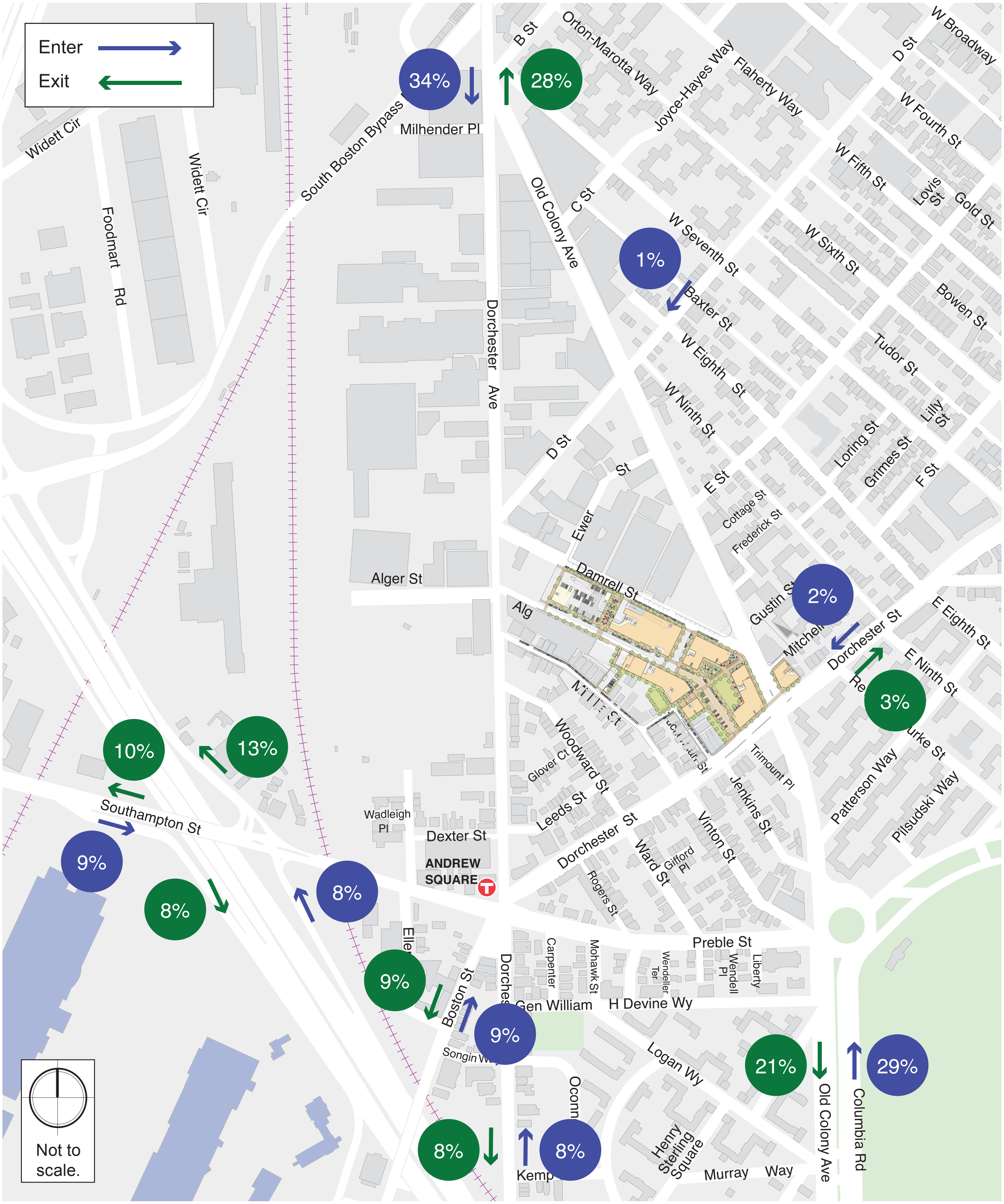

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Figure 2-12
Residential Trip Distribution

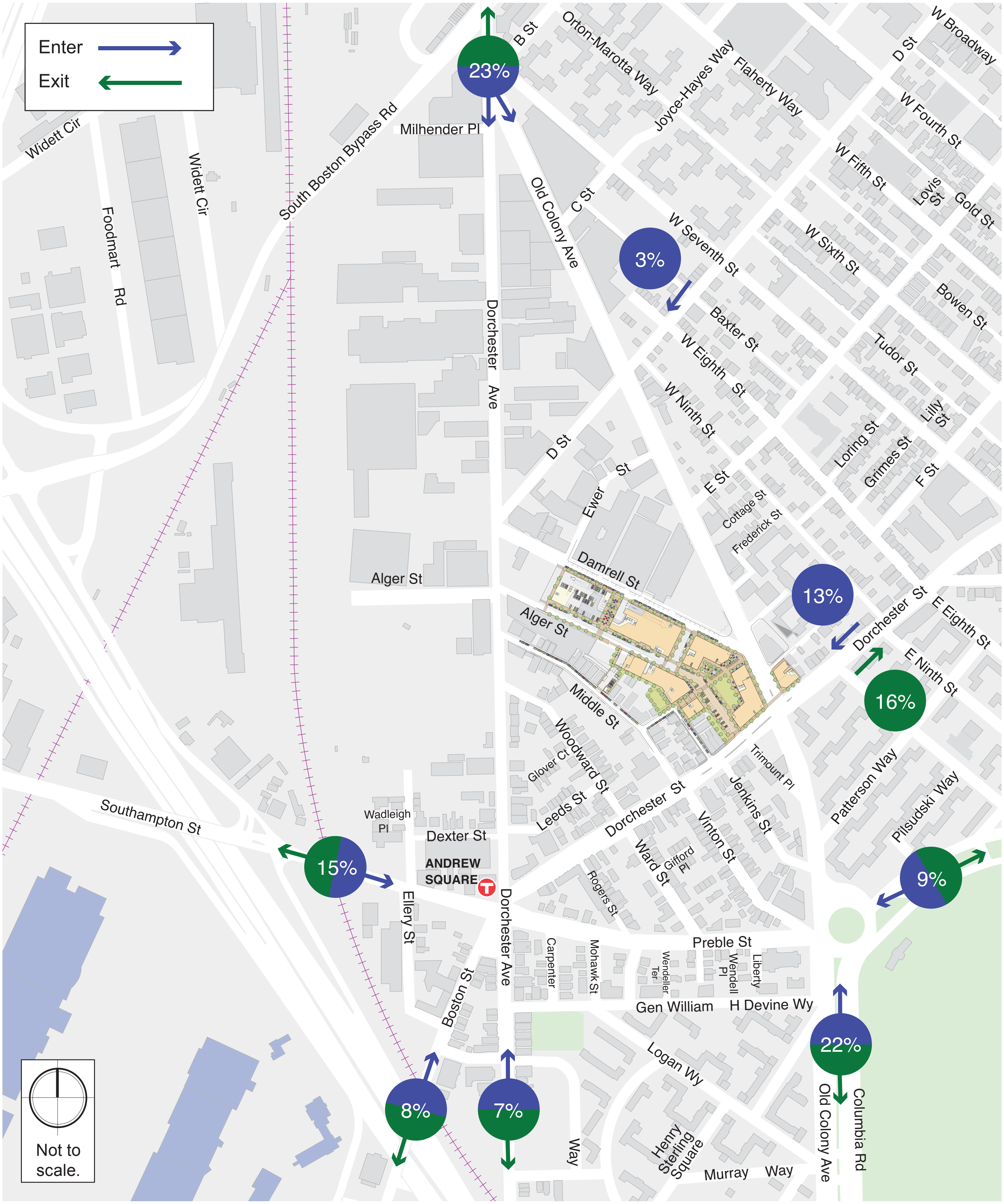

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Figure 2-13
Commerical Trip Distribution

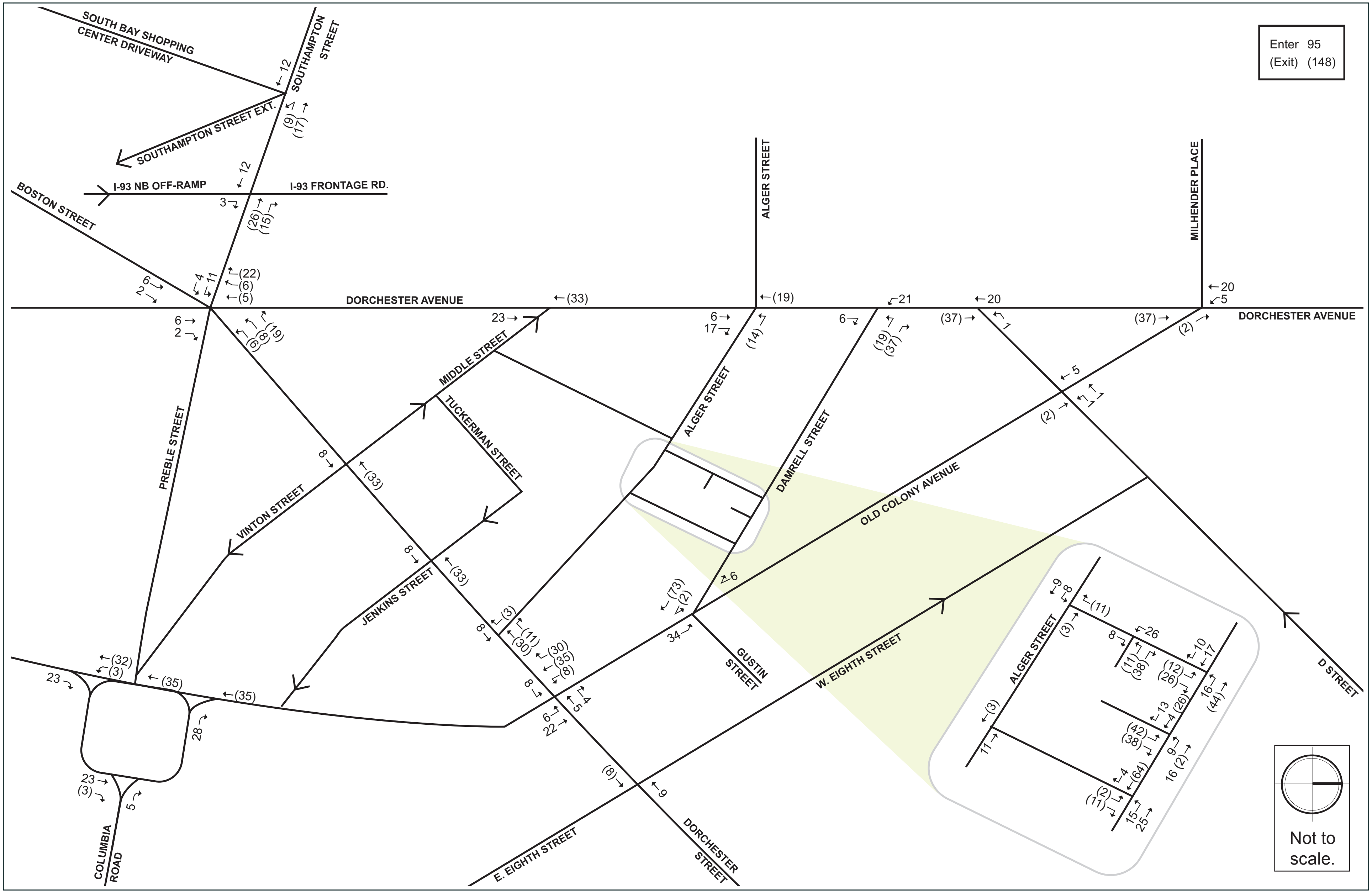

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Figure 2-14
Project-generated Trips, a.m. Peak Hour

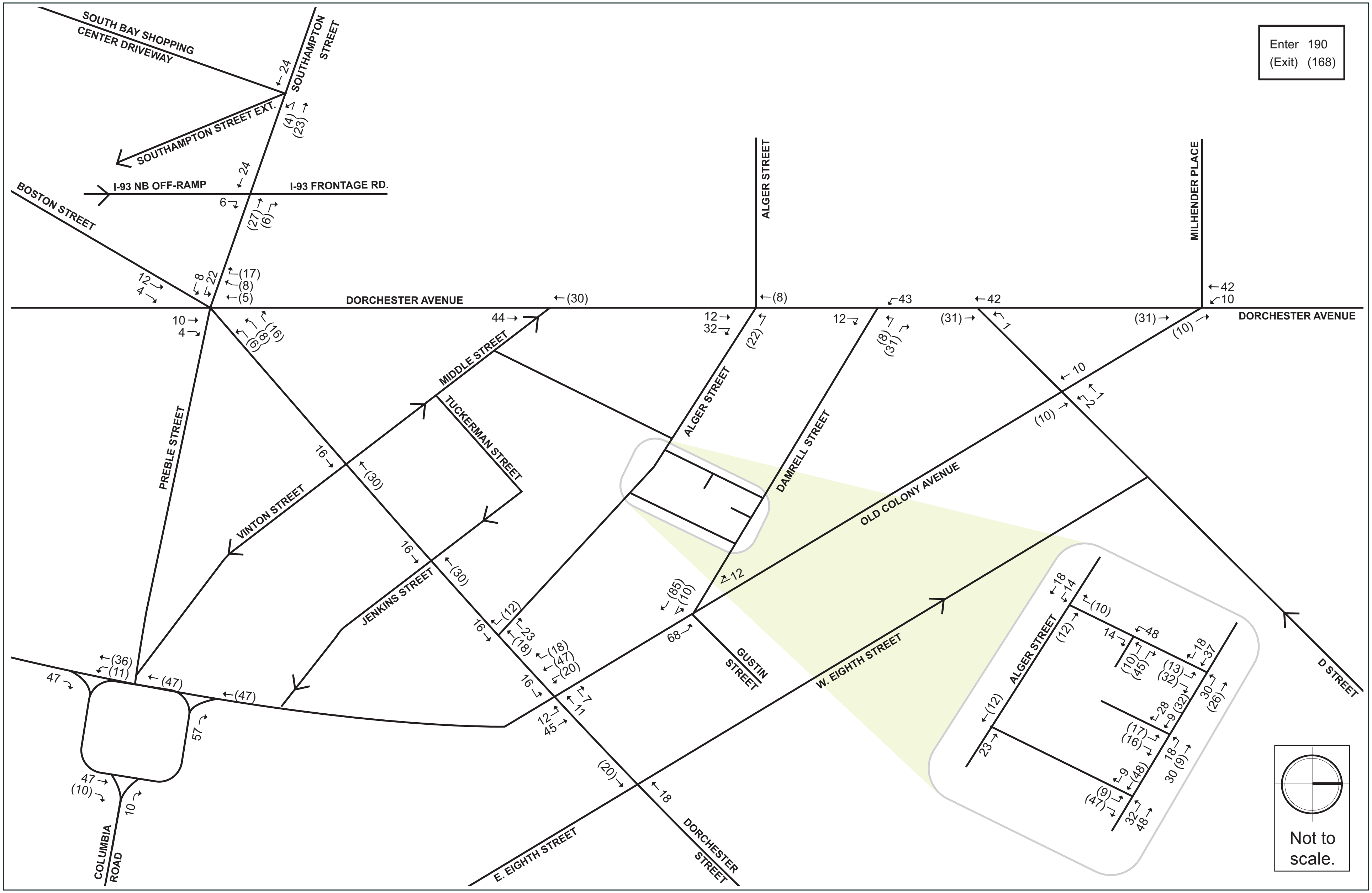

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Figure 2-15
Project-generated Trips, p.m. Peak Hour

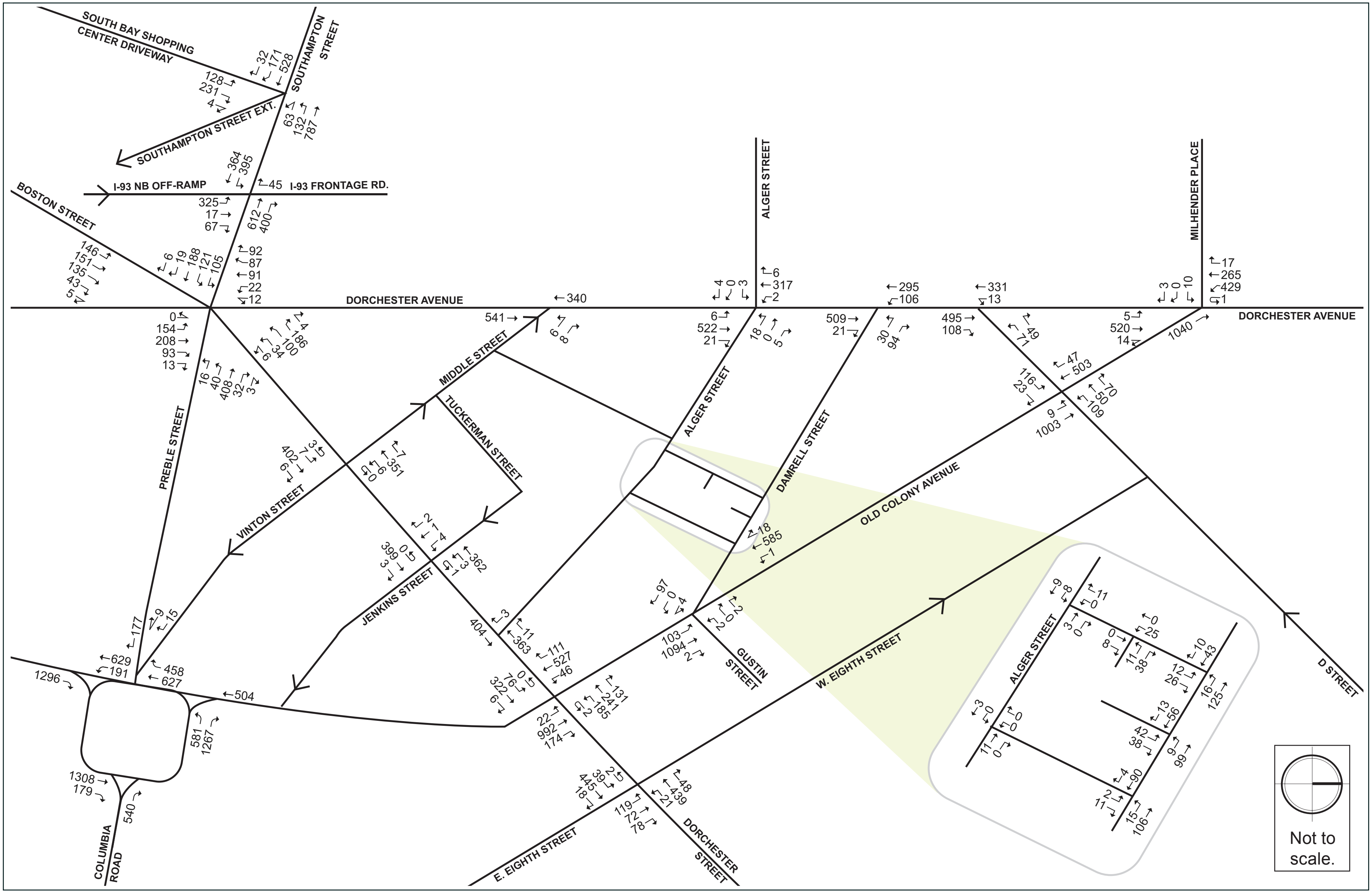

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Figure 2-16

Build (2020) Condition Traffic Volumes, a.m. Peak Hour

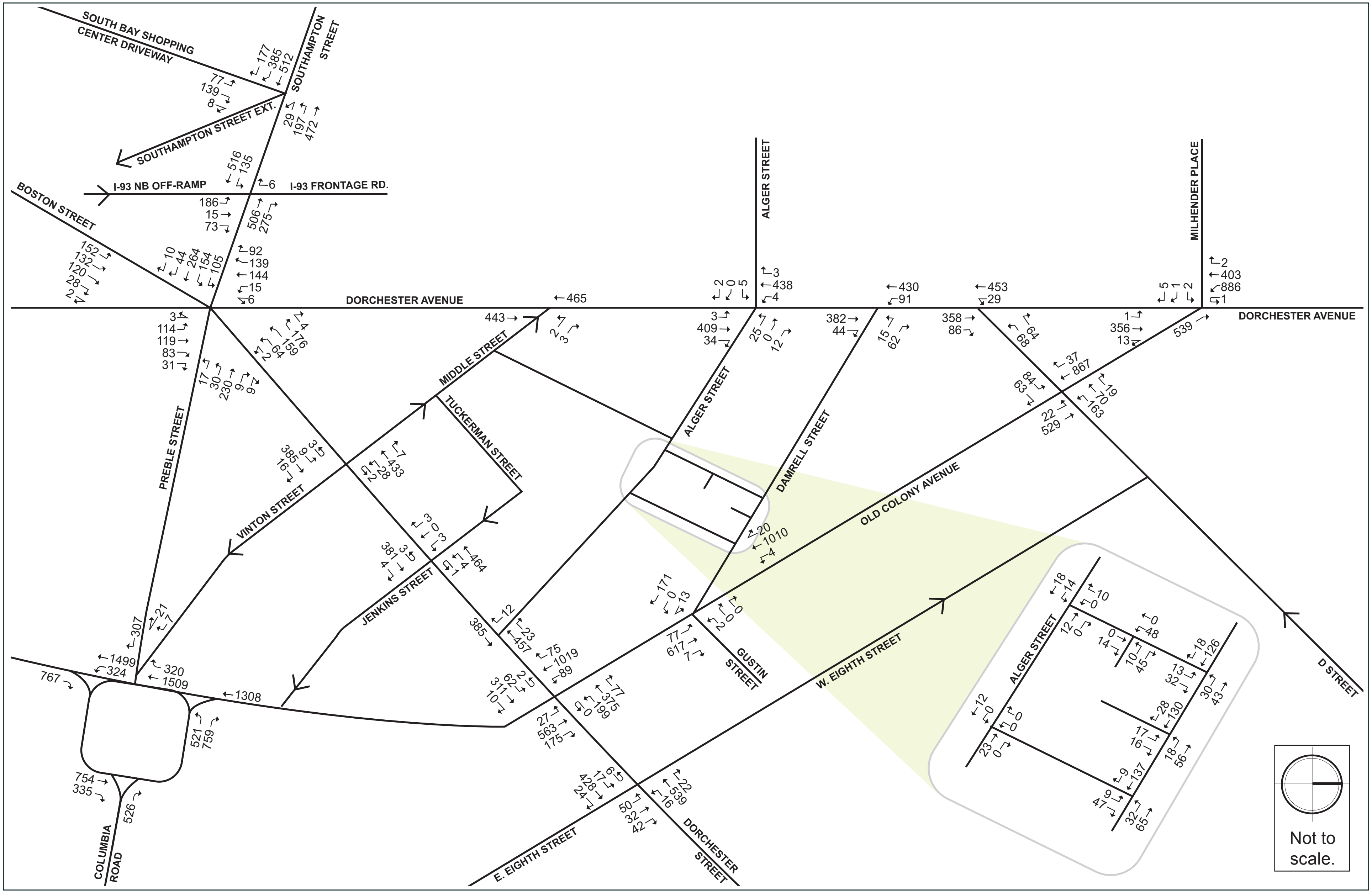

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Figure 2-17
Build (2020) Condition Traffic Volumes, p.m. Peak Hour

Table 2-11 Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized					
Old Colony Avenue at Dorchester Street	**F**	**>80.0**	-	-	-
Dorchester Street EB left/thru | thru/right	F	>80.0	>1.00	~172	#267
Dorchester Street WB left/thru | thru/right	F	>80.0	>1.00	~190	#321
Old Colony Avenue NB left/thru | thru/right	F	>80.0	>1.00	~496	#630
Old Colony Avenue SB left/thru | thru/right	F	>80.0	>1.00	~314	#397
Old Colony Avenue at D Street	**E**	**59.8**	-	-	-
D Street EB left	E	67.7	0.78	60	#149
D Street EB right	A	1.0	0.11	0	0
D Street WB left/thru/right	F	>80.0	>1.00	~181	#299
Old Colony Avenue NB left/thru | thru	C	25.3	0.74	260	#398
Old Colony Avenue SB thru | thru/right	B	17.9	0.45	133	170
Dorchester Avenue at Dorchester Street/ Southampton Street/Preble Street/Boston Street	**F**	**>80.0**	-	-	-
Southampton Street EB left/thru | thru/right	F	>80.0	>1.00dl	~291	#417
Preble Street WB left/thru | thru/right	F	>80.0	>1.00	~439	#546
Dorchester Avenue NB left/thru | thru/right	F	>80.0	>1.00	~387	#429
Dorchester Avenue SB left/thru | thru/right	E	72.9	0.88	201	219
Boston Street NEB left/thru | thru/right	E	70.0	0.99dl	250	321
Dorchester Street SWB left/thru | thru/right	F	>80.0	>1.00dr	~263	#322
Dorchester Avenue at D Street	**B**	**11.8**	-	-	-
D Street WB left/right	D	39.6	0.61	75	99
Dorchester Avenue NB thru/right	A	8.8	0.60	129	277
Dorchester Avenue SB left/thru	A	5.9	0.35	59	124
Old Colony Avenue at Dorchester Avenue	**C**	**26.6**	-	-	-
Milhender Place EB left/right	A	0.6	0.09	0	0
Dorchester Avenue NB left/thru | thru/right	C	27.4	0.64	163	166
Dorchester Avenue SB left | left	C	20.4	0.35	67	182
Dorchester Avenue SB thru/right	A	2.6	0.25	0	87
Old Colony Avenue NWB right | right	D	37.1	0.90	230	#714

Table 2-11 Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Southampton Street at Southampton Street Extension / South Bay Shopping Center Ring Road	**E**	**55.3**	-	-	-
Southampton Street EB thru | thru/right	D	45.8	0.78	361	445
Southampton Street WB left/thru | thru	E	57.9	1.00	~470	#638
South Bay Shopping Center NB left	D	51.2	0.44	112	191
South Bay Shopping Center NB slight right/right	E	76.3	0.85	229	#401
Southampton Street at I-93 NB Frontage Road/I-93 NB Off-Ramp	**D**	**38.9**	-	-	-
Southampton Street EB left	C	23.7	0.63	96	190
Southampton Street EB left/thru	E	58.6	1.00	232	#470
Southampton Street WB thru | thru	D	43.0	0.79	200	267
Southampton Street WB right	D	38.2	0.86	150	#327
I-93 NB Off-Ramp NB left	C	32.5	0.63	186	285
I-93 NB Off-Ramp NB thru	C	21.2	0.04	8	24
I-93 NB Off-Ramp NB right	A	1.0	0.13	0	5
I-93 Frontage Road SB right	A	0.6	0.16	0	0
Dorchester Street at East 8th Street/West 8th Street	**D**	**40.1**	-	-	-
Dorchester Street EB left/thru|thru/right	B	13.9	0.39	87	125
Dorchester Street WB left/thru|thru/right	B	13.0	0.35	76	111
East 8th Street NB left/thru/right	F	>80.0	>1.00	~172	#321
Unsignalized					
Old Colony Avenue at Damrell Street/Gustin Street	-	-	-	-	-
Damrell Street EB left/thru/right	B	13.9	0.28	-	30
Gustin Street WB left/thru/right	E	39.6	0.07	-	6
Old Colony Avenue NB left/thru | thru/right	A	2.9	0.33	-	10
Old Colony Avenue SB left/thru | thru/right	A	0.0	0.20	-	0
Dorchester Street at Middle Street/Vinton Street	-	-	-	-	-
Dorchester Street EB left/thru | thru/right	A	0.3	0.13	-	0
Dorchester Street WB left/thru | thru/right	A	0.3	0.12	-	0
Dorchester Street at Tuckerman Street/ Jenkins Street	-	-	-	-	-
Dorchester Street EB thru | thru/right	A	0.0	0.17	-	0
Dorchester Street WB left/thru | thru	A	0.2	0.16	-	0
Tuckerman Street SB left/thru/right	C	15.7	0.03	-	3

Table 2-11 Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Dorchester Avenue at Middle Street	-	-	-	-	-
Middle Street WB left/right	C	16.3	0.07	-	6
Dorchester Avenue NB thru	A	0.0	0.35	-	0
Dorchester Avenue SB thru	A	0.0	0.24	-	0
Dorchester Avenue at Alger Street	-	-	-	-	-
Alger Street EB left/thru/right	C	17.0	0.04	-	3
Alger Street WB left/thru/right	C	22.7	0.13	-	11
Dorchester Avenue NB left/thru/right	A	0.2	0.01	-	0
Dorchester Avenue SB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue at Damrell Street	-	-	-	-	-
Damrell Street WB left/right	C	24.5	0.51	-	69
Dorchester Avenue NB thru/right	A	0.0	0.34	-	0
Dorchester Avenue SB left/thru	A	3.5	0.12	-	11
Old Colony Avenue at Columbia Road/Preble Street (Rotary)	-	-	-	-	-
Preble Street EB right	C	17.7	0.43	-	53
Columbia Road EB right	E	44.5	0.80	-	172
Old Colony Avenue NB right	B	13.3	0.52	-	78
Old Colony Avenue SB right	C	15.5	0.46	-	60
Dorchester Street at Alger Street Extension	-	-	-	-	-
Dorchester Street EB thru|thru	A	0.0	0.13	-	0
Dorchester Street WB theu|thru/right	A	0.0	0.15	-	0
Alger Street SB right	A	9.5	0.00	-	0
Alger Street at Alger-Damrell Connection	-	-	-	-	-
Alger Street EB left/thru	A	0.0	0.00	-	0
Alger Street WB thru/right	A	0.0	0.01	-	0
Alger-Damrell Connection SB left/right	A	0.0	0.00	-	0
Alger Street at Grocery Road	-	-	-	-	-
Alger Street EB left/thru	A	3.4	0.01	-	0
Alger Street WB thru/right	A	0.0	0.00	-	0
Grocery Road SB left/right	A	8.4	0.01	-	1
Damrell Street at Grocery Road	-	-	-	-	-
Damrell Street EB thru/right	A	0.0	0.03	-	0
Damrell Street WB left/thru	A	0.9	0.01	-	1
Grocery Road NB left/right	A	9.1	0.05	-	4
Damrell Street at Alger-Damrell Connection	-	-	-	-	-
Damrell Street EB thru/right	A	0.0	0.06	-	0
Damrell Street WB left/thru	A	1.0	0.01	-	1
Alger-Damrell Connection NB left/right	A	9.0	0.02	-	1

Table 2-11 Build (2020) Condition, Capacity Analysis Summary, a.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Damrell Street at Building C Driveway	-	-	-	-	-
Damrell Street EB thru/right	A	0.0	0.04	-	0
Damrell Street WB left/thru	A	0.7	0.01	-	0
Building C Driveway NB left/right	A	9.6	0.10	-	8
Grocery Road at Building D Driveway	-	-	-	-	-
Building D Driveway WB left/right	A	8.6	0.05	-	4
Grocery Road NB thru/right	A	0.0	0.01	-	0
Grocery Road SB left/thru	A	7.3	0.02	-	1

~ 50th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
dr Defacto right-turn lane
dl Defacto left-turn lane
Grey indicates change to LOS E or F from No-Build Condition.

Table 2-12 Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Signalized					
Old Colony Avenue at Dorchester Street	**F**	**>80.0**	**-**	**-**	**-**
Dorchester Street EB left/thru | thru/right	F	>80.0	0.99	137	#241
Dorchester Street WB left/thru | thru/right	F	>80.0	>1.00	~306	#424
Old Colony Avenue NB left/thru | thru/right	E	71.5	>1.00	~299	#424
Old Colony Avenue SB left/thru | thru/right	F	>80.0	>1.00	~611	#747
Old Colony Avenue at D Street	**C**	**25.4**	**-**	**-**	**-**
D Street EB left	D	50.8	0.51	58	102
D Street EB right	B	12.3	0.31	0	35
D Street WB left/thru/right	E	63.0	0.85	159	#285
Old Colony Avenue NB left/thru | thru	C	22.9	0.41	195	m186
Old Colony Avenue SB thru | thru/right	B	15.1	0.52	185	268
Dorchester Avenue at Dorchester Street/ Southampton Street/Preble Street/Boston Street	**F**	**>80.0**	**-**	**-**	**-**
Southampton Street EB left/thru | thru/right	F	>80.0	>1.00dl	~521	#563
Preble Street WB left/thru | thru/right	F	>80.0	>1.00dl	~193	#297
Dorchester Avenue NB left/thru | thru/right	F	>80.0	>1.00dl	~294	#310
Dorchester Avenue SB left/thru | thru/right	E	58.0	0.75	212	278
Boston Street NEB left/thru | thru/right	E	70.1	>1.00dl	231	298
Dorchester Street SWB left/thru | thru/right	F	>80.0	>1.00	~286	#402

Table 2-12 Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Dorchester Avenue at D Street	**A**	**7.8**	-	-	-
D Street WB left/right	C	27.0	0.56	36	84
Dorchester Avenue NB thru/right	A	4.7	0.40	54	135
Dorchester Avenue SB left/thru	A	5.7	0.47	73	166
Old Colony Avenue at Dorchester Avenue	**B**	**13.8**			
Milhender Place EB left/right	A	0.5	0.07	0	0
Dorchester Avenue NB left/thru | thru/right	D	35.5	0.62	106	141
Dorchester Avenue SB left | left	B	11.9	0.47	101	257
Dorchester Avenue SB thru/right	A	1.9	0.29	0	75
Old Colony Avenue NWB right | right	B	11.6	0.41	77	177
Southampton Street at Southampton Street Extension / South Bay Shopping Center Ring Road	**D**	**49.6**	-	-	-
Southampton Street EB thru | thru/right	E	63.1	>1.00dr	~605	#836
Southampton Street WB left/thru | thru	C	22.9	0.91dl	204	299
South Bay Shopping Center NB left	D	54.0	0.36	69	121
South Bay Shopping Center NB slight right/right	E	72.1	0.73	141	223
Southampton Street at I-93 NB Frontage Road/I-93 NB Off-Ramp	**C**	**24.6**	-	-	-
Southampton Street EB left	B	13.0	0.31	44	77
Southampton Street EB left/thru	C	20.1	0.66	236	363
Southampton Street WB thru | thru	D	37.6	0.66	157	216
Southampton Street WB right	C	21.5	0.62	73	165
I-93 NB Off-Ramp NB left	C	25.8	0.36	94	156
I-93 NB Off-Ramp NB thru	C	21.1	0.03	7	21
I-93 NB Off-Ramp NB right	A	1.4	0.14	0	8
I-93 Frontage Road SB right	A	0.0	0.02	0	0
Dorchester Street at East 8th Street/West 8th Street	**B**	**15.5**	-	-	-
Dorchester Street EB left/thru|thru/right	B	11.3	0.31	73	105
Dorchester Street WB left/thru|thru/right	B	12.0	0.37	95	133
East 8th Street NB left/thru/right	D	48.5	0.71	52	#124
Unsignalized					
Old Colony Avenue at Damrell Street/Gustin Street	-	-	-	-	-
Damrell Street EB left/thru/right	B	14.0	0.38	-	44
Gustin Street WB left/thru/right	D	26.6	0.05	-	4
Old Colony Avenue NB left/thru | thru/right	A	3.4	0.20	-	10
Old Colony Avenue SB left/thru | thru/right	A	0.1	0.33	-	0
Dorchester Street at Middle Street/Vinton Street	-	-	-	-	-
Dorchester Street EB left/thru | thru/right	A	0.5	0.14	-	1
Dorchester Street WB left/thru | thru/right	A	1.2	0.15	-	2

Table 2-12 Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Dorchester Street at Tuckerman Street/ Jenkins Street	-	-	-	-	-
Dorchester Street EB thru | thru/right	A	0.0	0.17	-	0
Dorchester Street WB left/thru | thru	A	0.2	0.21	-	0
Tuckerman Street SB left/thru/right	C	17.8	0.05	-	4
Dorchester Avenue at Middle Street	-	-	-	-	-
Middle Street WB left/right	B	14.5	0.02	-	2
Dorchester Avenue NB thru	A	0.0	0.28	-	0
Dorchester Avenue SB thru	A	0.0	0.28	-	0
Dorchester Avenue at Alger Street	-	-	-	-	-
Alger Street EB left/thru/right	C	18.3	0.06	-	4
Alger Street WB left/thru/right	C	20.0	0.20	-	18
Dorchester Avenue NB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue SB left/thru/right	A	0.1	0.00	-	0
Dorchester Avenue at Damrell Street	-	-	-	-	-
Damrell Street WB left/right	C	16.3	0.28	-	29
Dorchester Avenue NB thru/right	A	0.0	0.26	-	0
Dorchester Avenue SB left/thru	A	2.3	0.09	-	7
Old Colony Avenue at Columbia Road/Preble Street (Rotary)	-	-	-	-	-
Preble Street EB right	F	>50.0	0.99	-	290
Columbia Road EB right	C	16.7	0.47	-	63
Old Colony Avenue NB right	B	11.6	0.35	-	39
Old Colony Avenue SB right	F	>50.0	0.99	-	392
Dorchester Street at Alger Street Extension	-	-	-	-	-
Dorchester Street EB thru|thru	A	0.0	0.12	-	0
Dorchester Street WB theu|thru/right	A	0.0	0.19	-	0
Alger Street SB right	A	10.0	0.02	-	1
Alger Street at Alger-Damrell Connection	-	-	-	-	-
Alger Street EB left/thru	A	0.0	0.00	-	0
Alger Street WB thru/right	A	0.0	0.01	-	0
Alger-Damrell Connection SB left/right	A	0.0	0.00	-	0
Alger Street at Grocery Road	-	-	-	-	-
Alger Street EB left/thru	A	3.2	0.01	-	1
Alger Street WB thru/right	A	0.0	0.01	-	0
Grocery Road SB left/right	A	8.4	0.01	-	1
Damrell Street at Grocery Road	-	-	-	-	-
Damrell Street EB thru/right	A	0.0	0.09	-	0
Damrell Street WB left/thru	A	3.2	0.02	-	2
Grocery Road NB left/right	A	9.6	0.06	-	5

Table 2-12 Build (2020) Condition, Capacity Analysis Summary, p.m. Peak Hour (cont'd.)

Intersection	LOS	Delay (seconds)	V/C Ratio	50th Percentile Queue Length (ft)	95th Percentile Queue Length (ft)
Damrell Street at Alger-Damrell Connection	-	-	-	-	-
Damrell Street EB thru/right	A	0.0	0.09	-	0
Damrell Street WB left/thru	A	2.6	0.02	-	2
Alger-Damrell Connection NB left/right	A	9.6	0.07	-	6
Damrell Street at Building C Driveway	-	-	-	-	-
Damrell Street EB thru/right	A	0.0	0.10	-	0
Damrell Street WB left/thru	A	1.9	0.01	-	1
Building C Driveway NB left/right	A	9.7	0.05	-	4
Grocery Road at Building D Driveway	-	-	-	-	-
Building D Driveway WB left/right	A	8.7	0.06	-	5
Grocery Road NB thru/right	A	0.0	0.01	-	0
Grocery Road SB left/thru	A	7.3	0.03	-	3

~ 50th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles
dr Defacto right-turn lane
dl Defacto left-turn lane
Grey indicates change to LOS E or F from No-Build Condition.

Based on the analysis presented in Table 2-11 and Table 2-12, the following intersections will experience a slight degradation in LOS when compared to the No-Build Condition scenario:

At the intersection of **Old Colony Avenue/Dorchester Street**, the Old Colony Avenue northbound movement will change from LOS C to LOS E during the p.m. peak hour with the construction of the Project.

At the intersection of **Dorchester Avenue/Dorchester Street/Southampton Street/Preble Street/Boston Street (Andrew Square)**, the Dorchester Avenue southbound movement will change from LOS D to LOS E during the p.m. peak hour with the construction of the Project.

The overall operations at the intersection of **Southampton Street/Southampton Street Extension/South Bay Shopping Center Ring Road** will change from LOS D to LOS E during the a.m. peak hour due to a slight increase in vehicular delays. The Southampton Street westbound movements will also change from LOS D to LOS E during the a.m. peak hours due to a slight increase in vehicular delays.

At the intersection of **Southampton Street/I-93 NB Frontage Road/I-93 NB Off-Ramp**, the Southampton Street eastbound movement will change from LOS D to LOS E during the a.m. peak hour with the construction of the Project.

At the intersection of **Old Colony Avenue/Damrell Street/Gustin Street**, the Gustin Street westbound approach will change from LOS C to LOS E during the a.m. peak hour with the construction of the Project. This approach will continue to operate under capacity.

At the intersection of **Old Colony Avenue/Columbia Road/Preble Street/Vinton Street**, the Old Colony Avenue southbound approach to the rotary will change from LOS E to LOS F during the p.m. peak hour with the construction of the Project.

The analysis tables also show that all internal roadways and the site driveway intersections with Damrell Street and Dorchester Street will operate at LOS A with minimal delays and queuing.

2.3.2.8 Parking

This section presents the Project's parking supply and an evaluation of the Project's parking demand. The Project will provide a total of approximately 560 parking spaces on the site. A total of approximately 440 residential parking spaces will be provided in two structured garages located in Buildings C and D in the western portion of the site (approximately 0.67 parking spaces per unit). The remaining approximately 120 parking spaces will be allocated for visitors to the commercial uses on the site and located in surface lots or along the curbside of the internal roadway network. Of the approximately 120 commercial parking spaces, a total of approximately 51 parking spaces will be located on the ground floor level of the westernmost residential tower on the Project site and will specifically serve the proposed grocery store.

2.3.2.9 Public Transportation

Based on the travel mode shares presented in Table 2-8, the future transit trips associated with the Project were estimated and are summarized in Table 2-13.

Table 2-13 Project Transit Trips

Time Period	Direction	Residential[1]	Retail[2]	Supermarket[3]	Pharmacy[4]	Total
Daily	In	444	247	171	112	974
	Out	444	247	171	112	974
	Total	**888**	**494**	**342**	**224**	**1,948**
a.m. Peak Hour	In	21	10	10	7	48
	Out	78	5	5	3	91
	Total	**99**	**15**	**15**	**10**	**139**
p.m. Peak Hour	In	45	22	18	11	96
	Out	32	23	16	11	82
	Total	**77**	**45**	**34**	**22**	**178**

1 Based on ITE LUC 220 – Apartments for 656 units.
2 Based on ITE LUC 820 – Shopping Center for 65,500 sf.
3 Based on ITE LUC 850 – Supermarket for 19,000 sf.
4 Based on ITE LUC 230 – Pharmacy for 14,100 sf.

As shown in Table 2-13, the Project will generate an estimated 1,948 new transit trips on a daily basis. Approximately 139 new transit trips will occur during the a.m. peak hour (48 alighting and 91 boarding) and 178 new trips will occur during the p.m. peak hour (96 alighting and 82 boarding). The majority of the transit trips will be accommodated by the MBTA Red Line at Andrew Station and the several MBTA bus routes that operate near the Project site.

2.3.2.10 Pedestrians/Bicycles

Based on the travel mode shares presented in Table 2-8, the future walk/bicycle trips were estimated and are summarized in Table 2-14.

Table 2-14 Project Pedestrian/Bicycle Trips

Time Period	Direction	Residential[1]	Retail[2]	Supermarket[3]	Pharmacy[4]	Total
Daily	In	463	650	451	295	1,859
	Out	463	650	451	295	1,859
	Total	**926**	**1,300**	**902**	**590**	**3,718**
a.m. Peak Hour	In	16	18	19	13	66
	Out	90	15	16	9	130
	Total	**106**	**33**	**35**	**22**	**196**
p.m. Peak Hour	In	52	67	53	33	205
	Out	25	45	31	21	122
	Total	**77**	**112**	**84**	**54**	**327**

1 Based on ITE LUC 220 – Apartments for 656 units.
2 Based on ITE LUC 820 – Shopping Center for 65,500 sf.
3 Based on ITE LUC 850 – Supermarket for 19,000 sf.
4 Based on ITE LUC 230 – Pharmacy for 14,100 sf.

As shown in Table 2-14, over the course of a day, the Project will generate an estimated 3,718 new pedestrian trips and an additional 1,948 new transit trips that will require a walk to or from the site. This results in an additional 5,666 new pedestrian trips per day. Approximately 196 new pedestrian trips will occur during the a.m. peak hour and 327 new pedestrian trips will occur during the p.m. peak hour in addition to the transit trips that will also require a walk from the site.

2.3.2.11 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure covered bicycle parking for residents and employees and short-term bicycle racks for visitors. The Project will provide approximately 656 covered and secure bicycle storage spaces on-site. Additional storage will be provided by outdoor bicycle racks accessible to visitors, guests and patrons to the site in accordance with BTD guidelines.

All bicycle racks, signs, and parking areas will conform to BTD guidelines and will be located in safe, secure locations. The Proponent will work with BTD to identify the most appropriate quantity and location for bicycle racks on the Project site as part of the Transportation Access Plan Agreement (TAPA) process.

2.3.2.12 Loading and Service Activity

Loading and service operations for the proposed grocery store will occur in a loading dock that will accommodate a WB-50 truck and will be accessed from Damrell Street. Additional loading areas will be provided off of Alger Street for the retail spaces located along the south side of the roadway. An approximately 30-foot wide by 60-foot long loading area will be provided along the western edge of Building E, and an approximately 20-foot wide by 40-foot long loading area will be provided within Building E.

Residential loading will occur within the parking garages and will accommodate SU-36 moving trucks. Move-in/move-out will also occur curbside along the internal roadway network, and will be coordinated with building management to ensure that spaces along the street will remain open for moving trucks. All trash truck activity will also take place within the Project site.

A summary of anticipated loading/service activity by land use is presented in Table 2-15; the sources of the assumptions are presented below. Delivery trip estimates were based on data provided in the Truck Trip Generation Rates by Land Use in the Central Artery/Tunnel Project Study Area report[4]. Deliveries to the Project site will be mostly limited to SU-36 trucks and smaller delivery vehicles, with the exception of deliveries to the proposed grocery store. Some deliveries to the proposed grocery store will be from a WB-50 trailer truck.

Residential. Residential units primarily generate delivery trips related to small packages and prepared food. Based on the CTPS report, residential uses generate approximately 0.01 light truck trips per 1,000 sf of gross floor area and 0.001 medium/heavy truck trips per 1,000 sf of gross floor area.

Retail. Retail uses depend on more frequent deliveries from smaller trucks. Based on the CTPS report, retail uses generate approximately 0.15 light truck trips per 1,000 sf of floor area and 0.15 medium/heavy truck trips per 1,000 sf of gross floor area.

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

Table 2-15 Delivery Activity by Land Use

Land Use	Number of Deliveries	General Delivery Times
Residential	6	10% before 7:00 a.m. 70% between 7:00 a.m. and 1:00 p.m. 20% after 1:00 p.m.
Retail	23	
Total	29	

The Project is expected to generate approximately 29 deliveries per day. It is anticipated that the majority of these deliveries will occur between 7:00 a.m. and 1:00 p.m. These numbers do not include trash truck trips. The design of the Project and layout of the interior roadway network will allow deliveries to occur with minimal impact on the vehicular operations along the surrounding roadway network including Old Colony Avenue, Dorchester Street, and Dorchester Avenue. The majority of the truck maneuvers will use Damrell Street to access the site and the loading docks.

2.4 Transportation Mitigation Measures

The Proponent will continue to work with the City of Boston and BTD to identify the most appropriate mitigation measures to offset any transportation related impacts, and to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks, the installation of new, accessible ramps, the planting of trees, and providing bicycle storage racks surrounding the site, where appropriate.

The Proponent is responsible for preparation of the TAPA, a formal legal agreement between the Proponent and BTD. The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, travel demand management measures, and any other responsibilities that are agreed to by both the Proponent and BTD. Because the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed. The Proponent will work closely with BTD to determine the level of transportation mitigation that will be necessary to accommodate the Project. Any transportation improvements to be undertaken as part of this Project will be defined and documented in the TAPA.

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

2.5 Transportation Demand Management

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

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

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

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

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

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

- **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.

- **Electric Charging Stations**: The Proponent will explore the feasibility of locating electric vehicle charging stations throughout the Project site.

- **Car Sharing**: The Proponent will work with car sharing services to explore the feasibility of locating car sharing spaces on the Project site.

2.6 Evaluation of Short-term Construction Impacts

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

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

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

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

Chapter 3.0

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW COMPONENT

3.1 Wind

3.1.1 Introduction

A pedestrian wind study was conducted by RWDI for the proposed Project. The objective of the study was to assess the impact that the Project may have on existing local pedestrian conditions around the study site, and to provide recommendations for minimizing adverse effects.

This analysis was completed using physical modeling of a 1:400 scale model of the proposed Project and surroundings. The wind conditions quantified through this work were compared against the BRA criteria. This section describes the methods and summarizes the results of the wind tunnel simulations.

3.1.2 Overview

Major buildings, especially those that protrude above their surroundings, often 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 increases 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 most effective way to assess potential pedestrian-level wind impacts around a proposed new building is to conduct scale model tests in a wind tunnel.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.

3.1.3 Methodology

The scale model of the Project was constructed using the information provided by the design team. As shown in Figures 3.1-1 and 3.1-2, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1,600 foot radius of the study site. Two configurations of the site were modeled to represent:

- **No Build Configuration:** includes the existing site and all existing surrounding buildings; and,
- **Full Build Configuration:** includes the proposed Project (for the full-build site) and all existing and in-construction surroundings.

The mean speed profile and turbulence of the natural wind approaching the modelled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 155 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of five feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10 degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the reference wind speed in the free stream above the model.

The results were combined with long-term meteorological data, recorded during the years 1993 to 2013 at Boston's Logan International Airport, in order to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year. Figures 3.1-3 to 3.1-5 present wind roses that summarize the annual and seasonal wind climates in the area. The left wind rose in Figure 3.1-3, for example, summarizes the spring (March, April, and May) wind data. In general, the prevailing winds at this time of year originate from the west-northwest, northwest, west, south-southwest and east-southeast. In the case of strong winds, however, the most common wind directions are northeast, west and west-northwest. Figure 3.1-4 presents the wind roses for the fall and winter months.

On an annual basis (Figure 3.1-5), the most common wind directions are those between south-southwest and northwest. Winds from the east and east-southeast are also relatively common. In the case of strong winds, northeast and west-northwest are the dominant wind directions.

This study involved state-of-the-art measurement and analysis techniques to predict wind conditions at the study site. Nevertheless, some uncertainty remains in predicting wind comfort. For example, the sensation of comfort among individuals can be quite variable. Variations in age, individual health, clothing, and other human factors can change a particular response of an individual. The comfort limits used in this report represent an average for the total population. Also, unforeseen changes in the Project area, such as the construction or removal of buildings, can affect the conditions experienced at the site. Finally, the prediction of wind speeds is necessarily a statistical procedure. The wind speeds reported are for the frequency of occurrence stated (one percent of the time). Higher wind speeds will occur but on a less frequent basis.

3.1.4 Pedestrian Wind Comfort Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of the time. The second set of criteria used by the BRA to determine the acceptability of specific locations is based on the work of Melbourne[1]. This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the one-hour mean wind speed exceeded one percent of the time (i.e., the 99-percentile mean wind speed). They are provided in Table 3.1-1.

Table 3.1-1 Boston Redevelopment Authority Mean Wind Criteria*

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

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

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BRA effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

3.1.5 Test Results

Appendix C includes a table showing the mean and effective gust wind speeds for each season, as well as those averaged annually. Figures 3.1-6 through 3.1-9 graphically depict the wind comfort conditions from the table in Appendix C at each wind measurement location based on the annual winds only. Typically the summer and fall winds tend to be more comfortable than the annual winds, while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested, except where noted below in the text.

---

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

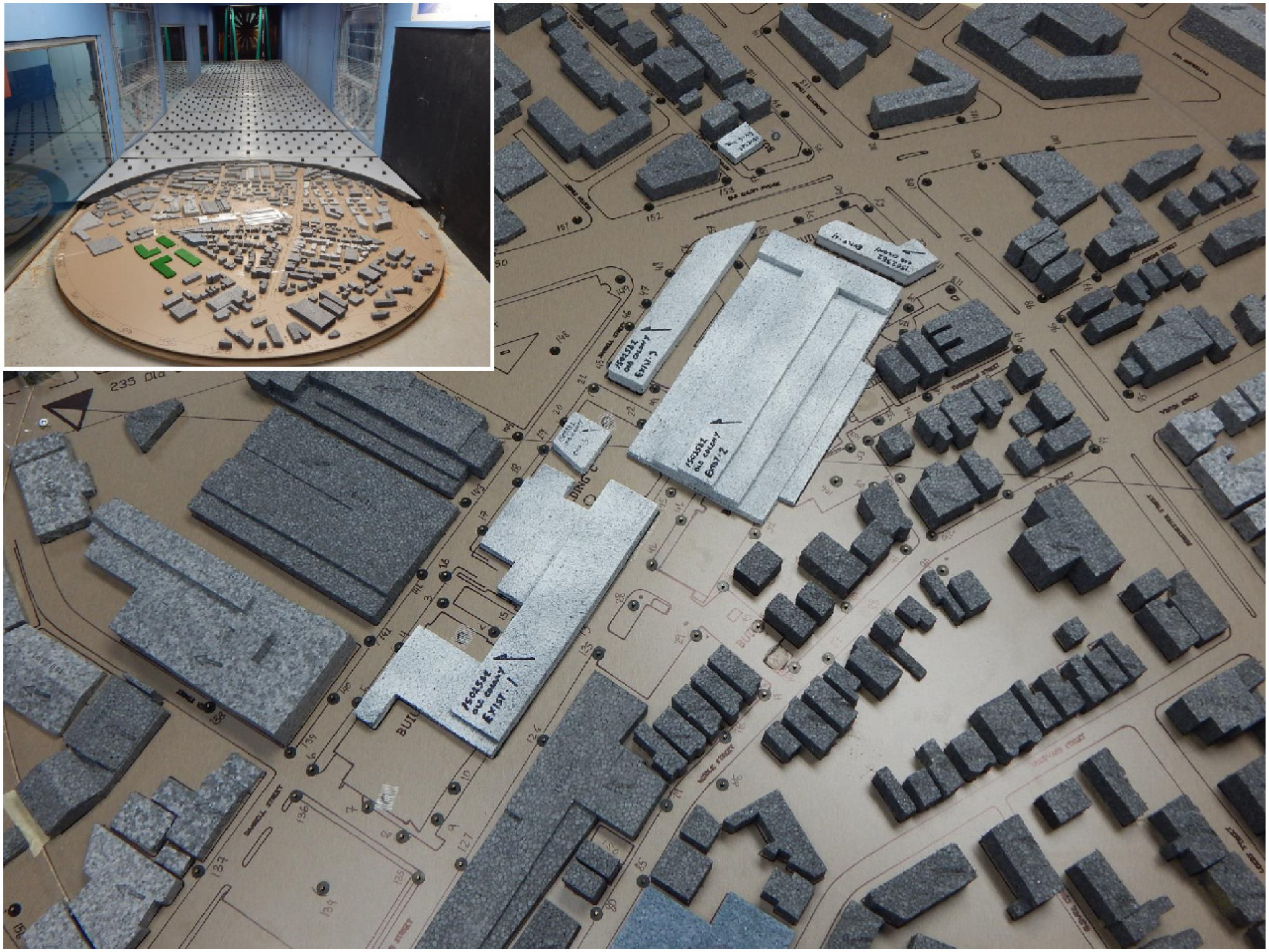

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Figure 3.1-1

Wind Tunnel Study Model, No Build Configuration

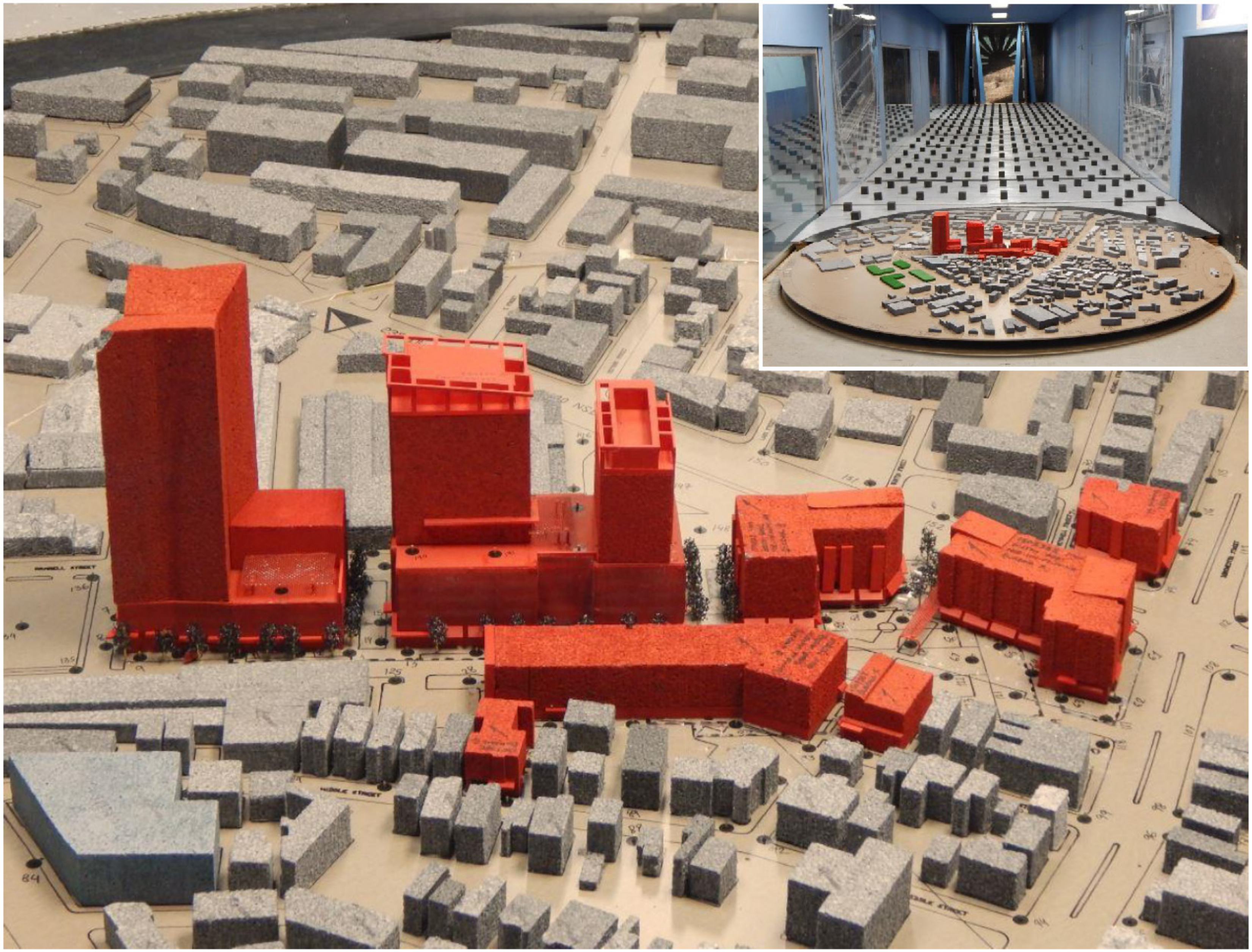

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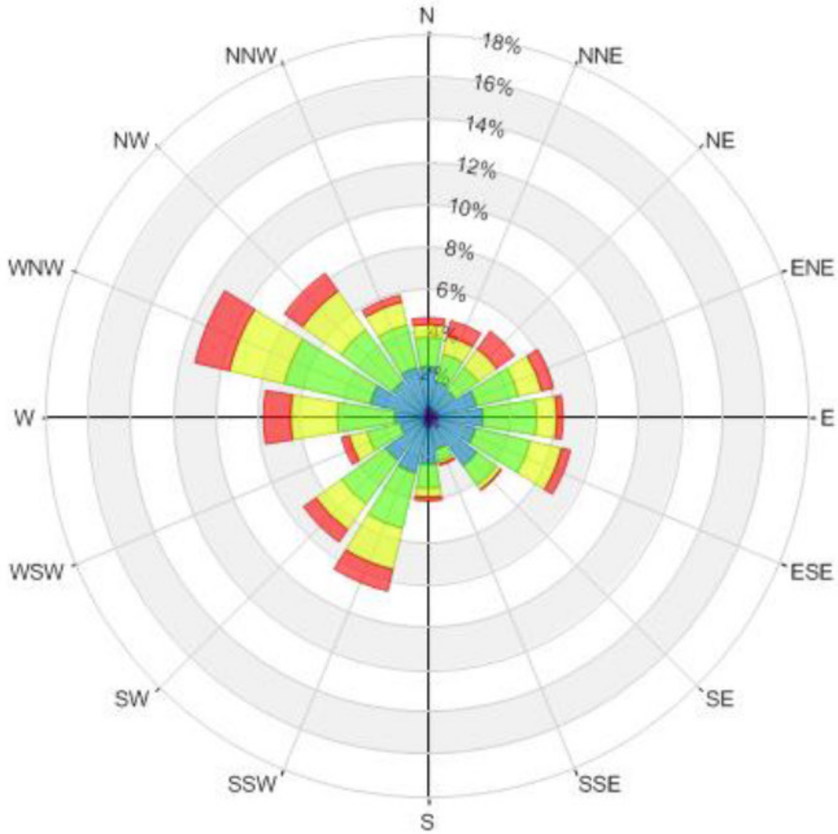
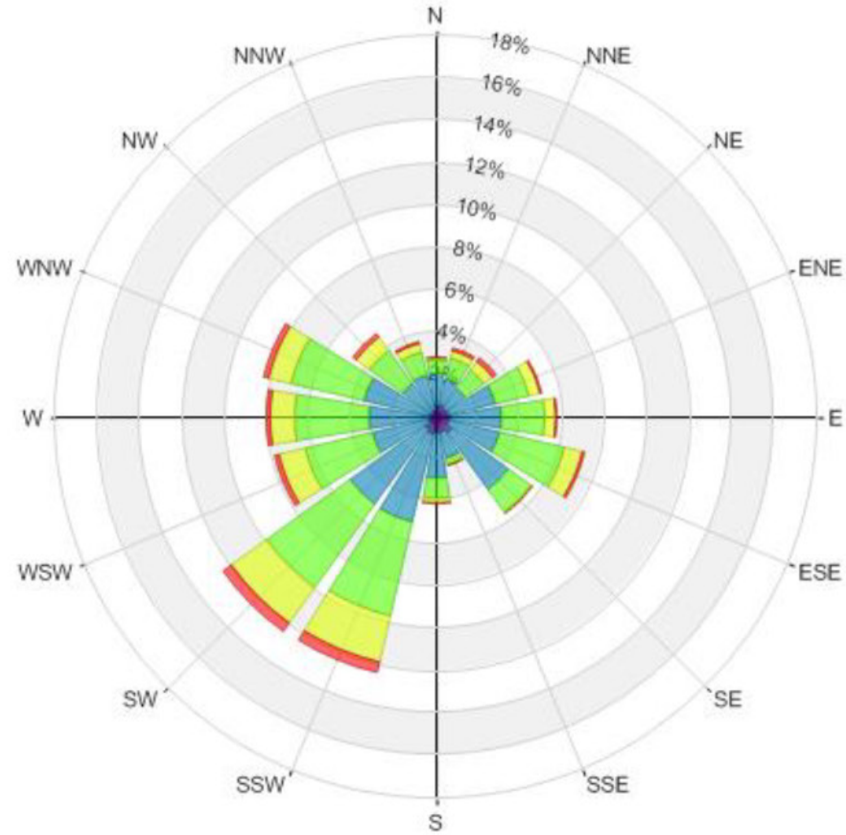
Figure 3.1-2

Wind Tunnel Study Model, Full Build Configuration)



Spring
(March - May)



Summer
(June - August)

Wind Speed (mph)	Probability (%) Spring	Summer
Calm	2.5	2.8
1-5	6.3	9.0
6-10	28.6	38.6
11-15	33.0	34.8
16-20	19.4	12.2
>20	10.2	2.6

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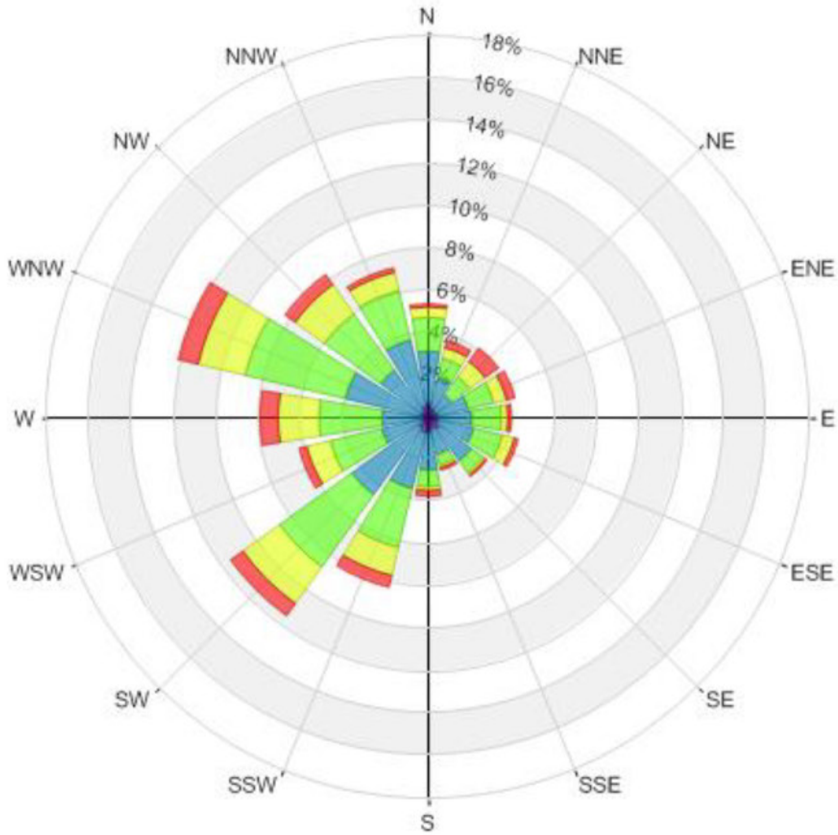
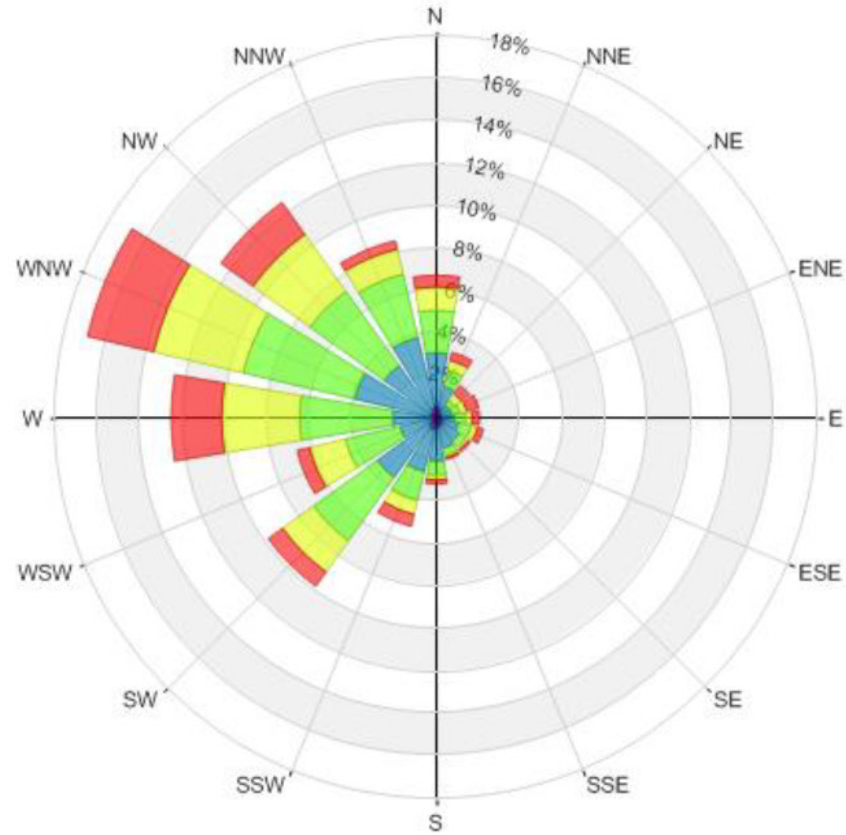
Figure 3.1-3

Directional Distribution (%) of Winds (Blowing From): Boston Logan International Airport (1993-2013), Spring and Summer



Fall
(September - November)



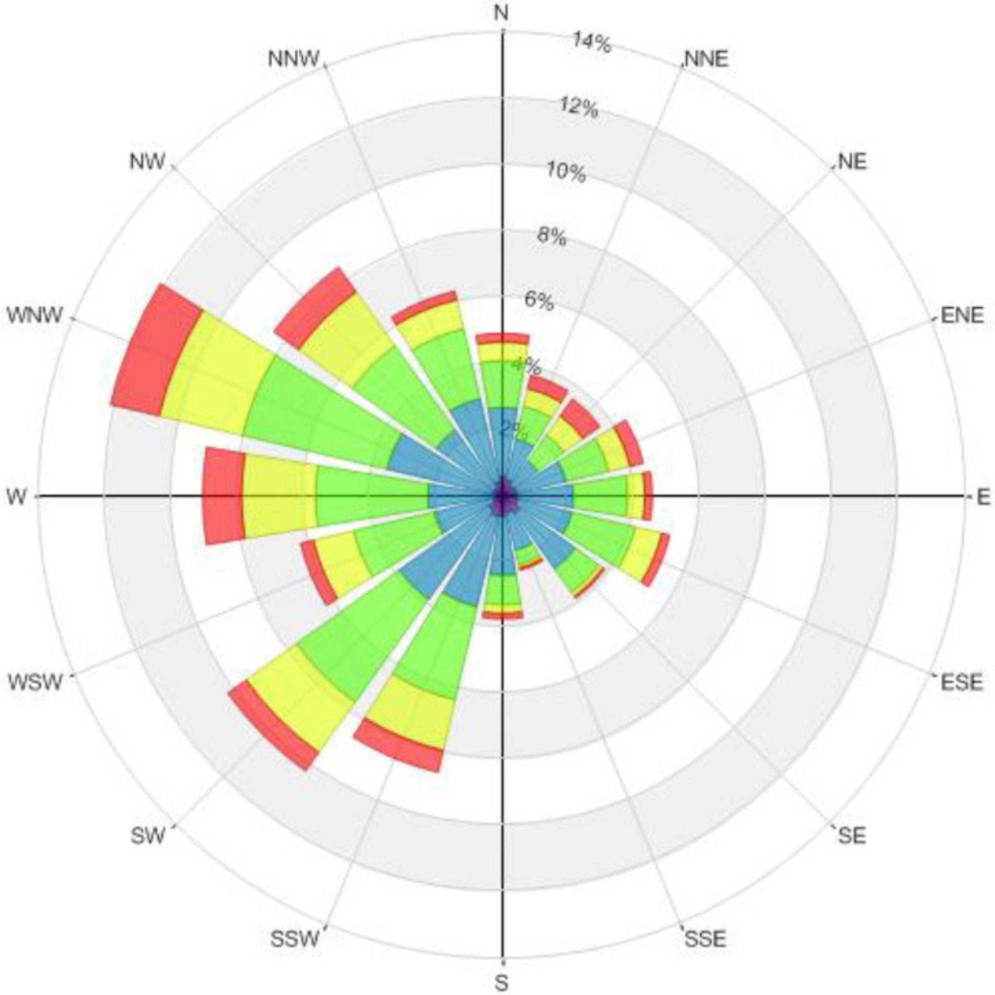
Winter
(December - February)

Wind Speed (mph)	Probability (%) Fall	Winter
Calm	3.1	2.4
1-5	8.0	6.1
6-10	34.2	27.6
11-15	32.7	30.9
16-20	15.2	20.1
>20	6.8	13.0

RWDI

Figure 3.1-4

Directional Distribution (%) of Winds (Blowing From): Boston Logan International Airport (1993-2013), Fall and Winter



Annual Winds

Wind Speed (mph)	Probability (%)
Calm	2.7
1-5	7.3
6-10	32.3
11-15	32.9
16-20	16.7
>20	8.1

Figure 3.1-5

Directional Distribution (%) of Winds (Blowing From): Boston Logan International Airport (1993-2013), Annual

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Figure 3.1-6

Pedestrian Wind Conditions – Effective Gust Speed, No Build

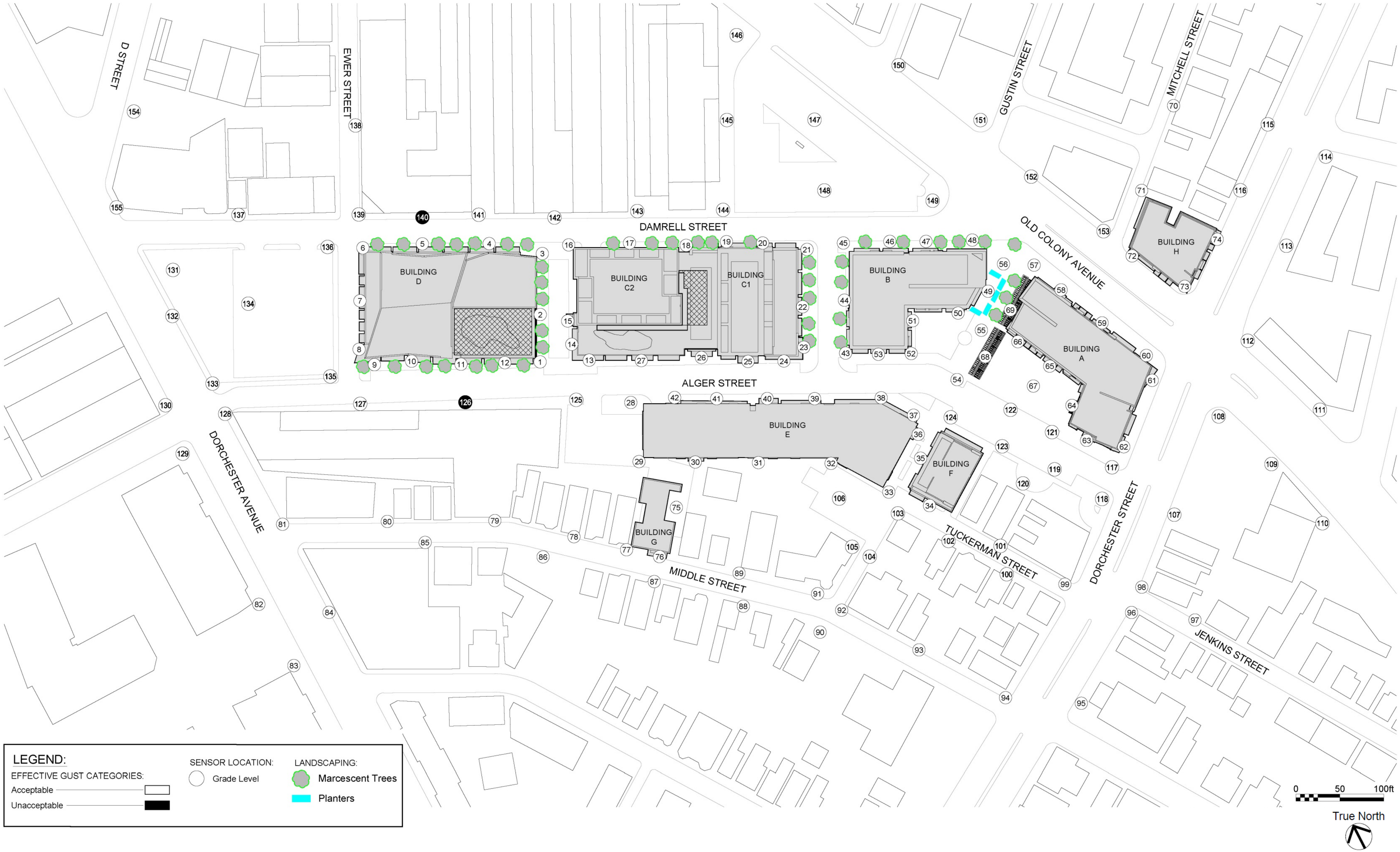

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Figure 3.1-7

Pedestrian Wind Conditions – Effective Gust Speed, Full Build

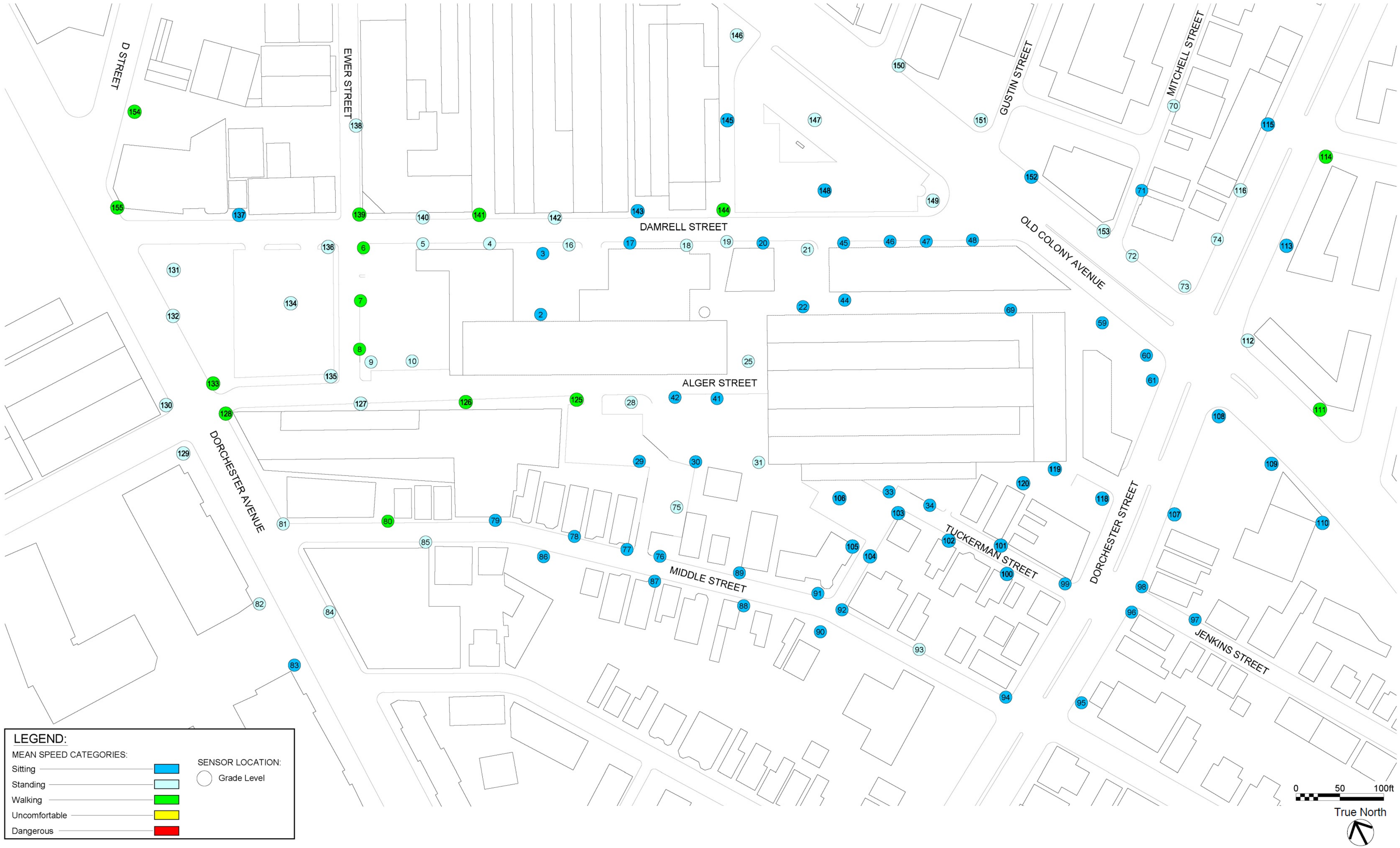

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Figure 3.1-8

Pedestrian Wind Conditions – Mean Speed, No Build

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Figure 3.1-9

Pedestrian Wind Conditions – Mean Speed, Full Build

3.1.5.1 Effective Gust Criterion

Overall, the effective gust criterion is met on an annual basis for the existing site condition (see Figure 3.1-6), and at most pedestrian areas for the future site (see Figure 3.1-7). Two exceedances are noted; one along Damrell Street, to the north of Building D (Location 140 on Figure 3.1-7) and one along Alger Street, to the south of Building D (Location 126 on Figure 3.1-7).

3.1.5.2 Comfort Criterion

No Build Configuration

A wind comfort categorization of walking is considered appropriate for sidewalks. Lower wind speeds conducive to standing are preferred at building entrances. As shown on Figure 3.1-8, all locations are currently anticipated to be suitable for walking and more passive activities annually (i.e., standing, strolling or sitting).

Build Configuration

Wind conditions suitable for walking are acceptable for sidewalks seasonally and annually. In the winter and spring, walking conditions are also considered acceptable in courtyard areas. The preferred wind climate during the summer should be comfortable for standing in the vicinity of building entrances and courtyards.

With the addition of the Project, winds at most locations are expected to remain comfortable for walking or for more passive activities (i.e., standing, strolling or sitting) on an annual basis (Figure 3.1-9). As shown in Figure 3.1-9, Locations 8, 9, 15, 24-26, 35, 40, 41, 44, 58-62 and 76 represent the proposed major entrances of the proposed development. Wind conditions comfortable for sitting or standing are predicted at most locations around the perimeters of the proposed buildings, including most of the entrances. Wind conditions comfortable for walking are predicted at the entrances identified as Locations 8, 15, 40 and 44. These results are mainly due to the horizontal wind flows approaching from the northwest, west, south and southwest directions.

The wind conditions at the area between Building A and Building B are predicted to be comfortable for walking, strolling, standing or sitting on an annual basis (Locations 49 through 57, 68 and 69 on Figure 3.1-9).

Uncomfortable wind conditions are expected along Damrell Street (Locations 6, 16, 136 and 141), to the west of Building D (Location 134) and along Alger Street, to the south of Building D (Locations 126 and 127). One location mid-block along Damrell Street, to the north of Building D, is expected to yield wind speeds that are dangerous, as defined by Melbourne[2] for winds above 27 mph occurring one percent of the time annually (Location 140 on Figure 3.1-9).

3.1.6 Conclusion

For most of the locations studied, wind conditions are anticipated to be suitable for walking or better. Seven out of the 155 locations studied, located near Building D, are predicted to be uncomfortable during one percent of the time on an annual basis. One location is predicted to be categorized as dangerous during one percent of the time on an annual basis. As the design progresses, the Proponent will evaluate measures on the site to improve wind conditions where necessary.

3.2 Shadow

3.2.1 Introduction and Methodology

As typically required by the BRA, 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 and sidewalks adjacent to and in the vicinity of the Project site. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 3.2-1 to 3.2-14.

The analysis shows that new shadow will be cast onto streets and sidewalks in the surrounding area. However, no new shadow will be cast onto existing open spaces. In addition, the proposed open spaces will be mostly free of shadow throughout most of the day, and particularly during the middle of the day.

---

[2] Ibid.

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Figure 3.2-1

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

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Figure 3.2-2

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

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Figure 3.2-3

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

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Figure 3.2-4

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

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Figure 3.2-5

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

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Figure 3.2-6

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

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Figure 3.2-7

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

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Figure 3.2-8

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

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Figure 3.2-9

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

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Figure 3.2-10

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

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Figure 3.2-11

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

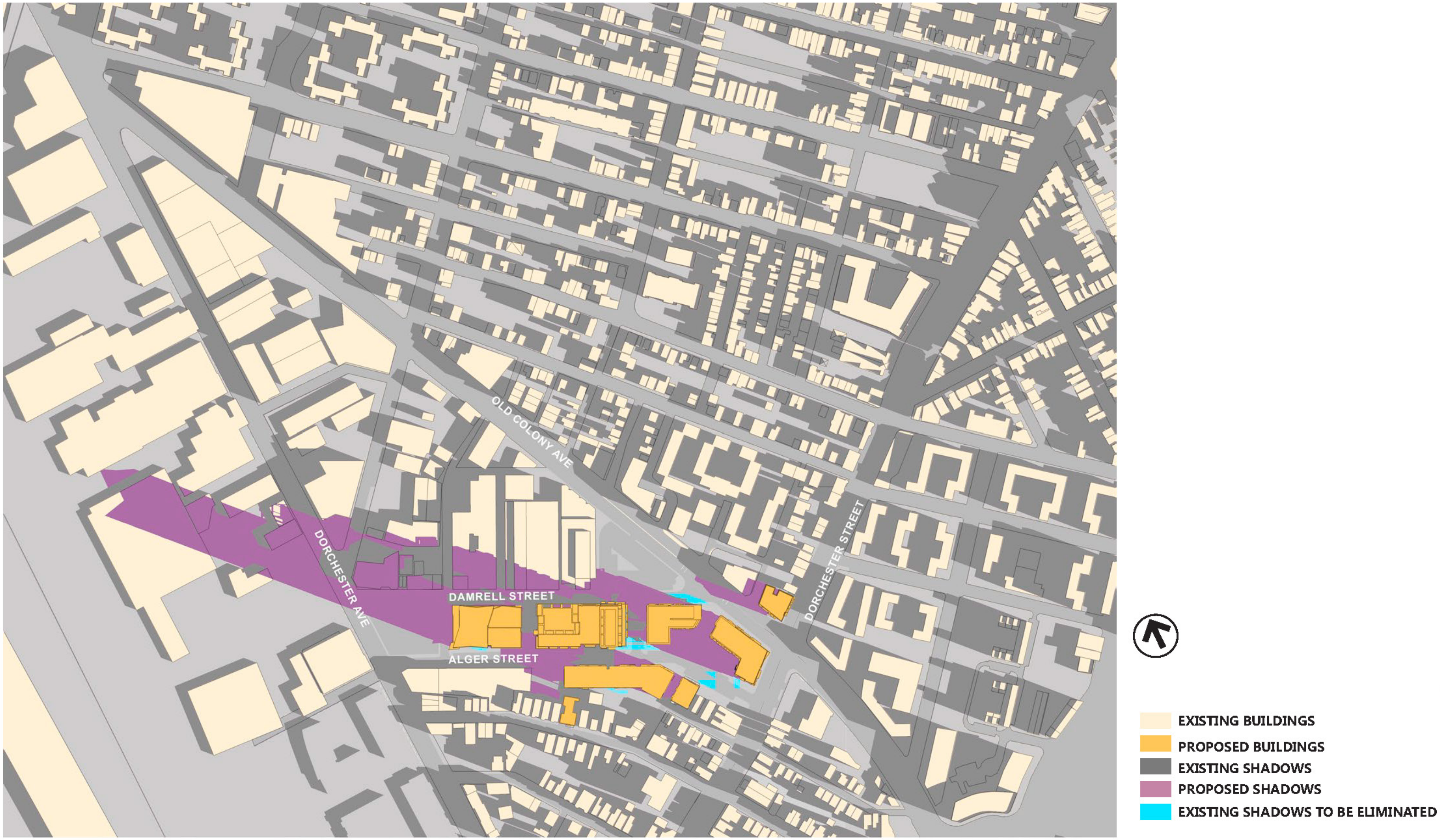

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Figure 3.2-12

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

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Figure 3.2-13

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

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Figure 3.2-14

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

3.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, shadows will be cast to the west, with new shadow from the Project cast across Dorchester Avenue and its sidewalks, Old Colony Avenue and its sidewalks, portions of Alger Street and its northern sidewalk, and small portions of Middle, Mitchell and Tuckerman streets. Areas of Alger Street currently under shadow or occupied by buildings will be free from shadow.

At 12:00 p.m., shadows will be cast to the north, and the Project will cast new shadow across Damrell Street and its sidewalks, Alger Street and its southern sidewalk, and a portion of Mitchell Street. Small areas of Alger Street currently under shadow or occupied by buildings will be free of shadow. During this time period, most of the Green and Plaza on Alger Street and the open space on Tuckerman Street will be free of shadow, as well as portions of the Project's other open spaces.

At 3:00 p.m., shadows will be cast to the northwest, with new shadow from the Project cast across Damrell Street and its sidewalks, Alger Street and its sidewalks, and portions of Old Colony Avenue and its sidewalks. Most of the Project's open spaces will be free from shadow. Small areas of Damrell Street currently under shadow will be free of shadow.

During all three time periods studied on March 21, no new shadow will be cast onto nearby existing public open spaces.

3.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, shadows will be cast to the west, with new shadow cast across Alger Street and its sidewalks, a portion of Dorchester Avenue and its sidewalks, and small portions of Old Colony Avenue and Middle Street and their north sidewalk. Areas of Alger Street currently under shadow or occupied by buildings will be free from shadow. Portions of the Project's new open spaces on Alger Street and Tuckerman Street will be free of shadow.

At 12:00 p.m., shadows will be cast to the north, with new shadow from the Project cast across portions of Damrell Street and its sidewalks, as well as a minor portion of Mitchell Street and Alger Street's southern sidewalk. Areas of Alger Street currently under shadow or occupied by buildings will be free from shadow. Most of the Project's open spaces will be free from shadow.

At 3:00 p.m., shadows will be cast to the northeast, with new shadow cast across Damrell Street and its sidewalks, as well as portions of Old Colony Avenue and Alger Street and their southern sidewalks. Areas of Alger Street currently under shadow or occupied by buildings will be free from shadow. Most of the Project's open spaces will be free from shadow.

At 6:00 p.m., shadows will be cast to the east, with new shadow cast across Damrell Street, Alger Street, Old Colony Avenue and their sidewalks. New shadow will also be cast across portions of Mitchel Street, Dorchester Avenue and its sidewalks, and Gustin Street. The Project's Green and Plaza along Alger Street and on Tuckerman Street will be mostly free from shadow.

During all four time periods studied on June 21, no new shadow will be cast onto nearby existing public open spaces.

3.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the autumnal equinox, shadows will be cast to the west, with new shadow from the Project cast across Dorchester Avenue and its sidewalks, Old Colony Avenue and its sidewalks, portions of Alger Street and its northern sidewalk, and small portions of Middle, Mitchell and Tuckerman streets. Areas of Alger Street currently under shadow or occupied by buildings will be free from shadow.

At 12:00 p.m., shadows will be cast to the north, and the Project will cast new shadow across Damrell Street and its sidewalks, Alger Street and its southern sidewalk, and a portion of Mitchell Street. Small areas of Alger Street currently under shadow or occupied by buildings will be free of shadow. During this time period, most of the Green and Plaza on Alger Street and the open space on Tuckerman Street will be free of shadow, as well as portions of the Project's other open spaces.

At 3:00 p.m., shadows will be cast to the northwest, with new shadow from the Project cast across Damrell Street and its sidewalks, Alger Street and its sidewalks, and portions of Old Colony Avenue and its sidewalks. Most of the Project's open spaces will be free from shadow. Small areas of Damrell Street currently under shadow will be free of shadow.

At 6:00 p.m., most of the area is under existing shadow. New shadow from the Project will be cast to the east across portions of Damrell Street, Alger Street, Old Colony Avenue and Dorchester Street not currently under shadow. Most of the new shadow will be cast onto rooftops in the surrounding area.

During all four time periods studied on September 21, no new shadow will be cast onto nearby existing public open spaces.

3.2.5 Winter Solstice (December 21)

The winter solstice creates the least favorable conditions for sunlight in New England. The sun angle during the winter is lower than in any other season, causing the shadows in urban areas to elongate and be cast onto large portions of the surrounding area.

At 9:00 a.m., during the winter solstice, shadows will be cast to the northwest, with new shadow from the Project cast across portions of Dorchester Avenue, Old Colony Avenue, D Street, Mitchell Street, Damrell Street and Alger Street, as well as their sidewalks. Areas of Alger Street currently under shadow or occupied by buildings will be free of shadow.

At 12:00 p.m., shadows will be cast to the north, with new shadow from the Project cast across portions of Old Colony Avenue, D Street, Mitchell Street, Damrell Street and Alger Street, as well as their sidewalks. Areas of Alger Street currently under shadow or occupied by buildings will be free of shadow. The Project's Green and Plaza on Alger Street will be free of shadow, as well as the open space between Buildings C and D.

At 3:00 p.m., much of the area is under existing shadow. New shadow will be cast to the northeast across portions of Alger Street, Damrell Street, Mitchell Street, Gustin Street, Cottage Street and E Street, as well as portions of their sidewalks.

During all three time periods studied on December 21, no new shadow will be cast onto nearby existing public open spaces.

3.2.6 Conclusions

New shadow from the Project will generally be cast onto surrounding streets and sidewalks. During the middle of the day and afternoon hours, most of the Project's open spaces will be free of shadow, with the exception of December 21. The removal of buildings on the site will result in areas free of shadow on Alger Street and portions of Damrell Street. During the time periods studied, no new shadow will be cast onto nearby existing public open spaces.

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.

3.3.2 Methodology

The daylight analysis was performed using the Boston Redevelopment Authority Daylight Analysis (BRADA) computer program[3]. 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.

---

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

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.

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

Eight viewpoints were chosen to evaluate the daylight obstruction for the Existing and Proposed Conditions. 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 Figures 3.3-1 and 3.3-2.

- **Viewpoint 1:** View from Damrell Street facing south toward the site of Buildings C and D
- **Viewpoint 2:** View from Damrell Street facing south toward the site of Building B
- **Viewpoint 3:** View from Old Colony Avenue facing north toward the site of Building H
- **Viewpoint 4:** View from Dorchester Street facing west toward the site of Building A
- **Viewpoint 5:** View from Alger Street facing north toward the site of Buildings C and D
- **Viewpoint 6:** View from Alger Street facing south toward the site of Building E
- **Viewpoint 7:** View from Alger Street facing north toward the site of Building B
- **Viewpoint 8:** View from Middle Street facing north toward the site of Building G
- **Area Context Viewpoint AC1:** View from Old Colony Avenue facing north toward the block between Lark and Cottage Streets
- **Area Context Viewpoint AC2:** View from Tuckerman Street facing south toward the Block between Dorchester Street and Tuckerman Street
- **Area Context Viewpoint AC3:** View from Middle Street facing a residential building

3.3.3 Results

The results for each viewpoint are described in Table 3.3-1. Figures 3.3-3 through 3.3-7 illustrate the BRADA results for each analysis.

Table 3.3-1 Results of Each Viewpoint

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	View from Damrell Street facing south toward the site of Buildings C and D	18.6%	79.5%
Viewpoint 2	View from Damrell Street facing south toward the site of Building B	44.8%	73.4%
Viewpoint 3	View from Old Colony Avenue facing north toward the site of Building H	8.6%	49.8%
Viewpoint 4	View from Dorchester Street facing west toward the site of Building A	14.1%	61.7%
Viewpoint 5	View from Alger Street facing north toward the site of Buildings C and D	51.4%	55.0%
Viewpoint 6	View from Alger Street facing south toward the site of Building E	58.0%	60.6%
Viewpoint 7	View from Alger Street facing north toward the site of Building B	N/A	49.7%
Viewpoint 8	View from Middle Street facing north toward the site of Building G	0%	70.6%
Area Context Points			
AC1	View from Old Colony Avenue facing north toward the block between Lark and Cottage Streets	32.1%	N/A
AC2	View from Tuckerman Street facing south toward the Block between Dorchester Street and Tuckerman Street	51.7%	N/A
AC3	View from Middle Street facing north toward a residential building	70.6%	N/A

Damrell Street

Viewpoints 1 and 2 were taken from Damrell Street looking south towards the site. The existing condition includes a surface parking lot on the west side of the site, which results in a lower daylight obstruction value of 18.6% for Viewpoint 1. The daylight obstruction value of 44.8% for Viewpoint 2 is moderate because a portion of the building it looks at is set back, and there are spaces between building areas and low building heights. In the proposed condition, these viewpoints will look at the taller buildings being proposed. The spaces between the buildings, including the pedestrian way between Buildings C and D, as well as podiums will allow for views of the sky. Since this portion of the site will be mostly developed, the daylight obstruction values are higher than the existing conditions—79.5% and 73.5%, respectively. Although the buildings will be taller than the buildings in the surrounding area, the daylight obstruction values will only be a little higher than the surrounding area context.

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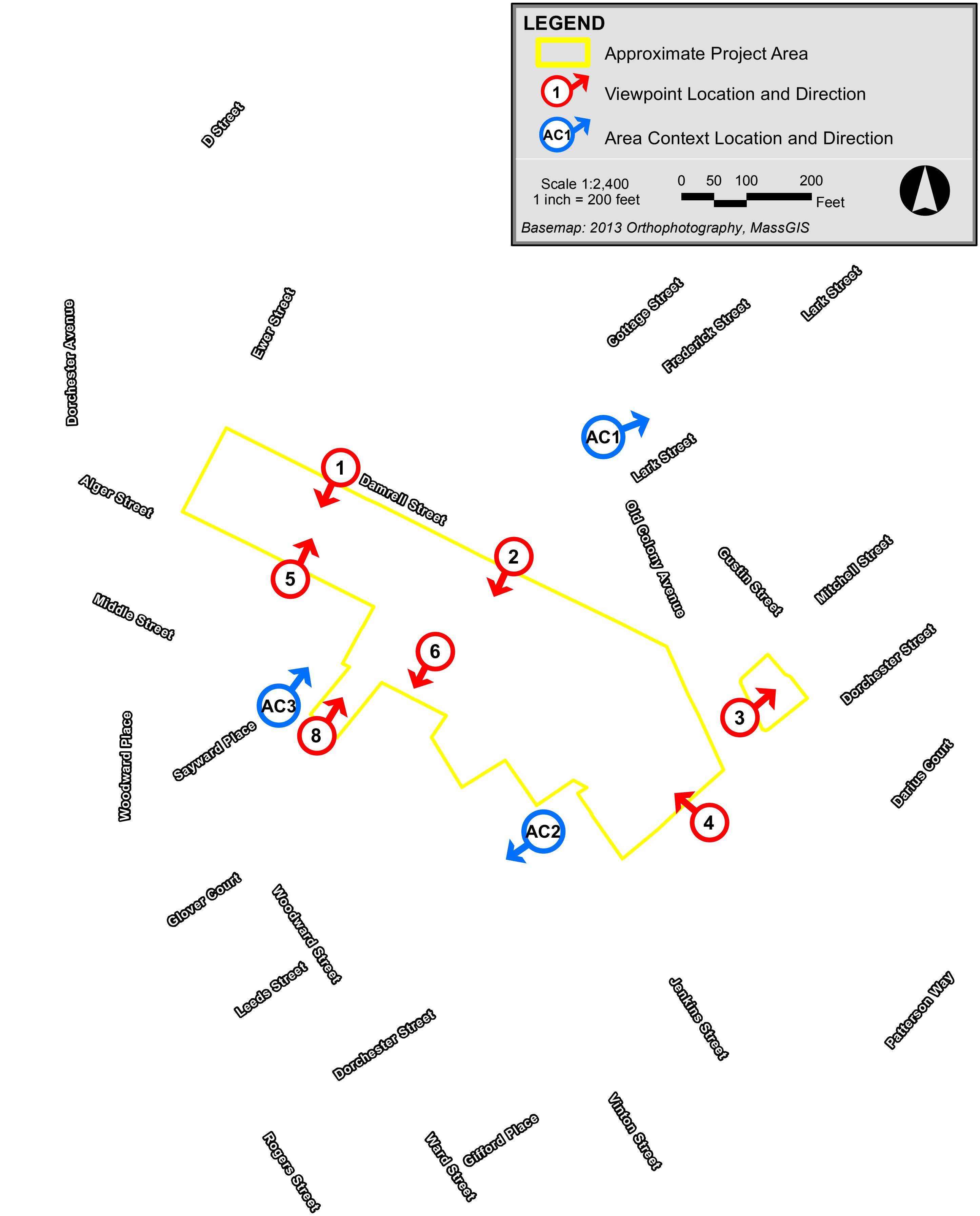

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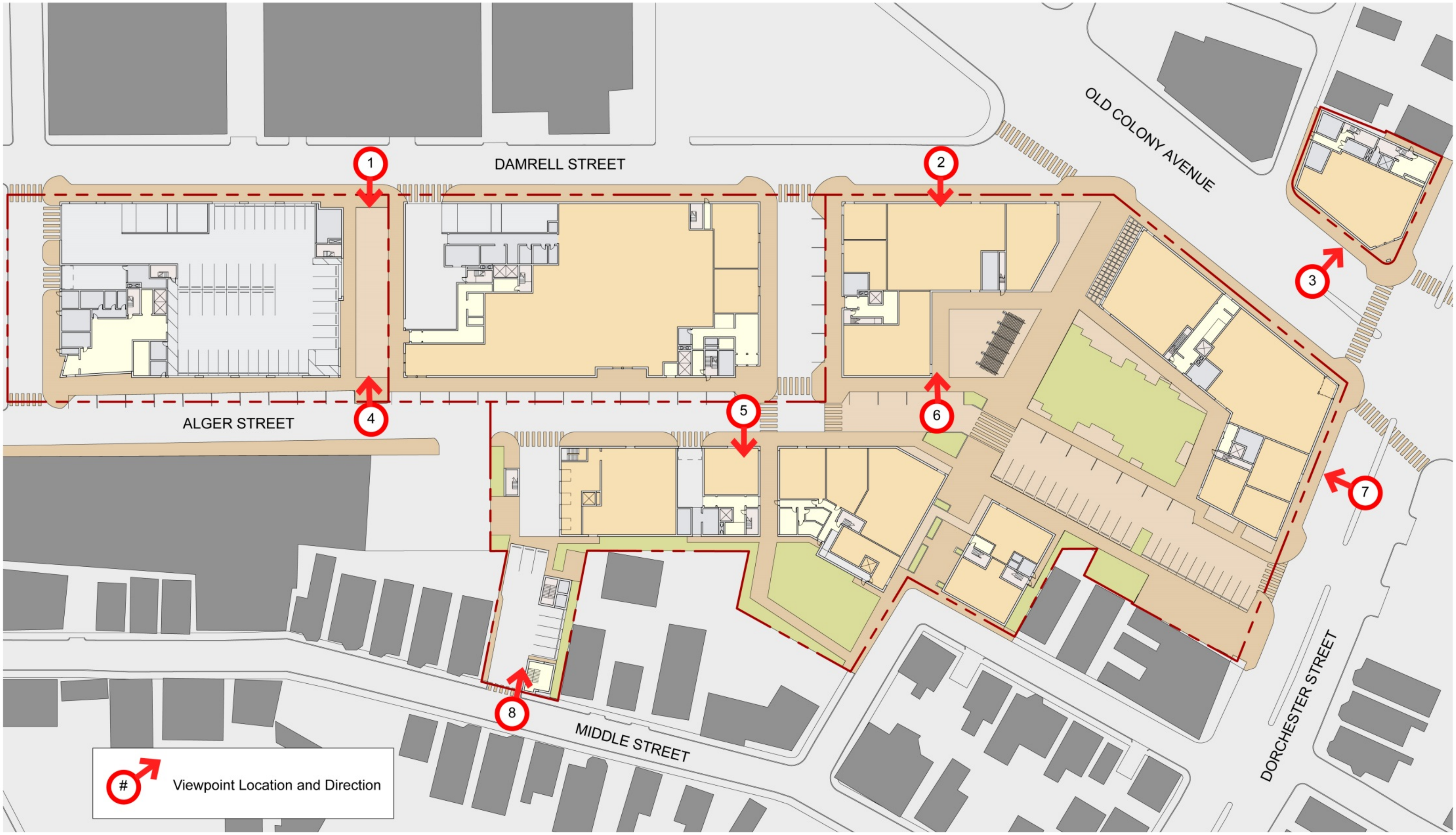
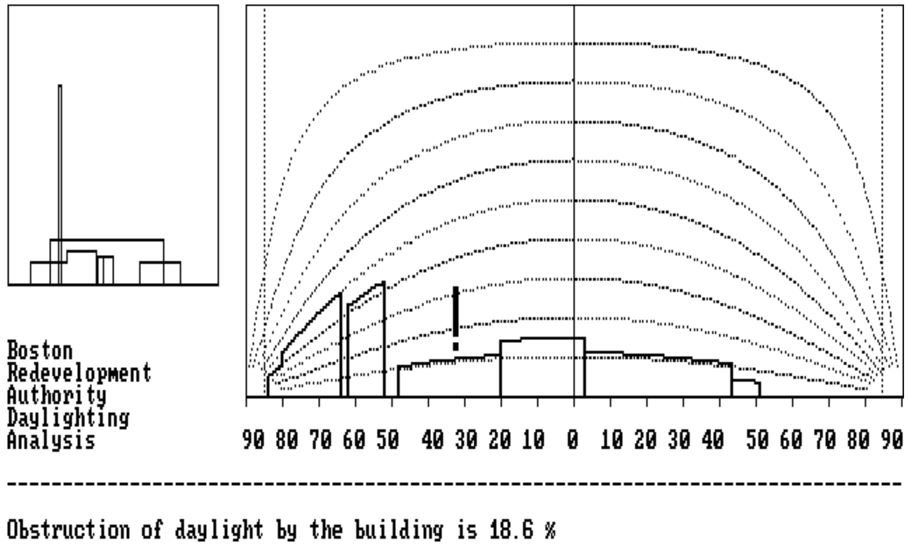
[redacted]

Figure 3.3-1

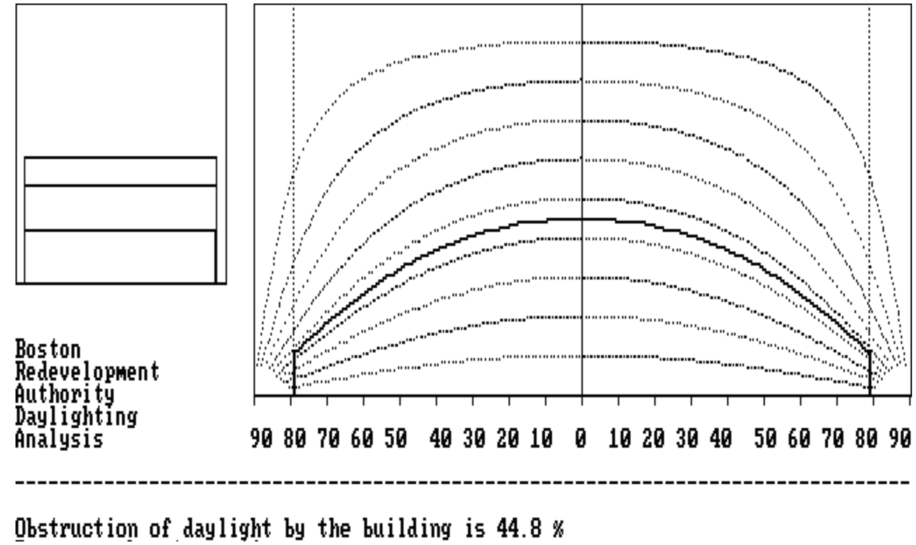
Existing Conditions and Area Context: Viewpoint Locations



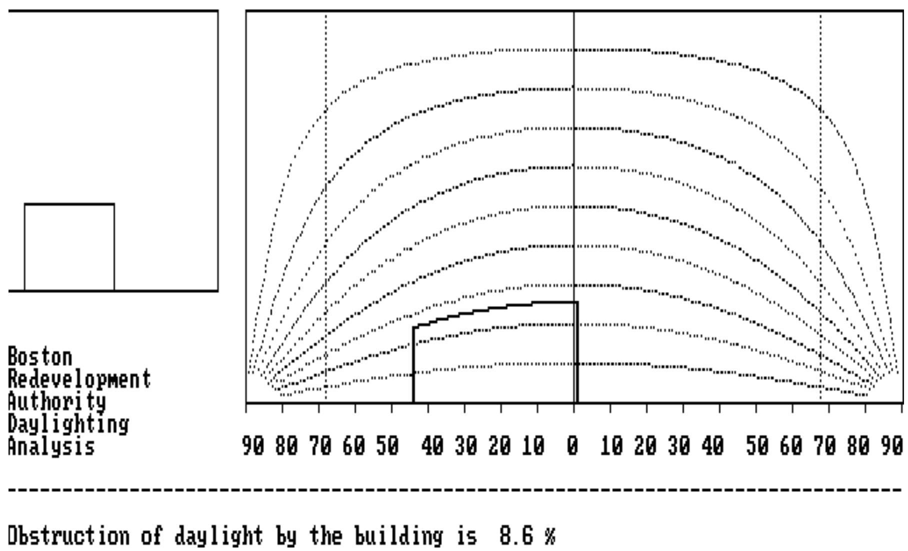
DAMRELL STREET
OLD COLONY AVENUE
ALGER STREET
MIDDLE STREET
DORCHESTER STREET
1
2
3
4
5
6
7
8
#
Viewpoint Location and Direction



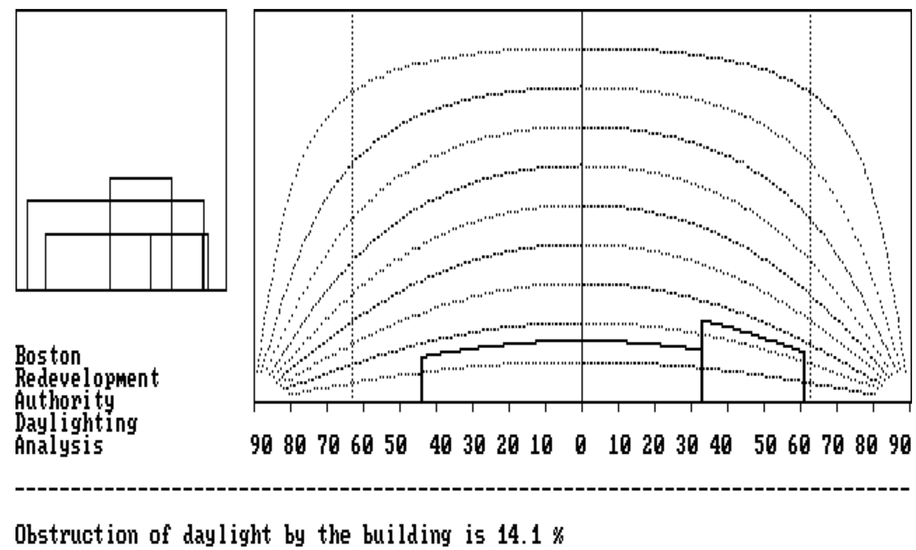
Viewpoint 1: View from Damrell Street facing south toward the site of Buildings C and D



Viewpoint 2: View from Damrell Street facing south toward the site of Building B



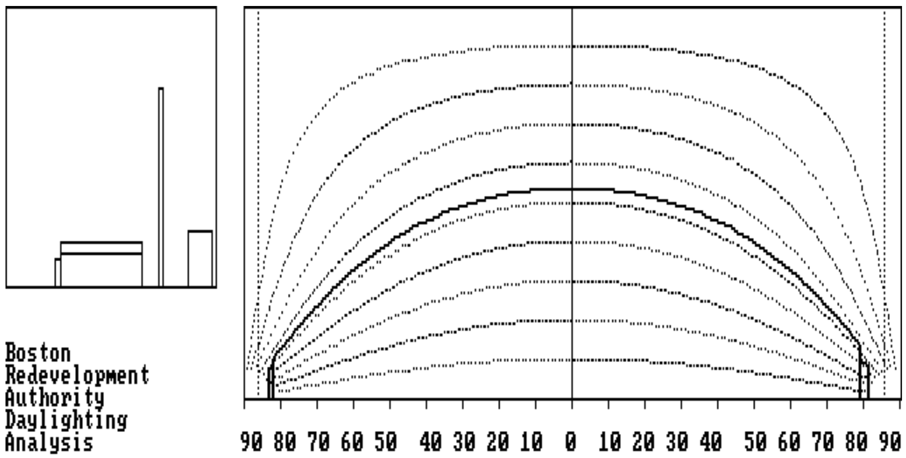
Viewpoint 3: View from Old Colony Avenue facing north toward the site of Building H



Viewpoint 4: View from Dorchester Street facing west toward the site of Building A

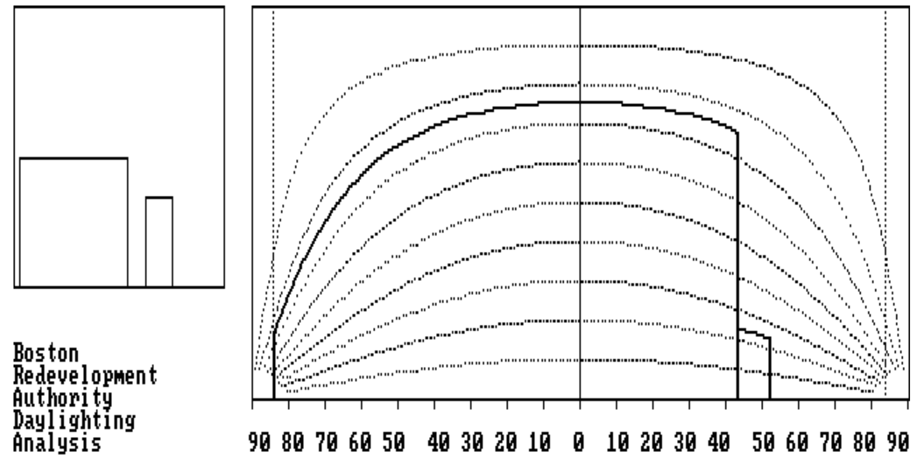
Figure 3.3-3

Existing Conditions



Obstruction of daylight by the building is 51.4 %

Viewpoint 5: View from Alger Street facing north toward the site of Buildings C and D



Obstruction of daylight by the building is 58.0 %

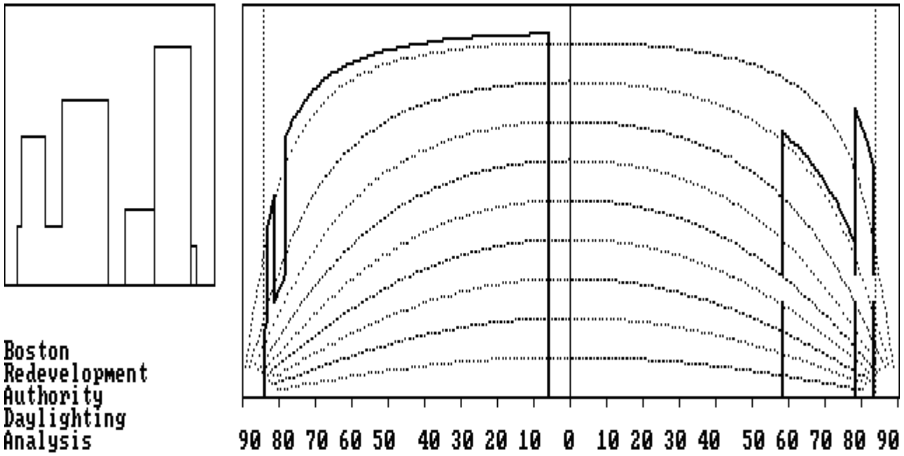
Viewpoint 6: View from Alger Street facing south toward the site of Building E

Not applicable

Viewpoint 7: View from Alger Street facing north toward the site of Building B

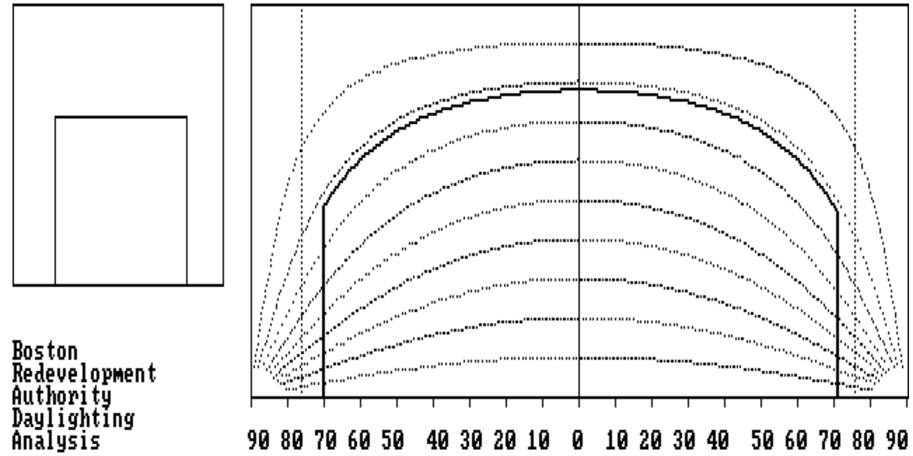
0% since the lot
is vacant

Viewpoint 8: View from Middle Street facing north toward the site of Building G



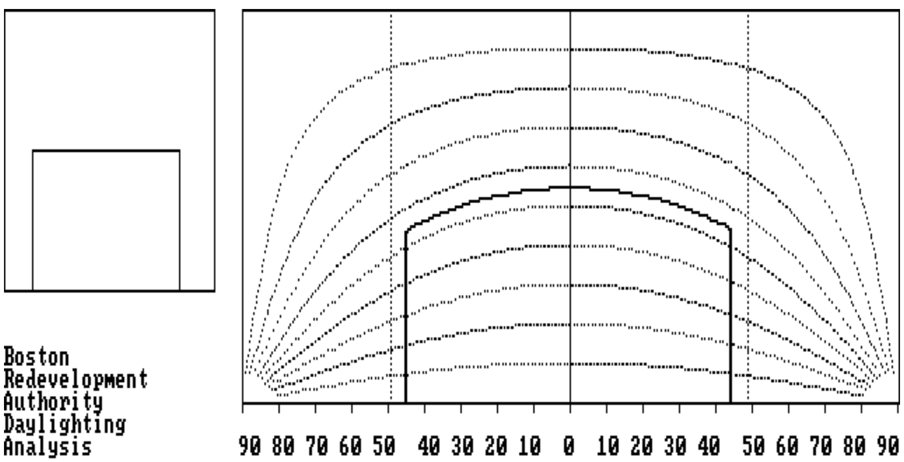
Obstruction of daylight by the building is 79.5 %

Viewpoint 1: View from Damrell Street facing south toward the site of Buildings C and D



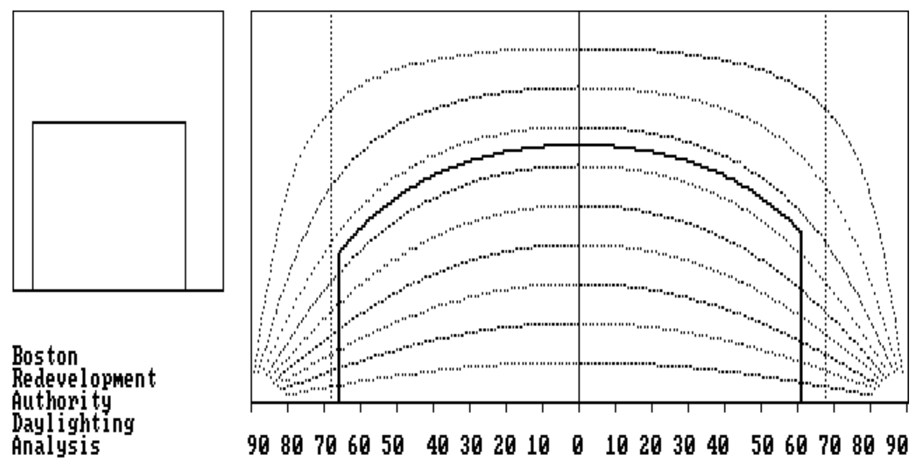
Obstruction of daylight by the building is 73.4 %

Viewpoint 2: View from Damrell Street facing south toward the site of Building B



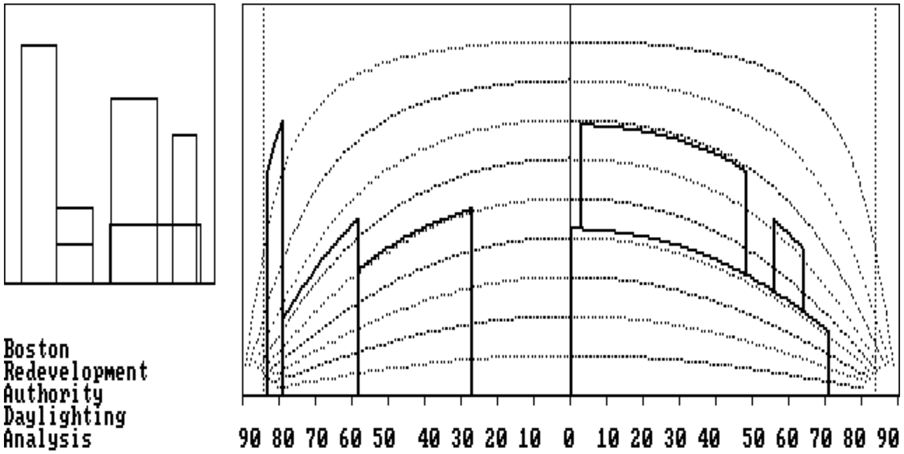
Obstruction of daylight by the building is 49.8 %

Viewpoint 3: View from Old Colony Avenue facing north toward the site of Building H



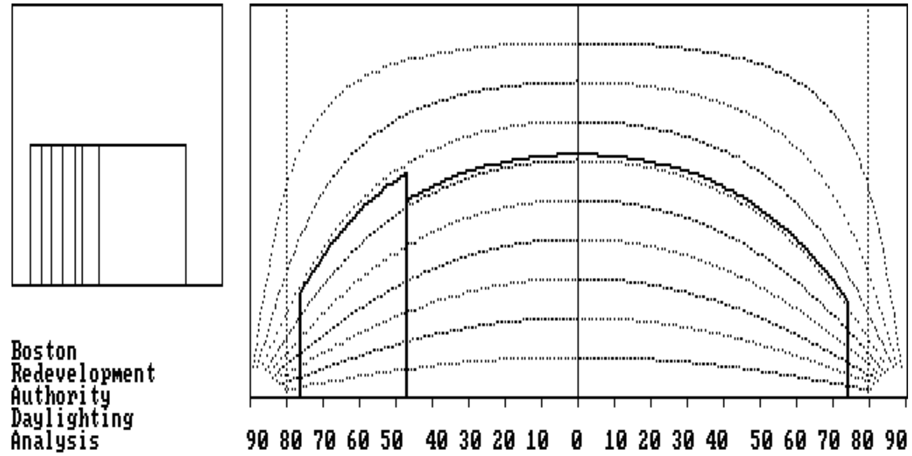
Obstruction of daylight by the building is 61.7 %

Viewpoint 4: View from Dorchester Street facing west toward the site of Building A



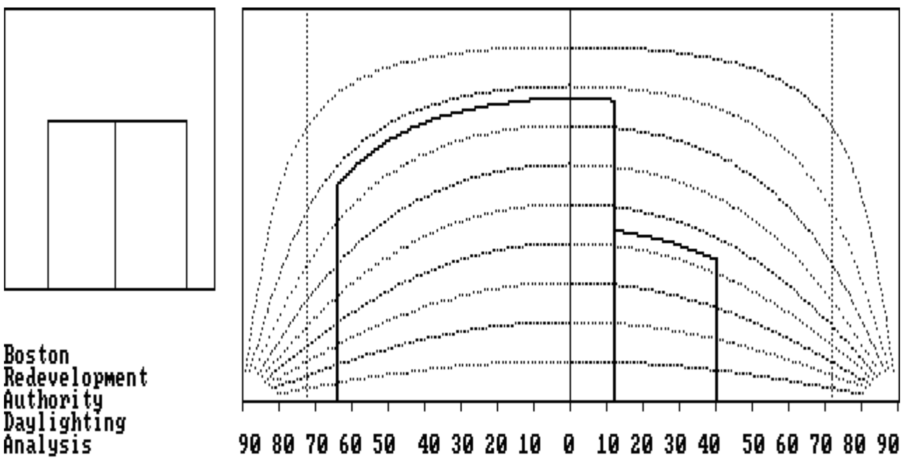
Obstruction of daylight by the building is 55.0 %

Viewpoint 5: View from Alger Street facing north toward the site of Buildings C and D



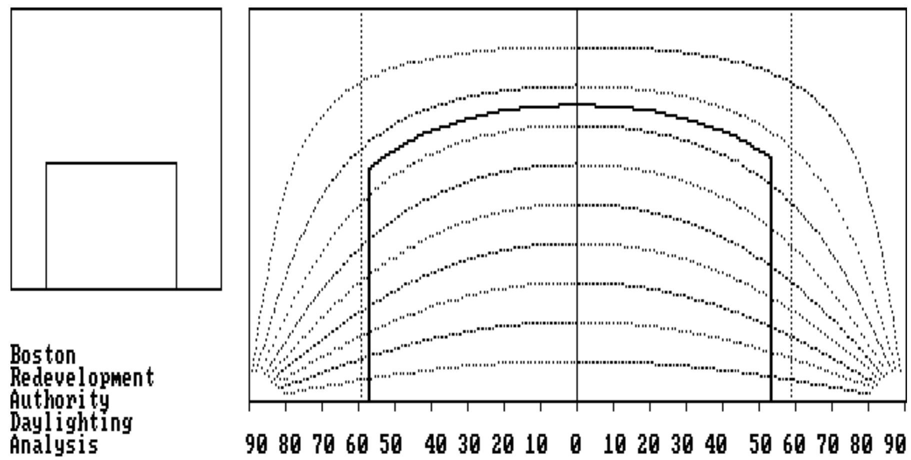
Obstruction of daylight by the building is 60.6 %

Viewpoint 6: View from Alger Street facing south toward the site of Building E



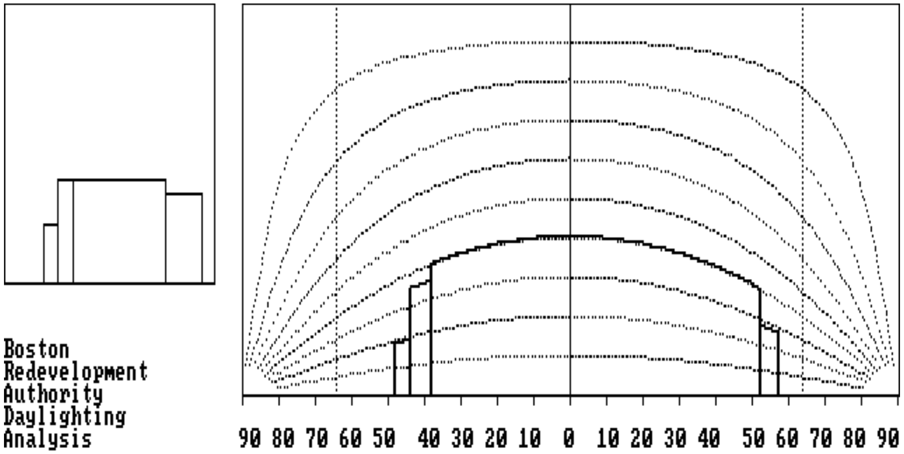
Obstruction of daylight by the building is 49.7 %

Viewpoint 7: View from Alger Street facing north toward the site of Building B



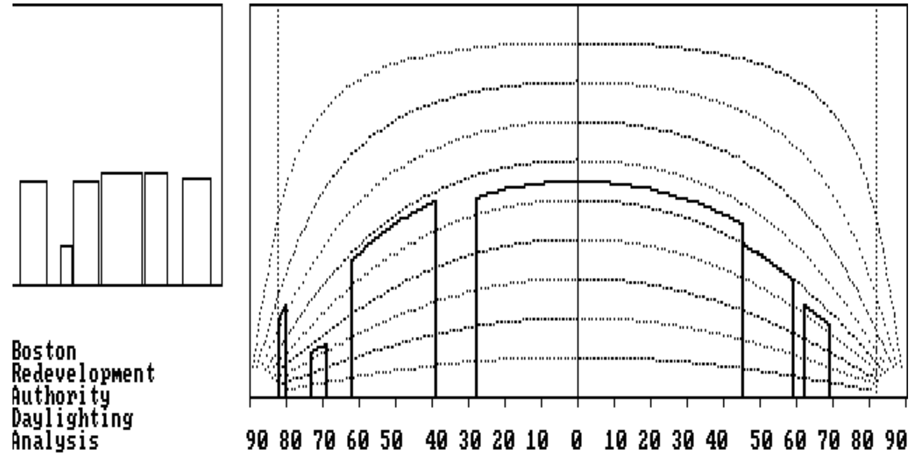
Obstruction of daylight by the building is 70.6 %

Viewpoint 8: View from Middle Street facing north toward the site of Building G



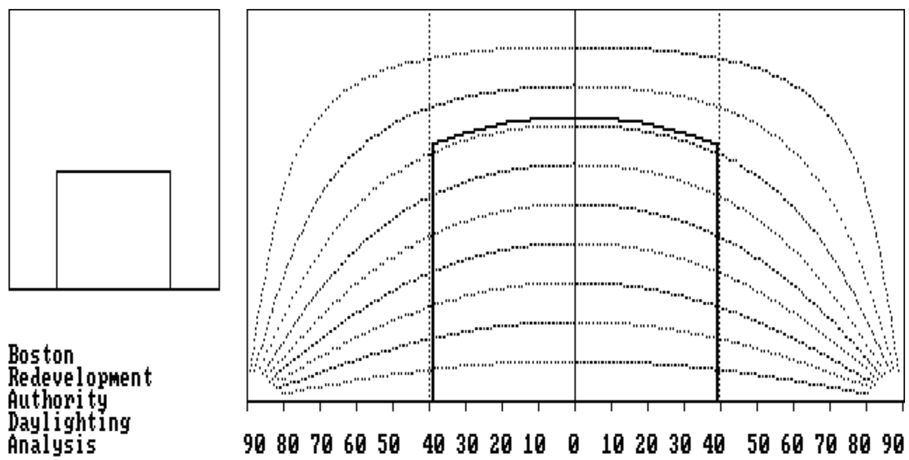
Obstruction of daylight by the building is 32.1 %

AC1: View from Old Colony Avenue facing north toward the block between Lark and Cottage Streets



Obstruction of daylight by the building is 51.7 %

AC2: View from Tuckerman Street facing south toward the Block between Dorchester Street and Tuckerman Street



Obstruction of daylight by the building is 70.6 %

AC3: View from Middle Street facing a residential building

Figure 3.3-7

Area Context

Old Colony Avenue

Viewpoint 3 was taken from Old Colony Avenue looking at the site of the proposed Building H. In the existing condition, the site is mostly covered by surface parking, leading to a low daylight obstruction value of 8.6%. The proposed Building H will cover the entire parcel, which will result in a higher daylight obstruction value than the existing condition, 49.8%, although the daylight obstruction value will not be inconsistent with the surrounding area.

Dorchester Street

Viewpoint 4 was taken from Dorchester Street looking at the site of the proposed Building A. Similar to other areas of the site, a large portion of the area is undeveloped, and the buildings are set back from the street, resulting in a low existing daylight obstruction value of 14.1%. Building A will be built along the edge of the property line, consistent with the development patterns in the surrounding area. The daylight obstruction value of the proposed condition will be higher than the existing condition at 61.7%, but not inconsistent with the daylight obstruction in the surrounding area.

Alger Street

Viewpoints 5 and 7 were taken from Alger Street looking north at the sites of the proposed Buildings B, C and D, while Viewpoint 6 looks south from Alger street toward Building E. In the existing condition, the buildings on the north of Alger Street are close to the edge of Alger Street, and are taller than the Damrell Street side of the site, resulting in a daylight obstruction value of 51.4% for Viewpoint 5 and 58.0% for Viewpoint 6. Viewpoint 7 is located in the footprint of an existing building, so an analysis was not completed for the existing condition. Viewpoint 6 looks at an undeveloped space, as well as a building that covers the eastern side of the view, resulting in a daylight obstruction value of 58.0%. In the proposed condition, the space between the buildings, the plaza between Buildings C and D, and the setbacks of the taller portions from the edge of the property line will result in a daylight obstruction value of 55.0% for Viewpoint 5, only a little higher than the existing condition. Viewpoint 6 will have the eastern part of its view opened up by the extension of Alger Street to Dorchester Street, resulting in a daylight obstruction value of 60.6%. Viewpoint 7 will have a daylight obstruction value of 49.7% due to the plaza area in the front corner of the lot. Overall, the daylight obstruction values of the proposed conditions will be similar to the surrounding area.

Middle Street

The Project site includes a lot that extends to Middle Street. Viewpoint 8 looks at this lot, and since it is undeveloped, the daylight obstruction value is 0%. In the proposed condition, Building G will be constructed similarly to the surrounding buildings, including limited space between neighboring buildings, which will result in a daylight obstruction value of 70.6%, the same daylight obstruction value of a neighboring building on Middle Street.

Area Context

Three area context points were chosen in the area as shown in Figure 3.3-1. These viewpoints are generally representative of the area, and have daylight obstruction values ranging from 32.1% to 70.6%.

3.3.4 Conclusion

The Project will replace large, low rise, industrial buildings surrounded by surface parking/pavement with eight new buildings, including several taller structures, surrounded by new streets and open spaces. The development will create new spaces between buildings, creating views of the sky, but also includes taller structures than the existing buildings. The existing daylight obstruction values range from 0% to 58.0%. The proposed development will result in daylight obstruction values ranging from 49.7% to 79.5%. These daylight obstruction values are not inconsistent with the surrounding area and similarly developed areas around Boston, as shown by the area context viewpoints which have daylight obstruction values ranging from 32.1% to 70.6%.

3.4 Solar Glare

The Project materials are still being studied and glazing of the windows will be determined as the design progresses. Due to the type of potential glass and glazing proposed, solar glare impacts are not currently anticipated.

3.5 Air Quality Analysis

3.5.1 Introduction

An air quality analysis has been conducted to determine the impact of pollutant emissions from mobile sources generated by the Project. Specifically, a microscale analysis was performed to evaluate the potential air quality impacts of carbon monoxide (CO) resulting from traffic flow around the Project area. Any new stationary sources will be reviewed by the Massachusetts Department of Environmental Protection (MassDEP) during permitting under the Environmental Results Program (ERP).

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 air quality impact analyses. Federal National Ambient Air Quality Standards (NAAQS) were developed by US Environmental Protection Agency (EPA) to protect the human health against adverse health effects with a margin of safety. The modeling methodologies were developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[4] 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 US 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 National Ambient Air Quality Standards (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 3.5-1. Massachusetts Ambient Air Quality Standards (MAAQS) are codified in 310 CMR 6.04, and generally follow the NAAQS but are not identical (highlighted in bold in Table 3.5-1).

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

A one-hour NO_2 standard was promulgated on January 22, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly NO_2 NAAQS was published in the Federal Register on February 9, 2010 and became effective on April 12, 2010. The form of this standard is the three-year average of the 98th percentile of the daily maximum one-hour concentrations.

Similarly, a one-hour SO_2 standard was promulgated on June 2, 2010 to protect public health, including the health of sensitive populations (e.g., people with asthma, children, and the elderly). The final rule for the new hourly SO_2 NAAQS was published in the Federal Register on June 22, 2010, and became effective on August 23, 2010. The form of this standard is the three-year average of the 99th percentile of the daily maximum one-hour concentrations.

The inhalable particulate (PM10) NAAQS were promulgated on July 1, 1987 at the federal level with the intent of replacing the existing standards limiting ambient levels of Total Suspended Particulate (TSP). In 2006, the annual PM10 standard was revoked. However it remains codified in 310 CMR 6.00. EPA also promulgated a Fine Particulate (PM2.5)

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[4] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005.

NAAQS, effective December 2006, with an annual standard of 15 μg/m3 and the 24-hour standard of 35 micrograms per cubic meter (μg/m^3). The annual standard has since been strengthened to 12 μg/m^3 (in 2012).

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.

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

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

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

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

3.5.2.2 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports was obtained for 2012 to 2014. 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 $\mu g/m^3$. For annual PM2.5 averages, the average of the highest yearly observations was used as the background concentration. A new one-hour NO_2 standard was recently promulgated. To attain this standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$.

Background concentrations were determined from the closest available monitoring stations to the proposed development. All pollutants are not monitored at every station, so data from multiple locations are necessary. The closest monitor is at East First Street in South Boston, roughly 1.5 kilometers northeast of the Project location. However this site only samples for SO_2 and NO_2. The next closest site is at Harrison Avenue, roughly 2.4 km west of the Project. This site samples for the remaining pollutants. A summary of the background air quality concentrations are presented in Table 3.5-2.

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

Pollutant	Averaging Time	2012	2013	2014	Background Concentration ($\mu g/m^3$)	NAAQS	Percent of NAAQS
SO_2 (1)(6)	1-Hour (5)	31.44	36.68	73.36	47.2	196.0	24%
	3-Hour	27.772	42.706	63.666	63.7	1300.0	5%
	24-Hour	11.79	17.03	21.222	21.2	365.0	6%
	Annual	4.323	4.0086	4.5588	4.6	80.0	6%
PM-10	24-Hour	32	34.0	61	61.0	150.0	41%
	Annual	14.2	15.1	13.9	15.1	50.0	30%
PM-2.5	24-Hour (5)	20.6	15.9	12.7	16.4	35.0	47%
	Annual (5)	8.28	7.3	5.96	7.2	12.0	60%
NO_2 (3)	1-Hour (5)	80.84	88	116.56	95.3	188.0	51%
	Annual	18.2924	22.9	26.32	26.3	100.0	26%
CO (2)	1-Hour	2474.2	2145.3	1963.1	2474.2	40000.0	6%
	8-Hour	2177.4	1375.2	1489.8	2177.4	10000.0	22%
Ozone (4)	8-Hour	121.706	115.817	106.002	121.7	147.0	83%
Lead	Rolling 3-Month	0.014	0.006	0.014	0.014	0.15	9%

Notes:
From 2012-2014 EPA's AirData Website
(1) SO_2 reported ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2.62 $\mu g/m^3$.
(2) CO reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1146 $\mu g/m^3$.
(3) NO_2 reported in ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1.88 $\mu g/m^3$.
(4) O_3 reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1963 $\mu g/m^3$.
(5) Background level is the average concentration of the three years.
(6) The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.

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

For use in the microscale analysis, background concentrations of CO in ppm were required. The corresponding maximum background concentrations in ppm were 2.2 ppm (2,474 $\mu g/m^3$) for one-hour and 1.9 ppm (2,177 $\mu g/m^3$) for eight-hour CO.

3.5.3 Methodology

A "microscale" analysis is typically required for any intersection (including garage entrances/exits) 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 carbon monoxide (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 analysis for the Project followed the procedure outlined in U.S. EPA's intersection modeling guidance.[5]

The microscale analysis has been conducted using the latest versions of EPA's MOVES and CAL3QHC programs to estimate CO concentrations at sidewalk receptor locations.

Baseline (2015) and future year (2020) 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.

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

Existing background values of CO at the nearest monitor location at Kenmore Square were obtained from MassDEP. CAL3QHC results were then added to background CO values of 2.2 ppm (one-hour) and 1.9 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).

The modeling methodology was developed in accordance with the latest MassDEP modeling policies and Federal modeling guidelines.[6]

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

3.5.3.1 Intersection Selection

A review of the nearby intersections has identified four signalized intersections included in the traffic study that meets the conditions for a microscale analysis as described above (see Chapter 2). The traffic volumes and LOS calculations provided in Chapter 2 form the basis of evaluating the traffic data versus the microscale thresholds. The intersections found to meet the criteria for inclusion in the microscale analysis are:

- Old Colony Avenue and Dorchester Street;
- Old Colony Avenue and D Street;
- Dorchester Avenue and Dorchester Street; and
- Southampton Street and South Bay Plaza Entrance/Exit.

Microscale modeling was performed for the intersections based on the aforementioned methodology. The 2015 existing conditions, and the 2020 No Build and Build conditions were each evaluated for both morning (a.m.) and afternoon (p.m.) peak.

3.5.3.2 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 (2015) and build year (2020) are provided by MassDEP.

[6] 40 CFR 51 Appendix W, Guideline on Air Quality Models, 70 FR 68228, Nov. 9, 2005.

All link types for the modeled intersection were input into MOVES. Idle emission factors are obtained from factors for a link average speed of 0 miles per hour (mph). Moving emissions are calculated based on speeds at which free-flowing vehicles travel through the intersection as stated in traffic modeling (SYNCHRO) reports. A speed of 30 mph is used for all free-flow traffic. 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.[7]

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

3.5.3.3 Receptors and Meteorology Inputs

Sets of up to roughly 225 model receptors were placed in the vicinity of the modeled intersection. Receptors extended approximately 300 feet on the sidewalks along the roadways approaching the intersection. The roadway links and receptor locations of the modeled intersection are presented in Figure 3.5-1 through Figure 3.5-4.

For the CAL3QHC model, limited meteorological inputs are required. Following EPA guidance[8], a wind speed of one meter per second, stability class D (4), and a mixing height of 1,000 meters were used. To account for the intersection geometry, wind directions from 0° to 350°, every 10° were selected. A surface roughness length of 321 centimeters was selected.[9]

3.5.3.4 Impact Calculations (CAL3QHC)

The CAL3QHC model predicts one-hour concentrations using queue-lengths at intersections, worst-case meteorological conditions, and traffic input data. The one-hour concentrations were scaled by a factor of 0.9 to estimate eight-hour concentrations.[10] The CAL3QHC methodology was based on EPA CO modeling guidance. Signal timings were provided directly from the traffic modeling outputs.

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

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

9 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.

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

Washington Village **Boston, Massachusetts**

Figure 3.5-1

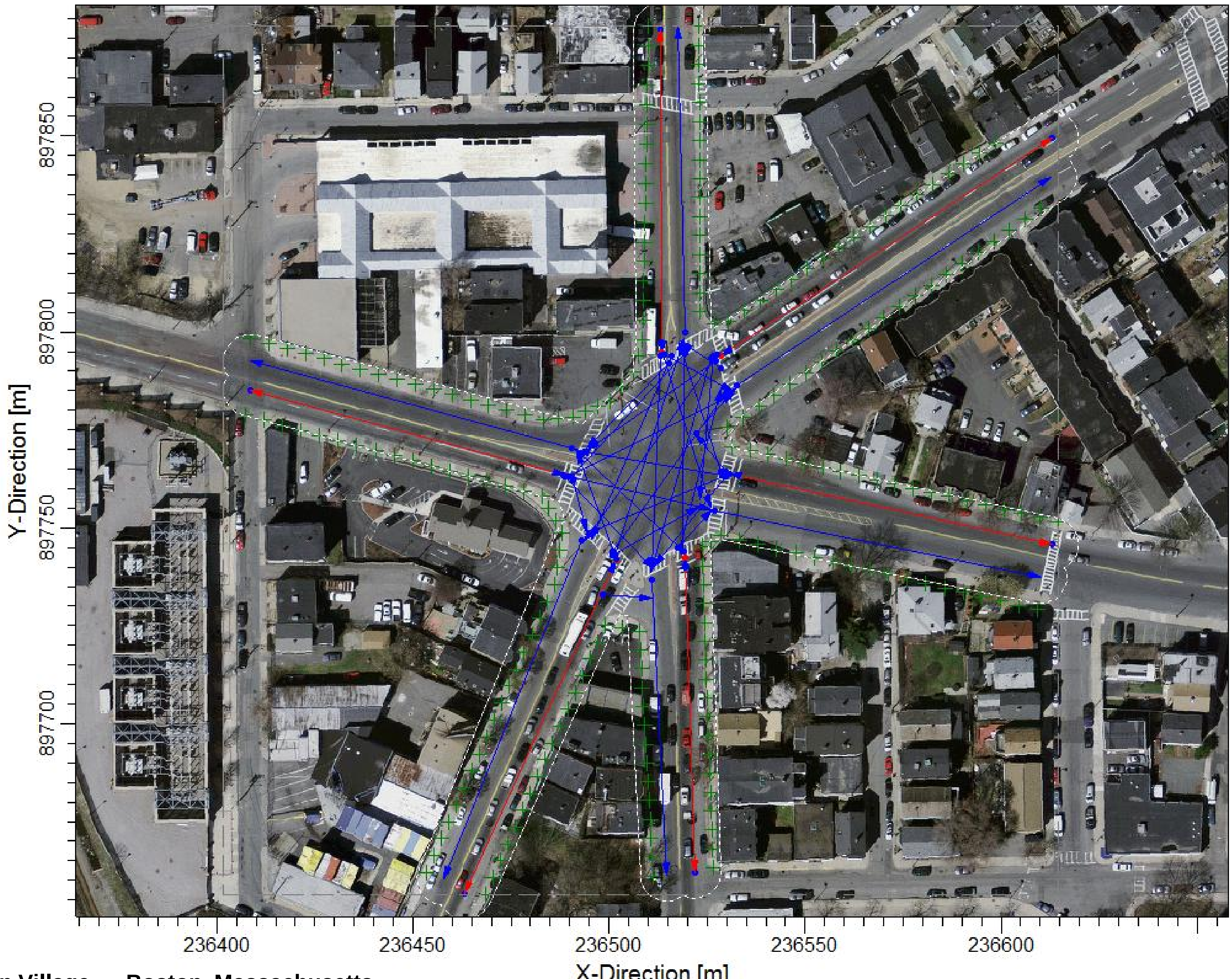
Link and Receptor Locations for CAL3QHC modeling of Intersection of Old Colony Ave. and Dorchester St.

Washington Village **Boston, Massachusetts**

Epsilon ASSOCIATES INC.

Figure 3.5-2

Link and Receptor Locations for CAL3QHC modeling of Intersection of Old Colony Ave. and D St.

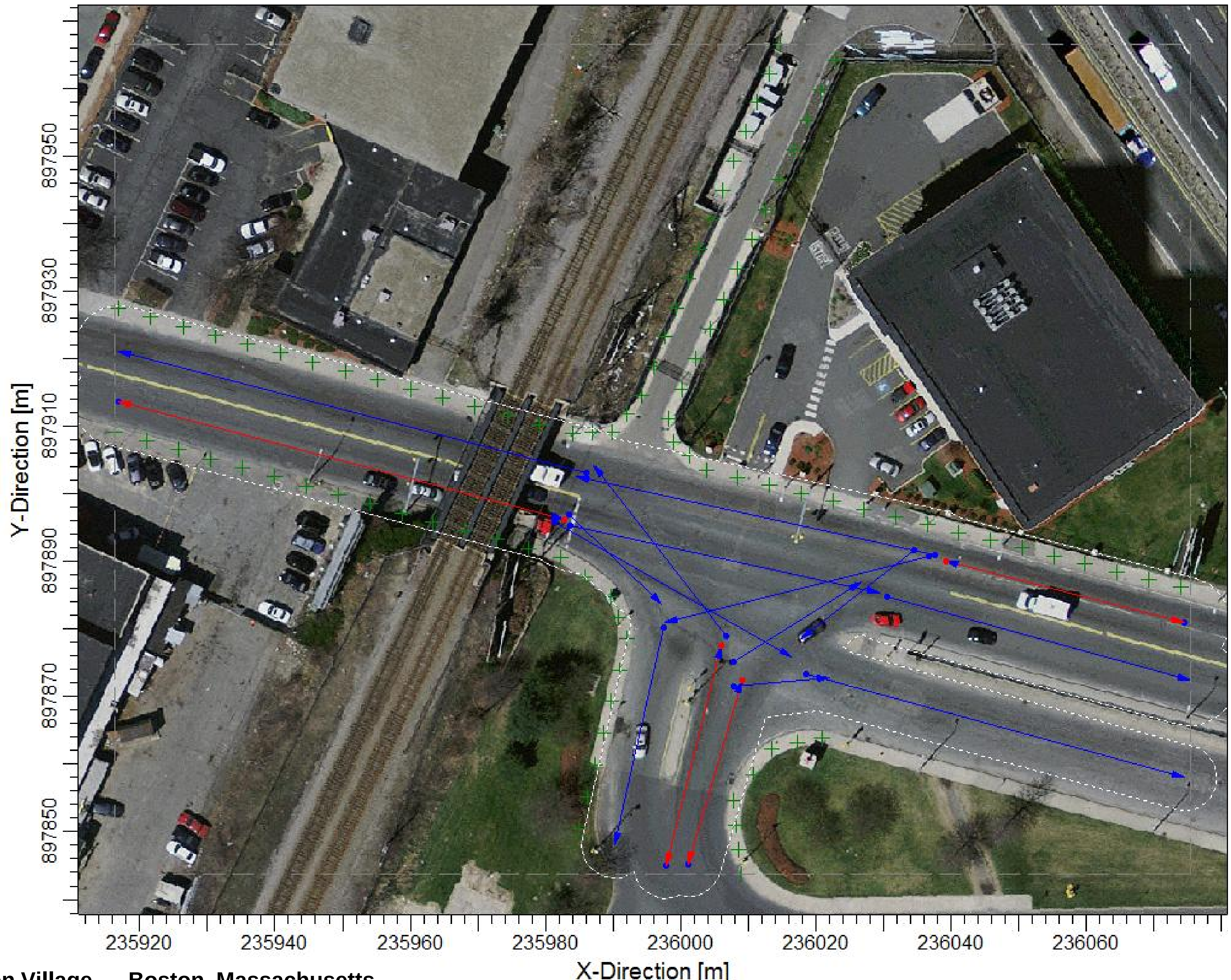


Washington Village **Boston, Massachusetts**

Epsilon ASSOCIATES INC.

Figure 3.5-3

Link and Receptor Locations for CAL3QHC modeling of Intersection of Dorchester Ave. and Dorchester St.



Washington Village **Boston, Massachusetts**

Epsilon ASSOCIATES INC.

Figure 3.5-4

Link and Receptor Locations for CAL3QHC modeling of Intersection of Southampton St. at South Bay Plaza

3.5.4 Air Quality Results

3.5.4.1 Microscale Analysis

The results of the maximum one-hour predicted CO concentrations from CAL3QHC are provided in Tables 3.5-3 through 3.5-5 for the 2015 and 2020 scenarios. Eight-hour average concentrations are calculated by multiplying the maximum one-hour concentrations by a factor of 0.9.[11]

The results of the one-hour and eight-hour maximum modeled CO ground-level concentrations from CAL3QHC were added to EPA supplied background levels for comparison to the NAAQS. These values represent the highest potential concentrations at the intersection as they are predicted during the simultaneous occurrence of "defined" worst case meteorology. The highest one-hour traffic-related concentration predicted in the area of the Project, for the modeled conditions (0.4 ppm) plus background (2.2 ppm) is 2.6 ppm for the all a.m. peak cases at the intersection of Old Colony Avenue and Dorchester Street. The highest eight-hour traffic-related concentration predicted in the area of the Project for the modeled conditions (0.4 ppm) plus background (1.9 ppm) is 2.3 ppm for the same location and scenario. All concentrations are well below the one-hour NAAQS of 35 ppm and the eight-hour NAAQS of 9 ppm.

Table 3.5-3 Summary of Microscale Modeling Analysis (Existing 2015)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Old Colony Avenue and Dorchester Street	AM	0.4	2.2	2.6	35
	PM	0.3	2.2	2.5	35
Old Colony Avenue and D Street	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35
Dorchester Avenue and Dorchester Street	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35
Southampton Street at South Bay Plaza Entrance/Exit	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35

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

Table 3.5-3 Summary of Microscale Modeling Analysis (Existing 2015) (cont'd)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
8-Hour					
Old Colony Avenue and Dorchester Street	AM	0.4	1.9	2.3	9
	PM	0.3	1.9	2.2	9
Old Colony Avenue and D Street	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9
Dorchester Avenue and Dorchester Street	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9
Southampton Street at South Bay Plaza Entrance/Exit	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9
Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.					

Table 3.5-4 Summary of Microscale Modeling Analysis (No-Build 2020)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Old Colony Avenue and Dorchester Street	AM	0.4	2.2	2.6	35
	PM	0.3	2.2	2.5	35
Old Colony Avenue and D Street	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35
Dorchester Avenue and Dorchester Street	AM	0.2	2.2	2.4	35
	PM	0.2	2.2	2.4	35
Southampton Street at South Bay Plaza Entrance/Exit	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35

Table 3.5-4 Summary of Microscale Modeling Analysis (No-Build 2020) (cont'd)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
8-Hour					
Old Colony Avenue and Dorchester Street	AM	0.4	1.9	2.3	9
	PM	0.3	1.9	2.2	9
Old Colony Avenue and D Street	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9
Dorchester Avenue and Dorchester Street	AM	0.2	1.9	2.1	9
	PM	0.2	1.9	2.1	9
Southampton Street at South Bay Plaza Entrance/Exit	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9
Notes: CAL3QHC eight-hour impacts were conservatively obtained by multiplying one-hour impacts by a screening factor of 0.9.					

Table 3.5-5 Summary of Microscale Modeling Analysis (Build 2020)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
1-Hour					
Old Colony Avenue and Dorchester Street	AM	0.4	2.2	2.6	35
	PM	0.3	2.2	2.5	35
Old Colony Avenue and D Street	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35
Dorchester Avenue and Dorchester Street	AM	0.2	2.2	2.4	35
	PM	0.2	2.2	2.4	35
Southampton Street at South Bay Plaza Entrance/Exit	AM	0.3	2.2	2.5	35
	PM	0.3	2.2	2.5	35

Table 3.5-5 Summary of Microscale Modeling Analysis (Build 2020) (cont'd)

Intersection	Peak	CAL3QHC Modeled CO Impacts (ppm)	Monitored Background Concentration (ppm)	Total CO Impacts (ppm)	NAAQS (ppm)
8-Hour					
Old Colony Avenue and Dorchester Street	AM	0.4	1.9	2.3	9
	PM	0.3	1.9	2.2	9
Old Colony Avenue and D Street	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9
Dorchester Avenue and Dorchester Street	AM	0.2	1.9	2.1	9
	PM	0.2	1.9	2.1	9
Southampton Street at South Bay Plaza Entrance/Exit	AM	0.3	1.9	2.2	9
	PM	0.3	1.9	2.2	9

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

3.6 Stormwater/Water Quality

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

3.7 Flood Hazard Zones/ Wetlands

The existing Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the Project site indicates that it is located outside of a designated flood zone (FIRM, City of Boston, Community-Panel Number 25025C0083G, Effective Date September 25, 2009). The "preliminary" revised floodplain map for the site area, which was recently released by FEMA, shows that the eastern portion of the site will be outside of a designated flood zone, while the western portion of the site will be within the 500-year flood zone (FIRM, Suffolk County, Massachusetts; Panel 0083J, Map Number 25025C0083J, Map Revised, Preliminary July 9, 2015).

The site does not contain wetlands.

3.8 Geotechnical Impacts

3.8.1 Subsurface Explorations and General Conditions

Twelve soil test borings (NEG-1 through NEG-12) were completed at the Project site in March and December of 2014 by the Project geotechnical engineer, Northeast Geotechnical, Inc. The test borings were advanced to depths of about 21± to 93± feet below the ground surface. Standard Penetration Testing was performed to assess soil density, soil samples were collected, and select soil samples were submitted to a laboratory for geotechnical soils testing.

Based on the results of the test borings, the subsurface profile at the site generally consists of existing fill materials underlain in succession by an intermittent layer of buried peat/organic silt, natural silty clay, natural granular soils including silt, sand, and gravel, natural glacial till, and then bedrock.

The existing fill materials were assessed to be about 7± to 15± feet thick, and the underlying peat/organic silt deposit was assessed to be up to about 2± feet thick. The natural clay layer was encountered in most of the test borings and was assessed to be about 2± to 73± feet thick. The natural clay layer was typically encountered below the existing fill and buried organic materials at depths ranging from 9± to 17± feet below the ground surface.

3.8.2 Groundwater

Groundwater was encountered in each of the test borings at depths of about 5± to 15± feet below the ground surface. Groundwater levels were recorded at the time and under the conditions at which the soils test borings were performed. Fluctuations in the groundwater levels due to changes in temperature, weather, and other conditions should be anticipated. As a result, groundwater levels encountered during construction and thereafter may differ from those reported herein.

3.8.3 Preliminary Foundation Recommendations

Preliminary geotechnical engineering methodology pertaining to foundations for the proposed buildings is described below.

Proposed Buildings C and D: It is anticipated that a pile foundation system and ground level structural floor slab will be required for proposed Buildings C and D. The piles would be advanced through the unsuitable existing fill, buried organic layers, and compressible silty clay layer to suitable bearing. Feasible pile options include pre-stressed concrete piles or steel H-piles installed to a sufficient distance into the natural glacial till or to bedrock for capacities in the 100 to 150 ton range. Pressure injected footings (PIFs) advanced through the existing fill, organics and clay layer with bases constructed in the underlying natural granular soils may also be a feasible option that will be evaluated.

Proposed Buildings A, B, E, F, and H: Installation of rammed aggregate piers to reinforce the existing fill and buried organic deposits to support spread footing foundations and slab-on-grade construction is anticipated to be a feasible option for the proposed buildings ranging up to six stories in height. Rammed aggregate piers would be installed throughout the proposed building areas for both spread footing foundation support and slab-on-grade support. Rammed aggregate piers would be installed through the existing fill and underlying organic layers and terminate at the underlying natural silty clay or natural granular soils.

Proposed Building G: Based on the thickness of the unsuitable existing fill materials (about 7± feet) and depths to groundwater encountered in test borings, excavation of the unsuitable fill materials down to natural granular soils and backfilling of the resulting excavation with compacted lifts of suitable structural fill for support of spread footing foundations and slab-on-grade construction is anticipated to be a feasible option for proposed Building G. This will depend on the location of the perimeter building foundation alignment relative to the adjacent existing buildings. Otherwise the existing fill materials may remain in place provided the fill is reinforced with rammed aggregate piers for support of spread footing foundations and slab-on-grade construction.

3.9 Solid and Hazardous Waste

3.9.1 Hazardous Waste

The disposal site for Response Tracking Number (RTN) 3-28694, as defined by the Massachusetts Contingency Plan (MCP), consists of the 39 and 69-83 Damrell Street properties, as well as the 235 and 241 Old Colony Avenue properties to which oil and/or hazardous materials (OHM) has been released to soil, soil gas and groundwater at the site. Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) activities have been completed under RTN 3-28694 in accordance with the Massachusetts Contingency Plan (MCP – 310 CMR 40.0000).

Based on the cumulative site histories, (39 Damrell Street, 235 Old Colony Avenue and 241 Old Colony Avenue and 49-89 Damrell Street properties) and through the outcome of the assessment activities performed at the Site to date, it has been concluded that the environmental conditions identified are likely related to the historical commercial and industrial property uses. Such activities have included printing operations, automobile repairs, gasoline retail sales, linen cleaning services, metals fabrication, and retail sales. Significant portions of the Site appear to contain off-site and/or urban fill materials consisting of coal, wood ash, and some building material debris.

In order to achieve a Permanent Solution for the disposal site, it is currently anticipated that excavation and dewatering programs will be implemented in required locations of the Site to reduce Site COC levels and overall exposure point concentrations (EPCs). In addition, an AUL is likely to be implemented.

3.9.2 Operation Solid and Hazardous Waste Generation

The Project will generate solid waste typical of residential and restaurant 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 1,126 tons of solid waste per year.

With the exception of household hazardous wastes typical of hotel and residential developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials.

3.9.3 Recycling

A dedicated recyclables storage and collection program will facilitate the reduction of waste generated by building occupants that is hauled to and disposed of in landfills. The recycling program will be fully developed in accordance with LEED standards as described in Chapter 4.

3.10 Noise Impacts

3.10.1 Introduction

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

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

3.10.2 Noise Terminology

There are several ways in which sound (noise) levels are measured and quantified, all of which use the logarithmic decibel (dB) scale. The following section defines the noise terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities observed in the environment. A property of the decibel scale is that the sound pressure levels of two distinct sounds are not purely additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a three-decibel increase (53 dB), not a doubling (100 dB). Thus, every three-decibel change in sound level represents a doubling or halving of sound energy. Related to this is the fact that a change in sound level of less than three dB is generally imperceptible to the human ear.

The sound level meter used to measure noise is a standardized instrument.[12] It contains "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various conditions. One network is the A-weighting network (there are also B- and C-weighting networks), which most closely approximates how the human ear responds to sound as a function of frequency, and is the accepted scale used for community sound level measurements. Sounds are frequently reported as detected with the A-weighting network of the sound level meter in dBA. A-weighted sound levels emphasize the middle frequencies (i.e., middle pitched—around 1,000 Hertz sounds), and de-emphasize lower and higher frequencies.

Because the sounds in our environment vary with time, they cannot simply be described with a single number. Two methods are used for describing variable sounds, exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment, A-weighted sound-level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated Ln, where n can have a value of 0 to 100 percent. Several sound-level metrics that are commonly reported in community noise studies are described below.

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

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

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

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

- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by occasional loud, intrusive noises.

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

By employing various noise metrics, it is possible to separate prevailing, steady sounds (the L_{90}) from occasional louder sounds (L_{10}) in the noise environment. This analysis treats all noise sources from the Project as though the emissions will be steady and continuous, described most accurately by the L_{90} exceedance level.

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

3.10.3 Noise Regulations and Criteria

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

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

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

Octave-band Center	Residential Zoning District		Residential Industrial Zoning District		Business Zoning District	Industrial Zoning District
Frequency (Hz)	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

Table 3.10-1 City Noise Standards, Maximum Allowable Sound Pressure Levels (cont'd)

Octave-band Center	Residential Zoning District		Residential Industrial Zoning District		Business Zoning District	Industrial Zoning District
500	56	46	62	51	62	67
1000	50	40	56	45	56	61
2000	45	33	51	39	51	57
4000	40	28	47	34	47	53
8000	38	26	44	32	44	50
A-Weighted (dBA)	**60**	**50**	**65**	**55**	**65**	**70**
Notes:	1. Noise standards from Regulation 2.5 "Zoning District Noise Standards", City of Boston Air Pollution Control Commission, "Regulations for the Control of Noise in the City of Boston", adopted December 17, 1976. 2. All standards apply at the property line of the receiving property. 3. dB and dBA based on a reference pressure of 20 micropascals. 4. Daytime refers to the period between 7:00 a.m. and 6:00 p.m. daily, except Sunday.					

3.10.4 Existing Conditions

A background noise level survey was conducted to characterize the existing "baseline" acoustical environment in the vicinity of the Project, located within the neighborhood of South Boston. Existing noise sources in the vicinity of the Project site currently include: vehicular traffic along local roadways (including Dorchester Street, Old Colony Avenue, and Interstate 93); birds; occasional aircraft; and the general city soundscape.

3.10.4.1 Noise Measurement Methodology

Since noise impacts from the Project on the community will be highest when background noise levels are the lowest, the study was designed to measure community noise levels under conditions typical of a "quiet period" for the area. Daytime measurements were scheduled to avoid peak traffic conditions. Sound level measurements were made on Monday, July 20, 2015 during the daytime (10:30 a.m. to 1:00 p.m.) and on Tuesday, July 21, 2015 during nighttime hours (12:00 a.m. to 2:00 a.m.). All measurements were 20 minutes in duration.

Sound levels were measured at publicly accessible locations at a height of five feet (1.5 meters) above ground level, under low wind conditions, and with dry roadway surfaces. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a General Tools digital psychrometer. Unofficial observations about meteorology or land use in the community were made solely to characterize the existing sound levels in the area and to estimate the noise sensitivity at properties near the Project site.

3.10.4.2 Noise Measurement Locations

The selection of the noise measurement locations was based upon a review of zoning and land use in the Project area. Four noise monitoring locations were selected as representative sites to obtain a sampling of the ambient baseline noise environment. An additional location was added during the measurement program based on site conditions. These measurement locations are depicted on Figure 3.10-1 and described below.

- **Location 1** is located at 18 Tuckerman Street, representative of the closest residential receptors to the south of the Project on the east end.
- **Location 2** is located at 45 Middle Street, representative of the closest residential receptors to the south of the Project on the west end.
- **Location 3** is located at 291 Dorchester Street, representative of the closest residential receptors east of the Project near the eastern parcel of the Project. Only nighttime measurements were performed at this location due to sidewalk construction occurring during the day.
- **Location 3A** is located at 34 Mitchell Street, representative of the closest residential receptors east of the Project near the eastern parcel of the Project. As an alternate location to Location 3, only daytime measurements were performed at this location due to sidewalk construction occurring at the preferred Location 3 during the day.
- **Location 4** is located at 156 E Street, representative of the closest residential receptors to the north of the Project.

3.10.4.3 Noise Measurement Equipment

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

3.10.4.4 Measured Background Noise Levels

Baseline noise measurement results are presented in Table 3.10-2, and summarized below:

- The daytime residual background (L_{90} dBA) measurements ranged from 45 to 57 dBA;

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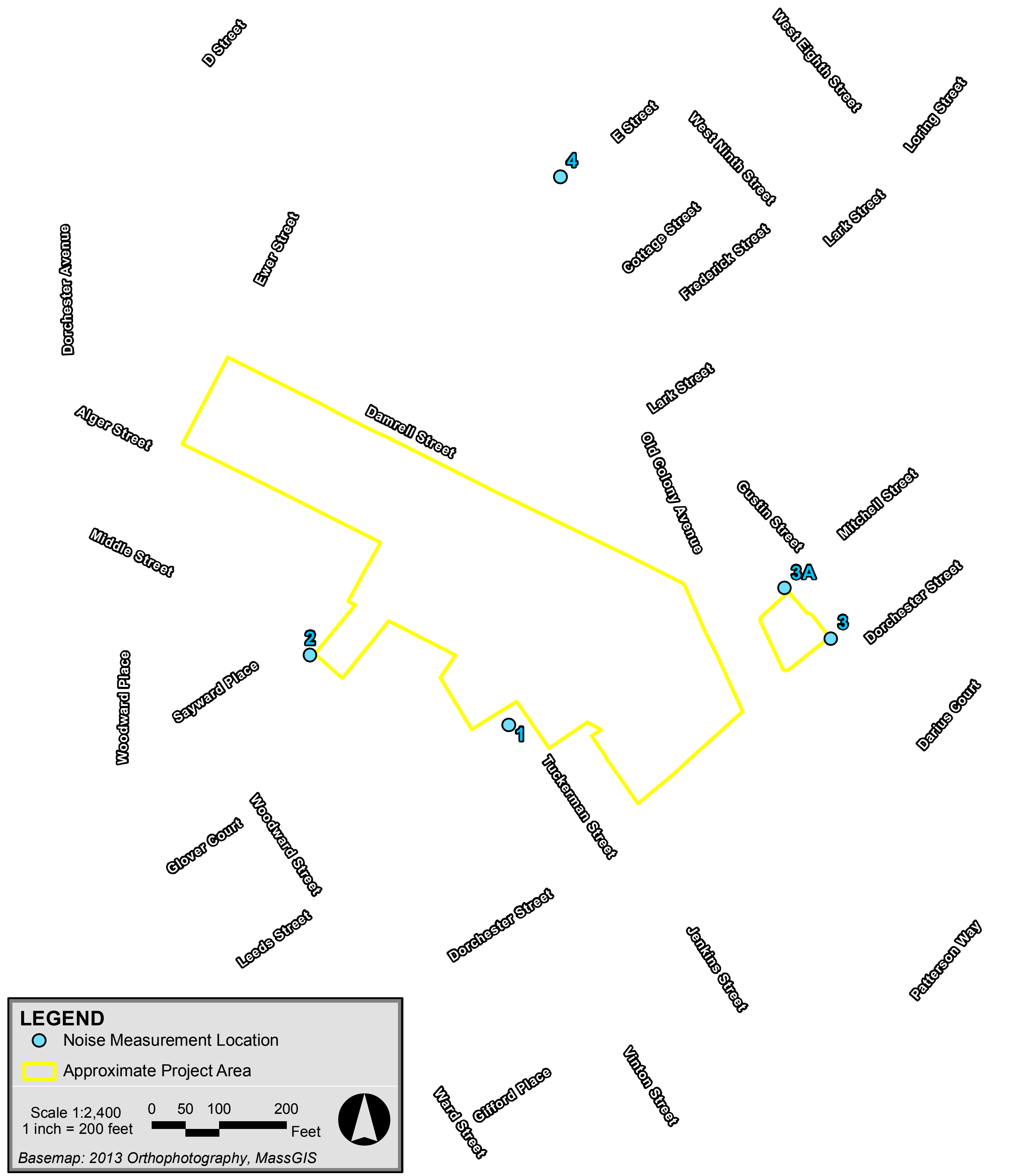

Washington Village **Boston, Massachusetts**

[redacted]

Figure 3.10-1

Noise Measurement Locations

Table 3.10-2 Summary of Measured Background Noise Levels – July 20, 2015 (Daytime) & July 21, 2015 (Nighttime)

Location	Period	Start Time	L_{eq}	L_{max}	L_{10}	L_{50}	L_{90}	L_{90} Sound Pressure Levels by Octave-Band								
								31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
			dBA	dBA	dBA	dBA	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
1	Day	10:55 AM	51	62	55	47	45	58	57	51	45	43	40	34	28	21
2	Day	11:20 AM	54	71	54	51	50	61	61	58	50	47	45	40	34	25
3A	Day	11:50 AM	68	86	66	59	54	66	62	59	55	50	48	43	36	26
4	Day	12:15 PM	70	93	68	63	57	63	63	59	58	53	52	47	38	29
1	Night	12:54 AM	47	55	48	47	46	55	56	49	46	44	41	35	27	21
2	Night	1:17 AM	48	53	49	48	46	55	55	51	47	43	41	37	32	25
3	Night	12:27 AM	61	81	63	54	50	56	58	55	48	48	46	40	33	25
4	Night	12:03 AM	58	72	62	52	50	56	57	53	52	47	45	39	32	23

Weather Conditions:

	Date	Temp	RH	Sky	Wind
Daytime	Monday, July 20, 2015	89 °F	51%	Mostly sunny	NW @ 0-1 mph
Nighttime	Tuesday, July 21, 2015	82 °F	43%	Clear	SW @ 0-1 mph

Monitoring Equipment Used:

	Manufacturer	Model	S/N
Sound Level Meter	Larson Davis	LD831	3753
Microphone	Larson Davis	377B20	142956
Preamp	Larson Davis	PRM831	029564
Calibrator	Larson Davis	Cal200	7147

- The nighttime residual background (L_{90} dBA) measurements ranged from 46 to 50 dBA;
- The daytime equivalent level (L_{eq} dBA) measurements ranged from 51 to 70 dBA; and
- The nighttime equivalent level (L_{eq} dBA) measurements ranged from 47 to 61 dBA.

3.10.5 Future Conditions

3.10.5.1 Overview of Potential Project Noise Sources

The Project will include eight new residential buildings, some with parking and most with ground floor retail, as well as new streets, plazas and green spaces. The primary sources of continuous sound exterior to the Project will consist of ventilation, heating, cooling, and emergency power noise sources. Multiple noise sources will be located on the roof of each building and there will be exhaust fans which will discharge along the facades of Buildings C and E.

Table 3.10-3 provides an anticipated list of the major sources of sound within the Project. The modeling analysis assumes that a maximum of 75% of the condensing units at each building will operate at a given time. Sound power levels used in the acoustical modeling of each piece of equipment are presented in Table 3.10-4. Sound power level data were provided by the manufacturer of each piece of equipment except for the emergency generator. The sound power level of the emergency generator was calculated using the sound-pressure levels provided by the manufacturer at a reference distance of 49 feet.

The Project includes various noise-control measures that are necessary to achieve compliance with the applicable noise regulations. As the design progresses, it is anticipated that mechanical equipment may change; however, appropriate measures will be taken to ensure compliance with the City Noise Standards. Mitigation in the form of a silencer will be installed for the loading dock and kitchen exhaust fans. Three-sided 10-15 foot barriers will be located around each of the energy recovery units (ERUs) on the rooftops. The sound levels from the ERUs, cooling towers, and condensing units will need to be mitigated; this will be accomplished through a sound mitigation package supplied by the vendor or through the selection of quieter equipment from an alternate manufacturer. The emergency generator sound levels will be controlled using a SA Canopy enclosure with an exhaust silencer. To further limit impacts from the standby generator, its required periodic, routine testing will be conducted during daytime hours, when background sound levels are highest. A summary of the noise mitigation proposed for the Project is presented below in Table 3.10-5.

Table 3.10-3 Modeled Noise Sources

Noise Source	Quantity	Approximate Location	Size/Capacity
Building A			
Kitchen Exhaust Fan	2	Roof (72′ tier)	10,000 CFM
Energy Recovery Unit	2	Roof (72′ tier)	8,000 CFM
Condensing Unit	60[1]	Roof (72′ tier)	3-ton
Building B			
Kitchen Exhaust Fan	2	Roof (72′ tier)	10,000 CFM
Energy Recovery Unit	2	Roof (72′ tier)	8,000 CFM
Condensing Unit	45[1]	Roof (72′ tier)	3-ton
Building C			
Cooling Tower	2	Roof (214′ tier)	300-ton
Energy Recovery Unit	1	Roof (214′ tier)	22,000 CFM
Energy Recovery Unit	1	Roof (171′ tier)	8,000 CFM
Loading Dock Fan	1	Western façade; 10′ AGL	10,000 CFM
Emergency Generator	1	Roof (214′ tier)	300 kW
Building D			
Cooling Tower	2	Roof (278′ tier)	300-ton
Energy Recovery Unit	1	Roof (278′ tier)	22,000 CFM
Energy Recovery Unit	1	Roof (87′ tier)	8,000 CFM
Emergency Generator	1	Roof (278′ tier)	300 kW
Building E			
Kitchen Exhaust Fan	1	Roof (50′ tier)	10,000 CFM
Energy Recovery Unit	1	Roof (50′ tier)	8,000 CFM
Condensing Unit	52[1]	Roof (50′ tier)	3-ton
Loading Dock Fan	2	Western façade; 10′ AGL	10,000 CFM
Building F			
Condensing Unit	6[1]	Roof (40′ tier)	3-ton
Building G			
Condensing Unit	5[1]	Roof (40′ tier)	3-ton
Building H			
Condensing Unit	14[1]	Roof (50′ tier)	3-ton

Notes:

1. 75% of the total proposed units were assumed to be operating at one time; therefore, 75% of the total was modeled.

Table 3.10-4 Modeled Sound Power Levels per Noise Source

Noise Source	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Kitchen Exhaust Fan[1]	88	94[7]	94	93	90	84	83	79	74	67
Cooling Tower[2]	89	92[7]	92	91	92	87	83	77	72	69
Energy Recovery Unit - 22,000 CFM – Supply[3]	94	85[7]	85	87	89	88	89	88	85	81
Energy Recovery Unit – 6,750 CFM – Exhaust[3]	95	90[7]	90	92	98	91	89	86	83	80

Table 3.10-4 Modeled Sound Power Levels per Noise Source (cont'd)

Noise Source	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Energy Recovery Unit – 8,000 CFM – Supply[3]	96	94[7]	94	93	92	93	90	89	87	84
Energy Recovery Unit – 8,000 CFM – Exhaust[3]	97	98[7]	98	96	98	96	90	87	84	79
Loading Dock Fan[4]	83	76[7]	76	85	86	80	75	73	68	62
Condensing Unit[5]	75	72[7]	72	75	72	73	70	67	58	51
Emergency Generator[6]	102	117[7]	117	111	107	98	91	89	86	80

Notes:
Sound power levels do not include mitigation identified in Table 3.10-5.
1. Greenheck USF-327-10-BI-75 10,000 CFM fan
2. Baltimore Aircoil Company Model 3240C-JM cooling tower
3. AAON ERU
4. Cook 270TCNB 10,000 CFM fan
5. Trane 4TTA3036B3/4
6. Caterpillar diesel generator set with SA Canopy enclosure.
7. No data provided by manufacturer. Octave band sound level assumed to be equal to dB level in 63 Hz band.

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

Noise Source	Form of Mitigation	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
ERU – 8,000 Supply[1]	Alternative/Modified Unit[9]	0	0	0	1	3	5	5	4	1
ERU – 8,000 Supply[2]	Alternative/Modified Unit[9]	0	0	0	1	4	7	10	9	3
ERU – 8,000 Exhaust[3]	Alternative/Modified Unit[9]	0	0	0	1	3	5	5	4	1
ERU – 8,000 Exhaust[4]	Alternative/Modified Unit[9]	0	0	0	1	4	7	10	9	3
Condensing Unit[5]	Alternative/Modified Unit[9]	0	0	0	1	2	5	5	3	1
Cooling Tower[6]	Alternative/Modified Unit[9]	0	0	0	0	0	1	3	2	0

Table 3.10-5 Attenuation Values Applied to Mitigate Each Noise Source (cont'd)

Noise Source	Form of Mitigation	Sound Level (dB) per Octave Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Kitchen Exhaust Fan[7]	Silencer[10]	1[12]	3	4	9	16	19	15	11	7
Loading Dock Fan[8]	Silencer[11]	1[12]	3	4	9	16	18	14	11	7

Notes:

1. Applied to unit on Building B.
2. Applied to units on Buildings A, B, C, D, & E.
3. Applied to units on Buildings A, D, and E.
4. Applied to units on Buildings A & B.
5. Applied to units on Buildings A, B, E, F, & G.
6. Applied to units on Building C.
7. Applied to exhaust fans on Buildings A, B, & E.
8. Applied to loading dock fans at Buildings C & E.
9. The Proponent will consult with the manufacturer to identify mitigation options to achieve at least the attenuation values presented or select a unit from an alternate manufacturer meeting the mitigated modeled sound levels.
10. Vibro-Acoustics Silencer Model RD-HV-F7, 36″
11. Vibro-Acoustics Silencer Model RD-HV-F7, 36″, insertion loss reduced due to self-noise.
12. Estimated sound level reduction.

3.10.5.2 Noise Modeling Methodology

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

3.10.5.3 Future Sound Levels - Nighttime

The analysis of sound levels at night considered all of the mechanical equipment without the emergency generator running, to simulate typical nighttime operating conditions at nearby receptors. 14 modeling locations were included in the analysis. Locations A through E are similar to measurement Locations 1 through 4 and 3A. Nine additional modeling locations, F through N, were added for additional residential uses in the vicinity of the Project. The modeling receptors, which correspond to the residential uses in the community, are depicted in Figure 3.10-2. The predicted exterior Project-only sound levels range from 38 to 47 dBA at nearby receptors. The City of Boston Residential limits have

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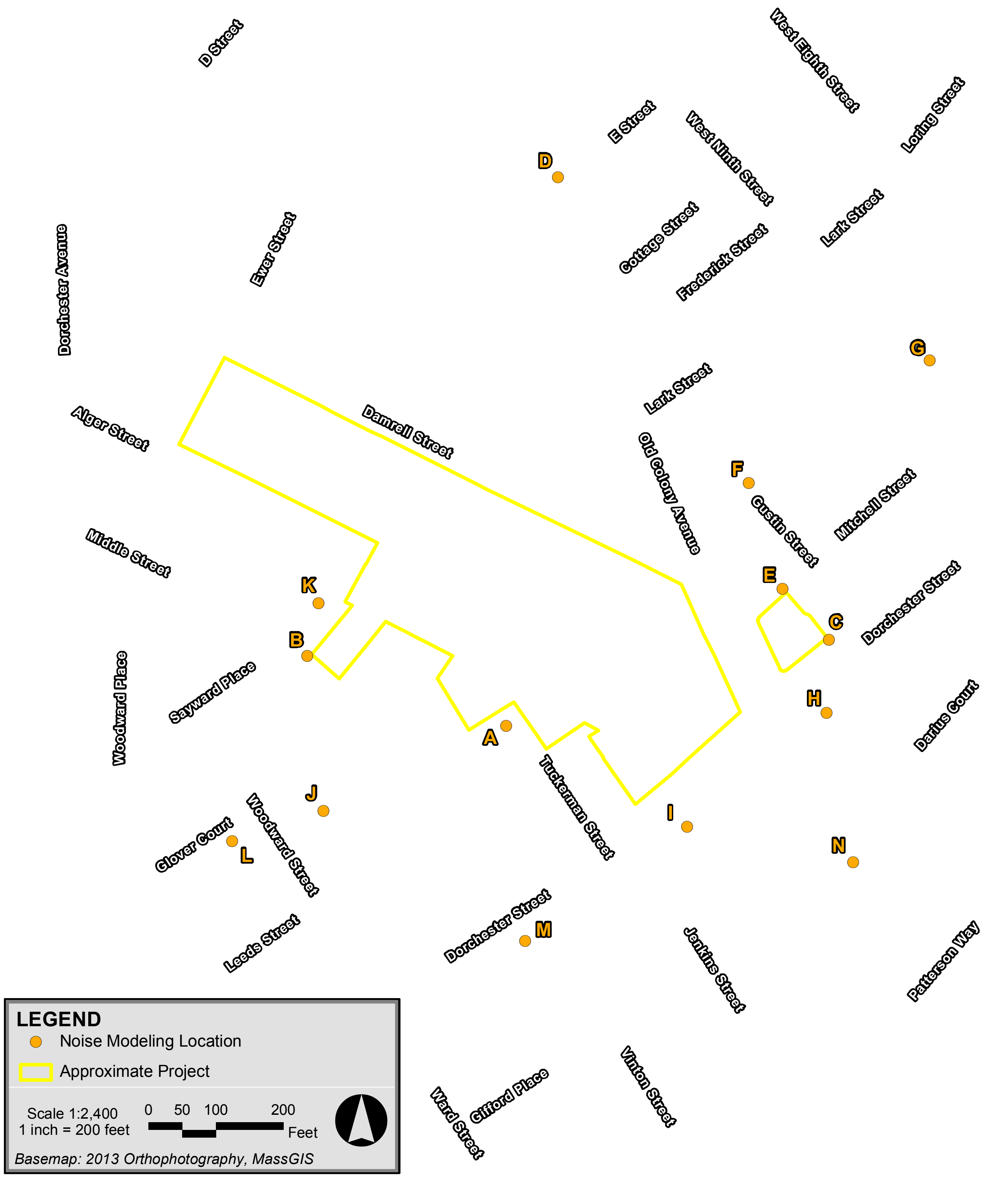

Washington Village **Boston, Massachusetts**

Figure 3.10-2
Noise Modeling Locations

been applied to each of these locations. Predicted sound levels from Project-related equipment are within the broadband and octave-band nighttime limits under the City Noise Standards at the modeling locations. The evaluation is presented in Table 3.10-6.

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

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Recreational	46	56	54	53	50	45	38	32	25	16
B	Residential	39	47	44	43	40	38	33	29	23	13
C	Business	38	49	46	43	41	37	30	26	18	10
D	Residential	44	50	50	48	47	44	35	30	21	2
E	Residential	43	53	51	49	47	42	35	30	23	16
F	Residential	46	53	53	51	50	45	37	31	24	14
G	Residential	46	50	52	50	49	45	38	33	26	12
H	Residential	42	53	51	48	46	41	34	29	20	9
I	Residential	46	55	53	51	49	45	38	33	26	14
J	Residential	47	52	53	51	50	46	39	33	26	11
K	Residential	46	53	51	50	48	45	37	33	28	20
L	Residential	43	49	48	46	46	42	35	29	21	4
M	Residential	44	52	51	49	47	43	36	29	21	4
N	Residential	41	51	49	46	44	40	33	29	20	4
City of Boston Limits	Residential	50	68	67	61	52	46	40	33	28	26

3.10.5.4 Future Sound Levels - Daytime

As noted above, the emergency generator will only operate during the day for brief, routine testing when the background sound levels are high, or during an interruption of power from the electrical grid. A second analysis combined noise from the Project's mechanical equipment and its emergency generator to reflect worst-case conditions. The sound levels were calculated at the same receptors as in the nighttime analysis, and then were evaluated against daytime limits. The predicted exterior Project-only daytime sound levels range from 38 to 51 dBA at nearby receptors. Predicted sound levels from Project-related equipment are within the daytime broadband and octave-band limits under the City Noise Standards at each of the modeling locations. This evaluation is presented in Table 3.10-7.

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

Modeling Location ID	Zoning / Land Use	Broadband (dBA)	Sound Level (dB) per Octave Band Center Frequency (Hz)								
			31.5	63	125	250	500	1k	2k	4k	8k
A	Recreational	49	64	63	58	54	46	39	34	26	16
B	Residential	41	59	56	48	44	39	33	29	23	13
C	Business	38	53	49	44	41	37	30	26	18	10
D	Residential	45	60	59	52	49	44	36	30	21	2
E	Residential	44	57	56	52	48	42	35	30	23	16
F	Residential	47	59	59	54	51	46	37	32	25	14
G	Residential	49	60	62	57	54	47	40	35	27	12
H	Residential	43	57	55	50	47	41	34	30	20	9
I	Residential	50	63	62	57	54	48	41	37	28	14
J	Residential	51	62	61	56	55	48	41	37	29	12
K	Residential	48	64	62	56	52	45	38	33	28	20
L	Residential	51	64	64	58	57	48	41	37	30	9
M	Residential	51	65	64	59	55	47	40	37	29	6
N	Residential	47	60	62	56	52	44	37	32	23	4
City of Boston Limits	Residential	60	76	75	69	62	56	50	45	40	38

3.10.6 Conclusions

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

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

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

3.11 Construction Impacts

3.11.1 Introduction

A Construction Management Plan (CMP) in compliance with the City's Construction Management Program will be submitted to the Boston Transportation Department (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, which ensure public safety and protect nearby residences and 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 Project is proposed to be built in three phases. Phase 1 includes the construction of Buildings A, B, E, F and G, as well as the ground floor retail and parking portions of Buildings C and D. Phase 2 will include the residential portion of Building C and Building H. Phase 3 will include the residential portion of Building D. This phasing is subject to change and may evolve over time to meet the demands of a dynamic real estate market and the capital markets.

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. Notification should occur during normal business hours, Monday through Friday. 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; certain components must be completed in a single pour, and placement of concrete cannot be interrupted.

3.11.4 Construction Staging/Access

Access to the 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. As part of this process, the Proponent and construction team will evaluate the Commonwealth's Clean Air Construction Initiative.

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 Charles River" 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 1,250 construction jobs will be created over the length of construction. The Proponent will make reasonable good-faith efforts to have at least 50% of the total employee work hours be for Boston residents, at least 25% of total employee work hours be for minorities and at least 10% of the total employee work hours be for women. The Proponent will enter into jobs agreements with the City of Boston.

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 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, pursuant to this Article 80 approval. 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 the 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 Vibration

All means and methods for performing work at the site will be evaluated for potential vibration impacts on adjoining property, utilities, and adjacent existing structures. Acceptable vibration criteria will be established prior to construction, and vibration will be monitored, if required, during construction to ensure compliance with the agreed-upon standard.

3.11.11 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.

3.11.12 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.

3.11.13 Rodent Control

A rodent extermination certificate will be filed with each 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 each phase of the Project, in compliance with the City's requirements.

3.12 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

4.0 SUSTAINABLE DESIGN AND CLIMATE CHANGE PREPAREDNESS

4.1 Sustainable Design

The Project is located in an underdeveloped area of South Boston with existing infrastructure and within one-quarter mile of an MBTA station. The site will include neighborhood retail, which will allow residents to take care of some of their needs without leaving the site. New open spaces will improve the pedestrian experience and allow stormwater infiltration. The buildings will be designed to meet current building and energy codes to minimize energy and water use, as well as reduce greenhouse gas emissions.

Article 37 of the Boston Zoning Code requires that projects that are subject to Article 80B, Large Project Review, be Leadership in Energy and Environmental Design (LEED) certifiable. The Project will use the LEED for Neighborhood Development 2009 rating system to show Article 37 compliance. The Proponent does not anticipate seeking LEED certification.

The following is a credit-by-credit analysis of the Project team's approach for achieving LEED-ND v2009 at the Silver level by currently targeting 57 credit points. There are a number of additional credit points, listed in italics below, which are still under consideration and will be decided as the design develops and engineering assumptions are substantiated. The LEED-ND v2009 checklist is included at the end of this section. The discussion below and associated checklist are preliminary and will be updated as the design of the Project moves forward.

Smart Location and Linkage

<u>SLLp1 – Smart Location:</u> The Project site includes existing water and wastewater infrastructure, and is an infill site.

<u>SLLp2 – Imperiled Species and Ecological Communities:</u> The Project site does not include imperiled species or ecological communities.

<u>SLLp3 – Wetland and Water Body Conservation:</u> The Project site does not contain wetlands or water bodies, and is not within 50 feet of a wetland nor within 100 feet of a water body.

<u>SLLp4 – Agricultural Land Conservation:</u> The Project site is an infill site that is not located within a state or locally designated agricultural preservation district.

<u>SLLp5 – Floodplain Avoidance:</u> The Project site is not located within a 100-year floodplain.

<u>SLLc1 – Preferred Locations:</u> The Project site is a previously developed infill site. The area around the site has an existing connectivity of between 300 and 350 intersections per square mile. The Project also anticipates achieving 2 points under NPDc4, Option 2.

SLLc2 – Brownfield Redevelopment: The portion of the Project site has been documented as contaminated. See Section 3.9 for more information.

SLLc3 – Locations with Reduced Automobile Dependence: Building entrances are all located within one-half mile of Andrew Station on the MBTA Red Line. The Red Line offers more than 320 weekday and more than 200 weekend trips.

SLLc4 – Bicycle Network and Storage: The Project site is located within one-quarter mile of a bicycle network as identified by the City of Boston Bike Network Plan. The Project will include bicycle racks consistent with BTD guidelines. However, the inclusion of shower and changing facilities for nonresidents is still being studied.

SLLc5 – Housing and Jobs Proximity: At least 30% of the Project's total floor area will be residential. The area around the Project may have 700 or more full-time jobs, which would achieve this credit.

SLLc6 – Steep Slope Protection: The Project site does not contain existing slopes greater than 15%.

SLLc7 – Site Design for Habitat or Wetland and Water Body Conservation: The Project site does not contain significant habitat, and the Project will fulfill the requirements of SLL Prerequisite 3 as described above.

Neighborhood Pattern and Design

NPDp1 – Walkable Streets: The Project will meet the requirements of this credit with improved sidewalks, plazas, and open spaces, as well as no surface parking lots outside of building entrances.

NPDp2 – Compact Development: The Project will meet the density requirements of this prerequisite—more than 12 dwelling units per acre.

NPDp3 – Connected and Open Community: The Project includes a number of streets and pedestrian ways to meet the requirements of this prerequisite.

NPDc1 – Walkable Streets: The Project is anticipated to meet at least 11 of the items listed to achieve this credit, including, but not limited to: having at least 80% of the total linear feet of street-facing building facades no more than 25 feet from the property line and at least 50% no more than 18 feet from the property line; at least 50% of the total linear feet of non-residential street facing building facades is within one foot of a sidewalk or other pedestrian space; functional entries to the building will occur at an average of 75 feet or less along building facades; blank walls along sidewalks will be no more than 40% of the façade's length or 50 feet; all ground floor retail spaces will be accessible from a public space and not a parking lot; and , bat-grade crossings with driveways will account for no more than 10% of the length of the sidewalks within the Project.

NPDc2 – Compact Development: The Project will include more than 63 dwelling units per acre.

NPDc3 – Mixed-use Neighborhood Centers: The surrounding area includes at least one use from the four identified categories, and including the proposed retail on site, will include more than 19 diverse uses within one-quarter mile walking distance for at least 50% of the dwelling units.

NPDc4 – Mixed-income Diverse Communities: The Project will include affordable units for a variety of incomes, including units in compliance with the Inclusionary Development Policy.

NPDc6 – Street Network: The Project and surrounding area (within ¼-mile of the boundary of the site) includes more than 400 intersections per square mile.

NPDc8 – Transportation Demand Management: The Project will include a TDM program as described in Section 2.5.

NPDc9 – Access to Civic and Public Spaces: The Project includes two green spaces and a number of plazas that will meet the requirements of this credit, including the Green and Plaza at the center of the site north of Alger Street between Buildings A and B.

NPDc10 – Access to Recreation Facilities: The Project site is located within a one-half mile walk of Joe Moakley Park which includes playgrounds, baseball diamonds, soccer fields, tennis courts and basketball courts.

NPDc12 – Community Outreach and Involvement: The Project team has met with a number of community groups, and anticipates future meetings that will meet the requirements of this credit.

NPDc14 – Tree-lined and Shaded Streets: The Project will include more than 150 new street trees through and around the site.

NPDc15: Neighborhood Schools: The Project site is located within one-half mile walk distance from the Michael J. Perkins School.

Green Infrastructure and Buildings

GIBp1 – Certified Green Building: The end of this chapter includes a checklist for Building C showing it meets the certifiable criteria. As the Project moves forward, another building may be chosen to meet this requirement.

GIBp2 – Minimum Building Energy Efficiency: This prerequisite requires that the new buildings demonstrate on average a 10% improvement over ANSI/ASHRAE/IESNA Standard 90.1-2007, with errata but without addenda. The Project's buildings will exceed this requirement as the will be built to the building requirements at the time of receiving their building permit, which will be more stringent than the LEED requirement.

GIBp3 – Minimum Building Water Efficiency: The Project will meet the prerequisite's requirements of water usage on average at least 20% less than the baseline.

GIBp4 – Construction Activity Pollution Prevention: The Project will have an erosion and sedimentation control plan for all construction activities.

GIBc2 – Building Energy Efficiency: The Project will demonstrate, on average, a reduction of energy cost of at least 18% from the baseline.

GIBc7 – Minimized Site Disturbance in Design and Construction: The Project site is previously developed and does not contain existing trees.

GIBc8 – Stormwater Management: The Project will have a stormwater management plan that will result in the capture and recharge of at least the 85^{th} percentile rainfall event.

GIBc9 – Heat Island Reduction: The Project will include a number of measures to reduce the heat island effect, including high SRI materials on rooftops, vegetative rooftops and shade trees.

GIBc10 – Solar Orientation: The Project will be located on existing blocks, meeting the requirements of this credit.

Innovation in Design

IDc2 – LEED Accredited Professional: The Project team includes at least one LEED AP.

Regional Priority

Regional Priority Credits (RPC) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project. This Project anticipates achieving four RPCs for the following: SLLc2, NPDc4, NPDc8, and NPDc9.

4.2 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 roofs of the low and mid-rise units will be almost entirely devoted to roof-top mechanical space. There will be limited space available on top of Buildings C and D. With a total of approximately 15,000 sf, approximately 5,000 sf would be devoted to rooftop mechanical space. Additionally, approximately 50% of the remaining space would be set aside for space around the panels, between panels, etc. This leaves approximately 5,000 sf available for rooftop solar. Assuming 12 watts per square foot, this allows for a 60 kW array. Based on early energy modeling, this could offset approximately 25% of the Project's common area usage. In the location proposed, the installation of this solar array equals an annual generation of 72.2 MW hours, or a GHG reduction of 26.4 tons.

4.3 Climate Change Preparedness

4.3.1 Introduction

Climate change conditions considered by the Project team include sea level rise, higher maximum and mean temperatures, more frequent and longer extreme heat events, more frequent and longer droughts, more severe freezing rain and heavy rainfall events, and increased wind gusts.

The expected life of the Project is anticipated to be approximately 50 years. Therefore, the Proponent planned for climate-related conditions projected 50 years into the future. A copy of the completed Checklist is included in Appendix D. Given the preliminary level of design, the responses are also preliminary and may be updated as the Project design progresses.

4.3.2 Extreme Heat Events

The Intergovernmental Panel on Climate Change (IPCC) has predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from the current five-to-twenty days annually, to thirty-to-sixty days annually.[1] The Project design will incorporate a number of measures to minimize the impact of high temperature events, including:

- Installing operable windows where possible;
- Planting shade trees around the site;
- Installing a high performance building envelope; and
- Specifying high albedo roof tops and green roofs to minimize the heat island effect.

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[1] IPCC (Intergovernmental Panel on Climate Change), 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Avery, M. Tignor, and H. L. Miller (eds.)]. Cambridge University Press, Cambridge, UK, and New York, 996 pp.

Energy modeling for the Project has not yet been completed; however, the Proponent will strive to reduce the Project's overall energy demand and greenhouse gas emissions that contribute to global warming. Due to the Project's proximity to Andrew Station, the Project proposes a parking ratio of approximately 0.63 for residential uses, and will encourage alternative modes of transportation through the Project's TDM program, as described in Section 2.5. The Proponent is also studying the inclusion of solar photovoltaic and combined heat and power, further reducing the Project's greenhouse gas emissions.

4.3.3 Sea Level Rise

According to the IPCC, if the sea level continues to rise at historic rates, the sea level in Massachusetts as a whole will rise by one foot by the year 2100. However, using a high emissions scenario of climate change, sea level rise could reach six feet by 2100. Adding this potential rise to the mean higher high water (MHHW) level, in 50 years the MHHW could be as high as 13.2 feet Boston City Base (BCB), assuming a sea level rise of approximately two feet.[2] The first floor elevation of the Project is more than 15 feet BCB, and the Project site is located more than 2,000 feet from the ocean.

Sea level rise is also a concern when combined with a large storm. The US Army Corps of Engineers updated hurricane inundation maps in March 2013 for coastal areas of Massachusetts as part of an update to the New England Hurricane Evacuation Study.[3] These maps, created using the Sea, Lake and Overland Surges from Hurricanes (SLOSH) model developed by the National Weather Service, estimate the potential impact from hurricanes categorized as 1 through 4 on the Saffir-Simpson Hurricane Wind Scale. These maps provide a worst case scenario based on timing, wind speeds, location of landfall and other criteria. Variations of these criteria, such as a hurricane making landfall during low tide, would be estimated to result in a decreased impact from what is shown on the map. Future sea level rise would be in addition to the inundation shown on the maps.

The hurricane inundation map shows that approximately half of the site could be flooded by a Category 1 hurricane, while most of the site could be flooded by a Category 2 hurricane. Almost the entire site could be flooded by Category 3 or 4 hurricanes. To minimize the impact of flooding, the garage of Building D will be able to be inundated in the event of flooding, critical mechanical equipment will be located above the potential flood level, and the Project will include water-tight utility conduits. As the design progresses, the Project team will evaluate additional measures to improve resilience, including, but not limited to, increasing the first floor elevation of certain buildings, increased back-up power generation, and safe rooms for residents.

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2 "Preparing for the Rising Tide". The Boston Harbor Association. February 2013.
3 http://www.mass.gov/eopss/agencies/mema/hurricane-inundation-maps.html, accessed September 2015.

4.3.4 Rain Events

As a result of climate change, the Northeast is expected to experience more frequent and intense storms. To mitigate this, the Proponent will take measures to minimize stormwater runoff and protect the Project's mechanical equipment. The Project will be designed to reduce the existing peak rates and volumes of stormwater runoff from the site, and promote runoff recharge to the greatest extent practicable. The Project will increase the pervious area on the site from the existing condition, creating infiltration ability on the site. Additional measures include:

- Incorporating green roofs on several buildings;
- Incorporating new green spaces;
- Incorporating pervious pavers where feasible;
- Locating critical mechanical and electrical equipment at the highest elevation possible to prevent exposure to flood waters; and
- Locating the backup generators above the potential flood elevation.

4.3.5 Drought Conditions

Although more intense rain storms are predicted, extended periods of drought are also predicted due to climate change. Under the high emissions scenario, the occurrence of droughts lasting one to three months could go up by as much as 75% over existing conditions by the end of the century. To minimize the Project's susceptibility to drought conditions, the landscape design is anticipated to incorporate native and adaptive plant materials and high efficiency irrigation systems will be installed. Aeration fixtures and appliances will be chosen for water conservation qualities, conserving potable water supplies.

LEED 2009 For Neighborhood Development

Project Checklist

Project Name: **Washington Village**

Date: **9/15/2015**

Y	?	N	Smart Location and Linkage		Possible Points: 27
20	5	2			
Y			Prereq 1	Smart Location	Req
Y			Prereq 2	Imperiled Species and Ecological Communities	Req
Y			Prereq 3	Wetland and Water Body Conservation	Req
Y			Prereq 4	Agricultural Land Conservation	Req
Y			Prereq 5	Floodplain Avoidance	Req
10			Credit 1	Preferred Locations	10
1	1		Credit 2	Brownfield Redevelopment	2
7			Credit 3	Locations with Reduced Automobile Dependence	7
	1		Credit 4	Bicycle Network and Storage	1
	3		Credit 5	Housing and Jobs Proximity	3
1			Credit 6	Steep Slope Protection	1
1			Credit 7	Site Design for Habitat or Wetland and Water Body Conservation	1
		1	Credit 8	Restoration of Habitat or Wetlands and Water Bodies	1
		1	Credit 9	Long-Term Conservation Management of Habitat or Wetlands and Water Bodies	1

			Neighborhood Pattern and Design		Possible Points: 44
26	14	4			
Y			Prereq 1	Walkable Streets	Req
Y			Prereq 2	Compact Development	Req
Y			Prereq 3	Connected and Open Community	Req
8	4		Credit 1	Walkable Streets	12
5	1		Credit 2	Compact Development	6
4			Credit 3	Mixed-Use Neighborhood Centers	4
2	5		Credit 4	Mixed-Income Diverse Communities	7
		1	Credit 5	Reduced Parking Footprint	1
2			Credit 6	Street Network	2
		1	Credit 7	Transit Facilities	1
1	1		Credit 8	Transportation Demand Management	2
1			Credit 9	Access to Civic and Public Spaces	1
1			Credit 10	Access to Recreation Facilities	1
		1	Credit 11	Visitability and Universal Design	1
	2		Credit 12	Community Outreach and Involvement	2
		1	Credit 13	Local Food Production	1
1	1		Credit 14	Tree-Lined and Shaded Streets	2
1			Credit 15	Neighborhood Schools	1

Y	?	N	Green Infrastructure and Buildings		Possible Points: 29
6	6	17			
Y			Prereq 1	Certified Green Building	Req
Y			Prereq 2	Minimum Building Energy Efficiency	Req
Y			Prereq 3	Minimum Building Water Efficiency	Req
Y			Prereq 4	Construction Activity Pollution Prevention	Req
		5	Credit 1	Certified Green Buildings	5
1		1	Credit 2	Building Energy Efficiency	2
		1	Credit 3	Building Water Efficiency	1
		1	Credit 4	Water-Efficient Landscaping	1
		1	Credit 5	Existing Building Use	1
		1	Credit 6	Historic Resource Preservation and Adaptive Reuse	1
1			Credit 7	Minimized Site Disturbance in Design and Construction	1
2	1	1	Credit 8	Stormwater Management	4
1			Credit 9	Heat Island Reduction	1
1			Credit 10	Solar Orientation	1
	3		Credit 11	On-Site Renewable Energy Sources	3
	2		Credit 12	District Heating and Cooling	2
		1	Credit 13	Infrastructure Energy Efficiency	1
		2	Credit 14	Wastewater Management	2
		1	Credit 15	Recycled Content in Infrastructure	1
		1	Credit 16	Solid Waste Management Infrastructure	1
		1	Credit 17	Light Pollution Reduction	1

			Innovation and Design Process		Possible Points: 6
1	5				
	1		Credit 1.1	Innovation in Design: Specific Title	1
	1		Credit 1.2	Innovation in Design: Specific Title	1
	1		Credit 1.3	Innovation in Design: Specific Title	1
	1		Credit 1.4	Innovation in Design: Specific Title	1
	1		Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1

			Regional Priority Credits		Possible Points: 4
4					

Regional Priority Credits are: SLLc2, NPDc4, NPDc8, NPDc9, GIBc2, GIBc5

1			Credit 1.1	Regional Priority: SLLc2	1
1			Credit 1.2	Regional Priority: NPDc4	1
1			Credit 1.3	Regional Priority: NPDc8	1
1			Credit 1.4	Regional Priority: NPDc9	1

			Total	Possible Points: 110
57	30	23		

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

LEED 2009 for New Construction and Major Renovations

Project Checklist

Sustainable Sites

Y	?	N		Sustainable Sites	Possible Points: 26
20	2	4			
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
5			Credit 2	Development Density and Community Connectivity	5
1			Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
	1		Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
		1	Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
	1		Credit 7.2	Heat Island Effect—Roof	1
		1	Credit 8	Light Pollution Reduction	1

Water Efficiency

Y	?	N		Water Efficiency	Possible Points: 10
2	8				
Y			Prereq 1	Water Use Reduction—20% Reduction	
	4		Credit 1	Water Efficient Landscaping	2 to 4
	2		Credit 2	Innovative Wastewater Technologies	2
2	2		Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere

Y	?	N		Energy and Atmosphere	Possible Points: 35
9	4	23			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
4	2	14	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
2			Credit 3	Enhanced Commissioning	2
2			Credit 4	Enhanced Refrigerant Management	2
1	2		Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

Materials and Resources

Y	?	N		Materials and Resources	Possible Points: 14
4	4	6			
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N		Materials and Resources, Continued	
1	1		Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

Indoor Environmental Quality

Y	?	N		Indoor Environmental Quality	Possible Points: 15
9	4	2			
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
	1		Credit 1	Outdoor Air Delivery Monitoring	1
	1		Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
	1		Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
	1		Credit 7.2	Thermal Comfort—Verification	1
		1	Credit 8.1	Daylight and Views—Daylight	1
		1	Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process

Y	?	N		Innovation and Design Process	Possible Points: 6
5	1				
1			Credit 1.1	Innovation in Design: Exemplary Performance SSc2	1
1			Credit 1.2	Innovation in Design: Exemplary Performance SSc7.1	1
1			Credit 1.3	Innovation in Design: Exemplary Performance SSc4.3	1
1			Credit 1.4	Innovation in Design: Energy Star	1
	1		Credit 1.5	Innovation in Design:	1
1			Credit 2	LEED Accredited Professional	1

Regional Priority Credits

Y	?	N		Regional Priority Credits	Possible Points: 4
3					
1			Credit 1.1	Regional Priority: SSc3	1
1			Credit 1.2	Regional Priority: SSc6.1	1
1			Credit 1.3	Regional Priority: SSc7.1	1
			Credit 1.4	Regional Priority:	1

Total

Y	?	N	Total	Possible Points: 110
52	23	35		

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

Chapter 5.0

Urban Design

5.0 URBAN DESIGN

The approximately 4.89-acre Project site is located in the South Boston neighborhood of Boston, and is generally bound by Dorchester Avenue to the west, Dorchester Street to the east, Damrell Street to the north, and Tuckerman Street, Middle Street, and residential and commercial properties to the south. The Project site includes surface parking, outdated and underutilized, vacant site area and one and two story industrial/commercial buildings that border streets with very narrow sidewalks and no open space. Although the site has been used for light industrial and commercial uses, within a one-quarter mile radius, most of the land use is residential with nearby amenities that create a well-rounded community, such as Andrew Square, Andrew Station and Joe Moakley Park (see Figure 5-1).

Furthering the policy goals of Mayor Martin J. Walsh's 2030 Housing Plan and consistent with the community's vision, as outlined in Andrew Square Civic Association's 2005 Andrew Square Master Plan, the Project will transform this underutilized site into a vibrant mixed-use village that will be a natural extension of the surrounding South Boston neighborhood.

The principles governing this development with a purpose are described below.

Connect to the Surrounding Neighborhood - The Project aims to overcome the isolation of the industrial site by connecting, both physically and symbolically, to the surrounding neighborhood and the public amenities in the area. Six new streets will open up the 'superblocks' that currently exist, introducing the South Boston street grid (see Figure 5-2) that results in six new city blocks. The new streets provide both physical and visual connections through the site, and include the widening of existing sidewalks along Damrell Street, Old Colony Avenue and Dorchester Street which will be redeveloped to include new street trees and lighting. The new open spaces, particularly the open space on Tuckerman Street, are intended to bring the surrounding neighbors onto the site and be welcoming.

Create Dynamic new Retail Meeting Place – The Project aspires to answer the need for neighborhood retail and restaurants to serve the area, a primary objective of the ASCA 2005 Andrew Square Master Plan, including a small grocery, pharmacy and a host of other convenience needs not currently provided in the area. This new commercial center has the potential to become the social hub for the surrounding community.

Active Public Realm and Open Space - With more than two acres of new public realm proposed, the Project will resemble the best neighborhoods in Boston (see Figure 5-3). A new yard, covering nearly one acre on the new shared street that is the extension of Alger Street, will provide the focus for a series of ground floor retail spaces, including cafes and restaurants that spill onto the sidewalks and activate the streets, as well as the residential units on the upper floors (see Figure 5-4).

The streets, in the tradition of great Boston residential neighborhoods, will be tree-lined, pedestrian-scaled and populated with as many storefront entrances as possible. Buildings on the edges of the site will be of appropriate density and scale to reinforce the continuity of the urban character of the streets.

Opportunity for a Diverse Community - The Project will include a mix of housing options for a mix of incomes, creating a diverse community for those wanting to downsize but stay within South Boston, and new residents seeking to put down roots. To achieve this diversity, the vision for the development includes creating housing for a mix of incomes, with a significant emphasis on residential units priced below many new residential units that have been built recently in Downtown Boston and nearby neighborhoods.

The variety of housing sizes and building typologies are intended for a range of family sizes, from single individuals to larger families, and they will all be accessible to elderly and disabled residents. Public spaces will also reflect the diversity of needs within the community. These spaces will include play areas for children, spaces for social gatherings and areas for passive recreation.

Transit-Oriented Development - The site's proximity to the MBTA's Andrew Station has also informed the vision and design of the Project, since many residents will not need a vehicle to travel to their jobs or other destinations around Boston. The Project is anticipated to include everyday services and goods, minimizing the need for residents to travel elsewhere to meet their basic needs. In addition to the site's future residents, the development will also be a destination for shoppers from the surrounding area, offering services and retail shops, mixed with outdoor dining, pedestrian plazas, and landscaped open spaces.

Create an Environmentally and Socially Sustainable Community -The buildings will be designed with energy efficiency and sustainability in mind. The principles of the Master Plan include an emphasis on limiting parking and utilizing multi-story garages to limit the amount of impervious surfaces.

The design strives toward energy efficiency including a high performance building envelope, extremely efficient mechanical and electrical system design and sophisticated site and stormwater technologies. The Project will also be certifiable under LEED for Neighborhood Development (see Chapter 4).

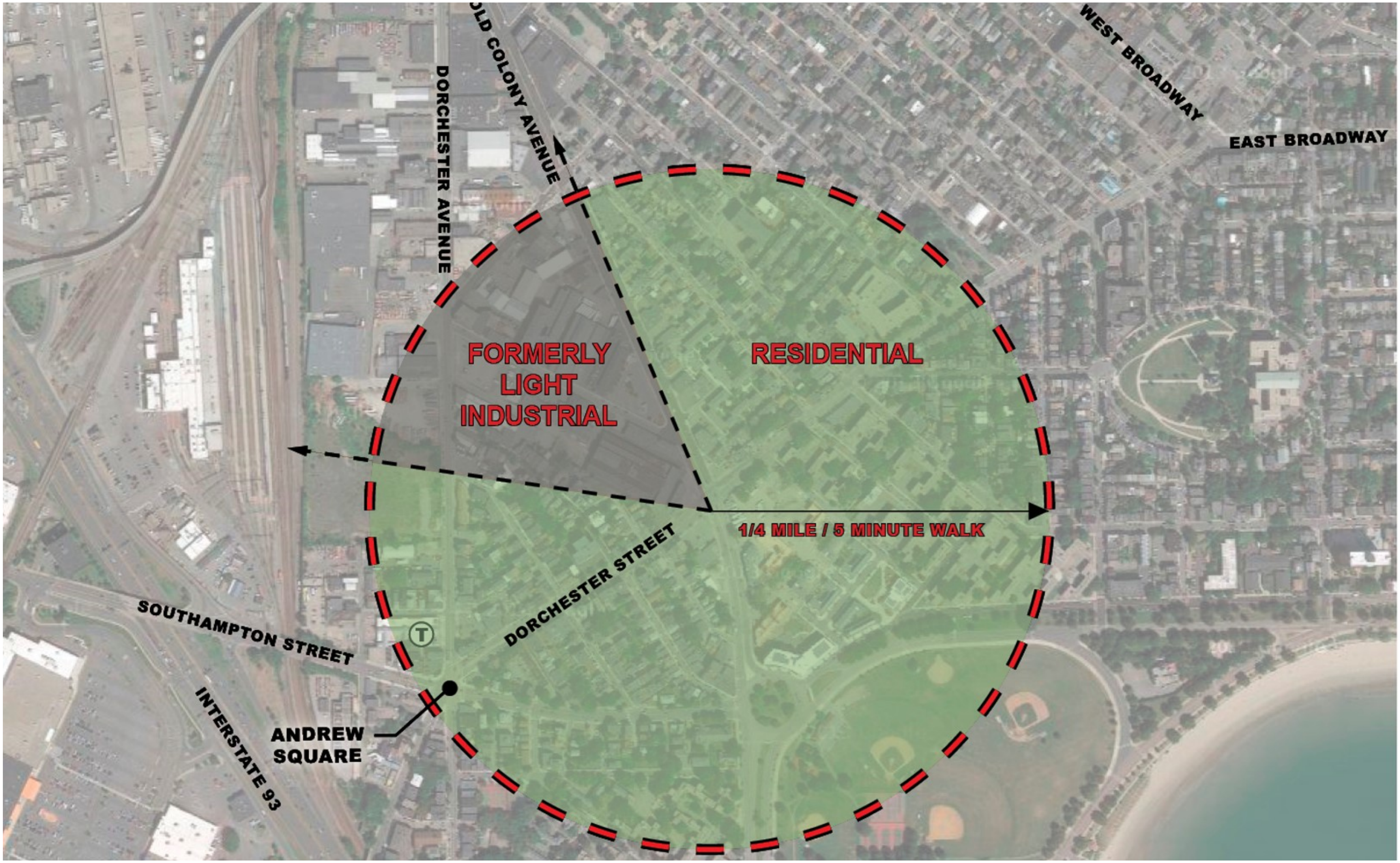


Figure 5-1
Site Context

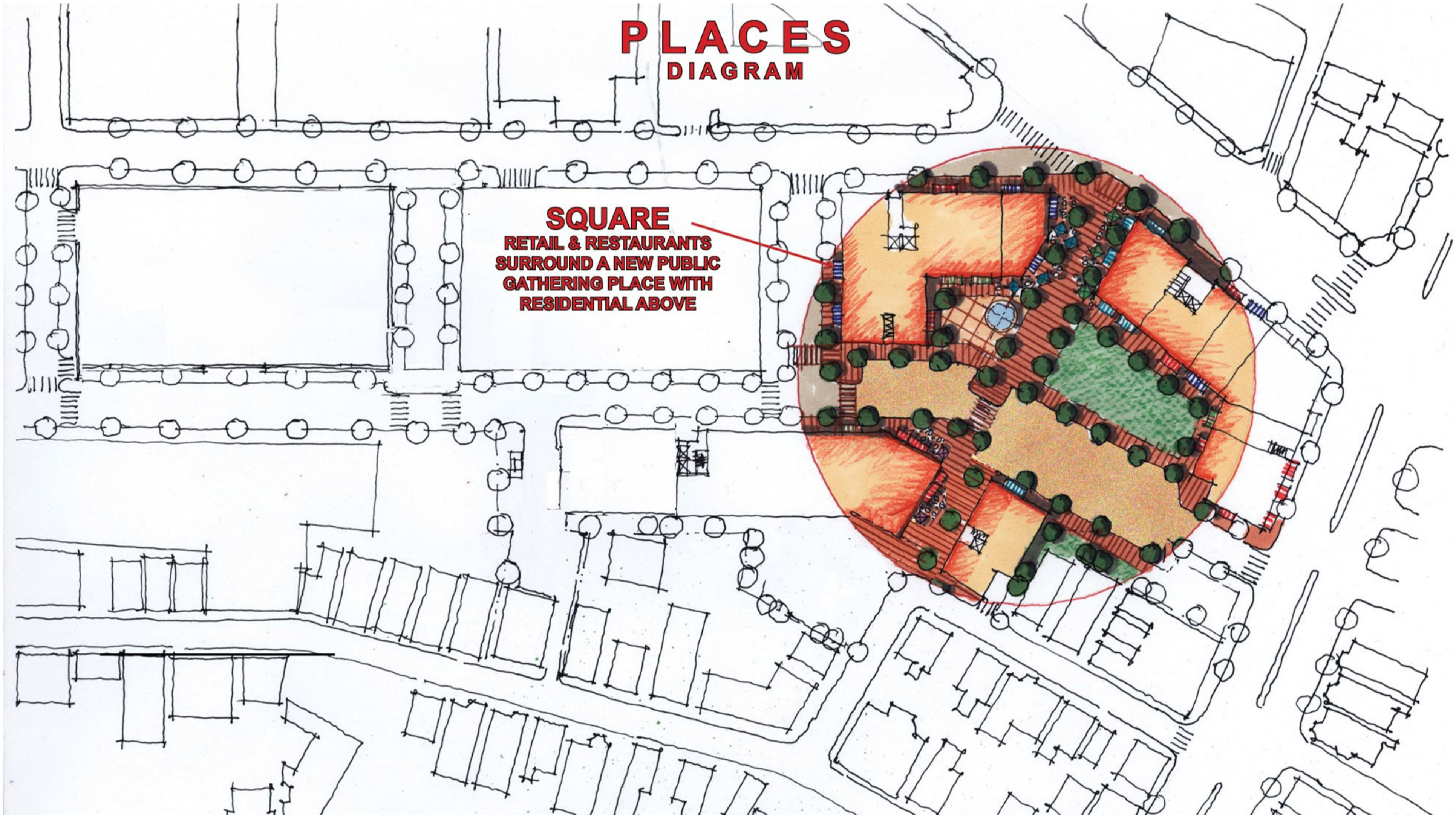
PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

Figure 5-2

Street Grid

Figure 5-3

Sidewalks



Washington Village Boston, Massachusetts

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

Figure 5-4

Public Space

Chapter 6.0

Historic and Archaeological Resources

6.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

6.1 Introduction

This section of the PNF identifies and describes historic resources on the Project site and within the vicinity of the Project, and assesses potential Project related impacts.

6.2 Historic Resources on the Project Site

The Project site is located at 235 Old Colony Avenue in South Boston at the northwest corner of the intersection of Old Colony Avenue and Dorchester Street. The site consists of an approximately 4.89-acre industrial property that is currently comprised predominately of 20th century industrial and commercial buildings that will be removed to accommodate the proposed new construction.

There are no buildings, sites, structures or objects on the Project site that are listed in the State or National Registers of Historic Places. There is one building located on the Project site that is included in the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth. Located at 27-37 Damrell Street, the S.A. Woods Woodworking Machinery Company Stable (MHC# BOS.6849) was constructed ca. 1886. The one-story brick building is the last surviving building from the S.A. Woods complex and is located on the south side of Damrell Street in the northwest portion of the Project site. Heavily altered by late 20th century additions and alterations, the building retains little architectural integrity. The windows of the building's façade have been brick filled and/or replaced with modern aluminum sash windows. The façade's entry has been infilled with an aluminum entry and arched aluminum transom sash window. Along the west elevation, a one-story cement block building replaced an original two-story building. The existing building will be removed to accommodate the Project's new construction.

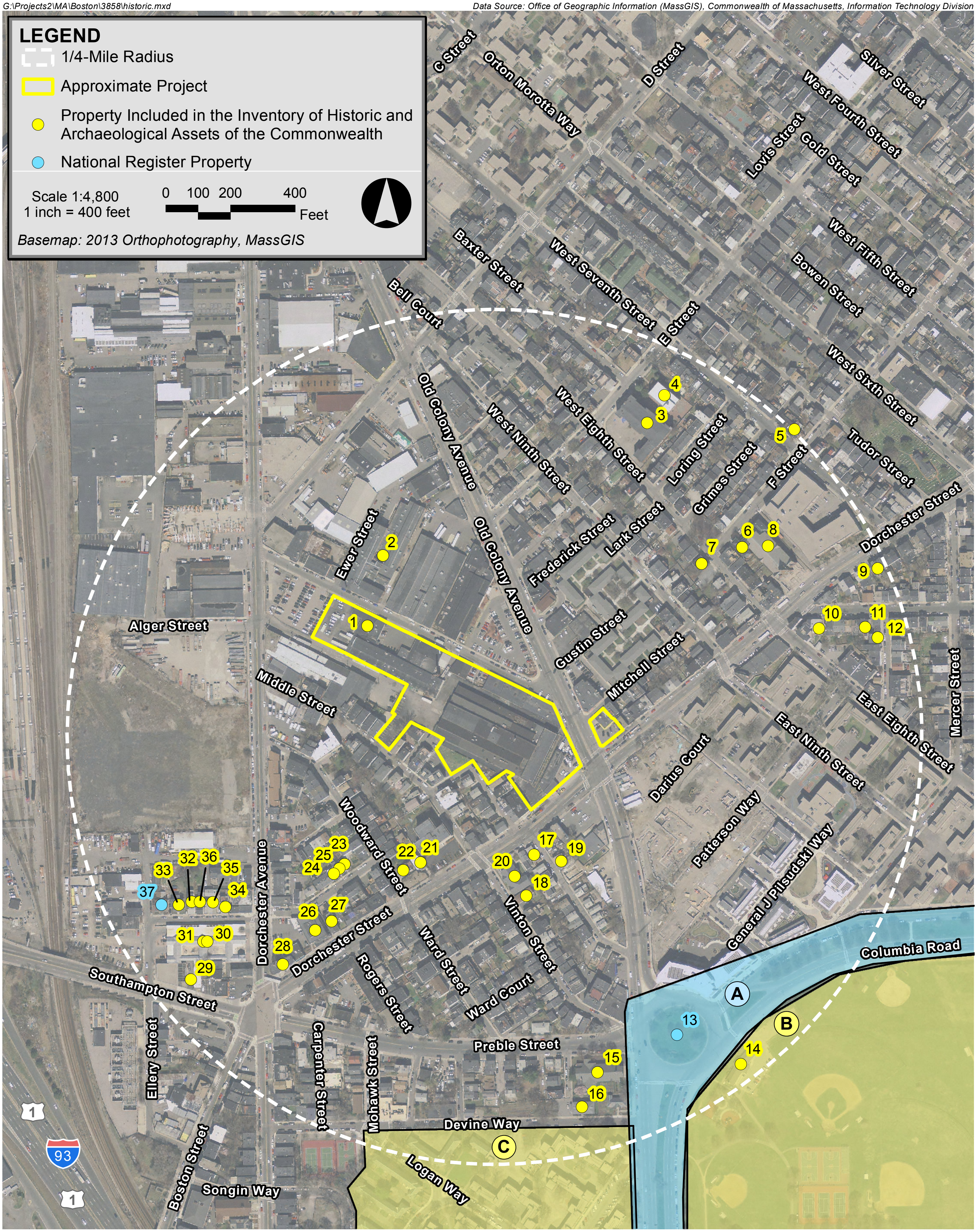
6.2.1 Historic Resources in the Project Vicinity

Historic resources within the Project's vicinity include the State and National Register listed Old Harbor Reservation Parkways which includes portions of Old Colony Avenue and Columbia Road southeast of the Project site. The Old Harbor Reservation Parkways was listed in the National Register of Historic Places in 2008 as part of a Multiple Property National Register Nomination for the parkways of the former Metropolitan District Commission (MDC), now known as the Department of Conservation and Recreation.

In addition, there are numerous residential and institutional properties located within a quarter-mile of the Project site that are included in the MHC Inventory. Table 6-1 below lists the State and National Register listed properties, and properties included in the MHC Inventory, within a quarter mile of the Project site. Figure 6-1 identifies the locations of the historic resources within and adjacent to the Project site.

G:\Projects2\MA\Boston\3858\historic.mxd

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



Washington Village Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 6-1

Historic Resources

Table 6-1 Historic Resources within One-Quarter Mile of the Project Site

Map No	Name	Address	Designation
A	Old Harbor Reservation Parkways	Columbia Road and Old Colony Avenue	National Register
B	South Boston Waterfront District	Columbus Park/Carson Beach-William J. Day Boulevard	MHC Inventory
C	Old Harbor Village	Logan Way, O'Callaghan Way	MHC Inventory
1	Woods, S.A Woodworking Machinery Company Stable	27-37 Damrell Street	MHC Inventory
2	Woods, S.A. Woodworking Machinery Company	28 Damrell Street	MHC Inventory
3	Saint Augustine Roman Catholic Church Complex	201 E Street	MHC Inventory
4	Saint Augustine Roman Catholic Church Convent	207 E Street	MHC Inventory
5	Cunningham, Mary-Furber, Benjamin Double House	190-192 West Seventh Street	MHC Inventory
6	Blessed Sacrament Roman Catholic Chapel	9 F Street	MHC Inventory
7	King, Augustus Double House	197-199 West Eighth Street	MHC Inventory
8	Saint Augustine Roman Catholic Church and Rectory	225 Dorchester Street	MHC Inventory
9	Mason, William H. House	200 Dorchester Street	MHC Inventory
10	Delaporte, Andre Gustave House	5 Telegraph Street	MHC Inventory
11	Mullin, Thomas M. – Willis, John E. Double House	19-21 Telegraph Street	MHC Inventory
12	Reardon, John W. House	7 Knowlton Street	MHC Inventory
13	Preble Circle, Old Harbor Reservation Parkway	Columbia Road	National Register
14	Columbus Park Building	William J. Day Blvd	MHC Inventory
15	Saint Monica's Roman Catholic Church	333 Old Colony Avenue	MHC Inventory
16	Saint Monica's Roman Catholic Church Rectory	70 Gen. William Devine Way	MHC Inventory
17	Boston Fire House Horse Hose Company #10	330 Dorchester Street	MHC Inventory
18	Collierson, Bessie D. House	5 Vinton Street	MHC Inventory
19	Carpenter, J.B. Davis, C.B. Double House	10-12 Jenkins Street	MHC Inventory
20	Dorchester Street Methodist Episcopal Church	340 Dorchester Street	MHC Inventory

Table 6-1 Historic Resources within One-Quarter Mile of the Project Site (cont'd)

Map No	Name	Address	Designation
21	Richmond, Augustus C. House	381 Dorchester Street	MHC Inventory
22	Richmond, Augustus C. House	52-54 Woodward Street	MHC Inventory
23	Dame, Theodore S. House	2 Leeds Street	MHC Inventory
24	Sowden, F. House	6 Leeds Street	MHC Inventory
25	Beck, G. House	4 Leeds Street	MHC Inventory
26	Unity Unitarian Chapel-Washington Village Chapel	Dorchester Street	MHC Inventory
27	Hussey, Robert House	381 Dorchester Street	MHC Inventory
28	Duke, Maria Apartment House	397-403 Dorchester Street	MHC Inventory
29	Washington Village Substation	Southampton Street	MHC Inventory
30	Andrew Subway Station	Dorchester Ave	MHC Inventory
31	Andrew Street Car Transfer Station	Dorchester Ave	MHC Inventory
32	Clough, Joseph H. House	15 Dexter Street	MHC Inventory
33	Ellis, Charles H. House	23 Dexter Street	MHC Inventory
34	Gogin, Thomas House	7 Dexter Street	MHC Inventory
35	Roers, R. House	9 Dexter Street	MHC Inventory
36	Clough, Joseph H. House	15 Dexter Street	MHC Inventory
37	Wadleigh, Dexter- Sharp, William Double House	27-29 Dexter Street	MHC Inventory

6.3 Archaeological Resources

The Project site consists of previously developed urban parcels. Due to previous development activities and disturbances, no significant archaeological resources are anticipated to be located within the Project site.

6.4 Impacts to Historic Resources

6.4.1 Urban Design

The approximately 4.89-acre Project site is located in the South Boston neighborhood of Boston, and is generally bound by Dorchester Avenue to the west, Dorchester Street to the east, Damrell Street to the north, and Tuckerman Street, Middle Street, and residential and commercial properties to the south. The Project site includes surface parking, outdated and underutilized one and two story industrial and commercial buildings that stand in contrast to the surrounding residential neighborhood. The Project will transform this underutilized site into a vibrant mixed-use village that will be a natural extension of the surrounding late 19^{th} and early 20^{th} century South Boston neighborhood.

The Project aims to connect both physically and symbolically to the surrounding residential neighborhood. Six new streets will open up the 'superblocks' that currently exist, introducing the South Boston street grid. The new streets will provide both physical and visual connections similar to those found in the surrounding residential neighborhood.

6.4.2 Shadow Impacts

As discussed in Section 3.2, new shadow from the Project will generally be cast onto surrounding streets and sidewalks. The removal of buildings on the site will result in areas free of shadow on Alger Street and portions of Damrell Street. During several of the time periods studied, new shadow will be cast on the S.A. Woods Woodworking Machinery Company building located across the street from the Project site at 28 Damrell Street. Similar to the S.A. Woods Company building located on the Project site, the building at 28 Damrell Street is also a heavily altered brick industrial building included in the MHC Inventory with inappropriate late 20th century window and door replacements and infilled openings; as a result of these alterations the building retains little architectural integrity.

During the time periods studied, no new shadow will be cast onto nearby existing public open spaces including the State and National Register listed Old Harbor Reservation Parkways.

6.5 Status of Project Review with Historical Agencies

6.5.1 Massachusetts Historical Commission

The Project will require state actions that require review by the MHC under State Register Review (950 CMR 71.00). In a letter dated August 10, 2015 to the MEPA Office, MHC stated that the Project is unlikely to affect significant historic or archaeological resources. Appendix E contains a copy of the MHC's August 10, 2015 letter.

6.5.2 Boston Landmarks Commission

Because some of the structures on the Project site proposed for demolition are greater than 50 years old, the proposed demolition activities are subject to review by the Boston Landmarks Commission (BLC) in accordance with Article 85 of the Boston Zoning Code (Demolition Delay). At the appropriate time the Proponent will file an Article 85 application as required; however, it is anticipated that the BLC staff will find the buildings proposed for demolition not significant and will not require an Article 85 Demolition Delay hearing by the Commission. The Proponent will work with the BLC staff to complete the Article 85 review process.

Chapter 7.0

Infrastructure

7.0 INFRASTRUCTURE

7.1 Introduction

The Infrastructure Systems Component 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
- Drainage
- Natural gas
- Electricity
- Telecommunications

The Project includes the construction of eight residential buildings, most with ground floor retail, as well as parking and new open spaces, as described in Section 1.3.

7.2 Wastewater

7.2.1 Sewer Infrastructure

Existing Boston Water and Sewer Commission (BWSC) combined and separated sewer mains are located in Dorchester Avenue, Middle Street, Tuckerman Street, Damrell Street, Old Colony Avenue and Dorchester Street adjacent to the Project site.

Dorchester Avenue

There is a 57-inch by 66-inch BWSC combined sewer (South Boston Interceptor North Branch) in Dorchester Avenue which flows in a southerly direction and into the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal. There is a 15-inch BWSC sewer main in Dorchester Avenue which flows northerly before also connecting to the South Boston Interceptor North Branch.

Middle Street

There is a 12-inch by 18-inch BWSC combined sewer main in Middle Street which flows westerly before connecting to the South Boston Interceptor North Branch in Dorchester Avenue. The South Boston Interceptor North Branch then flows in a southerly direction and into the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

Alger Street

There is a 12-inch private combined sewer main in Alger Street which flows westerly and connects to the South Boston Interceptor North Branch in Dorchester Avenue. The South Boston Interceptor North Branch then flows in a southerly direction and into the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

Damrell Street

There is a 12-inch BWSC combined sewer main in Damrell Street which flows westerly, increasing to a 15-inch combined sewer, and then to a 30-inch by 36-inch combined sewer before connecting to the South Boston Interceptor North Branch in Dorchester Avenue. The South Boston Interceptor North Branch then flows in a southerly direction and into the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

Old Colony Avenue

There are two 12-inch BWSC combined sewer mains in Old Colony Avenue which flow northerly, increasing to a 15-inch combined sewers before connecting to a 42-inch by 44.5-inch combined sewer main in D Street which flows westerly before connecting to the South Boston Interceptor North Branch in Dorchester Avenue. The South Boston Interceptor North Branch then flows in a southerly direction and into the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal. An overflow pipe connects the downstream end of the 42-inch by 44.5-inch combined sewer in D Street to a 90-inch by 101-inch combined sewer which begins at Dorchester Avenue and flows westerly. The 90-inch by 101-inch combined sewer increases to a 102-inch combined sewer before connecting to a 142-inch by 124-inch combined sewer flowing northerly. The 142-inch by 124-inch combined sewer increases to two 204-inch by 162-inch combined sewer mains, which then increases to two 40-inch by 186-inch combined sewers before outletting into the Fort Point Channel.

Dorchester Street

There is a 15-inch BWSC combined sewer main in Dorchester Street which flows in an easterly direction, increasing to a 15-inch and then a 18-inch combined sewer before connecting to a 20-inch by 26-inch combined sewer at West Ninth Street and flowing northerly along West Ninth Street. The 20-inch by 26-inch combined sewer increases to a 24-inch by 30-inch combined sewer before connecting to a 42-inch by 44.5-inch combined sewer main in D Street which flows westerly before connecting to the South Boston Interceptor North Branch in Dorchester Avenue. The South Boston Interceptor North Branch then flows in a southerly direction and into the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal. An overflow pipe connects the downstream end of the 42-inch by 44.5-inch combined sewer in D Street to a 90-inch by 101-inch combined sewer which begins at Dorchester Avenue and flows westerly. The 90-inch by 101-inch combined sewer increases to a 102-inch combined sewer before connecting to a 142-inch by 124-inch combined sewer flowing northerly. The 142-inch by 124-inch combined sewer increases to two 204-inch by 162-inch combined sewer mains, which then increases to two 240-inch by 186-inch combined sewers before outletting into the Fort Point Channel.

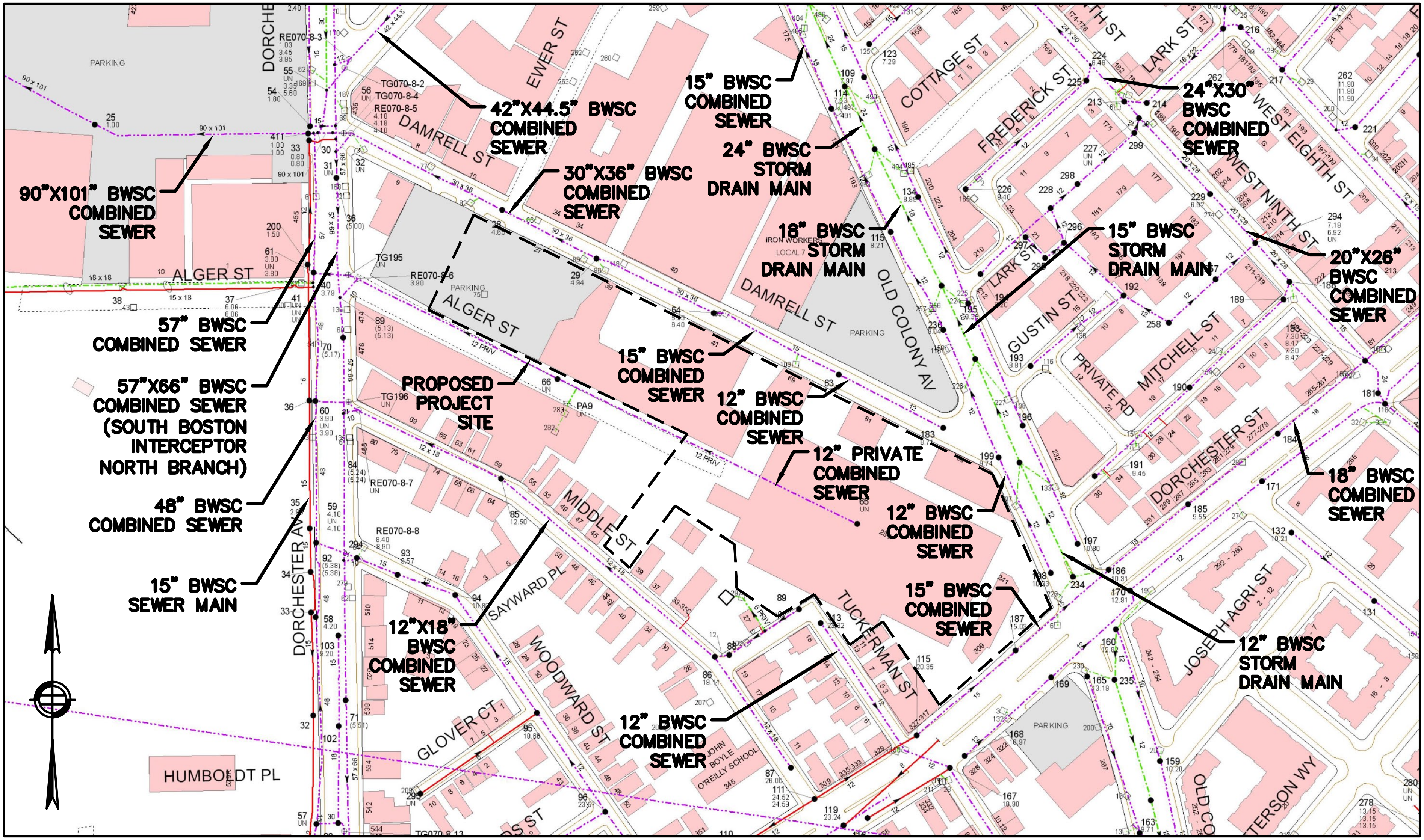
Tuckerman Street

There is a 12-inch BWSC combined sewer main in Tuckerman Street which flows southerly, increasing to a 15-inch combined sewer before connecting to a 24-inch combined sewer in Old Colony Avenue and continuing southerly flow before redirecting flow to the west within a 24-inch BWSC combined sewer in Preble Street. The 24-inch combined sewer in Preble Street connects to the New Boston Main Interceptor which ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal.

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

7.2.2 Wastewater Generation

The Project's sewage generation rates were estimated using 314 CMR 07.00 and the proposed building program. 314 CMR 07.00 lists typical sewage generation values for the proposed building use, as shown in Table 7-1. Typical generation values are conservative values for estimating the sewage flows from new construction. The proposed site is comprised of eight new buildings made up of both residential and retail space. The existing site is comprised of seven existing buildings. Due to the limited information available for the existing buildings, all flows for the existing buildings were determined by calculating the average usage during the April 2014-May 2015 billing period per water and sewer records. Table 7-1 describes the increased sewage generation in gallons per day (gpd) due to the Project.



Washington Village Boston, Massachusetts

SCALE: 1"=100'

Figure 7-1

Existing Combined Sewer System

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Table 7-1 Proposed Project Wastewater Generation

Proposed Building Sewer Flows

Use	Approximate Dimension	314 CMR Value (gpd/unit)	Total Flow (gpd)
Building A			
Family Dwelling	92 bedrooms	110/bedroom	10,120
Retail	28,050 sf	50/1,000 sf	1,403
Building B			
Family Dwelling	100 bedrooms	110/bedroom	11,000
Retail	11,300 sf	50/1,000 sf	565
Building C			
Family Dwelling	284 bedrooms	110/bedroom	31,240
Retail	19,000 sf	50/1,000 sf	950
Amenity Space	2,250 sf	50/1,000 sf	113
Building D			
Family Dwelling	349 bedrooms	110/bedroom	38,390
Amenity Space	1,850 sf	50/1,000 sf	93
Building E			
Family Dwelling	62 bedrooms	110/bedroom	6,820
Retail	39,250 sf	50/1,000 sf	1,963
Building F			
Family Dwelling	8 bedrooms	110/bedroom	880
Retail	2,900 sf	50/1,000 sf	145
Building G			
Family Dwelling	6 bedrooms	110/bedroom	660
Building H			
Family Dwelling	24 bedrooms	110/bedroom	2,640
Retail	3,600 sf	50/1,000 sf	180
	Total Proposed Sewer Flows		107,162

Existing Building Sewer Flows

Use	Total Flow (gpd)
235 Old Colony Avenue	15
39 Damrell Street	9,905
81 Damrell Street	259
241 Old Colony Avenue	155
240 Old Colony Avenue	37
Total Existing Sewer Flows	10,371

Increase in Sewer Flows (gpd):	96,791

7.2.3 Sewage Capacity & Impacts

The Project's impact on the existing BWSC systems in Dorchester Avenue, Middle Street, Tuckerman Street, Damrell Street, Old Colony Avenue and Dorchester Street were 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 (%)	Diameter (inches)	Manning's Number	Flow Capacity (cfs)	Flow Capacity (MGD)
Damrell Street								
63 to 183	170	8.3	7.2	0.6%	12	0.013	2.87	1.85
63 to 64	185	7.2	5.80	0.8%	15	0.013	4.58	2.96
RE070-8-5 to 64	560	5.8	4.10	0.3%	30 x 36	0.013	28.66	18.52
						Minimum Flow Analyzed:	2.87	1.85
Alger Street								
RE070-8-6 to 65	775	8.71	3.90	0.6%	12	0.013	1.49	0.96
						Minimum Flow Analyzed:	1.49	0.96
Middle Street								
86 to 89	135	19.40	19.00	0.3%	12	0.013	1.94	1.25
RE070-8-7 to 86	600	19.00	8.90	1.7%	12 x 18	0.013	7.73	4.99
						Minimum Flow Analyzed:	1.94	1.25
Tuckerman Street								
113 to 167	280	23.10	18.90	1.5%	12	0.013	4.36	2.82
						Minimum Flow Analyzed:	4.36	2.82
Dorchester Avenue								
36 to 89	170	-5.00	-5.13	0.1%	57 x 66	0.013	76.10	49.19
						Minimum Flow Analyzed:	76.10	49.19
Dorchester Street								
115 to 186	350	20.35	10.31	2.9%	15	0.013	10.94	7.07
						Minimum Flow Analyzed:	10.94	7.07
Old Colony Avenue								
113 to 167	365	10.33	9.04	0.4%	12	0.013	2.12	1.37
						Minimum Flow Analyzed:	2.12	1.37

Note:
1. Manhole numbers taken from BWSC Sewer system GIS Map received on Friday, January 17, 2014.
2. Flow Calculations based on Manning Equation

7.2.4 Proposed Conditions

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the sewer system. The Project is expected to generate an increase in wastewater flows of approximately 96,791 gpd. Approval for the increase in sanitary flow will come from BWSC.

Sewer services for the existing buildings will be evaluated for capacity and condition and will be replaced as necessary. New sewer services resulting from the Project will connect to the existing sanitary sewer mains in Damrell Street, Old Colony Avenue and/or Dorchester Street and Tuckerman Street and/or Middle 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.

7.2.5 Proposed Impacts

The adjacent roadway sewer systems in Damrell Street, Alger Street, Middle Street, Tuckerman Street, Dorchester Avenue, Dorchester Street, Old Colony Avenue and potential building service connections to the sewer system were analyzed.

Table 7-2 indicates the hydraulic capacity of the existing 12-inch, 15-inch, and 30-inch by 36-inch combined sewer main in Damrell Street, the 12-inch combined sewer main in Alger Street, the 12-inch and 12-inch by 18-inch combined sewer mains in Middle Street, the 12-inch combined sewer main in Tuckerman Street, the 57-inch by 66-inch (South Boston Interceptor North Branch) combined sewer main in Dorchester Avenue, the 15-inch combined sewer main in Dorchester Street and the 12-inch combined sewer main in Old Colony Avenue. The minimum hydraulic capacity is 1.85 million gallons per day (MGD) or 2.87 cubic feet per second (cfs) for the combined sewer system in Damrell Street, 0.96 MGD or 1.49 cfs for the combined sewer system in Alger Street, 1.25 MGD or 1.94 cfs for the combined sewer system in Middle Street, 2.82 MGD or 4.36 cfs for the combined sewer system in Tuckerman Street, 49.09 MGD or 76.10 cfs for the South Boston Interceptor North Branch combined sewer system in Dorchester Avenue, 7.07 MGD or 10.94 cfs for the combined sewer system in Dorchester Street and 1.37 MGD or 2.12 cfs for the combined sewer system in Old Colony Avenue. It is likely that the proposed Project will result in multiple connections to existing BWSC combined sewer mains within Damrell Street, Alger Street, Middle Street, Tuckerman Street, Dorchester Avenue, Dorchester Street, and Old Colony Avenue. Based on this assumption and an average increase in daily flow estimate for the Project of 96,791 gpd or 0.10 MGD; and with a factor of safety of 10 (total estimate = 0.10 MGD x 10 = 1.00 MGD), no sewer capacity problems are expected within the proposed Project area.

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 are existing BWSC water mains in Dorchester Avenue, Middle Street, Tuckerman Street, Alger Street, Damrell Street, Old Colony Avenue and Dorchester Street.

There is a 12-inch Southern Low Main and a 30-inch Southern Low Main in Dorchester Avenue. There is a 8-inch Southern Low Main in Middle Street which continues through Tuckerman Street. There is a 8-inch Southern Low Main in Alger Street. There is a 8-inch Southern Low Main in Damrell Street which increases to a 10-inch Southern Low Main. There is a 12-inch Southern Low Main in Old Colony Avenue. There is a 16-inch Southern High Main, a 20-inch Southern Low Main and a 12-inch Southern Low Main in Dorchester Street.

The existing water system is illustrated in Figure 7-2.

7.3.2 Water Consumption

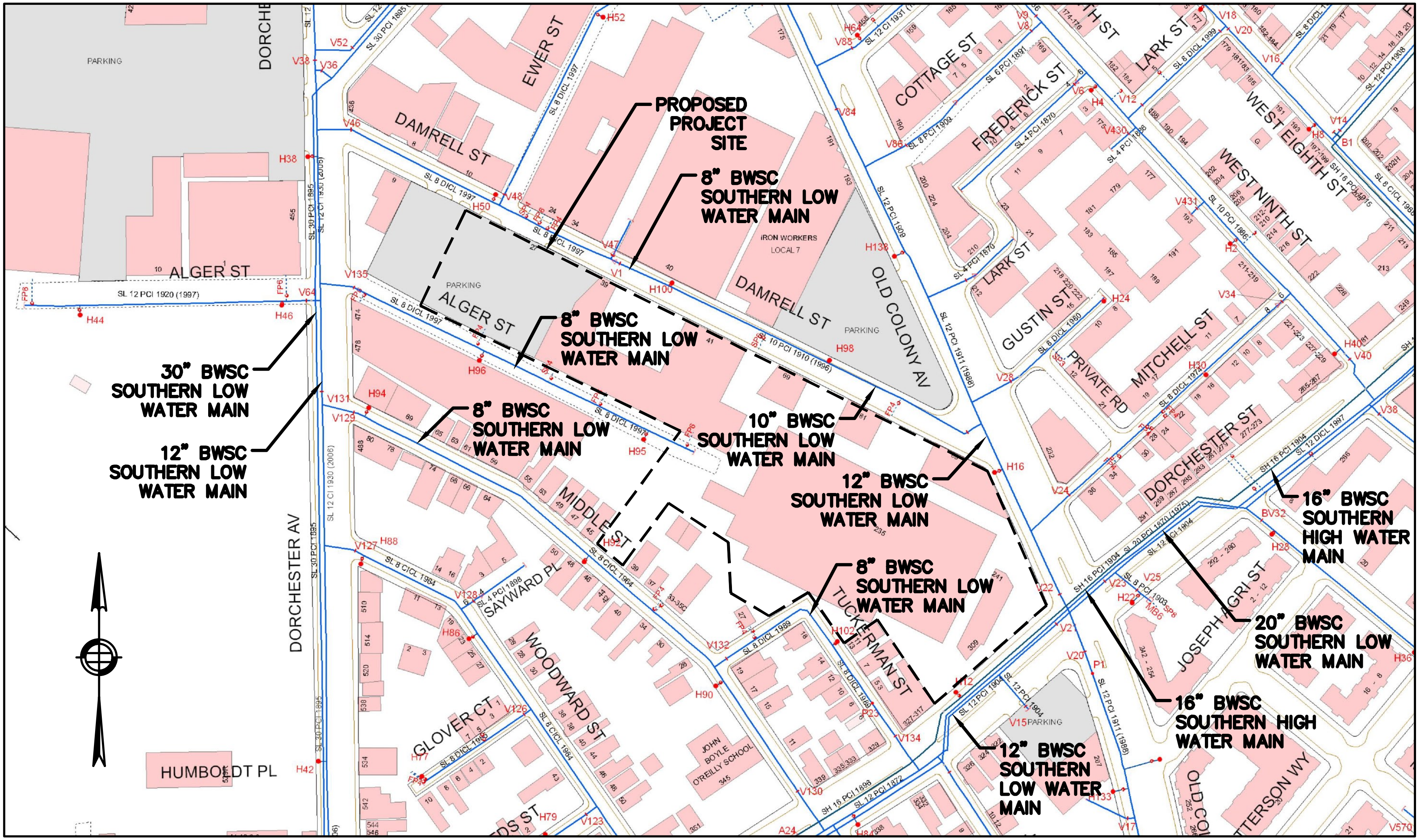
The Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described above. A conservative factor of 1.1 (10%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 07.00 values to account for consumption, system losses and other usages to estimate an average daily water demand. The Project's estimated domestic water demand is 106,470 gpd. The water for the Project will be supplied by the BWSC systems in Alger Street and/or Damrell Street, Middle Street, Tuckerman Street and Dorchester Street and/or Old Colony Avenue.

Efforts to reduce water consumption will be made. Aeration fixtures and appliances will be chosen for water conservation qualities. In public areas, sensor operated faucets and toilets will be installed.

New water services will 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.

7.3.3 Proposed Project

The domestic and fire protection water services for the Project will connect to the existing BWSC water mains in Alger Street and/or Damrell Street, Middle Street, Tuckerman Street and Dorchester Street and/or Old Colony Avenue.



Washington Village Boston, Massachusetts

SCALE: 1"=100'

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Figure 7-2

Existing Water System

The proposed Project's impacts to the existing water system will be reviewed as part of the BWSC's Site Plan Review process.

The domestic and fire protection water service connections required for the Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connection will be reviewed as part of 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.

7.3.4 Proposed Impacts

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

7.4 Stormwater

There are existing BWSC combined sewer mains in Dorchester Avenue, Middle Street, Tuckerman Street, Damrell Street, Old Colony Avenue and Dorchester Street adjacent to the Project site, as previously described in Section 7.2.1. The existing combined sewer mains in Dorchester Avenue, Middle Street, Tuckerman Street, Damrell Street, Old Colony Avenue and Dorchester Street ultimately flow to the New Boston Main Interceptor to the south.

The combined sewer mains in Dorchester Street and Old Colony Avenue flow to a 42-inch by 44.5-inch combined sewer main in D Street which flows westerly before connecting to the South Boston Interceptor North Branch in Dorchester Avenue. There is also an overflow connection at this location (intersection of D Street and Dorchester Avenue) to a 90-inch by 101-inch combined sewer main at the intersection of Dorchester Avenue and Damrell Street, which flows westerly. The 90-inch by 101-inch combined sewer increases to a 102-inch combined sewer before connecting to a 142-inch by 124-inch combined sewer flowing northerly. The 142-inch by 124-inch combined sewer increases to two 204-inch by 162-inch combined sewer mains, which then increases to two 240-inch by 186-inch combined sewers before outletting into the Fort Point Channel.

There are existing storm drain mains in Dorchester Avenue and Old Colony Avenue.

Dorchester Avenue

There is a 48-inch BWSC storm drain main which flows northerly, increasing to a 57-inch storm drain main before connecting to the 90-inch by 101-inch combined sewer main at the intersection of Dorchester Avenue and Damrell Street and flowing westerly. The 90-inch by 101-inch combined sewer increases to a 102-inch combined sewer before connecting to a 142-inch by 124-inch combined sewer flowing northerly. The 142-inch by 124-inch combined sewer increases to two 204-inch by 162-inch combined sewer mains, which then increases to two 240-inch by 186-inch combined sewers before outletting into the Fort Point Channel.

Old Colony Avenue

There is a 12-inch BWSC storm drain main in Old Colony Avenue which flows northerly. The 12-inch main increases to a 15-inch main, which then increases to a 18-inch main, which then increases to a 24-inch main before connecting to the 42-inch by 44.5-inch combined sewer main in D Street which flows westerly and ultimately connects to the South Boston Interceptor North Branch in Dorchester Avenue. There is also an overflow connection at this location (intersection of D Street and Dorchester Avenue) to a 90-inch by 101-inch combined sewer which begins at Dorchester Avenue and flows westerly. The 90-inch by 101-inch combined sewer increases to a 102-inch combined sewer before connecting to a 142-inch by 124-inch combined sewer flowing northerly. The 142-inch by 124-inch combined sewer increases to two 204-inch by 162-inch combined sewer mains, which then increases to two 240-inch by 186-inch combined sewers before outletting into the Fort Point Channel.

The existing BWSC storm drain system is illustrated in Figure 7-1.

Existing stormwater is currently captured by existing closed drainage systems at each building. Stormwater in the roadways is captured by existing catch basins, which flow to the existing BWSC combined sewer mains or the existing BWSC storm drain mains in Old Colony Avenue or Dorchester Avenue. Stormwater runoff from Middle Street and a portion of Tuckerman Street sheet flows to the catch basins in the adjacent roadways.

7.4.1 Proposed Project

The existing site is comprised of seven existing buildings, as well as concrete sidewalk, parking, and roadway, and is approximately 97 percent impervious. The Project will meet or reduce the existing peak rates of stormwater discharge and volumes of stormwater runoff from the site and promote runoff recharge to the greatest extent possible.

The Project will strive to infiltrate one-inch 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.

If it is determined that groundwater recharge is not feasible, the Proponent will treat the stormwater runoff to adequately capture TSS and phosphorus prior to discharging to the BWSC system.

7.4.2 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 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.

7.4.3 MassDEP Stormwater Management Policy Standards

In March 1997, MassDEP adopted a Stormwater Management Policy to address non-point source pollution. In 1997, 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 proposed design will comply with this Standard. The design will incorporate the appropriate stormwater treatment and 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 proposed design 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 proposed design will comply with this standard. Within the Project's limit of work, there will be mostly building roof and paved sidewalk and roadway areas. 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 proposed design 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 proposed design 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 Proposed 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 Proposed 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 proposed Project.

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 designated to comply with the standards of the Americans with Disabilities Act. See Appendix F for the Accessibility Checklist.

8.2 Massachusetts Environmental Policy Act

The Project is subject to review under the Massachusetts Environmental Policy Act (MEPA) since the Proponent may pursue funding from the Commonwealth's MassWorks Infrastructure program. An Environmental Notification Form (ENF) for the Project was submittal to the MEPA office on July 15, 2015. The Secretary of the Executive Office of Energy and Environmental Affairs issued the Certificate on the ENF on August 21, 2015. The Proponent will be filing a Draft Environmental Impact Report (EIR) in the near future, followed by a Final EIR.

8.3 Massachusetts Historical Commission

The Project will require state actions that require review by MHC under State Register review regulations (950 CMR 71.00). In a letter dated August 10, 2015 to the MEPA Office, MHC stated that the Project is unlikely to affect significant historic or archaeological resources. Appendix E contains a copy of the MHC's August 10, 2015 letter.

8.4 Boston Landmarks Commission

The Project will involve demolition of structures that are greater than 50 years old; therefore, the proposed demolition activities are subject to review by the BLC's Article 85 (Demolition Delay) regulations. At the appropriate time the Proponent will file an Article 85 application. Similar to the MHC findings, it is anticipated that the BLC staff will find the buildings proposed for demolition not significant.

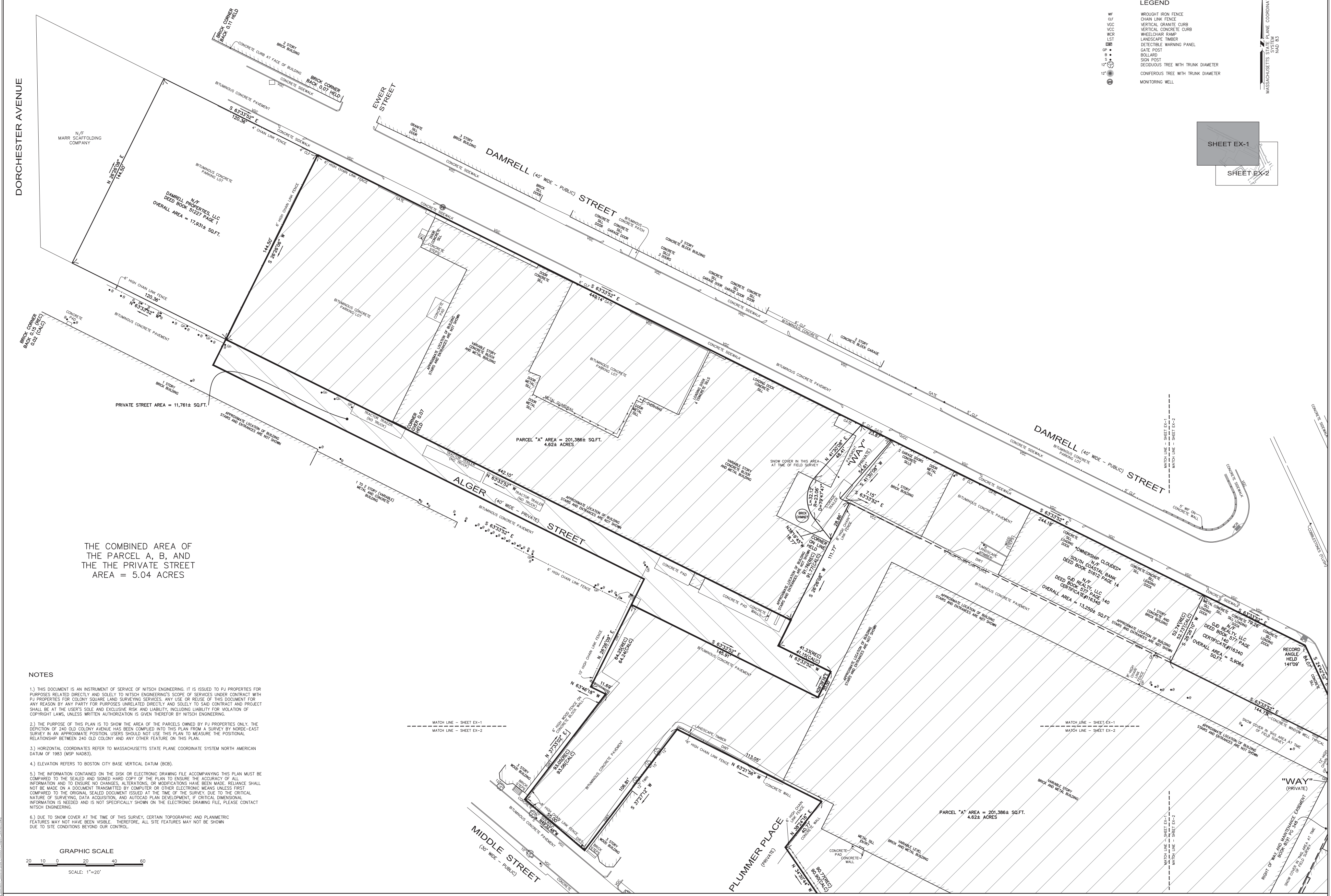
8.5 Boston Civic Design Commission

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 BRA as part of the Article 80 process.

Appendix A

Site Survey

PROGRESS 2/20/2015



NOTES

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3.) HORIZONTAL COORDINATES REFER TO MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983 (MSP NAD83).

4.) ELEVATION REFERS TO BOSTON CITY BASE VERTICAL DATUM (BCB).

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GRAPHIC SCALE

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SCALE: 1"=20'

Nitsch Engineering

www.nitscheng.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472

- Civil Engineering
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PREPARED FOR:

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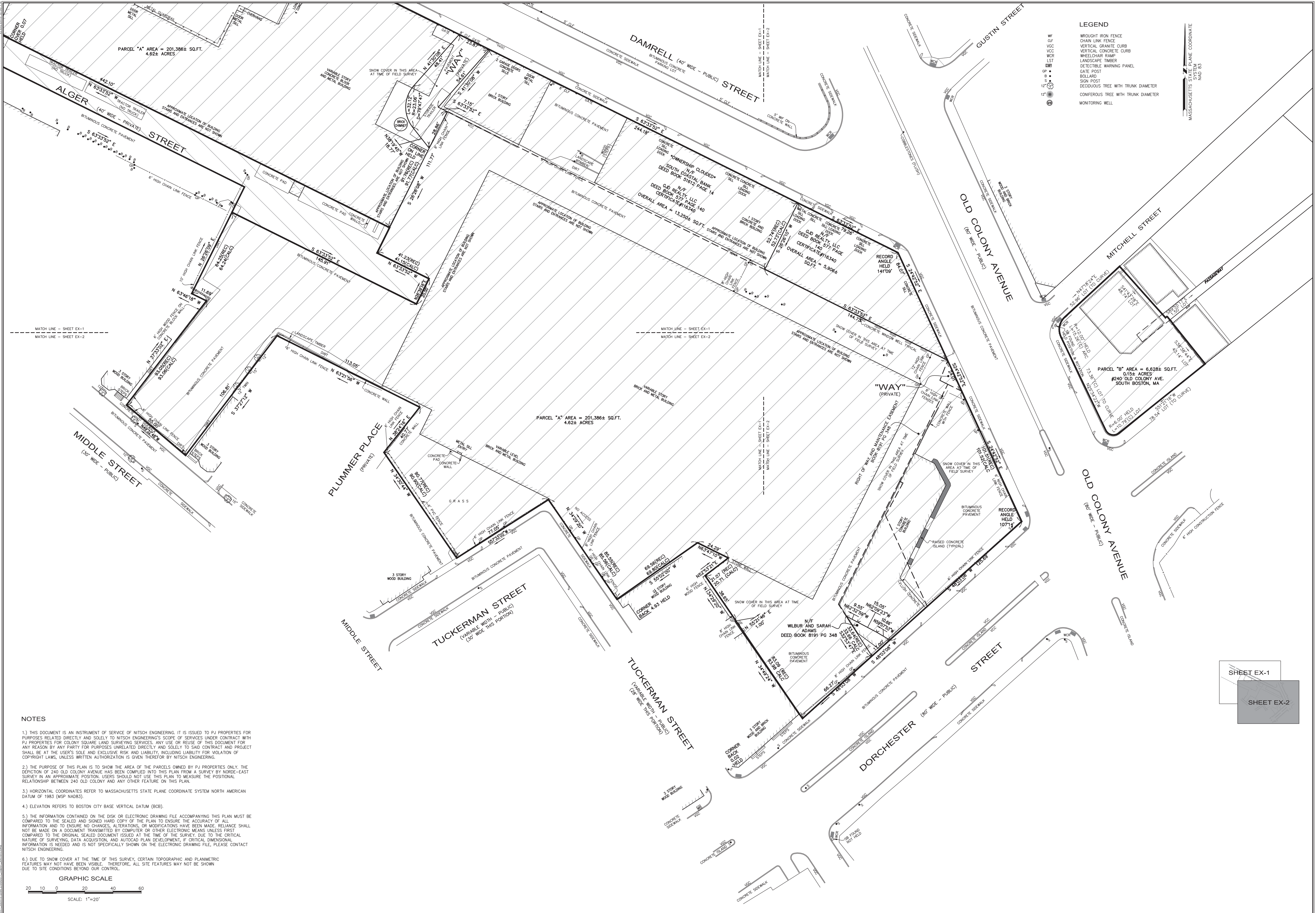

NOTES

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2.) THE PURPOSE OF THIS PLAN IS TO SHOW THE AREA OF THE PARCELS OWNED BY PJ PROPERTIES ONLY. THE DEPICTION OF 240 OLD COLONY AVENUE HAS BEEN COMPLIED INTO THIS PLAN FROM A SURVEY BY NORDE-EAST SURVEY IN AN APPROXIMATE POSITION. USERS SHOULD NOT USE THIS PLAN TO MEASURE THE POSITIONAL RELATIONSHIP BETWEEN 240 OLD COLONY AND ANY OTHER FEATURE ON THIS PLAN.

3.) HORIZONTAL COORDINATES REFER TO MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983 (MSP NAD83).

4.) ELEVATION REFERS TO BOSTON CITY BASE VERTICAL DATUM (BCB).

5.) THE INFORMATION CONTAINED ON THE DISK OR ELECTRONIC DRAWING FILE ACCOMPANYING THIS PLAN MUST BE COMPARED TO THE SEALED AND SIGNED HARD COPY OF THE PLAN TO ENSURE THE ACCURACY OF ALL INFORMATION AND TO ENSURE NO CHANGES, ALTERATIONS, OR MODIFICATIONS HAVE BEEN MADE. RELIANCE SHALL NOT BE MADE ON A DOCUMENT TRANSMITTED BY COMPUTER OR OTHER ELECTRONIC MEANS UNLESS FIRST COMPARED TO THE ORIGINAL SEALED DOCUMENT ISSUED AT THE TIME OF THE SURVEY. DUE TO THE CRITICAL NATURE OF SURVEYING, DATA ACQUISITION, AND AUTOCAD PLAN DEVELOPMENT, IF CRITICAL DIMENSIONAL INFORMATION IS NEEDED AND IS NOT SPECIFICALLY SHOWN ON THE ELECTRONIC DRAWING FILE, PLEASE CONTACT NITSCH ENGINEERING.

6.) DUE TO SNOW COVER AT THE TIME OF THIS SURVEY, CERTAIN TOPOGRAPHIC AND PLANIMETRIC FEATURES MAY NOT HAVE BEEN VISIBLE. THEREFORE, ALL SITE FEATURES MAY NOT BE SHOWN DUE TO SITE CONDITIONS BEYOND OUR CONTROL.

GRAPHIC SCALE

20 10 0 20 40 60

SCALE: 1"=20'

Nitsch Engineering
www.nitscheng.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Sustainable Site Consulting
- Planning
- GIS

PROJECT # 10085.1
FILE: 10085.1_TOPO1_EXHIBIT.dwg
SCALE: 1"=20'
DATE: FEBRUARY 2015
PROJECT MANAGER: ADD
FIELD BOOK: 579
DRAFTED BY: AH
CHECKED BY:

REV.	COMMENTS	DATE
	REVISIONS	

AREA EXIBIT PLAN
COLONY SQUARE
BOSTON, MASSACHUSETTS 02127

PREPARED FOR:
PJ PROPERTIES
41 WEST STREET, SUITE 800 BOSTON, MA 02111

SHEET: 2
EX-2
OF 2 REV.

Appendix B

Transportation

Available Upon Request

Appendix C

Air Quality

AIR QUALITY APPENDIX

Introduction

This Air Quality Appendix provides modeling assumptions and backup for results presented in Section 3.5 of the report. Included within this documentation is a brief description of the methodology employed along with pertinent calculations and data used in the emissions and dispersion calculations supporting the microscale air quality analysis.

Motor Vehicle Emissions

The EPA MOVES computer program generated motor vehicle emissions used in the garage stationary source analysis along with the mobile source CAL3QHC modeling and mesoscale analysis. The model input parameters were provided by MassDEP. Emission rates were derived for 2015 and 2020 for speed limits of idle, 10, 15, and 30 mph for use in the microscale analyses.

MOVES CO Emission Factor Summary

Carbon Monoxide Only

		2015	2020
Free Flow	30 mph	2.018	2.091
Right Turns	10 mph	3.484	3.369
Left Turns	15 mph	2.920	2.939
Queues	Idle	7.654	5.015

Notes: Winter CO emission factors are higher than Summer and are conservatively used
Urban Unrestricted Roadway type used

CAL3QHC

For the intersection studied, the CAL3QHC model was applied to calculate CO concentrations at sensitive receptor locations using emission rates derived in MOVES. The intersection's queue links and free flow links were input to the model along with sensitive receptors at all locations nearby each intersection. The meteorological assumptions input into the model were a 1.0 meter per second wind speed, Pasquill-Gifford Class D stability combined with a mixing height of 1000 meters. For each direction, the full range of wind directions at 10 degree intervals was examined. In addition, a surface roughness (z_0) of 321 cm was used for the intersection. Idle emission rates for queue links were based on 0 mph emission rates derived in MOVES. Emission rates for speeds of 10, 15, and 30 mph were used for right turn, left turn, and free flow links, respectively.

235 Old Colony Ave, Boston, MA
Background Concentrations

POLLUTANT	AVERAGING TIME	Form	2012	2013	2014	Units	ppm/ppb to $\mu g/m^3$ Conversion Factor	2012-2014 Background Concentration ($\mu g/m^3$)	Location
SO_2 (1)(6)	1-Hour (5)	99th %	12	14	28	ppb	2.62	47.2	531A E. 1st St., Boston
	3-Hour	H2H	10.6	16.3	24.3	ppb	2.62	63.7	531A E. 1st St., Boston
	24-Hour	H2H	4.5	6.5	8.1	ppb	2.62	21.2	531A E. 1st St., Boston
	Annual	H	1.65	1.53	1.74	ppb	2.62	4.6	531A E. 1st St., Boston
PM-10	24-Hour	H2H	32.0	34	61	$\mu g/m^3$	1	61	Harrison Ave., Boston
	Annual	H	14.2	15.1	13.9	$\mu g/m^3$	1	15.1	Harrison Ave., Boston
PM-2.5	24-Hour (5)	98th %	20.6	15.9	12.7	$\mu g/m^3$	1	16.4	Harrison Ave., Boston
	Annual (5)	H	8.3	7.3	6.0	$\mu g/m^3$	1	7.2	Harrison Ave., Boston
NO_2 (3)	1-Hour (5)	98th %	43	47	62	ppb	1.88	95.3	531A E. 1st St., Boston
	Annual	H	9.7	12.2	14	ppb	1.88	26.3	531A E. 1st St., Boston
CO (2)	1-Hour	H2H	2.2	1.9	1.7	ppm	1146	2474.2	Harrison Ave., Boston
	8-Hour	H2H	1.9	1.2	1.3	ppm	1146	2177.4	Harrison Ave., Boston
Ozone (4)	8-Hour	H4H	0.062	0.059	0.054	ppm	1963	121.7	Harrison Ave., Boston
Lead	Rolling 3-Month	H	0.014	0.006	0.014	$\mu g/m^3$	1	0.014	Harrison Ave., Boston

Notes:
From 2012-2014 EPA's AirData Website
[1] SO_2 reported ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 2.62 $\mu g/m^3$.
[2] CO reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1146 $\mu g/m^3$.
[3] NO_2 reported in ppb. Converted to $\mu g/m^3$ using factor of 1 ppm = 1.88 $\mu g/m^3$.
[4] O_3 reported in ppm. Converted to $\mu g/m^3$ using factor of 1 ppm = 1963 $\mu g/m^3$.
[5] Background level is the average concentration of the three years.
[6] The 24-hour and Annual standards were revoked by EPA on June 22, 2010, Federal Register 75-119, p. 35520.

Due to excessive size CAL3QHC, and MOVES input and output files are available on digital media upon request.

Appendix D

Climate Change Checklist

Climate Change Preparedness and Resiliency Checklist for New Construction

In November 2013, in conformance with the Mayor's 2011 Climate Action Leadership Committee's recommendations, the Boston Redevelopment Authority adopted policy for all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and to mitigate any identified adverse impacts that might arise under future climate conditions.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at http://www.cityofboston.gov/climate

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/)
3. Army Corps of Engineers guidance on sea level rise (http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf)
4. Proceeding of the National Academy of Science, "Global sea level rise linked to global temperature", Vermeer and Rahmstorf, 2009 (http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf)
5. "Hotspot of accelerated sea-level rise on the Atlantic coast of North America", Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 (http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf)
6. "Building Resilience in Boston": Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

Checklist

Please respond to all of the checklist questions to the fullest extent possible. For projects that respond "Yes" to any of the D.1 – Sea-Level Rise and Storms, Location Description and Classification questions, please respond to all of the remaining Section D questions.

Checklist responses are due at the time of initial project filing or Notice of Project Change and final filings just prior seeking Final BRA Approval. A PDF of your response to the Checklist should be submitted to the Boston Redevelopment Authority via your project manager.

Please Note: When initiating a new project, please visit the BRA web site for the most current Climate Change Preparedness & Resiliency Checklist.

A.1 - Project Information

Project Name:	235 Old Colony Avenue
Project Address Primary:	
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Tim Mackie / Project Manager / DJ Properties / tmackie@coreinvestmentsinc.com / 617-428-8000

A.2 - Team Description

Owner / Developer:	DJ Properties
Architect:	Prellwitz Chilinski Associates
Engineer (building systems):	Cosentini Associates
Sustainability / LEED:	Epsilon Associates
Permitting:	Epsilon Associates
Construction Management:	TBD
Climate Change Expert:	Epsilon Associates

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

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

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

☑ Wood Frame	☐ Masonry	☑ Steel Frame	☐ Concrete

Describe the building?

Site Area:	*4.8 acres*	Building Area:	*905,000 SF*
Building Height:	*Up to 270 Ft.*	Number of Stories:	*Up to 24 Flrs.*
First Floor Elevation (reference Boston City Base):	*15.0 to 30.0 Elev.*	Are there below grade spaces/levels, if yes how many:	*No*

A.5 - Green Building

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

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

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

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

A.6 - Building Energy-

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

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

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

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

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

Electrical Generation:	*300 kW*		Fuel Source:	*Diesel*
System Type and Number of Units:	☑ Combustion Engine	☐ Gas Turbine	☐ Combine Heat and Power	*2 (Units)*

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

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

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

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

What time span of future Climate Conditions was considered?

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

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

8/91 Deg.

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

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

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

30-90 Days	*0.2 Events / yr.*

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

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

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

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

B.2 - Mitigation Strategies

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

Building energy use below code:	*20%*
How is performance determined:	Energy model

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

Select all appropriate:	☑ High performance building envelop	☐ High performance lighting & controls	☐ Building day lighting	☑ EnergyStar equip. / appliances
	☑ High performance HVAC equipment	☑ Energy recovery ventilation	☐ No active cooling	☐ No active heating
Describe any added measures:				

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

Roof:	*R = 25*	Walls / Curtain Wall Assembly:	*R = Walls = 11.4-13.3 CW U-value=0.31 SF U-value=0.32 (system performance)*
Foundation:	*R = 10 (24" below)*	Basement / Slab:	*R =7.5-19*
Windows:	*U =0.24*	Doors:	*R = 4.75/U =0.37*

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

	☐ On-site clean energy / CHP system(s)	☐ Building-wide power dimming	☐ Thermal energy storage systems	☐ Ground source heat pump
	☐ On-site Solar PV	☐ On-site Solar Thermal	☐ Wind power	☐ None
Describe any added measures:	On-site solar PV is being studied			

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

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

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

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

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

Select all appropriate:	☐ Solar oriented – longer south walls	☐ Prevailing winds oriented	☐ External shading devices	☐ Tuned glazing,
	☐ Building cool zones	☑ Operable windows	☑ Natural ventilation	☐ Building shading
	☐ Potable water for drinking / food preparation	☐ Potable water for sinks / sanitary systems	☐ Waste water storage capacity	☑ High Performance Building Envelop
Describe any added measures:				

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	☐ High reflective paving materials	☑ Shade trees & shrubs	☑ High reflective roof materials	☑ Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:	☐ On-site retention systems & ponds	☑ Infiltration galleries & areas	☐ Vegetated water capture systems	☑ Vegetated roofs
Describe other strategies:				

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:	☐ Hardened building structure & elements	☑ Buried utilities & hardened infrastructure	☐ Hazard removal & protective landscapes	☑ Soft & permeable surfaces (water infiltration)
Describe other strategies:				

C - Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

C.1 - Location Description and Classification:

Do you believe the building to susceptible to flooding now or during the full expected life of the building?

	Yes

Describe site conditions?

Site Elevation – Low/High Points:	*15 to 30 ft Boston City Base*
Building Proximity to Water:	*2,200 Ft.*

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

Coastal Zone:	*No*	Velocity Zone:	*No*
Flood Zone:	*No*	Area Prone to Flooding:	*No*

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

2013 FEMA Prelim. FIRMs:	*Yes (500-year)*	Future floodplain delineation updates:	*No*

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

	400 Ft.

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. Otherwise you have completed the questionnaire; thank you!

C - Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

C.2 - Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise:	*2 Ft.*	Frequency of storms:	*0.25 per year*

C.3 - Building Flood Proofing

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

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

Flood Proof Elevation:	*TBD*	First Floor Elevation:	*Above 15 ft BCB*

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

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

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

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

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

No

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

Yes	If yes, to what height above 100 Year Floodplain:	

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

	No
If Yes, describe:	

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

No	If Yes, for how long:	*days*

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

C.4 - Building Resilience and Adaptability

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

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

Select appropriate:	*Yes*	☐ Hardened / Resilient Ground Floor Construction	☐ Temporary shutters and or barricades	☐ Resilient site design, materials and construction

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

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

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

Select appropriate:	*No*	☐ Solar PV	☐ Solar Thermal	☐ Clean Energy / CHP System(s)

		☐ Potable water storage	☐ Wastewater storage	☐ Back up energy systems & fuel
Describe any specific or additional strategies:				

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

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

Appendix E

Massachusetts Historical Commission Letter, August 10, 2015

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

August 10, 2015

Secretary Matthew A. Beaton
Executive Office of Energy & Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn: Holly Johnson, MEPA Unit

RE: 235 Old Colony Avenue New Residential, 235 Old Colony Avenue, Damrell Street, Alger Street, Dorchester Street, Tuckerman Street, Boston (South Boston), MA; MHC# RC.58463, EEA# 15397

Dear Secretary Beaton:

Staff of the Massachusetts Historical Commission (MHC) have reviewed the Environmental Notification Form (ENF) that was submitted for the 235 Old Colony Avenue New Residential project. The staff of the MHC have the following comments.

The proposed project consists of demolition of existing buildings, including 27 Damrell Street, and construction of eight new residential buildings within the project area.

Review of the MHC's *Inventory of Historic and Archaeological Assets of the Commonwealth* indicates that the building located at 27 Damrell Street, is included in the Inventory (BOS.6849). The building was historically part of a group of industrial buildings once part of the S.A. Woods Machine Company. It was originally connected via a foot bridge to the building at 24 Damrell Street (BOS.6850). The building at 27 Damrell Street has been heavily modified and disconnected from the building at 24 Damrell Street. Due to the alterations to the building, including the removal of the second floor, it is in the opinion of MHC staff that 27 Damrell Street (BOS.6849) does not meet the criteria for eligibility for listing in the State Register of Historic Places.

After review of MHC files and the materials submitted, it has been determined that this project is unlikely to affect significant historic or archaeological resources.

These comments are offered to assist in compliance with M.G.L. Chapter 9, sections 26-27C (950 CMR 71.00) and MEPA (301 CMR 11). Please do not hesitate to contact Elizabeth Sherva of my staff if you have any questions.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc: DJ Properties LLC, c/o Core Investments, Inc.
Geoff Starsiak, Epsilon Associates

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

Appendix F

Accessibility Checklist

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

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

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

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

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

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

Accessibility Analysis Information Sources:

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

Project Information

Project Name:	Boston Yards / 235 Old Colony
Project Address Primary:	235 Old Colony Avenue, Boston, MA
Project Address Additional:	235 – 241 Old Colony Avenue, 240 Old Colony Avenue, 27-39 Damrell Street, 59-89 Damrell Street
Project Contact (name / Title / Company / email / phone):	Tim Mackie / Project Manager / DJ Properties / tmackie@coreinvestmentsinc.com / 617-428-8000

Team Description

Owner / Developer:	DJ Properties
Architect:	Prellwitz Chilinski Associates
Engineer (building systems):	Cosentini Associates
Sustainability / LEED:	Epsilon Associates
Permitting:	Epsilon Associates
Construction Management:	TBD

Project Permitting and Phase

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

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

Building Classification and Description

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

	Residential – One to Three Unit	**Residential - Multi-unit, Four +**	Institutional	Education
	Commercial	Office	**Retail**	Assembly
	Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	*Retail & Lobbies for multi-unit residential, Parking*			

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	**Steel Frame**	Concrete

Describe the building?

Site Area:	*4.77 acres*	Building Area:	*905,000 SF*
Building Height:	*Max. 270 Ft.*	Number of Stories:	*Up to 24 Flrs.*
First Floor Elevation:	*15-30 ft BCB*	Are there below grade spaces:	*Yes, Partial basement in Bldg. E.*

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.	The approximately 5.04-acre Project site is located in the South Boston neighborhood of Boston, and is generally bound by Dorchester Avenue to the west, Dorchester Street to the east, Damrell Street to the north, and Tuckerman Street, Middle Street, and residential and commercial properties to the south. The Project includes surface parking, one to two story industrial and commercial buildings, and vacant site area. Most of the building space is vacant, with a portion used for storage, office space and a paint supply store.
List the surrounding ADA compliant	Adjacent to site (Dorchester Street): Bus Routes 5 and 10

MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	~1/4 mile: MBTA Andrew Station (Red Line); Bus Routes CT3, 5, 10, 16, 17, 18 and 171
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	Old Colony Housing Development, Local 7 Ironworkers Union, UP Academy Charter School of Boston, Michael J. Perkins School
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	No. Joe Moakley Park, Carson Beach, Veterans Park

Surrounding Site Conditions – Existing:

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

Are there sidewalks and pedestrian ramps existing at the development site?	Yes
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	Narrow concrete sidewalks with overturned granite curbs and uneven surfaces
Are the sidewalks and pedestrian ramps existing-to-remain? **If yes,** have the sidewalks and pedestrian ramps been verified as compliant? **If yes,** please provide surveyors report.	No
Is the development site within a historic district? **If yes,** please identify.	No

Surrounding Site Conditions – Proposed

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

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? See: www.bostoncompletestreets.org	Yes
If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Neighborhood Main Street , Neighborhood Residential, Neighborhood Connector, and Shared Street
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	10' – 12', depending on location. Equal width of Pedestrian and Frontage zones with a 5' minimum pedestrian zone.
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?	Concrete for Pedestrian zone (except for Shared Street). Unit pavers in Green scape/ Site Furnishing zone. It will be a combination of private property and City of Boston pedestrian right of way.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	No
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	No
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	

Proposed Accessible Parking:

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

What is the total number of parking spaces provided at the development site parking lot or garage?	562 Parking Spaces
What is the total number of accessible spaces provided at the development site?	2% of total spaces… 12 spaces (includes 2 van spaces)
Will any on street accessible parking spaces be required? If yes, has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	TBD
Where is accessible visitor parking located?	Both on street and in parking structures.
Has a drop-off area been identified? If yes, will it be accessible?	No
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	See attached figure.

Circulation and Accessible Routes:

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

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

Provide a diagram of the accessible route connections through the site.	See attached figure.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	All entries are flush conditions. All buildings except for F & G include elevators to upper floors. F & G have stairs only.
Are the accessible entrance and the standard entrance integrated?	Yes
If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes, route via elevator
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	No

Accessible Units: (If applicable)

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

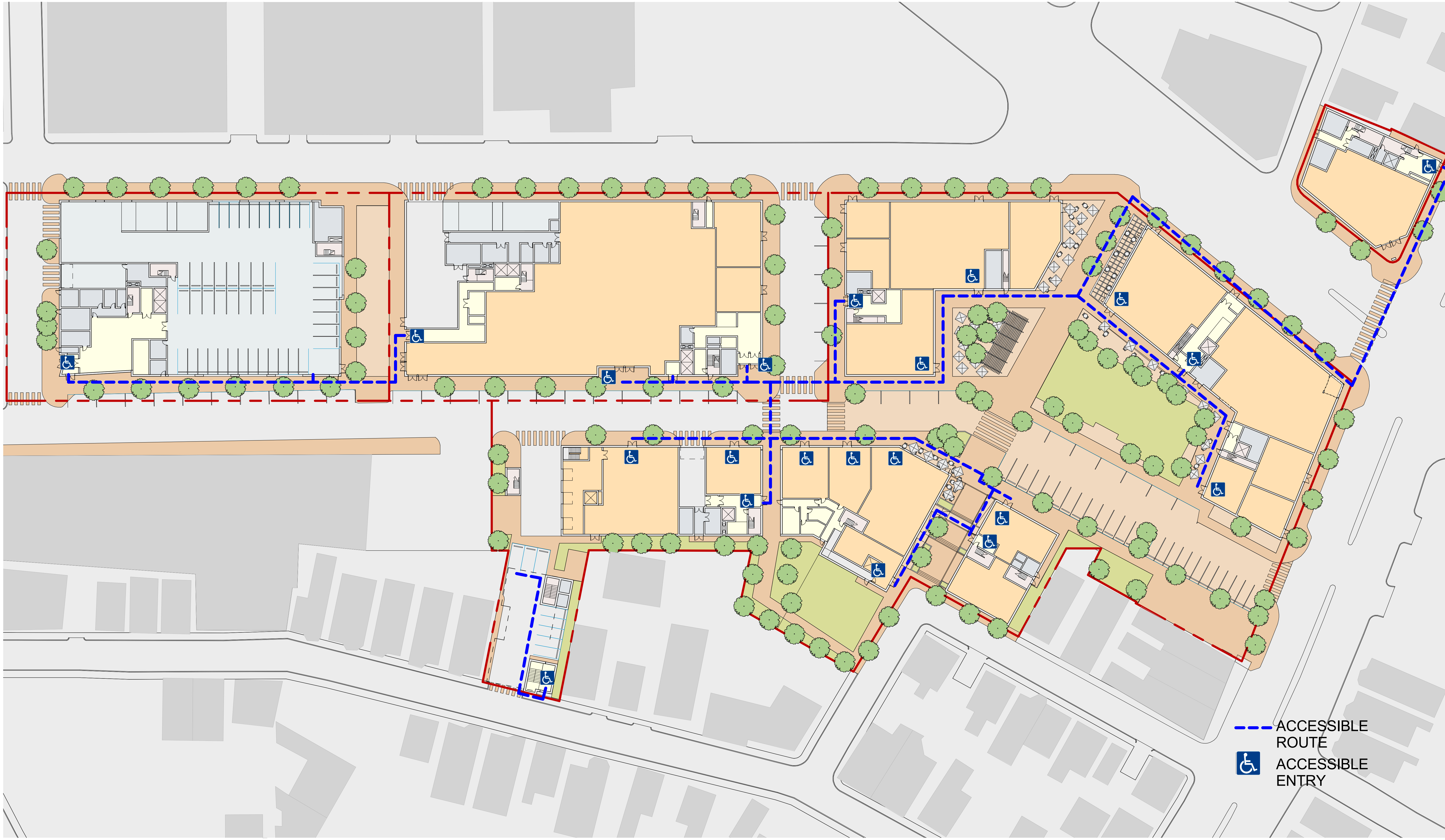
What is the total number of proposed units for the development?	Approximately 700
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	Roughly 50% for sale and 50% for rent. Approximately 609 units will be market value, and approximately 91 units will be affordable per Inclusionary Development Policy
How many accessible units are being proposed?	Approximately 35 units (5% per Massachusetts 521 CMR AAB Rules and Regulations), 14 units (2% of units) will be designed for the hearing impaired

Please provide plan and diagram of the accessible units.	See diagram attached.
How many accessible units will also be affordable? If none, please describe reason.	Approximately 5 units
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs at entry or step to balcony. If yes, please provide reason.	No
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	No
Did the Advisory Board vote to support this project? If no, what recommendations did the Advisory Board give to make this project more accessible?	No

Thank you for completing the Accessibility Checklist!

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

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



DJ PROPERTIES LLC

WASHINGTON VILLAGE

GROUND ACCESSIBILITY DIAGRAM

0' 30' 60'

PCA
PRELLWITZ CHILINSKI ASSOCIATES
Architecture Planning Interiors

BUILDING UNIT COUNT

A	64	
B	60	
C	205	(50% CONDOMINIUM EXEMPT)
D	249	(CONDOMINIUM EXEMPT)
E	46	
F	08	
G	06	
H	18	
TOTAL	305 x 5% = 16 GROUP 2 ACCESSIBLE UNITS REQUIRED 305 x 2% = 6 HEARING IMPAIRED UNITS REQUIRED	

PROPORTIONAL DISTRIBUTION

Unit Type	Group 2 Accessible	Hearing Impaired
STUDIOS	20% = 3 units	1 unit
1 BEDROOMS	45% = 8 units	3 units
2 BEDROOMS	30% = 4 units	2 units
3 BEDROOM	05% = 1 unit	0 units
TOTAL	16 units	6 units

LEGEND

- GROUP 2 ACCESSIBLE UNIT
- HEARING IMPAIRED UNIT
- FOR SALE (NOT IN SCOPE)

MASS ACCESS 521 CMR 9.4 "In multiple dwellings that are for rent, hire, or lease (but not for sale) at least 5% of the dwelling units must be Group 2A accessible units"

When multiple dwellings consist of more than one building on a site all dwelling units shall be added together to determine applicability of 521 CMR 9.4.

DJ PROPERTIES LLC

WASHINGTON VILLAGE

ACCESSIBLE UNIT DIAGRAM

0' 30' 60'

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