



# The Chandlery

## 270 Dorchester Avenue

### Expanded Project Notification Form

October 2016

#### SUBMITTED TO

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

#### PROPONENT

270 Dorchester Ave LLC  
P.O.Box 326  
Boston, MA 02127

#### PREPARED BY



99 High Street, 10<sup>th</sup> Floor  
Boston, MA 02110

#### IN ASSOCIATION WITH

Pisani + Associates Architects  
Blair Hines Design Associates  
LaCasse Law, LLC  
GEI Consultants, Inc.  
M.E.A. Engineering Associates





October 31, 2016

Ref: 12790.00

Brian Golden, Director  
Boston Planning and Development Agency  
One City Hall Square, 9<sup>th</sup> Floor  
Boston, MA 02201

**Re: Expanded Project Notification Form  
The Chandlery, 270 Dorchester Avenue, South Boston**

Dear Director Golden:

On behalf of 270 Dorchester Avenue LLC (the "Proponent"), VHB is pleased to submit the enclosed Expanded Project Notification Form (EPNF) for The Chandlery, 270 Dorchester Avenue, which includes construction of a new mixed use building and associated parking (the "Project"). The Project is located at 270-284 Dorchester Avenue at the intersection of Dorchester Avenue and B Street in South Boston (the "Project Site"). The enclosed EPNF is being filed to initiate the Article 80B, Large Project Review process required by the Boston Zoning Code and Enabling Act.

The Project consists of construction of a five- to eight-story (approximately 90') mixed use building containing 150 residential units and up to 6,560 sf of retail space, as well as approximately 120 parking spaces. The approximately 0.5 acre Project Site is bounded by Dorchester Avenue, B Street, W 6th Street, and the South Boston Bypass (Haul Road). The Project requires several variances from the dimensional regulations and a conditional use permit set forth in the Base Zoning Code.

Overall, the Project will generate numerous benefits to the neighborhood by revitalizing an underutilized urban site and activating the public realm. The Proponent intends to strive for a Silver rating or higher under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) Green Building Rating System for Design and Construction.

The enclosed EPNF presents details about the Project and provides information pertaining to transportation/traffic, urban design, sustainability and green building, potential environmental impacts, infrastructure needs and historic resources. This information is provided to inform state and city agencies and neighborhood residents about the Project, its potential impacts, and the mitigation measures proposed to address those potential impacts. Since the information provided in this submission is similar to the level of information normally presented in a Draft Project Impact Report under Article 80B, it is the desire of the Proponent that the BPDA, after reviewing public and agency comments, will issue a Scoping Determination waiving further review pursuant to Section 80B-5.3(d) of Article 80B.

Ref: 12790.00  
April 6, 2016  
Page 2



We look forward to continuing to work collaboratively with you and your staff, other city agencies, and members of the community to create the best development for this location. We anticipate that the BPDA will publish notice of the receipt of the EPNF within five days, as required by Section 80A-2(3). Requests for copies of the EPNF should be directed to me at 617-607-2972 or via e-mail at [skruel@vhb.com](mailto:skruel@vhb.com).

Very truly yours,

A handwritten signature in black ink that reads "Stephanie Krue".

Stephanie Krue, ENV SP  
Senior Environmental Planner  
[skruel@vhb.com](mailto:skruel@vhb.com)

cc: Mark Edwards, 270 Dorchester Avenue LLC  
Marc LaCasse, LaCasse Law, LLC



## Expanded Project Notification Form

# The Chandlery 270 Dorchester Avenue

Boston, Massachusetts

Submitted to **Boston Planning and Development Agency**  
One City Hall Square, Room 900  
Boston, MA 02201

Proponent **270 Dorchester Ave LLC**  
P.O. Box 326  
Boston, MA 02127

Submitted by **VHB**  
99 High Street, 10<sup>th</sup> Floor  
Boston, MA 02110

*In association with* Pisani + Associates Architects  
Blair Hines Design Associates  
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October 2016

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Appendix A: Letter of Intent

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# 1

## General Information and Project Description

270 Dorchester Ave LLC (the “Proponent”) submits this “expanded” Project Notification Form (PNF) to the Boston Planning and Development Agency (the “BPDA”) to initiate the Article 80B, Large Project Review process required by the Boston Zoning Code and Enabling Act for construction of a new mixed use development consisting of a residential building with associated ground-floor retail at the terminus of Dorchester Avenue, Haul Road and B Street in South Boston (the “Project”). The Project will be known as “The Chandlery, 270 Dorchester Avenue.”

This chapter provides an overview of the existing site conditions and describes the Project and its public benefits, and identifies the anticipated required permits and approvals. This chapter also describes how the Project is consistent with applicable plans and policies.

### 1.1 Site Context and Existing Conditions

The approximately 0.5 acre Project Site, located in South Boston, is bounded by Dorchester Avenue, B Street, W 6<sup>th</sup> Street, and the South Boston Bypass (Haul Road) (Figure 1.1). Directly adjacent to the Site are a one-story structure (with an associated access-way from W 6<sup>th</sup> Street) and a freight rail line within the Haul Road right-of-way (Figure 1.2).

The Site consists of two parcels of land which are being combined: 284 Dorchester Avenue and 270 Dorchester Avenue, with the combined lot to be known as 270 Dorchester Avenue. 284 Dorchester Avenue contains a single story 863 square foot commercial building, formerly occupied by Chuck & Ann’s Submarines restaurant, and a pole-mounted billboard. 270 Dorchester Avenue contains a 23,892 square foot warehouse, currently occupied by C.G. Edwards Co. Inc. Marine Chandlery and Industrial Hardware and Supplies, and Ultimate Self Defense Performance Center (Figures 1.3 and 1.4).

The Site is virtually impervious, but does contain one tree. Portions of the Site are bordered or enclosed by a chain link fence. There are multiple vehicular access points including two curb cuts each on Dorchester Avenue and B Street, and one curb cut on West 6<sup>th</sup> Street. Loading docks are located on W 6<sup>th</sup> Street. Sidewalks are located on all three streets.

The Project Site is approximately 0.3 miles from the MBTA Red Line's Broadway Station and 0.6 miles from Andrew Station. Immediately southeast of the Site is a low-rise residential development. To the north are low-rise commercial/industrial buildings. To the west is an MBTA bus and train maintenance facility.

Recent developments in the area include Eleven West Broadway (50 residential units and 8,000 sf of retail). Developments in the planning stages and/or under construction include 248 Dorchester Avenue (33 residential units with 4,400 sf of retail); 30 B Street (32 condominiums); 39 A Street (23 condominiums); 120 West 4<sup>th</sup> Street (9 residential units); 14 West Broadway (47 residential units and office/retail/restaurant space); 22-26 West Broadway Street (31 residential units and 3,800 sf of retail); 45 West 3<sup>rd</sup> Street (105 residential units and 2,200 sf of retail); and 148-152 Dorchester Avenue Phase II (30 condo units), among others. A more detailed description of these developments is included in Section 4.5.1 of this report.

## 1.2 Project Description

The Project intends to provide workforce housing that is affordable to middle class households in a neighborhood that is otherwise out of reach for many.<sup>1</sup> A new eight-story mixed use building will include a total of 150 residential units, 70 of which will be affordable in conformance with the BPDA's Inclusionary Development Policy.

Approximately 6,590 sf of retail space will be constructed on the first two levels. This space will be occupied by Ultimate Self Defense Gym (currently located on the Site), a commercial automobile rental company, and a community-oriented use such as a restaurant.

For those residents who rely primarily on public transit, the Project provides easy access to several MBTA subway stations and bus lines. Shopping, recreation and employment opportunities are located within a comfortable ten- to twenty-minute walk. For those who have personal vehicles, parking will be available in a 120-space below grade parking garage that will utilize an environmentally-friendly automated parking system. A portion of the parking will be reserved for the automobile rental company's rental and shared vehicles, which will be available to both residents and the public.

The Project also includes approximately 12,400 sf of multi-level private and public open space, with a sunny courtyard acting as the Project's centerpiece. The Project will be designed, constructed, and managed to be LEED Silver certifiable (Figure 1.5).



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<sup>1</sup> According to *Housing a Changing City, Boston 2030* (City of Boston, 2014), Bostonians with a household income of \$80,000 have only moderate access to rental housing in the South Boston neighborhood, and they are virtually priced out of homeownership opportunities in that location.



### 1.2.1 Development Program

The proposed development program is detailed in Table 1.1 below. Figures 1.6a-b present Project Renderings, and Figures 1.7a-f present Project Floor Plans.

**TABLE 1.1 PROPOSED DEVELOPMENT PROGRAM**

Element	Size
Lot Area	21,063 sf
Building Gross Square Footage	119,250 sf
FAR	5.67
Stories	Up to 8
Height	90' Dorchester Ave; 50' B Street
Residential Units	150 units
Studio	24 units
1 Bedroom	97 units
2 Bedroom	29 units
Affordable Units ( <i>included in unit count above</i> )	70 units
Commercial/Office	6,590 sf
Open Space	12,400 sf
Parking	120 spaces
Bicycle Parking	50 (40 indoor, 10 outdoor)

### 1.2.2 Schedule

The Construction period for the proposed Project is expected to last 15-18 months, beginning in the 4<sup>th</sup> Quarter of 2017 and reaching completion and occupancy in the 2<sup>nd</sup> Quarter of 2019.

### 1.2.3 Summary of Public Benefits

The Project is expected to provide a number of public benefits, including:

- Revitalization of an underutilized parcel
- New transit-oriented workforce housing
- On-site affordable housing
- Improved streetscapes including trees, plantings, seating, and lighting
- New pedestrian plaza
- New retail space
- Maintenance of existing community-oriented uses
- Improved stormwater management

## 1.3 Regulatory Context

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

### 1.3.1 Neighborhood/Corridor Plans

#### Plan: South Boston Dorchester Ave

In July of 2015, the BPDA began a neighborhood planning study encompassing the Dorchester Avenue Corridor between Andrew Square and Broadway Station, which is considered a prime corridor for transit-oriented development. The goal of this study and planning process is to create new zoning that aligns the aspirations of the community with predictable, as-of-right development conditions that will enhance overall livability in the area. The study will examine and determine the compatibility of different uses including retail, housing, light industrial, as well as other commercial uses. Of particular focus are the area's underutilized light industrial buildings and their potential transformation and contribution to the Corridor's future. The Project is located within the area covered by *Plan: South Boston Dorchester Avenue* and is consistent with the goals and initiatives currently being discussed for Dorchester Avenue and the Project Site. Efforts will continue to be made to comply with the anticipated outcomes of the planning initiative with respect to use, density and urban design goals.

### 1.3.2 Anticipated Permits/Approvals

Table 1.2 lists those permits and approvals from local governmental agencies that are anticipated to be required for the Project.

**TABLE 1.2 ANTICIPATED PROJECT PERMITS AND APPROVALS**

Agency/Department	Permit/Approval/Action
Boston Redevelopment Authority	Article 80B Large Project Review <ul style="list-style-type: none"> <li>• Cooperation Agreement</li> <li>• Affordable Housing Agreement</li> <li>• Boston Residents Construction Employment Plan Agreement</li> <li>• Certification of Compliance</li> </ul>
Zoning Board of Appeals	Variances for: <ul style="list-style-type: none"> <li>• Dwellings in non-residential district</li> <li>• Additional lot area required</li> <li>• Floor Area Ratio [FAR] excessive</li> <li>• Front Yard insufficient</li> <li>• Side Yard insufficient</li> <li>• Building height excessive</li> <li>• Usable open space insufficient</li> </ul> Conditional Use Permit for: <ul style="list-style-type: none"> <li>• Restricted Parking Overlay District [RPOD] for non-residential parking</li> <li>• Car Rental Agency/Wash Bay</li> </ul>

<b>Agency/Department</b>	<b>Permit/Approval/Action</b>
Boston Transportation Department	Construction Management Plan (CMP) Transportation Access Plan Agreement (TAPA) Loading dock/commercial parking review Curb-cut approval ( <i>if required</i> )
Boston Water & Sewer Commission	Water and Sewer Connection Permits Construction Dewatering Discharge Permit General Service Application Site Plan Review
Boston Landmarks Commission	Article 85 Demolition Delay Demolition List of Buildings
Public Works Department	Curb-cut Permit
Public Improvement Commission	Review of Specific repairs to sidewalks Review of street trees/tree pits/furniture
Committee on Licenses	Garage Fuel Storage Permit
Boston Inspectional Services Department	Demolition Permit Foundation Permit Building Permit Certificate(s) of Occupancy
Boston Fire Department	Assembly Permit for Gym use

### 1.3.3 Local Planning and Regulatory Controls

This Project is subject to the Boston Zoning Base Code, as established by the Enabling Act, 1956 Mass. Acts, c. 665. Since the proposed Project is to construct a building or structure having a gross floor area of 50,000 or more square feet, it is subject to review by the BPDA pursuant to Article 80B-2(2)(a).

#### City of Boston Zoning Code

The Project Site is located within the South Boston zoning district and an M-1 zoning sub-district [Restricted Manufacturing]. It is subject to the Restricted Parking Overlay District [RPOD] established by Article 3-1A(c). The Project Site is located on the City of Boston Zoning Map No. 4.

Table 1.3 below outlines the dimensional regulations for the M-1 district as well as the proposed Project dimensions. Pursuant to Article 13-4, dwellings in an M subdistrict shall comply with the lot area, lot width, usable open space, and yard requirements of the nearest H district.

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

<b>Dimensional Requirements</b>	<b>M-1 District</b>	<b>Proposed Project</b>
Lot Area (min per DU)	5,000	21,063
Additional Lot Area (per add'l DU)	1,000	280
Lot Width (min feet)	50	151.62
Lot Frontage (min feet)	None	151.62
FAR (max)	1.0	5.62
Building Height Max (stories, feet)	None	90' and 50'

<b>Dimensional Requirements</b>	<b>M-1 District</b>	<b>Proposed Project</b>
Usable Open Space (min sf per DU)	400	121.4 sf
Front Yard (min depth feet)	20	10' on Dorchester Ave; 5' on B Street
Side Yard (min depth feet)	10	5' on B Street
Rear yard (min depth feet)	20	0
Rear yard (max occupancy by accessory buildings, percent)	None	None

Based upon the plans submitted to the Inspectional Services Department for administrative zoning review in April 2015, the following zoning violations were set forth by ISD in a zoning code refusal letter:

- Article 13-4 dwellings in non-residential district
- Article 14-2 lot area for additional dwelling units is insufficient
- Article 15-1 floor area ratio is excessive
- Article 18-1 front yard insufficient on Dorchester Avenue and W. Sixth St.
- Article 19-1 side yard insufficient
- Article 16-1 building height excessive [stories exceed 2 ½]
- Article 16-1 building height excessive: exceeds 35'
- Article 17-1 Usable Open Space insufficient
- Article 8-6 pre-existing conditional uses
- Article 80B Large Project Review applicability
- Article 85 Demolition Delay

Since the submission of the original plans to ISD, the scope of the Project has changed in response to community and BPDA feedback, review and input. Accordingly, revised plans representing the scope of the Project subject to this Article 80B review have been submitted to ISD for a revised zoning code refusal letter. It is expected that the same violations will be identified. Based on revised plans for the parking garage, it is anticipated that an additional zoning code provision is implicated. A rental car agency will occupy a portion of the retail space and garage. Accordingly, a conditional use permit will be required under Article 8-7, Table A, Use Item No. 61.

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

The Proponent has commenced Large Project Review under Article 80B of the Code with the filing of a Letter of Intent (LOI) with the BPDA on June 4, 2015 that indicated the Proponent's intent to file an "expanded" PNF in connection with the Project. A revised LOI was filed on February 9, 2016 to reflect the changes in the Project since the filing of the original LOI. Copies of these letter are provided in Appendix A.

This EPNF aims to meet the requirements of City of Boston Article 80B Large Project Review, presents details about the Project and provides an analysis of transportation, environmental protection, infrastructure, and other components of the proposed Project, in order to inform

city agencies and neighborhood residents about the Project, its potential impacts and mitigation proposed to address those potential impacts. Based on a comprehensive approach to address potential impacts similar to the level of information normally presented in a Draft Project Impact Report (DPIR), the Proponent requests that the BPDA, after reviewing public and agency comments on this PNF and any further responses to comments made by the Proponent, issue a Scoping Determination Waiving Further Review pursuant to the Article 80B process.

### **Massachusetts Environmental Policy Act**

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

## **1.4 Agency Coordination and Community Outreach**

Since the Project's conception, the Project team has kept an open line of communication with the community, elected officials and the BPDA. The Project has benefited from input from these groups regarding building design and use, site access, open space design, shared vehicle location, and parking. As a result, the Project as presented has been well-received by the community.

Presentations have been made to the following groups both casually and formally:

- St. Vincent's Neighborhood Association
- West Broadway Neighborhood Association

The proponent is a long-time participant in the Dorchester Avenue Taxpayers Association (DATA), which was established in the late 1980s to engage local businesses around planning for the future of Dorchester Avenue. This has allowed him to remain engaged in the local business community and to carefully discern the types of retail uses that would be most beneficial to the community.

The proponent has also been active in the BPDA's PLAN South Boston Dorchester Avenue process, and has followed the direction on design and density that has come out of this process. He attended the following events associated with this process:

- "Talk to Us" Open House: July 30, 2015
- "Walk and Bike With Us" Study Area Tours: September 14, 2015
- "Plan with Us" Streets & Blocks Workshop: October 26, 2015
- "Draw With Us" Design Workshop: November 17, 2015
- "What We Heard" Recap Session/Dialogue: December 14, 2015
- "Choose with Us" Plan Scenario Session: January, 27 2016
- "Discuss with Us" Preferred Plan Draft Session: February, 23 2016

The proponent has also met with the following government officials and organizations to discuss the proposed project:

- City Councilor Bill Linehan: May 2014 and June 2014
- City Councilor At Large Michael Flaherty: June 2014
- State Representative Nick Collins: June 2014 and January 2016
- Boston Redevelopment Authority: June 2014, September 2014, December 2014, January 2016, and June 16, 2016.

## 1.5 Development Team

Proponent	270 Dorchester Avenue, LLC PO Box 326 Boston, MA 02127 617-529-4114 <i>Contact: Mark Edwards</i>
Architect	Pisani + Associates Architects 374 Congress Street Boston MA 02210-1807 617-423-1022 <i>Contact: William A. Paquette, R.A.</i>
Landscape Architect	Blair Hines Design Associates 318 Harvard Street, Suite 25 Brookline MA 02446 617-735-1180 <i>Contact: Blair Hines</i>
Legal Counsel	LaCasse Law, LLC 75 Arlington Street, Suite 500 Boston, MA 02116 617-605-2767 <i>Contact: Marc LaCasse</i>
Permitting, Transportation & Civil Engineering	VHB 99 High Street, 10th Floor Boston, MA 02210 617-728-7777 <i>Contact: Elizabeth Grob Stephanie Kruel, ENV SP Patrick Dunford, P.E. Mark Jackson</i>
Geotechnical Engineer	GEI Consultants, Inc. 400 Unicorn Park Drive Woburn, MA 01801 781-721-4031 <i>Contact: Douglas J. Aghjayan, P.E.</i>
MEP	M.E.A. Engineering Associates 20 Felton Street Waltham, MA 02154 781-894-6730 <i>Contact: Al Muccni</i>

## **1.6 Legal Information**

The Project Site is comprised of two separate parcels totaling 21,063 sf that are being combined as part of the zoning approval process. The parcel that fronts on Dorchester Avenue is approximately 4,546 sf and has an address of 284 Dorchester Avenue. It is identified by the City of Boston Assessing Department as Parcel No. 0600209000 and is classified as commercial land. A small building, which once housed Chuck & Anne's Submarine shop, is located on this parcel and will be demolished as part of this Project.

The parcel that has frontage on Dorchester Avenue but lies primarily along B Street is approximately 16,517 sf and has an address of 270 Dorchester Avenue. It is identified by the City of Boston Assessing Department as Parcel No. 0600210000 and is classified as commercial land. The building that sits on this parcel is the headquarters of C.G. Edwards Company, Inc., a ship chandlery, which also supplies: marine hardware, marine coatings, industrial coatings and nautical charts. This building will also be demolished and C.G. Edwards will relocate to another property, preferably in the South Boston neighborhood.

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

There are no pending legal actions or proceedings pending against either parcel; nor any insolvency proceedings or bankruptcy involving either parcel. There are no known encroachments, or easements of record that would impair the ability to construct the proposed Project.

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

There are no legal judgments of record against either parcel and all property taxes have been paid to the City of Boston.

### **1.6.3 Site Control/Public Easements**

The Project Proponent owns and controls both parcels, although currently two different entities own each parcel. It is expected that once the lots have been combined by ISD as part of the Board of Appeal process, both parcels will be conveyed into a common ownership entity. There are no known easements on the property.

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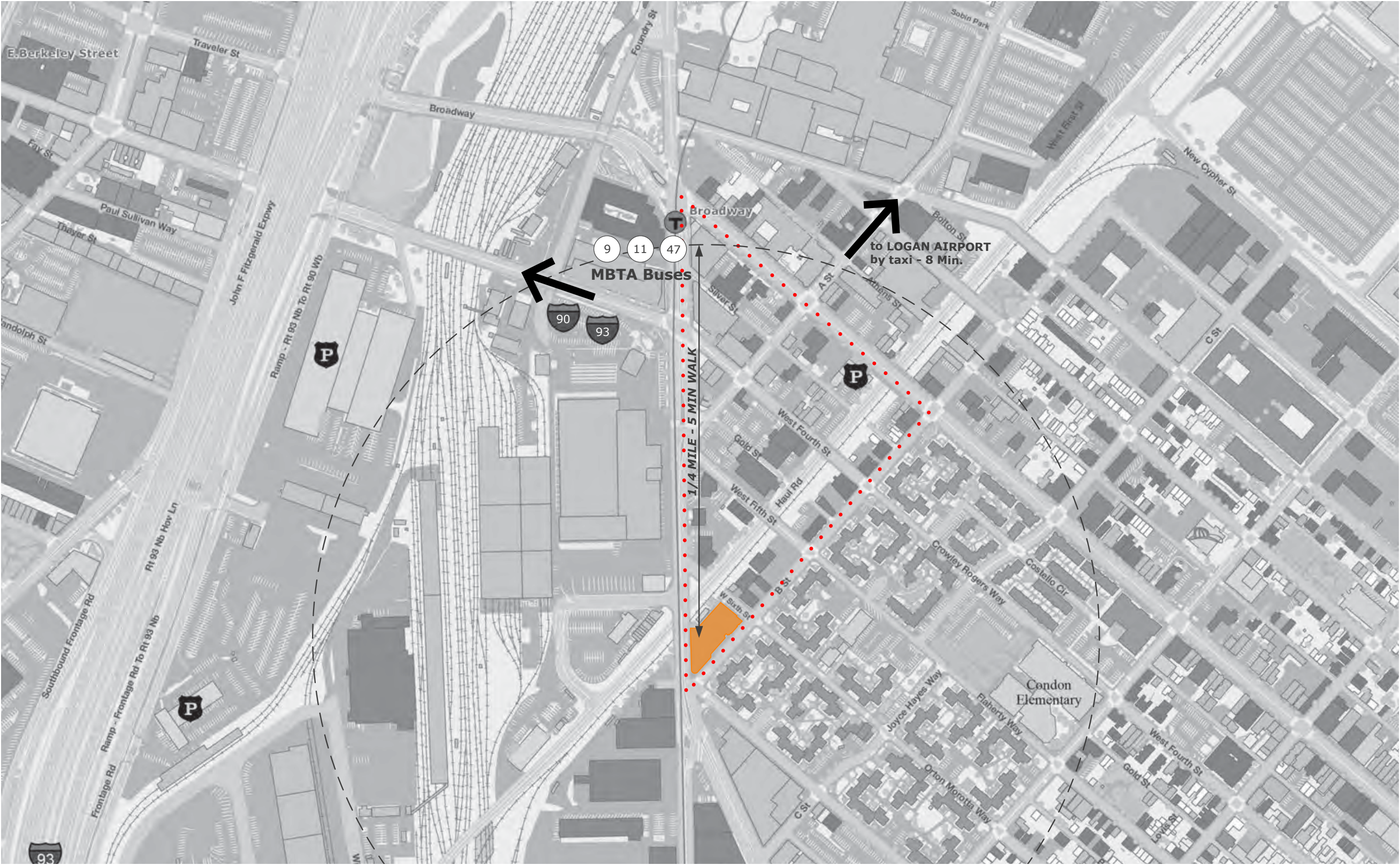


Figure 1.1  
Locus Map

270 Dorchester Avenue  
South Boston, Massachusetts

Source: 2015 USGS Boston South





PISANI + ASSOCIATES  
ARCHITECTS



Figure 1.2  
Project Site Context

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



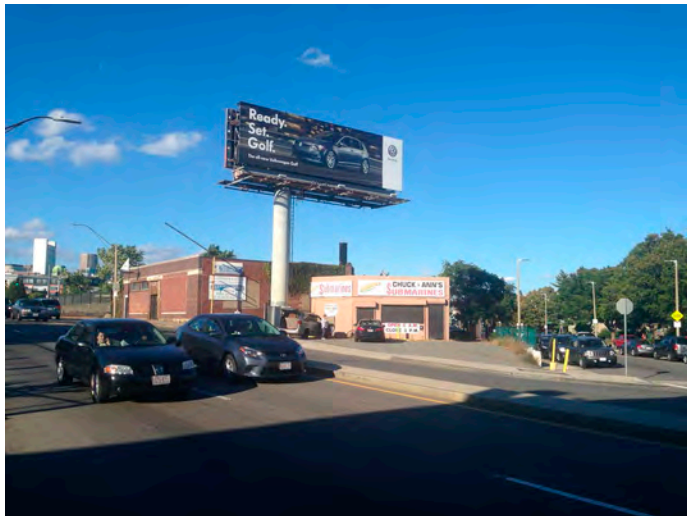


Figure 1.3  
Existing Conditions

**270 Dorchester Avenue  
South Boston, Massachusetts**

Source: Pisani & Associates Architects





View to Northeast from Dorchester Avenue



View to South from Dorchester Avenue



View to Northeast from B Street



View to Northwest from W. 6th Street



Figure 1.4  
Existing Site Photographs

270 Dorchester Avenue  
South Boston, Massachusetts





PISANI + ASSOCIATES  
ARCHITECTS



Figure 1.5  
Proposed Project

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





PISANI + ASSOCIATES  
ARCHITECTS

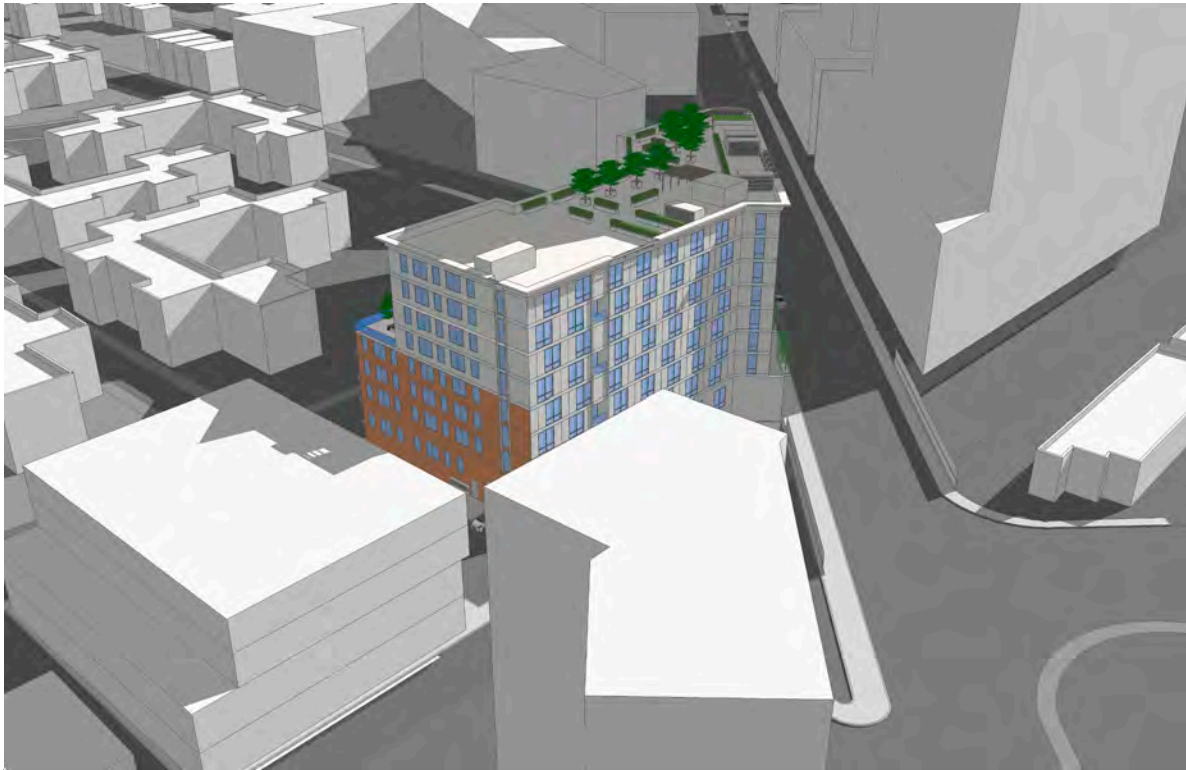


Figure 1.6a  
Project Renderings

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





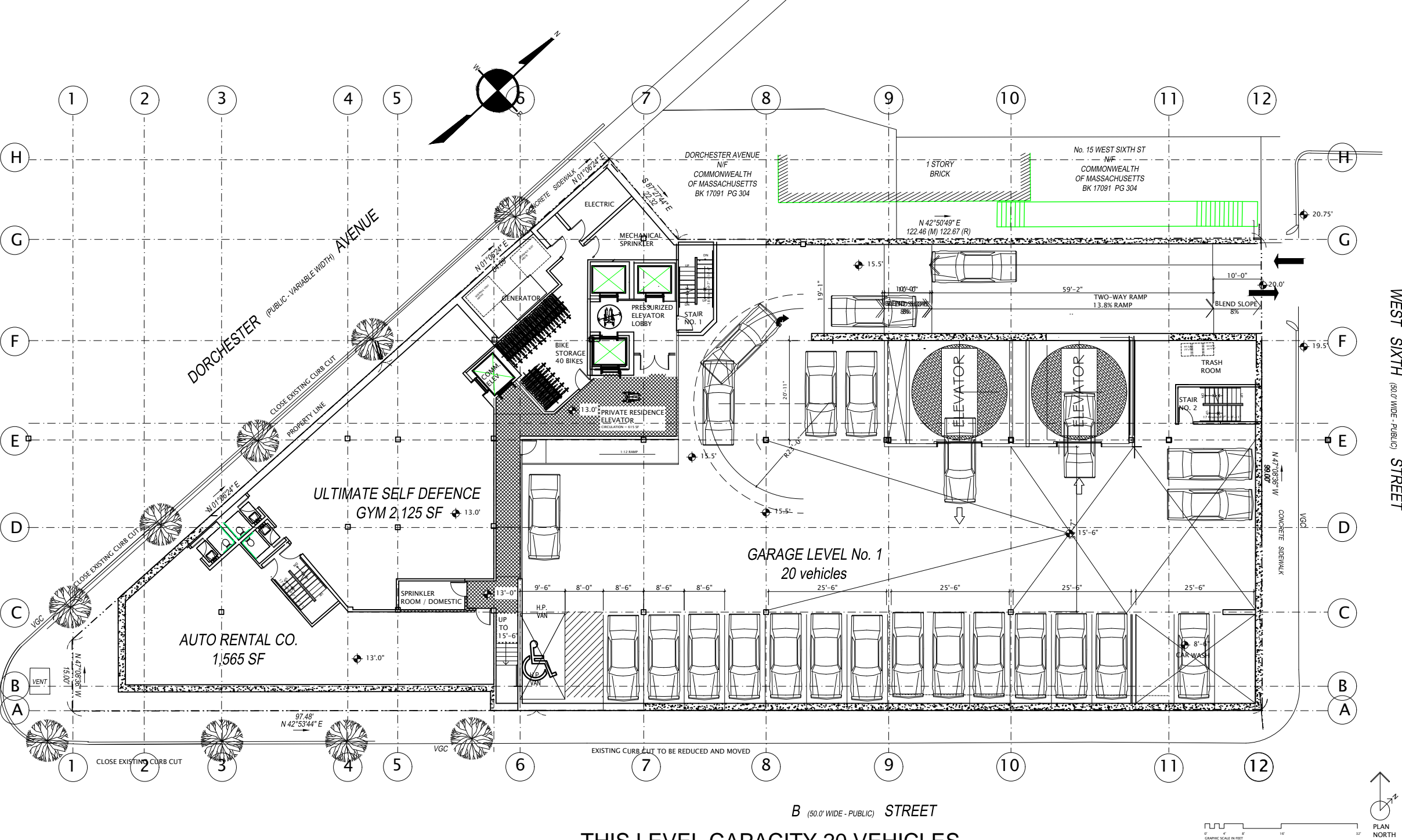
PISANI + ASSOCIATES  
ARCHITECTS



Figure 1.6b  
Project Renderings

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



THIS LEVEL CAPACITY 20 VEHICLES  
LOWER LEVEL CAPACITY= 50 + 50 VEHICLES = 120 VEHICLES

PISANI + ASSOCIATES  
ARCHITECTS

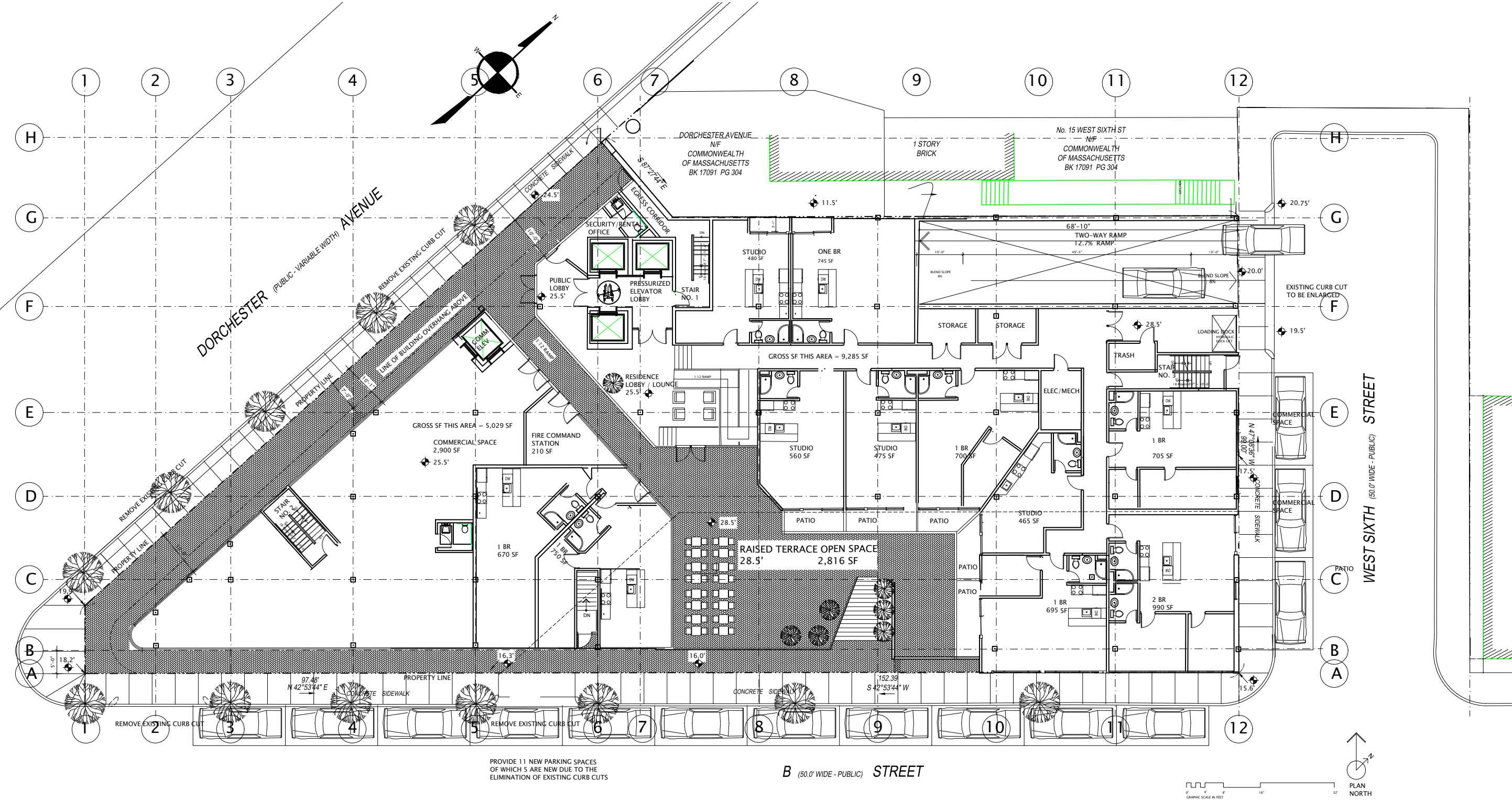


Figure 1.7a  
Garage Level

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





SITE INFORMATION TAKEN FROM  
"SITE PLAN OF LAND" BY BOSTON SURVEY, INC  
DATED FEBRUARY 14, 2013

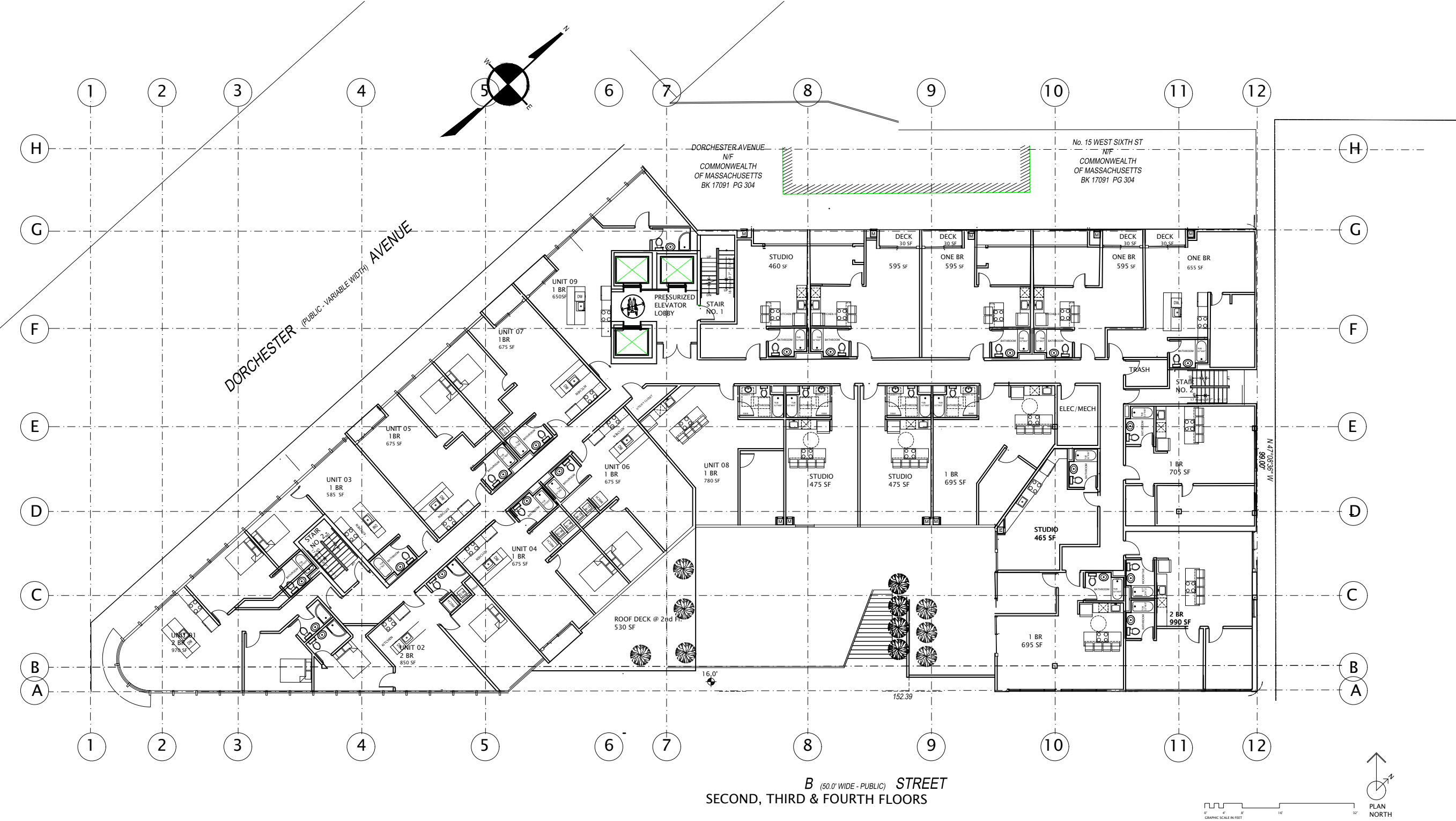
PISANI + ASSOCIATES  
ARCHITECTS



Figure 1.7b  
Ground Floor Plan

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



SITE INFORMATION TAKEN FROM  
"SITE PLAN OF LAND" BY BOSTON SURVEY, INC  
DATED FEBRUARY 14, 2013

PISANI + ASSOCIATES  
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Figure 1.7c  
2nd, 3rd & 4th Floor Plan

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



SITE INFORMATION TAKEN FROM  
"SITE PLAN OF LAND" BY BOSTON SURVEY, INC  
DATED FEBRUARY 14, 2013

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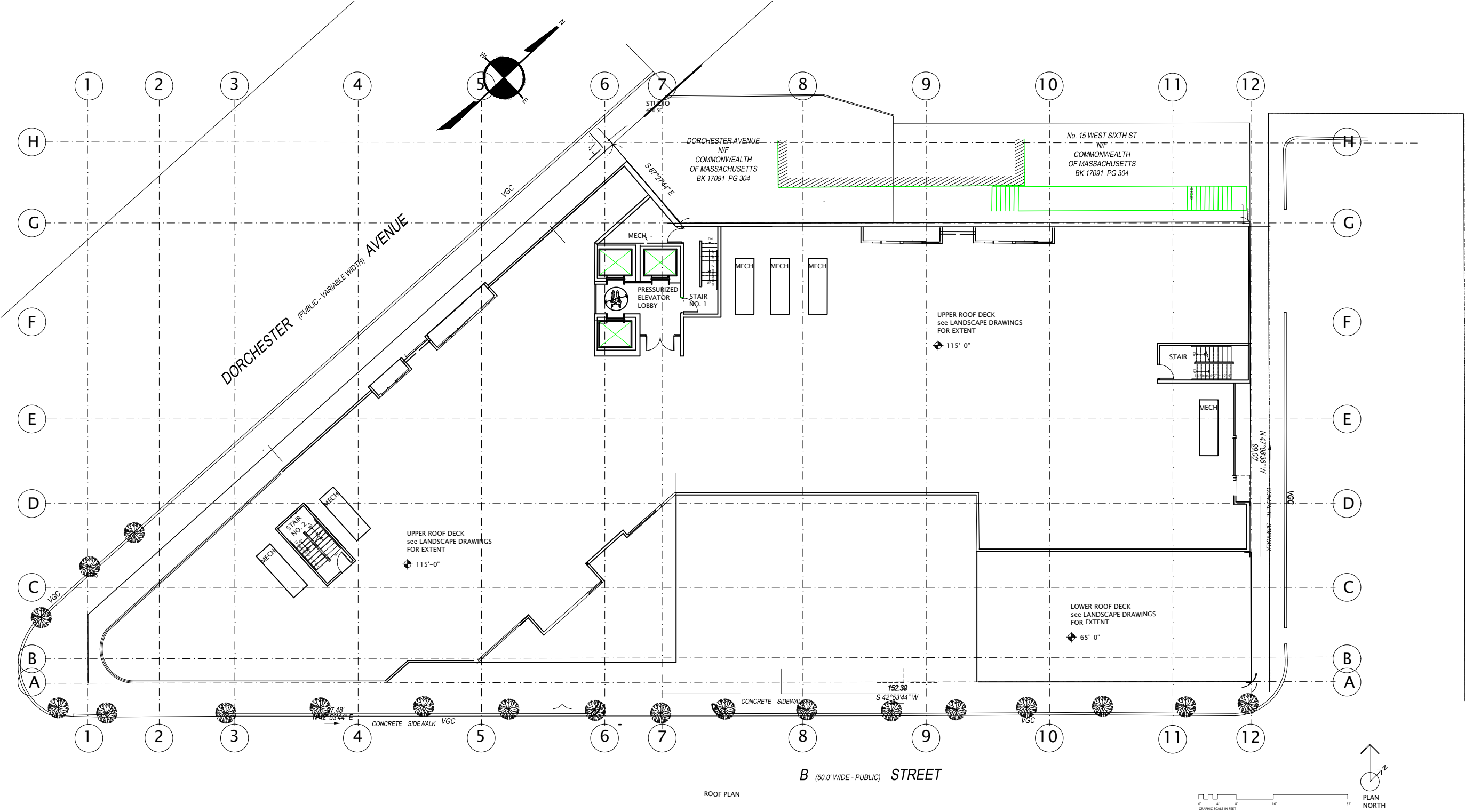


Figure 1.7d  
5th through 8th Floor Plans

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





SITE INFORMATION TAKEN FROM  
"SITE PLAN OF LAND" BY BOSTON SURVEY, INC  
DATED FEBRUARY 14, 2013

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Figure 1.7e  
Roof Plan

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects

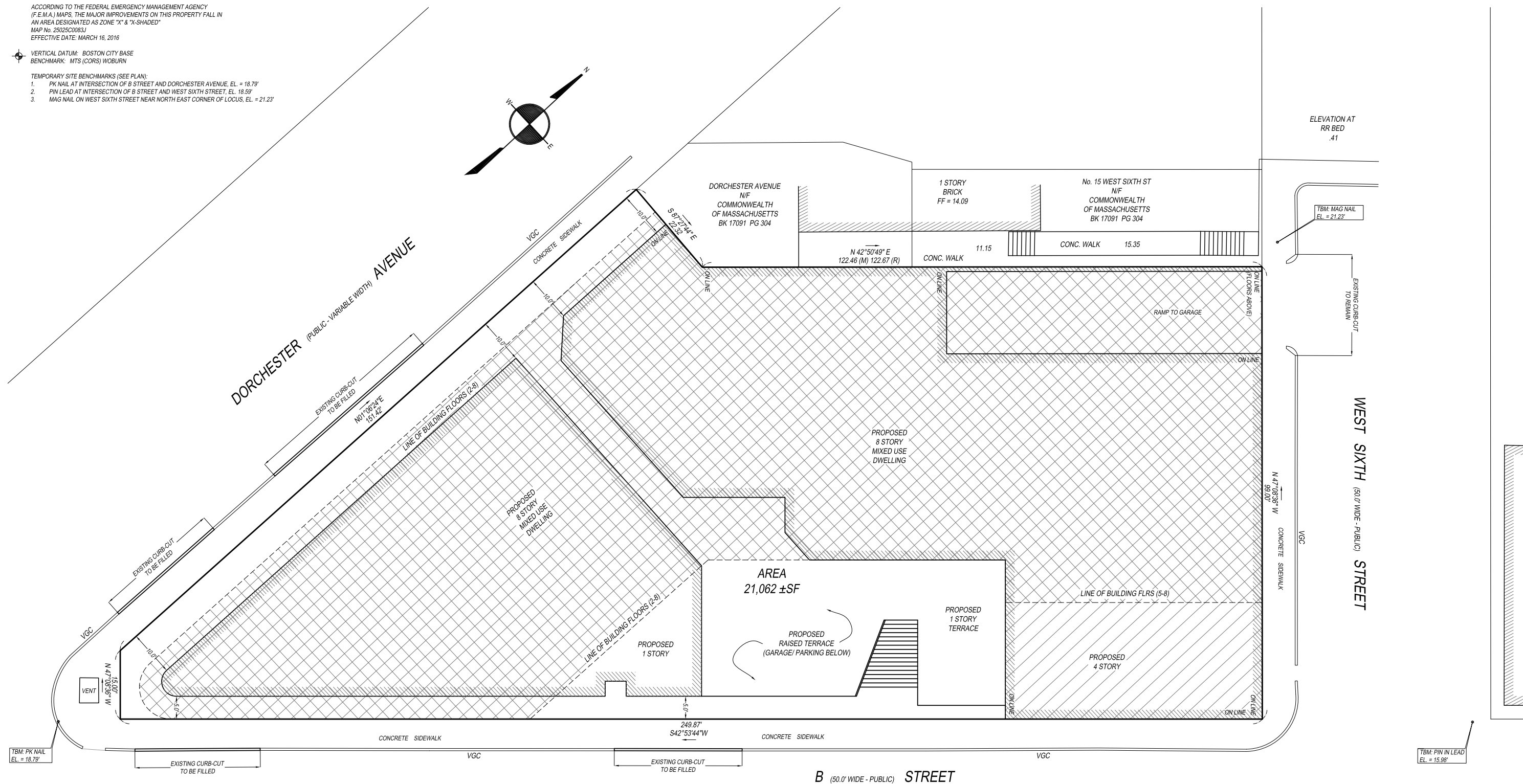
I CERTIFY THAT THIS PLAN WAS MADE FROM AN INSTRUMENT SURVEY ON THE GROUND ON THE DATE OF NOVEMBER 13, 2013 AND ALL STRUCTURES ARE LOCATED AS SHOWN HEREON.

ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A.) MAPS, THE MAJOR IMPROVEMENTS ON THIS PROPERTY FALL IN AN AREA DESIGNATED AS ZONE "X" & "X-SHADED"  
MAP No. 25025C0083J  
EFFECTIVE DATE: MARCH 16, 2016

VERTICAL DATUM: BOSTON CITY BASE  
BENCHMARK: MTS (CORS) WOBURN

TEMPORARY SITE BENCHMARKS (SEE PLAN):

1. PK NAIL AT INTERSECTION OF B STREET AND DORCHESTER AVENUE, EL. = 18.79'
2. PIN LEAD AT INTERSECTION OF B STREET AND WEST SIXTH STREET, EL. 18.59'
3. MAG NAIL ON WEST SIXTH STREET NEAR NORTH EAST CORNER OF LOCUS, EL. = 21.23'



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Figure 1.7f  
Site Plan

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects

# 2

## Urban Design

This chapter describes the existing urban context of the Project Site, and discusses the planning principles and design goals for the Project. This section describes the Project's urban design characteristics (i.e., height and massing) and public realm improvements, including proposed landscaping. Supporting graphics include building floorplans, building elevations, building sections and view perspectives. Refer to Figure 1.5 for the proposed conditions plan.

### 2.1 Key Findings and Benefits

The key findings and benefits of the Project related to urban design and sustainability are listed below.

- The project location is convenient to public transit.
- The building massing and height is consistent with plans for corridor.
- The Project provides ample public and private open space.
- The building will be designed with high-quality, durable materials.
- The public realm will be designed to comply with the City of Boston's Complete Streets guidelines.
- Proposed landscaping will increase the amount of green space on-site.
- The Project will be accessible to those with disabilities.

### 2.2 Neighborhood Context

The Project is located in South Boston, which is home to both long-time residents and a new wave of young professionals who are drawn to the area's open space, emerging nightlife, and easy access to downtown. The Project Site boasts excellent transit access, located approximately 0.3 miles (a five-minute walk) from the Broadway Red Line station, 0.6 miles from Andrew Station, and within blocks of three MBTA bus routes (9, 11 and 47). Destinations within a ten minute walk include the West Broadway Neighborhood Shopping District and the South End's SoWa Arts District. The Site is also easily accessible by car, with direct access to Downtown Boston, Logan Airport, and the Massachusetts Turnpike.

## 2.3 Planning Principles and Design Goals

The Project was developed based on the following planning goals:

**Develop a project of appropriate scale and density for the neighborhood.** The height and massing, described in Section 2.4.1 below, were developed in response to community input and the ongoing *PLAN: South Boston Dorchester Ave* process.

**Provide housing that is affordable to middle class Bostonians.** Rental units in South Boston are not affordable to the majority of middle class working households. This Project aims to help fill the housing gap in this neighborhood.

**Engage the community to create a project that is desirable and well-supported.** Community outreach, described in Section 1.4 of this document, was performed to illicit input from local stakeholders to ensure that the Project meets the community's needs.

**Enhance existing and provide new community uses.** It is of the utmost importance that Ultimate Self Defense Gym, a treasured community asset, continues to be located at the Site. In addition, the community expressed a need to retain an automobile rental use in the area, and the Project has seized the opportunity to provide space for such a use by securing a letter of intent from a major automobile rental agency. Finally, space for a community-oriented use such as a restaurant will be provided at-grade.

**Enhance community access to open space.** The *PLAN: South Boston Dorchester Ave* process identified a lack of adequate open space within a 0.25 mile radius of the Project Site. The Project's sunny courtyard will attract neighbors and visitors to its approximately 1,500 square feet of public open space, and significant building setbacks on Dorchester Avenue and B Street will provide expanded pedestrian areas.

**Improve the visual appeal of the site.** The existing warehouse-style buildings will be replaced with an attractive new building. In addition, the existing large-scale billboard, which is an eyesore to the community, will be removed.

## 2.4 Design Concept and Development

The Chandlery will become the highly visible entry point into the South Boston neighborhood. It will provide a contemporary character to the currently-revitalizing Dorchester Avenue corridor. The southern end of the development is defined by the triangular intersection of Dorchester Avenue with B Street. The design of the building and streetscape accentuate this geometry.

The Site plane is a warped surface sloping up approximately six feet from the intersection of Dorchester Avenue and B Street in a northerly direction toward the bridge over the Haul Road. The Site slopes down approximately three feet to the corner of B Street and West 6<sup>th</sup> Street. The Project design takes advantage of the site's various elevations by creating a two-story

glass commercial storefront that provides a partially below-grade space. It also provides a number of site entry points and various levels of public and private open space.

### **2.4.1 Building Massing**

The *Plan: South Boston Dot Ave* process recognizes the Site's role in transforming the corridor from a low-density, light-industrial area to an activated destination. The proposed massing responds to this by fronting the taller (90') portion of the building at the intersection of Dorchester Avenue and B Street, and creating a pedestrian-scale façade for the Project along B Street. The building's height is stepped down to 50 feet further east along B Street and on West 6<sup>th</sup> Street in recognition of the adjacent residential scale, with a series of Town House duplex units and at-grade accessible studio units proposed at this location. Figures 2.1a-h present Project elevations. Figure 2.2 shows a building section.

### **2.4.2 Building Access / Open Space**

Primary residential access is via the main entrance, which is located at the northwest corner of the site on Dorchester Avenue. Studio units and townhouses are accessed via private entrances located on B Street. Commercial areas are accessed via the main entrance on Dorchester Avenue, as well as through the central public courtyard.

The Project features a landscaped public courtyard accessible through the main building entrance at 270 Dorchester Avenue as well as via a community-oriented stairway at B Street. This public open space is described in Section 2.5, Public Realm. Landscaping of this space described in Section 2.6, Site Landscaping.

Approximately 10,000 square feet of private open space is provided in the form of private decks for many of the residential units, as well as communal decks on the second floor and roof top. The rooftop deck is designed take advantage of unobstructed views of Downtown Boston, Boston Harbor, and points south and east.

### **2.4.3 Character and Exterior Materials**

The contemporary structure will respect the architectural detailing of the adjacent buildings, and will incorporate brick, glass and metal panel elements into the façade. The Project's name, The Chandlery, acknowledges the site's current use as a premiere marine and industrial supplier (historically known as a ship chandlery), and reflects the owner's 80-year family history in the local chandlery business. The building's notable five-foot curved cornice is reminiscent of marine bulwarks as a gesture to the Project's nautical heritage.

The townhomes located on B Street and West 6<sup>th</sup> Street are scaled to match the height of buildings across the street and will be clad in traditional brick. Due to side grade changes, the building will be clad in solid brick along B Street in order to accommodate planned interior uses.



#### **2.4.4 Signage**

Signage will be designed subject to the BRA's signage guidelines.

### **2.5 Public Realm**

Public open space begins along Dorchester Avenue, where the building is set back from the property line ten feet at-grade, creating an arcaded area. Combined with the existing six-foot pedestrian right-of-way, a 16-foot wide sidewalk is created, with amenities including street trees, landscape plantings, seating, bicycle parking, pedestrian lighting and trash receptacles located in the greenscape/furnishing zone. Along B Street the sidewalk will vary in width from eight to thirteen feet. The sidewalk on West 6<sup>th</sup> Street will remain at its current width of six feet.

The development concept includes a pedestrian passage that conveniently connects Dorchester Avenue with B Street through the central public courtyard. This courtyard includes outdoor space for general public use between the hours of 6:00 am and 10:00 pm; outdoor space associated with the commercial use on the second level of the main building; semi-private garden space associated with plaza level residential units; and intensive and extensive planters. Pedestrian lighting and other safety considerations will be incorporated. Given the southern orientation of the public courtyard, which is typically bathed in sunlight, and the attractive landscaped seating areas, it is anticipated that the space will be heavily utilized by both Chandlery residents and the wider community.

### **2.6 Site Landscaping**

To create a rich landscape adjacent to the pedestrian walkways, the Project includes both street trees and large planters within the Greenscape/Furnishing Zone. These planters will contain shrub, groundcover and perennial plantings. Likewise, the public courtyard will include intensive planters with tree, shrub, groundcover and perennial plantings to create an inviting garden setting. The taller planting will be visible as users ascend the stairway from B Street to the courtyard level.

Both private and semi-private rooftops gardens are included in the project at four levels, imparting a strong urban garden character to the development. All rooftop outdoor spaces include pedestal pavement systems to effectively drain water from roof surfaces, and extensive and intensive green roof plantings as well as container planting. The main rooftop garden will have expansive 360-degree views with raised planters and extensive green roof plantings. The garden design includes informal gathering spaces, overlook points, and several "living room" seating areas with wind attenuation structures and overhead trellises. Figures 2.3a-d provide conceptual landscaping plans.

## **2.7 Accessibility**

Many of the Project's residential units will be designed to be universally accessible. Public open space will be accessible via the main entrance on Dorchester Avenue. Accessible parking will be located on the first level of the parking garage, with elevator access to the street and plaza levels. Detailed information can be found in the Accessibility Checklist located in Appendix C, BRA Checklists.



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Figure 2.1a  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



PISANI + ASSOCIATES  
ARCHITECTS



Figure 2.1b  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





PISANI + ASSOCIATES  
ARCHITECTS



Figure 2.1c  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





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ARCHITECTS



Figure 2.1d  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





PISANI + ASSOCIATES  
ARCHITECTS



Figure 2.1e  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





PISANI + ASSOCIATES  
ARCHITECTS



Figure 2.1f  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





PISANI + ASSOCIATES  
ARCHITECTS



Figure 2.1g  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects





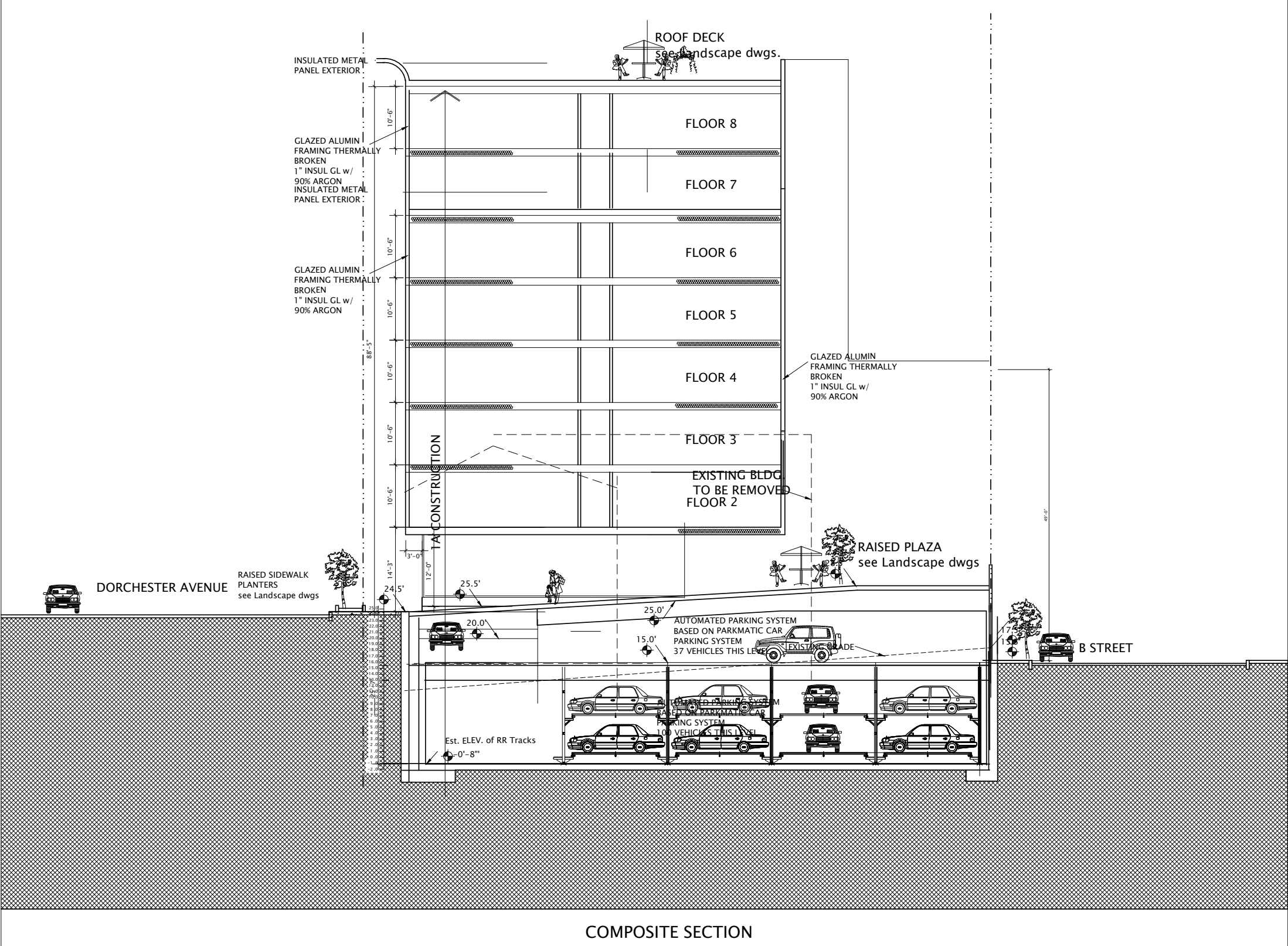
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ARCHITECTS



Figure 2.1h  
Project Elevations

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



COMPOSITE SECTION

PISANI + ASSOCIATES  
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Figure 2.2  
Building Section

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Pisani & Associates Architects



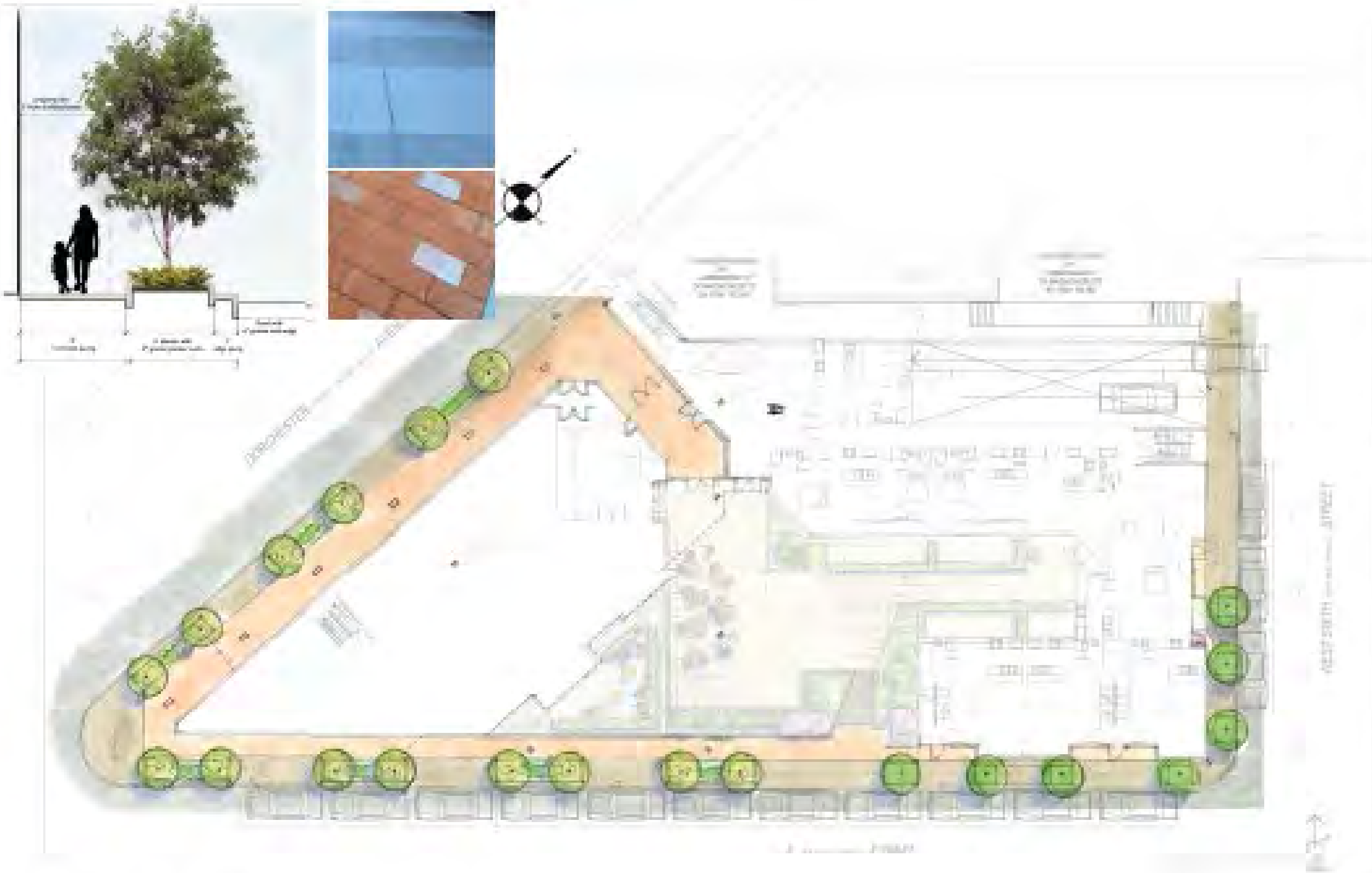


Figure 2.3a  
Landscape Plan  
Streetscape  
**270 Dorchester Avenue**  
**South Boston, Massachusetts**

Source: Blair Hines Design Associates



Figure 2.3b  
Landscape Plan  
Entry Plaza & Third Floor  
**270 Dorchester Avenue**  
**South Boston, Massachusetts**

Source: Blair Hines Design Associates



Figure 2.3c  
Landscape Plan  
Townhouse's Roof Deck  
**270 Dorchester Avenue**  
**South Boston, Massachusetts**

Source: Blair Hines Design Associates



Figure 2.3d  
Landscape Plan  
Roof Deck  
**270 Dorchester Avenue**  
**South Boston, Massachusetts**

Source: Blair Hines Design Associates

# 3

## Sustainability and Green Building

This chapter provides preliminary information regarding the project's sustainability, green building and climate resiliency strategies. It identifies the proposed US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system and outcome, describes building-specific strategies for each LEED category and how key credits will be achieved. It also discusses a framework for considering present and future climate conditions in project design.

### 3.1 Key Findings and Benefits

In order to meet sustainability goals, the Project will be designed to:

- Comply with the Massachusetts Stretch Energy Code;
- Qualify as LEED 2009 Silver certifiable;
- Minimize energy consumption and maximize the use of clean and renewable energy; and
- Be resilient to anticipated changes in climate during the Project's lifetime.

### 3.2 Regulatory Context

#### 3.2.1 Massachusetts Stretch Energy Code

Per the Boston City Council adoption of the Stretch Energy Code November, 2010, the Project is required to comply with Massachusetts Stretch Energy Code Chapter 5, Advanced Commercial Energy Efficiency. The compliance method selected by the Project team is Section 501.1.4 Performance Option for Buildings from 5,000 to 100,000 sq. ft. The Project is being designed to achieve energy use per square foot at least 20% below the energy requirements of ASHRAE/IESNA Standard 90.1-2007, Energy Standard for Buildings Except for Low-Rise Residential Buildings. This will be verified using an industry accepted energy modeling practice.

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

Per the adoption of Article 37 by the City of Boston in January, 2007, the Project is required to achieve a minimum level of LEED certifiable. With the necessary support from Project team



LEED Accredited Professionals (AP) and oversight by a LEED for Homes Green Rater, the Project will be designed, constructed, and managed to be LEED Silver certifiable. The Project will strive to minimize adverse environmental impacts; to conserve natural resources; to promote sustainable development; and to enhance the quality of life in Boston.

### 3.3 Sustainability Approach

The Project will meet or exceed the following green design and construction standards:

- LEED 2009 for New Construction and Major Renovations
- Massachusetts Stretch Energy Code

The Project is currently tracking for 60 points and will at a minimum meet the LEED Silver certification level of 50-59 points.

Sustainable Sites (SSp)	[23 of 26 points]
Water Efficiency (WEp)	[7 of 10 points]
Energy & Atmosphere (EAp)	[8 of 35 points]
Materials & Resources (MRp)	[4 of 14 points]
Indoor Environmental Quality (EQp)	[13 of 15 points]
Innovation (INc)	[5 of 6 point]
<hr/>	
Total Points	[60 of 110 points]

The full scorecard is included in Appendix C.

#### 3.3.1 Heat Island

The Project will minimize the heat island effect by installing site landscaping, utilizing light-colored paving materials on the pedestrian-oriented hardscape, and a installing a reflective rooftop membrane to absorb less heat. The Project also minimizes paved surfaces through the inclusion of extensive and intensive green roof plantings as well as street trees and container plantings within the public realm.

#### 3.3.2 Stormwater

The Project will incorporate stormwater management and treatment systems that will improve water quality, reduce runoff volume and control peak rates of runoff in comparison to existing conditions. The Project is anticipated to include an innovative infiltration system that retains site runoff while providing treatment and peak flow mitigation. All rooftop outdoor spaces include pedestal pavement systems to effectively drain water from roof surfaces, and extensive and intensive green roof plantings as well as container planting to minimize roof runoff.

### **3.3.3 Water-Use Reduction**

The project will employ highly efficient hot water heaters, low flow/high performance plumbing fixtures, and efficient distribution systems (compact design, strategic pipe size selection and insulation).

### **3.3.4 Energy Optimization**

Energy use reduction is a critical issue and one where the design can have a large impact in a cost effective way. Careful attention will be paid to ensure an exterior envelope assembly with high effective R values and thorough air sealing. High efficiency windows and doors will also be used. This provides mechanical systems that ensure comfort while meeting reduced heating and cooling loads. The amount of on-site combustion based equipment will be minimized. The Project will be designed to be ready to accept photovoltaics or solar hot-water systems in the future as funding permits. Electrical load will be reduced through lighting design using efficient fixtures (fluorescent and LED) and controls. Appliances will be Energy Star rated.

## **3.4 Greenhouse Gas Reduction**

In support of Boston's greenhouse gas (GHG) reduction goals, the Project will implement passive and active strategies that minimize energy consumption and maximize the use of clean and renewable energy. A preliminary energy model is currently being developed by the Project team (see Appendix D or initial results). A clean and renewable energy analysis will be conducted, and a description of the team's engagement with energy efficiency entities will be provided.

## **3.5 Climate Change Preparedness and Resiliency**

This section discusses the approach to preparing for anticipated changes in climate, in accordance with Appendix 7 of Article 80 of the Code. The required Climate Change Resiliency and Preparedness Checklist has been completed for the project and is provided in Appendix C of this EPNF.

### **3.5.1 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. This section examines how the project may be affected by and will prepare for these phenomena.

As a result of climate change, the Northeast is expected to experience more frequent and intense storms. The IPCC has also predicted that in Massachusetts the number of days with temperatures greater than 90°F will increase from 5 to 20 days. To prepare for this, the Project will minimize the heat island effect by installing site landscaping, utilizing light-colored paving

materials on the pedestrian-oriented hardscape, and a installing a reflective rooftop membrane to absorb less heat.

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

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

### **3.5.2 Sea Level Rise and Storms**

Rising sea levels and more frequent extreme storms increase the probability of coastal and riverine flooding and enlarging of the 100 Year flood plain. According to the Boston Harbor Flood Risk Model (BH-FRM) developed as part of the MassDOT-FHWA Pilot Project Report, *Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery (2015)*, the project site is not susceptible to coastal flooding until sometime around 2070, when there will be a 0.2% chance of flooding in any given year (equivalent to flooding from the 500 year storm). Due to the low risk of storm flooding at the project site during the project's lifetime, flood-proofing options are not currently being considered. However, adaptive measures may be considered in the future as conditions change.

# 4

## Transportation and Parking

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

### 4.1 Key Findings and Benefits

The proposed redevelopment of the Project Site will provide several benefits to the surrounding area with negligible potential impacts. Key elements of the Project are summarized below and are discussed in greater detail throughout this chapter:

- The Project will be replacing existing uses with a mixed-use development consistent with the City's goals for this area.
- The study area is well served by public transportation which will minimize the need for residents and visitors to the Site to travel by automobile.
- Considering the Boston Transportation Department's projected mode splits for this area, the Project is expected to generate minimal automobile traffic – only 37 and 57 vehicle trips during the critical weekday morning and evening peak hours, respectively.
- The Site is currently served by five poorly defined curb cuts located in close proximity to nearby intersections. These will be consolidated into a single driveway on West 6<sup>th</sup> Street.
- The parking needs for the Site will be accommodated by a proposed 120-space parking garage. The efficiency and use of this garage will be enhanced through an internal automated/mechanical system which will maximize the number of parking spaces and avoid impacts to the on-street parking supply.

### 4.2 Project Overview

The Project is proposed to be constructed on 0.48 acres of land combined from two parcels located at 270-284 Dorchester Avenue at the northeast corner of the intersection of Dorchester Avenue and B Street. Most recently, the existing buildings on this Site have been

used as a marine supply business (C.G. Edwards Co. Inc. Marine and Industrial Hardware Supplies) and a martial arts studio (Ultimate Self Defense Performance Center). The parcel located immediately adjacent to the Dorchester Avenue/B Street intersection (284 Dorchester Avenue) was formerly occupied by a roughly 863 square foot “Chuck & Ann’s Submarines” restaurant and contains a pole-mounted billboard. All of these existing uses will be removed to accommodate the new redevelopment on this Site. A summary of the proposed uses for the Project is provided in Table 4.1.

**TABLE 4.1 PROJECT DEVELOPMENT PROGRAM**

<b>Land Use</b>	<b>Size</b>
Residential	150 units
Retail/Commercial Space	Up to 6,600 square feet (sf)
Parking	120 spaces

As shown in Table 4.1, the Project will involve the construction of a new 150-unit residential building with up to 6,600 sf of supporting ground-floor/street front commercial space (office/retail). Specifically, approximately 6,590 sf of retail space will be constructed on the first two levels of the building. This space will be occupied by Ultimate Self Defense Gym (which is currently located on the Site), a commercial automobile rental company, and a community-oriented use. The parking needs for the Project will be accommodated by a two-level, below-grade parking garage. Through the use of elevators and an automated parking system the garage will have parking for approximately 120 vehicles. To maximize the efficiency of the parking, the garage will be fully-automated through mechanical “stacking” systems that will provide the most spaces within the limited area available.

### 4.3 Study Methodology

The analysis presented in this Expanded Project Notification Form (PNF) provides a detailed description of the Project’s transportation characteristics and evaluates any impacts to the transportation infrastructure. The transportation analysis presented in this chapter conforms to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines.

Transportation analysis includes the projection of Project-related trips based on Institute of Transportation Engineers (ITE) trip generation data and the application of local travel characteristics established through the *Access Boston 2000-2010* initiative. Synchro 8 software was used to facilitate the evaluation of traffic operations based on Highway Capacity Manual<sup>1</sup> (HCM) methodologies.



<sup>1</sup> Highway Capacity Manual; Transportation Research Board; Washington D.C.; 2010.

#### 4.3.1 Study Area Intersections

Based on a review of the traffic studies prepared for the other nearby development projects and familiarity with the surrounding area, vehicular traffic associated with the Project should be widely dispersed throughout the nearby street network. Considering these and other factors, the following intersections, as shown in Figure 4.1 were included in the study area for the analysis:

- Dorchester Avenue at Old Colony Avenue – *Signalized*
- Dorchester Avenue at West 7<sup>th</sup> Street/B Street – *Unsignalized*
- B Street at West 6<sup>th</sup> Street/ Orton Marotta Way – *Unsignalized*
- B Street at Flaherty Way – *Unsignalized*
- B Street at West 4<sup>th</sup> Street - *Unsignalized*
- Dorchester Avenue at West 4<sup>th</sup> Street – *Signalized*

#### 4.3.2 Analysis Conditions

The transportation analysis considers the following primary scenarios:

- **2016 Existing Condition** – based on existing traffic conditions in the study area
- **2021 No-Build Condition** – future conditions for a five-year time horizon as expected to occur if the Project was not constructed.
- **2021 Build Condition** – future conditions for a five-year time horizon assuming construction and full occupancy of the Project.

#### 4.3.3 Mode Share Assumptions

After the initial calculation of the base Project trip generation using ITE data, further adjustments were made to account for local mode share following guidelines by the Boston Transportation Department (BTD) for individual city zones. This mode-shared calculation is critical to the evaluation of overall Project-related traffic impacts as there will be a mixture of automobile travel to the Project Site, along with residents and customers that utilize public transit or walk and/or bike. As the Project falls within Zone 8, standard BTD mode-split data for that part of the city were utilized for this study.

Transit and bike/pedestrian activity was further evaluated by considering local vehicle occupancy rates (VOR) derived from the 2001 National Household Travel Survey based on United State Census data. Due to the urban neighborhood environment a substantial portion of the Project-generated trips are expected to use the MBTA transit system, or walk and/or bike. Regardless, the majority of the trips still will be in the form of motor-vehicle trips. The results of the adjusted trip generation are provided later in this chapter.

The vehicle trip totals evaluated as part of this study do not account for the traffic currently generated by the Project Site. A qualitative discussion of the trip generation for the Project Site under existing conditions is provided later in this chapter. However, as the Site currently

was observed to generate only minimal traffic during the critical peak hours, this study was conservatively conducted without taking any credit for the existing activity on-site.

## 4.4 Existing Conditions

This section describes existing transportation conditions, including an overview of roadway conditions, transit, pedestrian and bicycle facilities, and general site conditions. A discussion of the existing on-street parking supply and utilization is also provided.

### 4.4.1 Roadways

The Project is located on the corner of Dorchester Avenue and B Street.

- Dorchester Avenue is a principal arterial running through the study area connecting Foundry Street near Broadway to the north with Washington Street in Mattapan to the south. Near the Project Site, Dorchester Avenue does not provide any on-street parking and provides “sharrows” directly adjacent to the Site indicating shared use by motorists and cyclists, which transition into bike lanes north and south of the Site.

### 4.4.2 Study Area Intersections

The study area consists of six study intersections shown in Figure 4.1 and which are described below. Traffic operations and level of service (LOS) analysis are presented later in this chapter.

- **Dorchester Avenue at Old Colony Avenue/Milhender Place** – The intersection of Dorchester Avenue at Old Colony Avenue is a signalized intersection southwest of the Project Site. Dorchester Avenue runs north/south and Old Colony Avenue runs northwest/southeast. The Dorchester Avenue northbound approach provides two general purpose lanes with no parking permitted. The Dorchester Avenue southbound approach provides one through lane towards Dorchester Avenue and two left turn lanes towards Old Colony Avenue with no two hour parking provided. The Dorchester Avenue southbound approach is median separated. The Old Colony Avenue northbound approach provides two general purpose lanes with no parking provided. Old Colony Road is median separated. Crosswalks are provided on the northbound approach of Dorchester Avenue and the Northwest bound approach of Old Colony Avenue with ramps on all corners.
- **Dorchester Avenue at B Street / West 7<sup>th</sup> Street** – The intersection of Dorchester Avenue at B Street / West 7<sup>th</sup> Street is an unsignalized intersection at the southwest corner of the Project Site. Dorchester Avenue runs north/south, B Street runs northeast/southwest, and West 7<sup>th</sup> Street runs northwest/southeast. Dorchester Avenue northbound is median separated and is free flowing with no parking allowed and sharrows provided for bicycle accommodation. B Street south westbound approach provides one general purpose lane with two hour visitor parking on the north side and resident parking on the south side. West 7<sup>th</sup> Street north westbound approach provides one general purpose lane

with an MBTA bus stop on the east side and no parking on the west side. Crosswalks are provided across B Street and West 7<sup>th</sup> Street with ramps on all corners

- **B Street at West 6<sup>th</sup> Street / Orton Marotta Way** – The intersection of B Street at West 6<sup>th</sup> Street / Orton Marotta Way is an unsignalized intersection at the southeast corner of the Project Site. B Street runs northeast/southwest, West 6<sup>th</sup> Street runs northwest/southeast, and Orton Marotta Way runs one way northwest bound. The B Street northeast bound approach provides one free-flowing general purpose lane with visitor parking on the north side and resident parking on the south side. The B Street southwest approach provides one free-flowing general purpose lane in each direction with visitor parking on the north side of the northeast bound approach and the south side of the southwest bound approach, an MBTA Bus Stop on the north side of the southwest bound approach, and resident parking on the south side of the northeast bound approach. Orton Marotta Way is one way northwest bound and provides one stop controlled general purpose lane with parking provided for the Boston Housing Authority residents on the east side. West 6<sup>th</sup> Street is a dead end street that provides one general purpose lane with no stop control. A crosswalk is provided along Orton Marotta Way with ramps on both ends.
- **B Street at West 5<sup>th</sup> Street / Flaherty Way** – The intersection of B Street at West 5<sup>th</sup> Street / Flaherty Way is an unsignalized intersection northeast of the Project Site. B Street runs northeast/southwest, West 5<sup>th</sup> Street runs northwest/southeast and Flaherty Way runs one way southeast bound. B Street northeast bound approach provides one free-flowing general purpose lane with visitor parking provided on the north side and resident parking on the south side. B Street southwest bound approach provides one free-flowing general purpose lane with an MBTA Bus Stop on the north side and resident parking on the south side. West 5<sup>th</sup> Street southeast bound approach provides one stop controlled general purpose lane with unrestricted parking on both sides. Crosswalks and ramps are provided on all approaches
- **B Street at West 4<sup>th</sup> Street** – The intersection of B Street at West 4<sup>th</sup> Street is an unsignalized intersection northeast of the Project Site. B Street runs northeast/southwest and West 4<sup>th</sup> Street runs northwest/southeast. B Street northeast bound approach provides one free-flowing general purpose lane with visitor parking on the north side and residential parking on the south side. The B Street southwest bound approach provides one free-flowing general purpose lane with resident parking on both sides of the street. West 4<sup>th</sup> Street southeast bound approach provides one stop controlled general purpose lane with unrestricted parking on the west side. The West 4<sup>th</sup> Street southeast bound approach is one way away from the intersection. Crosswalks and ramps are provided on all approaches.
- **Dorchester Avenue at West 4<sup>th</sup> Street** – The intersection of Dorchester Avenue at West 4<sup>th</sup> Street is a signalized intersection north of the Project Site. Dorchester Avenue runs north/south and West 4<sup>th</sup> Street runs east/west. The Dorchester avenue northbound approach provides one left turn lane, two through lanes, a bicycle lane, and one right turn lane with unrestricted parking provided on the east side. The West 4<sup>th</sup> Street westbound



approach provides one general purpose lane with two-hour parking on the north side. The Dorchester Avenue southbound approach provides two general purpose lanes with two-hour parking on the west side and sharrows. The West 4<sup>th</sup> Street eastbound approach provides one left/through lane and one right turn lane. No parking is allowed and no bicycle facilities are provided. Crosswalks and ramps are provided across all approaches.

#### 4.4.3 Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) currently provides local bus service and Red Line service within walking distance (0.25 miles) of the Project Site. Figure 4.2 illustrates existing MBTA services and Table 4.2 provides a summary of the bus and rail services. A detailed description of each service also is provided.

**TABLE 4.2 MBTA PUBLIC TRANSPORTATION SERVICES**

Service	Origin / Destination	Peak Hour Frequency	Closest Stop
Bus Route 9	City Point/Copley Square	5-10 minutes	West Broadway at B Street (0.21 miles)
Bus Route 11	City Point/Downtown	7-12 minutes	250 Dorchester Ave (200 feet)
Bus Route 47	Central Square/Broadway Station	8-20 minutes	Broadway Station (0.26 miles)
Red Line – Ashmont Line	Alewiffe/Ashmont	9 minutes	Broadway Station (0.26 miles)
Red Line – Braintree Line	Alewiffe/Braintree	9 minutes	Broadway Station (0.26 miles)

Source: MBTA

**Route #9 – City Point – Copley Square** – This route travels from City Point in South Boston to Copley Square via Broadway and Berkeley Street and Herald Street with stops along the Red Line, Silver Line and the Prudential Center. The closest stop to the Project Site is West Broadway at B Street approximately one-third of a mile away. During the weekday, Route 9 operates from 5:13 AM to 1:14 AM with 5-10 minute headways during peak hours. Over the weekend, the bus operates from 5:10 AM to 1:14 AM on Saturdays and from 6:00 AM to 1:12 AM on Sundays.

**Route #11 – City Point – Downtown** – This route travels from City Point in South Boston to Downtown Boston via East 8<sup>th</sup> Street, Chinatown and the Financial District with stops along the Red, Orange and Silver Lines. The closest stops to the Project Site are at 250 Dorchester avenue approximately 200 feet away for inbound service, and at B Street at W 6<sup>th</sup> Street approximately 150 feet away for outbound service. During the weekday, Route 11 operates from 5:11 AM to 1:22 AM with 7-12 minute headways during peak hours. Over the weekend, the bus operates from 5:10 AM to 1:20 AM on Saturdays and from 6:15 AM to 1:28 AM on Sundays.

**Route #47 – Central Square, Cambridge – Broadway Station** – This route travels from Central Square in Cambridge to Broadway Station in South Boston via the South End, Fenway, Longwood Medical Area, and Boston University with stops along the Red, Silver, Orange and Green Line. The closest stop to the Project Site is at Broadway Station approximately one-third of a mile away. During the weekday, Route 47 operates from 5:15 AM to 1:24 AM with 8-20 minute headways during peak hours. Over the weekend, the bus operates from 5:00 AM to 1:40 AM on Saturdays and from 7:30 AM to 1:04 AM on Sundays.

**Red Line – Alewife – Ashmont or Braintree** – The Ashmont branch of the Red Line provides service from Alewife Station in Cambridge to Ashmont Station in Mattapan. Service is provided on weekdays from 5:16 AM to 12:30 AM with 9 minute headways during peak hours. On Fridays, due to the Late Night Program, service runs until 1:49 AM. On the weekends, service runs from 5:16 AM to 1:49 AM on Saturdays and from 6:00 AM to 12:30 AM on Sundays.

The Braintree branch of the Red Line provides service from Alewife Station in Cambridge to Braintree Station in Braintree. Service is provided on weekdays from 5:15 AM to 12:18 AM with 9 minute headways during peak hours. On Fridays, due to the Late Night Program, service runs until 1:38 AM. On weekends, service runs from 5:15 AM to 1:38 AM on Saturdays and from 6:00 AM to 12:18 AM on Sundays.

Since both the Ashmont and Braintree lines run on the same track from Alewife to JFK/UMASS, the combined headway at Broadway Station is 4.5 minutes.

#### **4.4.4 Bicycles**

The intersection descriptions provided in Section 4.4.2 include inventories of the existing bicycle facilities in this area. Figure 4.3 shows the bicycle accommodations that currently are provided within a one-quarter mile radius of the Project Site.

#### **4.4.5 On-Street Parking**

As part of the existing conditions data collection VHB conducted an inventory of the existing on-street parking facilities provided within the Project study area. Figure 4.4 shows the current on-street parking conditions within a ¼ mile radius of the Project Site. This graphic also shows current on-street loading areas, bus stops, and parking classifications.

#### **4.4.6 Vehicular Traffic Volumes**

To properly assess the traffic conditions of the surrounding street network, manual turning movement counts (TMCs) were collected at the six study area intersections. TMCs were collected on June 18, 2014 during a typical weekday morning peak period (7:00 AM – 9:00 AM) and evening peak period (4:00 PM – 6:00 PM). These counts were then increased to the year 2016 using the growth rate that is described in the No-Build section of this report.

The TMCs were used to establish the study area network peak hour volumes for the existing conditions analysis. The weekday morning peak hour was determined to be from 7:45 AM to

8:45 AM and the evening peak hour was from 5:00 PM to 6:00 PM. No seasonal adjustments were required based on VHB's research of this area. The existing weekday morning and evening peak hour traffic volumes are shown in Figures 4.5 and 4.6, respectively. The raw count data are included in Appendix B.

#### **4.4.7 Existing Pedestrian Environment**

Sidewalks along the roadway network near the Project Site are in varying condition with striped crosswalks and concurrent pedestrian signal phasing provided at the signalized intersections within the study area. Moderate levels of pedestrian congestion was observed on the roadways near the Project Site, with many of the pedestrians congregating around MBTA bus stops within the study area. Figures 4.7 and 4.8 provide the observed intersection crossing volumes during the respective weekday morning and evening peak hours.

#### **4.4.8 Existing Bicycling Activity**

The observed bicycle volumes throughout the traffic study area are highlighted in Figures 4.9 and 4.10, respectively, for the weekday morning and weekday evening peak hours.

#### **4.4.9 Crash Analysis**

Study area crash data were obtained from MassDOT records for the four-year period from January 2011 through December 2014 (the most recent data available). Analysis of the crash data is summarized in Table 4.3 and includes the statewide average crash rates compared to the calculated crash rates for each study area intersection. For the B Street/Orton Marotta Way/West 6<sup>th</sup> Street, B Street/West 4<sup>th</sup> Street, and Dorchester Avenue/B Street/West 7<sup>th</sup> Street intersections, there were not any crashes included in the crash database. It is possible that some accidents may have occurred but were either not reported or not included in the MassDOT database, and therefore not considered. Regardless, for those locations listed in Table 4.3 the calculated crash rate was well below the state average.

**TABLE 4.3 VEHICULAR CRASH SUMMARY (2011-2014)**

	<b>Dorchester Avenue at:</b>		<b>B Street at:</b>
	<b>Old Colony Rd</b>	<b>West 4<sup>th</sup> St</b>	<b>West 5<sup>th</sup> St/ Flaherty Way</b>
Signalized?	Yes	Yes	No
MassDOT Average Crash Rate	0.70	0.70	0.53
MassDOT Calculated Crash Rate	0.25	0.03	0.25
Exceeds?	No	No	No
<b>Year</b>			
2011	0	1	0
2012	0	0	1
2013	2	0	0
2014	2	0	0
<b>Total</b>	<b>4</b>	<b>1</b>	<b>1</b>
<b>Collision Type</b>			
Angle	1	1	1
Head-on	0	0	0
Rear-end	3	0	0
Sideswipe	0	0	0
Not Reported	0	0	0
<b>Total</b>	<b>4</b>	<b>1</b>	<b>1</b>
<b>Severity</b>			
Fatal Injury	0	0	0
Non-Fatal Injury	2	0	0
Property Only	1	1	0
Not Reported	1	0	1
<b>Total</b>	<b>4</b>	<b>1</b>	<b>1</b>
<b>Time of Day</b>			
Weekday, 7:00 AM-9:00 AM	0	0	0
Weekday, 4:00 PM-6:00 PM	1	0	0
Saturday, 11:00 AM-2:00 PM	0	0	0
Weekday, other time	1	1	1
Weekend, other time	2	0	0
<b>Total</b>	<b>4</b>	<b>1</b>	<b>1</b>
<b>Pavement Conditions</b>			
Dry	3	1	1
Wet	1	0	0
Snow/ice	0	0	0
<b>Total</b>	<b>4</b>	<b>1</b>	<b>1</b>
Non-Motorist (Ped/Bike)	0	1	0

Source: MassDOT crash data

## 4.5 Future Conditions

To assess future transportation conditions, the analysis considered the following future scenarios for a five-year time horizon (2021) from the time of the existing conditions described earlier:

- **2021 No-Build Condition** – assumes no changes to the Project Site, but with background growth associated with other planned projects and general regional growth, along with any planned roadway/infrastructure improvements; and
- **2021 Build Condition** – assuming the same background growth and any planned infrastructure improvements, but including the redevelopment of the Project Site.

### 4.5.1 No-Build Conditions

The 2021 No-Build Condition was developed to evaluate future transportation conditions in the traffic study without consideration of the Project. In accordance with BTS guidelines, this future analysis year represents a five-year horizon (2021) from existing conditions (2016). Accordingly, the 2016 Existing Condition volumes presented earlier in this report were projected five years into the future using this growth rate to establish the 2021 baseline conditions. The No-Build conditions provide insight to future traffic conditions resulting from regional growth as well as traffic generated by specific projects that are expected to affect the local roadway network.

#### Background Growth

A background growth rate of one-percent per year was applied to the existing traffic volumes. The growth rate is consistent with recent traffic studies for other developments within the South Boston area as well as Downtown Boston. In addition to the background growth rate, traffic projections and infrastructure changes for several specific projects were incorporated in the development of No-Build Conditions. These include the following development projects:

- **14 West Broadway** involves the redevelopment of an existing 0.33 acre site currently occupied by a restaurant/bar. This new mixed-use development will consist of 47 privately-owned residential units, 5,315 sf of restaurant use, and approximately 3,400 sf of general commercial space (office/retail) within a single building. The parking needs for the project will be accommodated by a 70-space underground parking garage. This project has been approved by the Boston Planning and Development Agency (BPDA).
- **30 B Street** is a proposed five story residential building that will consist of 32 new residential units and 28 off street parking spaces. This project is currently under construction.
- **39 A Street** consist of the existing single-store building on this 0.17-acre site being demolished and replaced with a new five-story, 24-unit residential building with 30 on-site parking spaces.

- **45 West 3<sup>rd</sup> Street** is a proposed mixed use building containing 164 residential units and approximately 2,200 square feet of ground floor retail/commercial space as well as 115 off-street parking spaces. This project has been approved by the BPDA.
- **120 West 4<sup>th</sup> Street** is an expansion of Michael Indresano Photography. The existing building will be demolished and a new building will be constructed with ground floor retail, two floors of photography studio space and 9 rental apartments. The project will include 30 parking spaces for clients and residents. This project has been approved by the BPDA.
- **135 Athens Street** is a proposed three- to four-story residential building with 15 condominiums and 20 off-street parking spaces. This project has been approved by the BPDA.
- **148-152 Dorchester Avenue** is a proposed six story building with 30 condominium units and one commercial unit with 30 off-street parking spaces. Phase II of this project is currently under construction.
- **150 West Broadway** is a proposed residential building which includes 31 units, four affordable units and four commercial units with 33 off-street parking spaces. This project has been approved by the BPDA.
- **170 West Broadway** is a proposed mixed use building which includes 33 condominiums and approximately 4,283 square feet of ground floor retail and 39 off-street parking spaces. This project is currently under construction.
- **South Boston Boutique Hotel** is a 156 room hotel with approximately 4,619 square feet of ground floor restaurant and bar space and 1,589 square feet of rooftop bar/lounge space. No on-site parking will be provided but an off-site parking supply for valet parking will be provided by some nearby landowners. This project is currently under construction.

Figures 4.11 and 4.12 presents the respective 2021 No-Build Condition weekday morning and weekday evening peak-hour traffic volumes accounting for background growth summarized above.

#### **4.5.2 Build Condition**

The 2021 Build Condition includes construction of the 150-unit residential building with 6,600 sf of ground floor supporting commercial space. An approximately 120-space automated parking garage will be provided for use by residents, the commercial tenants, and visitors to the Site.

### Project-Generated Trips

To assess the traffic impacts of the Project, trip estimates were based on standard data from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*<sup>2</sup>. Trip generation for the proposed mixed-use building was estimated based on ITE Land Use Codes as shown in Table 4.4 below.

**TABLE 4.4 TRIP GENERATION LAND USE CODES**

Land Use	ITE Land Use Code (LUC)	Independent Variable
Residential	220 – Apartments	Dwelling Units
Retail/Commercial	820 – Shopping Center	Square Feet

Source: ITE Trip Generation Handbook

As shown in Table 4.4, the 6,600 sf of ground-floor supporting commercial space was assumed to be occupied by a general retail use for the purposes of this study. As noted earlier, this space will be occupied by Ultimate Self Defense Gym (currently located on the Site), a commercial automobile rental company, and a community-oriented use.

While these uses should generate less traffic than that typically associated with the general retail stores included in the ITE shopping center database, this land use code was used to provide for a conservative analysis. Traffic generated by the residential component of the Site was estimated using ITE data for apartments so that the maximum potential residential traffic would be considered in the analysis.

As noted earlier, the Project Site is currently occupied by C.G. Edwards Co. Inc. Marine Chandlery and Industrial Hardware and Supplies, and Ultimate Self Defense Performance Center at 270 Dorchester Avenue. Based on field observations by VHB, neither use currently generates significant traffic volumes under peak period conditions. However, the consolidation of the multiple curb cuts currently serving the property should help to improve overall traffic operations adjacent to the Site. Regardless, to provide for a conservative analysis no credit was taken for the volume of traffic currently generated by the Project Site.

### Mode Share and Vehicle Occupancy Rates

To account for alternative modes of transportation, mode shares for the area, based on BTS guidelines, were applied to the unadjusted ITE trip results. Mode shares by land use are shown in Table 4.5.

<sup>2</sup> [Trip Generation](#); Ninth Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

**TABLE 4.5 MODE SPLITS**

<b>Mode</b>	<b>Residential</b>	<b>Retail/Commercial</b>
<b>Daily</b>		
Automobile	53%	61%
Public Transit	23%	11%
Walk/Bike/Other	24%	28%
<b>AM/PM Peak</b>		
Automobile	44%	52%
Public Transit	26%	12%
Walk/Bike/Other	30%	36%

Source: BTB Zone 8 Mode Split

Vehicle Occupancy Rates (VOR) were also applied to the ITE trip generation to convert the ITE estimated unadjusted vehicle trips to person trips. The VOR's were based on the 2009 National Household Travel Survey. For residential space 1.13 persons per vehicle was used and for retail/commercial a 1.78 persons per vehicle was used. After VOR is applied to the ITE unadjusted vehicle trips to produce person trips, these trips are split into modes based on the mode splits shown above in Table 4.5. VOR's are again applied to the vehicle trips to produce adjusted vehicle trips.

The Project generated trips, as shown in Table 4.6 are the proposed Project trips estimated using the ITE Trip Generation Handbook.

**TABLE 4.6 TOTAL PROJECT TRIP GENERATION**

<b>Time Period/Direction</b>	<b>Public Transportation</b>	<b>Walk/Bike/Other</b>	<b>Vehicle Trips</b>
Weekday Daily			
Enter	162	210	360
Exit	162	210	360
<b>Total</b>	<b>324</b>	<b>420</b>	<b>720</b>
Weekday Morning			
Enter	6	8	9
Exit	19	23	28
<b>Total</b>	<b>25</b>	<b>31</b>	<b>37</b>
Weekday Evening			
Enter	22	30	35
Exit	13	20	22
<b>Total</b>	<b>35</b>	<b>50</b>	<b>57</b>

Source: Trip Generation, 9<sup>th</sup> Edition, Institute of Transportation Engineers, Washington D.C. (2012)

Notes: Land Use Codes (LUC) 220 – Apartment and 820 – Shopping Center. [Trip generation for apartments based on proposed 150-unit count.] The base trip generation estimates were subsequently categorized into transit, walk, bike or vehicular trips following BTB's guidelines for Zone 8.

The Project is estimated to generate approximately 720 daily weekday vehicle trips (360 entering, 360 existing) primarily due to the retail component when standard trip generation



procedures are applied. However, traffic generated by the proposed retail uses noted earlier should be less than the typical retail uses include in the ITE database.

On a typical weekday the Project is expected to generate 37 vehicle trips (9 entering, 28 exiting) during the morning peak hour and 57 vehicle trips (35 entering, 22 exiting) during the evening peak hour.

With the Project's close proximity to public transit, the Project will generate 324 transit trips (162 entering, 162 exiting) during a typical weekday. The morning peak hour is expected to generate 25 transit trips (6 entering, 19 exiting) and the evening peak hour is expected to generate 35 transit trips (22 entering, 13 exiting).

Due to the close proximity to Downtown Boston, the Project Site is ideal for walking and biking, as well as other modes of transportation besides vehicle and transit, as the mode splits indicate in Table 4.5. The Project will generate 420 daily trips by bicyclists or pedestrians (210 entering, 210 exiting) on a typical weekday. During the weekday morning peak hour, the Project is expected to generate 31 walking/biking trips (8 entering, 23 exiting) while during the weekday evening peak hour 50 walk/bike/other trips (30 entering, 20 exiting) are expected.

### Automobile Trip Distribution

Trip distribution was based on BTD's guidelines for Area 8 (where the Project Site is located). These guidelines, based on 2000 census data, provide information on where area residents work and where area employees live. Using these data, Project vehicle trips can then be assigned to the roadway network. Trip distribution patterns were established separately for the residential and the retail/commercial uses. A summary of the regional trip distribution results is presented in Table 4.7 and shown graphically in Figure 4.13.

**TABLE 4.7 GEOGRAPHIC TRIP DISTRIBUTION**

<b>Corridor</b>	<b>Residential</b>	<b>Retail/Commercial</b>
West 4 <sup>th</sup> St (To/From West)	31%	38%
Dorchester Ave (To/From South)	6%	8%
Old Colony Ave (To/From Southwest)	34%	41%
B Street (To/From West)	29%	13%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Source: BTD Zone 8 Trip Distribution

The net-new Project generated vehicle trips were added to the No-Build traffic networks using the local trip distribution patterns described above. The Project Generated Trips are shown for the weekday morning and evening peak hours in Figure 4.14 and Figure 4.15, respectively. The resulting 2021 Build Condition networks for the respective weekday morning and weekday evening peak hours are shown in Figure 4.16 and 4.17.

A comprehensive operational and capacity analysis of the study area intersections is presented later in the following section.

## 4.6 Traffic Operations Analysis

Consistent with BTD guidelines, Synchro 8 software was used to model Level Of Service (LOS) operations at the study area intersections. LOS is a qualitative measure of control delay at an intersection providing an index to the operational qualities of a roadway or intersection.

LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS D is considered acceptable. LOS E indicates vehicles experience significant delay while LOS F suggests unacceptable delay for the average vehicle. LOS thresholds differ for signalized and unsignalized intersections. Longer delays at signalized intersections are perceived as acceptable.

Table 4.8 below presents the level of service delay threshold criteria as defined in the 2010 Highway Capacity Manual (HCM).

**TABLE 4.8 LEVEL OF SERVICE CRITERIA**

<b>Level of Service</b>	<b>Unsignalized Intersection Control Delay (sec/veh)</b>	<b>Signalized Intersection Control Delay (sec/veh)</b>
LOS A	0-10	$\geq 10$
LOS B	> 10-15	> 10-20
LOS C	> 15-25	> 20-35
LOS D	> 25-35	> 35-55
LOS E	> 35-50	> 55-80
LOS F	> 50	> 80

Source: 2010 HCM.

Adjustments were made to the Synchro model to include characteristics of the study area such as heavy vehicles, bus operations, parking activity, and pedestrian crossings. The capacity analysis results are summarized in the following sections.

### 4.6.1 Signalized Capacity Analysis

The results of the signalized capacity analyses are summarized in Table 4.9A and 4.9B for the Existing, No-Build, and Build condition weekday morning and evening peak hours, respectively. Detailed capacity analysis worksheets are included in Appendix B.

**TABLE 4.9A SIGNALIZED INTERSECTION LEVEL OF SERVICE SUMMARY – WEEKDAY MORNING PEAK HOUR**

Location	2016 Existing Conditions					2021 No-Build Conditions					2021 Build Conditions				
	v/c <sup>1</sup>	Delay	LOS <sup>3</sup>	Vehicle Queues		v/c	Delay	LOS	50th	95th	v/c	Delay	LOS	50th	95th
<b>Dorchester Avenue at Old Colony Avenue /Milhender Place</b>	<b>0.60</b>	<b>18.5</b>	<b>B</b>			<b>0.66</b>	<b>20.6</b>	<b>C</b>			<b>0.66</b>	<b>20.7</b>	<b>C</b>		
Milhender Pl EB Left/Right	0.01	43.5	D	0	0	0.01	44.3	D	0	0	0.01	44.3	D	0	0
Old Colony Rd NWB Through	0.56	13.6	B	59	233	0.62	15.5	B	93	284	0.63	15.6	B	94	288
Dorchester Ave NB Through	0.80	41.7	D	127	228	0.85	45.2	D	151	265	0.85	45.2	D	151	265
Dorchester Ave SB Left	0.16	9.2	A	27	84	0.18	10.1	B	35	92	0.18	10.1	B	35	92
Dorchester Ave SB Thru/Right	0.15	1.4	A	0	46	0.18	1.5	A	0	54	0.18	1.5	A	0	54
<b>Dorchester Avenue at West 4<sup>th</sup> Street</b>	<b>1.00</b>	<b>62.2</b>	<b>E</b>			<b>&gt;1.20</b>	<b>100.1</b>	<b>F</b>			<b>&gt;1.20</b>	<b>104.6</b>	<b>F</b>		
W. 4 <sup>th</sup> St EB Left/Through	>1.20	>120	F	~172	#296	>1.20	>120	F	~231	#360	>1.20	>120	F	~239	#369
W. 4 <sup>th</sup> St EB Right	0.08	30.3	C	0	27	0.09	30.4	C	0	34	0.09	30.4	C	0	34
W 4 <sup>th</sup> St WB Left/Thru/Right	1.16	>120	F	~326	#511	>1.20	>120	F	~377	#566	>1.20	>120	F	~385	#574
Dorchester Ave NB Left	0.84	25.9	C	177	#362	0.94	38.8	D	234	#470	0.94	38.8	D	234	#470
Dorchester Ave NB Through	0.36	8.7	A	104	137	0.40	9.1	A	118	155	0.40	9.1	A	118	155
Dorchester Ave NB Right	0.00	6.4	A	0	0	0.00	6.4	A	0	0	0.00	6.4	A	0	0
Dorchester Ave SB Left/Thru/Right	0.89	55.8	E	112	#212	1.04	89.7	F	~157	#264	1.05	90.2	F	~158	#264

**TABLE 4.9B SIGNALIZED INTERSECTION LEVEL OF SERVICE SUMMARY – WEEKDAY EVENING PEAK HOUR**

Location	2016 Existing Conditions					2021 No-Build Conditions					2021 Build Conditions				
	v/c <sup>1</sup>	Delay	LOS <sup>3</sup>	Vehicle Queues		v/c	Delay	LOS	50th	95th	v/c	Delay	LOS	50th	95th
<b>Dorchester Avenue at Old Colony Avenue /Milhender Place</b>	<b>0.47</b>	<b>13.3</b>	<b>B</b>			<b>0.52</b>	<b>16.1</b>	<b>B</b>			<b>0.52</b>	<b>16.0</b>	<b>B</b>		
Milhender Pl EB Left/Right	0.15	43.5	D	4	15	0.15	43.8	D	4	15	0.15	43.8	D	4	15
Old Colony Rd NWB Through	0.23	6.8	A	0	0	0.26	7.2	A	0	0	0.26	7.2	A	0	0
Dorchester Ave NB Through	0.81	49.5	D	91	#193	0.92	63.8	E	110	#244	0.92	63.8	E	110	#244
Dorchester Ave SB Left	0.42	8.2	A	75	204	0.46	8.7	A	83	226	0.46	8.7	A	83	226
Dorchester Ave SB Thru/Right	0.25	1.7	A	0	82	0.31	1.8	A	0	105	0.31	1.8	A	0	105
<b>Dorchester Avenue at West 4<sup>th</sup> Street</b>	<b>0.86</b>	<b>33.7</b>	<b>C</b>			<b>1.03</b>	<b>49.2</b>	<b>D</b>			<b>1.03</b>	<b>49.4</b>	<b>D</b>		
W. 4 <sup>th</sup> St EB Left/Through	0.59	35.5	D	138	223	0.69	40.0	D	158	254	0.71	41.2	D	165	#269
W. 4 <sup>th</sup> St EB Right	0.13	26.0	C	0	49	0.14	26.2	C	0	51	0.14	26.2	C	0	51
W 4 <sup>th</sup> St WB Left/Through/Right	0.67	37.0	D	205	308	0.73	39.5	D	227	337	0.74	39.9	D	230	343
Dorchester Ave NB Left	0.97	59.1	E	128	#299	>1.20	>120	F	~237	#414	>1.20	>120	F	~237	#414
Dorchester Ave NB Through	0.24	14.0	B	65	89	0.28	14.4	B	75	103	0.28	14.4	B	75	103
Dorchester Ave NB Right	0.01	12.1	B	0	2	0.01	12.1	B	0	2	0.01	12.1	B	0	2
Dorchester Ave SB Left/Thru/Right	0.79	33.2	C	257	338	0.91	41.4	D	316	#450	0.91	41.4	D	316	#450

1 volume to capacity ratio

2 delay in seconds

3 level of service

4 50<sup>th</sup> percentile queue5 95<sup>th</sup> percentile queue

~ volume exceeds capacity, queue is theoretically infinite

# 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer

As shown in Table 4.9A and 4.9 B, Dorchester Avenue's intersection with Old Colony Avenue and Milhender Place currently operates at LOS B during both the weekday morning and evening peak hours. With the additional of Project-related traffic under the 2021 Build Condition this same LOS will be maintained with no notable changes in operating conditions.

Dorchester Avenue's intersection with West 4<sup>th</sup> Street currently operates at LOS E and C during the respective weekday morning and evening peak hours. Under future conditions, this intersection will operate at LOS D with or without the Project in place. However, during the weekday morning peak hour this intersection is projected to operate at LOS F under both the 2021 No-Build and 2021 Build conditions. This degradation is primarily due to the anticipated traffic growth in this area as documented earlier in this study. There are two specific intersection movements which most directly impact the overall intersection operation: the eastbound left/through movement from West 4<sup>th</sup> Street and the overall westbound West 4<sup>th</sup> Street approach. Both of these movements currently operate at LOS F and will continue to do so under future conditions, but with increased delays. The increased delays are mainly associated with the projected annual background traffic growth, and site-specific traffic from nearby development projects. During the weekday morning peak hour, Project traffic added to these movements will be limited to only two eastbound through-movements, one additional westbound left-turn movement, and four westbound through-movements. At most, this translates into one additional vehicle being added to these movements every ten signal cycles. Accordingly, this nominal level of traffic should not be expected to create a perceptible impact at this location.

#### 4.6.2 Unsignalized Capacity Analysis

The capacity analysis results for the unsignalized study area intersections is summarized in Table 4.10. Detailed capacity analysis worksheets are presented in Appendix B.

**TABLE 4.10 UNSIGNALIZED INTERSECTION LEVEL OF SERVICE SUMMARY**

Location	Critical Side Street Movement	Peak Hour	2016 Existing Conditions				2021 No-Build Conditions				2021 Build Conditions			
			v/c <sup>1</sup>	Del <sup>2</sup>	LOS <sup>3</sup>	95 <sup>th</sup> Queue <sup>4</sup>	v/c	Del	LOS	95 <sup>th</sup> Queue	v/c	Del	LOS	95 <sup>th</sup> Queue
Dorchester Ave at B St/W. 7 <sup>th</sup> St	West 7 <sup>th</sup> St NB Right	Weekday AM	0.29	12.6	B	30	0.31	13.2	B	34	0.33	13.6	B	35
		Weekday PM	0.12	10.8	B	10	0.12	11.2	B	10	0.13	11.6	B	11
	B St WB Left	Weekday AM	0.06	6.5	A	5	0.07	6.7	A	5	0.07	6.8	A	6
		Weekday PM	0.07	6.6	A	6	0.08	6.7	A	7	0.09	6.9	A	7
B Street at West 6 <sup>th</sup> Street	W 6 <sup>th</sup> St NWB Left	Weekday AM	0.09	10.3	B	7	0.09	10.4	B	7	0.09	10.5	B	7
		Weekday PM	0.03	9.4	A	2	0.03	9.6	A	2	0.03	9.8	A	2
B Street at West 5 <sup>th</sup> Street	W 5 <sup>th</sup> St SEB Left	Weekday AM	0.06	10.7	B	5	0.06	11.0	B	5	0.06	11.1	B	5
		Weekday PM	0.02	9.2	A	2	0.02	9.3	A	2	0.02	9.4	A	2
B Street at West 4 <sup>th</sup> Street	W. 4 <sup>th</sup> St SEB Left	Weekday AM	0.25	14.6	B	25	0.29	15.5	C	29	0.31	16.1	C	32
		Weekday PM	0.20	11.8	B	18	0.23	12.4	B	21	0.25	12.7	B	24
	West 4 <sup>th</sup> St NWB Left	Weekday AM	0.08	15.3	C	7	0.09	16.0	C	7	0.09	16.7	C	7
		Weekday PM	0.05	12.1	B	4	0.06	12.6	B	5	0.06	13.1	B	5
West 6 <sup>th</sup> Street at Site Driveway	Site Driveway	Weekday AM	-	-	-	-	-	-	-	-	0.03	8.4	A	2
		Weekday PM	-	-	-	-	-	-	-	-	0.02	8.4	A	2

- 1 volume to capacity ratio  
2 delay  
3 level of service  
4 95<sup>th</sup> percentile queue  
- Not analyzed under condition (driveway does not exist)

The results of the capacity analysis indicate that each of the unsignalized study area intersections is operating at an acceptable LOS C or better during the peak hours studied. These current operating conditions are not expected to change significantly under future conditions with or without the addition of Project-related traffic.

## **4.7 Proposed Improvements**

Based on the minor levels of vehicular traffic expected to be generated by the Project, and the capacity analysis results, there is not a clear need for any Project-specific mitigation to address conditions within the study area. While the analysis does document some areas with pre-existing issues, the Project will be adding negligible traffic to those locations. However, with the redevelopment of this Site there are opportunities to address existing deficiencies at the Site and its abutting roadways. These improvements are discussed in detail in the following section.

### **4.7.1 Project Site Access/Sidewalk Improvements**

Under existing conditions, multiple poorly-defined curb cuts are provided at the Project Site. Specifically, 284 Dorchester Avenue currently has a single full-access driveway on B Street less than 20 feet from Dorchester Avenue. There also are two curb cuts to this business located on Dorchester Avenue 30- and 75-feet to the north of B Street. Both driveways are located to the north of the median-divided portion of Dorchester Avenue.

Access to the martial arts studio at 270 Dorchester Avenue is provided by way of a single full-access curb cut located on B Street roughly 225 feet to the north of Dorchester Avenue. The driveway provides access to the currently unstriped on-site parking area and connects to West 6<sup>th</sup> Street by a driveway located less than twenty feet to the west of B Street. The existing building at this Site also has a loading dock that is accessed from an existing curb cut on West 6<sup>th</sup> Street along with a separate at-grade loading door.

The proposed redevelopment of this Site will involve a significant consolidation of the Site's existing five driveways discussed above. As proposed, the new building on this Site will have a single access driveway to the on-site parking garage. This driveway will be located on West 6<sup>th</sup> Street roughly 90 feet to the west of B Street. The other existing curb cuts, which are located in close proximity to nearby intersections, will be closed as part of the Site redevelopment. This measure by itself should help to reduce conflicts that occur on both Dorchester Avenue and B Street as a result of these driveways.

With the curb-cut closures noted above, new sidewalks will need to be installed along both B Street and Dorchester Avenue. This is required both to fill in those areas currently used for driveways, and to replace the other existing sidewalks next to the Site which are in subpar condition. Furthermore, the proposed building is being designed so that it will be recessed from both abutting roadways. With that treatment this will result in the Dorchester Avenue sidewalk being expanded by 10 feet with new landscaping features compared to existing conditions, and the B Street sidewalk being widened by five feet. This extra width will allow for



additional features, such as planters, bicycle parking, etc., to be provided. These enhancements will represent a significant improvement compared to existing conditions with the limited-width sidewalks currently abutting the Site.

#### **4.7.2 Loading Facilities**

The Project Site's current loading facilities on West 6<sup>th</sup> Street were developed to accommodate the historic warehousing/storage use of this Site. With the new residential uses and supporting commercial uses, there should be less need for this type of designated loading area compared to that former condition. Instead, the only loading activity associated with the residential use will be during the initial occupancy of a given unit by residents. Tenants moving in or out of residential units of the proposed size typically only require a small van or box truck. Likewise, the retail/commercial tenants occupying the 6,600 sf of ground floor commercial space could have some degree of regular loading activity. However, given the size of the tenant spaces and the nature of the uses, these tenants should likely only have deliveries being made only by small box trucks. B Street is also currently restricted for use by trucks with less than a 2.5-ton capacity which will limit the size of delivery vehicles to this Site. As shown earlier in this chapter, the Site's 250-foot frontage along B Street currently is designated for two-hour visitor parking only (except for those vehicles with residential stickers). Within this area the Proponent will work with BTM to identify an appropriate area to be converted to short-term loading for tenants of the Site.

#### **4.7.3 Transportation Demand Management Strategies**

Consistent with the City's goals to reduce auto-dependency, the Project will include Transportation Demand Management (TDM) measures to encourage alternative modes of transportation. TDM measures are most often directed at commuter travel. However, due to the mixed-use nature and nearby public transportation there are opportunities to implement TDM measures for the proposed residential and supporting commercial uses.

The following section discusses the land use types for which TDM measures will be implemented. A description of the TDM elements is presented in this section along with information on how those elements aid shoppers, employees, visitors, and residents getting to and from the Project Site. Measures being considered as part of the Project include:

- Provide secure bicycle storage for building residents and employees.
  - Appropriately designed bike racks will be provided at select, highly-visible locations within the Site. The racks will be securely mounted and feature current designs to properly secure bikes of all kinds with the ability for them to be properly locked. These racks will be located at centralized locations to serve the proposed retail stores (customers and employees).
  - Covered and secure bike storage will be provided within the garage for the residents.
- Implement TDM measures for the entire Project. Specifically, the provision of bicycle racks, improved sidewalks next to the Site, and proximity to public transportation (including several bus lines, and the MBTA Red Line) should help to minimize the need for vehicular

travel. This residential building may be desirable to commuters already using these routes to travel into Boston.

- Retail/commercial tenants will be encouraged to provide employer subsidies and/or discounts to employees who purchase monthly or multiple trip transit passes.
- Commercial tenants will be encouraged to provide a guaranteed ride home program, in conjunction with MassRIDES, to eliminate an often-cited deterrent to carpool and vanpool participation.
- Commercial tenants will be encouraged to offer direct deposit to employees to avoid the need for employees to have to drive to the bank.
- Designate an on-site Transportation Coordinator to oversee parking and loading operations as well as promote alternative transportation measures. The person in this role will coordinate with residents and commercial tenants to help promote a reduced reliance on single-occupant motor-vehicle travel to the Project Site. To that end, the TDM measures identified in this section will be implemented under the direction and supervision of this person. The duties of the transportation coordinator may include, but not be limited to:
  - Acting as a liaison with commercial employers and MassRIDES.
  - Assisting commercial employees and residents with ride matching and transportation planning.
  - Disseminating information on alternate modes of transportation and developing transportation related marketing and education materials, including a website. This includes posting relevant public transit information at a central location and could include providing transit information such as maps and schedules to new residents and tenants in an orientation package.
  - Developing and maintaining information pertaining to pedestrian and cycling access to and from the Project Site.
  - Encourage tenants to provide on-site transit pass sales to employees and residents.

All TDM measures will be formalized in the Transportation Access Plan Agreement (TAPA) to be executed with BTM. As the expected tenants will consist of small uses there may not be the same levels of TDM opportunities internal to each individual business as would be available with a larger employer. Regardless, employees who work on-site will be able to take advantage of the transportation guidance and programs coordinated by the overall TDM program.

## **4.8 Construction**

A detailed construction management plan will be provided as part of the Project TAPA, and provisions for traffic management on the surrounding roadways during the Site construction also will be discussed. This plan will include discussion of expected working hours, routes to be used by construction vehicles and workers, and other traffic-related matters.

## **4.9 Parking**

The following section compares the current parking provisions on the Site to those planned to be implemented in conjunction with the Project.

### **4.9.1 Existing On-Site Parking Supply**

Under existing conditions there is a small unstriped parking area in front of the former Chuck & Ann's Submarines restaurant capable of accommodating approximately three to five cars. This is in addition to six spaces that currently are striped for use by the ZipCar® car-sharing service. There also is room for roughly six parallel parking spaces within the Site between B Street and the existing 270 Dorchester Avenue building. This supply is in addition to those parallel parking spaces currently in place along the Site's B Street frontage. There is a small paved but unstriped parking area between that building and the existing martial arts building that can accommodate another three vehicles.

### **4.9.2 Proposed On-Site Parking Supply**

The parking needs for the Site will be accommodated through a 120-space on-site parking garage with two levels of underground parking. The required residential supply was based on the city's required 0.5 space per unit ratio and the commercial supply was based on the required 2.0 spaces per 1,000 sf ratio. In total, the 120-space supply exceeds the 86-space supply required by zoning. Access and egress for the parking garage will be provided via a single driveway located on West 6<sup>th</sup> Street.

#### **Automated Parking System**

Due to the size of the Project Site and the limited opportunities for parking within the neighborhood, the Project will employ an innovative automatic parking system developed by Parkmatic Car Parking Systems. An automated parking system is a computer operated system of mechanical lifts and horizontal racks that park and retrieve vehicles with little or no human involvement. These systems are utilized throughout Germany, Austria, Poland, Western Europe and the Middle East.

#### Detriments of Conventional Enclosed Parking Garages

The most prevalent environmental issues in enclosed parking garages are:

- Buildup of carbon monoxide (CO), nitrogen oxides (NOx) volatile organic compounds (VOC) generated from internal combustion engine vehicles, requiring 11.25 air changes per hour.
- Leakage of harmful emissions into occupied spaces adjoining a parking facility.
- Excessive fuel use during low speed driving (typically 5-10 mph) that occurs as patrons drive up and down ramps to each parking level to find an available parking space.

### Benefits of Automated Parking Systems

The environmental benefits of automated parking systems include:

- Reduction of emissions buildup because vehicles are delivered to their parking spaces within the garage with their engines turned off.
- Reduction of harmful emission leakage to adjoining occupied spaces.
- Reduction of human exposure to pollutants, since mechanical equipment parks and retrieves the vehicles, relieving patrons of the need to enter the garage parking area.
- Reduction in fuel use as vehicles are parked and retrieved from a ground floor Entry/Exit Cabin, eliminating the need to drive up and down ramps in search of a parking space.

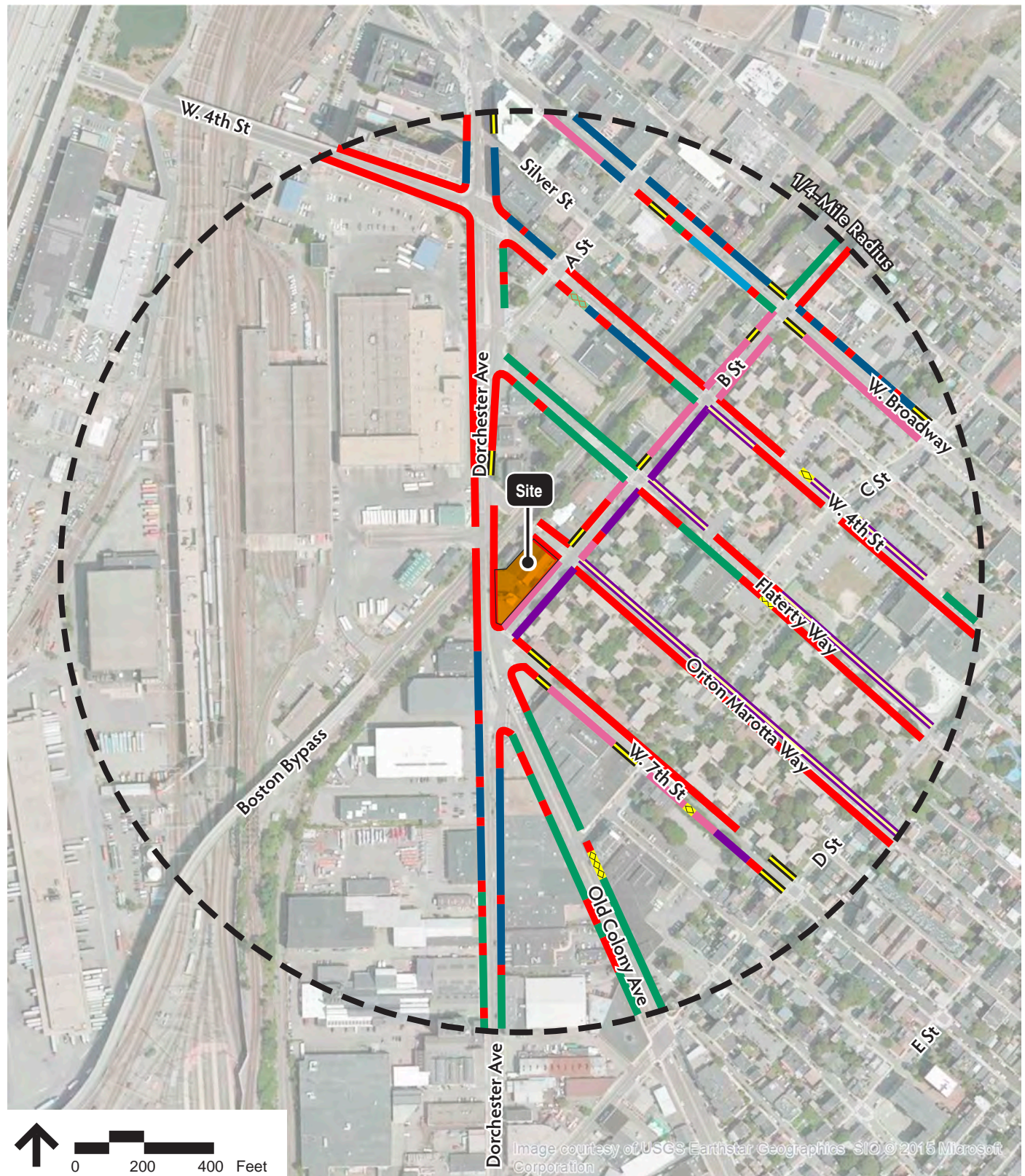
#### **4.9.3 On-Street Parking Supply**

The removal of four (4) large curb cuts will result in an increase of on-street parking of five spaces, for a total of eleven parking spaces on B Street and West Sixth Street.

#### **4.9.4 Bicycle Parking**

Parking for ten bicycles will be provided for visitors within the sidewalk furnishing zone. Parking for 40 bicycles will be provided within the parking garage for use by residents.





- No Parking
- Unregulated
- 2-Hour Parking
- Bus Stop
- Visitor Parking  
(2-Hour Limit except Residents)
- Police Parking
- Resident Parking

- - - - - 15-Minute Loading Zone
- - - - - Loading Zone
- - - - - BHA Permit
- - - - - Handicapped
- - - - - Residential Parking



Figure 4.4  
Parking Regulations

**270 Dorchester Avenue  
South Boston, Massachusetts**

Source: Arcmap Online Bing Aerial



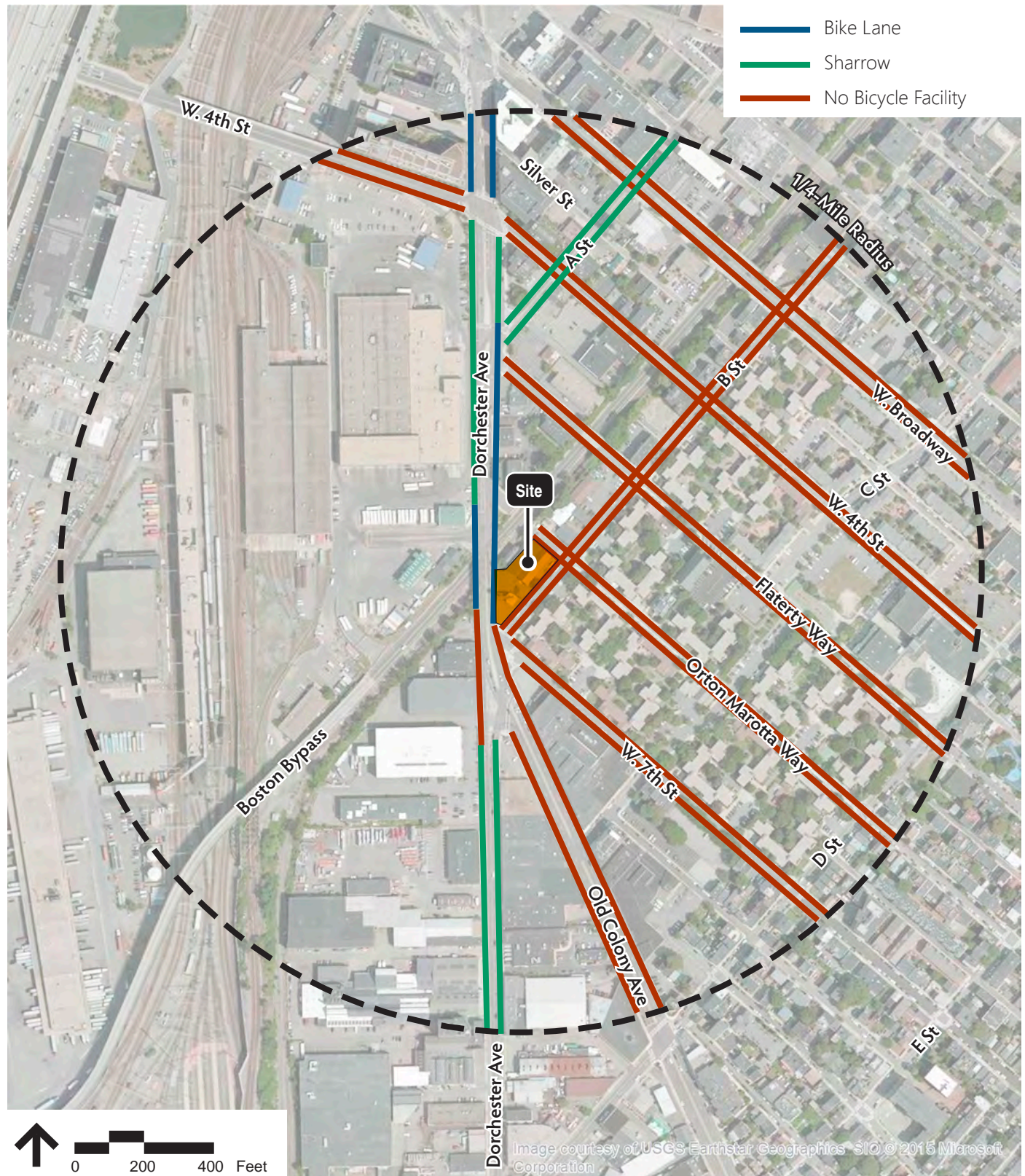


Figure 4.3  
Bike Facilities

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Arcmap Online Bing Aerial



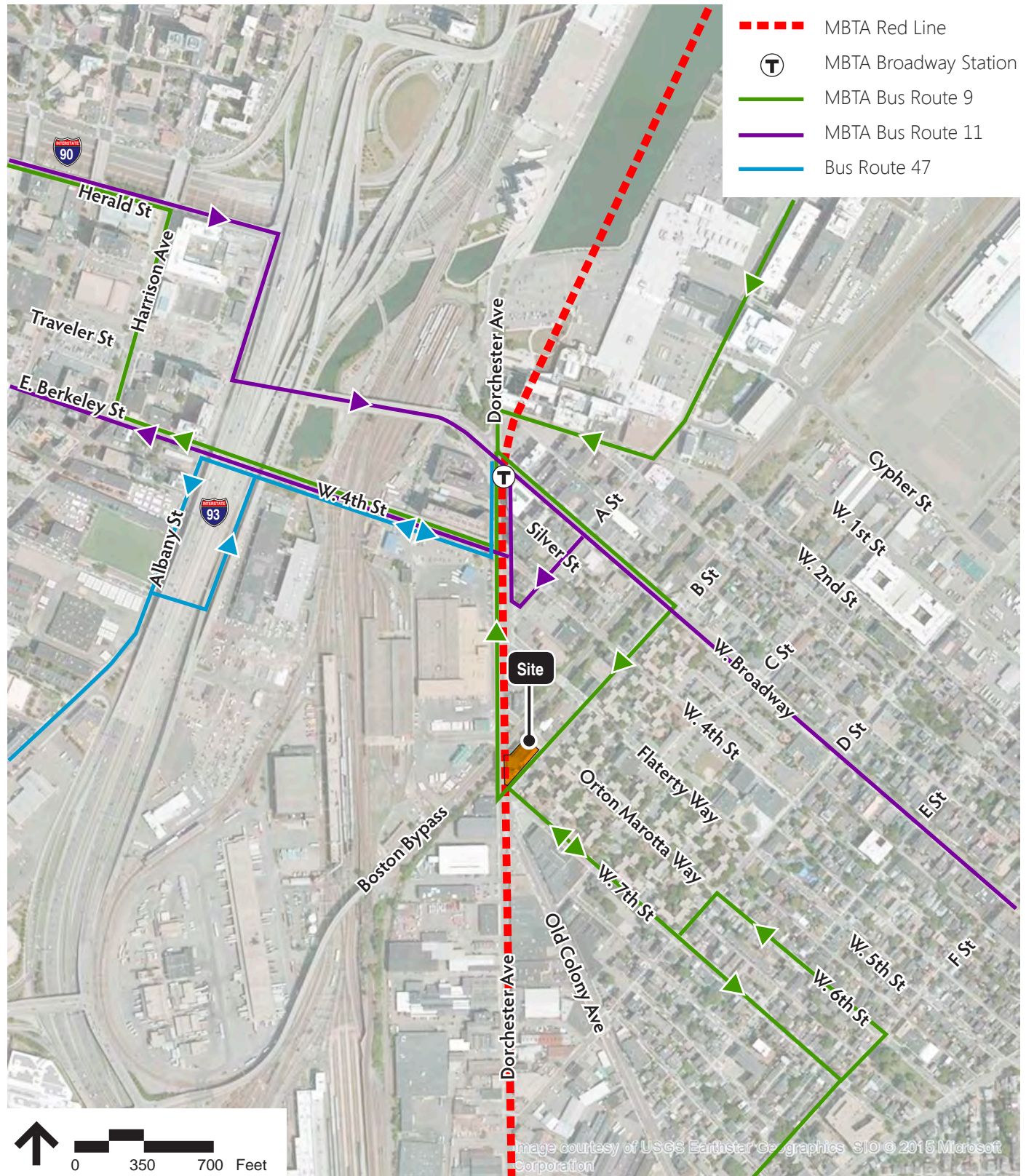


Figure 4.2  
Existing Public Transit

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Arcmap Online Bing Aerial



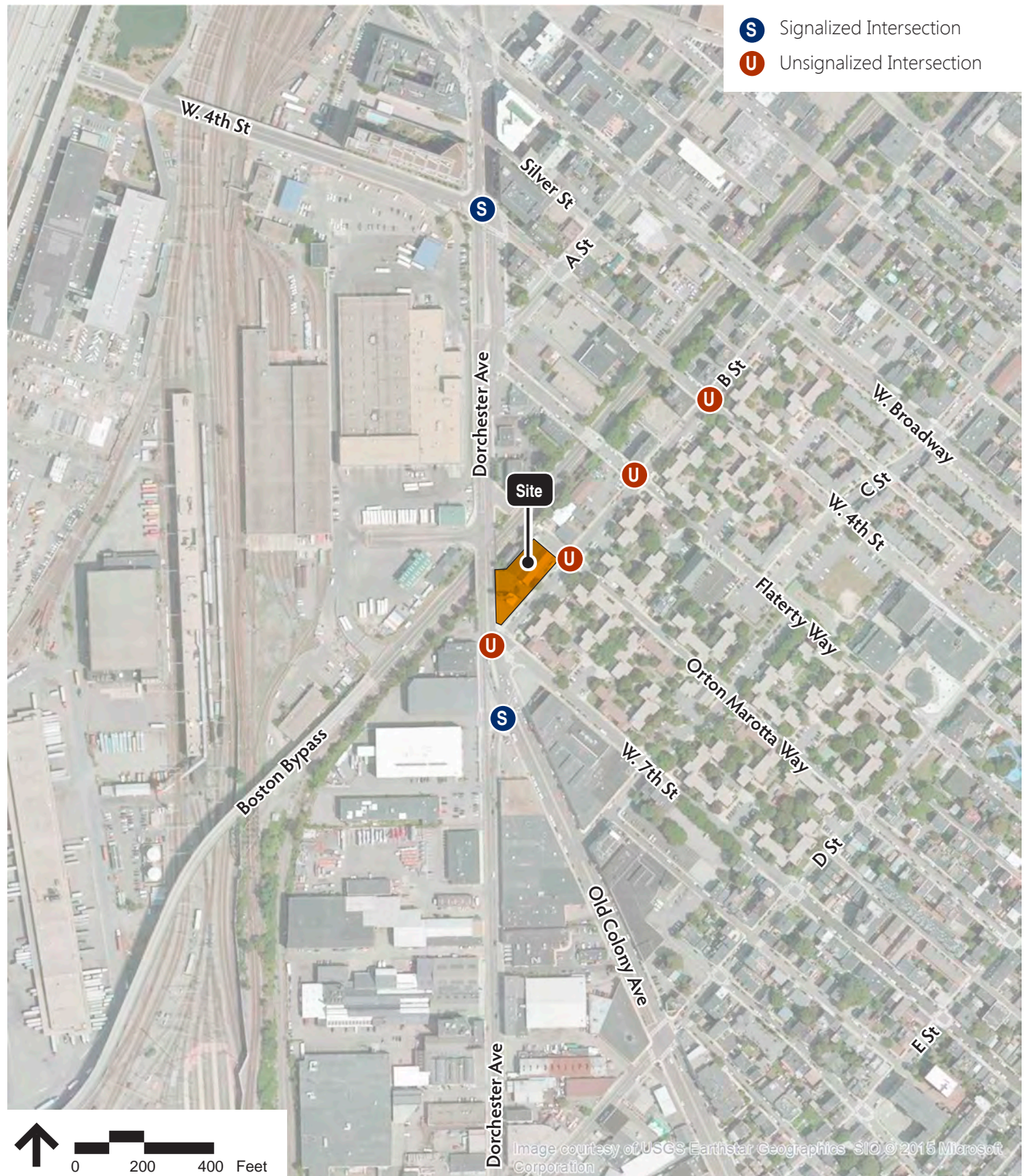
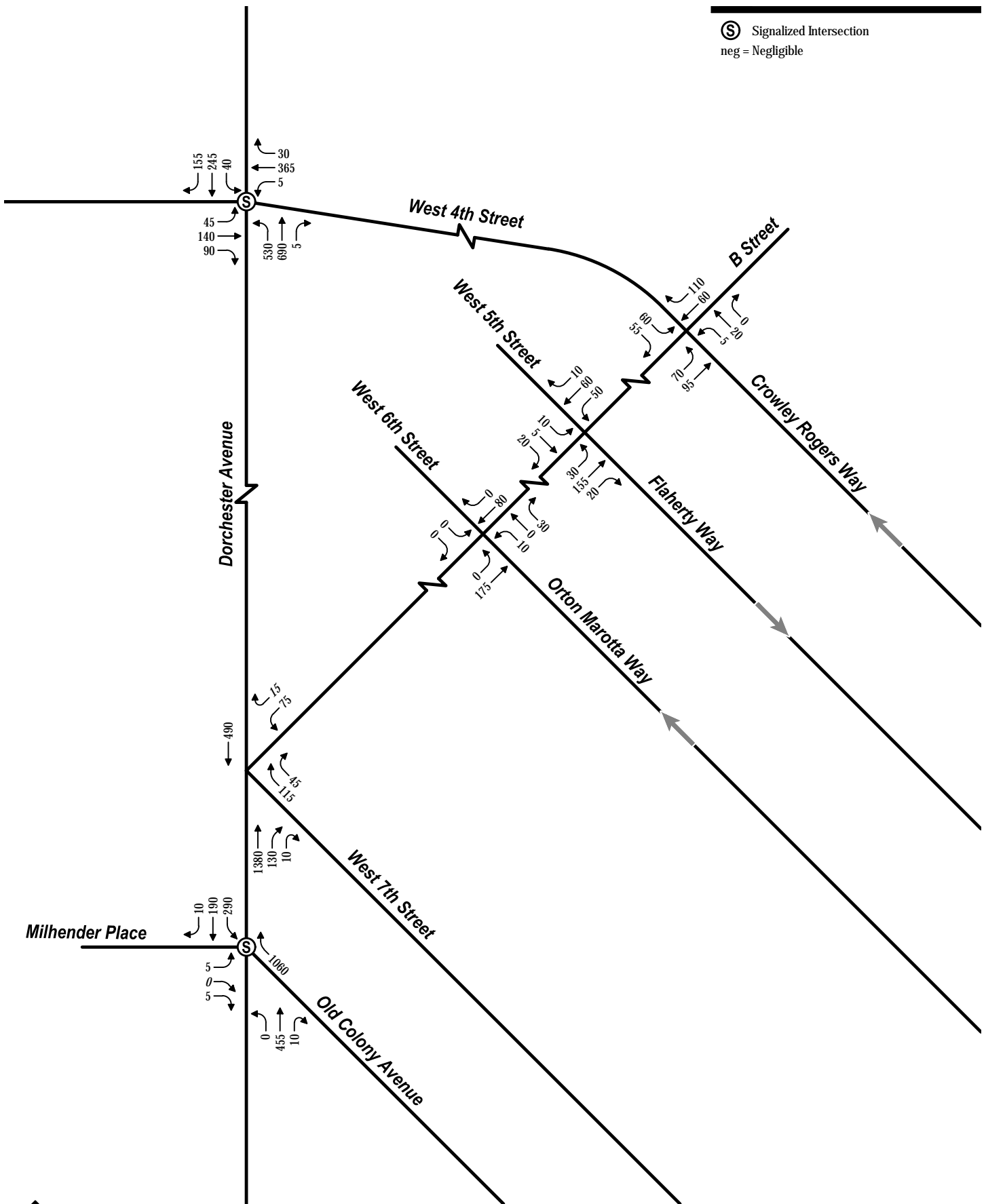


Figure 4.1  
Traffic Study Area

**270 Dorchester Avenue  
South Boston, Massachusetts**

Source: Arcmap Online Bing Aerial

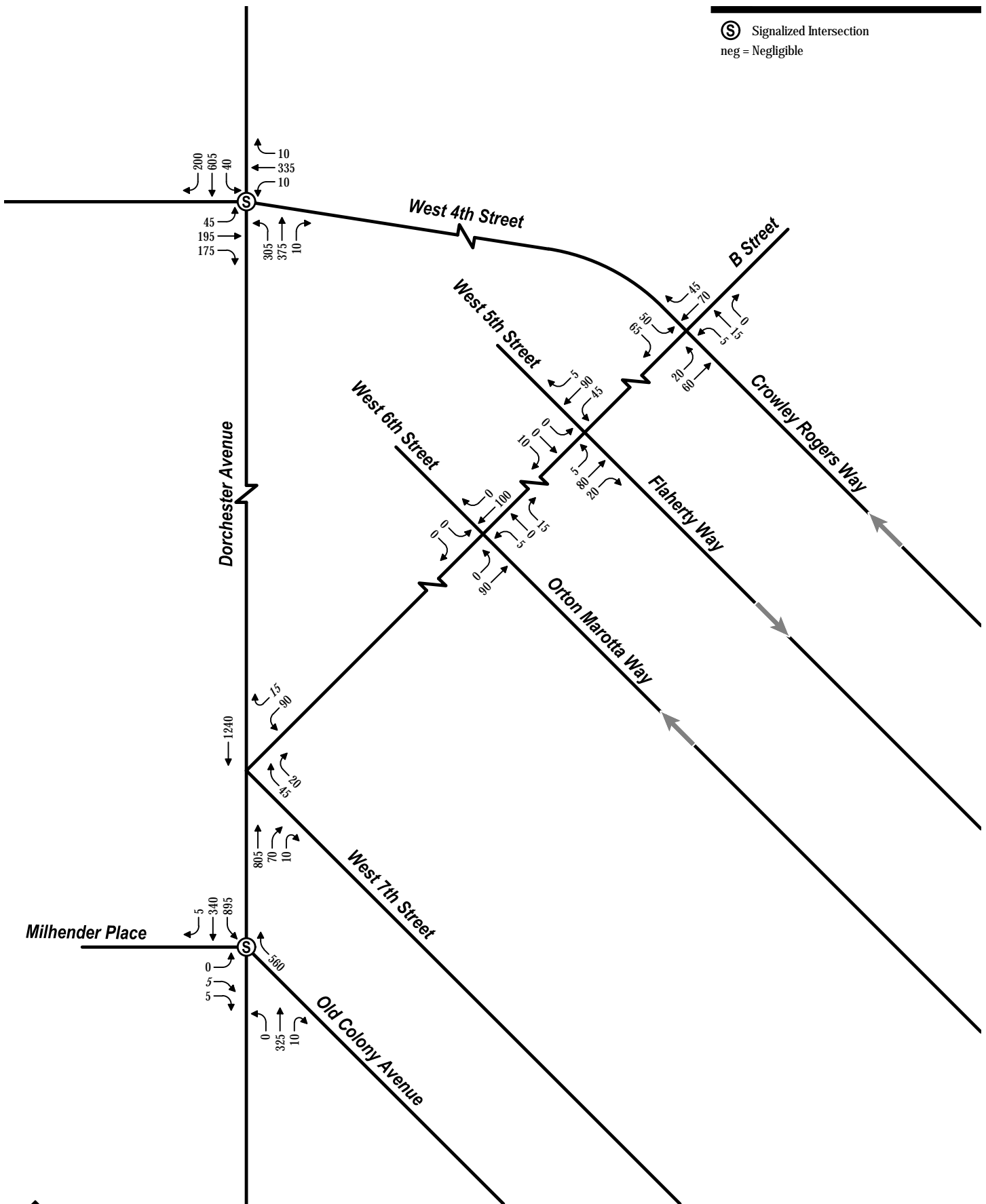




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Not to Scale



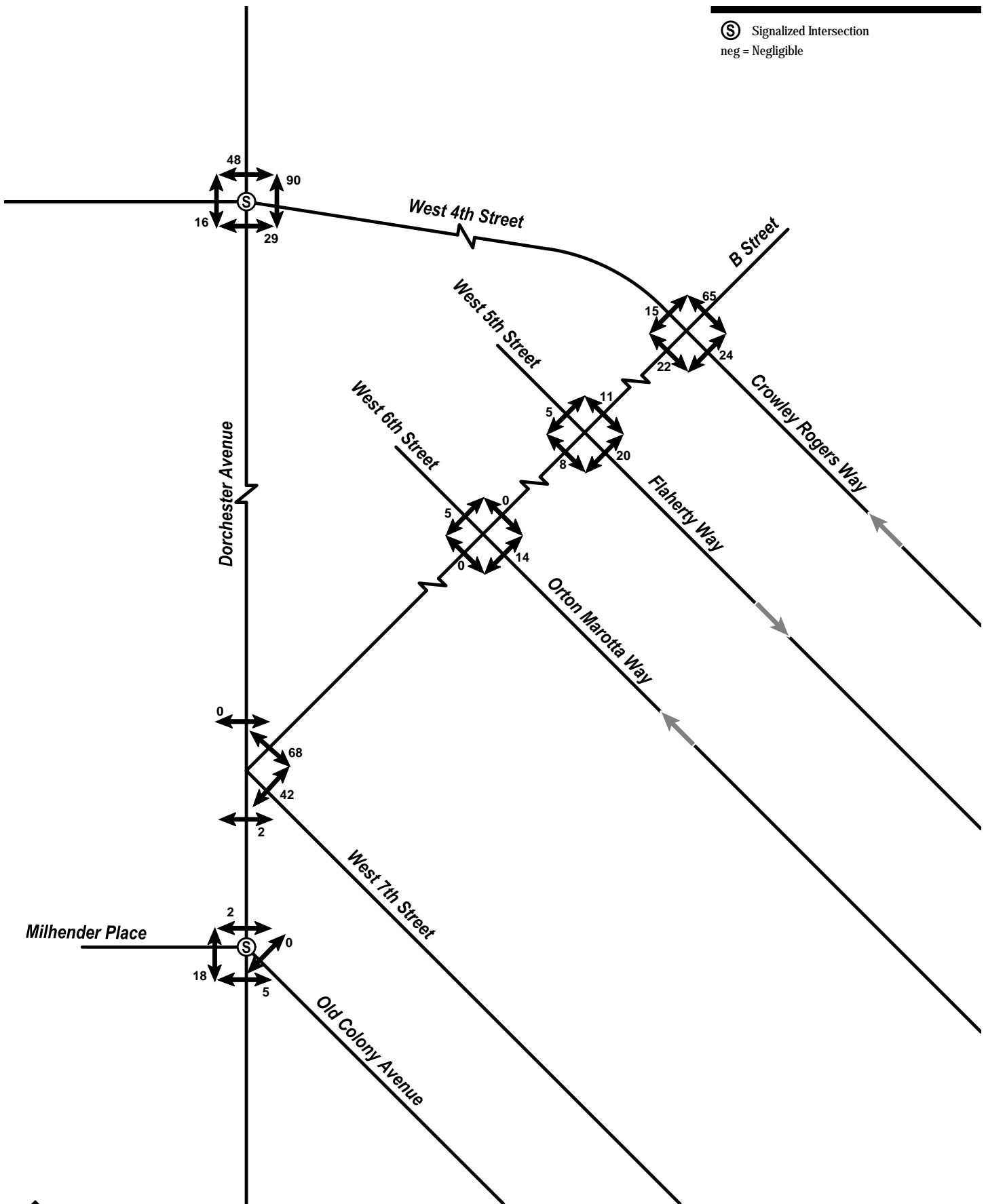
Figure 4.5  
2016 Existing Morning Peak Hour  
270 Dorchester Avenue  
South Boston, Massachusetts



↑  
Not to Scale



Figure 4.6  
 2016 Existing Evening Peak Hour  
 270 Dorchester Avenue  
 South Boston, Massachusetts



↑  
Not to Scale

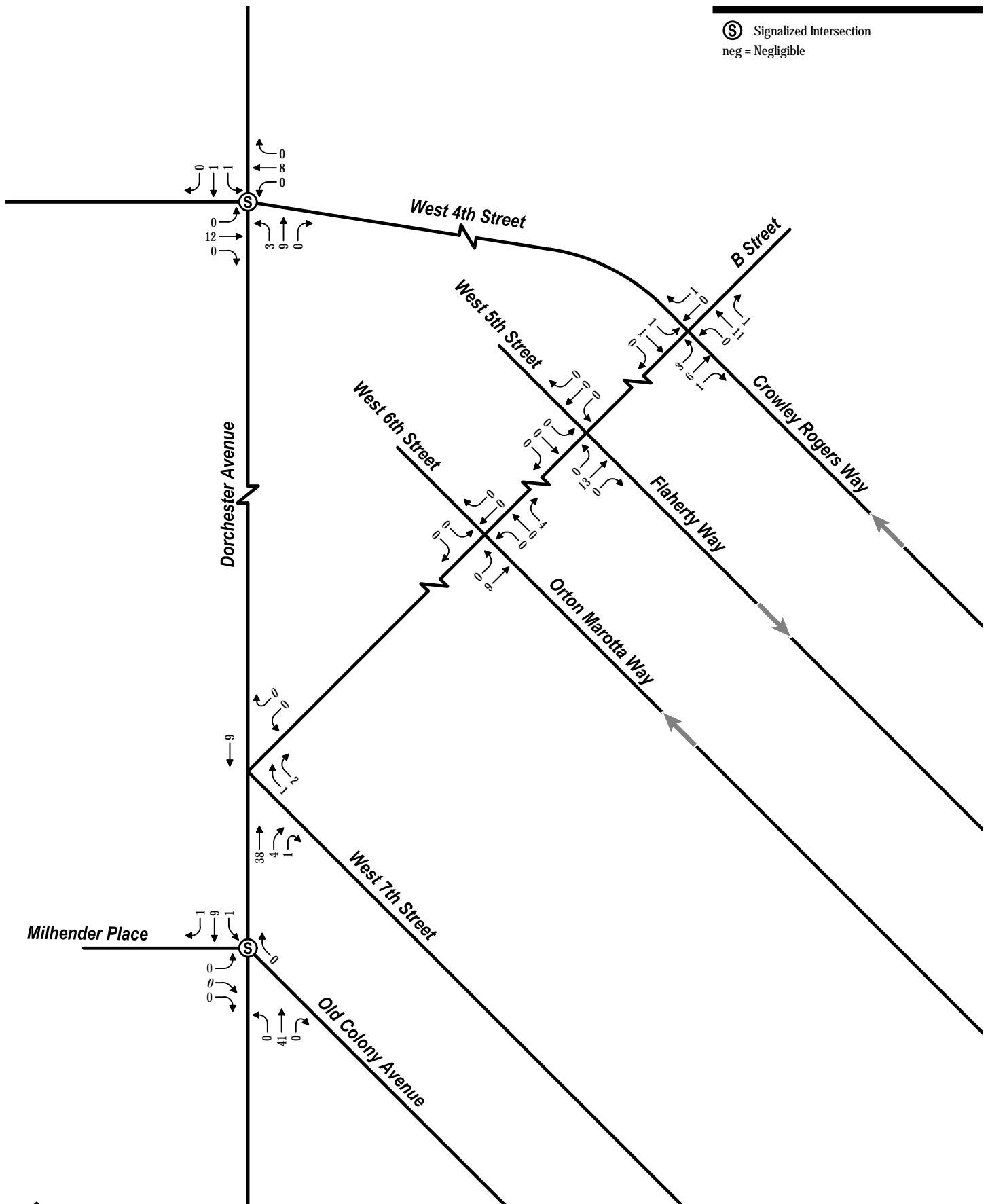


Figure 4.7  
 2016 Existing Morning Peak Hour Pedestrian Volumes  
 270 Dorchester Avenue  
 South Boston, Massachusetts



Figure 4.8  
2016 Existing Evening Peak Hour Pedestrian Volumes  
270 Dorchester Avenue  
South Boston, Massachusetts





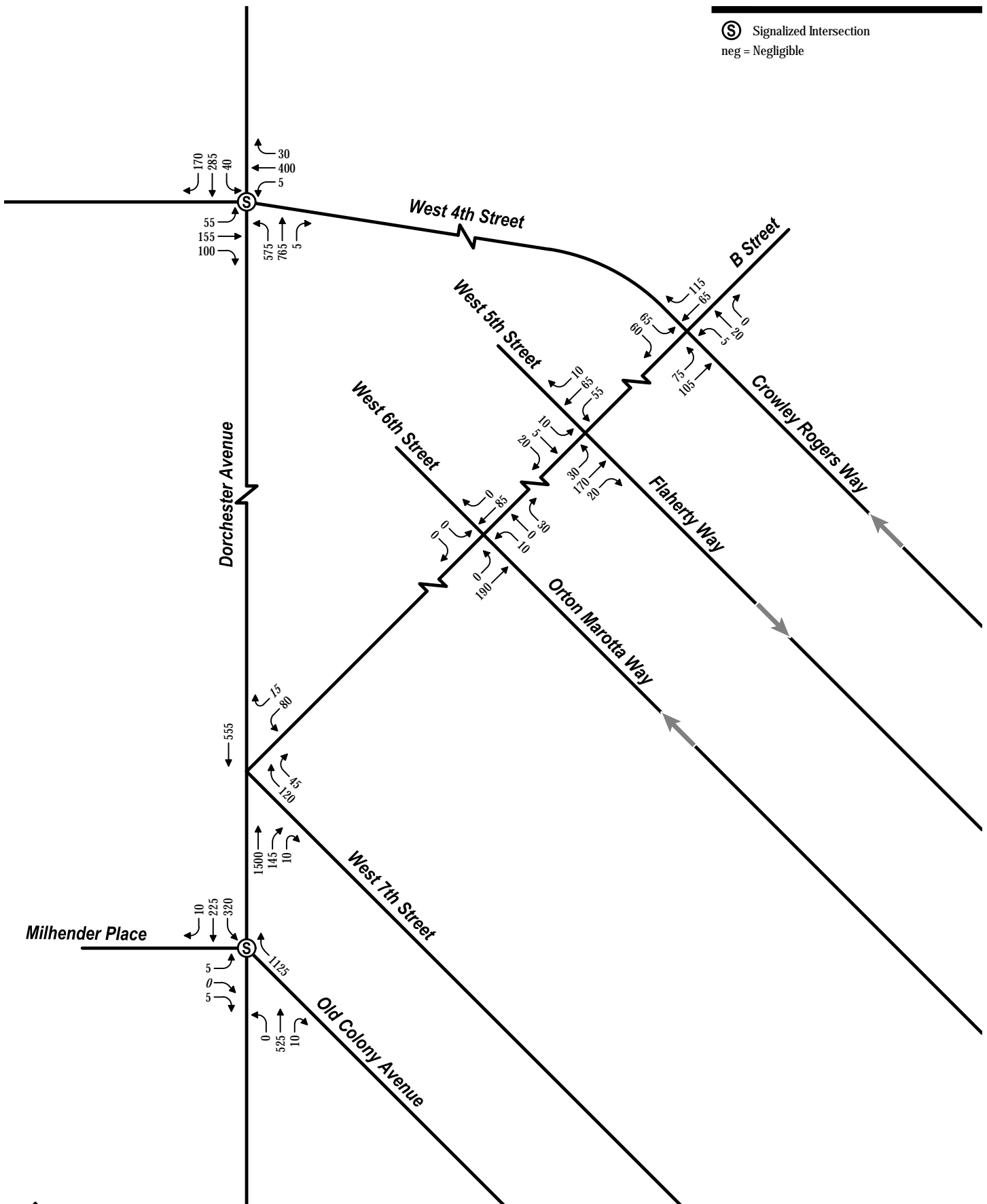
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Figure 4.9  
2016 Existing Morning Peak Hour Bicycle Volumes  
270 Dorchester Avenue  
South Boston, Massachusetts



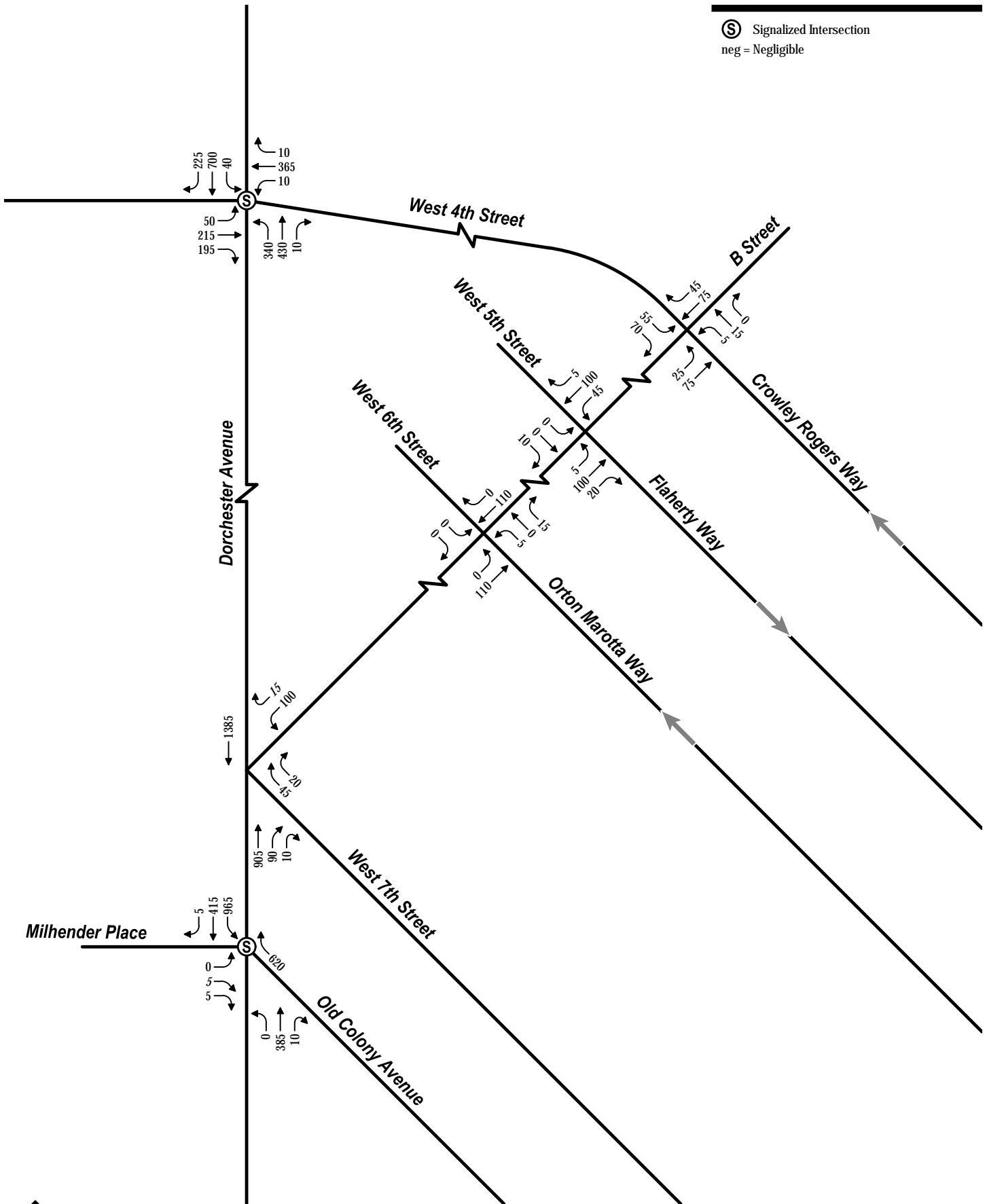
Figure 4.10  
2016 Existing Evening Peak Hour Bicycle Volumes  
270 Dorchester Avenue  
South Boston, Massachusetts



↑  
Not to Scale



Figure 4.11  
 2021 No-Build Morning Peak Hour  
 270 Dorchester Avenue  
 South Boston, Massachusetts



↑  
Not to Scale



Figure 4.12  
 2021 No-Build Evening Peak Hour  
 270 Dorchester Avenue  
 South Boston, Massachusetts

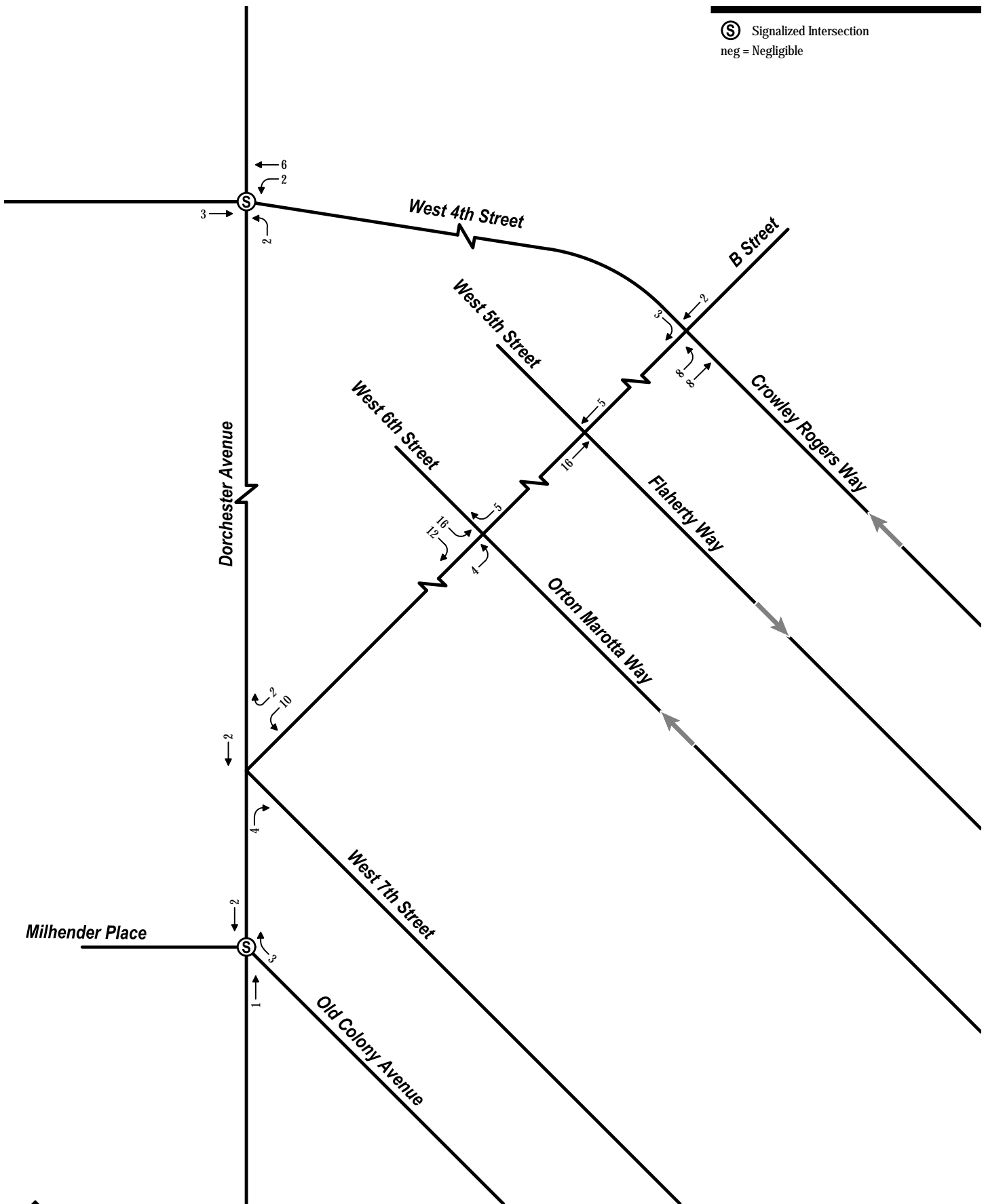




Figure 4.13  
Regional Trip Distribution

270 Dorchester Avenue  
South Boston, Massachusetts

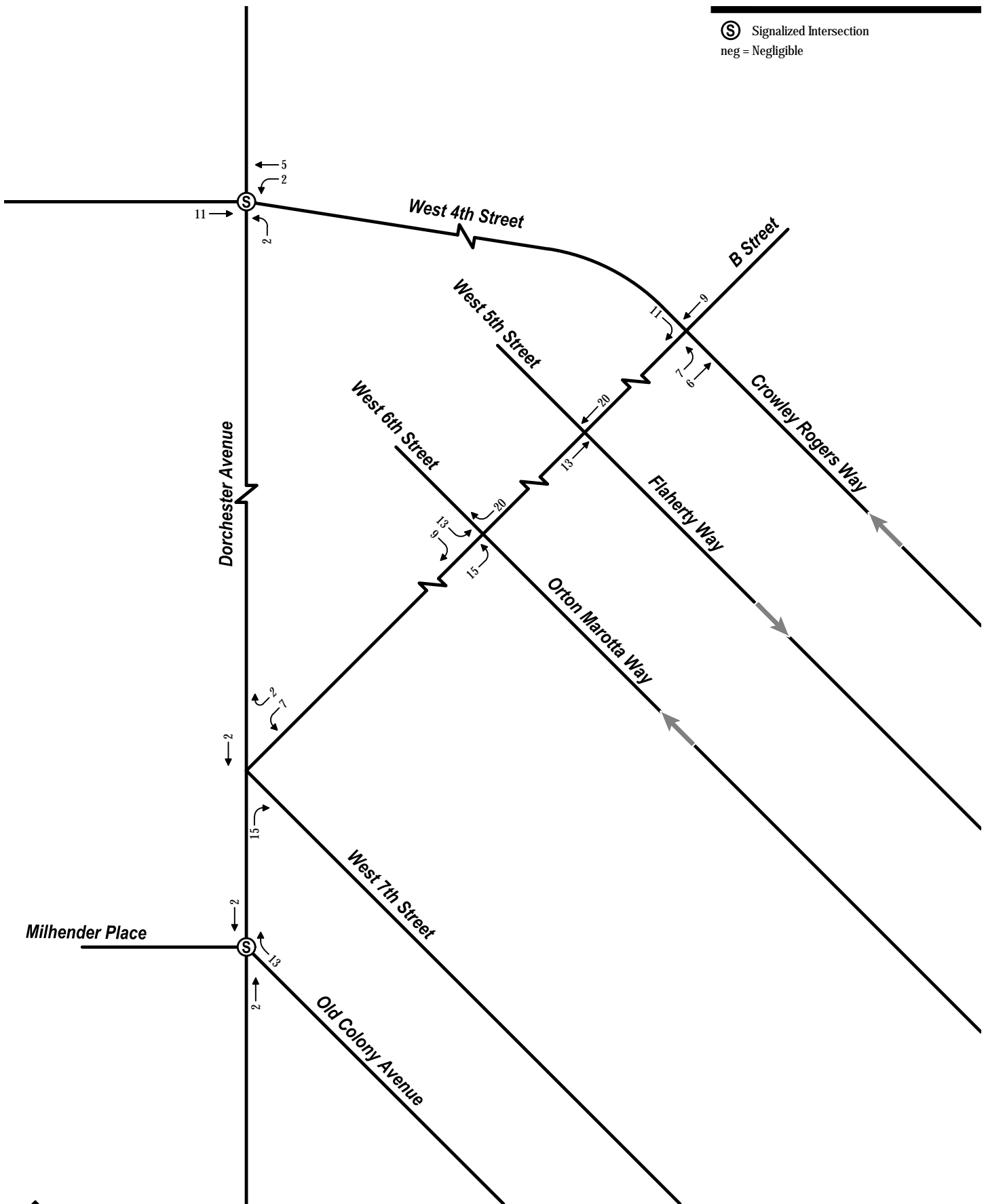
Source: Arcmap Online Bing Aerial



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Not to Scale



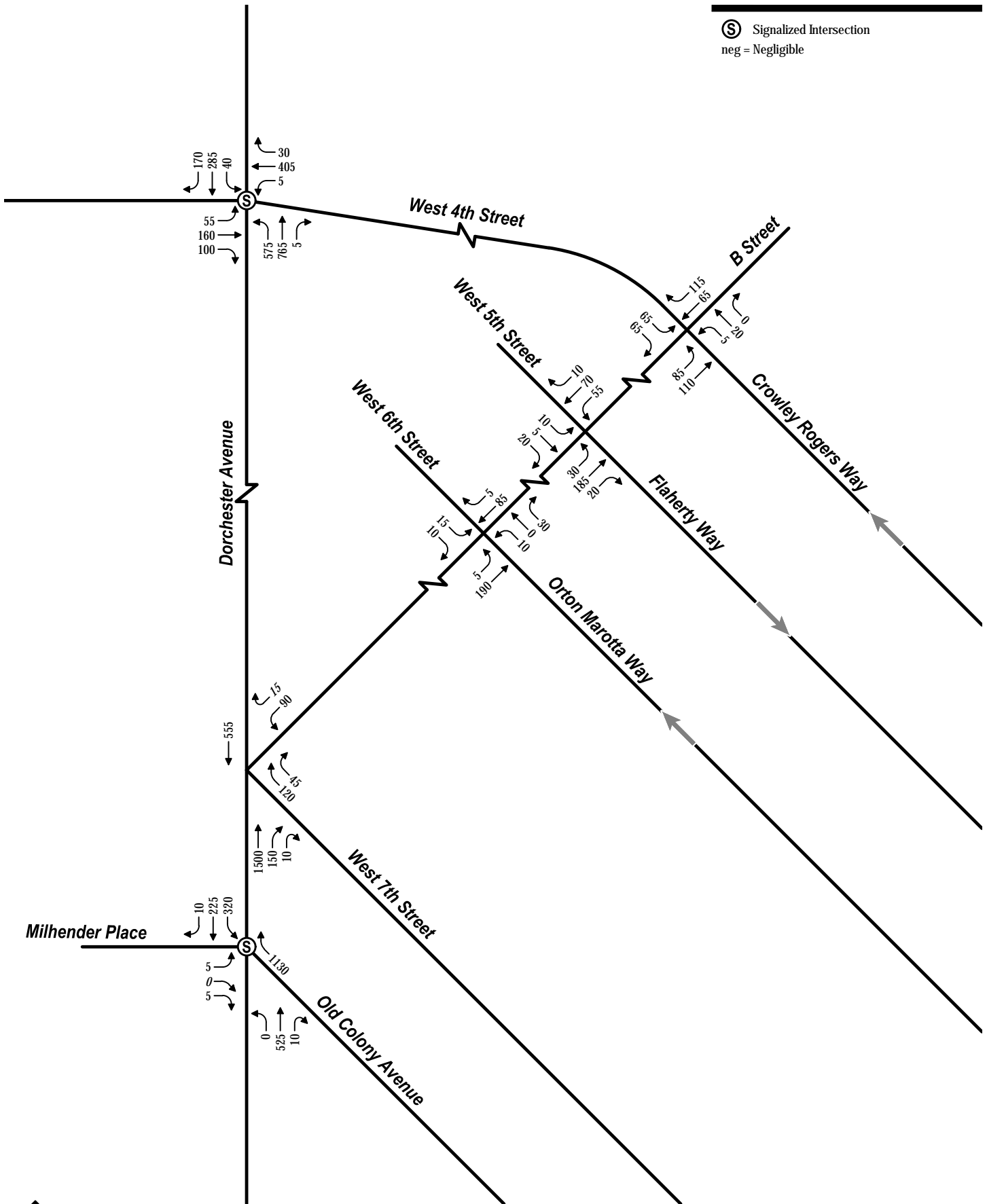
Figure 4.14  
 Morning Project Generated Trips  
 270 Dorchester Avenue  
 South Boston, Massachusetts



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Not to Scale



Figure 4.15  
 Evening Project Generated Trips  
 270 Dorchester Avenue  
 South Boston, Massachusetts

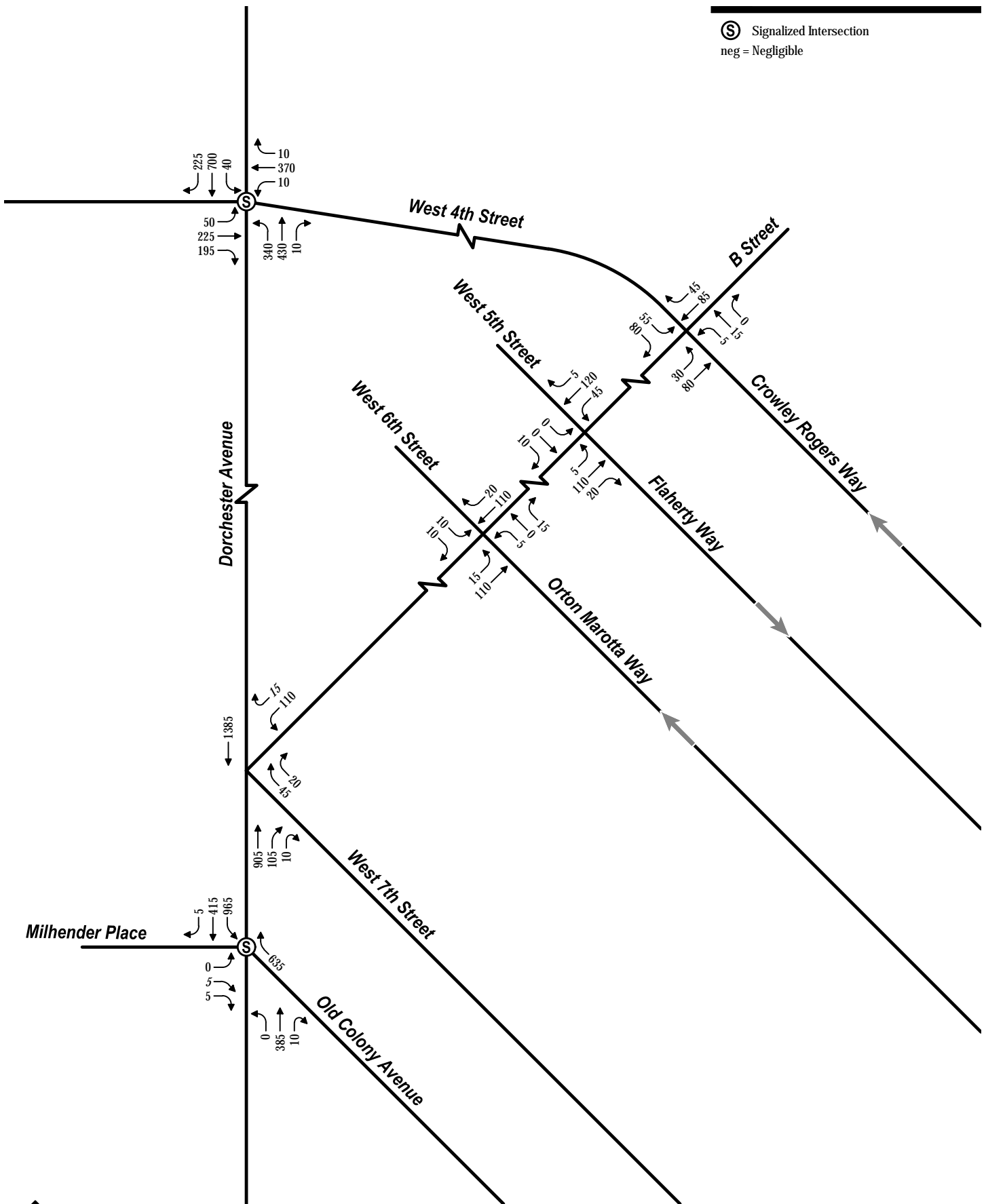


↑  
Not to Scale



Figure 4.16  
 2021 Build Morning Peak Hour  
 270 Dorchester Avenue  
 South Boston, Massachusetts





↑  
Not to Scale



Figure 4.17  
 2021 Build Evening Peak Hour  
 270 Dorchester Avenue  
 South Boston, Massachusetts

# 5

## Environmental Protection

This chapter presents information on the existing environmental conditions in the vicinity of the Project Site and the potential changes that may occur as a result of the Project. A goal of the Project is to avoid and/or minimize potential adverse environmental impacts to the Project area and its vicinity to the greatest extent practicable.

### 5.1 Key Findings and Benefits

- Shadow impacts resulting from the Proposed Project are minimal, with the largest impacts at Haul Road and West Sixth Street during the Winter Solstice.
- All viewpoints are expected to experience an increase in skyplane obstruction due to the additional massing of the proposed building.
- No significant adverse air quality impacts from the Project are anticipated.
- The quality and quantity of Site stormwater runoff will be improved compared to existing conditions.
- There are no wetlands in the immediate vicinity of the Project Site and the Project is not located in a designated flood hazard zone.
- The sound levels associated with the Project's operations are expected to have negligible noise impacts on the existing background sound levels at nearby sensitive receptor locations.
- Subsurface investigations confirmed the presence of contaminants in soil attributable to urban fill. Depending on the specific nature and source of these contaminants, compliance with the Massachusetts Contingency Plan (MCP) may be necessary.
- The Site is not located within a Groundwater Conservation Overlay District, and the proposed development is not anticipated to have adverse impacts on groundwater levels.
- A plan to control construction-related impacts including erosion, sedimentation, and other pollutant sources during construction and any land disturbance activities will be developed and implemented.

## **5.2 Shadow**

This section describes the anticipated changes to shadows within adjacent areas as a result of the Project. The Project Site, bounded by Dorchester Avenue running North & South, the Haul Road running to the North East, West Sixth Street running North West and B Street to the South West, is located at Latitude 42° 20' 18.62" N and Longitude 71° 3' 24.90" W.

### **5.2.1 Summary of Key Findings**

The shadow impact analysis demonstrates that the shadow impacts resulting from the Proposed Project are minimal. Of these the largest occur during the Winter Solstice, December 2, when the new structures cast shadows on the Haul Road and West Sixth Street.

### **5.2.2 Regulatory Context**

The Architect has completed a Shadow Impact Study to ascertain the potential new shadow impacts resulting from the Project. This study has been conducted in accordance with Section 80B-2 of the City of Boston Zoning Code with particular emphasis on sidewalks, public plazas and other open spaces as well as nearby buildings.

### **5.2.3 Methodology**

The Shadow Impact Study has been prepared using methodologies consistent with accepted practices performed under Article 80 review. The study provides a comparison of the No-Build and Build Conditions. This was accomplished by using a three dimensional model of the project area rendered in Sketch-up and incorporating the BPDA's 3D massing model of existing and projected future built projects.

The study was completed using the standard sun altitude and azimuth data for each date estimated to occur at Latitude 42° 20' 18.62" N and Longitude 71° 3' 24.90" W. The conditions were studied for Spring and Fall Equinoxes, and the Summer and Winter Solstices at 9:00 AM, 12:00 Noon and 4:00 PM.

### **5.2.4 Potential Effects**

The results of the Shadow Impact Studies are shown in Figures 5.1a-d.

#### **No-Build Condition**

In the No-Build Condition, shadow impacts are the same during all four study periods, as follows:

- At the first time period (9:00 AM) the shadow is cast to the west onto Dorchester Avenue and the Haul Road, which is 30 feet below.
- At the second time period (12:00 PM) the building no longer casts a shadow on Dorchester Avenue, and a slight shadow appears on West Sixth Street.

- At the third time period (4:00 PM) the shadow leaves the Haul Road, increases on West Sixth Street, and appears on B Street.

### **Build Condition**

#### Vernal Equinox (March 21)

- At the first time period (9:00 AM) the building's shadow is cast to the west onto Dorchester Avenue and the Haul Road, which is 30 feet below. The raised public courtyard is flooded with sunlight.
- At the second time period (12:00 PM) the building no longer casts a shadow on Dorchester Avenue, and a small shadow appears on West Sixth Street. The public courtyard starts to incur a small area of shadow.
- At the third time period (4:00 PM) the shadow leaves the Haul Road, increases on West Sixth Street, and appears on B Street. The public courtyard is in total shadow.

#### Summer Solstice (June 21)

- At the first time period (9:00 AM) the building's shadow is cast to the west onto Dorchester Avenue and the Haul Road, which is 30 feet below grade. The public courtyard is flooded with sunlight.
- At the second time period (12:00 PM) the building no longer casts a shadow on Dorchester Avenue, and a small shadow appears on West Sixth Street. The public courtyard remains sunlit.
- At the third time period (4:00 PM) the shadow leaves the Haul Road, increases on West Sixth Street, and appears on B Street. The public courtyard is engulfed in cool shadow.

#### Autumnal Equinox (September 21)

- At the first time period (9:00 AM) the building's shadow is cast to the west onto Dorchester Avenue and the Haul Road, which is 30 feet below grade. The public courtyard is flooded with sunlight.
- At the second time period (12:00 PM) the building no longer casts a shadow on Dorchester Avenue, and a small shadow appears on West Sixth Street. The public courtyard starts to incur a small area of shadow.
- At the third time period (4:00 PM) the shadow leaves the Haul Road, increases on West Sixth Street, and appears on B Street. The public courtyard is engulfed in cool shadow.

#### Winter Solstice (December 21)

- At the first time period (9:00 AM) the building's shadow is cast to the north onto Dorchester Avenue and the Haul Road, which is 30 feet below grade. The public courtyard is in partial shadow.
- At the second time period (12:00 PM) the building no longer casts a shadow on Dorchester Avenue, and shadow engulfs West Sixth Street. Shadows increase within the public courtyard.



- At the third time period (4:00 PM) the entire Site is in total shadow.

## 5.3 Daylight

The following section describes the anticipated effect on daylight coverage at the Project Site as a result of the Project. An analysis of the percentage of skydome obstructed under the Build and No-Build conditions is a requirement of the Article 80 Large Project Review as part of the Environmental Protection component (Section 80B-2(c) of the City of Boston Zoning Code). The daylight analysis was prepared using the BPDA's Daylight Analysis Program (BRADA) and has been completed in accordance with the requirements of Article 80 of the City of Boston Zoning Code. The results of the analysis are presented in Figure 5.2a-c.

### 5.3.1 Methodology

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

#### **BRADA Software**

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

The model inputs used for the study presented in this EPNF were taken from a combination of the BPDA City model, an existing conditions survey prepared by VHB, and schematic design plans prepared by Pisani + Associates Architects. As described above, the BRADA software considers the relative reflectivity of building facades when calculating perceived daylight obstruction. Highly reflective materials are thought to reduce the perceived skydome obstruction when compared to non-reflective materials. For the purposes of this daylight analysis, the building facades are considered non-reflective, resulting in a conservative estimate of daylight obstruction.

#### **Viewpoints**

The following viewpoints were used for this daylight analysis:

- Center of Dorchester Avenue
- Center of B Street
- Center of West 6<sup>th</sup> Street

### **5.3.2 Daylight Existing/No-Build Conditions**

Existing buildings were analyzed to illustrate the existing skyplane impacts (15.8 percent obstruction along Dorchester Avenue, 17.7 percent along B Street, and 34.8 percent along West 6<sup>th</sup> Street) and are meant to serve as a reference of how much increased impact the proposed project would have on the skyplane.

### **5.3.3 Daylight Build Conditions**

Under the Build Condition, all viewpoints are expected to experience an increase in skyplane obstruction (71.6 percent obstruction along Dorchester Avenue, 56.4 percent along B Street, and 80.4 percent along West 6<sup>th</sup> Street) due to the additional massing of the proposed building. This effect is to be expected and cannot be avoided when taller buildings replace existing shorter buildings.

## **5.4 Solar Glare**

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

## **5.5 Air Quality Microscale Analysis**

This section presents an overview of and the results for the air quality assessment conducted for the 270 Dorchester Avenue Project. The purpose of the air quality assessment is to demonstrate that the Project satisfies applicable regulatory requirements, and whether it complies with the 1990 Clean Air Act Amendments (CAAA) following the local and the U.S. Environmental Protection Agency (EPA) policies and procedures.

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

### **5.5.1 Background**

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

air quality has improved to attainment. After 20 years of clean air quality, maintenance areas can be re-designated to attainment. Projects located in maintenance areas are required to evaluate their CO concentrations with the NAAQS.

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

### 5.5.2 Air Quality Standards

The EPA has established the NAAQS to protect the public health. Massachusetts has adopted similar standards as those set by the EPA for carbon monoxide. Table 5-1 presents the NAAQS for carbon monoxide.

**TABLE 5-1 NATIONAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour	None	None
	35 ppm (40 mg/m <sup>3</sup> )	1-hour	None	None

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

The Department of Environmental Protection (MassDEP) maintains a network of air quality monitors to measure background CO concentrations. Background concentrations are ambient pollution levels from all stationary, mobile, and area sources. Background CO concentrations are determined by choosing the maximum of the 2nd-high annual values from the previous three years. Looking at the air quality monitor closest to the project site (Harrison Avenue) for the years 2012-2014, the CO background values are 2.2 ppm for the 1-hour averaging time and 1.6 ppm for the 8-hour averaging time. These values are much less than the 1-hour and 8-hour NAAQS. The background values are presented in Table 5-2.



<sup>1</sup> Environmental Protection Agency, *National Air Quality and Emissions Trends Report*, 1999, March 2001.

**TABLE 5-2 AIR QUALITY BACKGROUND CONCENTRATIONS**

<b>Pollutant</b>	<b>Background Concentrations</b>		<b>NAAQS</b>	
	<b>Level</b>	<b>Averaging Time</b>	<b>Level</b>	<b>Averaging Time</b>
Carbon	1.6 ppm	8-hour	9 ppm	8-hour
Monoxide	2.2 ppm	1-hour	35 ppm	1-hour

Monitoring Location: Harrison Avenue, Boston, MA

The CO concentrations from motor vehicle traffic related to the Project will be taken into consideration to demonstrate that the Project will comply with the NAAQS Standards, as discussed in the following section.

### **5.5.3 Boston Planning and Development Agency Development Review Guidelines**

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

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

#### **Traffic Data**

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

##### Signalized Intersections:

- Dorchester Avenue at West 4<sup>th</sup> Street
- Dorchester Avenue at Milhender Place and Old Colony Avenue

##### Unsignalized Intersections:

- Dorchester Avenue at B Street and West 7<sup>th</sup> Street
- B Street at West 6<sup>th</sup> Street and Orton Marotta Way
- B Street at West 5<sup>th</sup> Street and Flaherty Way
- B Street at West 4<sup>th</sup> Street and Crowley Rogers Way

The traffic study predicted project generated trips and evaluated LOS at the signalized intersections for the existing, no-build and build conditions. The Project is expected to



generate 37 trips in the morning peak hour and 57 trips in the evening peak hour. The calculated LOS and Control Delay at the signalized intersections are shown in Table 5-3

**TABLE 5-3 LEVELS OF SERVICE AT SIGNALIZED INTERSECTIONS**

Intersection		2016 Existing Condition		2021 No-Build Condition		2021 Build Condition	
		AM	PM	AM	PM	AM	PM
Dorchester Avenue at West 4 <sup>th</sup> Street	LOS	E	C	F	D	F	D
	Control Delay (s)	62.2	33.7	100.1	49.2	104.6	49.4
Dorchester Avenue at Milhender Place and Old Colony Avenue	LOS	B	B	C	B	C	B
	Control Delay (s)	18.5	13.3	20.6	16.1	20.7	16.0

#### 5.5.4 Microscale Analysis

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

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

- Project traffic is not projected to cause LOS at the signalized study intersection to decline to D, E, or F. The two study intersections currently operate at LOS E and B during the morning peak hour per Table 5.3. In a future No-Build condition the two intersections are projected to operate at a LOS of F and B in the morning peak hour. With the proposed Project built, the LOS of the two intersections are projected continue to be F and B. Thus, the proposed action would not worsen the intersection LOS and intersection LOS would remain the same as the No-Build scenario. In addition, the Project would have no impact on the Control Delay for Dorchester Avenue at Milhender Place and Old Colony Avenue compared to a No-Build scenario. The project would not substantially increase the Control Delay for Dorchester Avenue at West 4<sup>th</sup> Street—with an increase of 3.2 seconds in the morning peak hour and 0.3 seconds in the evening peak hour.
- Project traffic would not increase traffic volumes on nearby roadways by 10 percent or more (the increase in traffic volume is less than 100 vehicles per hour). The project is expected to generate 37 vehicle trips in the morning peak hour and 57 vehicle trips in the evening peak hour, which is an increase of fewer than a 100 vehicles per hour.
- The Project will not generate 3,000 or more new average daily trips on roadways providing access to a single location. The project is projected to generate 544 daily vehicle trips, less than 3,000 average daily trips.

Thus, under BPDA Review Guidelines the project is not expected to cause or contribute to a violation of the NAAQS and a quantitative microscale analysis is not required.

A review of the predicted traffic volumes at the two intersections of detailed study show that project generated trips will account for less than 1% of the total intersection volumes for both intersections during the morning and evening peak hours. The project traffic impacts are minor compared to the background traffic of the No-Build network. Since CO emissions are directly correlated to vehicular traffic, it is probable that the project will create similarly insignificant CO emissions when compared to the background concentrations and the NAAQS. If the background CO emissions were increased by 1% they would still remain well under the NAAQS.

Violation of the CO standard set by the NAAQS has become increasingly infrequent. This is due to a number of factors. Primarily, the vehicular emission rates of CO have decreased and will continue to decrease with the passage of time due to newer, more controlled vehicles entering the fleet.<sup>2</sup> Additionally, the CO background concentration in Boston has decreased with time.<sup>3</sup>

Under consideration of these three controlling factors for the determination of CO emissions impacts (Project traffic, background concentration, and emission rates), it is highly unlikely for CO impacts to exist or to be created with the introduction of the Project. The Project will generate minimal vehicular activity in the surrounding network. The CO emission rates of the fleet will decrease over time, and the background CO concentration is a relatively small relative to the NAAQS (18% and 6% of the respective 1-hour and 8-hour NAAQS).

### **5.5.5 Summary of Findings**

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

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

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

## **5.6 Water Quality**

The Project represents an opportunity to improve the quality and reduce the quantity of site stormwater runoff compared to existing conditions. Through the implementation of improved stormwater management practices, the Project will comply with the 2008 DEP Stormwater Management Policy and Standards. The Project design includes a stormwater infiltration



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

<sup>3</sup> "Massachusetts Annual Air Quality Report" *Department of Environmental Protection, Bureau of Air and Waste, Division of Air and Climate Programs*. Multiple Years.

system, which provides pollutant treatment and promotes the introduction of stormwater runoff into the ground and reduces the rate and quantity of stormwater discharged to the municipal drainage system and ultimately, to the Fort Port Channel. The infiltration system will have a positive impact on the surrounding groundwater table.

The Proponent will assist in educating the public and further improving the water quality of local water bodies installing permanently plaques that bear the warning “Don’t Dump - Drains to Boston Harbor” adjacent to all existing, modified, and new catch basins.

## **5.7 Flood Hazard**

There are no wetlands in the immediate vicinity of the Project Site and the Project is not located in a designated flood hazard zone as indicated by a review of the most recent flood insurance rate maps (FIRMs) available from the Federal Emergency Management Agency (FEMA) (effective March 16, 2016).

## **5.8 Noise**

The noise impact assessment evaluated the potential noise impacts associated with the 270 Dorchester Avenue Redevelopment Project’s activities, including mechanical equipment (e.g., heating and ventilation units, emergency generator, etc.) and loading activities. This section discusses the noise background, noise impact criteria, noise analysis methodology, and potential noise impacts. Noise monitoring was conducted to determine existing ambient sound levels. The analysis demonstrates that the Project will comply with City of Boston noise regulations.

### **5.8.1 Noise Analysis Background**

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

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

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

- A 3 dB increase is a doubling of acoustic energy and is the threshold of perceptibility to the average person.
- A 10 dB increase is a tenfold increase in acoustic energy but is perceived as a doubling in loudness to the average person.

The human ear does not perceive sound levels from each frequency as equally loud. To compensate for this phenomenon in perception, a frequency filter known as A weighted [dB(A)] is used to evaluate environmental noise levels. Table 5.1 presents a list of common outdoor and indoor sound levels.

**TABLE 5.1 COMMON OUTDOOR AND INDOOR SOUND LEVELS**

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

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

\*  $\mu$ PA – MicroPascals, which describe pressure. The pressure level is what sound level monitors measure.

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



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

- L90 is the sound level which is exceeded for 90 percent of the time during the time period. The L90 is generally considered to be the ambient or background sound level.
- Leq is the A-weighted sound level, which averages the background sound levels with short-term transient sound levels and provides a uniform method for comparing sound levels that vary over time.

### **5.8.2 Methodology**

The noise analysis evaluated the potential noise impacts associated with the Project's operations, which include mechanical equipment and loading dock activities. The noise analysis included measurements of existing ambient background sound levels and a qualitative evaluation of potential noise impacts associated with the proposed mechanical equipment (e.g. heating, ventilation, and air conditioning (HVAC) systems, and emergency generator) and loading activities. The study area was evaluated and sensitive receptor locations in the vicinity of the Project were identified and examined. The Site layout and building design, as it relates to the loading area and management of deliveries at the Project Site were also considered. The analysis considered sound level reductions due to distance, proposed building design, and blockages from the surrounding structures. The results of the assessment were compared to the City of Boston's noise standards for determining compliance.

### **5.8.3 Receptor Locations**

The noise assessment included an evaluation of the study area to identify nearby sensitive receptor locations, which typically include areas of sleep and areas of outdoor activities that may be sensitive to noise associated with the Project. The noise assessments identified three nearby sensitive receptor locations in the vicinity of the Project. As shown on Figure 5.3, the receptor locations include the following:

- R1 – Project property line along West 6th Street;
- R2 – Residential use on B Street to the southwest; and
- R3 – Residential use on West 5th Street to the east.

These receptor locations, selected based on land use considerations, represent the most sensitive locations in the vicinity of the Project Site. As sound waves dissipate over distance, receptors located further away would experience lower sound levels associated with the Project.

### **5.8.4 City of Boston Noise Impact Criteria**

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

Under Chapter 40, Section 21 of the General Laws of the Commonwealth of Massachusetts and Title 7, Section 50 of the City of Boston Code, the Air Pollution Control Commission of the City of Boston has adopted Regulations for the Control of Noise in the City of Boston. These regulations establish maximum allowable sound levels based upon the land use affected by the proposed development. Table 5.2 summarizes the maximum allowable sound levels that should not be exceeded.

**TABLE 5.2 CITY OF BOSTON NOISE STANDARDS BY ZONING DISTRICT**

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

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

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

### 5.8.5 Existing Noise Conditions

A noise monitoring program was conducted to establish existing sound levels. The existing sound levels were measured using a Type 1 sound analyzer (Larson Davis 831). Measurements were conducted at three locations in the vicinity of the sensitive receptor locations on June 10, 2015 and June 11, 2015. The measurements were conducted during a weekday daytime period between 1:00 PM and 3:00 PM and during the late night period between 12:00 AM and 2:00 AM. The measured sound levels data under existing conditions was composed of noise from vehicles traveling on local roadways (Dorchester Avenue and B Street) and mechanical equipment from nearby buildings.

The existing measured sound level data are presented in Table 5.3. The measured L90 sound levels range from approximately 54 dB(A) to approximately 55 dB(A) during the daytime period and from approximately 55 dB(A) to approximately 56 dB(A) during the nighttime period. These sound levels are representative of a typical active urban area. The result of the noise monitoring program indicates that the sound levels within the study area are currently below the City of Boston's daytime standard of 60 dB(A) for a Residential District. However, the measured nighttime sound levels exceed the City's nighttime standard of 50 dB(A).

**TABLE 5.3 EXISTING MEASURED SOUND LEVELS, dB(A)**

<b>Location</b>	<b>City of Boston Residential District Noise Criteria</b>		<b>Measured L90 Sound Levels</b>	
	<b>Daytime</b>	<b>Nighttime</b>	<b>Daytime</b>	<b>Nighttime</b>
R1 – West 6th Street	60	50	55*	55
R2 – B Street	60	50	55	56
R3 – West 5th Street	60	50	54	56

Source: VHB, Inc.

Note: Refer to Figure 5.3 for monitoring locations.

\* Assumed to be similar sound level as B Street.

### 5.8.6 Future Noise Conditions

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

#### Mechanical Equipment

Since the Project is in the early stages of the design process, the specific details related to the potential mechanical equipment are unknown at the time of this noise assessment. However, the mechanical equipment associated with the Project would include building heating and ventilation systems and/or emergency generator for life safety purposes. During the design and selection process, the proponent will select appropriate low-noise mechanical equipment, including noise mitigation measures, such as acoustical enclosures, penthouse, and/or acoustical screening walls to minimize the Project's potential noise impacts. The system would be strategically located on the rooftop, utilizing the height of the proposed building in providing noise attenuation. The Project will incorporate noise attenuation measures necessary to comply with the City of Boston's noise criteria at the sensitive receptor locations. As such, the sound levels associated with the Project's mechanical equipment is expected to be negligible at the surrounding sensitive receptor locations due to the distance from the proposed noise sources, shielding from structures, and applicable noise mitigation.

The Project may require an emergency generator for life safety purposes, such as emergency lighting. The determination of specific generator parameters, such as the size and location will be made during the building design process. The Project will be required to adhere to Massachusetts Department of Environmental Protection's (MassDEP's) regulations that require such equipment to be permitted and registered. As part of the air permitting process, the equipment will be required to meet additional noise requirements described in MassDEP regulations under the Codes of Massachusetts Regulations (310 CMR 7.00). When the details of the emergency generator are developed, the proponent will submit the appropriate permit application to MassDEP including the noise mitigation measures (such as acoustic enclosures and exhaust silencers) necessary to meet MassDEP's noise criteria.

### **Service and Loading Activities**

Loading activities associated with the Project is expected to be located on West 6<sup>th</sup> Street. Single panel trucks are expected to service the development. The Project is located in area that consists of commercial uses that is currently serviced by vehicles of all sizes, including tractor trailers. As such, the additional single panel trucks associated with the Project is not expected to significantly increase sound levels in the area. The loading area activities will be managed so that service and loading operations do not impact the local roadway along the frontage of the Project Site.

### **5.8.7 Conclusion of Noise Impact Assessment**

The noise analysis evaluated the sound levels associated with the proposed 270 Dorchester Avenue Redevelopment Project. This assessment determined that the sensitive receptor locations (residential units) in the vicinity of the Project Site currently experience sound levels exceeding the City of Boston's noise criteria during the nighttime period. The dominant noise source contributing to the existing sound levels in the study area is traffic traveling along the local roadways and mechanical equipment from nearby buildings. Due to the design of the proposed building and the anticipated rooftop location of the mechanical equipment, the sound levels associated with the Project's operations are expected to have negligible noise impacts on the existing background sound levels at nearby sensitive receptor locations. While impacts of the emergency generator are also expected to be negligible, a separate MassDEP permitting process will allow for further review of this equipment at a later date.

## **5.9 Solid and Hazardous Waste**

Environmental due diligence investigations have been performed at the Site. The project area is located in South Boston, which has a long history of land filling. In these areas, urban fill soils are commonly encountered and can contain heavy metals, petroleum hydrocarbons, and polycyclic aromatic hydrocarbons (PAHs). Subsurface investigations confirmed the presence of contaminants in soil attributable to urban fill. Depending on the specific nature and source of these contaminants, compliance with the Massachusetts Contingency Plan (MCP) may be necessary. According to the Massachusetts Department of Environmental Protection (DEP) online database, the Site is not currently a listed contaminated disposal site. However, excess excavated soil that may be generated during construction will be managed in accordance with MassDEP policy and, if necessary, the MCP. The project proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or disposal of soil encountered during construction. The LSP will also prepare required MCP regulatory compliance submittals, if required.

Further environmental characterization for this property will be performed by GEI Consultants, Inc. on behalf of the project proponent. As part of GEI's environmental work, a subsurface exploration program will be implemented to fully characterize soil for off-site disposal and groundwater for on-site recharge or off-site discharge.

## 5.10 Groundwater

The site is not located within a Groundwater Conservation Overlay District as outlined in Article 32 of the City of Boston Zoning Code.

The depth to groundwater is about 16 to 17 feet below the ground surface, based on groundwater measurements in monitoring wells at the Site. The basement floor slab and foundation walls will be membrane waterproofed and designed to resist hydrostatic pressures. Thus, proposed development is not anticipated to have adverse short- or long-term effects on the groundwater levels.

## 5.11 Geotechnical

Based on preliminary subsurface exploration program, the subsurface conditions consist of the following major soil layers, beginning at the ground surface and proceeding downward:

- Fill: An approximately 12-foot-thick layer of urban fill was encountered beneath asphalt.
- Organic Soil: An approximately 7-foot-thick layer of organic soil was encountered beneath the fill that extended to a depth of approximately 19 feet.
- Sand: An approximately 13-foot-thick layer of glaciomarine sand was encountered beneath the peat. The sand extended to a depth of approximately 32 feet.
- Clay: An approximately 67-foot-thick layer of soft clay (locally referred to as "Boston Blue Clay") was encountered beneath the sand. The clay extended to a depth of approximately 99 feet.
- Till: An approximately 8-foot-thick layer of dense glacial till was encountered beneath the clay. The till extended to depth of approximately 107 feet.
- Weathered bedrock (Argillite): Weathered bedrock consisting of gray argillite was encountered at a depth of approximately 107 feet.

The proposed buildings will likely be supported on piles driven into the glacial till or bedrock. Alternately, it may be possible to support the proposed buildings on structural mats that bear on the sand layer. Because of the difference in height between the buildings and court yard area, the mats between these areas would need to be isolated from each other and settlement analyses would need to be performed to evaluate if differential settlements between the buildings are within acceptable limits.

Since the floor slab appears to be very near the measured groundwater table and higher groundwater levels can occur, the basement floor slab and foundation walls will be membrane waterproofed.

The bottom level garage floor slab will be designed as a structural or framed slab supported by the piles. The floor slab will be designed to resist hydrostatic uplift pressures from the groundwater.



A temporary excavation support system will be required during construction to protect adjacent rights-of-way, properties, and infrastructure. The excavation support system can consist of either drilled in soldier piles with concrete or steel lagging, or interlocking sheetpiles, with internal bracing consisting of series of walers with rakers. It is unlikely that tie-backs can be used for this project because of the numerous buried utilities in the surrounding rights-of-way, and the downward sloping topography and two-story concrete block structure along Dorchester Avenue.

The exterior walls of the buildings appear to be located on the property line along B Street, which does not provide room of the temporary excavation support system. Thus, a temporary construction easement will be likely be required to install the excavation support system.

## **5.12 Construction Impacts**

The Proponent will employ a Construction Manager who will be responsible for developing a construction phasing and staging plan for coordinating construction activities with all appropriate utility companies and regulatory agencies. A plan to control construction-related impacts including erosion, sedimentation, and other pollutant sources during construction and any land disturbance activities will be developed and implemented. The Project's geotechnical consultant will provide consulting services associated with the design recommendations, prepare geotechnical specifications and review the construction contractor's proposed procedures. The Project is expected to provide up to 150 construction jobs over the course of project construction.

### **5.12.1 Construction Activity Schedule**

The Construction period for the proposed Project is expected to last 15-18 months, beginning in the 4<sup>th</sup> Quarter of 2017 and reaching completion in the 2<sup>nd</sup> Quarter of 2019. The City of Boston Noise and Work Ordinances will dictate the normal work hours, which will be from 7:00 AM to 6:00 PM, Monday through Friday.

### **5.12.2 Construction Air Quality**

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

The Project will comply with the requirements of the Clean Construction Equipment Initiative aimed at reducing air emissions from diesel-powered construction equipment. Oxidation catalysts and catalyzed particulate filters will be utilized on all construction vehicles and equipment to reduce air quality degradation caused by emissions from heavy-duty, diesel-powered construction equipment. All pre-2007 diesel construction vehicles working on the

Project will be retrofitted using retrofit technologies approved by the United States Environmental Protection Agency (EPA). Additionally, ultra-low-sulfur diesel (ULSD) fuel (15 parts per million) will be used for all off-road diesel equipment.

### **5.12.3 Construction Noise**

The construction activity associated with the Project may temporarily increase nearby sound levels due to the use of heavy machinery. Heavy machinery is expected to be used intermittently throughout the Project's construction phases, typically during daytime periods. The construction phases that will generate the highest sound levels include the demolition of existing buildings, site excavation and grading, and construction of the foundations for the proposed building. The City of Boston Regulations for the Control of Noise considers construction sound levels to be an impact to residential land uses if the L10 is in excess of 75 dB(A) or the Lmax is in excess of 86 dB(A). A construction management program will be developed with the City of Boston to ensure compliance with the City of Boston noise regulations related to construction noise. Permission will be sought from the City of Boston if noise level exceedances are expected.

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

### **5.12.4 Construction Traffic and Parking**

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

The following elements are typically addressed in the CMP:

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

### **5.12.5 Construction Trip Generation and Worker Parking**

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

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

### **5.12.6 Construction Truck Routes and Volumes**

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

### **5.12.7 Construction Hazardous Materials and Solid Waste**

All solid waste generated will be recycled off-site or disposed of in accordance with federal, state, and city regulations. The Construction Manager will implement a waste management plan that will seek to divert at least 75 percent of construction and demolition waste material removed from the Site from landfills through recycling and salvaging.

### **5.12.8 Rodent Control During Construction**

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

### **5.12.9 Public Safety During Construction**

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

Larger deliveries of construction materials may require the use of police details to assist in managing vehicular and pedestrian traffic. Coordination with the Boston Police Department will be essential in providing safe travel routes for pedestrians during peak construction periods. Additional details will be provided in the CMP, which is subject to approval by the City of Boston.

### **5.13 Rodent Control Post-Construction**

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



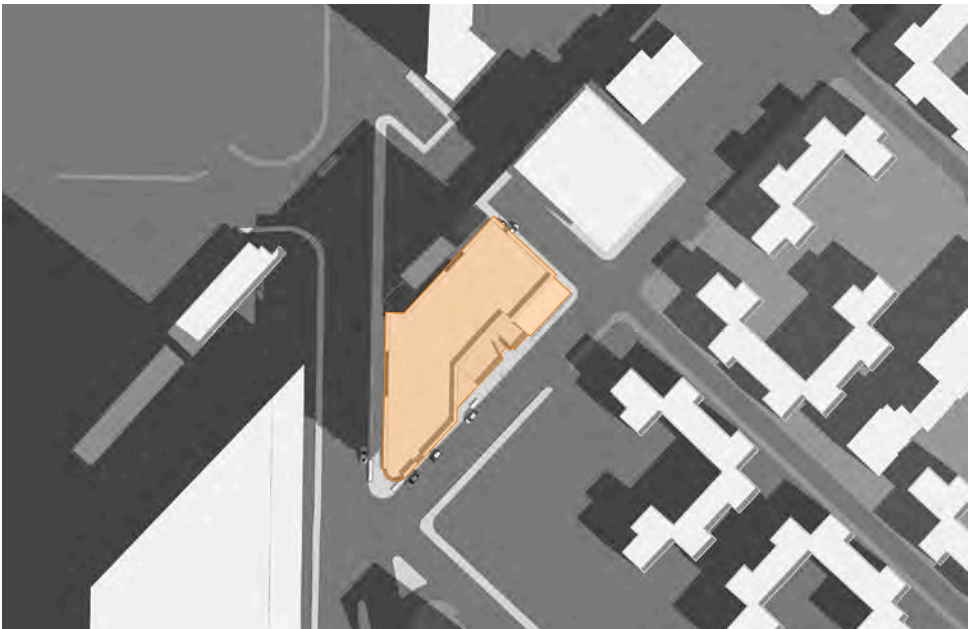
Existing - 9 AM



Existing - 12 PM



Existing - 4 PM



Proposed - 9 AM



Proposed - 12 PM



Proposed - 4PM





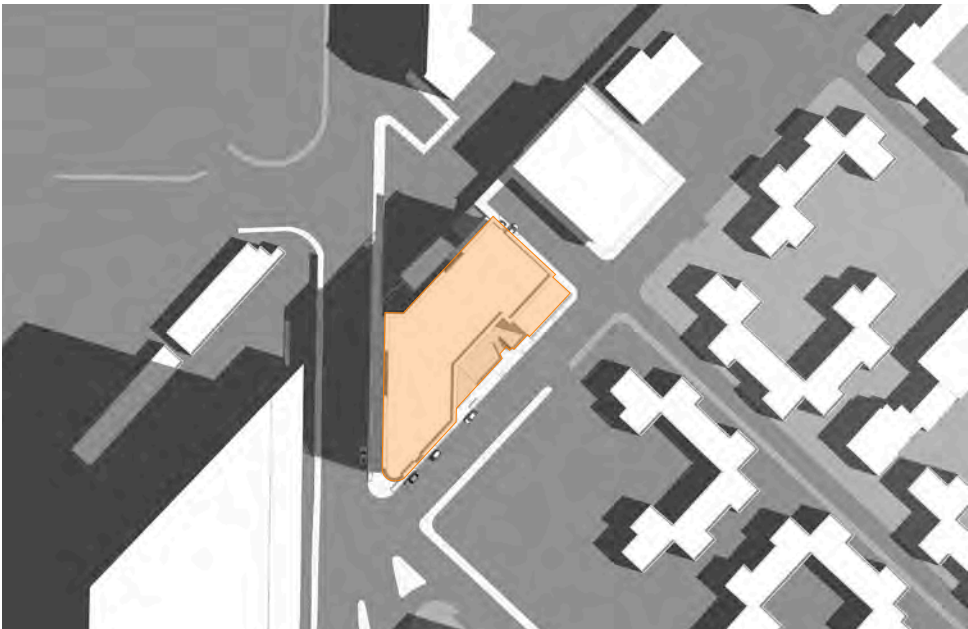
Existing - 9 AM



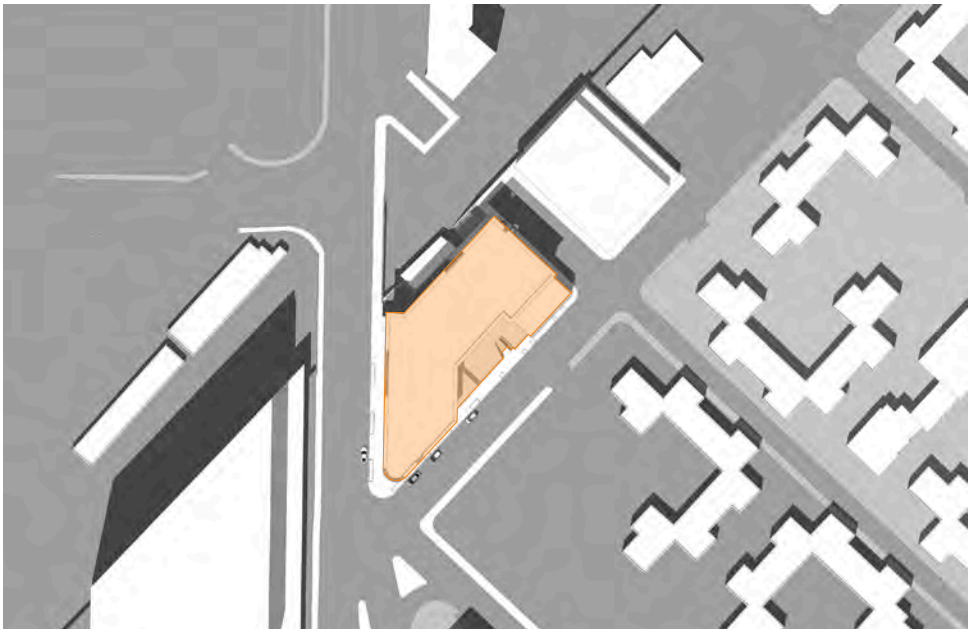
Existing - 12 PM



Existing - 4 PM



Proposed - 9 AM



Proposed - 12 PM



Proposed - 4PM





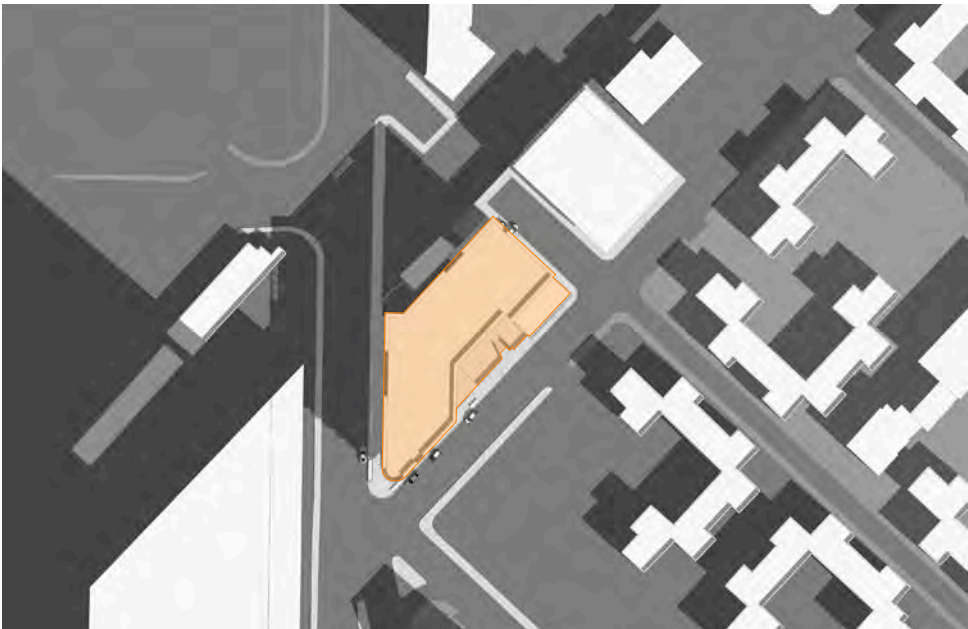
Existing - 9 AM



Existing - 12 PM



Existing - 4 PM



Proposed - 9 AM



Proposed - 12 PM



Proposed - 4PM



Existing - 9 AM



Existing - 12 PM



Existing - 4 PM



Proposed - 9 AM



Proposed - 12 PM

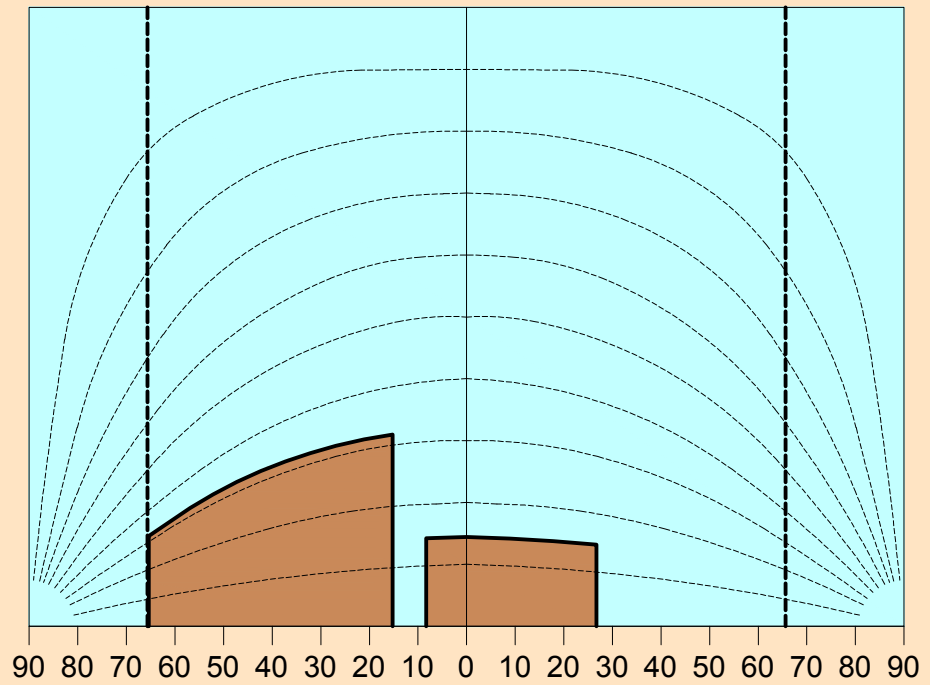
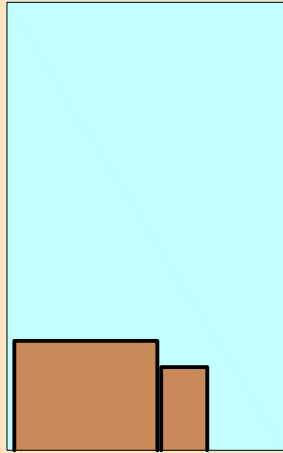


Proposed - 4PM



### Existing

Obstruction of  
Skyplane = 15.8%



### Proposed

Obstruction of  
Skyplane = 71.6%

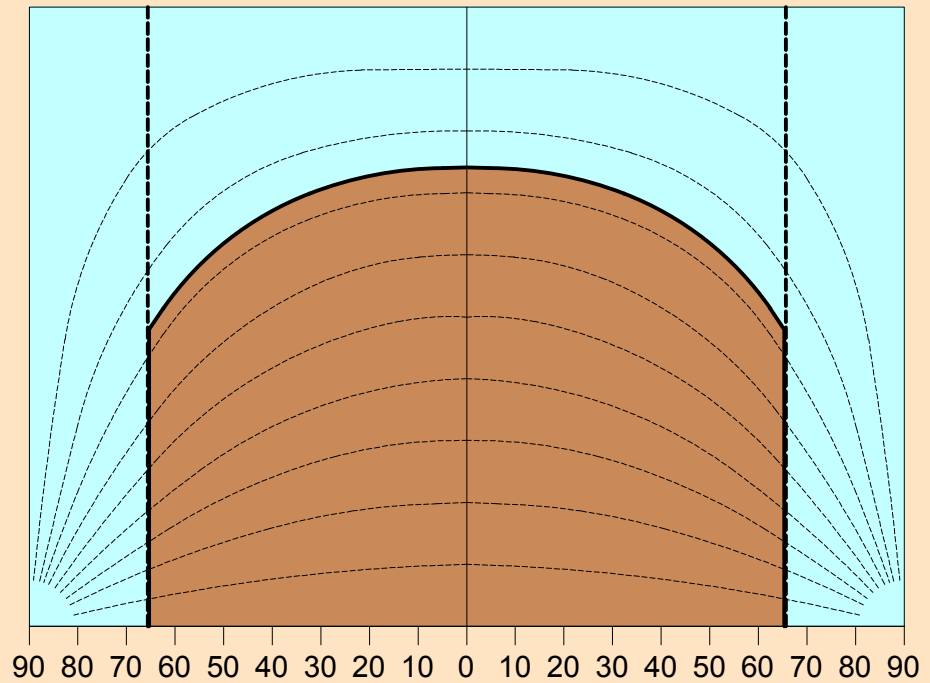
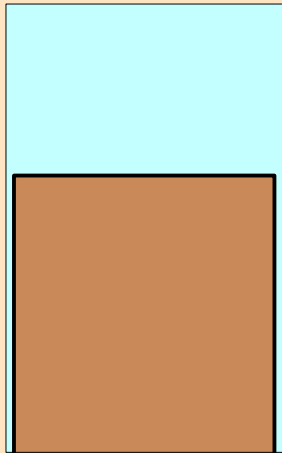


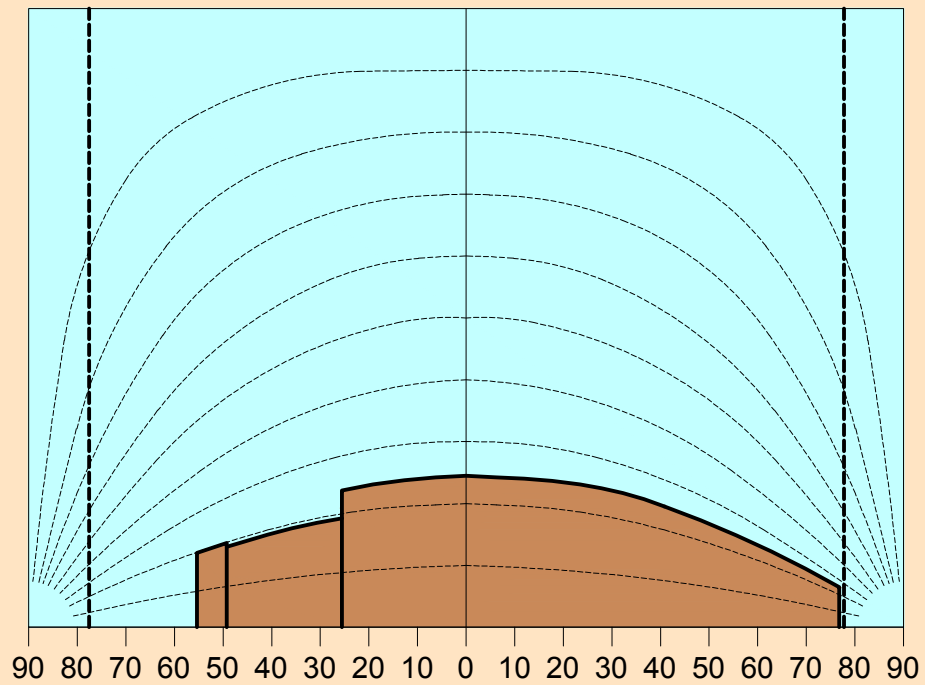
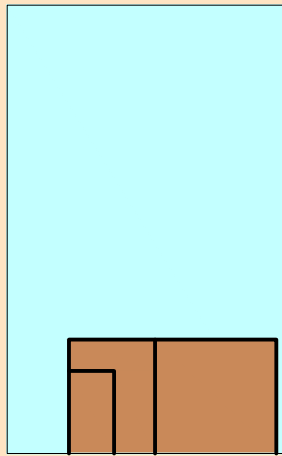
Figure 5.2a

Daylighting Analysis  
Center of Dorchester Avenue

270 Dorchester Avenue  
South Boston, Massachusetts

## Existing

Obstruction of  
Skyplane = 17.7%



## Proposed

Obstruction of  
Skyplane = 56.4%

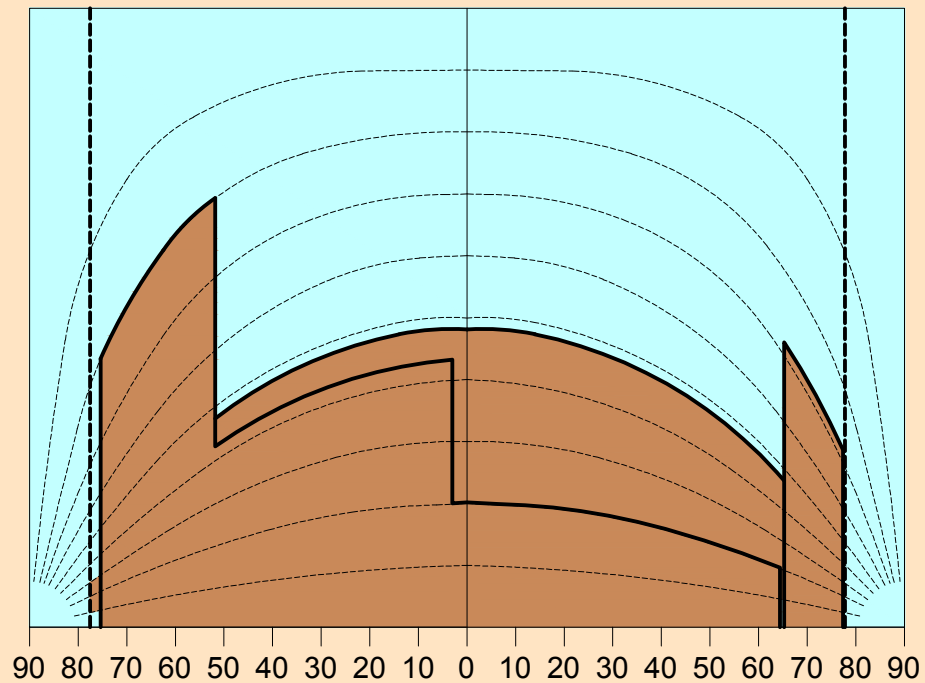
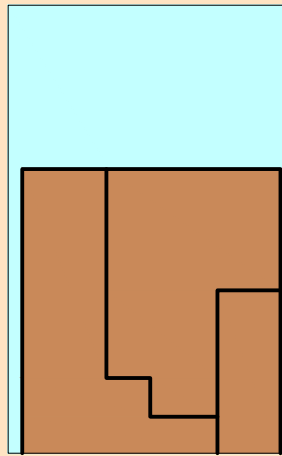


Figure 5.2b

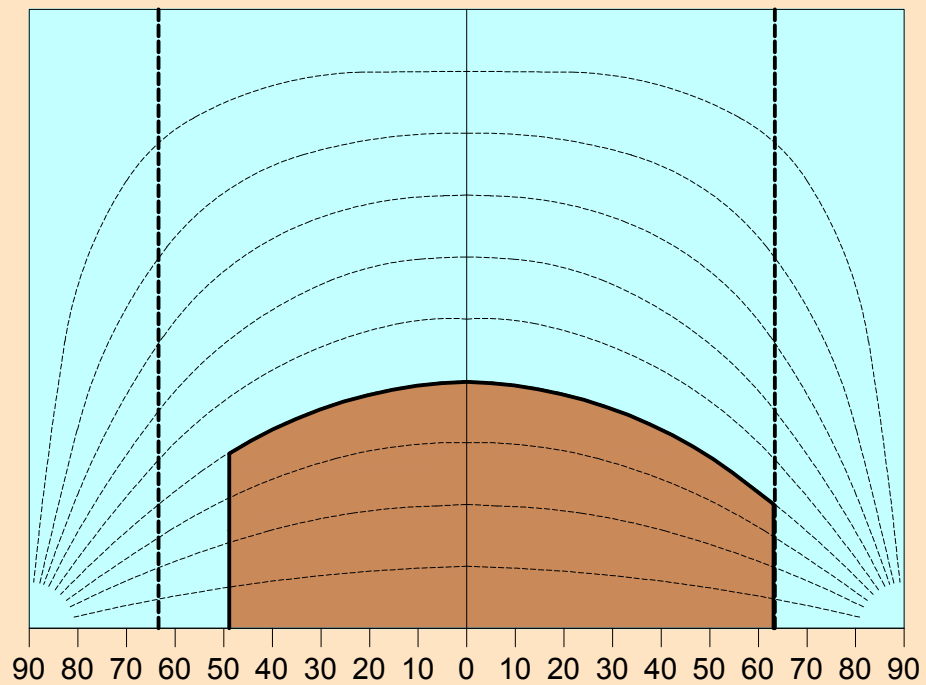
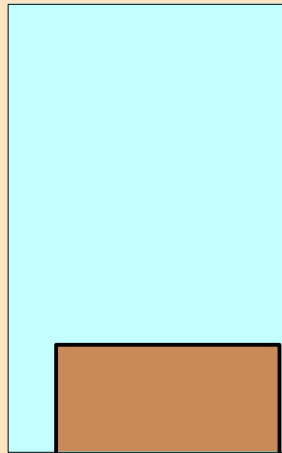
Daylighting Analysis  
Center of B Street

270 Dorchester Avenue  
South Boston, Massachusetts



## Existing

Obstruction of  
Skyplane = 34.8%



## Proposed

Obstruction of  
Skyplane = 80.4%

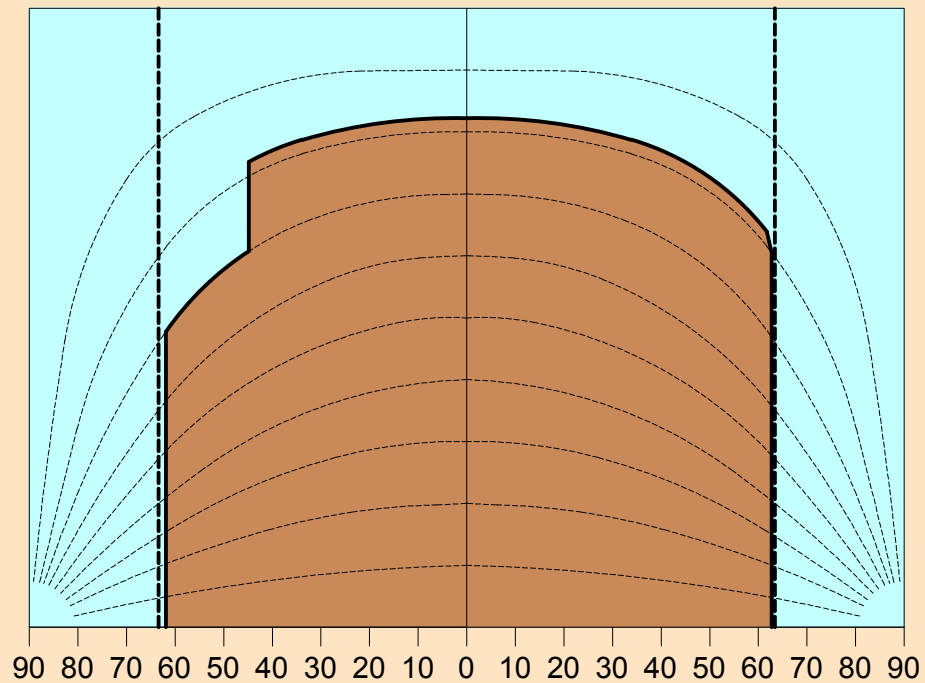
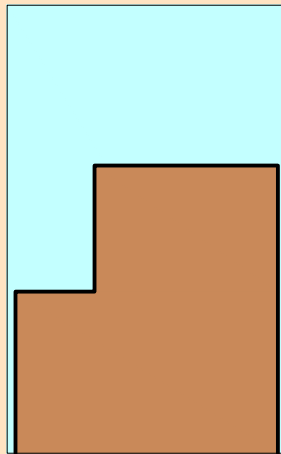


Figure 5.2c

Daylighting Analysis  
Center of West 6th Street

270 Dorchester Avenue  
South Boston, Massachusetts

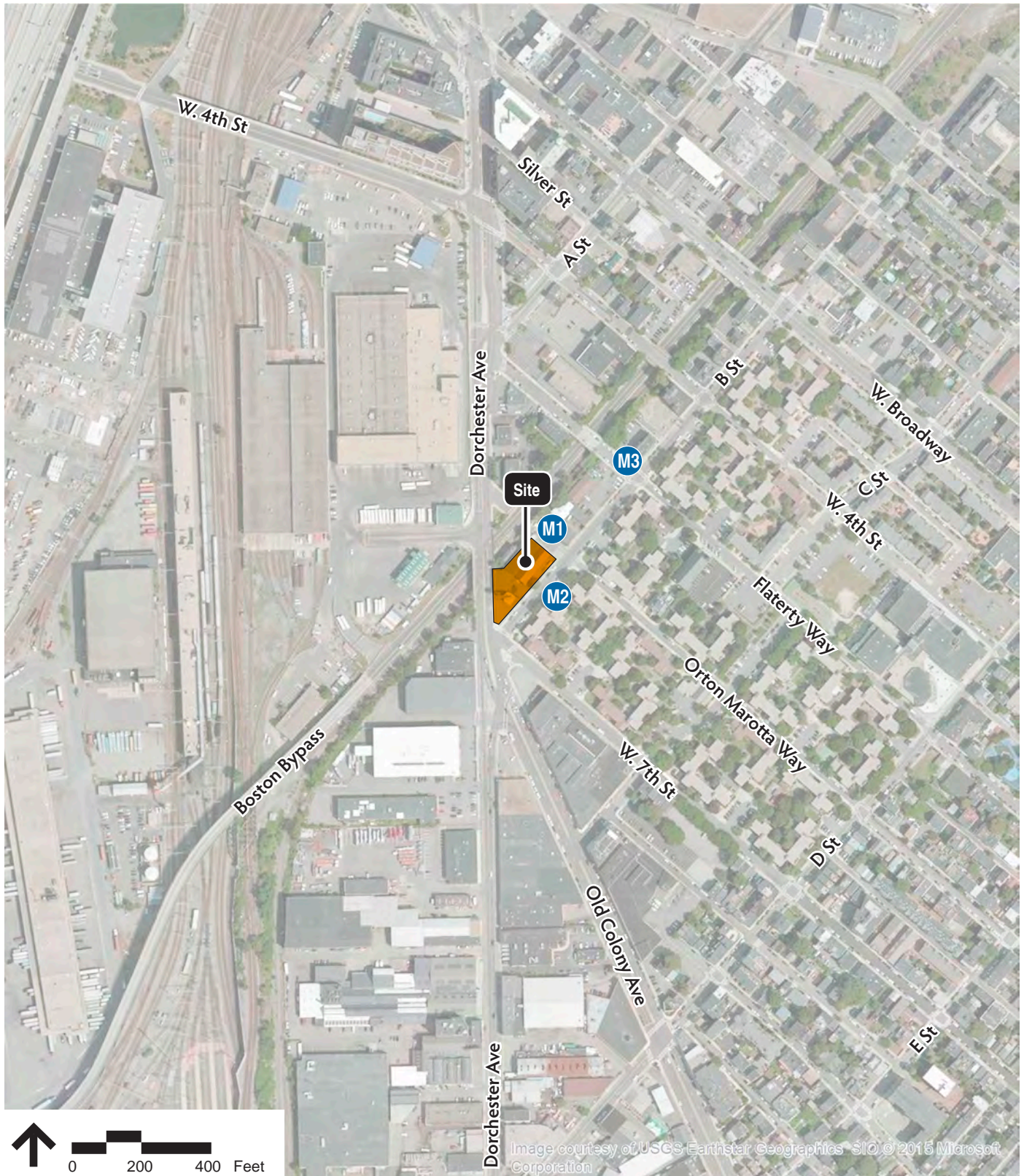


Figure 5.3  
Noise Monitoring Locations

**270 Dorchester Avenue  
South Boston, Massachusetts**

Source: Arcmap Online Bing Aerial

# 6

## Infrastructure

This chapter describes the infrastructure systems that will support the Project. The following utilities are evaluated: wastewater, water, stormwater management, natural gas, electricity, and telecommunications. The Project is located in an urban context with a comprehensive utility service network available at the Site frontage.

The Project will connect to existing city and utility company systems in the adjacent public streets. Based on initial investigations and consultations with the appropriate agencies and utility companies, we anticipate that the existing infrastructure systems will support the incremental increase in demand associated with the development and operation of the Project. As design progresses, all required engineering analyses will be conducted and the final design will adhere to all applicable protocols and design standards ensuring that the proposed building is properly supported by and properly uses city infrastructure. Detailed design of the Project's utility systems will proceed in conjunction with the design of the building and interior mechanical systems.

The systems discussed herein include those owned or managed by the Boston Water and Sewer Commission (BWSC), private utility companies, and on-site infrastructure systems. There will be close coordination among these entities and with the project engineers and architects during the construction process for the Project. Figure 6.1 shows the existing infrastructure at the Site.

### 6.1 Key Findings and Benefits

The key impact assessment findings related to infrastructure systems include:

- Utility infrastructure systems are available at the Site frontage and our current indication is that they will support the demand associated with the development and operation of the Project. This will be confirmed as the design develops, service locations are established and we meet with the appropriate agencies and utility companies.
- On-site drainage generally flows towards the Fort Point Channel via BWSC-owned and maintained drainage infrastructure in Dorchester Avenue fronting the Project Site
- The Project Site is currently serviced by the BWSC for domestic and fire protection water and sanitary sewage conveyance.

- Based upon sewage generation rates outlined in the DEP Sewer Connection and Extension Regulations, 310 CMR 15.203.f, the Project is estimated to generate approximately 20,020 gallons per day of sanitary sewage and will require between approximately 22,022 gallons of water per day.

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

- The Project will not result in the introduction of additional peak flows, pollutants, or sediments that would potentially impact the receiving waters of the local BWSC stormwater drainage system.
- The Project will improve the quality and quantity of site stormwater runoff compared to existing conditions. Additionally, the proposed stormwater management systems will comply with the 2008 DEP Stormwater Management Policy and Standards.
- Appropriate low-flow and low-consumption plumbing fixtures will be installed in all residential units to achieve a reduction in water usage of 30 to 40 percent over the baseline in order to comply with Article 37 of the Boston Zoning Code.

## **6.2 Regulatory Context**

The following discusses the regulatory framework of utility connection reviews and standards. All connections will be designed and constructed in accordance with city, state and federal standards. A complete list of the state and local permits anticipated associated with Project-related infrastructure is included in Chapter 1, *General Information and Regulatory Context*. For the Project:

- BWSC approval will be required for all water, sewer, and stormwater systems.
- The Boston Fire Department will review the Project with respect to fire protection measures such as siamese connections, hydrants, and standpipes.
- Design of the Site access, hydrant locations, and energy systems (gas and electric) will also be coordinated with the respective system owners.
- Where new utility connections are needed and existing connections are to be capped, the excavation will be authorized by the Boston Public Works Department (BPWD) through the street opening permit process, as required.
- Additional information on the regulatory framework for each utility system is included in subsequent sections of this chapter.

## **6.3 Stormwater Management**

Since the Project Site is already impervious, the Project will not produce significant changes in either the pattern of, or rate of, stormwater runoff. Stormwater management controls will be established in compliance with the BWSC standards. The Project is expected to increase



stormwater runoff quality and reduce peak flows through the use of treatment and infiltration facilities.

### **6.3.1 Existing Drainage Conditions**

On-site drainage generally flows towards the Fort Point Channel (as shown on BWSC maps). Dorchester Avenue and B Street contains BWSC-owned and maintained drainage infrastructure fronting the Project Site. A portion of the site run-off is collected by an on-site catch basin and connects to existing BWSC infrastructure in B Street. Roadway runoff is piped from the Project Site by the BWSC at several locations along Dorchester Avenue and B Street. There is an existing 24-inch drain line in Dorchester Avenue and an existing 60-inch by 78-inch combined sewer in B Street. Both Systems connect to the Dorchester Brook Conduit which ultimately discharges in the Fort Point Channel through the Roxbury Canal Conduit. Refer to Figure 6.1 for the existing drainage facilities serving the Project Site.

### **6.3.2 Proposed Drainage Conditions**

Construction of the Project will incorporate stormwater management and treatment systems that will improve water quality, reduce runoff volume and control peak rates of runoff in comparison to existing conditions. The current design of the Project is anticipated to include an innovative infiltration system that retains site runoff while providing treatment and peak flow mitigation.

Stormwater runoff calculations will be done for existing and proposed conditions for the 2-, 10-, 25- and 100-year storm events. During construction, measures will be implemented to minimize water quality impacts and avoid impacts to abutters. Figure 6.2 shows proposed drainage conditions.

## **6.4 Sanitary Sewage**

### **6.4.1 Existing Sewer System**

The BWSC owns and maintains the sanitary sewer lines in the vicinity of the Project Site. These include the 36-inch by 60-inch combined sewer along the Site frontage in Dorchester Avenue and a 60-inch by 78-inch combined sewer line in B Street. Existing site uses generate approximately 850 gallons per day of wastewater.

### **6.4.2 Proposed Sewage Flow and Connection**

Generation rates from the Massachusetts State Environmental Code (Title 5) were used to estimate the Project's sewage generation rates. The Project's approximately 150 residential units are projected to generate an estimated 19,690 gallons per day of sewage. The proposed retail use (up to 2,650 square feet) will generate approximately 133 gallons per day. The total generation for the Project is estimated to be approximately 19,823 gallons per day.

These calculations anticipate a dry retail use. Inclusion of a restaurant use would increase sanitary flows and would be based on seats. The inclusion of a restaurant would add approximately 1,500 gallons per day resulting in a total flow of up to 21,190 gallons per day.



At this stage of the design, options for potential sewer connections are being evaluated and will be coordinated with the BWSC. Figure 6.2 shows proposed sewage connections.

**TABLE 6.1 EXISTING AND PROPOSED SEWER GENERATION**

Program Type	Units	Generation Rate	Sewer Generation (GPD)
<b>Existing Generation</b>			
Restaurant	*20 Seats	35 GPD/Seat	700
Warehouse	*10 Employees	15 GPD/Employee	150
TOTAL			850
<b>Proposed Generation</b>			
Residential	179 Beds	110 GPD/Bed	19,690
Retail	6,590 SF	50 GPD/1,000 SF	330
TOTAL			20,020
NET NEW			<b>19,170</b>

Note: Based on DEP 214 CMR 7.15 flow calculation factors

\* Estimated units based on square footage

## 6.5 Domestic Water and Fire Protection

### 6.5.1 Existing Water Supply System

The BWSC owns and maintains the water mains in the vicinity of the Project Site (Figure 6.1). BWSC record drawings show the streets surrounding the Site are serviced by southern low service pipes. These pipes range in size from a 16-inch main in Dorchester Avenue, to eight-inch main in B Street. The installation dates and materials of these pipes also vary, from pit-cast iron ("PCI") pipe installed in 1917, relined in 2006 and ductile iron cement lined ("DICL") pipe installed and lined in 2006. The existing water infrastructure provides a high level of service and diversity to the South Boston neighborhood. Additionally, currently two fire hydrants are in close proximity to the Project Site.

The existing building is currently serviced by an existing fire protection line connecting to the BWSC main in B Street.

### 6.5.2 Proposed Water Demand and Connection

Domestic water demand is based on estimated sewage generation with an added factor of 10 percent for consumption, system losses, and other use. Based upon sewage generation rates outlined in the DEP Sewer Connection and Extension Regulations, 310 CMR 15.203.f, the Project will require 22,022 gallons of water per day. However, appropriate low-flow and low-consumption plumbing fixtures will be installed in all residential units to achieve a reduction in water usage of 30 to 40 percent over the baseline in order to comply with Article 37 of the Boston Zoning Code (as LEED "certifiable"), as discussed in Chapter 5, *Environmental Protection*. The Proponent will continue to consider and evaluate methods to conserve water as building design evolves.

New water connections will be designed in accordance with BWSC design standards and requirements. Water services to new buildings will be metered in accordance with BWSC's Site Plan Requirements and Site Review Process. The review includes, but is not limited to, sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and Siamese connections conform to BWSC and Boston Fire Department (BFD) requirements. The Proponent will provide for the connection of the meter to the BWSC's automatic meter reading system. Fire protection connections on the Project Site will also need approval of the BFD. Figure 6.2 shows proposed water connections.

## **6.6 Other Utilities**

Figure 6.2 shows proposed utility services.

### **6.6.1 Natural Gas Service**

National Grid Energy owns and operates the gas mains and services in the vicinity of the Project Site (Figure 6.1). National Grid record plans indicate a 8-inch main in Dorchester Avenue and a 6-inch mains in B Street. Given the existing infrastructure, gas line connections could be made from Dorchester Avenue or B Street.

The building's main heating and cooling systems shall be via a water source heat pump system. The peak demand for gas for heating and kitchen use is estimated to be 6,000,000 BTU per hour. The Proponent will work with National Grid to confirm adequate system capacity as design is finalized.

### **6.6.2 Electrical Service**

Eversource owns and operates the electric facilities in the vicinity of the Project Site (Figure 6.1). Eversource record plans indicate underground power facilities in Dorchester Avenue and B Street along the frontage of the Project Site. Potential connections for the Project could be made from either public street. Further into design of the Project, the Proponent's electrical engineer and civil engineer will coordinate with Eversource on future configurations of the power system and connections.

The estimated electrical demand load for the Project is a 2,000 ampere service at 208/120 volt-3 phase-4 wire. Energy conservation measures will be an integral part of the Project-related infrastructure design. The buildings will employ energy-efficient and water-conservation features for mechanical, electrical, architectural, and structural systems, assemblies, and materials, where feasible and reasonable. Mechanical and HVAC systems will be installed to the current industry standards and full cooperation with the local utility providers will be maintained during design and construction.

### **6.6.3 Telephone and Telecommunications**

Verizon owns and operates the telephone facilities and services in the vicinity of the Project Site (Figure 6.1). Verizon record plans indicate that there is an active conduit and manhole located in Dorchester Avenue. Given the existing infrastructure, telephone for the Project Site could be provided from Dorchester Avenue. The configuration of the proposed service will be developed with Verizon as the Project design progresses.

Comcast owns and operates the telecommunications facilities and services in the vicinity of the Project Site. Comcast record plans indicate that cable is in Dorchester Avenue. Telecommunications for the Project Site could be provided from Dorchester Avenue. The configuration of the proposed service will be developed with Comcast as the Project design progresses.

### **6.6.4 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 BWSC, Boston Public Works Department, the Dig-Safe Program, and governing utility company requirements. All necessary permits will be obtained before the commencement of work. 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.



- |                  |                   |
|------------------|-------------------|
| Water Service    | Cable TV Service  |
| Sewer Service    | Telephone Service |
| Drain Service    |                   |
| Gas Service      |                   |
| Electric Service |                   |



Figure 6.1  
Existing Utilities

**270 Dorchester Avenue  
South Boston, Massachusetts**

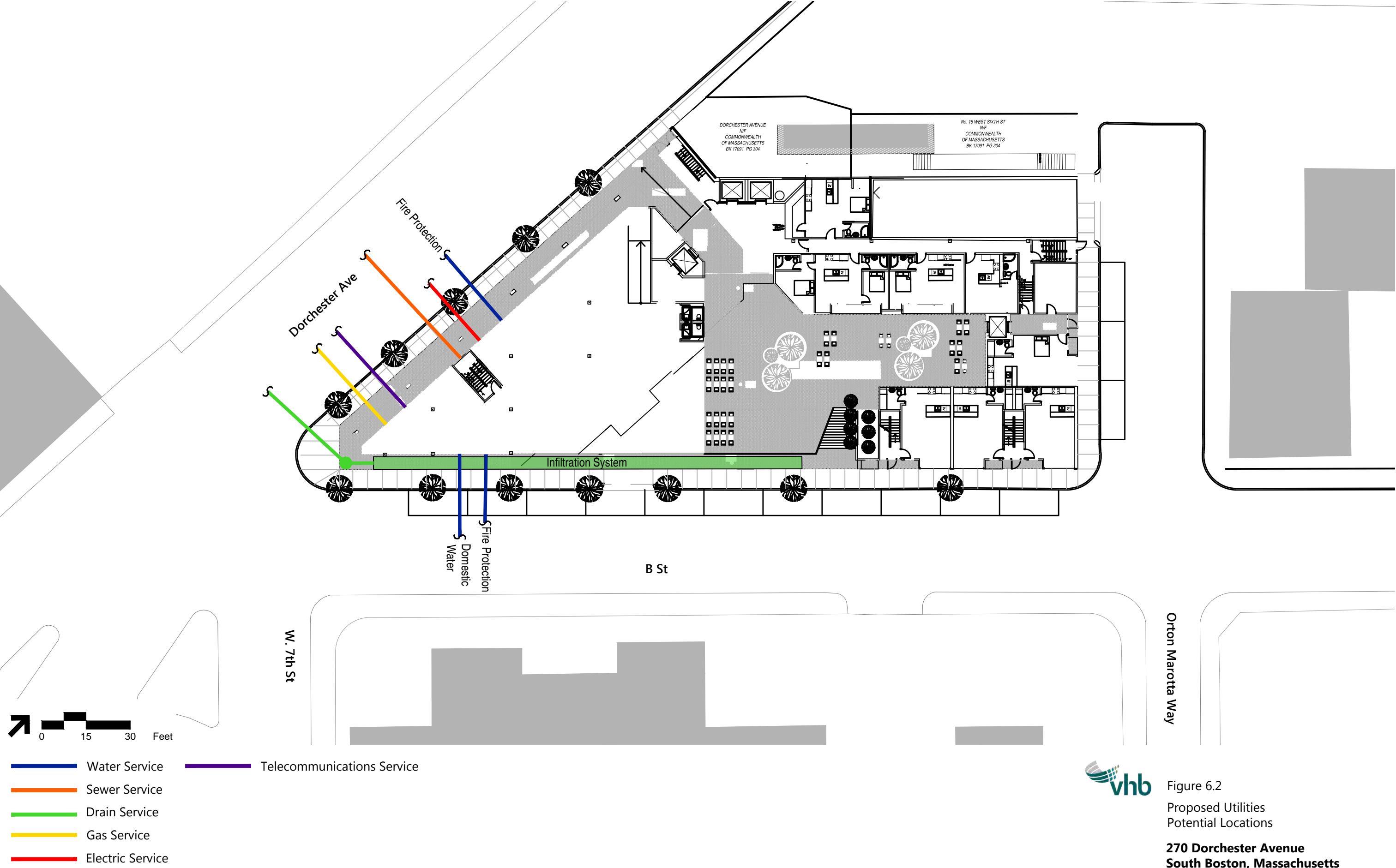


Figure 6.2  
Proposed Utilities  
Potential Locations  
**270 Dorchester Avenue**  
**South Boston, Massachusetts**



# 7

## Historic Resources

This chapter identifies properties that are either in the Inventory of Historic and Archaeological Assets of the Commonwealth (Inventory) or listed in the National or State Registers (NR or SR) of Historic Places that are within or in close proximity to the Project Site. This chapter also describes any effects to these properties and proposed mitigation, if required, and Project-related benefits.

A search of the Massachusetts Historical Commission's (MHC) Massachusetts Cultural Resource Information System (MACRIS) database and mapping tool was completed to identify previously recorded above-ground and archaeological resources located on or within a one-quarter mile radius of the Project Site. Figure 7.1 shows the location and the proximity of these properties to the Project Site, which are summarized in Table 7.1.

This section also provides information about the existing on-site buildings at 270 and 284 Dorchester Avenue, which are proposed for removal. Because the buildings are over 50 years old, they are subject to Article 85 Demolition Delay review by the Boston Landmarks Commission. An Article 85 Application to the Boston Landmarks Commission will be submitted in the near future.

### 7.1 Key Findings and Benefits

The key findings and benefits related to historic and cultural resources include:

- Seventeen inventoried properties and two inventoried areas within the one-quarter mile radius from the Project Site (see also Table 7.1):
  - Four buildings are eligible for listing in the NR, by MHC Opinion. Three (3) of these buildings are in one eligible historic district. See Section 7.3.2 for more details on the properties.
  - Three are ineligible for the National Register (NR), by MHC Opinion.
  - Ten have no MHC eligibility opinion.
  - None are formally listed in the National or State Register of Historic Places.

- The proposed Project provides a solid corner to the block and intersection and strengthens a pattern of residential development with ground floor retail.
- The proposed Project provides a residential development in close proximity to public transportation. It is a five- to six-minute walk to Broadway Station on the Massachusetts Bay Transportation Authority (MBTA) Red Line and bus routes 9, 11, and 47.

## **7.2 Historic Context**

The Project Site is located in the South Boston neighborhood, located on the peninsula just south of Downtown Boston and east of the South End and Dorchester. Soon after South Boston was annexed by Boston in 1804, the City constructed a bridge linking the neighborhood with the rest of the city. In the mid-19th century, the Old Colony Railroad brought rapid growth to South Boston as the area became a hub of industry, containing iron foundries, machine shops, shipyards, and refineries, all of which fueled the Civil War effort. Throughout the 20th century, shipyard and railroad jobs continued to provide work for South Boston residents, and industrial buildings still mark the northern edge of the peninsula. The older streets were lined with four-story brick commercial and residential buildings constructed in the later decades of the 19th century. The Project Site is located on Dorchester Avenue, which was built as a public turnpike connecting the neighborhood to downtown Boston. The nearby South Boston Bypass opened in 1993 on a former railroad right-of-way.

Currently, South Boston is home to both long-time residents and a new wave of mostly young professionals who are drawn to the area's open space, emerging nightlife, and easy access to downtown. The neighborhood boasts miles of beaches and waterfront parks, including Carson Beach, L Street Beach, Pleasure Bay, and the Strandway.

South Boston's commercial district, including established businesses alongside new bars, restaurants, and retailers, is built around East and West Broadway. Newmarket Square, just to the west of I-93, is a strong center of food processing and distribution and borders Dorchester, Roxbury, and the South End.

## **7.3 Historic Resources**

### **7.3.1 On-Site Resources**

The Project Site consists of two parcels of land, 270 and 284 Dorchester Avenue, which are being combined and will be known as 270 Dorchester Avenue. None of the buildings on these two parcels have been previously inventoried.

#### **270 Dorchester Avenue**

Currently, 270 Dorchester Avenue contains a 23,892 square foot warehouse (currently occupied by C.G. Edwards Co. Inc Marine and Industrial Hardware and Supplies, and the Ultimate Self Defense & Performance Center).

The building on this parcel appears to date to ca. 1931, although the available building permits are elusive on exact dimensions. It is a one-story, brick, flat-roofed building with concrete foundation and minimal ornamentation and altered fenestration. The building is located directly adjacent to the Dorchester Avenue sidewalk, and set back from the Y intersection of Dorchester Avenue and B Street. According to building permits, additions were constructed in 1951, 1983, and 1999. These large rectangular one-story additions are constructed of brick, concrete and steel. Loading docks are located at the rear of the building and the additions on West Sixth Street. Historically, the building has been used as a store and a warehouse.

### **284 Dorchester Avenue**

The building at 284 Dorchester Avenue is a small one-story, flat-roofed concrete block building, measuring approximately 30 feet by 30 feet (863 square feet). It is currently occupied as a restaurant called Chuck & Ann's Submarines. It is located directly adjacent to 270 Dorchester Avenue, and adjacent to a pole-mounted billboard. Its previous use is unknown.

### **7.3.2 Historic Resources in Project Site Vicinity**

A radius of approximately one-quarter mile from the Project Site was established to assess the potential effects of the Project. There are several properties that are in the Inventory of Historic and Archaeological Assets of the Commonwealth although none are in the National and State Registers of Historic Places located in the vicinity of the Project Site. See Table 7.1.

None of these properties have been listed in the State Register or National Register of Historic Places; however, the MHC has given official opinions regarding NR eligibility on four buildings (three of which are in an eligible historic district). These properties are:

- (1) BOS.6817, The Timothy Jacob Pike Abbott House, 92-94 B Street
- (2) BOS.WV, Saints Peter and Paul Parish Complex, which includes:
  - a. BOS.15331, Devine Block, 78 West Broadway
  - b. BOS.7113, Saints Peter and Paul Church, 45 West Broadway
  - c. BOS.7114, Saints Peter and Paul Rectory, 55-59 West Broadway.

See the list of all inventoried buildings in Table 7.1.

**TABLE 7.1 MASSACHUSETTS HISTORICAL COMMISSION INVENTORIED AND LISTED PROPERTIES WITHIN A ¼-MILE RADIUS OF THE PROJECT SITE**

<b>Property/Area Name</b>	<b>Location</b>	<b>MHC Inventory #</b>	<b>Listed in State or National Register</b>	<b>NR Eligibility</b>
York House – South Boston Hotel	99-101 West Fourth Street	BOS.7146	N	No MHC opinion
Abbott, Timothy, Jacob Pike House	92-94 B Street	BOS.6817	N	Individually eligible, MHC opinion 4/18/1980

<b>Property/Area Name</b>	<b>Location</b>	<b>MHC Inventory #</b>	<b>Listed in State or National Register</b>	<b>NR Eligibility</b>
West Sixth Street Bridge over Conrail	West Sixth Street	BOS.9232	N	Ineligible, MHC opinion, 6/10/1982. Demolished
Thomas Casey Building	82 West Broadway	BOS.7105	N	No MHC opinion
West Fifth Street Bridge over Conrail	West Fifth Street	BOS.9239	N	Ineligible, MHC opinion 5/21/1982
William W. Wood Double House	123-125 West Fourth Street	BOS.7147	N	No MHC opinion
Silver Street Bridge over Conrail	N.Y., N.H., and H. Railroad Bridge #0.45	BOS.9237	N	Ineligible, MHC opinion 4/30/1990
Boston Fire Department Hose Company #9	116 B Street	BOS.6818	N	No MHC opinion
Saint Peter Roman Catholic Church	45 West Broadway	BOS.7113	N	NR Eligible as District, BOS.WV (BOS.7104, BOS.15331, BOS.7113, BOS.7114), MHC opinion, 5/4/2005
Saint Peter's Roman Catholic Rectory	55-59 West Broadway	BOS.7114	N	NR Eligible as District, BOS.WV (BOS.7104, BOS.15331, BOS.7113, BOS.7114), MHC opinion, 5/4/2005
Saint Peter's Roman Catholic Church Rectory	50 Orton Marotta Way	BOS.15330	N	No MHC opinion. Recommended as eligible in survey form, part of BOS.WU
Harry and Joseph Hausman Building	143 West Fourth Street	BOS.7139	N	No MHC opinion
Harry and Joseph Hausman Building	150-154 West Fourth Street	BOS.7140	N	No MHC opinion
Norway Iron Works Machine Shop	383 Dorchester Ave	BOS.6865	N	No MHC opinion
Saint Peter Lithuanian Roman Catholic Church	75 Flaherty Way	BOS.6987	N	No MHC opinion. Recommended as eligible in survey form, part of BOS.WU
N.Y., N.H., and H. Railroad Bridge #1.08	Midland Bridge #1.08	BOS.9244	N	No MHC opinion
Devine Block	78 West Broadway	BOS.15331	N	NR Eligible as District, BOS.WV (BOS.7104, BOS.15331, BOS.7113, BOS.7114), MHC opinion, 5/4/2005
Saint Peter (Lithuanian) Roman Catholic Church	South Boston East - 3 buildings, 2 discontinuous sites	BOS.WU	N	Church & Rectory recommended as individually eligible in survey form, 12/2003
Saints Peter and Paul Parish Complex	South Boston West – West Broadway/A Street	BOS.WV	N	NR Eligible as District (BOS.7104, BOS.15331, BOS.7113, BOS.7114), MHC opinion, 5/4/2005

## **7.4 Potential Impacts to Historic Resources**

The two buildings located on the Project Site exhibit later alterations that affect both buildings' integrity and neither have been included in the MHC Inventory. Inventoried buildings are not located adjacent to the Project Site. The inventoried bridge (BOS.9232), the West 6<sup>th</sup> Street Bridge was recommended as ineligible for the National Register of Historic Places in 1982 and has since been demolished.

Most inventoried properties are located at least three blocks to the northeast. The Area BOS.WU (no official MHC opinion, but recommended eligible by consultant survey) is located one block north on B Street between Orton Marotta Way and Flaherty Street, and one block south towards C Street.

The properties that have been determined eligible by MHC opinion are BOS.6817 and BOS.WV. The former is located three blocks northeast, up B Street; the latter is located three to four blocks northeast and one block north near A Street. These will not be within the line of sight of the Project.

Removal of these two buildings (270-276 Dorchester Ave and 284 Dorchester Ave) and construction of the proposed Project will not directly affect the historic integrity of any of the previously inventoried buildings or areas. The Project site is not located in a historic district, and the Project is located in an area of mixed residential and commercial buildings with new construction as well as older building stock.



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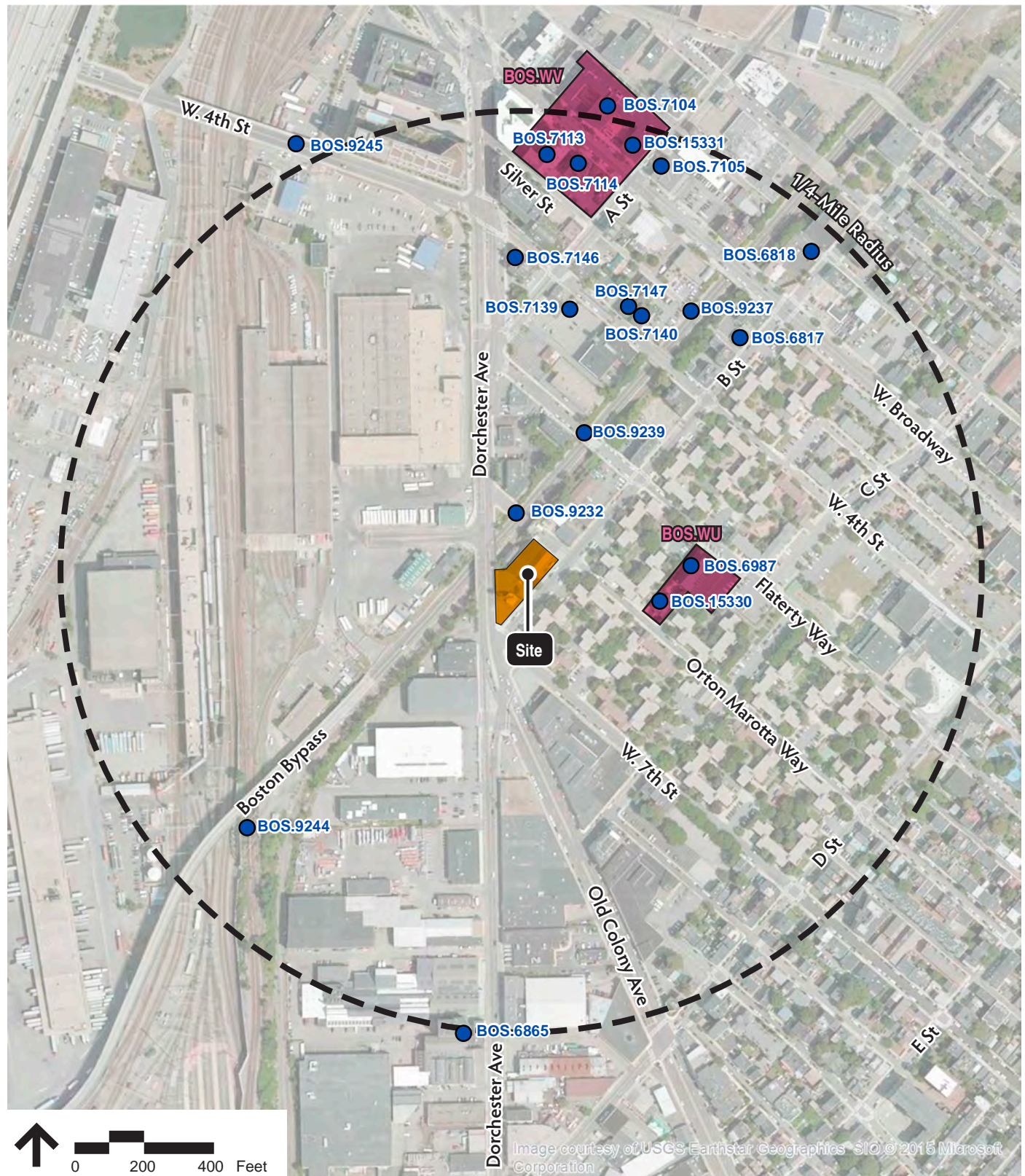


Figure 7.1

Inventoried and Listed Properties within a 1/4-mile radius of the Project Site

270 Dorchester Avenue  
South Boston, Massachusetts

Source: Arcmap Online Bing Aerial

# 8

## Project Certification

This expanded PNF has been submitted to the Boston Planning and Development Agency, as required by Article 80B of the Zoning Code, on the 28<sup>th</sup> of October, 2016.

**Proponent**

270 Dorchester Avenue, LLC



---

Mark F. Edwards  
Project Manager

**Preparer**

VHB



---

Stephanie Kruel  
Senior Environmental Planner

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## **APPENDIX A: Letter of Intent**

June 4, 2015

February 9, 2016





June 4, 2015

Brian Golden, Director  
Boston Redevelopment Authority  
Boston City Hall – 9<sup>th</sup> Floor  
Boston, MA 02201

**RE: 270 Dorchester Avenue, South Boston: Letter of Intent under Article 80**

Dear Director Golden:

This office serves as legal and development counsel to 270 Dorchester Avenue, LLC, by and through its manager Mark F. Edwards, in connection with the proposed development at 270 Dorchester Avenue in South Boston. The project architect is Anthony Pisani + Associates.

The project site consists of two parcels of land which are being combined: 284 Dorchester Avenue and 270 Dorchester Avenue, with the combined lot to be known as 270 Dorchester Avenue. The resulting combined parcel will be approximately 20,559 square feet. The existing buildings on each parcel will be demolished and a new mixed-use structure with residential and street level commercial space will be built.

This letter shall serve as the project proponent's letter of intent to file an Expanded Project Notification Form [PNF] under Article 80B of the Boston Zoning Code to initiate Large Project Review. To date, the developer has conducted several pre-review planning meetings with BRA staff and the Mayor's Office of Neighborhood Services pursuant to Art. 80B-5(1). Additionally, the developer has made introductory presentations of the proposed project to the West Broadway Neighborhood Association [WBNA] and the St. Vincent's Neighborhood Association, as well as meeting individually with many abutters of the project location. We have also met with all of South Boston's elected officials to introduce the project to them.

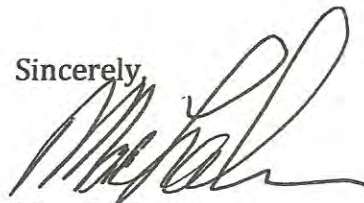
The proposed project will consist of 91 residential units; approximately 8,350 square feet of commercial space; a two level underground parking garage with space for 123 vehicles; and outdoor terrace spaces for both residents and the general public. The project will comply with the Inclusionary Development Policy and include 12 affordable units based on the current proposed unit count.

The gross square footage of the new structure is approximately 150,000 square feet and the Floor Area Ratio square footage is approximately 118,000 square feet. The proposed height of the new structure is 9 stories at 100 feet.

The project site lies in the South Boston Zoning District governed by the Base Code. The zoning sub-district is M-1. We have submitted an application for a building permit to the Inspectional Services Department [ISD] and received a Zoning Code Refusal letter which will require variances from various provisions of the Boston Zoning Code.

We anticipate filing the PNF in the next few months and look forward to working with your staff, the community and elected officials to advance this project. We appreciate the kind assistance from your staff to date and anticipate a positive approval process.

Sincerely,

A handwritten signature in black ink, appearing to read 'Marc LaCasse', with a stylized, flowing script.

Marc LaCasse

cc:

Heather Campisano

Erico Lopez

Lance Campbell

Mark F. Edwards



February 9, 2016

Brian P. Golden, Director  
Boston Redevelopment Authority  
Boston City Hall – 9<sup>th</sup> Floor  
Boston, MA 02201

**RE: 270 Dorchester Avenue, South Boston: Amended and Revised Letter of Intent under Article 80B, Large Project Review**

Dear Director Golden:

This office serves as legal and development counsel to 270 Dorchester Avenue, LLC, by and through its manager Mark F. Edwards, in connection with the proposed development at 270 Dorchester Avenue in South Boston. The project architect is Anthony Pisani + Associates.

This Amended and Revised Letter of Intent replaces the original Letter of Intent dated June 4, 2015. Since that time, the developer/proponent has presented the proposal to the West Broadway Neighborhood Association and the St. Vincent/Lower End Neighborhood Association on numerous occasions. Additionally, the project proponent has conducted dozens of private meetings with abutters and other interested community stakeholders. Following these meetings, several changes have been made to the proposed project.

Since the original Letter of Intent was filed, the project has undergone the following material changes in response to the community review process and other development considerations:

- |                |  |
|----------------|--|
| 1. Height:     | reduced from 100' to 69.9'   |
| 2. Unit Count: | reduced from 91 to 83 residential units; 11 affordable units in accordance with the IDP    |
| 3. Gross SF:   | reduced from 150,000 to 123,204  |
| 4. FAR SF:     | reduced from 118,000 to 86,517   |
| 5. Parking:    | increased from 123 to 201 with the introduction of an automated parking system below grade |
| 6. Open Space: | enhancements to plaza level and perimeter trees  |

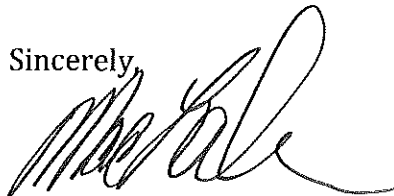
The project site consists of two parcels of land which are being combined as part of the building permit application and zoning relief: 284 Dorchester Avenue and 270 Dorchester Avenue, with the combined lot to be known as 270 Dorchester Avenue. The resulting combined parcel will be approximately 21,063 square feet. The existing buildings on each parcel will be demolished and a new mixed-use structure with residential and street level commercial space will be built, together with the accessory parking at grade [a portion of the ground level is for parking] and below grade parking garage.

This letter shall serve to Amend and Revise the project proponent's original letter of intent to file an Expanded Project Notification Form [PNF] under Article 80B of the Boston Zoning Code to initiate Large Project Review. To date, the development team has conducted several additional pre-review planning meetings with BRA staff and the Mayor's Office of Neighborhood Services pursuant to Art. 80B-5(1).

The project site lies in the South Boston Zoning District governed by the Base Code. The zoning sub-district is M-1. The project site also lies within the area of the recently launched BRA Planning Initiative, Plan: South Boston Dot Ave., which seeks to establish a new strategic plan and zoning for the Dorchester Avenue corridor from Broadway Station to Andrew Square. All efforts are being made to make this project consistent with the new Plan for Dorchester Avenue.

We anticipate filing the PNF in the next month and look forward to working with your staff, the community and elected officials to advance this project. We appreciate the kind assistance from your staff to date and anticipate a positive approval process.

Sincerely,



Marc LaCasse

cc: Lance Campbell, Project Manager



## **APPENDIX B: Transportation Supporting Documentation**

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

- Traffic Volume Count Data
- Vehicle Crash Data Worksheets
- Intersection Capacity Analyses
  - 2016 Existing Conditions
  - 2021 No Build Conditions
  - 2021 Build Conditions

# Traffic Volume Count Data





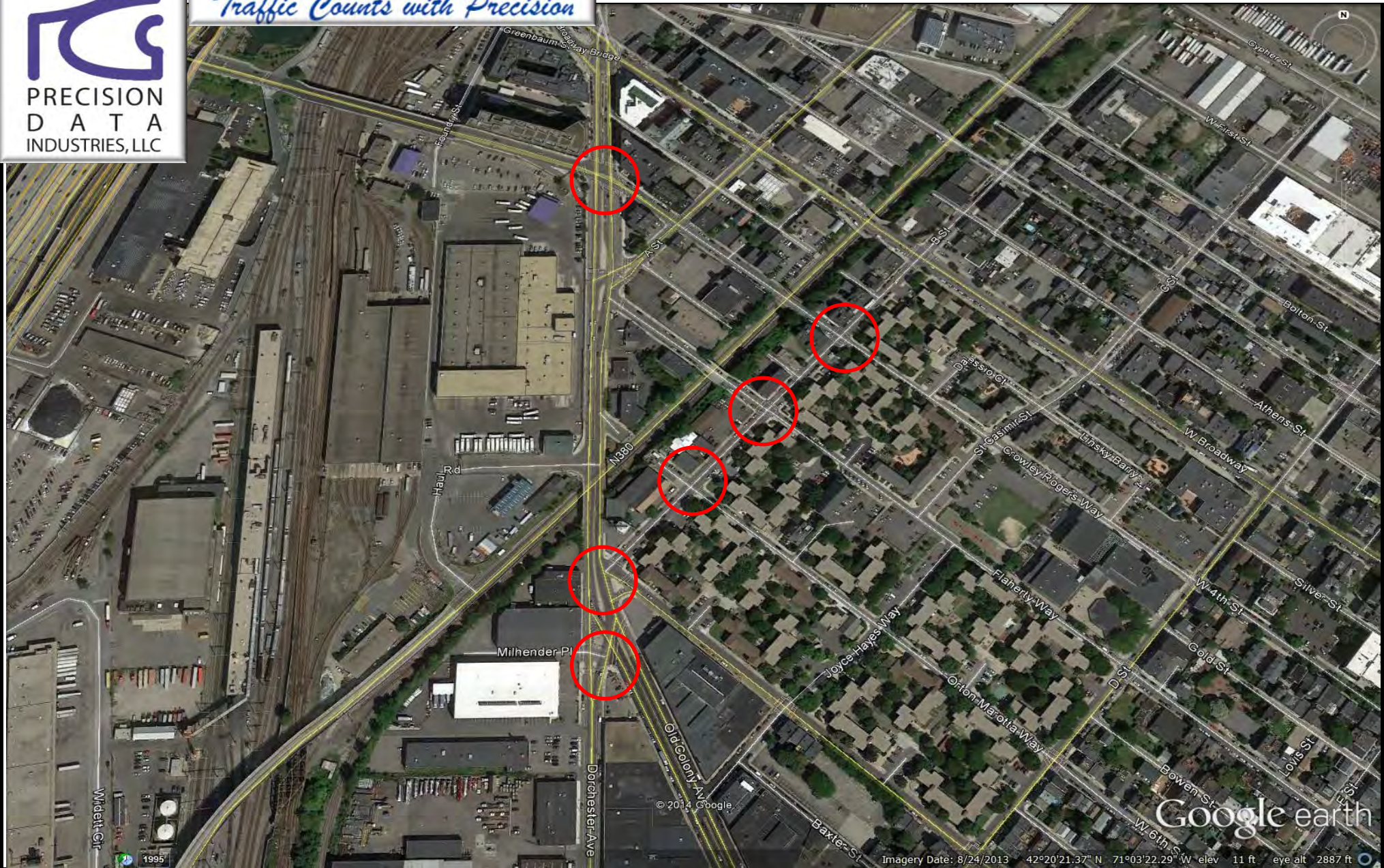
PRECISION  
DATA  
INDUSTRIES, LLC

PRECISION DATA INDUSTRIES, LLC

Office: 508.481.3999 Fax: 508.545.1234

Email: [datarequests@pdillc.com](mailto:datarequests@pdillc.com)

*Traffic Counts with Precision*



Client:  
VHB

Engineer:  
P. Dunford

Site Code:  
81983.14

Date:  
Wednesday 6/18/2014

PDI Job Number:  
143960

City, State:  
South Boston, MA





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INDUSTRIES, LLC

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N/S: Dorchester Avenue  
E/W: Old Colony Ave/ Milhender Place  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 A  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	4	43	56	1	223	0	0	0	1	91	0	0	0	1	0	0	420
07:15 AM	6	41	53	0	254	0	0	0	2	92	0	0	0	0	0	0	448
07:30 AM	4	41	48	0	261	0	0	0	4	88	1	0	1	0	1	0	449
07:45 AM	4	38	78	0	274	0	0	0	1	115	2	0	1	0	1	0	514
Total	18	163	235	1	1012	0	0	0	8	386	3	0	2	1	2	0	1831
08:00 AM	0	53	62	2	250	0	0	0	3	91	0	0	1	0	2	0	464
08:15 AM	3	46	80	0	244	0	0	0	3	101	0	0	0	0	2	0	479
08:30 AM	4	50	57	0	229	0	0	0	4	118	0	0	1	0	1	0	464
08:45 AM	5	63	67	1	254	0	0	0	2	86	0	0	1	0	1	0	480
Total	12	212	266	3	977	0	0	0	12	396	0	0	3	0	6	0	1887
Grand Total	30	375	501	4	1989	0	0	0	20	782	3	0	5	1	8	0	3718
Apprch %	3.3	41.2	55.1	0.4	100	0	0	0	2.5	97.1	0.4	0	35.7	7.1	57.1	0	
Total %	0.8	10.1	13.5	0.1	53.5	0	0	0	0.5	21	0.1	0	0.1	0	0.2	0	
Cars	27	329	481	4	1934	0	0	0	20	684	2	0	3	1	4	0	3489
% Cars	90	87.7	96	100	97.2	0	0	0	100	87.5	66.7	0	60	100	50	0	93.8
Heavy Vehicles	3	46	20	0	55	0	0	0	0	98	1	0	2	0	4	0	229
% Heavy Vehicles	10	12.3	4	0	2.8	0	0	0	0	12.5	33.3	0	40	0	50	0	6.2

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	4	38	78	0	120	274	0	0	0	274	1	115	2	0	118	1	0	1	0	2	514
08:00 AM	0	53	62	2	117	250	0	0	0	250	3	91	0	0	94	1	0	2	0	3	464
08:15 AM	3	46	80	0	129	244	0	0	0	244	3	101	0	0	104	0	0	2	0	2	479
08:30 AM	4	50	57	0	111	229	0	0	0	229	4	118	0	0	122	1	0	1	0	2	464
Total Volume	11	187	277	2	477	997	0	0	0	997	11	425	2	0	438	3	0	6	0	9	1921
% App. Total	2.3	39.2	58.1	0.4		100	0	0	0		2.5	97	0.5	0		33.3	0	66.7	0		
PHF	.688	.882	.866	.250	.924	.910	.000	.000	.000	.910	.688	.900	.250	.000	.898	.750	.000	.750	.000	.750	.934
Cars	10	166	262	2	440	973	0	0	0	973	11	369	1	0	381	3	0	3	0	6	1800
% Cars	90.9	88.8	94.6	100	92.2	97.6	0	0	0	97.6	100	86.8	50.0	0	87.0	100	0	50.0	0	66.7	93.7
Heavy Vehicles	1	21	15	0	37	24	0	0	0	24	0	56	1	0	57	0	0	3	0	3	121
% Heavy Vehicles	9.1	11.2	5.4	0	7.8	2.4	0	0	0	2.4	0	13.2	50.0	0	13.0	0	0	50.0	0	33.3	6.3



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E/W: Old Colony Ave/ Milhender Place  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 A  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	4	39	55	1	219	0	0	0	1	79	0	0	0	1	0	0	399
07:15 AM	6	37	53	0	241	0	0	0	2	85	0	0	0	0	0	0	424
07:30 AM	3	30	45	0	257	0	0	0	4	77	1	0	0	0	0	0	417
07:45 AM	4	30	76	0	270	0	0	0	1	105	1	0	1	0	1	0	489
Total	17	136	229	1	987	0	0	0	8	346	2	0	1	1	1	0	1729
08:00 AM	0	49	59	2	241	0	0	0	3	82	0	0	1	0	1	0	438
08:15 AM	3	43	77	0	237	0	0	0	3	84	0	0	0	0	0	0	447
08:30 AM	3	44	50	0	225	0	0	0	4	98	0	0	1	0	1	0	426
08:45 AM	4	57	66	1	244	0	0	0	2	74	0	0	0	0	1	0	449
Total	10	193	252	3	947	0	0	0	12	338	0	0	2	0	3	0	1760
Grand Total	27	329	481	4	1934	0	0	0	20	684	2	0	3	1	4	0	3489
Apprch %	3.2	39.1	57.2	0.5	100	0	0	0	2.8	96.9	0.3	0	37.5	12.5	50	0	
Total %	0.8	9.4	13.8	0.1	55.4	0	0	0	0.6	19.6	0.1	0	0.1	0	0.1	0	

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	4	30	76	0	110	270	0	0	0	270	1	105	1	0	107	1	0	1	0	2	489
08:00 AM	0	49	59	2	110	241	0	0	0	241	3	82	0	0	85	1	0	1	0	2	438
08:15 AM	3	43	77	0	123	237	0	0	0	237	3	84	0	0	87	0	0	0	0	0	447
08:30 AM	3	44	50	0	97	225	0	0	0	225	4	98	0	0	102	1	0	1	0	2	426
Total Volume	10	166	262	2	440	973	0	0	0	973	11	369	1	0	381	3	0	3	0	6	1800
% App. Total	2.3	37.7	59.5	0.5		100	0	0	0		2.9	96.9	0.3	0		50	0	50	0		
PHF	.625	.847	.851	.250	.894	.901	.000	.000	.000	.901	.688	.879	.250	.000	.890	.750	.000	.750	.000	.750	.920





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City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 A  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Heavy Vehicles

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	4	1	0	4	0	0	0	0	12	0	0	0	0	0	0	21
07:15 AM	0	4	0	0	13	0	0	0	0	7	0	0	0	0	0	0	24
07:30 AM	1	11	3	0	4	0	0	0	0	11	0	0	1	0	1	0	32
07:45 AM	0	8	2	0	4	0	0	0	0	10	1	0	0	0	0	0	25
Total	1	27	6	0	25	0	0	0	0	40	1	0	1	0	1	0	102
08:00 AM	0	4	3	0	9	0	0	0	0	9	0	0	0	0	1	0	26
08:15 AM	0	3	3	0	7	0	0	0	0	17	0	0	0	0	2	0	32
08:30 AM	1	6	7	0	4	0	0	0	0	20	0	0	0	0	0	0	38
08:45 AM	1	6	1	0	10	0	0	0	0	12	0	0	1	0	0	0	31
Total	2	19	14	0	30	0	0	0	0	58	0	0	1	0	3	0	127
Grand Total	3	46	20	0	55	0	0	0	0	98	1	0	2	0	4	0	229
Apprch %	4.3	66.7	29	0	100	0	0	0	0	99	1	0	33.3	0	66.7	0	
Total %	1.3	20.1	8.7	0	24	0	0	0	0	42.8	0.4	0	0.9	0	1.7	0	

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	4	3	0	7	9	0	0	0	9	0	9	0	0	9	0	0	1	0	1	26
08:15 AM	0	3	3	0	6	7	0	0	0	7	0	17	0	0	17	0	0	2	0	2	32
08:30 AM	1	6	7	0	14	4	0	0	0	4	0	20	0	0	20	0	0	0	0	0	38
08:45 AM	1	6	1	0	8	10	0	0	0	10	0	12	0	0	12	1	0	0	0	1	31
Total Volume	2	19	14	0	35	30	0	0	0	30	0	58	0	0	58	1	0	3	0	4	127
% App. Total	5.7	54.3	40	0		100	0	0	0		0	100	0	0		25	0	75	0		
PHF	.500	.792	.500	.000	.625	.750	.000	.000	.000	.750	.000	.725	.000	.000	.725	.250	.000	.375	.000	.500	.836



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E/W: Old Colony Ave/ Milhender Place  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 A  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Peds and Bikes

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	1	0	0	0	0	0	0	4	0	1	0	0	0	5	11
07:15 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	3	9
07:30 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	5	11
07:45 AM	0	0	0	0	0	0	0	0	0	12	0	1	0	0	0	9	22
Total	0	0	1	0	0	0	0	0	0	28	0	2	0	0	0	22	53
08:00 AM	0	0	0	0	0	0	0	0	0	11	0	1	0	0	0	4	16
08:15 AM	1	3	1	0	0	0	0	0	0	9	0	1	0	0	0	3	18
08:30 AM	0	6	0	2	0	0	0	0	0	9	0	2	0	0	0	2	21
08:45 AM	0	2	1	0	0	0	0	0	0	10	0	2	0	0	0	4	19
Total	1	11	2	2	0	0	0	0	0	39	0	6	0	0	0	13	74
Grand Total	1	11	3	2	0	0	0	0	0	67	0	8	0	0	0	35	127
Apprch %	5.9	64.7	17.6	11.8	0	0	0	0	0	89.3	0	10.7	0	0	0	100	
Total %	0.8	8.7	2.4	1.6	0	0	0	0	0	52.8	0	6.3	0	0	0	27.6	

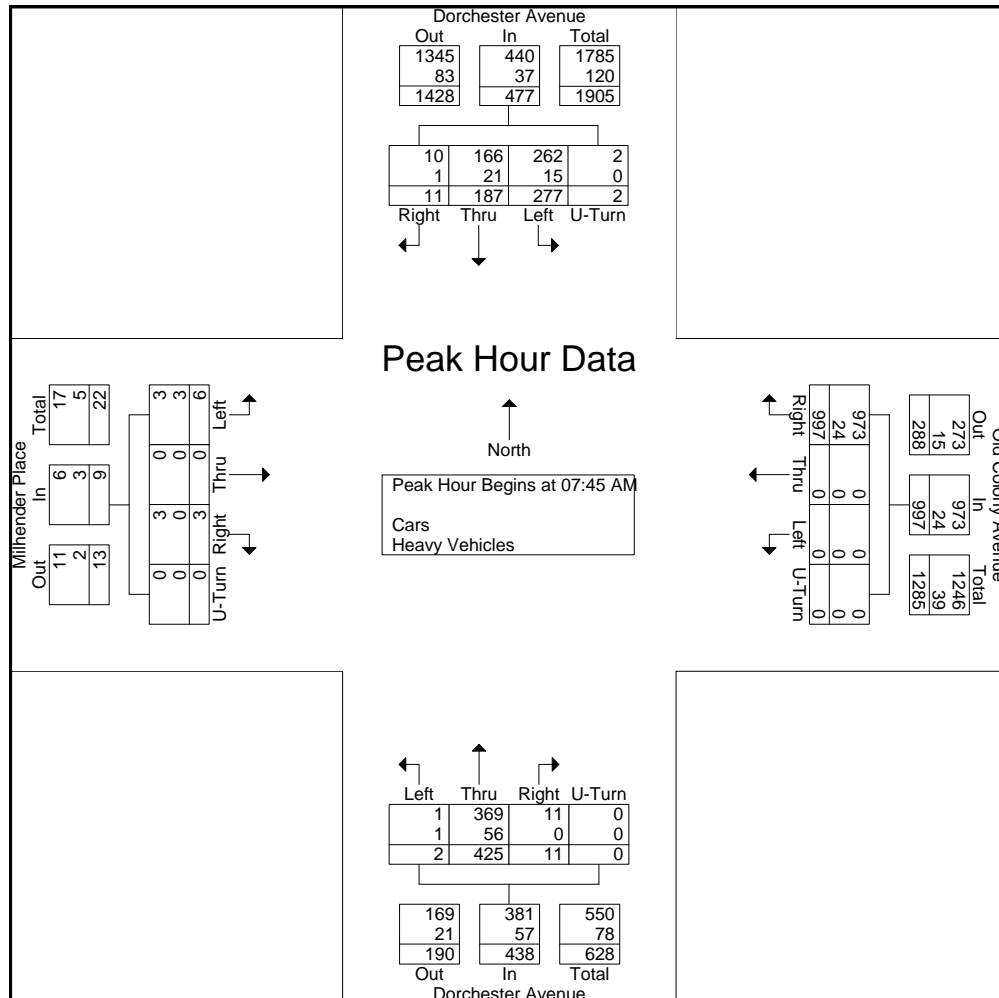
	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	12	0	1	13	0	0	0	9	9	22
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	11	0	1	12	0	0	0	4	4	16
08:15 AM	1	3	1	0	5	0	0	0	0	0	0	9	0	1	10	0	0	0	3	3	18
08:30 AM	0	6	0	2	8	0	0	0	0	0	0	9	0	2	11	0	0	0	2	2	21
Total Volume	1	9	1	2	13	0	0	0	0	0	0	41	0	5	46	0	0	0	18	18	77
% App. Total	7.7	69.2	7.7	15.4		0	0	0	0		0	89.1	0	10.9		0	0	0	100		
PHF	.250	.375	.250	.250	.406	.000	.000	.000	.000	.000	.000	.854	.000	.625	.885	.000	.000	.000	.500	.500	.875

N/S: Dorchester Avenue  
 E/W: Old Colony Ave/ Milhender Place  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 A  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	4	38	78	0	120	274	0	0	0	274	1	115	2	0	118	1	0	1	0	2	514
08:00 AM	0	53	62	2	117	250	0	0	0	250	3	91	0	0	94	1	0	2	0	3	464
08:15 AM	3	46	80	0	129	244	0	0	0	244	3	101	0	0	104	0	0	2	0	2	479
08:30 AM	4	50	57	0	111	229	0	0	0	229	4	118	0	0	122	1	0	1	0	2	464
Total Volume	11	187	277	2	477	997	0	0	0	997	11	425	2	0	438	3	0	6	0	9	1921
% App. Total	2.3	39.2	58.1	0.4		100	0	0	0		2.5	97	0.5	0		33.3	0	66.7	0		
PHF	.688	.882	.866	.250	.924	.910	.000	.000	.000	.910	.688	.900	.250	.000	.898	.750	.000	.750	.000	.750	.934
Cars	10	166	262	2	440	973	0	0	0	973	11	369	1	0	381	3	0	3	0	6	1800
% Cars	90.9	88.8	94.6	100	92.2	97.6	0	0	0	97.6	100	86.8	50.0	0	87.0	100	0	50.0	0	66.7	93.7
Heavy Vehicles	1	21	15	0	37	24	0	0	0	24	0	56	1	0	57	0	0	3	0	3	121
% Heavy Vehicles	9.1	11.2	5.4	0	7.8	2.4	0	0	0	2.4	0	13.2	50.0	0	13.0	0	0	50.0	0	33.3	6.3





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City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 AA  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	3	71	201	0	113	0	0	0	2	80	0	0	0	0	2	0	472
04:15 PM	1	83	221	0	110	1	0	0	3	76	0	0	3	0	1	0	499
04:30 PM	2	72	239	0	119	0	0	0	3	70	0	0	0	0	0	0	505
04:45 PM	0	82	199	0	143	0	0	0	0	67	0	0	2	0	0	0	493
Total	6	308	860	0	485	1	0	0	8	293	0	0	5	0	3	0	1969
05:00 PM	1	84	197	0	132	0	0	0	1	76	0	0	1	0	0	0	492
05:15 PM	1	92	226	0	139	0	0	0	1	74	0	0	3	1	0	0	537
05:30 PM	0	77	217	0	152	0	0	0	4	75	0	0	0	2	0	0	527
05:45 PM	1	82	239	0	102	0	0	0	4	79	0	0	2	0	0	0	509
Total	3	335	879	0	525	0	0	0	10	304	0	0	6	3	0	0	2065
Grand Total	9	643	1739	0	1010	1	0	0	18	597	0	0	11	3	3	0	4034
Apprch %	0.4	26.9	72.7	0	99.9	0.1	0	0	2.9	97.1	0	0	64.7	17.6	17.6	0	
Total %	0.2	15.9	43.1	0	25	0	0	0	0.4	14.8	0	0	0.3	0.1	0.1	0	
Cars	8	593	1716	0	989	1	0	0	14	573	0	0	10	3	3	0	3910
% Cars	88.9	92.2	98.7	0	97.9	100	0	0	77.8	96	0	0	90.9	100	100	0	96.9
Heavy Vehicles	1	50	23	0	21	0	0	0	4	24	0	0	1	0	0	0	124
% Heavy Vehicles	11.1	7.8	1.3	0	2.1	0	0	0	22.2	4	0	0	9.1	0	0	0	3.1

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	84	197	0	282	132	0	0	0	132	1	76	0	0	77	1	0	0	0	1	492
05:15 PM	1	92	226	0	319	139	0	0	0	139	1	74	0	0	75	3	1	0	0	4	537
05:30 PM	0	77	217	0	294	152	0	0	0	152	4	75	0	0	79	0	2	0	0	2	527
05:45 PM	1	82	239	0	322	102	0	0	0	102	4	79	0	0	83	2	0	0	0	2	509
Total Volume	3	335	879	0	1217	525	0	0	0	525	10	304	0	0	314	6	3	0	0	9	2065
% App. Total	0.2	27.5	72.2	0		100	0	0	0		3.2	96.8	0	0		66.7	33.3	0	0		
PHF	.750	.910	.919	.000	.945	.863	.000	.000	.000	.863	.625	.962	.000	.000	.946	.500	.375	.000	.000	.563	.961
Cars	2	307	872	0	1181	514	0	0	0	514	7	294	0	0	301	6	3	0	0	9	2005
% Cars	66.7	91.6	99.2	0	97.0	97.9	0	0	0	97.9	70.0	96.7	0	0	95.9	100	100	0	0	100	97.1
Heavy Vehicles	1	28	7	0	36	11	0	0	0	11	3	10	0	0	13	0	0	0	0	0	60
% Heavy Vehicles	33.3	8.4	0.8	0	3.0	2.1	0	0	0	2.1	30.0	3.3	0	0	4.1	0	0	0	0	0	2.9



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E/W: Old Colony Ave/ Milhender Place  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 AA  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	3	66	197	0	110	0	0	0	1	76	0	0	0	0	2	0	455
04:15 PM	1	80	217	0	109	1	0	0	3	72	0	0	2	0	1	0	486
04:30 PM	2	64	234	0	116	0	0	0	3	67	0	0	0	0	0	0	486
04:45 PM	0	76	196	0	140	0	0	0	0	64	0	0	2	0	0	0	478
Total	6	286	844	0	475	1	0	0	7	279	0	0	4	0	3	0	1905
05:00 PM	0	75	197	0	130	0	0	0	1	75	0	0	1	0	0	0	479
05:15 PM	1	84	224	0	134	0	0	0	1	71	0	0	3	1	0	0	519
05:30 PM	0	69	213	0	150	0	0	0	3	75	0	0	0	2	0	0	512
05:45 PM	1	79	238	0	100	0	0	0	2	73	0	0	2	0	0	0	495
Total	2	307	872	0	514	0	0	0	7	294	0	0	6	3	0	0	2005
Grand Total	8	593	1716	0	989	1	0	0	14	573	0	0	10	3	3	0	3910
Apprch %	0.3	25.6	74.1	0	99.9	0.1	0	0	2.4	97.6	0	0	62.5	18.8	18.8	0	
Total %	0.2	15.2	43.9	0	25.3	0	0	0	0.4	14.7	0	0	0.3	0.1	0.1	0	

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	75	197	0	272	130	0	0	0	130	1	75	0	0	76	1	0	0	0	1	479
05:15 PM	1	84	224	0	309	134	0	0	0	134	1	71	0	0	72	3	1	0	0	4	519
05:30 PM	0	69	213	0	282	150	0	0	0	150	3	75	0	0	78	0	2	0	0	2	512
05:45 PM	1	79	238	0	318	100	0	0	0	100	2	73	0	0	75	2	0	0	0	2	495
Total Volume	2	307	872	0	1181	514	0	0	0	514	7	294	0	0	301	6	3	0	0	9	2005
% App. Total	0.2	26	73.8	0		100	0	0	0		2.3	97.7	0	0		66.7	33.3	0	0		
PHF	.500	.914	.916	.000	.928	.857	.000	.000	.000	.857	.583	.980	.000	.000	.965	.500	.375	.000	.000	.563	.966





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City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 AA  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Heavy Vehicles

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	5	4	0	3	0	0	0	1	4	0	0	0	0	0	0	17
04:15 PM	0	3	4	0	1	0	0	0	0	4	0	0	1	0	0	0	13
04:30 PM	0	8	5	0	3	0	0	0	0	3	0	0	0	0	0	0	19
04:45 PM	0	6	3	0	3	0	0	0	0	3	0	0	0	0	0	0	15
Total	0	22	16	0	10	0	0	0	1	14	0	0	1	0	0	0	64
05:00 PM	1	9	0	0	2	0	0	0	0	1	0	0	0	0	0	0	13
05:15 PM	0	8	2	0	5	0	0	0	0	3	0	0	0	0	0	0	18
05:30 PM	0	8	4	0	2	0	0	0	1	0	0	0	0	0	0	0	15
05:45 PM	0	3	1	0	2	0	0	0	2	6	0	0	0	0	0	0	14
Total	1	28	7	0	11	0	0	0	3	10	0	0	0	0	0	0	60
Grand Total	1	50	23	0	21	0	0	0	4	24	0	0	1	0	0	0	124
Apprch %	1.4	67.6	31.1	0	100	0	0	0	14.3	85.7	0	0	100	0	0	0	
Total %	0.8	40.3	18.5	0	16.9	0	0	0	3.2	19.4	0	0	0.8	0	0	0	

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	8	5	0	13	3	0	0	0	3	0	3	0	0	3	0	0	0	0	0	19
04:45 PM	0	6	3	0	9	3	0	0	0	3	0	3	0	0	3	0	0	0	0	0	15
05:00 PM	1	9	0	0	10	2	0	0	0	2	0	1	0	0	1	0	0	0	0	0	13
05:15 PM	0	8	2	0	10	5	0	0	0	5	0	3	0	0	3	0	0	0	0	0	18
Total Volume	1	31	10	0	42	13	0	0	0	13	0	10	0	0	10	0	0	0	0	0	65
% App. Total	2.4	73.8	23.8	0		100	0	0	0		0	100	0	0		0	0	0	0		
PHF	.250	.861	.500	.000	.808	.650	.000	.000	.000	.650	.000	.833	.000	.000	.833	.000	.000	.000	.000	.000	.855



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City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 AA  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Peds and Bikes

	Dorchester Avenue From North				Old Colony Avenue From East				Dorchester Avenue From South				Milhender Place From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
04:00 PM	0	4	2	1	0	0	0	0	0	0	0	3	0	0	0	4	14
04:15 PM	0	4	0	0	0	0	0	2	0	1	0	1	0	0	0	5	13
04:30 PM	0	3	0	0	0	0	0	2	0	1	0	1	0	0	0	5	12
04:45 PM	0	11	1	0	0	0	0	1	0	0	0	0	0	1	0	5	19
Total	0	22	3	1	0	0	0	5	0	2	0	5	0	1	0	19	58
05:00 PM	0	5	1	0	0	0	0	2	0	1	0	2	0	0	0	6	17
05:15 PM	0	8	1	0	0	0	0	0	0	1	0	2	0	0	0	10	22
05:30 PM	0	13	0	0	1	0	0	0	0	2	0	3	0	0	0	10	29
05:45 PM	0	11	0	0	0	0	0	0	0	1	0	0	0	0	0	14	26
Total	0	37	2	0	1	0	0	2	0	5	0	7	0	0	0	40	94
Grand Total	0	59	5	1	1	0	0	7	0	7	0	12	0	1	0	59	152
Apprch %	0	90.8	7.7	1.5	12.5	0	0	87.5	0	36.8	0	63.2	0	1.7	0	98.3	
Total %	0	38.8	3.3	0.7	0.7	0	0	4.6	0	4.6	0	7.9	0	0.7	0	38.8	

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	5	1	0	6	0	0	0	2	2	0	1	0	2	3	0	0	0	6	6	17
05:15 PM	0	8	1	0	9	0	0	0	0	0	0	1	0	2	3	0	0	0	10	10	22
05:30 PM	0	13	0	0	13	1	0	0	0	1	0	2	0	3	5	0	0	0	10	10	29
05:45 PM	0	11	0	0	11	0	0	0	0	0	0	1	0	0	1	0	0	0	14	14	26
Total Volume	0	37	2	0	39	1	0	0	2	3	0	5	0	7	12	0	0	0	40	40	94
% App. Total	0	94.9	5.1	0		33.3	0	0	66.7		0	41.7	0	58.3		0	0	0	100		
PHF	.000	.712	.500	.000	.750	.250	.000	.000	.250	.375	.000	.625	.000	.583	.600	.000	.000	.000	.714	.714	.810



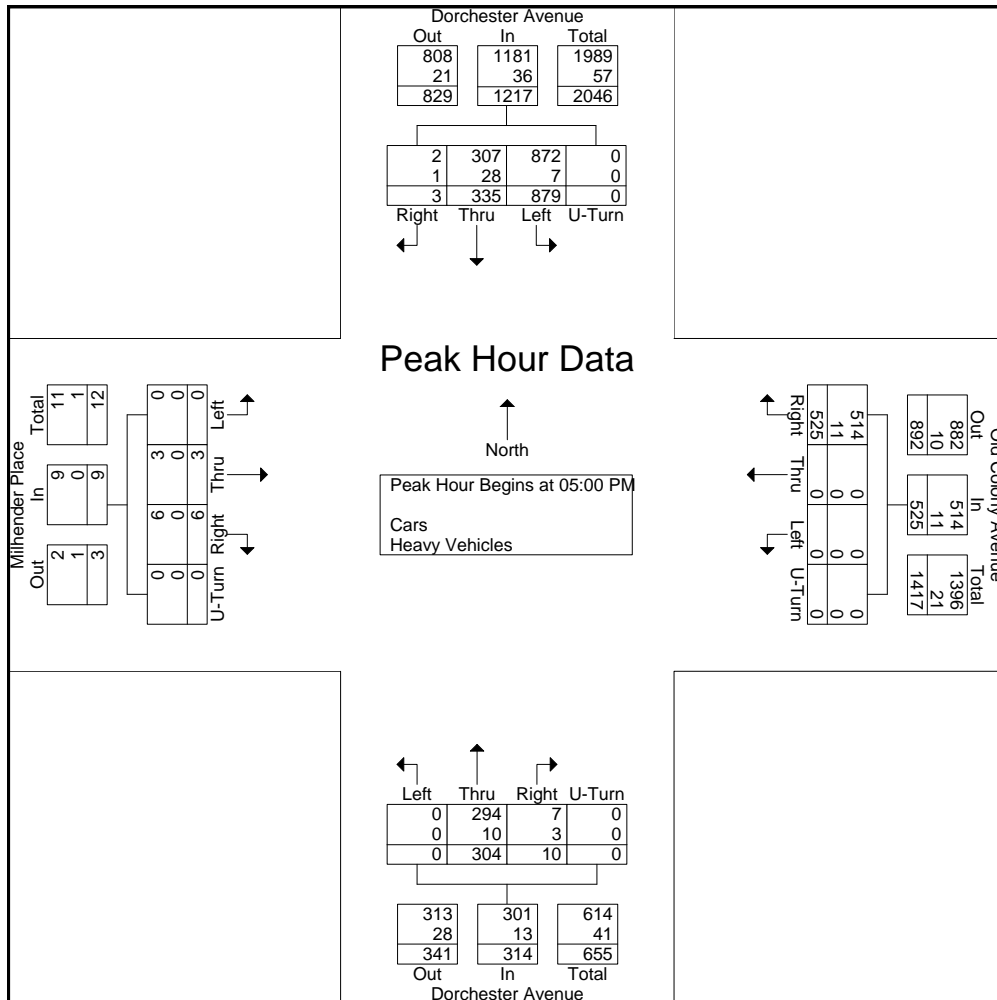
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E/W: Old Colony Ave/ Milhender Place  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 AA  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

	Dorchester Avenue From North					Old Colony Avenue From East					Dorchester Avenue From South					Milhender Place From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1	84	197	0	282	132	0	0	0	132	1	76	0	0	77	1	0	0	0	1	492
05:15 PM	1	92	226	0	319	139	0	0	0	139	1	74	0	0	75	3	1	0	0	4	537
05:30 PM	0	77	217	0	294	152	0	0	0	152	4	75	0	0	79	0	2	0	0	2	527
05:45 PM	1	82	239	0	322	102	0	0	0	102	4	79	0	0	83	2	0	0	0	2	509
Total Volume	3	335	879	0	1217	525	0	0	0	525	10	304	0	0	314	6	3	0	0	9	2065
% App. Total	0.2	27.5	72.2	0		100	0	0	0		3.2	96.8	0	0		66.7	33.3	0	0		
PHF	.750	.910	.919	.000	.945	.863	.000	.000	.000	.863	.625	.962	.000	.000	.946	.500	.375	.000	.000	.563	.961
Cars	2	307	872	0	1181	514	0	0	0	514	7	294	0	0	301	6	3	0	0	9	2005
% Cars	66.7	91.6	99.2	0	97.0	97.9	0	0	0	97.9	70.0	96.7	0	0	95.9	100	100	0	0	100	97.1
Heavy Vehicles	1	28	7	0	36	11	0	0	0	11	3	10	0	0	13	0	0	0	0	0	60
% Heavy Vehicles	33.3	8.4	0.8	0	3.0	2.1	0	0	0	2.1	30.0	3.3	0	0	4.1	0	0	0	0	0	2.9





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N/S: Dorchester Avenue  
E/SE: B Street/ West 7th Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 B  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	U-Turn		Right	Left	Hard Left	U-Turn		Hard Right	Bear Right	Hard Left	U-Turn		Hard Right	Right	Thru	U-Turn		Int. Total
07:00 AM	108	0	0	0		4	0	9	0		5	20	0	0		3	17	299	0		465
07:15 AM	100	0	0	0		2	0	10	0		7	26	0	0		2	28	333	0		508
07:30 AM	94	0	0	0		3	0	15	0		9	34	0	0		2	25	320	0		502
07:45 AM	118	0	0	0		3	0	13	0		17	32	0	0		2	27	366	0		578
Total	420	0	0	0		12	0	47	0		38	112	0	0		9	97	1318	0		2053
08:00 AM	120	0	0	0		3	0	17	0		12	29	0	0		1	34	340	0		556
08:15 AM	124	0	0	0		4	0	19	0		8	32	0	0		9	31	326	0		553
08:30 AM	116	0	0	0		4	0	19	0		8	22	0	0		0	33	321	0		523
08:45 AM	134	0	0	0		9	0	14	0		9	17	0	0		3	31	325	0		542
Total	494	0	0	0		20	0	69	0		37	100	0	0		13	129	1312	0		2174
Grand Total	914	0	0	0		32	0	116	0		75	212	0	0		22	226	2630	0		4227
Apprch %	100	0	0	0		21.6	0	78.4	0		26.1	73.9	0	0		0.8	7.9	91.4	0		
Total %	21.6	0	0	0		0.8	0	2.7	0		1.8	5	0	0		0.5	5.3	62.2	0		
Cars	842	0	0	0		31	0	102	0		70	185	0	0		20	207	2492	0		3949
% Cars	92.1	0	0	0		96.9	0	87.9	0		93.3	87.3	0	0		90.9	91.6	94.8	0		93.4
Heavy Vehicles	72	0	0	0		1	0	14	0		5	27	0	0		2	19	138	0		278
% Heavy Vehicles	7.9	0	0	0		3.1	0	12.1	0		6.7	12.7	0	0		9.1	8.4	5.2	0		6.6

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	118	0	0	0	118	3	0	13	0	16	17	32	0	0	49	2	27	366	0	395	578
08:00 AM	120	0	0	0	120	3	0	17	0	20	12	29	0	0	41	1	34	340	0	375	556
08:15 AM	124	0	0	0	124	4	0	19	0	23	8	32	0	0	40	9	31	326	0	366	553
08:30 AM	116	0	0	0	116	4	0	19	0	23	8	22	0	0	30	0	33	321	0	354	523
Total Volume	478	0	0	0	478	14	0	68	0	82	45	115	0	0	160	12	125	1353	0	1490	2210
% App. Total	100	0	0	0		17.1	0	82.9	0		28.1	71.9	0	0		0.8	8.4	90.8	0		
PHF	.964	.000	.000	.000	.964	.875	.000	.895	.000	.891	.662	.898	.000	.000	.816	.333	.919	.924	.000	.943	.956
Cars	440	0	0	0	440	13	0	62	0	75	43	101	0	0	144	12	110	1282	0	1404	2063
% Cars	92.1	0	0	0	92.1	92.9	0	91.2	0	91.5	95.6	87.8	0	0	90.0	100	88.0	94.8	0	94.2	93.3
Heavy Vehicles	38	0	0	0	38	1	0	6	0	7	2	14	0	0	16	0	15	71	0	86	147
% Heavy Vehicles	7.9	0	0	0	7.9	7.1	0	8.8	0	8.5	4.4	12.2	0	0	10.0	0	12.0	5.2	0	5.8	6.7



PRECISION  
D A T A  
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503  
Office: 508.481.3999 Fax: 508.545.1234  
Email: datarequests@pdillc.com

N/S: Dorchester Avenue  
E/SE: B Street/ West 7th Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 B  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars

	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	U-Turn	Hard Right	Right	Thru	U-Turn	Int. Total
07:00 AM	100	0	0	0	4	0	6	0	5	18	0	0	2	17	284	0	436
07:15 AM	95	0	0	0	2	0	9	0	5	20	0	0	1	26	315	0	473
07:30 AM	81	0	0	0	3	0	13	0	9	31	0	0	2	25	304	0	468
07:45 AM	109	0	0	0	3	0	12	0	16	30	0	0	2	26	348	0	546
Total	385	0	0	0	12	0	40	0	35	99	0	0	7	94	1251	0	1923
08:00 AM	114	0	0	0	3	0	15	0	11	26	0	0	1	31	322	0	523
08:15 AM	116	0	0	0	3	0	17	0	8	28	0	0	9	21	313	0	515
08:30 AM	101	0	0	0	4	0	18	0	8	17	0	0	0	32	299	0	479
08:45 AM	126	0	0	0	9	0	12	0	8	15	0	0	3	29	307	0	509
Total	457	0	0	0	19	0	62	0	35	86	0	0	13	113	1241	0	2026
Grand Total	842	0	0	0	31	0	102	0	70	185	0	0	20	207	2492	0	3949
Apprch %	100	0	0	0	23.3	0	76.7	0	27.5	72.5	0	0	0.7	7.6	91.7	0	
Total %	21.3	0	0	0	0.8	0	2.6	0	1.8	4.7	0	0	0.5	5.2	63.1	0	

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	109	0	0	0	109	3	0	12	0	15	16	30	0	0	46	2	26	348	0	376	546
08:00 AM	114	0	0	0	114	3	0	15	0	18	11	26	0	0	37	1	31	322	0	354	523
08:15 AM	116	0	0	0	116	3	0	17	0	20	8	28	0	0	36	9	21	313	0	343	515
08:30 AM	101	0	0	0	101	4	0	18	0	22	8	17	0	0	25	0	32	299	0	331	479
Total Volume	440	0	0	0	440	13	0	62	0	75	43	101	0	0	144	12	110	1282	0	1404	2063
% App. Total	100	0	0	0		17.3	0	82.7	0		29.9	70.1	0	0		0.9	7.8	91.3	0		
PHF	.948	.000	.000	.000	.948	.813	.000	.861	.000	.852	.672	.842	.000	.000	.783	.333	.859	.921	.000	.934	.945



N/S: Dorchester Avenue  
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 City, State: South Boston, MA  
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File Name : 143960 B  
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 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Heavy Vehicles

	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	U-Turn	Hard Right	Right	Thru	U-Turn	Int. Total
07:00 AM	8	0	0	0	0	0	3	0	0	2	0	0	1	0	15	0	29
07:15 AM	5	0	0	0	0	0	1	0	2	6	0	0	1	2	18	0	35
07:30 AM	13	0	0	0	0	0	2	0	0	3	0	0	0	0	16	0	34
07:45 AM	9	0	0	0	0	0	1	0	1	2	0	0	0	1	18	0	32
Total	35	0	0	0	0	0	7	0	3	13	0	0	2	3	67	0	130
08:00 AM	6	0	0	0	0	0	2	0	1	3	0	0	0	3	18	0	33
08:15 AM	8	0	0	0	1	0	2	0	0	4	0	0	0	10	13	0	38
08:30 AM	15	0	0	0	0	0	1	0	0	5	0	0	0	1	22	0	44
08:45 AM	8	0	0	0	0	0	2	0	1	2	0	0	0	2	18	0	33
Total	37	0	0	0	1	0	7	0	2	14	0	0	0	16	71	0	148
Grand Total	72	0	0	0	1	0	14	0	5	27	0	0	2	19	138	0	278
Apprch %	100	0	0	0	6.7	0	93.3	0	15.6	84.4	0	0	1.3	11.9	86.8	0	
Total %	25.9	0	0	0	0.4	0	5	0	1.8	9.7	0	0	0.7	6.8	49.6	0	

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					Int. Total
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	6	0	0	0	6	0	0	2	0	2	1	3	0	0	4	0	3	18	0	21	33
08:15 AM	8	0	0	0	8	1	0	2	0	3	0	4	0	0	4	0	10	13	0	23	38
08:30 AM	15	0	0	0	15	0	0	1	0	1	0	5	0	0	5	0	1	22	0	23	44
08:45 AM	8	0	0	0	8	0	0	2	0	2	1	2	0	0	3	0	2	18	0	20	33
Total Volume	37	0	0	0	37	1	0	7	0	8	2	14	0	0	16	0	16	71	0	87	148
% App. Total	100	0	0	0		12.5	0	87.5	0		12.5	87.5	0	0		0	18.4	81.6	0		
PHF	.617	.000	.000	.000	.617	.250	.000	.875	.000	.667	.500	.700	.000	.000	.800	.000	.400	.807	.000	.946	.841

N/S: Dorchester Avenue  
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 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 B  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Peds and Bikes

Start Time	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				Int. Total
	Thru	Bear Left	Left	Peds	Right	Left	Hard Left	Peds	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	Peds	
07:00 AM	1	0	0	0	0	0	0	13	1	1	0	13	0	0	4	0	33
07:15 AM	1	0	0	0	0	0	0	5	1	0	0	8	0	2	7	0	24
07:30 AM	0	0	0	0	0	0	0	12	0	0	0	5	0	0	4	0	21
07:45 AM	0	0	0	0	0	0	0	16	2	0	0	12	0	1	9	0	40
Total	2	0	0	0	0	0	0	46	4	1	0	38	0	3	24	0	118
08:00 AM	0	0	0	0	0	0	0	19	0	0	0	9	0	2	9	1	40
08:15 AM	3	0	0	0	0	0	0	7	0	1	0	4	0	0	11	0	26
08:30 AM	6	0	0	0	0	0	0	26	0	0	0	17	1	1	9	1	61
08:45 AM	3	0	0	0	0	0	0	15	1	1	0	14	0	1	10	0	45
Total	12	0	0	0	0	0	0	67	1	2	0	44	1	4	39	2	172
Grand Total	14	0	0	0	0	0	0	113	5	3	0	82	1	7	63	2	290
Apprch %	100	0	0	0	0	0	0	100	5.6	3.3	0	91.1	1.4	9.6	86.3	2.7	
Total %	4.8	0	0	0	0	0	0	39	1.7	1	0	28.3	0.3	2.4	21.7	0.7	

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	Peds	App. Total	Right	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	0	0	19	19	0	0	0	9	9	0	2	9	1	12	40
08:15 AM	3	0	0	0	3	0	0	0	7	7	0	1	0	4	5	0	0	11	0	11	26
08:30 AM	6	0	0	0	6	0	0	0	26	26	0	0	0	17	17	1	1	9	1	12	61
08:45 AM	3	0	0	0	3	0	0	0	15	15	1	1	0	14	16	0	1	10	0	11	45
Total Volume	12	0	0	0	12	0	0	0	67	67	1	2	0	44	47	1	4	39	2	46	172
% App. Total	100	0	0	0		0	0	0	100		2.1	4.3	0	93.6		2.2	8.7	84.8	4.3		
PHF	.500	.000	.000	.000	.500	.000	.000	.000	.644	.644	.250	.500	.000	.647	.691	.250	.500	.886	.500	.958	.705



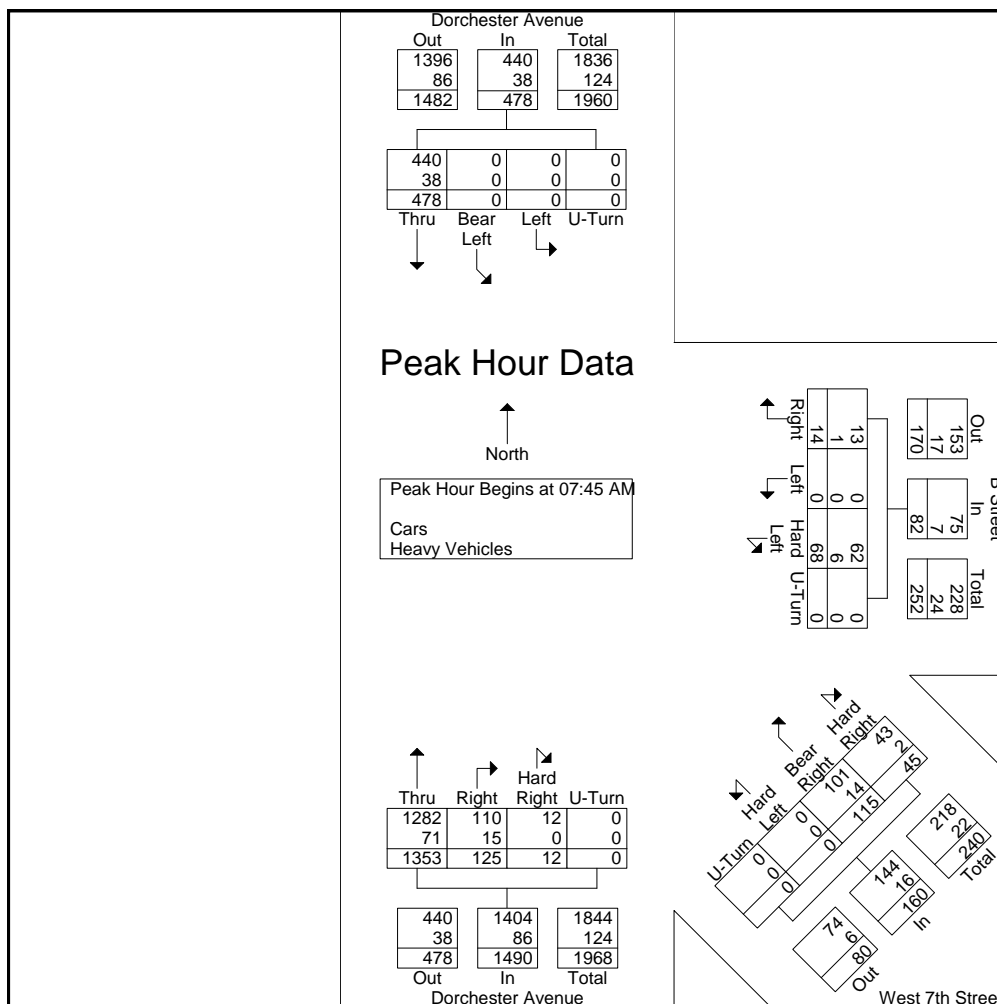
PRECISION  
D A T A  
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Page No : 1

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	118	0	0	0	118	3	0	13	0	16	17	32	0	0	49	2	27	366	0	395	578
08:00 AM	120	0	0	0	120	3	0	17	0	20	12	29	0	0	41	1	34	340	0	375	556
08:15 AM	124	0	0	0	124	4	0	19	0	23	8	32	0	0	40	9	31	326	0	366	553
08:30 AM	116	0	0	0	116	4	0	19	0	23	8	22	0	0	30	0	33	321	0	354	523
Total Volume	478	0	0	0	478	14	0	68	0	82	45	115	0	0	160	12	125	1353	0	1490	2210
% App. Total	100	0	0	0		17.1	0	82.9	0		28.1	71.9	0	0		0.8	8.4	90.8	0		
PHF	.964	.000	.000	.000	.964	.875	.000	.895	.000	.891	.662	.898	.000	.000	.816	.333	.919	.924	.000	.943	.956
Cars	440	0	0	0	440	13	0	62	0	75	43	101	0	0	144	12	110	1282	0	1404	2063
% Cars	92.1	0	0	0	92.1	92.9	0	91.2	0	91.5	95.6	87.8	0	0	90.0	100	88.0	94.8	0	94.2	93.3
Heavy Vehicles	38	0	0	0	38	1	0	6	0	7	2	14	0	0	16	0	15	71	0	86	147
% Heavy Vehicles	7.9	0	0	0	7.9	7.1	0	8.8	0	8.5	4.4	12.2	0	0	10.0	0	12.0	5.2	0	5.8	6.7





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File Name : 143960 BB  
Site Code : 81983.14  
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Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				Int. Total
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	U-Turn	Hard Right	Right	Thru	U-Turn	
04:00 PM	290	0	0	0	3	0	20	0	6	9	0	0	2	23	171	0	524
04:15 PM	307	0	0	0	8	0	21	0	6	14	0	0	0	15	174	0	545
04:30 PM	321	0	0	0	2	0	17	0	8	15	0	0	5	25	171	0	564
04:45 PM	268	0	0	0	3	0	15	0	4	13	0	1	3	22	202	0	531
Total	1186	0	0	0	16	0	73	0	24	51	0	1	10	85	718	0	2164
05:00 PM	249	0	0	0	5	0	21	0	5	14	0	0	2	17	187	0	500
05:15 PM	292	0	0	0	1	0	19	0	4	5	0	0	3	12	206	0	542
05:30 PM	266	0	0	0	3	0	22	0	8	7	0	0	2	20	214	0	542
05:45 PM	287	0	0	0	5	0	25	0	2	16	0	0	3	12	183	0	533
Total	1094	0	0	0	14	0	87	0	19	42	0	0	10	61	790	0	2117
Grand Total	2280	0	0	0	30	0	160	0	43	93	0	1	20	146	1508	0	4281
Apprch %	100	0	0	0	15.8	0	84.2	0	31.4	67.9	0	0.7	1.2	8.7	90.1	0	
Total %	53.3	0	0	0	0.7	0	3.7	0	1	2.2	0	0	0.5	3.4	35.2	0	
Cars	2208	0	0	0	28	0	152	0	41	84	0	1	18	142	1471	0	4145
% Cars	96.8	0	0	0	93.3	0	95	0	95.3	90.3	0	100	90	97.3	97.5	0	96.8
Heavy Vehicles	72	0	0	0	2	0	8	0	2	9	0	0	2	4	37	0	136
% Heavy Vehicles	3.2	0	0	0	6.7	0	5	0	4.7	9.7	0	0	10	2.7	2.5	0	3.2

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					Int. Total
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	290	0	0	0	290	3	0	20	0	23	6	9	0	0	15	2	23	171	0	196	524
04:15 PM	307	0	0	0	307	8	0	21	0	29	6	14	0	0	20	0	15	174	0	189	545
04:30 PM	321	0	0	0	321	2	0	17	0	19	8	15	0	0	23	5	25	171	0	201	564
04:45 PM	268	0	0	0	268	3	0	15	0	18	4	13	0	1	18	3	22	202	0	227	531
Total Volume	1186	0	0	0	1186	16	0	73	0	89	24	51	0	1	76	10	85	718	0	813	2164
% App. Total																					
PHF	.924	.000	.000	.000	.924	.500	.000	.869	.000	.767	.750	.850	.000	.250	.826	.500	.850	.889	.000	.895	.959
Cars	1151	0	0	0	1151	14	0	68	0	82	24	43	0	1	68	9	84	696	0	789	2090
% Cars	97.0	0	0	0	97.0	87.5	0	93.2	0	92.1	100	84.3	0	100	89.5	90.0	98.8	96.9	0	97.0	96.6
Heavy Vehicles																					
% Heavy Vehicles	3.0	0	0	0	3.0	12.5	0	6.8	0	7.9	0	15.7	0	0	10.5	10.0	1.2	3.1	0	3.0	3.4



PRECISION  
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Client: VHB/ P. Dunford

File Name : 143960 BB  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars

	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	U-Turn	Hard Right	Right	Thru	U-Turn	Int. Total
04:00 PM	283	0	0	0	3	0	20	0	6	7	0	0	2	22	166	0	509
04:15 PM	298	0	0	0	7	0	19	0	6	12	0	0	0	15	169	0	526
04:30 PM	308	0	0	0	2	0	17	0	8	13	0	0	5	25	165	0	543
04:45 PM	262	0	0	0	2	0	12	0	4	11	0	1	2	22	196	0	512
Total	1151	0	0	0	14	0	68	0	24	43	0	1	9	84	696	0	2090
05:00 PM	239	0	0	0	5	0	21	0	4	13	0	0	2	17	185	0	486
05:15 PM	281	0	0	0	1	0	18	0	4	5	0	0	3	10	201	0	523
05:30 PM	254	0	0	0	3	0	22	0	8	7	0	0	2	20	212	0	528
05:45 PM	283	0	0	0	5	0	23	0	1	16	0	0	2	11	177	0	518
Total	1057	0	0	0	14	0	84	0	17	41	0	0	9	58	775	0	2055
Grand Total	2208	0	0	0	28	0	152	0	41	84	0	1	18	142	1471	0	4145
Apprch %	100	0	0	0	15.6	0	84.4	0	32.5	66.7	0	0.8	1.1	8.7	90.2	0	
Total %	53.3	0	0	0	0.7	0	3.7	0	1	2	0	0	0.4	3.4	35.5	0	

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	283	0	0	0	283	3	0	20	0	23	6	7	0	0	13	2	22	166	0	190	509
04:15 PM	298	0	0	0	298	7	0	19	0	26	6	12	0	0	18	0	15	169	0	184	526
04:30 PM	308	0	0	0	308	2	0	17	0	19	8	13	0	0	21	5	25	165	0	195	543
04:45 PM	262	0	0	0	262	2	0	12	0	14	4	11	0	1	16	2	22	196	0	220	512
Total Volume	1151	0	0	0	1151	14	0	68	0	82	24	43	0	1	68	9	84	696	0	789	2090
% App. Total																					
PHF	.934	.000	.000	.000	.934	.500	.000	.850	.000	.788	.750	.827	.000	.250	.810	.450	.840	.888	.000	.897	.962



N/S: Dorchester Avenue  
 E/SE: B Street/ West 7th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 BB  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Heavy Vehicles

	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				Int. Total
Start Time	Thru	Bear Left	Left	U-Turn	Right	Left	Hard Left	U-Turn	Hard Right	Bear Right	Hard Left	U-Turn	Hard Right	Right	Thru	U-Turn	
04:00 PM	7	0	0	0	0	0	0	0	0	2	0	0	0	1	5	0	15
04:15 PM	9	0	0	0	1	0	2	0	0	2	0	0	0	0	5	0	19
04:30 PM	13	0	0	0	0	0	0	0	0	2	0	0	0	0	6	0	21
04:45 PM	6	0	0	0	1	0	3	0	0	2	0	0	1	0	6	0	19
Total	35	0	0	0	2	0	5	0	0	8	0	0	1	1	22	0	74
05:00 PM	10	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	14
05:15 PM	11	0	0	0	0	0	1	0	0	0	0	0	0	2	5	0	19
05:30 PM	12	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	14
05:45 PM	4	0	0	0	0	0	2	0	1	0	0	0	1	1	6	0	15
Total	37	0	0	0	0	0	3	0	2	1	0	0	1	3	15	0	62
Grand Total	72	0	0	0	2	0	8	0	2	9	0	0	2	4	37	0	136
Apprch %	100	0	0	0	20	0	80	0	18.2	81.8	0	0	4.7	9.3	86	0	
Total %	52.9	0	0	0	1.5	0	5.9	0	1.5	6.6	0	0	1.5	2.9	27.2	0	

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					Int. Total
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	7	0	0	0	7	0	0	0	0	0	0	2	0	0	2	0	1	5	0	6	15
04:15 PM	9	0	0	0	9	1	0	2	0	3	0	2	0	0	2	0	0	5	0	5	19
04:30 PM	13	0	0	0	13	0	0	0	0	0	0	2	0	0	2	0	0	6	0	6	21
04:45 PM	6	0	0	0	6	1	0	3	0	4	0	2	0	0	2	1	0	6	0	7	19
Total Volume	35	0	0	0	35	2	0	5	0	7	0	8	0	0	8	1	1	22	0	24	74
% App. Total	100	0	0	0		28.6	0	71.4	0		0	100	0	0		4.2	4.2	91.7	0		
PHF	.673	.000	.000	.000	.673	.500	.000	.417	.000	.438	.000	1.00	.000	.000	1.00	.250	.250	.917	.000	.857	.881



PRECISION  
D A T A  
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503  
Office: 508.481.3999 Fax: 508.545.1234  
Email: datarequests@pdillc.com

N/S: Dorchester Avenue  
E/SE: B Street/ West 7th Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 BB  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Peds and Bikes

	Dorchester Avenue From North				B Street From East				West 7th Street From Southeast				Dorchester Avenue From South				Int. Total
Start Time	Thru	Bear Left	Left	Peds	Right	Left	Hard Left	Peds	Hard Right	Bear Right	Hard Left	Peds	Hard Right	Right	Thru	Peds	
04:00 PM	0	0	0	0	0	0	1	2	0	0	0	3	0	0	2	1	9
04:15 PM	0	0	0	0	0	0	0	4	0	0	0	4	0	0	2	0	10
04:30 PM	0	0	0	1	0	0	0	4	0	0	0	5	0	0	3	0	13
04:45 PM	4	0	0	0	0	0	0	7	1	0	0	2	0	0	1	0	15
Total	4	0	0	1	0	0	1	17	1	0	0	14	0	0	8	1	47
05:00 PM	2	0	0	0	0	0	0	14	0	0	0	2	0	0	3	0	21
05:15 PM	1	0	0	2	0	0	0	12	0	0	0	4	0	0	2	1	22
05:30 PM	4	0	0	0	0	0	0	8	0	0	0	7	0	0	3	1	23
05:45 PM	3	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	6
Total	10	0	0	2	0	0	0	34	0	0	0	15	0	0	9	2	72
Grand Total	14	0	0	3	0	0	1	51	1	0	0	29	0	0	17	3	119
Apprch %	82.4	0	0	17.6	0	0	1.9	98.1	3.3	0	0	96.7	0	0	85	15	
Total %	11.8	0	0	2.5	0	0	0.8	42.9	0.8	0	0	24.4	0	0	14.3	2.5	

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					Int. Total
Start Time	Thru	Bear Left	Left	Peds	App. Total	Right	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	4	0	0	0	4	0	0	0	7	7	1	0	0	2	3	0	0	1	0	1	15
05:00 PM	2	0	0	0	2	0	0	0	14	14	0	0	0	2	2	0	0	3	0	3	21
05:15 PM	1	0	0	2	3	0	0	0	12	12	0	0	0	4	4	0	0	2	1	3	22
05:30 PM	4	0	0	0	4	0	0	0	8	8	0	0	0	7	7	0	0	3	1	4	23
Total Volume	11	0	0	2	13	0	0	0	41	41	1	0	0	15	16	0	0	9	2	11	81
% App. Total	84.6	0	0	15.4		0	0	0	100		6.2	0	0	93.8		0	0	81.8	18.2		
PHF	.688	.000	.000	.250	.813	.000	.000	.000	.732	.732	.250	.000	.000	.536	.571	.000	.000	.750	.500	.688	.880



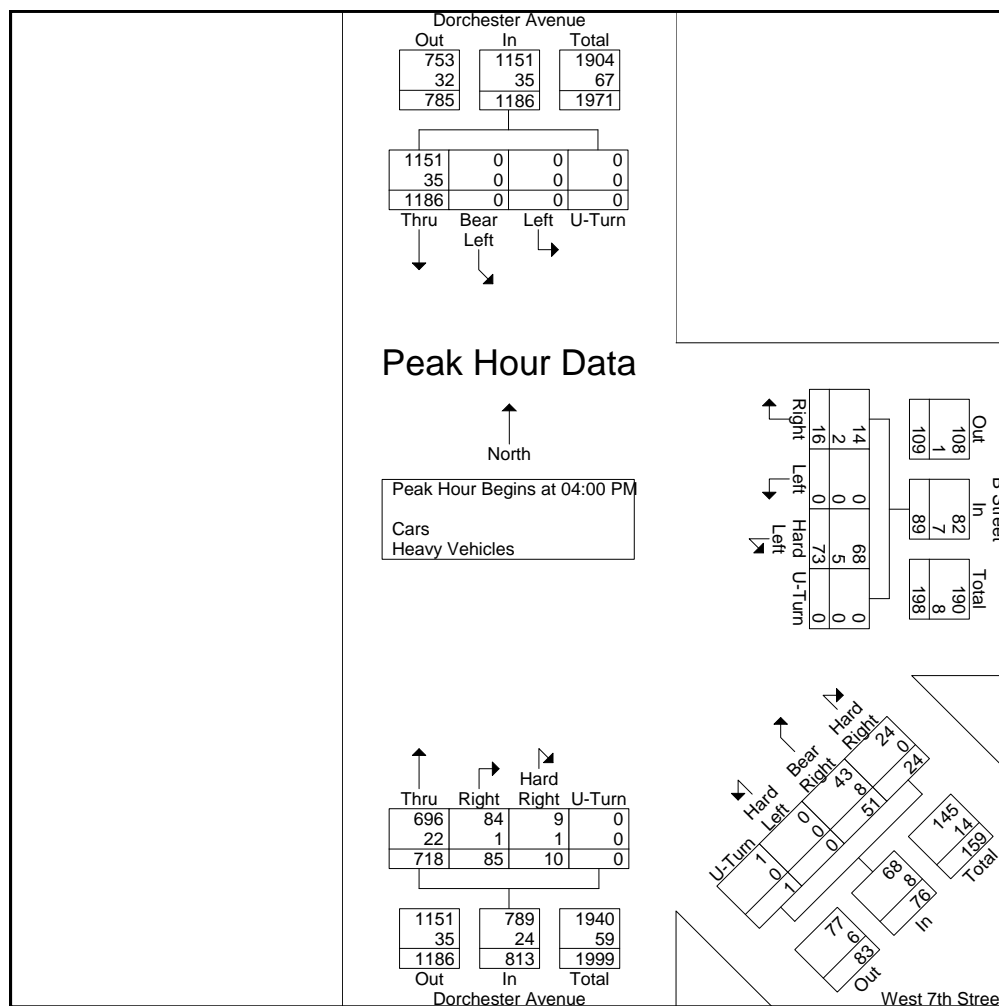
PRECISION  
D A T A  
INDUSTRIES, LLC

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N/S: Dorchester Avenue  
E/SE: B Street/ West 7th Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 BB  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

	Dorchester Avenue From North					B Street From East					West 7th Street From Southeast					Dorchester Avenue From South					
Start Time	Thru	Bear Left	Left	U-Turn	App. Total	Right	Left	Hard Left	U-Turn	App. Total	Hard Right	Bear Right	Hard Left	U-Turn	App. Total	Hard Right	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	290	0	0	0	290	3	0	20	0	23	6	9	0	0	15	2	23	171	0	196	524
04:15 PM	307	0	0	0	307	8	0	21	0	29	6	14	0	0	20	0	15	174	0	189	545
04:30 PM	321	0	0	0	321	2	0	17	0	19	8	15	0	0	23	5	25	171	0	201	564
04:45 PM	268	0	0	0	268	3	0	15	0	18	4	13	0	1	18	3	22	202	0	227	531
Total Volume	1186	0	0	0	1186	16	0	73	0	89	24	51	0	1	76	10	85	718	0	813	2164
% App. Total																					
PHF	.924	.000	.000	.000	.924	.500	.000	.869	.000	.767	.750	.850	.000	.250	.826	.500	.850	.889	.000	.895	.959
Cars	1151	0	0	0	1151	14	0	68	0	82	24	43	0	1	68	9	84	696	0	789	2090
% Cars	97.0	0	0	0	97.0	87.5	0	93.2	0	92.1	100	84.3	0	100	89.5	90.0	98.8	96.9	0	97.0	96.6
Heavy Vehicles																					
% Heavy Vehicles	3.0	0	0	0	3.0	12.5	0	6.8	0	7.9	0	15.7	0	0	10.5	10.0	1.2	3.1	0	3.0	3.4





PRECISION  
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Email: datarequests@pdillc.com

N/S: West 6th St/ Orton Marotta Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 C  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	0	0	0	1	11	0	0	2	0	3	0	0	22	0	0	39
07:15 AM	0	0	0	0	0	13	0	0	6	0	1	0	0	36	0	0	56
07:30 AM	0	0	0	0	0	18	0	0	2	0	1	0	0	32	0	0	53
07:45 AM	0	0	0	0	1	15	0	0	7	0	1	0	1	46	0	0	71
Total	0	0	0	0	2	57	0	0	17	0	6	0	1	136	0	0	219
08:00 AM	0	0	0	0	0	20	0	0	2	0	2	0	0	47	0	1	72
08:15 AM	0	0	0	0	0	22	0	0	12	0	0	0	0	37	2	0	73
08:30 AM	0	0	0	0	0	17	0	0	9	0	7	0	0	40	1	1	75
08:45 AM	0	0	0	0	1	21	0	0	5	0	2	0	0	40	0	0	69
Total	0	0	0	0	1	80	0	0	28	0	11	0	0	164	3	2	289
Grand Total	0	0	0	0	3	137	0	0	45	0	17	0	1	300	3	2	508
Apprch %	0	0	0	0	2.1	97.9	0	0	72.6	0	27.4	0	0.3	98	1	0.7	
Total %	0	0	0	0	0.6	27	0	0	8.9	0	3.3	0	0.2	59.1	0.6	0.4	
Cars	0	0	0	0	3	123	0	0	39	0	16	0	1	277	3	2	464
% Cars	0	0	0	0	100	89.8	0	0	86.7	0	94.1	0	100	92.3	100	100	91.3
Heavy Vehicles	0	0	0	0	0	14	0	0	6	0	1	0	0	23	0	0	44
% Heavy Vehicles	0	0	0	0	0	10.2	0	0	13.3	0	5.9	0	0	7.7	0	0	8.7

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	1	15	0	0	16	7	0	1	0	8	1	46	0	0	47	71
08:00 AM	0	0	0	0	0	0	20	0	0	20	2	0	2	0	4	0	47	0	1	48	72
08:15 AM	0	0	0	0	0	0	22	0	0	22	12	0	0	0	12	0	37	2	0	39	73
08:30 AM	0	0	0	0	0	0	17	0	0	17	9	0	7	0	16	0	40	1	1	42	75
Total Volume	0	0	0	0	0	1	74	0	0	75	30	0	10	0	40	1	170	3	2	176	291
% App. Total	0	0	0	0		1.3	98.7	0	0		75	0	25	0		0.6	96.6	1.7	1.1		
PHF	.000	.000	.000	.000	.000	.250	.841	.000	.000	.852	.625	.000	.357	.000	.625	.250	.904	.375	.500	.917	.970
Cars	0	0	0	0	0	1	68	0	0	69	26	0	9	0	35	1	154	3	2	160	264
% Cars	0	0	0	0	0	100	91.9	0	0	92.0	86.7	0	90.0	0	87.5	100	90.6	100	100	90.9	90.7
Heavy Vehicles	0	0	0	0	0	0	6	0	0	6	4	0	1	0	5	0	16	0	0	16	27
% Heavy Vehicles	0	0	0	0	0	0	8.1	0	0	8.0	13.3	0	10.0	0	12.5	0	9.4	0	0	9.1	9.3

N/S: West 6th St/ Orton Marotta Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 C  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Cars

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	0	0	0	1	8	0	0	2	0	3	0	0	22	0	0	36
07:15 AM	0	0	0	0	0	12	0	0	5	0	1	0	0	32	0	0	50
07:30 AM	0	0	0	0	0	16	0	0	1	0	1	0	0	32	0	0	50
07:45 AM	0	0	0	0	1	14	0	0	7	0	1	0	1	44	0	0	68
Total	0	0	0	0	2	50	0	0	15	0	6	0	1	130	0	0	204
08:00 AM	0	0	0	0	0	18	0	0	2	0	2	0	0	43	0	1	66
08:15 AM	0	0	0	0	0	19	0	0	11	0	0	0	0	28	2	0	60
08:30 AM	0	0	0	0	0	17	0	0	6	0	6	0	0	39	1	1	70
08:45 AM	0	0	0	0	1	19	0	0	5	0	2	0	0	37	0	0	64
Total	0	0	0	0	1	73	0	0	24	0	10	0	0	147	3	2	260
Grand Total	0	0	0	0	3	123	0	0	39	0	16	0	1	277	3	2	464
Apprch %	0	0	0	0	2.4	97.6	0	0	70.9	0	29.1	0	0.4	97.9	1.1	0.7	
Total %	0	0	0	0	0.6	26.5	0	0	8.4	0	3.4	0	0.2	59.7	0.6	0.4	

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	1	14	0	0	15	7	0	1	0	8	1	44	0	0	45	68
08:00 AM	0	0	0	0	0	0	18	0	0	18	2	0	2	0	4	0	43	0	1	44	66
08:15 AM	0	0	0	0	0	0	19	0	0	19	11	0	0	0	11	0	28	2	0	30	60
08:30 AM	0	0	0	0	0	0	17	0	0	17	6	0	6	0	12	0	39	1	1	41	70
Total Volume	0	0	0	0	0	1	68	0	0	69	26	0	9	0	35	1	154	3	2	160	264
% App. Total	0	0	0	0		1.4	98.6	0	0		74.3	0	25.7	0		0.6	96.2	1.9	1.2		
PHF	.000	.000	.000	.000	.000	.250	.895	.000	.000	.908	.591	.000	.375	.000	.729	.250	.875	.375	.500	.889	.943



N/S: West 6th St/ Orton Marotta Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 C  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Heavy Vehicles

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	1	0	0	1	0	0	0	0	4	0	0	6
07:30 AM	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	3
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Total	0	0	0	0	0	7	0	0	2	0	0	0	0	6	0	0	15
08:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
08:15 AM	0	0	0	0	0	3	0	0	1	0	0	0	0	9	0	0	13
08:30 AM	0	0	0	0	0	0	0	0	3	0	1	0	0	1	0	0	5
08:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	3	0	0	5
Total	0	0	0	0	0	7	0	0	4	0	1	0	0	17	0	0	29
Grand Total	0	0	0	0	0	14	0	0	6	0	1	0	0	23	0	0	44
Apprch %	0	0	0	0	0	100	0	0	85.7	0	14.3	0	0	100	0	0	
Total %	0	0	0	0	0	31.8	0	0	13.6	0	2.3	0	0	52.3	0	0	

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
08:15 AM	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	9	0	0	9	13
08:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	1	0	4	0	1	0	0	1	5
08:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
Total Volume	0	0	0	0	0	0	7	0	0	7	4	0	1	0	5	0	17	0	0	17	29
% App. Total	0	0	0	0		0	100	0	0		80	0	20	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.583	.000	.000	.583	.333	.000	.250	.000	.313	.000	.472	.000	.000	.472	.558



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E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 C  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Peds and Bikes

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	2	0	0	1	0	0	4	0	1	0	0	8
07:15 AM	0	0	0	1	0	0	0	1	0	0	0	5	0	4	0	0	11
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	3	0	0	0	0	4
07:45 AM	0	0	0	0	0	0	0	0	1	0	0	4	0	4	0	0	9
Total	0	0	0	1	0	2	0	1	3	0	0	16	0	9	0	0	32
08:00 AM	0	0	0	2	0	0	0	0	1	0	0	4	0	2	0	0	9
08:15 AM	0	0	0	3	0	0	0	0	1	0	0	3	0	1	0	0	8
08:30 AM	0	0	0	1	0	0	0	0	1	0	0	3	0	2	0	0	7
08:45 AM	0	0	0	0	0	1	0	0	1	0	0	2	0	3	0	0	7
Total	0	0	0	6	0	1	0	0	4	0	0	12	0	8	0	0	31
Grand Total	0	0	0	7	0	3	0	1	7	0	0	28	0	17	0	0	63
Apprch %	0	0	0	100	0	75	0	25	20	0	0	80	0	100	0	0	
Total %	0	0	0	11.1	0	4.8	0	1.6	11.1	0	0	44.4	0	27	0	0	

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	5	5	0	4	0	0	4	11
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	3	4	0	0	0	0	0	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	4	5	0	4	0	0	4	9
08:00 AM	0	0	0	2	2	0	0	0	0	0	1	0	0	4	5	0	2	0	0	2	9
Total Volume	0	0	0	3	3	0	0	0	1	1	3	0	0	16	19	0	10	0	0	10	33
% App. Total	0	0	0	100		0	0	0	100		15.8	0	0	84.2		0	100	0	0		
PHF	.000	.000	.000	.375	.375	.000	.000	.000	.250	.250	.750	.000	.000	.800	.950	.000	.625	.000	.000	.625	.750



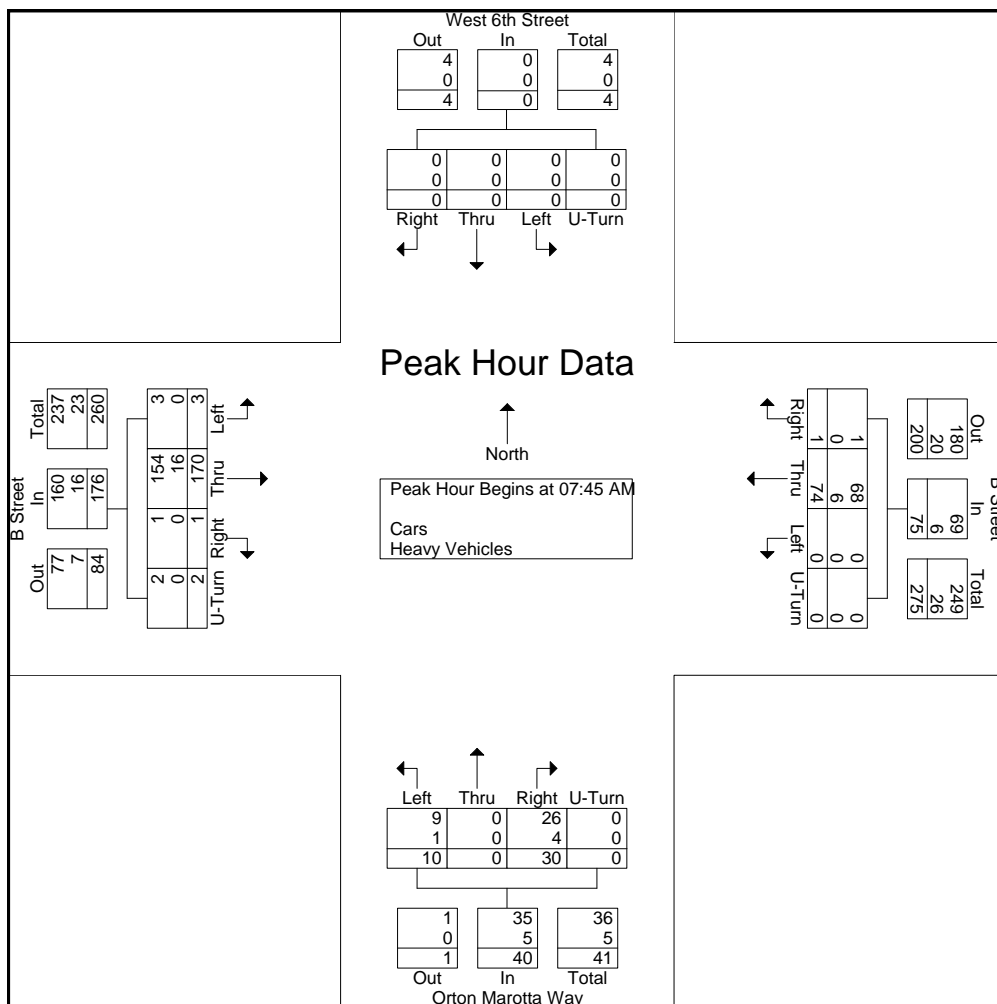
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	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	1	15	0	0	16	7	0	1	0	8	1	46	0	0	47	71
08:00 AM	0	0	0	0	0	0	20	0	0	20	2	0	2	0	4	0	47	0	1	48	72
08:15 AM	0	0	0	0	0	0	22	0	0	22	12	0	0	0	12	0	37	2	0	39	73
08:30 AM	0	0	0	0	0	0	17	0	0	17	9	0	7	0	16	0	40	1	1	42	75
Total Volume	0	0	0	0	0	1	74	0	0	75	30	0	10	0	40	1	170	3	2	176	291
% App. Total	0	0	0	0	0	1.3	98.7	0	0	0	75	0	25	0	0	0.6	96.6	1.7	1.1	0	0
PHF	.000	.000	.000	.000	.000	.250	.841	.000	.000	.852	.625	.000	.357	.000	.625	.250	.904	.375	.500	.917	.970
Cars	0	0	0	0	0	1	68	0	0	69	26	0	9	0	35	1	154	3	2	160	264
% Cars	0	0	0	0	0	100	91.9	0	0	92.0	86.7	0	90.0	0	87.5	100	90.6	100	100	90.9	90.7
Heavy Vehicles	0	0	0	0	0	0	6	0	0	6	4	0	1	0	5	0	16	0	0	16	27
% Heavy Vehicles	0	0	0	0	0	0	8.1	0	0	8.0	13.3	0	10.0	0	12.5	0	9.4	0	0	9.1	9.3





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File Name : 143960 CC  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	0	1	0	0	22	0	0	6	0	3	0	0	29	0	0	61
04:15 PM	0	0	0	0	0	32	0	0	5	0	0	0	0	22	0	0	59
04:30 PM	0	0	1	0	0	19	0	0	3	0	3	0	0	34	0	0	60
04:45 PM	1	0	1	0	1	16	0	0	8	0	0	0	0	23	1	0	51
Total	1	0	3	0	1	89	0	0	22	0	6	0	0	108	1	0	231
05:00 PM	1	0	0	0	0	25	0	0	4	1	2	0	0	22	0	1	56
05:15 PM	0	0	0	0	0	17	0	0	4	0	1	0	0	15	0	1	38
05:30 PM	1	0	0	0	1	24	0	1	4	0	1	0	0	26	0	2	60
05:45 PM	0	0	0	0	0	23	0	0	4	0	3	0	0	17	0	0	47
Total	2	0	0	0	1	89	0	1	16	1	7	0	0	80	0	4	201
Grand Total	3	0	3	0	2	178	0	1	38	1	13	0	0	188	1	4	432
Apprch %	50	0	50	0	1.1	98.3	0	0.6	73.1	1.9	25	0	0	97.4	0.5	2.1	
Total %	0.7	0	0.7	0	0.5	41.2	0	0.2	8.8	0.2	3	0	0	43.5	0.2	0.9	
Cars	3	0	1	0	2	166	0	1	36	1	13	0	0	180	1	4	408
% Cars	100	0	33.3	0	100	93.3	0	100	94.7	100	100	0	0	95.7	100	100	94.4
Heavy Vehicles	0	0	2	0	0	12	0	0	2	0	0	0	0	8	0	0	24
% Heavy Vehicles	0	0	66.7	0	0	6.7	0	0	5.3	0	0	0	0	4.3	0	0	5.6

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	1	0	1	0	22	0	0	22	6	0	3	0	9	0	29	0	0	29	61
04:15 PM	0	0	0	0	0	0	32	0	0	32	5	0	0	0	5	0	22	0	0	22	59
04:30 PM	0	0	1	0	1	0	19	0	0	19	3	0	3	0	6	0	34	0	0	34	60
04:45 PM	1	0	1	0	2	1	16	0	0	17	8	0	0	0	8	0	23	1	0	24	51
Total Volume	1	0	3	0	4	1	89	0	0	90	22	0	6	0	28	0	108	1	0	109	231
% App. Total	25	0	75	0		1.1	98.9	0	0		78.6	0	21.4	0		0	99.1	0.9	0		
PHF	.250	.000	.750	.000	.500	.250	.695	.000	.000	.703	.688	.000	.500	.000	.778	.000	.794	.250	.000	.801	.947
Cars	1	0	1	0	2	1	80	0	0	81	20	0	6	0	26	0	106	1	0	107	216
% Cars	100	0	33.3	0	50.0	100	89.9	0	0	90.0	90.9	0	100	0	92.9	0	98.1	100	0	98.2	93.5
Heavy Vehicles	0	0	2	0	2	0	9	0	0	9	2	0	0	0	2	0	2	0	0	2	15
% Heavy Vehicles	0	0	66.7	0	50.0	0	10.1	0	0	10.0	9.1	0	0	0	7.1	0	1.9	0	0	1.8	6.5



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Client: VHB/ P. Dunford

File Name : 143960 CC  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	0	0	0	0	22	0	0	4	0	3	0	0	27	0	0	56
04:15 PM	0	0	0	0	0	27	0	0	5	0	0	0	0	22	0	0	54
04:30 PM	0	0	0	0	0	19	0	0	3	0	3	0	0	34	0	0	59
04:45 PM	1	0	1	0	1	12	0	0	8	0	0	0	0	23	1	0	47
Total	1	0	1	0	1	80	0	0	20	0	6	0	0	106	1	0	216
05:00 PM	1	0	0	0	0	25	0	0	4	1	2	0	0	20	0	1	54
05:15 PM	0	0	0	0	0	16	0	0	4	0	1	0	0	13	0	1	35
05:30 PM	1	0	0	0	1	24	0	1	4	0	1	0	0	26	0	2	60
05:45 PM	0	0	0	0	0	21	0	0	4	0	3	0	0	15	0	0	43
Total	2	0	0	0	1	86	0	1	16	1	7	0	0	74	0	4	192
Grand Total	3	0	1	0	2	166	0	1	36	1	13	0	0	180	1	4	408
Apprch %	75	0	25	0	1.2	98.2	0	0.6	72	2	26	0	0	97.3	0.5	2.2	
Total %	0.7	0	0.2	0	0.5	40.7	0	0.2	8.8	0.2	3.2	0	0	44.1	0.2	1	

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	22	0	0	22	4	0	3	0	7	0	27	0	0	27	56
04:15 PM	0	0	0	0	0	0	27	0	0	27	5	0	0	0	5	0	22	0	0	22	54
04:30 PM	0	0	0	0	0	0	19	0	0	19	3	0	3	0	6	0	34	0	0	34	59
04:45 PM	1	0	1	0	2	1	12	0	0	13	8	0	0	0	8	0	23	1	0	24	47
Total Volume	1	0	1	0	2	1	80	0	0	81	20	0	6	0	26	0	106	1	0	107	216
% App. Total	50	0	50	0		1.2	98.8	0	0		76.9	0	23.1	0		0	99.1	0.9	0		
PHF	.250	.000	.250	.000	.250	.250	.741	.000	.000	.750	.625	.000	.500	.000	.813	.000	.779	.250	.000	.787	.915





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Start Date : 6/18/2014  
Page No : 1

Groups Printed- Heavy Vehicles

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	0	1	0	0	0	0	0	2	0	0	0	0	2	0	0	5
04:15 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	2	0	0	9	0	0	2	0	0	0	0	2	0	0	15
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	0	0	0	0	3	0	0	0	0	0	0	0	6	0	0	9
Grand Total	0	0	2	0	0	12	0	0	2	0	0	0	0	8	0	0	24
Apprch %	0	0	100	0	0	100	0	0	100	0	0	0	0	100	0	0	
Total %	0	0	8.3	0	0	50	0	0	8.3	0	0	0	0	33.3	0	0	

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	0	2	0	0	2	5
04:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	2	0	2	0	9	0	0	9	2	0	0	0	2	0	2	0	0	2	15
% App. Total	0	0	100	0		0	100	0	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.500	.000	.500	.000	.450	.000	.000	.450	.250	.000	.000	.000	.250	.000	.250	.000	.000	.250	.750

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File Name : 143960 CC  
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 Page No : 1

Groups Printed- Peds and Bikes

	West 6th Street From North				B Street From East				Orton Marotta Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
04:00 PM	0	0	0	1	0	2	0	0	1	0	0	3	0	0	0	0	7
04:15 PM	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	6	0	0	0	0	1	0	0	0	0	0	0	1	8
Total	0	0	0	8	0	2	0	0	3	0	0	4	0	0	0	1	18
05:00 PM	0	0	0	5	0	0	0	0	0	0	0	6	0	1	0	1	13
05:15 PM	0	0	0	5	0	0	0	0	0	0	1	1	0	0	0	0	7
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	1	5
05:45 PM	0	0	0	4	0	0	0	1	0	0	0	4	0	0	0	0	9
Total	0	0	0	15	0	0	0	1	0	0	1	12	0	3	0	2	34
Grand Total	0	0	0	23	0	2	0	1	3	0	1	16	0	3	0	3	52
Apprch %	0	0	0	100	0	66.7	0	33.3	15	0	5	80	0	50	0	50	
Total %	0	0	0	44.2	0	3.8	0	1.9	5.8	0	1.9	30.8	0	5.8	0	5.8	

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	6	6	0	1	0	1	2	13
05:15 PM	0	0	0	5	5	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	7
05:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	2	0	1	3	5
05:45 PM	0	0	0	4	4	0	0	0	1	1	0	0	0	4	4	0	0	0	0	0	9
Total Volume	0	0	0	15	15	0	0	0	1	1	0	0	1	12	13	0	3	0	2	5	34
% App. Total	0	0	0	100		0	0	0	100		0	0	7.7	92.3		0	60	0	40		
PHF	.000	.000	.000	.750	.750	.000	.000	.000	.250	.250	.000	.000	.250	.500	.542	.000	.375	.000	.500	.417	.654



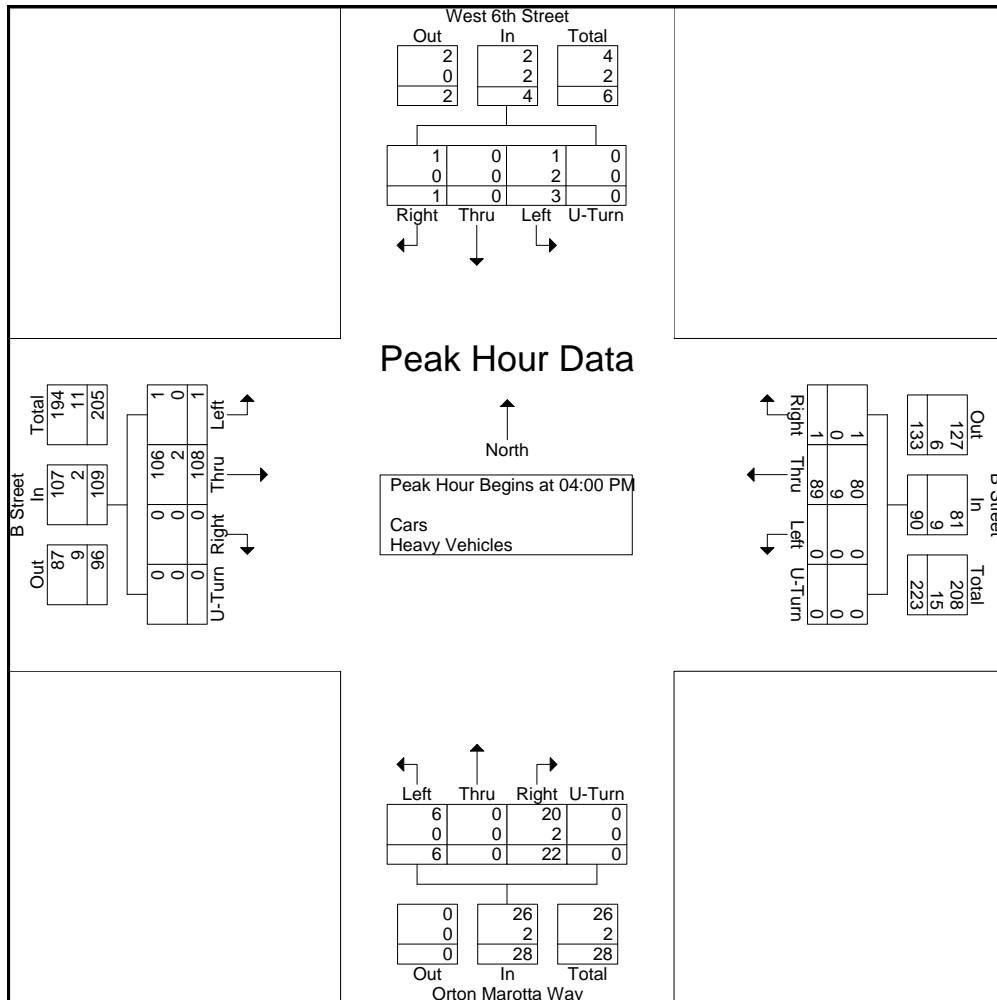
PRECISION  
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INDUSTRIES, LLC

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N/S: West 6th St/ Orton Marotta Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 CC  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

	West 6th Street From North					B Street From East					Orton Marotta Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	1	0	1	0	22	0	0	22	6	0	3	0	9	0	29	0	0	29	61
04:15 PM	0	0	0	0	0	0	32	0	0	32	5	0	0	0	5	0	22	0	0	22	59
04:30 PM	0	0	1	0	1	0	19	0	0	19	3	0	3	0	6	0	34	0	0	34	60
04:45 PM	1	0	1	0	2	1	16	0	0	17	8	0	0	0	8	0	23	1	0	24	51
Total Volume	1	0	3	0	4	1	89	0	0	90	22	0	6	0	28	0	108	1	0	109	231
% App. Total	25	0	75	0		1.1	98.9	0	0		78.6	0	21.4	0		0	99.1	0.9	0		
PHF	.250	.000	.750	.000	.500	.250	.695	.000	.000	.703	.688	.000	.500	.000	.778	.000	.794	.250	.000	.801	.947
Cars	1	0	1	0	2	1	80	0	0	81	20	0	6	0	26	0	106	1	0	107	216
% Cars	100	0	33.3	0	50.0	100	89.9	0	0	90.0	90.9	0	100	0	92.9	0	98.1	100	0	98.2	93.5
Heavy Vehicles	0	0	2	0	2	0	9	0	0	9	2	0	0	0	2	0	2	0	0	2	15
% Heavy Vehicles	0	0	66.7	0	50.0	0	10.1	0	0	10.0	9.1	0	0	0	7.1	0	1.9	0	0	1.8	6.5





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N/S: West 5th Street/ Flaherty Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 D  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	1	1	2	0	1	11	4	0	0	0	0	0	1	20	3	0	44
07:15 AM	0	0	0	0	2	14	10	0	0	0	0	0	3	37	0	0	66
07:30 AM	2	2	0	1	4	18	5	0	0	0	0	0	2	32	3	0	69
07:45 AM	5	0	4	0	3	11	12	0	0	0	0	0	3	42	10	0	90
Total	8	3	6	1	10	54	31	0	0	0	0	0	9	131	16	0	269
08:00 AM	1	3	2	0	2	18	8	0	0	0	0	0	5	32	6	0	77
08:15 AM	6	1	0	0	2	16	9	0	0	0	0	0	9	31	7	0	81
08:30 AM	7	0	2	0	2	11	13	0	0	0	0	0	3	42	4	0	84
08:45 AM	5	2	3	0	6	18	7	0	0	0	0	0	5	38	3	0	87
Total	19	6	7	0	12	63	37	0	0	0	0	0	22	143	20	0	329
Grand Total	27	9	13	1	22	117	68	0	0	0	0	0	31	274	36	0	598
Apprch %	54	18	26	2	10.6	56.5	32.9	0	0	0	0	0	9.1	80.4	10.6	0	
Total %	4.5	1.5	2.2	0.2	3.7	19.6	11.4	0	0	0	0	0	5.2	45.8	6	0	
Cars	25	9	12	1	20	103	63	0	0	0	0	0	22	251	35	0	541
% Cars	92.6	100	92.3	100	90.9	88	92.6	0	0	0	0	0	71	91.6	97.2	0	90.5
Heavy Vehicles	2	0	1	0	2	14	5	0	0	0	0	0	9	23	1	0	57
% Heavy Vehicles	7.4	0	7.7	0	9.1	12	7.4	0	0	0	0	0	29	8.4	2.8	0	9.5

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	5	0	4	0	9	3	11	12	0	26	0	0	0	0	0	3	42	10	0	55	90
08:00 AM	1	3	2	0	6	2	18	8	0	28	0	0	0	0	0	5	32	6	0	43	77
08:15 AM	6	1	0	0	7	2	16	9	0	27	0	0	0	0	0	9	31	7	0	47	81
08:30 AM	7	0	2	0	9	2	11	13	0	26	0	0	0	0	0	3	42	4	0	49	84
Total Volume	19	4	8	0	31	9	56	42	0	107	0	0	0	0	0	20	147	27	0	194	332
% App. Total	61.3	12.9	25.8	0		8.4	52.3	39.3	0		0	0	0	0		10.3	75.8	13.9	0		
PHF	.679	.333	.500	.000	.861	.750	.778	.808	.000	.955	.000	.000	.000	.000	.000	.556	.875	.675	.000	.882	.922
Cars	18	4	7	0	29	9	50	39	0	98	0	0	0	0	0	14	130	27	0	171	298
% Cars	94.7	100	87.5	0	93.5	100	89.3	92.9	0	91.6	0	0	0	0	0	70.0	88.4	100	0	88.1	89.8
Heavy Vehicles	1	0	1	0	2	0	6	3	0	9	0	0	0	0	0	6	17	0	0	23	34
% Heavy Vehicles	5.3	0	12.5	0	6.5	0	10.7	7.1	0	8.4	0	0	0	0	0	30.0	11.6	0	0	11.9	10.2

N/S: West 5th Street/ Flaherty Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 D  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Cars

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	1	1	2	0	1	8	4	0	0	0	0	0	1	20	3	0	41
07:15 AM	0	0	0	0	1	13	10	0	0	0	0	0	2	33	0	0	59
07:30 AM	1	2	0	1	3	16	3	0	0	0	0	0	1	31	3	0	61
07:45 AM	5	0	3	0	3	10	11	0	0	0	0	0	3	38	10	0	83
Total	7	3	5	1	8	47	28	0	0	0	0	0	7	122	16	0	244
08:00 AM	1	3	2	0	2	15	7	0	0	0	0	0	4	29	6	0	69
08:15 AM	5	1	0	0	2	14	8	0	0	0	0	0	5	24	7	0	66
08:30 AM	7	0	2	0	2	11	13	0	0	0	0	0	2	39	4	0	80
08:45 AM	5	2	3	0	6	16	7	0	0	0	0	0	4	37	2	0	82
Total	18	6	7	0	12	56	35	0	0	0	0	0	15	129	19	0	297
Grand Total	25	9	12	1	20	103	63	0	0	0	0	0	22	251	35	0	541
Apprch %	53.2	19.1	25.5	2.1	10.8	55.4	33.9	0	0	0	0	0	7.1	81.5	11.4	0	
Total %	4.6	1.7	2.2	0.2	3.7	19	11.6	0	0	0	0	0	4.1	46.4	6.5	0	

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	5	0	3	0	8	3	10	11	0	24	0	0	0	0	0	3	38	10	0	51	83
08:00 AM	1	3	2	0	6	2	15	7	0	24	0	0	0	0	0	4	29	6	0	39	69
08:15 AM	5	1	0	0	6	2	14	8	0	24	0	0	0	0	0	5	24	7	0	36	66
08:30 AM	7	0	2	0	9	2	11	13	0	26	0	0	0	0	0	2	39	4	0	45	80
Total Volume	18	4	7	0	29	9	50	39	0	98	0	0	0	0	0	14	130	27	0	171	298
% App. Total	62.1	13.8	24.1	0		9.2	51	39.8	0		0	0	0	0		8.2	76	15.8	0		
PHF	.643	.333	.583	.000	.806	.750	.833	.750	.000	.942	.000	.000	.000	.000	.000	.700	.833	.675	.000	.838	.898





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E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 D  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Heavy Vehicles

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	1	4	0	0	7
07:30 AM	1	0	0	0	1	2	2	0	0	0	0	0	1	1	0	0	8
07:45 AM	0	0	1	0	0	1	1	0	0	0	0	0	0	4	0	0	7
Total	1	0	1	0	2	7	3	0	0	0	0	0	2	9	0	0	25
08:00 AM	0	0	0	0	0	3	1	0	0	0	0	0	1	3	0	0	8
08:15 AM	1	0	0	0	0	2	1	0	0	0	0	0	4	7	0	0	15
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	4
08:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	1	1	1	0	5
Total	1	0	0	0	0	7	2	0	0	0	0	0	7	14	1	0	32
Grand Total	2	0	1	0	2	14	5	0	0	0	0	0	9	23	1	0	57
Apprch %	66.7	0	33.3	0	9.5	66.7	23.8	0	0	0	0	0	27.3	69.7	3	0	
Total %	3.5	0	1.8	0	3.5	24.6	8.8	0	0	0	0	0	15.8	40.4	1.8	0	

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	1	0	0	0	1	1	2	2	0	5	0	0	0	0	0	1	1	0	0	2	8
07:45 AM	0	0	1	0	1	0	1	1	0	2	0	0	0	0	0	0	4	0	0	4	7
08:00 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	1	3	0	0	4	8
08:15 AM	1	0	0	0	1	0	2	1	0	3	0	0	0	0	0	4	7	0	0	11	15
Total Volume	2	0	1	0	3	1	8	5	0	14	0	0	0	0	0	6	15	0	0	21	38
% App. Total	66.7	0	33.3	0		7.1	57.1	35.7	0		0	0	0	0		28.6	71.4	0	0		
PHF	.500	.000	.250	.000	.750	.250	.667	.625	.000	.700	.000	.000	.000	.000	.000	.375	.536	.000	.000	.477	.633



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City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 D  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Peds and Bikes

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	1	0	1	0	1	0	0	0	7	0	3	0	1	14
07:15 AM	0	0	0	3	0	0	0	2	0	0	0	7	0	4	0	1	17
07:30 AM	0	0	0	1	0	0	0	5	0	0	0	3	0	0	0	3	12
07:45 AM	0	0	0	0	0	0	0	3	0	0	0	4	0	3	0	2	12
Total	0	0	0	5	0	1	0	11	0	0	0	21	0	10	0	7	55
08:00 AM	0	0	0	3	0	0	0	5	0	0	0	6	0	5	0	3	22
08:15 AM	0	0	0	1	0	0	0	2	0	0	0	8	0	2	0	1	14
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	3	0	2	8
08:45 AM	0	0	0	2	0	1	0	6	0	0	0	2	1	2	1	1	16
Total	0	0	0	6	0	1	0	14	0	0	0	18	1	12	1	7	60
Grand Total	0	0	0	11	0	2	0	25	0	0	0	39	1	22	1	14	115
Apprch %	0	0	0	100	0	7.4	0	92.6	0	0	0	100	2.6	57.9	2.6	36.8	
Total %	0	0	0	9.6	0	1.7	0	21.7	0	0	0	33.9	0.9	19.1	0.9	12.2	

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	3	3	0	0	0	2	2	0	0	0	7	7	0	4	0	1	5	17
07:30 AM	0	0	0	1	1	0	0	0	5	5	0	0	0	3	3	0	0	0	3	3	12
07:45 AM	0	0	0	0	0	0	0	0	3	3	0	0	0	4	4	0	3	0	2	5	12
08:00 AM	0	0	0	3	3	0	0	0	5	5	0	0	0	6	6	0	5	0	3	8	22
Total Volume	0	0	0	7	7	0	0	0	15	15	0	0	0	20	20	0	12	0	9	21	63
% App. Total	0	0	0	100		0	0	0	100		0	0	0	100		0	57.1	0	42.9		
PHF	.000	.000	.000	.583	.583	.000	.000	.000	.750	.750	.000	.000	.000	.714	.714	.000	.600	.000	.750	.656	.716



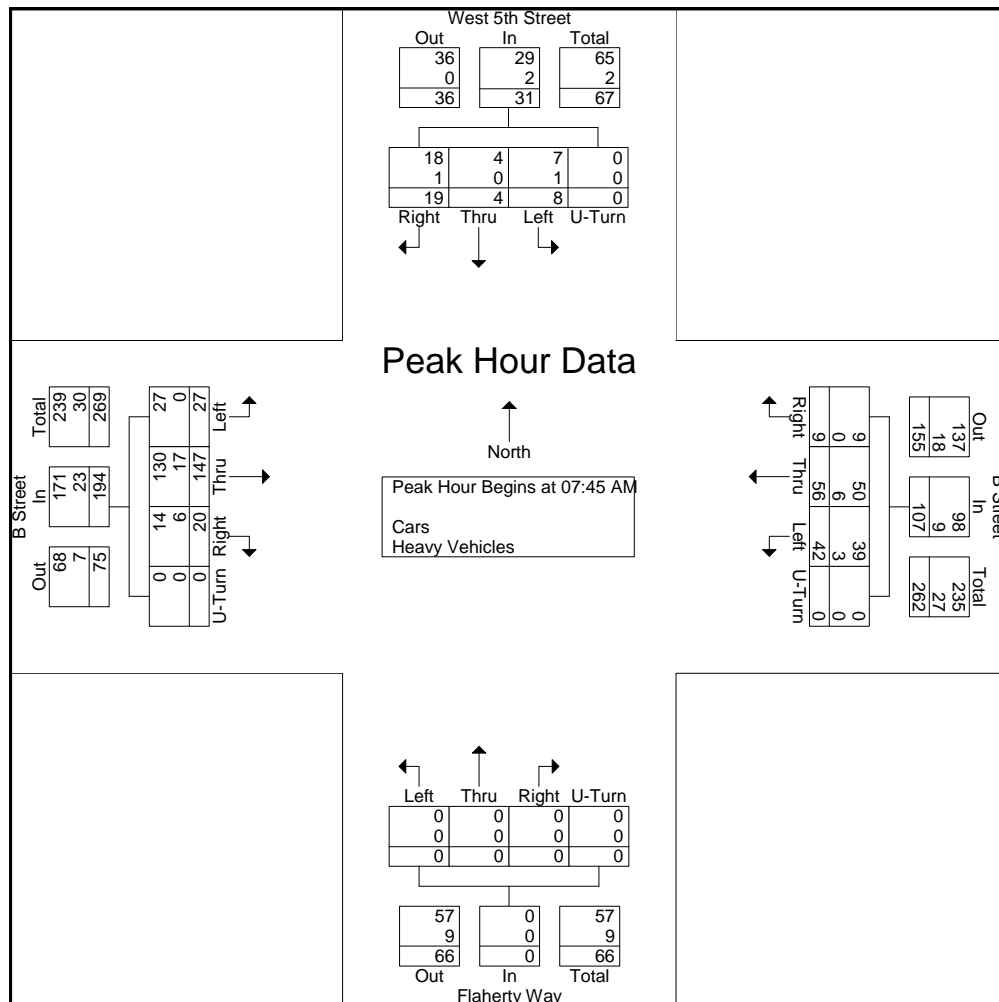
PRECISION  
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Start Date : 6/18/2014  
Page No : 1

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	5	0	4	0	9	3	11	12	0	26	0	0	0	0	0	3	42	10	0	55	90
08:00 AM	1	3	2	0	6	2	18	8	0	28	0	0	0	0	0	5	32	6	0	43	77
08:15 AM	6	1	0	0	7	2	16	9	0	27	0	0	0	0	0	9	31	7	0	47	81
08:30 AM	7	0	2	0	9	2	11	13	0	26	0	0	0	0	0	3	42	4	0	49	84
Total Volume	19	4	8	0	31	9	56	42	0	107	0	0	0	0	0	20	147	27	0	194	332
% App. Total	61.3	12.9	25.8	0		8.4	52.3	39.3	0		0	0	0	0	0	10.3	75.8	13.9	0		
PHF	.679	.333	.500	.000	.861	.750	.778	.808	.000	.955	.000	.000	.000	.000	.000	.556	.875	.675	.000	.882	.922
Cars	18	4	7	0	29	9	50	39	0	98	0	0	0	0	0	14	130	27	0	171	298
% Cars	94.7	100	87.5	0	93.5	100	89.3	92.9	0	91.6	0	0	0	0	0	70.0	88.4	100	0	88.1	89.8
Heavy Vehicles	1	0	1	0	2	0	6	3	0	9	0	0	0	0	0	6	17	0	0	23	34
% Heavy Vehicles	5.3	0	12.5	0	6.5	0	10.7	7.1	0	8.4	0	0	0	0	0	30.0	11.6	0	0	11.9	10.2





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Client: VHB/ P. Dunford

File Name : 143960 DD  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	2	5	3	0	2	22	9	1	0	0	0	0	5	27	2	0	78
04:15 PM	3	1	0	0	2	27	10	0	0	0	0	0	8	21	0	0	72
04:30 PM	7	5	1	0	6	11	11	0	0	0	0	0	3	32	0	0	76
04:45 PM	0	1	2	0	1	17	8	0	0	0	0	0	3	33	0	0	65
Total	12	12	6	0	11	77	38	1	0	0	0	0	19	113	2	0	291
05:00 PM	2	0	0	0	0	22	12	0	0	0	0	0	4	21	0	0	61
05:15 PM	3	1	1	0	1	17	8	1	0	0	0	0	2	16	3	0	53
05:30 PM	0	0	0	1	1	29	14	0	0	0	0	0	7	27	1	0	80
05:45 PM	3	0	0	0	1	20	8	0	0	0	0	0	7	16	0	0	55
Total	8	1	1	1	3	88	42	1	0	0	0	0	20	80	4	0	249
Grand Total	20	13	7	1	14	165	80	2	0	0	0	0	39	193	6	0	540
Apprch %	48.8	31.7	17.1	2.4	5.4	63.2	30.7	0.8	0	0	0	0	16.4	81.1	2.5	0	
Total %	3.7	2.4	1.3	0.2	2.6	30.6	14.8	0.4	0	0	0	0	7.2	35.7	1.1	0	
Cars	19	13	7	1	12	154	78	2	0	0	0	0	38	184	5	0	513
% Cars	95	100	100	100	85.7	93.3	97.5	100	0	0	0	0	97.4	95.3	83.3	0	95
Heavy Vehicles	1	0	0	0	2	11	2	0	0	0	0	0	1	9	1	0	27
% Heavy Vehicles	5	0	0	0	14.3	6.7	2.5	0	0	0	0	0	2.6	4.7	16.7	0	5

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	2	5	3	0	10	2	22	9	1	34	0	0	0	0	0	5	27	2	0	34	78
04:15 PM	3	1	0	0	4	2	27	10	0	39	0	0	0	0	0	8	21	0	0	29	72
04:30 PM	7	5	1	0	13	6	11	11	0	28	0	0	0	0	0	3	32	0	0	35	76
04:45 PM	0	1	2	0	3	1	17	8	0	26	0	0	0	0	0	3	33	0	0	36	65
Total Volume	12	12	6	0	30	11	77	38	1	127	0	0	0	0	0	19	113	2	0	134	291
% App. Total	40	40	20	0		8.7	60.6	29.9	0.8		0	0	0	0		14.2	84.3	1.5	0		
PHF	.429	.600	.500	.000	.577	.458	.713	.864	.250	.814	.000	.000	.000	.000	.000	.594	.856	.250	.000	.931	.933
Cars	11	12	6	0	29	9	69	36	1	115	0	0	0	0	0	19	108	2	0	129	273
% Cars	91.7	100	100	0	96.7	81.8	89.6	94.7	100	90.6	0	0	0	0	0	100	95.6	100	0	96.3	93.8
Heavy Vehicles	1	0	0	0	1	2	8	2	0	12	0	0	0	0	0	0	5	0	0	5	18
% Heavy Vehicles	8.3	0	0	0	3.3	18.2	10.4	5.3	0	9.4	0	0	0	0	0	0	4.4	0	0	3.7	6.2



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N/S: West 5th Street/ Flaherty Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 DD  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	2	5	3	0	1	22	7	1	0	0	0	0	5	23	2	0	71
04:15 PM	2	1	0	0	2	23	10	0	0	0	0	0	8	21	0	0	67
04:30 PM	7	5	1	0	6	11	11	0	0	0	0	0	3	31	0	0	75
04:45 PM	0	1	2	0	0	13	8	0	0	0	0	0	3	33	0	0	60
Total	11	12	6	0	9	69	36	1	0	0	0	0	19	108	2	0	273
05:00 PM	2	0	0	0	0	22	12	0	0	0	0	0	4	19	0	0	59
05:15 PM	3	1	1	0	1	16	8	1	0	0	0	0	2	15	2	0	50
05:30 PM	0	0	0	1	1	29	14	0	0	0	0	0	7	27	1	0	80
05:45 PM	3	0	0	0	1	18	8	0	0	0	0	0	6	15	0	0	51
Total	8	1	1	1	3	85	42	1	0	0	0	0	19	76	3	0	240
Grand Total	19	13	7	1	12	154	78	2	0	0	0	0	38	184	5	0	513
Apprch %	47.5	32.5	17.5	2.5	4.9	62.6	31.7	0.8	0	0	0	0	16.7	81.1	2.2	0	
Total %	3.7	2.5	1.4	0.2	2.3	30	15.2	0.4	0	0	0	0	7.4	35.9	1	0	

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	2	5	3	0	10	1	22	7	1	31	0	0	0	0	0	5	23	2	0	30	71
04:15 PM	2	1	0	0	3	2	23	10	0	35	0	0	0	0	0	8	21	0	0	29	67
04:30 PM	7	5	1	0	13	6	11	11	0	28	0	0	0	0	0	3	31	0	0	34	75
04:45 PM	0	1	2	0	3	0	13	8	0	21	0	0	0	0	0	3	33	0	0	36	60
Total Volume	11	12	6	0	29	9	69	36	1	115	0	0	0	0	0	19	108	2	0	129	273
% App. Total	37.9	41.4	20.7	0		7.8	60	31.3	0.9		0	0	0	0		14.7	83.7	1.6	0		
PHF	.393	.600	.500	.000	.558	.375	.750	.818	.250	.821	.000	.000	.000	.000	.000	.594	.818	.250	.000	.896	.910





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N/S: West 5th Street/ Flaherty Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 DD  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Heavy Vehicles

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	0	0	0	0	1	0	2	0	0	0	0	0	0	4	0	0	7
04:15 PM	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	5
Total	1	0	0	0	2	8	2	0	0	0	0	0	0	5	0	0	18
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	1	1	0	0	4
Total	0	0	0	0	0	3	0	0	0	0	0	0	1	4	1	0	9
Grand Total	1	0	0	0	2	11	2	0	0	0	0	0	1	9	1	0	27
Apprch %	100	0	0	0	13.3	73.3	13.3	0	0	0	0	0	9.1	81.8	9.1	0	
Total %	3.7	0	0	0	7.4	40.7	7.4	0	0	0	0	0	3.7	33.3	3.7	0	

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	0	4	0	0	4	7
04:15 PM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
04:45 PM	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Total Volume	1	0	0	0	1	2	8	2	0	12	0	0	0	0	0	0	5	0	0	5	18
% App. Total	100	0	0	0		16.7	66.7	16.7	0		0	0	0	0		0	100	0	0		
PHF	.250	.000	.000	.000	.250	.500	.500	.250	.000	.600	.000	.000	.000	.000	.000	.000	.313	.000	.000	.313	.643

N/S: West 5th Street/ Flaherty Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 DD  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Peds and Bikes

	West 5th Street From North				B Street From East				Flaherty Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
04:00 PM	0	0	0	5	0	2	0	1	0	1	0	9	0	1	0	4	23
04:15 PM	0	0	0	3	0	0	0	5	0	0	0	6	1	1	0	1	17
04:30 PM	0	0	0	0	0	0	0	4	0	0	1	5	0	0	0	1	11
04:45 PM	0	0	0	6	0	1	2	3	0	0	0	9	0	0	0	1	22
Total	0	0	0	14	0	3	2	13	0	1	1	29	1	2	0	7	73
05:00 PM	0	1	0	9	0	0	0	6	0	0	0	15	0	1	0	3	35
05:15 PM	0	0	0	4	0	0	0	3	0	0	0	9	0	0	0	5	21
05:30 PM	0	0	0	1	0	0	0	0	1	0	0	7	1	0	0	3	13
05:45 PM	0	0	0	5	0	0	1	6	0	0	0	4	0	0	0	0	16
Total	0	1	0	19	0	0	1	15	1	0	0	35	1	1	0	11	85
Grand Total	0	1	0	33	0	3	3	28	1	1	1	64	2	3	0	18	158
Apprch %	0	2.9	0	97.1	0	8.8	8.8	82.4	1.5	1.5	1.5	95.5	8.7	13	0	78.3	
Total %	0	0.6	0	20.9	0	1.9	1.9	17.7	0.6	0.6	0.6	40.5	1.3	1.9	0	11.4	

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	6	6	0	1	2	3	6	0	0	0	9	9	0	0	0	1	1	22
05:00 PM	0	1	0	9	10	0	0	0	6	6	0	0	0	15	15	0	1	0	3	4	35
05:15 PM	0	0	0	4	4	0	0	0	3	3	0	0	0	9	9	0	0	0	5	5	21
05:30 PM	0	0	0	1	1	0	0	0	0	0	1	0	0	7	8	1	0	0	3	4	13
Total Volume	0	1	0	20	21	0	1	2	12	15	1	0	0	40	41	1	1	0	12	14	91
% App. Total	0	4.8	0	95.2		0	6.7	13.3	80		2.4	0	0	97.6		7.1	7.1	0	85.7		
PHF	.000	.250	.000	.556	.525	.000	.250	.250	.500	.625	.250	.000	.000	.667	.683	.250	.250	.000	.600	.700	.650



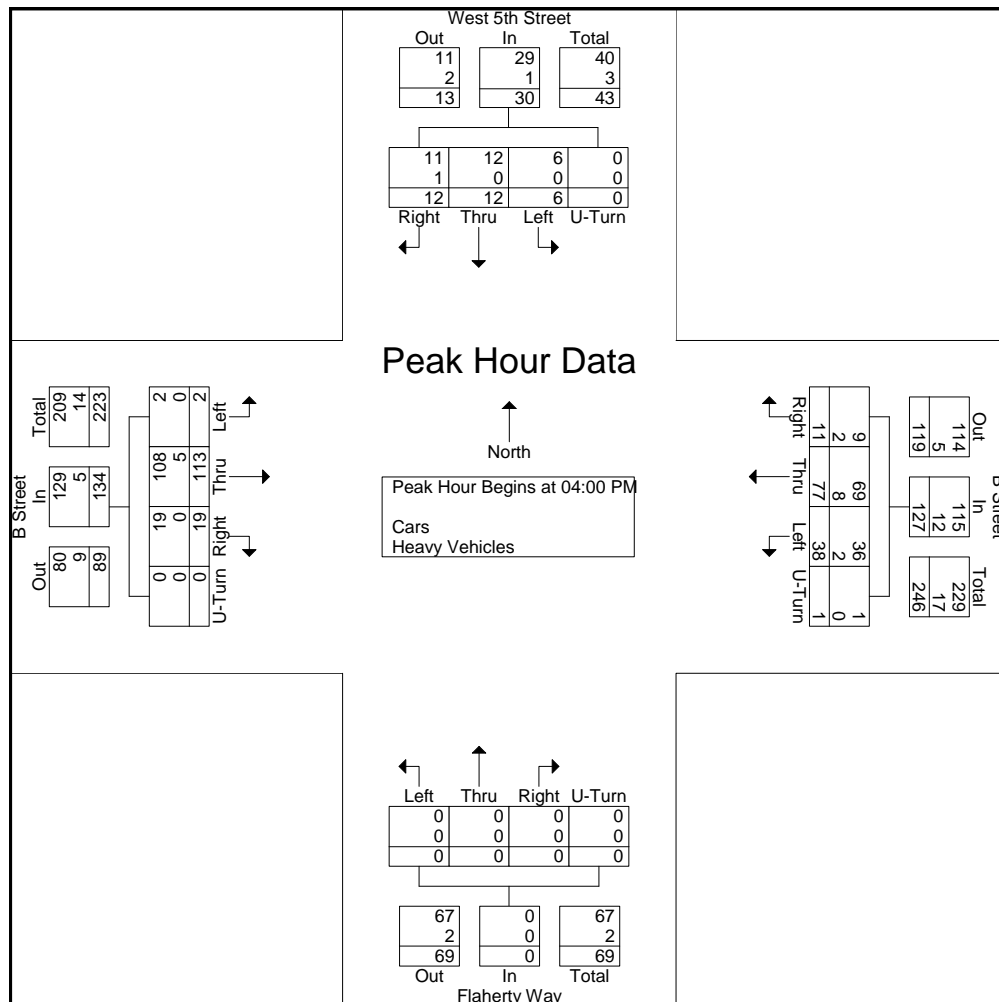
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N/S: West 5th Street/ Flaherty Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 DD  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

	West 5th Street From North					B Street From East					Flaherty Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	2	5	3	0	10	2	22	9	1	34	0	0	0	0	0	5	27	2	0	34	78
04:15 PM	3	1	0	0	4	2	27	10	0	39	0	0	0	0	0	8	21	0	0	29	72
04:30 PM	7	5	1	0	13	6	11	11	0	28	0	0	0	0	0	3	32	0	0	35	76
04:45 PM	0	1	2	0	3	1	17	8	0	26	0	0	0	0	0	3	33	0	0	36	65
Total Volume	12	12	6	0	30	11	77	38	1	127	0	0	0	0	0	19	113	2	0	134	291
% App. Total	40	40	20	0		8.7	60.6	29.9	0.8		0	0	0	0	0	14.2	84.3	1.5	0		
PHF	.429	.600	.500	.000	.577	.458	.713	.864	.250	.814	.000	.000	.000	.000	.000	.594	.856	.250	.000	.931	.933
Cars	11	12	6	0	29	9	69	36	1	115	0	0	0	0	0	19	108	2	0	129	273
% Cars	91.7	100	100	0	96.7	81.8	89.6	94.7	100	90.6	0	0	0	0	0	100	95.6	100	0	96.3	93.8
Heavy Vehicles	1	0	0	0	1	2	8	2	0	12	0	0	0	0	0	0	5	0	0	5	18
% Heavy Vehicles	8.3	0	0	0	3.3	18.2	10.4	5.3	0	9.4	0	0	0	0	0	0	4.4	0	0	3.7	6.2





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E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 E  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	4	0	5	0	19	11	0	0	1	5	1	0	0	13	7	0	66
07:15 AM	15	0	12	0	17	12	0	0	0	7	1	0	0	22	15	0	101
07:30 AM	6	0	9	0	32	15	0	0	0	4	3	0	0	25	11	0	105
07:45 AM	8	0	23	0	28	18	0	0	0	3	3	0	0	29	20	0	132
Total	33	0	49	0	96	56	0	0	1	19	8	0	0	89	53	0	404
08:00 AM	14	0	16	0	37	17	0	0	0	6	0	0	0	23	13	0	126
08:15 AM	15	0	10	0	21	11	0	0	1	6	2	0	0	18	14	0	98
08:30 AM	16	0	11	0	24	11	0	0	1	5	2	0	0	22	22	0	114
08:45 AM	12	0	9	0	24	19	0	0	1	4	2	0	0	34	17	0	122
Total	57	0	46	0	106	58	0	0	3	21	6	0	0	97	66	0	460
Grand Total	90	0	95	0	202	114	0	0	4	40	14	0	0	186	119	0	864
Apprch %	48.6	0	51.4	0	63.9	36.1	0	0	6.9	69	24.1	0	0	61	39	0	
Total %	10.4	0	11	0	23.4	13.2	0	0	0.5	4.6	1.6	0	0	21.5	13.8	0	
Cars	85	0	88	0	196	100	0	0	4	35	13	0	0	171	114	0	806
% Cars	94.4	0	92.6	0	97	87.7	0	0	100	87.5	92.9	0	0	91.9	95.8	0	93.3
Heavy Vehicles	5	0	7	0	6	14	0	0	0	5	1	0	0	15	5	0	58
% Heavy Vehicles	5.6	0	7.4	0	3	12.3	0	0	0	12.5	7.1	0	0	8.1	4.2	0	6.7

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	8	0	23	0	31	28	18	0	0	46	0	3	3	0	6	0	29	20	0	49	132
08:00 AM	14	0	16	0	30	37	17	0	0	54	0	6	0	0	6	0	23	13	0	36	126
08:15 AM	15	0	10	0	25	21	11	0	0	32	1	6	2	0	9	0	18	14	0	32	98
08:30 AM	16	0	11	0	27	24	11	0	0	35	1	5	2	0	8	0	22	22	0	44	114
Total Volume	53	0	60	0	113	110	57	0	0	167	2	20	7	0	29	0	92	69	0	161	470
% App. Total	46.9	0	53.1	0		65.9	34.1	0	0		6.9	69	24.1	0		0	57.1	42.9	0		
PHF	.828	.000	.652	.000	.911	.743	.792	.000	.000	.773	.500	.833	.583	.000	.806	.000	.793	.784	.000	.821	.890
Cars	50	0	57	0	107	107	51	0	0	158	2	16	7	0	25	0	82	66	0	148	438
% Cars	94.3	0	95.0	0	94.7	97.3	89.5	0	0	94.6	100	80.0	100	0	86.2	0	89.1	95.7	0	91.9	93.2
Heavy Vehicles	3	0	3	0	6	3	6	0	0	9	0	4	0	0	4	0	10	3	0	13	32
% Heavy Vehicles	5.7	0	5.0	0	5.3	2.7	10.5	0	0	5.4	0	20.0	0	0	13.8	0	10.9	4.3	0	8.1	6.8

N/S: West 4th Street/Crowley Rogers Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 E  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Cars

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	4	0	4	0	19	8	0	0	1	5	1	0	0	13	7	0	62
07:15 AM	13	0	11	0	16	11	0	0	0	7	1	0	0	19	14	0	92
07:30 AM	6	0	8	0	30	13	0	0	0	4	2	0	0	24	11	0	98
07:45 AM	8	0	22	0	27	15	0	0	0	2	3	0	0	27	19	0	123
Total	31	0	45	0	92	47	0	0	1	18	7	0	0	83	51	0	375
08:00 AM	13	0	15	0	35	15	0	0	0	6	0	0	0	21	12	0	117
08:15 AM	13	0	9	0	21	10	0	0	1	4	2	0	0	13	14	0	87
08:30 AM	16	0	11	0	24	11	0	0	1	4	2	0	0	21	21	0	111
08:45 AM	12	0	8	0	24	17	0	0	1	3	2	0	0	33	16	0	116
Total	54	0	43	0	104	53	0	0	3	17	6	0	0	88	63	0	431
Grand Total	85	0	88	0	196	100	0	0	4	35	13	0	0	171	114	0	806
Apprch %	49.1	0	50.9	0	66.2	33.8	0	0	7.7	67.3	25	0	0	60	40	0	
Total %	10.5	0	10.9	0	24.3	12.4	0	0	0.5	4.3	1.6	0	0	21.2	14.1	0	

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	8	0	22	0	30	27	15	0	0	42	0	2	3	0	5	0	27	19	0	46	123
08:00 AM	13	0	15	0	28	35	15	0	0	50	0	6	0	0	6	0	21	12	0	33	117
08:15 AM	13	0	9	0	22	21	10	0	0	31	1	4	2	0	7	0	13	14	0	27	87
08:30 AM	16	0	11	0	27	24	11	0	0	35	1	4	2	0	7	0	21	21	0	42	111
Total Volume	50	0	57	0	107	107	51	0	0	158	2	16	7	0	25	0	82	66	0	148	438
% App. Total	46.7	0	53.3	0		67.7	32.3	0	0		8	64	28	0		0	55.4	44.6	0		
PHF	.781	.000	.648	.000	.892	.764	.850	.000	.000	.790	.500	.667	.583	.000	.893	.000	.759	.786	.000	.804	.890



N/S: West 4th Street/Crowley Rogers Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 E  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Heavy Vehicles

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	4
07:15 AM	2	0	1	0	1	1	0	0	0	0	0	0	0	3	1	0	9
07:30 AM	0	0	1	0	2	2	0	0	0	0	1	0	0	1	0	0	7
07:45 AM	0	0	1	0	1	3	0	0	0	1	0	0	0	2	1	0	9
Total	2	0	4	0	4	9	0	0	0	1	1	0	0	6	2	0	29
08:00 AM	1	0	1	0	2	2	0	0	0	0	0	0	0	2	1	0	9
08:15 AM	2	0	1	0	0	1	0	0	0	2	0	0	0	5	0	0	11
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	3
08:45 AM	0	0	1	0	0	2	0	0	0	1	0	0	0	1	1	0	6
Total	3	0	3	0	2	5	0	0	0	4	0	0	0	9	3	0	29
Grand Total	5	0	7	0	6	14	0	0	0	5	1	0	0	15	5	0	58
Apprch %	41.7	0	58.3	0	30	70	0	0	0	83.3	16.7	0	0	75	25	0	
Total %	8.6	0	12.1	0	10.3	24.1	0	0	0	8.6	1.7	0	0	25.9	8.6	0	

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	1	0	1	2	2	0	0	4	0	0	1	0	1	0	1	0	0	1	7
07:45 AM	0	0	1	0	1	1	3	0	0	4	0	1	0	0	1	0	2	1	0	3	9
08:00 AM	1	0	1	0	2	2	2	0	0	4	0	0	0	0	0	0	2	1	0	3	9
08:15 AM	2	0	1	0	3	0	1	0	0	1	0	2	0	0	2	0	5	0	0	5	11
Total Volume	3	0	4	0	7	5	8	0	0	13	0	3	1	0	4	0	10	2	0	12	36
% App. Total	42.9	0	57.1	0		38.5	61.5	0	0		0	75	25	0		0	83.3	16.7	0		
PHF	.375	.000	1.00	.000	.583	.625	.667	.000	.000	.813	.000	.375	.250	.000	.500	.000	.500	.500	.000	.600	.818

N/S: West 4th Street/Crowley Rogers Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 E  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Peds and Bikes

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	3	1	0	9	1	0	0	8	0	2	0	5	0	1	2	3	35
07:15 AM	1	0	1	8	0	0	0	7	0	0	0	4	0	2	3	3	29
07:30 AM	0	0	0	4	1	0	0	11	0	1	0	3	0	0	0	3	23
07:45 AM	0	1	0	5	0	0	0	10	1	5	0	3	0	2	0	4	31
Total	4	2	1	26	2	0	0	36	1	8	0	15	0	5	5	13	118
08:00 AM	0	0	1	2	0	0	0	15	0	1	0	11	1	1	2	6	40
08:15 AM	0	0	0	7	0	0	0	21	0	3	0	7	0	1	1	7	47
08:30 AM	0	0	0	1	1	0	0	19	0	2	0	3	0	2	0	5	33
08:45 AM	0	0	0	2	0	1	0	6	0	0	0	4	0	1	2	1	17
Total	0	0	1	12	1	1	0	61	0	6	0	25	1	5	5	19	137
Grand Total	4	2	2	38	3	1	0	97	1	14	0	40	1	10	10	32	255
Apprch %	8.7	4.3	4.3	82.6	3	1	0	96	1.8	25.5	0	72.7	1.9	18.9	18.9	60.4	
Total %	1.6	0.8	0.8	14.9	1.2	0.4	0	38	0.4	5.5	0	15.7	0.4	3.9	3.9	12.5	

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	1	0	5	6	0	0	0	10	10	1	5	0	3	9	0	2	0	4	6	31
08:00 AM	0	0	1	2	3	0	0	0	15	15	0	1	0	11	12	1	1	2	6	10	40
08:15 AM	0	0	0	7	7	0	0	0	21	21	0	3	0	7	10	0	1	1	7	9	47
08:30 AM	0	0	0	1	1	1	0	0	19	20	0	2	0	3	5	0	2	0	5	7	33
Total Volume	0	1	1	15	17	1	0	0	65	66	1	11	0	24	36	1	6	3	22	32	151
% App. Total	0	5.9	5.9	88.2		1.5	0	0	98.5		2.8	30.6	0	66.7		3.1	18.8	9.4	68.8		
PHF	.000	.250	.250	.536	.607	.250	.000	.000	.774	.786	.250	.550	.000	.545	.750	.250	.750	.375	.786	.800	.803



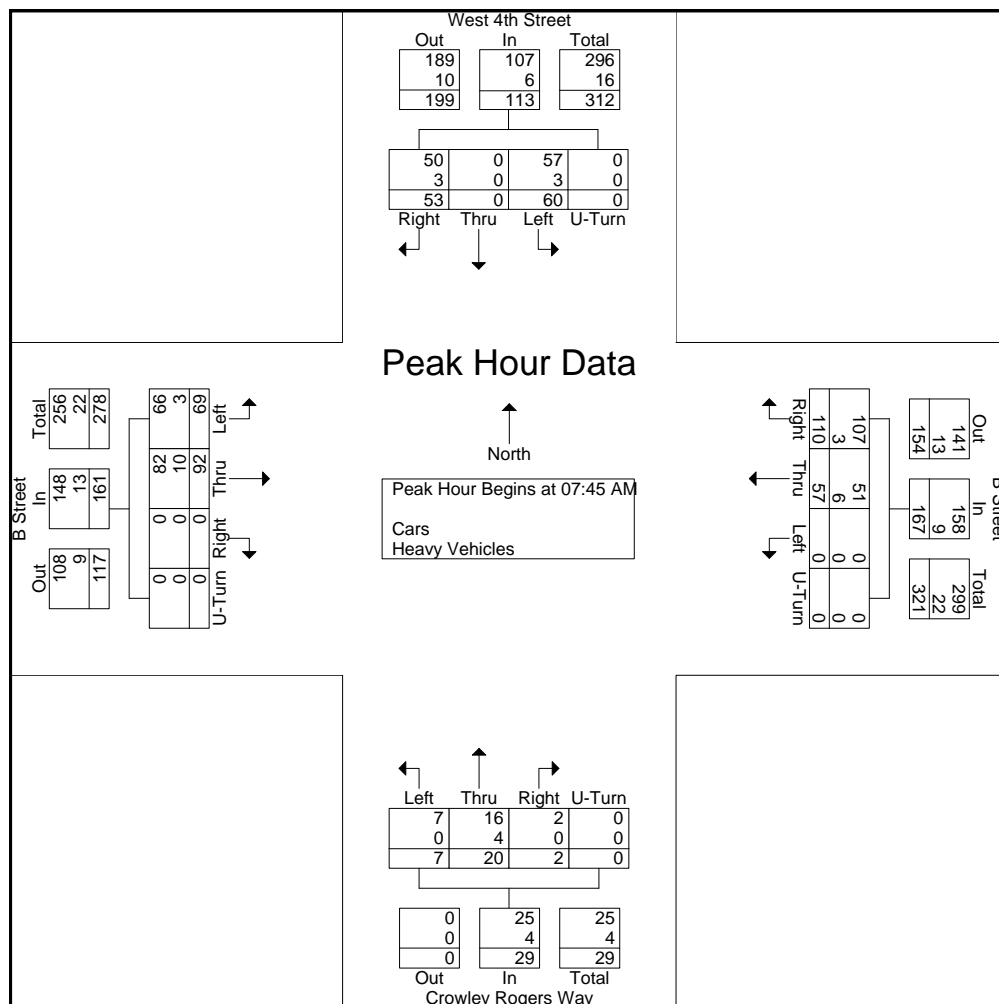
PRECISION  
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N/S: West 4th Street/Crowley Rogers Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 E  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	8	0	23	0	31	28	18	0	0	46	0	3	3	0	6	0	29	20	0	49	132
08:00 AM	14	0	16	0	30	37	17	0	0	54	0	6	0	0	6	0	23	13	0	36	126
08:15 AM	15	0	10	0	25	21	11	0	0	32	1	6	2	0	9	0	18	14	0	32	98
08:30 AM	16	0	11	0	27	24	11	0	0	35	1	5	2	0	8	0	22	22	0	44	114
Total Volume	53	0	60	0	113	110	57	0	0	167	2	20	7	0	29	0	92	69	0	161	470
% App. Total	46.9	0	53.1	0		65.9	34.1	0	0		6.9	69	24.1	0		0	57.1	42.9	0		
PHF	.828	.000	.652	.000	.911	.743	.792	.000	.000	.773	.500	.833	.583	.000	.806	.000	.793	.784	.000	.821	.890
Cars	50	0	57	0	107	107	51	0	0	158	2	16	7	0	25	0	82	66	0	148	438
% Cars	94.3	0	95.0	0	94.7	97.3	89.5	0	0	94.6	100	80.0	100	0	86.2	0	89.1	95.7	0	91.9	93.2
Heavy Vehicles	3	0	3	0	6	3	6	0	0	9	0	4	0	0	4	0	10	3	0	13	32
% Heavy Vehicles	5.7	0	5.0	0	5.3	2.7	10.5	0	0	5.4	0	20.0	0	0	13.8	0	10.9	4.3	0	8.1	6.8





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N/S: West 4th Street/Crowley Rogers Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 EE  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	22	0	18	0	8	11	0	0	1	2	2	0	0	22	10	0	96
04:15 PM	17	0	10	0	12	24	0	1	1	10	1	0	0	17	6	0	99
04:30 PM	19	0	14	0	7	7	0	1	0	6	2	0	0	24	7	1	88
04:45 PM	8	0	8	0	7	17	0	0	2	6	1	0	0	25	11	0	85
Total	66	0	50	0	34	59	0	2	4	24	6	0	0	88	34	1	368
05:00 PM	14	0	6	0	5	17	0	0	1	3	2	0	0	13	7	0	68
05:15 PM	17	0	15	0	19	9	0	0	1	3	1	0	0	14	3	1	83
05:30 PM	17	0	13	0	11	23	0	0	0	5	4	0	0	22	5	0	100
05:45 PM	13	0	17	0	9	15	0	0	0	5	0	0	0	11	4	0	74
Total	61	0	51	0	44	64	0	0	2	16	7	0	0	60	19	1	325
Grand Total	127	0	101	0	78	123	0	2	6	40	13	0	0	148	53	2	693
Apprch %	55.7	0	44.3	0	38.4	60.6	0	1	10.2	67.8	22	0	0	72.9	26.1	1	
Total %	18.3	0	14.6	0	11.3	17.7	0	0.3	0.9	5.8	1.9	0	0	21.4	7.6	0.3	
Cars	123	0	97	0	77	112	0	2	6	39	13	0	0	142	50	2	663
% Cars	96.9	0	96	0	98.7	91.1	0	100	100	97.5	100	0	0	95.9	94.3	100	95.7
Heavy Vehicles	4	0	4	0	1	11	0	0	0	1	0	0	0	6	3	0	30
% Heavy Vehicles	3.1	0	4	0	1.3	8.9	0	0	0	2.5	0	0	0	4.1	5.7	0	4.3

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					Int. Total
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	22	0	18	0	40	8	11	0	0	19	1	2	2	0	5	0	22	10	0	32	96
04:15 PM	17	0	10	0	27	12	24	0	1	37	1	10	1	0	12	0	17	6	0	23	99
04:30 PM	19	0	14	0	33	7	7	0	1	15	0	6	2	0	8	0	24	7	1	32	88
04:45 PM	8	0	8	0	16	7	17	0	0	24	2	6	1	0	9	0	25	11	0	36	85
Total Volume	66	0	50	0	116	34	59	0	2	95	4	24	6	0	34	0	88	34	1	123	368
% App. Total	56.9	0	43.1	0		35.8	62.1	0	2.1		11.8	70.6	17.6	0		0	71.5	27.6	0.8		
PHF	.750	.000	.694	.000	.725	.708	.615	.000	.500	.642	.500	.600	.750	.000	.708	.000	.880	.773	.250	.854	.929
Cars	62	0	48	0	110	34	51	0	2	87	4	23	6	0	33	0	85	32	1	118	348
% Cars	93.9	0	96.0	0	94.8	100	86.4	0	100	91.6	100	95.8	100	0	97.1	0	96.6	94.1	100	95.9	94.6
Heavy Vehicles	4	0	2	0	6	0	8	0	0	8	0	1	0	0	1	0	3	2	0	5	20
% Heavy Vehicles	6.1	0	4.0	0	5.2	0	13.6	0	0	8.4	0	4.2	0	0	2.9	0	3.4	5.9	0	4.1	5.4

N/S: West 4th Street/Crowley Rogers Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 EE  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Cars

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	19	0	18	0	8	11	0	0	1	1	2	0	0	19	9	0	88
04:15 PM	16	0	9	0	12	21	0	1	1	10	1	0	0	17	6	0	94
04:30 PM	19	0	13	0	7	7	0	1	0	6	2	0	0	24	6	1	86
04:45 PM	8	0	8	0	7	12	0	0	2	6	1	0	0	25	11	0	80
Total	62	0	48	0	34	51	0	2	4	23	6	0	0	85	32	1	348
05:00 PM	14	0	6	0	5	17	0	0	1	3	2	0	0	12	6	0	66
05:15 PM	17	0	14	0	18	8	0	0	1	3	1	0	0	13	3	1	79
05:30 PM	17	0	13	0	11	23	0	0	0	5	4	0	0	22	5	0	100
05:45 PM	13	0	16	0	9	13	0	0	0	5	0	0	0	10	4	0	70
Total	61	0	49	0	43	61	0	0	2	16	7	0	0	57	18	1	315
Grand Total	123	0	97	0	77	112	0	2	6	39	13	0	0	142	50	2	663
Apprch %	55.9	0	44.1	0	40.3	58.6	0	1	10.3	67.2	22.4	0	0	73.2	25.8	1	
Total %	18.6	0	14.6	0	11.6	16.9	0	0.3	0.9	5.9	2	0	0	21.4	7.5	0.3	

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	19	0	18	0	37	8	11	0	0	19	1	1	2	0	4	0	19	9	0	28	88
04:15 PM	16	0	9	0	25	12	21	0	1	34	1	10	1	0	12	0	17	6	0	23	94
04:30 PM	19	0	13	0	32	7	7	0	1	15	0	6	2	0	8	0	24	6	1	31	86
04:45 PM	8	0	8	0	16	7	12	0	0	19	2	6	1	0	9	0	25	11	0	36	80
Total Volume	62	0	48	0	110	34	51	0	2	87	4	23	6	0	33	0	85	32	1	118	348
% App. Total	56.4	0	43.6	0		39.1	58.6	0	2.3		12.1	69.7	18.2	0		0	72	27.1	0.8		
PHF	.816	.000	.667	.000	.743	.708	.607	.000	.500	.640	.500	.575	.750	.000	.688	.000	.850	.727	.250	.819	.926



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N/S: West 4th Street/Crowley Rogers Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 EE  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Heavy Vehicles

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	3	0	0	0	0	0	0	0	0	1	0	0	0	3	1	0	8
04:15 PM	1	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
04:45 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Total	4	0	2	0	0	8	0	0	0	1	0	0	0	3	2	0	20
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2
05:15 PM	0	0	1	0	1	1	0	0	0	0	0	0	0	1	0	0	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	1	0	0	2	0	0	0	0	0	0	0	1	0	0	4
Total	0	0	2	0	1	3	0	0	0	0	0	0	0	3	1	0	10
Grand Total	4	0	4	0	1	11	0	0	0	1	0	0	0	6	3	0	30
Apprch %	50	0	50	0	8.3	91.7	0	0	0	100	0	0	0	66.7	33.3	0	
Total %	13.3	0	13.3	0	3.3	36.7	0	0	0	3.3	0	0	0	20	10	0	

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	3	0	0	0	3	0	0	0	0	0	0	1	0	0	1	0	3	1	0	4	8
04:15 PM	1	0	1	0	2	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Total Volume	4	0	2	0	6	0	8	0	0	8	0	1	0	0	1	0	3	2	0	5	20
% App. Total	66.7	0	33.3	0		0	100	0	0		0	100	0	0		0	60	40	0		
PHF	.333	.000	.500	.000	.500	.000	.400	.000	.000	.400	.000	.250	.000	.000	.250	.000	.250	.500	.000	.313	.625



N/S: West 4th Street/Crowley Rogers Way  
 E/W: B Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 EE  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Peds and Bikes

	West 4th Street From North				B Street From East				Crowley Rogers Way From South				B Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
04:00 PM	1	1	1	4	1	1	0	6	0	0	0	5	0	1	0	3	24
04:15 PM	0	0	1	1	1	0	0	10	0	1	0	6	0	1	0	2	23
04:30 PM	1	0	0	3	0	0	0	5	0	0	0	4	0	1	0	2	16
04:45 PM	2	2	0	13	0	0	0	11	0	0	0	9	0	0	0	8	45
Total	4	3	2	21	2	1	0	32	0	1	0	24	0	3	0	15	108
05:00 PM	0	0	0	3	1	0	0	14	0	0	0	5	0	0	1	4	28
05:15 PM	0	1	0	12	2	0	0	19	0	1	0	7	0	0	0	7	49
05:30 PM	0	1	0	6	0	0	0	18	0	0	0	6	0	0	0	2	33
05:45 PM	1	2	0	11	0	0	0	5	0	0	0	4	0	0	0	6	29
Total	1	4	0	32	3	0	0	56	0	1	0	22	0	0	1	19	139
Grand Total	5	7	2	53	5	1	0	88	0	2	0	46	0	3	1	34	247
Apprch %	7.5	10.4	3	79.1	5.3	1.1	0	93.6	0	4.2	0	95.8	0	7.9	2.6	89.5	
Total %	2	2.8	0.8	21.5	2	0.4	0	35.6	0	0.8	0	18.6	0	1.2	0.4	13.8	

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	2	2	0	13	17	0	0	0	11	11	0	0	0	9	9	0	0	0	8	8	45
05:00 PM	0	0	0	3	3	1	0	0	14	15	0	0	0	5	5	0	0	1	4	5	28
05:15 PM	0	1	0	12	13	2	0	0	19	21	0	1	0	7	8	0	0	0	7	7	49
05:30 PM	0	1	0	6	7	0	0	0	18	18	0	0	0	6	6	0	0	0	2	2	33
Total Volume	2	4	0	34	40	3	0	0	62	65	0	1	0	27	28	0	0	1	21	22	155
% App. Total	5	10	0	85		4.6	0	0	95.4		0	3.6	0	96.4		0	0	4.5	95.5		
PHF	.250	.500	.000	.654	.588	.375	.000	.000	.816	.774	.000	.250	.000	.750	.778	.000	.000	.250	.656	.688	.791



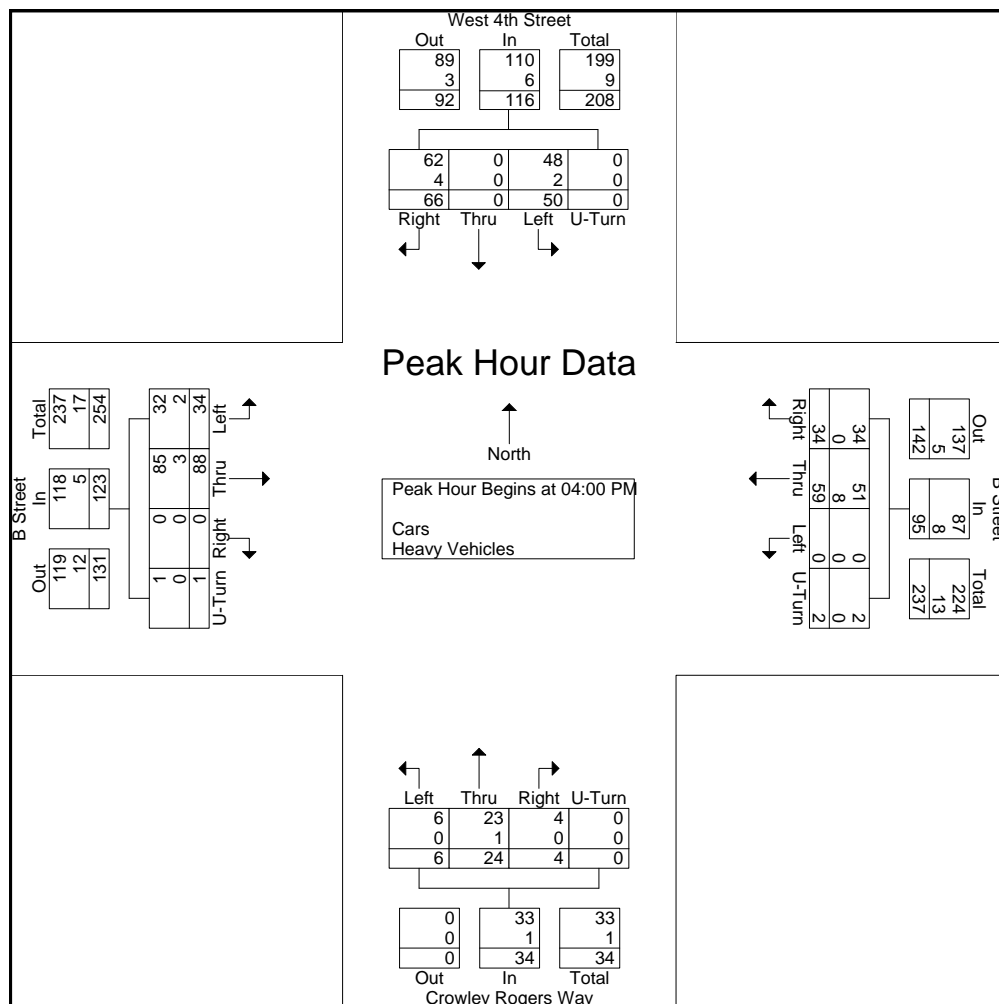
PRECISION  
D A T A  
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503  
Office: 508.481.3999 Fax: 508.545.1234  
Email: datarequests@pdillc.com

N/S: West 4th Street/Crowley Rogers Way  
E/W: B Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 EE  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

	West 4th Street From North					B Street From East					Crowley Rogers Way From South					B Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	22	0	18	0	40	8	11	0	0	19	1	2	2	0	5	0	22	10	0	32	96
04:15 PM	17	0	10	0	27	12	24	0	1	37	1	10	1	0	12	0	17	6	0	23	99
04:30 PM	19	0	14	0	33	7	7	0	1	15	0	6	2	0	8	0	24	7	1	32	88
04:45 PM	8	0	8	0	16	7	17	0	0	24	2	6	1	0	9	0	25	11	0	36	85
Total Volume	66	0	50	0	116	34	59	0	2	95	4	24	6	0	34	0	88	34	1	123	368
% App. Total	56.9	0	43.1	0		35.8	62.1	0	2.1		11.8	70.6	17.6	0		0	71.5	27.6	0.8		
PHF	.750	.000	.694	.000	.725	.708	.615	.000	.500	.642	.500	.600	.750	.000	.708	.000	.880	.773	.250	.854	.929
Cars	62	0	48	0	110	34	51	0	2	87	4	23	6	0	33	0	85	32	1	118	348
% Cars	93.9	0	96.0	0	94.8	100	86.4	0	100	91.6	100	95.8	100	0	97.1	0	96.6	94.1	100	95.9	94.6
Heavy Vehicles	4	0	2	0	6	0	8	0	0	8	0	1	0	0	1	0	3	2	0	5	20
% Heavy Vehicles	6.1	0	4.0	0	5.2	0	13.6	0	0	8.4	0	4.2	0	0	2.9	0	3.4	5.9	0	4.1	5.4





PRECISION  
D A T A  
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503  
Office: 508.481.3999 Fax: 508.545.1234  
Email: datarequests@pdillc.com

N/S: Dorchester Avenue  
E/W: West 4th Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 F  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	40	52	7	0	2	71	1	0	0	156	113	0	16	22	8	0	488
07:15 AM	33	47	5	0	2	75	1	0	0	145	148	0	15	36	11	0	518
07:30 AM	31	39	4	0	3	84	0	0	2	173	128	0	18	24	14	0	520
07:45 AM	40	62	11	0	7	80	0	0	0	184	147	0	19	41	8	0	599
Total	144	200	27	0	14	310	2	0	2	658	536	0	68	123	41	0	2125
08:00 AM	44	56	8	0	7	102	2	0	2	172	131	0	26	40	13	0	603
08:15 AM	42	61	7	0	7	76	2	0	2	178	122	0	18	32	9	0	556
08:30 AM	28	63	11	1	9	101	1	0	2	140	120	0	27	26	13	0	542
08:45 AM	23	58	15	0	9	70	2	0	0	139	121	0	26	28	7	0	498
Total	137	238	41	1	32	349	7	0	6	629	494	0	97	126	42	0	2199
Grand Total	281	438	68	1	46	659	9	0	8	1287	1030	0	165	249	83	0	4324
Apprch %	35.7	55.6	8.6	0.1	6.4	92.3	1.3	0	0.3	55.4	44.3	0	33.2	50.1	16.7	0	
Total %	6.5	10.1	1.6	0	1.1	15.2	0.2	0	0.2	29.8	23.8	0	3.8	5.8	1.9	0	
Cars	213	402	65	1	45	611	9	0	8	1185	975	0	149	233	64	0	3960
% Cars	75.8	91.8	95.6	100	97.8	92.7	100	0	100	92.1	94.7	0	90.3	93.6	77.1	0	91.6
Heavy Vehicles	68	36	3	0	1	48	0	0	0	102	55	0	16	16	19	0	364
% Heavy Vehicles	24.2	8.2	4.4	0	2.2	7.3	0	0	0	7.9	5.3	0	9.7	6.4	22.9	0	8.4

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	40	62	11	0	113	7	80	0	0	87	0	184	147	0	331	19	41	8	0	68	599
08:00 AM	44	56	8	0	108	7	102	2	0	111	2	172	131	0	305	26	40	13	0	79	603
08:15 AM	42	61	7	0	110	7	76	2	0	85	2	178	122	0	302	18	32	9	0	59	556
08:30 AM	28	63	11	1	103	9	101	1	0	111	2	140	120	0	262	27	26	13	0	66	542
Total Volume	154	242	37	1	434	30	359	5	0	394	6	674	520	0	1200	90	139	43	0	272	2300
% App. Total	35.5	55.8	8.5	0.2		7.6	91.1	1.3	0		0.5	56.2	43.3	0		33.1	51.1	15.8	0		
PHF	.875	.960	.841	.250	.960	.833	.880	.625	.000	.887	.750	.916	.884	.000	.906	.833	.848	.827	.000	.861	.954
Cars	119	223	35	1	378	30	338	5	0	373	6	623	493	0	1122	78	133	34	0	245	2118
% Cars	77.3	92.1	94.6	100	87.1	100	94.2	100	0	94.7	100	92.4	94.8	0	93.5	86.7	95.7	79.1	0	90.1	92.1
Heavy Vehicles	35	19	2	0	56	0	21	0	0	21	0	51	27	0	78	12	6	9	0	27	182
% Heavy Vehicles	22.7	7.9	5.4	0	12.9	0	5.8	0	0	5.3	0	7.6	5.2	0	6.5	13.3	4.3	20.9	0	9.9	7.9

N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 F  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Cars

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	28	49	7	0	2	64	1	0	0	144	108	0	15	17	5	0	440
07:15 AM	25	41	4	0	2	65	1	0	0	134	139	0	14	34	8	0	467
07:30 AM	22	33	4	0	3	79	0	0	2	160	122	0	17	23	11	0	476
07:45 AM	28	59	11	0	7	76	0	0	0	171	144	0	16	39	5	0	556
Total	103	182	26	0	14	284	2	0	2	609	513	0	62	113	29	0	1939
08:00 AM	38	52	8	0	7	93	2	0	2	161	122	0	21	38	11	0	555
08:15 AM	35	57	5	0	7	73	2	0	2	162	114	0	17	30	8	0	512
08:30 AM	18	55	11	1	9	96	1	0	2	129	113	0	24	26	10	0	495
08:45 AM	19	56	15	0	8	65	2	0	0	124	113	0	25	26	6	0	459
Total	110	220	39	1	31	327	7	0	6	576	462	0	87	120	35	0	2021
Grand Total	213	402	65	1	45	611	9	0	8	1185	975	0	149	233	64	0	3960
Apprch %	31.3	59	9.5	0.1	6.8	91.9	1.4	0	0.4	54.7	45	0	33.4	52.2	14.3	0	
Total %	5.4	10.2	1.6	0	1.1	15.4	0.2	0	0.2	29.9	24.6	0	3.8	5.9	1.6	0	

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	28	59	11	0	98	7	76	0	0	83	0	171	144	0	315	16	39	5	0	60	556
08:00 AM	38	52	8	0	98	7	93	2	0	102	2	161	122	0	285	21	38	11	0	70	555
08:15 AM	35	57	5	0	97	7	73	2	0	82	2	162	114	0	278	17	30	8	0	55	512
08:30 AM	18	55	11	1	85	9	96	1	0	106	2	129	113	0	244	24	26	10	0	60	495
Total Volume	119	223	35	1	378	30	338	5	0	373	6	623	493	0	1122	78	133	34	0	245	2118
% App. Total	31.5	59	9.3	0.3		8	90.6	1.3	0		0.5	55.5	43.9	0		31.8	54.3	13.9	0		
PHF	.783	.945	.795	.250	.964	.833	.880	.625	.000	.880	.750	.911	.856	.000	.890	.813	.853	.773	.000	.875	.952

N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 F  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Heavy Vehicles

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
07:00 AM	12	3	0	0	0	7	0	0	0	12	5	0	1	5	3	0	48
07:15 AM	8	6	1	0	0	10	0	0	0	11	9	0	1	2	3	0	51
07:30 AM	9	6	0	0	0	5	0	0	0	13	6	0	1	1	3	0	44
07:45 AM	12	3	0	0	0	4	0	0	0	13	3	0	3	2	3	0	43
Total	41	18	1	0	0	26	0	0	0	49	23	0	6	10	12	0	186
08:00 AM	6	4	0	0	0	9	0	0	0	11	9	0	5	2	2	0	48
08:15 AM	7	4	2	0	0	3	0	0	0	16	8	0	1	2	1	0	44
08:30 AM	10	8	0	0	0	5	0	0	0	11	7	0	3	0	3	0	47
08:45 AM	4	2	0	0	1	5	0	0	0	15	8	0	1	2	1	0	39
Total	27	18	2	0	1	22	0	0	0	53	32	0	10	6	7	0	178
Grand Total	68	36	3	0	1	48	0	0	0	102	55	0	16	16	19	0	364
Apprch %	63.6	33.6	2.8	0	2	98	0	0	0	65	35	0	31.4	31.4	37.3	0	
Total %	18.7	9.9	0.8	0	0.3	13.2	0	0	0	28	15.1	0	4.4	4.4	5.2	0	

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	12	3	0	0	15	0	7	0	0	7	0	12	5	0	17	1	5	3	0	9	48
07:15 AM	8	6	1	0	15	0	10	0	0	10	0	11	9	0	20	1	2	3	0	6	51
07:30 AM	9	6	0	0	15	0	5	0	0	5	0	13	6	0	19	1	1	3	0	5	44
07:45 AM	12	3	0	0	15	0	4	0	0	4	0	13	3	0	16	3	2	3	0	8	43
Total Volume	41	18	1	0	60	0	26	0	0	26	0	49	23	0	72	6	10	12	0	28	186
% App. Total	68.3	30	1.7	0		0	100	0	0		0	68.1	31.9	0		21.4	35.7	42.9	0		
PHF	.854	.750	.250	.000	1.00	.000	.650	.000	.000	.650	.000	.942	.639	.000	.900	.500	.500	1.00	.000	.778	.912

N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 F  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Peds and Bikes

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	10	0	3	0	19	0	0	0	5	1	2	0	6	46
07:15 AM	0	0	0	6	0	2	0	10	0	1	2	1	0	1	0	5	28
07:30 AM	0	0	0	5	0	2	0	29	0	0	2	11	0	0	0	3	52
07:45 AM	0	0	1	3	0	4	0	26	0	4	2	6	0	4	0	5	55
Total	0	0	1	24	0	11	0	84	0	5	6	23	1	7	0	19	181
08:00 AM	0	0	0	17	0	2	0	21	0	1	0	9	0	4	0	3	57
08:15 AM	0	0	0	12	0	1	0	19	0	2	0	6	0	2	0	6	48
08:30 AM	0	1	0	16	0	1	0	24	0	2	1	8	0	2	0	2	57
08:45 AM	0	2	0	12	0	1	0	20	0	3	0	6	1	3	0	5	53
Total	0	3	0	57	0	5	0	84	0	8	1	29	1	11	0	16	215
Grand Total	0	3	1	81	0	16	0	168	0	13	7	52	2	18	0	35	396
Apprch %	0	3.5	1.2	95.3	0	8.7	0	91.3	0	18.1	9.7	72.2	3.6	32.7	0	63.6	
Total %	0	0.8	0.3	20.5	0	4	0	42.4	0	3.3	1.8	13.1	0.5	4.5	0	8.8	

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	1	3	4	0	4	0	26	30	0	4	2	6	12	0	4	0	5	9	55
08:00 AM	0	0	0	17	17	0	2	0	21	23	0	1	0	9	10	0	4	0	3	7	57
08:15 AM	0	0	0	12	12	0	1	0	19	20	0	2	0	6	8	0	2	0	6	8	48
08:30 AM	0	1	0	16	17	0	1	0	24	25	0	2	1	8	11	0	2	0	2	4	57
Total Volume	0	1	1	48	50	0	8	0	90	98	0	9	3	29	41	0	12	0	16	28	217
% App. Total	0	2	2	96		0	8.2	0	91.8		0	22	7.3	70.7		0	42.9	0	57.1		
PHF	.000	.250	.250	.706	.735	.000	.500	.000	.865	.817	.000	.563	.375	.806	.854	.000	.750	.000	.667	.778	.952

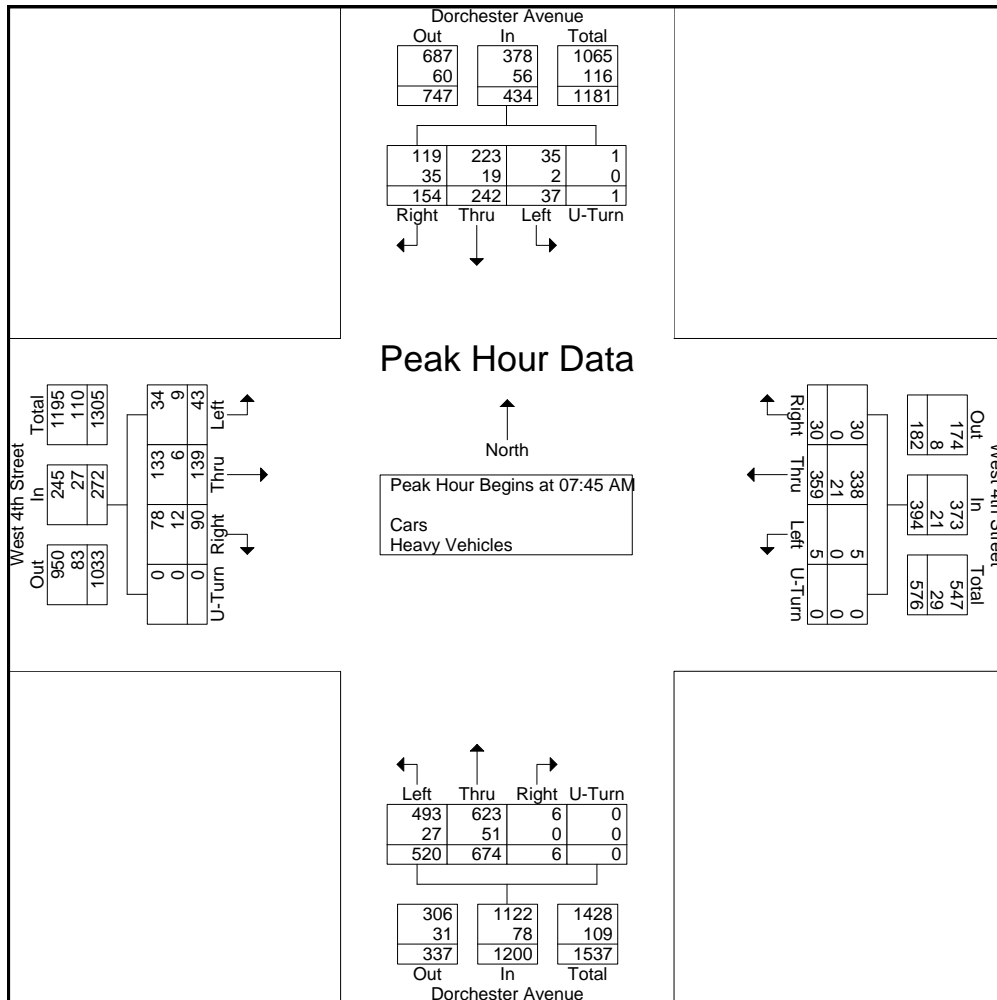


N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 F  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	40	62	11	0	113	7	80	0	0	87	0	184	147	0	331	19	41	8	0	68	599
08:00 AM	44	56	8	0	108	7	102	2	0	111	2	172	131	0	305	26	40	13	0	79	603
08:15 AM	42	61	7	0	110	7	76	2	0	85	2	178	122	0	302	18	32	9	0	59	556
08:30 AM	28	63	11	1	103	9	101	1	0	111	2	140	120	0	262	27	26	13	0	66	542
Total Volume	154	242	37	1	434	30	359	5	0	394	6	674	520	0	1200	90	139	43	0	272	2300
% App. Total	35.5	55.8	8.5	0.2		7.6	91.1	1.3	0		0.5	56.2	43.3	0		33.1	51.1	15.8	0		
PHF	.875	.960	.841	.250	.960	.833	.880	.625	.000	.887	.750	.916	.884	.000	.906	.833	.848	.827	.000	.861	.954
Cars	119	223	35	1	378	30	338	5	0	373	6	623	493	0	1122	78	133	34	0	245	2118
% Cars	77.3	92.1	94.6	100	87.1	100	94.2	100	0	94.7	100	92.4	94.8	0	93.5	86.7	95.7	79.1	0	90.1	92.1
Heavy Vehicles	35	19	2	0	56	0	21	0	0	21	0	51	27	0	78	12	6	9	0	27	182
% Heavy Vehicles	22.7	7.9	5.4	0	12.9	0	5.8	0	0	5.3	0	7.6	5.2	0	6.5	13.3	4.3	20.9	0	9.9	7.9





PRECISION  
D A T A  
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503  
Office: 508.481.3999 Fax: 508.545.1234  
Email: datarequests@pdillc.com

N/S: Dorchester Avenue  
E/W: West 4th Street  
City, State: South Boston, MA  
Client: VHB/ P. Dunford

File Name : 143960 FF  
Site Code : 81983.14  
Start Date : 6/18/2014  
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	34	140	9	0	4	52	1	0	1	81	55	0	59	59	16	0	511
04:15 PM	38	143	10	0	4	70	1	0	4	98	68	0	69	45	9	0	559
04:30 PM	42	140	6	0	4	62	0	0	2	92	70	0	54	57	16	0	545
04:45 PM	34	146	6	0	4	69	1	0	1	85	67	1	53	40	8	0	515
Total	148	569	31	0	16	253	3	0	8	356	260	1	235	201	49	0	2130
05:00 PM	42	127	9	1	5	84	0	0	3	105	80	0	47	44	8	0	555
05:15 PM	47	155	10	1	0	87	1	0	2	105	68	0	49	46	12	0	583
05:30 PM	52	151	11	0	3	75	1	0	2	76	76	0	44	50	14	0	555
05:45 PM	54	161	11	0	2	82	6	0	1	80	73	1	33	49	10	0	563
Total	195	594	41	2	10	328	8	0	8	366	297	1	173	189	44	0	2256
Grand Total	343	1163	72	2	26	581	11	0	16	722	557	2	408	390	93	0	4386
Apprch %	21.7	73.6	4.6	0.1	4.2	94	1.8	0	1.2	55.7	42.9	0.2	45.8	43.8	10.4	0	
Total %	7.8	26.5	1.6	0	0.6	13.2	0.3	0	0.4	16.5	12.7	0	9.3	8.9	2.1	0	
Cars	307	1133	69	2	26	572	11	0	15	680	532	2	387	376	78	0	4190
% Cars	89.5	97.4	95.8	100	100	98.5	100	0	93.8	94.2	95.5	100	94.9	96.4	83.9	0	95.5
Heavy Vehicles	36	30	3	0	0	9	0	0	1	42	25	0	21	14	15	0	196
% Heavy Vehicles	10.5	2.6	4.2	0	0	1.5	0	0	6.2	5.8	4.5	0	5.1	3.6	16.1	0	4.5

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	42	127	9	1	179	5	84	0	0	89	3	105	80	0	188	47	44	8	0	99	555
05:15 PM	47	155	10	1	213	0	87	1	0	88	2	105	68	0	175	49	46	12	0	107	583
05:30 PM	52	151	11	0	214	3	75	1	0	79	2	76	76	0	154	44	50	14	0	108	555
05:45 PM	54	161	11	0	226	2	82	6	0	90	1	80	73	1	155	33	49	10	0	92	563
Total Volume	195	594	41	2	832	10	328	8	0	346	8	366	297	1	672	173	189	44	0	406	2256
% App. Total	23.4	71.4	4.9	0.2		2.9	94.8	2.3	0		1.2	54.5	44.2	0.1		42.6	46.6	10.8	0		
PHF	.903	.922	.932	.500	.920	.500	.943	.333	.000	.961	.667	.871	.928	.250	.894	.883	.945	.786	.000	.940	.967
Cars	176	576	41	2	795	10	323	8	0	341	8	349	289	1	647	167	184	40	0	391	2174
% Cars	90.3	97.0	100	100	95.6	100	98.5	100	0	98.6	100	95.4	97.3	100	96.3	96.5	97.4	90.9	0	96.3	96.4
Heavy Vehicles	19	18	0	0	37	0	5	0	0	5	0	17	8	0	25	6	5	4	0	15	82
% Heavy Vehicles	9.7	3.0	0	0	4.4	0	1.5	0	0	1.4	0	4.6	2.7	0	3.7	3.5	2.6	9.1	0	3.7	3.6

N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 FF  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Cars

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	31	137	8	0	4	50	1	0	1	73	51	0	57	57	12	0	482
04:15 PM	33	141	9	0	4	70	1	0	4	91	66	0	64	42	8	0	533
04:30 PM	37	137	5	0	4	61	0	0	1	87	64	0	53	56	11	0	516
04:45 PM	30	142	6	0	4	68	1	0	1	80	62	1	46	37	7	0	485
Total	131	557	28	0	16	249	3	0	7	331	243	1	220	192	38	0	2016
05:00 PM	38	123	9	1	5	83	0	0	3	102	79	0	46	42	7	0	538
05:15 PM	43	150	10	1	0	84	1	0	2	101	65	0	48	46	11	0	562
05:30 PM	45	147	11	0	3	74	1	0	2	73	75	0	40	48	12	0	531
05:45 PM	50	156	11	0	2	82	6	0	1	73	70	1	33	48	10	0	543
Total	176	576	41	2	10	323	8	0	8	349	289	1	167	184	40	0	2174
Grand Total	307	1133	69	2	26	572	11	0	15	680	532	2	387	376	78	0	4190
Apprch %	20.3	75	4.6	0.1	4.3	93.9	1.8	0	1.2	55.3	43.3	0.2	46	44.7	9.3	0	
Total %	7.3	27	1.6	0	0.6	13.7	0.3	0	0.4	16.2	12.7	0	9.2	9	1.9	0	

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	38	123	9	1	171	5	83	0	0	88	3	102	79	0	184	46	42	7	0	95	538
05:15 PM	43	150	10	1	204	0	84	1	0	85	2	101	65	0	168	48	46	11	0	105	562
05:30 PM	45	147	11	0	203	3	74	1	0	78	2	73	75	0	150	40	48	12	0	100	531
05:45 PM	50	156	11	0	217	2	82	6	0	90	1	73	70	1	145	33	48	10	0	91	543
Total Volume	176	576	41	2	795	10	323	8	0	341	8	349	289	1	647	167	184	40	0	391	2174
% App. Total	22.1	72.5	5.2	0.3		2.9	94.7	2.3	0		1.2	53.9	44.7	0.2		42.7	47.1	10.2	0		
PHF	.880	.923	.932	.500	.916	.500	.961	.333	.000	.947	.667	.855	.915	.250	.879	.870	.958	.833	.000	.931	.967

N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 FF  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Heavy Vehicles

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	
04:00 PM	3	3	1	0	0	2	0	0	0	8	4	0	2	2	4	0	29
04:15 PM	5	2	1	0	0	0	0	0	0	7	2	0	5	3	1	0	26
04:30 PM	5	3	1	0	0	1	0	0	1	5	6	0	1	1	5	0	29
04:45 PM	4	4	0	0	0	1	0	0	0	5	5	0	7	3	1	0	30
Total	17	12	3	0	0	4	0	0	1	25	17	0	15	9	11	0	114
05:00 PM	4	4	0	0	0	1	0	0	0	3	1	0	1	2	1	0	17
05:15 PM	4	5	0	0	0	3	0	0	0	4	3	0	1	0	1	0	21
05:30 PM	7	4	0	0	0	1	0	0	0	3	1	0	4	2	2	0	24
05:45 PM	4	5	0	0	0	0	0	0	0	7	3	0	0	1	0	0	20
Total	19	18	0	0	0	5	0	0	0	17	8	0	6	5	4	0	82
Grand Total	36	30	3	0	0	9	0	0	1	42	25	0	21	14	15	0	196
Apprch %	52.2	43.5	4.3	0	0	100	0	0	1.5	61.8	36.8	0	42	28	30	0	
Total %	18.4	15.3	1.5	0	0	4.6	0	0	0.5	21.4	12.8	0	10.7	7.1	7.7	0	

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	3	3	1	0	7	0	2	0	0	2	0	8	4	0	12	2	2	4	0	8	29
04:15 PM	5	2	1	0	8	0	0	0	0	0	0	7	2	0	9	5	3	1	0	9	26
04:30 PM	5	3	1	0	9	0	1	0	0	1	1	5	6	0	12	1	1	5	0	7	29
04:45 PM	4	4	0	0	8	0	1	0	0	1	0	5	5	0	10	7	3	1	0	11	30
Total Volume	17	12	3	0	32	0	4	0	0	4	1	25	17	0	43	15	9	11	0	35	114
% App. Total	53.1	37.5	9.4	0		0	100	0	0		2.3	58.1	39.5	0		42.9	25.7	31.4	0		
PHF	.850	.750	.750	.000	.889	.000	.500	.000	.000	.500	.250	.781	.708	.000	.896	.536	.750	.550	.000	.795	.950

N/S: Dorchester Avenue  
 E/W: West 4th Street  
 City, State: South Boston, MA  
 Client: VHB/ P. Dunford



File Name : 143960 FF  
 Site Code : 81983.14  
 Start Date : 6/18/2014  
 Page No : 1

Groups Printed- Peds and Bikes

	Dorchester Avenue From North				West 4th Street From East				Dorchester Avenue From South				West 4th Street From West				Int. Total
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
04:00 PM	2	1	0	8	0	2	0	12	0	2	1	3	1	3	0	13	48
04:15 PM	0	0	0	11	0	4	0	12	0	0	0	6	0	0	0	16	49
04:30 PM	0	0	0	13	0	0	0	9	0	0	2	3	0	1	0	18	46
04:45 PM	1	3	0	15	0	5	0	20	0	0	1	5	1	2	0	18	71
Total	3	4	0	47	0	11	0	53	0	2	4	17	2	6	0	65	214
05:00 PM	0	0	0	2	0	9	0	37	0	1	0	9	0	0	0	4	62
05:15 PM	0	3	1	11	0	3	0	16	0	0	0	7	1	0	0	10	52
05:30 PM	1	4	0	5	0	5	0	16	0	1	0	3	0	3	1	7	46
05:45 PM	0	0	0	2	0	6	0	23	0	0	0	13	0	5	0	13	62
Total	1	7	1	20	0	23	0	92	0	2	0	32	1	8	1	34	222
Grand Total	4	11	1	67	0	34	0	145	0	4	4	49	3	14	1	99	436
Apprch %	4.8	13.3	1.2	80.7	0	19	0	81	0	7	7	86	2.6	12	0.9	84.6	
Total %	0.9	2.5	0.2	15.4	0	7.8	0	33.3	0	0.9	0.9	11.2	0.7	3.2	0.2	22.7	

	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	13	13	0	0	0	9	9	0	0	2	3	5	0	1	0	18	19	46
04:45 PM	1	3	0	15	19	0	5	0	20	25	0	0	1	5	6	1	2	0	18	21	71
05:00 PM	0	0	0	2	2	0	9	0	37	46	0	1	0	9	10	0	0	0	4	4	62
05:15 PM	0	3	1	11	15	0	3	0	16	19	0	0	0	7	7	1	0	0	10	11	52
Total Volume	1	6	1	41	49	0	17	0	82	99	0	1	3	24	28	2	3	0	50	55	231
% App. Total	2	12.2	2	83.7		0	17.2	0	82.8		0	3.6	10.7	85.7		3.6	5.5	0	90.9		
PHF	.250	.500	.250	.683	.645	.000	.472	.000	.554	.538	.000	.250	.375	.667	.700	.500	.375	.000	.694	.655	.813



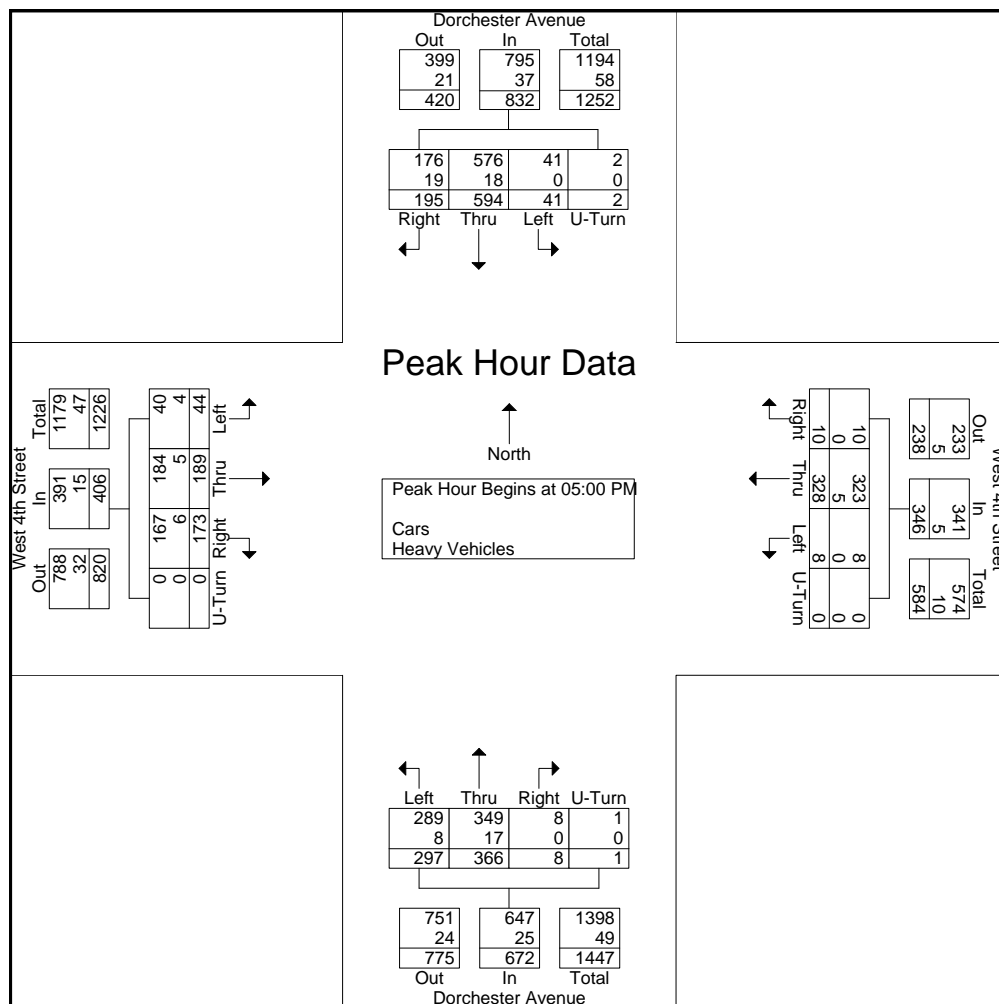
PRECISION  
D A T A  
INDUSTRIES, LLC

P.O. Box 301 Berlin, MA 01503  
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N/S: Dorchester Avenue  
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	Dorchester Avenue From North					West 4th Street From East					Dorchester Avenue From South					West 4th Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	42	127	9	1	179	5	84	0	0	89	3	105	80	0	188	47	44	8	0	99	555
05:15 PM	47	155	10	1	213	0	87	1	0	88	2	105	68	0	175	49	46	12	0	107	583
05:30 PM	52	151	11	0	214	3	75	1	0	79	2	76	76	0	154	44	50	14	0	108	555
05:45 PM	54	161	11	0	226	2	82	6	0	90	1	80	73	1	155	33	49	10	0	92	563
Total Volume	195	594	41	2	832	10	328	8	0	346	8	366	297	1	672	173	189	44	0	406	2256
% App. Total	23.4	71.4	4.9	0.2		2.9	94.8	2.3	0		1.2	54.5	44.2	0.1		42.6	46.6	10.8	0		
PHF	.903	.922	.932	.500	.920	.500	.943	.333	.000	.961	.667	.871	.928	.250	.894	.883	.945	.786	.000	.940	.967
Cars	176	576	41	2	795	10	323	8	0	341	8	349	289	1	647	167	184	40	0	391	2174
% Cars	90.3	97.0	100	100	95.6	100	98.5	100	0	98.6	100	95.4	97.3	100	96.3	96.5	97.4	90.9	0	96.3	96.4
Heavy Vehicles	19	18	0	0	37	0	5	0	0	5	0	17	8	0	25	6	5	4	0	15	82
% Heavy Vehicles	9.7	3.0	0	0	4.4	0	1.5	0	0	1.4	0	4.6	2.7	0	3.7	3.5	2.6	9.1	0	3.7	3.6





# Vehicle Crash Data

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Boston, MA COUNT DATE : Jun-14

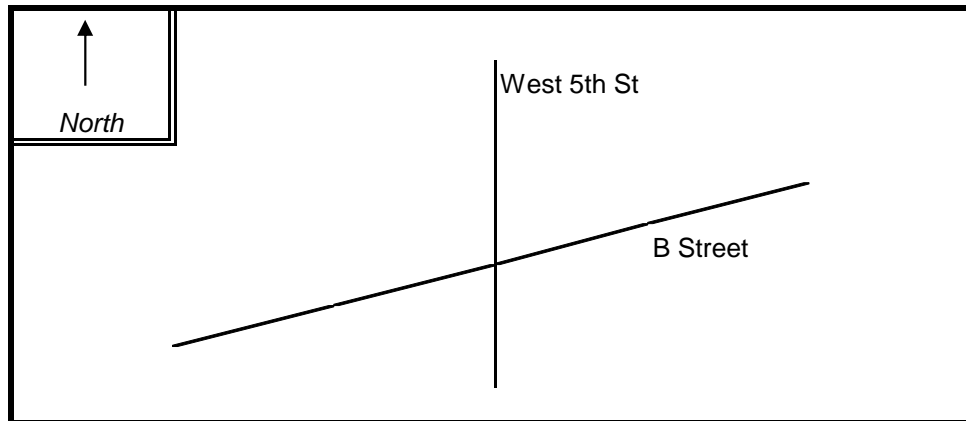
DISTRICT : 6 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : B Street

MINOR STREET(S) : West 5th Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NEB	SEB	SWB			
PEAK HOURLY VOLUMES (PM) :	104	10	133			247

" K " FACTOR : **0.090** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **2,744**

TOTAL # OF CRASHES : **1** # OF YEARS : **4** AVERAGE # OF CRASHES PER YEAR ( A ) : **0.25**

**CRASH RATE CALCULATION :**

**0.25**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : \_\_\_\_\_

Project Title & Date: \_\_\_\_\_

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Boston, MA COUNT DATE : Jun-14

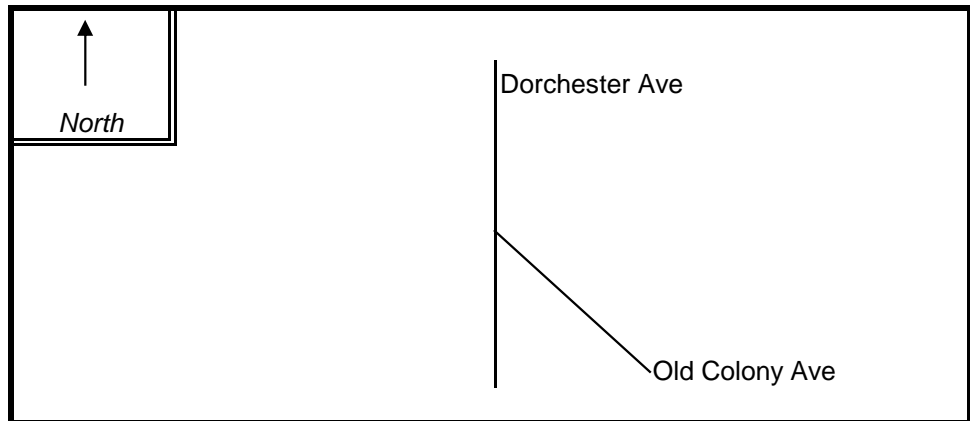
DISTRICT : 6 UNSIGNALIZED : ☐ SIGNALIZED : ☒

### ~ INTERSECTION DATA ~

MAJOR STREET : Dorchester Avenue

MINOR STREET(S) : Old Colony Avenue

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	NB	NWB		
PEAK HOURLY VOLUMES (PM) :	1,217	9	314	525		2,065

" K " FACTOR : **0.090** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **22,944**

TOTAL # OF CRASHES : **4** # OF YEARS : **4** AVERAGE # OF CRASHES PER YEAR ( A ) : **1.00**

**CRASH RATE CALCULATION :**

**0.12**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : \_\_\_\_\_

Project Title & Date: \_\_\_\_\_

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Boston, MA COUNT DATE : Jun-14

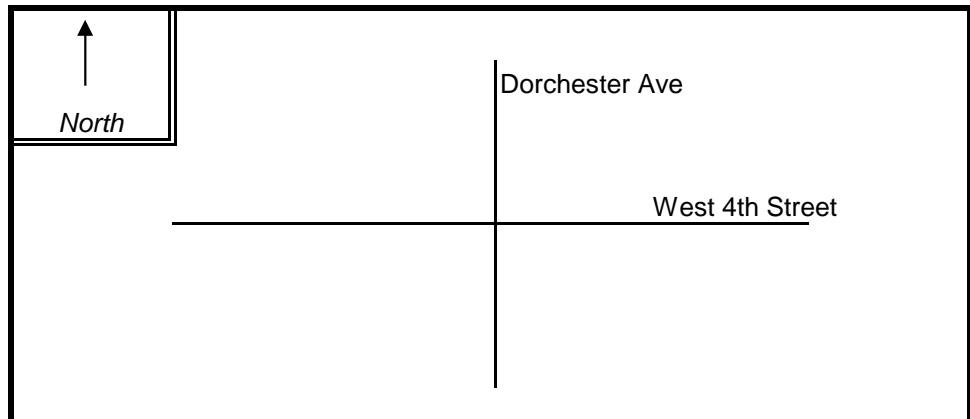
DISTRICT : 6 UNSIGNALIZED : ☐ SIGNALIZED : ☒

### ~ INTERSECTION DATA ~

MAJOR STREET : Dorchester Avenue

MINOR STREET(S) : West 4th Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	NB	WB	SB		
PEAK HOURLY VOLUMES (PM) :	406	671	346	830		2,253

" K " FACTOR :

**0.090**

INTERSECTION ADT ( V ) = TOTAL DAILY  
APPROACH VOLUME :

**25,033**

TOTAL # OF CRASHES :

1

# OF  
YEARS :

4

AVERAGE # OF  
CRASHES PER YEAR ( A ) :

**0.25**

**CRASH RATE CALCULATION :**

**0.03**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$


















Comments : \_\_\_\_\_

Project Title & Date: \_\_\_\_\_

# Intersection Capacity Analyses

	→	↖	↑	↗	↓
Lane Group	EBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	14	1165	517	315	218
v/c Ratio	0.07	0.60	0.76	0.16	0.14
Control Delay	0.7	7.5	41.2	10.0	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	7.5	41.2	10.0	1.7
Queue Length 50th (ft)	0	59	127	27	0
Queue Length 95th (ft)	0	233	228	84	46
Internal Link Dist (ft)	242		474		86
Turn Bay Length (ft)					
Base Capacity (vph)	233	1936	917	2030	1559
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.60	0.56	0.16	0.14
Intersection Summary					












												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	0	0	1060	0	455	10	290	190	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0				5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00				0.88		0.95		0.97	1.00	
Frpb, ped/bikes		0.98				1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00				1.00		1.00		1.00	1.00	
Frt		0.93				0.85		1.00		1.00	0.99	
Flt Protected		0.98				1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1355				2787		3188		3335	1697	
Flt Permitted		0.98				1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1355				2787		3188		3335	1697	
Peak-hour factor, PHF	0.75	0.75	0.75	0.91	0.91	0.91	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	7	0	7	0	0	1165	0	506	11	315	207	11
RTOR Reduction (vph)	0	14	0	0	0	258	0	2	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	0	907	0	515	0	315	217	0
Confl. Peds. (#/hr)	2		5	5		2	18					18
Confl. Bikes (#/hr)									41			9
Heavy Vehicles (%)	50%	0%	0%	0%	0%	2%	50%	13%	0%	5%	11%	9%
Turn Type	Split	NA				Over		NA		Prot	NA	
Protected Phases	6	6				1		5		1	15	
Permitted Phases							5	5				
Actuated Green, G (s)		3.2				54.1		18.9		54.1	78.0	
Effective Green, g (s)		3.2				54.1		18.9		54.1	78.0	
Actuated g/C Ratio		0.03				0.58		0.20		0.58	0.84	
Clearance Time (s)		7.0				5.0		5.0		5.0		
Vehicle Extension (s)		2.0				2.0		2.0		2.0		
Lane Grp Cap (vph)		46				1617		646		1935	1420	
v/s Ratio Prot		c0.00				c0.33		c0.16		0.09	0.13	
v/s Ratio Perm												
v/c Ratio		0.01				0.56		0.80		0.16	0.15	
Uniform Delay, d1		43.5				12.2		35.3		9.1	1.4	
Progression Factor		1.00				1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.0				1.4		6.4		0.2	0.0	
Delay (s)		43.5				13.6		41.7		9.2	1.4	
Level of Service		D				B		D		A	A	
Approach Delay (s)		43.5			13.6			41.7			6.0	
Approach LOS		D			B			D			A	

















#### Intersection Summary
















HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

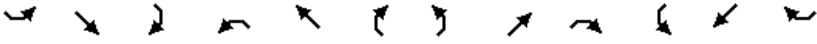




c Critical Lane Group

	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑			↑↑	↘	
Volume (veh/h)	1380	140	0	490	0	130
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.89	0.89
Hourly flow rate (vph)	1468	149	0	510	0	146
Pedestrians					68	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	166			1241		
pX, platoon unblocked			0.85		0.85	0.85
vC, conflicting volume			1536		1866	877
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1287		1673	515
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			100		100	63
cM capacity (veh/h)			440		71	396
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SW 1	
Volume Total	979	638	255	255	146	
Volume Left	0	0	0	0	0	
Volume Right	0	149	0	0	146	
cSH	1700	1700	1700	1700	396	
Volume to Capacity	0.58	0.38	0.15	0.15	0.37	
Queue Length 95th (ft)	0	0	0	0	42	
Control Delay (s)	0.0	0.0	0.0	0.0	19.3	
Lane LOS					C	
Approach Delay (s)	0.0		0.0		19.3	
Approach LOS					C	
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			57.8%		ICU Level of Service	B
Analysis Period (min)			15			

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	115	45	130	10	75	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.94	0.94	0.89	0.89
Hourly flow rate (vph)	140	55	138	11	84	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	329	144			149	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329	144			149	
tC, single (s)	6.5	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	77	94			94	
cM capacity (veh/h)	606	899			1391	
Direction, Lane #	NW 1	NE 1	SW 1			
Volume Total	195	149	101			
Volume Left	140	0	84			
Volume Right	55	11	0			
cSH	667	1700	1391			
Volume to Capacity	0.29	0.09	0.06			
Queue Length 95th (ft)	30	0	5			
Control Delay (s)	12.6	0.0	6.5			
Lane LOS	B		A			
Approach Delay (s)	12.6	0.0	6.5			
Approach LOS	B					
Intersection Summary						
Average Delay			7.0			
Intersection Capacity Utilization			31.5%		ICU Level of Service	A
Analysis Period (min)			15			

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	10	0	30	0	175	0	0	80	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.63	0.63	0.63	0.92	0.92	0.92	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	16	0	48	0	190	0	0	94	0
Pedestrians		6			14							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		1			1							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	338	304	100	298	304	204	100			204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	338	304	100	298	304	204	100			204		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	97	100	94	100			100		
cM capacity (veh/h)	569	599	951	623	602	800	1498			1363		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	0	63	190	94								
Volume Left	0	16	0	0								
Volume Right	0	48	0	0								
cSH	1700	747	1498	1700								
Volume to Capacity	0.00	0.09	0.00	0.06								
Queue Length 95th (ft)	0	7	0	0								
Control Delay (s)	0.0	10.3	0.0	0.0								
Lane LOS	A	B										
Approach Delay (s)	0.0	10.3	0.0	0.0								
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			1.9									
Intersection Capacity Utilization			20.7%			ICU Level of Service			A			
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	5	20	0	0	0	30	155	20	50	60	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88	0.96	0.96	0.96
Hourly flow rate (vph)	12	6	23	0	0	0	34	176	23	52	62	10
Pedestrians		4			20			8			11	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	443	463	80	482	457	218	77			219		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	443	463	80	482	457	218	77			219		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	98	99	98	100	100	100	98			96		
cM capacity (veh/h)	476	467	963	455	471	819	1530			1321		
Direction, Lane #	SE 1	NE 1	SW 1									
Volume Total	41	233	125									
Volume Left	12	34	52									
Volume Right	23	23	10									
cSH	667	1530	1321									
Volume to Capacity	0.06	0.02	0.04									
Queue Length 95th (ft)	5	2	3									
Control Delay (s)	10.7	1.2	3.5									
Lane LOS	B	A	A									
Approach Delay (s)	10.7	1.2	3.5									
Approach LOS	B											
<b>Intersection Summary</b>												
Average Delay			2.9									
Intersection Capacity Utilization			31.7%			ICU Level of Service				A		
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	60	0	55	5	20	0	70	95	0	0	60	110
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.82	0.82	0.82	0.77	0.77	0.77
Hourly flow rate (vph)	66	0	60	6	25	0	85	116	0	0	78	143
Pedestrians		15			24			22			65	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			5	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	528	475	186	542	546	205	236			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	528	475	186	542	546	205	236			140		
tC, single (s)	7.1	6.6	6.4	7.1	6.7	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	82	100	92	98	94	100	93			100		
cM capacity (veh/h)	376	434	780	374	381	779	1303			1427		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	126	31	201	221								
Volume Left	66	6	85	0								
Volume Right	60	0	0	143								
cSH	499	379	1303	1700								
Volume to Capacity	0.25	0.08	0.07	0.13								
Queue Length 95th (ft)	25	7	5	0								
Control Delay (s)	14.6	15.3	3.7	0.0								
Lane LOS	B	C	A									
Approach Delay (s)	14.6	15.3	3.7	0.0								
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay			5.3									
Intersection Capacity Utilization			47.5%			ICU Level of Service			A			
Analysis Period (min)			15									



	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	215	105	450	582	758	5	458
v/c Ratio	1.34	0.27	1.16	0.84	0.36	0.01	0.91
Control Delay	223.3	5.9	132.2	25.1	8.8	0.0	49.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	223.3	5.9	132.2	25.1	8.8	0.0	49.3
Queue Length 50th (ft)	~172	0	~326	177	104	0	112
Queue Length 95th (ft)	#296	27	#511	#362	137	0	#212
Internal Link Dist (ft)	553		756		1161		668
Turn Bay Length (ft)				180			
Base Capacity (vph)	160	390	388	694	2124	820	506
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.34	0.27	1.16	0.84	0.36	0.01	0.91





















#### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	140	90	5	365	30	530	690	5	40	245	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0	7.0		7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.94		0.99		1.00	1.00	0.78		0.98	
Flpb, ped/bikes		1.00	1.00		1.00		0.99	1.00	1.00		1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85		0.95	
Flt Protected		0.99	1.00		1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1728	1340		1770		1708	3343	1265		2954	
Flt Permitted		0.42	1.00		0.99		0.42	1.00	1.00		0.52	
Satd. Flow (perm)		733	1340		1762		758	3343	1265		1535	
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	52	163	105	6	410	34	582	758	5	42	255	161
RTOR Reduction (vph)	0	0	82	0	3	0	0	0	2	0	75	0
Lane Group Flow (vph)	0	215	23	0	447	0	582	758	3	0	383	0
Confl. Peds. (#/hr)	48		29	29		48	16		90	90		16
Confl. Bikes (#/hr)			12			8			9			1
Heavy Vehicles (%)	21%	4%	13%	0%	6%	0%	5%	8%	0%	5%	8%	23%
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA	Perm	Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2		2	2			1		1 3	1		
Actuated Green, G (s)		21.0	21.0		21.0		54.0	61.0	61.0		27.0	
Effective Green, g (s)		21.0	21.0		21.0		54.0	61.0	61.0		27.0	
Actuated g/C Ratio		0.22	0.22		0.22		0.56	0.64	0.64		0.28	
Clearance Time (s)		7.0	7.0		7.0		7.0				7.0	
Lane Grp Cap (vph)		160	293		385		693	2124	803		431	
v/s Ratio Prot							c0.24	0.23				
v/s Ratio Perm		c0.29	0.02		0.25		0.24		0.00		c0.25	
v/c Ratio		1.34	0.08		1.16		0.84	0.36	0.00		0.89	
Uniform Delay, d1		37.5	29.8		37.5		14.1	8.3	6.4		33.0	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		190.4	0.5		97.4		11.7	0.5	0.0		22.7	
Delay (s)		227.9	30.3		134.9		25.9	8.7	6.4		55.8	
Level of Service		F	C		F		C	A	A		E	
Approach Delay (s)		163.1			134.9			16.1			55.8	
Approach LOS		F			F			B			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			62.2				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			96.0				Sum of lost time (s)		21.0			
Intersection Capacity Utilization			102.7%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												



Lane Group	EBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	18	651	353	952	367
v/c Ratio	0.10	0.30	0.77	0.40	0.23
Control Delay	29.6	0.3	50.5	7.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	0.3	50.5	7.8	2.0
Queue Length 50th (ft)	4	0	91	75	0
Queue Length 95th (ft)	15	0	#193	204	82
Internal Link Dist (ft)	242		474		86
Turn Bay Length (ft)					
Base Capacity (vph)	225	2195	477	2380	1584
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.74	0.40	0.23










#### Intersection Summary










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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	5	0	0	560	0	325	10	895	340	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0				5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00				0.88		0.95		0.97	1.00	
Frpb, ped/bikes		0.98				1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00				1.00		1.00		1.00	1.00	
Frt		0.93				0.85		1.00		1.00	1.00	
Flt Protected		1.00				1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1728				2787		3457		3467	1749	
Flt Permitted		1.00				1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1728				2787		3457		3467	1749	
Peak-hour factor, PHF	0.56	0.56	0.56	0.86	0.86	0.86	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	0	9	9	0	0	651	0	342	11	952	362	5
RTOR Reduction (vph)	0	9	0	0	0	225	0	3	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	426	0	350	0	952	367	0
Confl. Peds. (#/hr)			7				40		2	2		40
Confl. Bikes (#/hr)									5			37
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	3%	30%	1%	8%	33%
Turn Type		NA				Over		NA		custom	NA	
Protected Phases	6	6				1		5		1	1 5	
Permitted Phases							5			1		
Actuated Green, G (s)		3.4				60.5		11.6		60.5	77.1	
Effective Green, g (s)		3.4				60.5		11.6		60.5	77.1	
Actuated g/C Ratio		0.04				0.65		0.13		0.65	0.83	
Clearance Time (s)		7.0				5.0		5.0		5.0		
Vehicle Extension (s)		2.0				2.0		2.0		2.0		
Lane Grp Cap (vph)		63				1822		433		2267	1457	
v/s Ratio Prot		c0.01				0.15		c0.10		c0.27	0.21	
v/s Ratio Perm												
v/c Ratio		0.15				0.23		0.81		0.42	0.25	
Uniform Delay, d1		43.1				6.5		39.4		7.6	1.6	
Progression Factor		1.00				1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.4				0.3		10.1		0.6	0.0	
Delay (s)		43.5				6.8		49.5		8.2	1.7	
Level of Service		D				A		D		A	A	
Approach Delay (s)		43.5			6.8			49.5			6.4	
Approach LOS		D			A			D			A	

















Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
















c Critical Lane Group

















						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	805	80	0	1240	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.94	0.94	0.84	0.84
Hourly flow rate (vph)	885	88	0	1319	0	71
Pedestrians				2	34	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	166			1241		
pX, platoon unblocked			0.91		0.94	0.91
vC, conflicting volume			919		1622	522
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			703		1089	266
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	89
cM capacity (veh/h)			778		195	649
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SW 1	
Volume Total	590	383	660	660	71	
Volume Left	0	0	0	0	0	
Volume Right	0	88	0	0	71	
cSH	1700	1700	1700	1700	649	
Volume to Capacity	0.35	0.23	0.39	0.39	0.11	
Queue Length 95th (ft)	0	0	0	0	9	
Control Delay (s)	0.0	0.0	0.0	0.0	11.2	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		11.2	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			45.5%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	45	20	70	10	90	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	56	25	77	11	107	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	315	82			88	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	82			88	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	91	97			93	
cM capacity (veh/h)	630	953			1502	
Direction, Lane #	NW 1	NE 1	SW 1			
Volume Total	81	88	125			
Volume Left	56	0	107			
Volume Right	25	11	0			
cSH	703	1700	1502			
Volume to Capacity	0.12	0.05	0.07			
Queue Length 95th (ft)	10	0	6			
Control Delay (s)	10.8	0.0	6.6			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	6.6			
Approach LOS	B					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			22.8%		ICU Level of Service	A
Analysis Period (min)			15			



												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	5	0	15	0	90	0	0	100	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.86	0.86	0.86	0.75	0.75	0.75	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	6	0	17	0	120	0	0	114	0
Pedestrians		15			12			2			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type						None						
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	267	261	131	248	261	133	129	132				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	267	261	131	248	261	133	129	132				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	100	100	100	99	100	98	100	100				
cM capacity (veh/h)	656	633	911	690	633	912	1451	1432				
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	0	23	120	114								
Volume Left	0	6	0	0								
Volume Right	0	17	0	0								
cSH	1700	844	1451	1700								
Volume to Capacity	0.00	0.03	0.00	0.07								
Queue Length 95th (ft)	0	2	0	0								
Control Delay (s)	0.0	9.4	0.0	0.0								
Lane LOS	A	A										
Approach Delay (s)	0.0	9.4	0.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			19.1%	ICU Level of Service					A			
Analysis Period (min)			15									





















												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	10	0	0	0	5	80	20	45	90	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.55	0.55	0.55	0.92	0.92	0.92	0.74	0.74	0.74	0.76	0.76	0.76
Hourly flow rate (vph)	0	0	18	0	0	0	7	108	27	59	118	7
Pedestrians		19			35			11			15	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	409	443	152	439	433	172	144			170		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	409	443	152	439	433	172	144			170		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.4			2.2		
p0 queue free %	100	100	98	100	100	100	99			96		
cM capacity (veh/h)	515	481	877	491	487	866	1288			1419		
Direction, Lane #	SE 1	NE 1	SW 1									
Volume Total	18	142	184									
Volume Left	0	7	59									
Volume Right	18	27	7									
cSH	877	1288	1419									
Volume to Capacity	0.02	0.01	0.04									
Queue Length 95th (ft)	2	0	3									
Control Delay (s)	9.2	0.4	2.7									
Lane LOS	A	A	A									
Approach Delay (s)	9.2	0.4	2.7									
Approach LOS	A											
<b>Intersection Summary</b>												
Average Delay			2.1									
Intersection Capacity Utilization			28.2%			ICU Level of Service			A			
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	50	0	65	5	15	0	20	60	0	0	70	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.69	0.69	0.69	0.74	0.74	0.74	0.79	0.79	0.79
Hourly flow rate (vph)	57	0	74	7	22	0	27	81	0	0	89	57
Pedestrians		32			22			19			56	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			2			2			5	
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	351	306	168	367	335	159	178			103		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	351	306	168	367	335	159	178			103		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	91	99	96	100	98			100		
cM capacity (veh/h)	514	572	844	497	551	834	1344			1474		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	131	29	108	146								
Volume Left	57	7	27	0								
Volume Right	74	0	0	57								
cSH	660	537	1344	1700								
Volume to Capacity	0.20	0.05	0.02	0.09								
Queue Length 95th (ft)	18	4	2	0								
Control Delay (s)	11.8	12.1	2.1	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	11.8	12.1	2.1	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			31.8%	ICU Level of Service				A				
Analysis Period (min)			15									

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	255	186	369	343	421	11	918
v/c Ratio	0.59	0.32	0.67	0.96	0.21	0.01	0.80
Control Delay	36.3	5.7	37.7	59.2	10.9	0.6	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	5.7	37.7	59.2	10.9	0.6	32.3
Queue Length 50th (ft)	138	0	205	128	65	0	257
Queue Length 95th (ft)	223	49	308	#299	89	2	338
Internal Link Dist (ft)	553		756		1161		668
Turn Bay Length (ft)		80		130		175	
Base Capacity (vph)	433	576	550	357	1959	805	1153
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.32	0.67	0.96	0.21	0.01	0.80


















#### Intersection Summary

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










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	195	175	10	335	10	305	375	10	40	605	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	7.0	7.0		7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.95		1.00		1.00	1.00	0.86		0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85		1.00		1.00	1.00	0.85		0.96	
Flt Protected		0.99	1.00		1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1804	1488		1852		1750	3438	1389		3258	
Flt Permitted		0.79	1.00		0.99		0.18	1.00	1.00		0.91	
Satd. Flow (perm)		1446	1488		1834		335	3438	1389		2958	
Peak-hour factor, PHF	0.94	0.94	0.94	0.96	0.96	0.96	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	48	207	186	10	349	10	343	421	11	43	658	217
RTOR Reduction (vph)	0	0	130	0	1	0	0	0	5	0	29	0
Lane Group Flow (vph)	0	255	56	0	368	0	343	421	6	0	889	0
Confl. Peds. (#/hr)	20		32	32		20	34		92	92		34
Confl. Bikes (#/hr)			8			23			2			7
Heavy Vehicles (%)	9%	3%	3%	0%	2%	0%	3%	5%	0%	0%	3%	10%
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA	Perm	Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2		2	2			1		1 3	1		
Actuated Green, G (s)		30.0	30.0		30.0		51.0	57.0	57.0		38.0	
Effective Green, g (s)		30.0	30.0		30.0		51.0	51.0	51.0		38.0	
Actuated g/C Ratio		0.30	0.30		0.30		0.51	0.51	0.51		0.38	
Clearance Time (s)		6.0	6.0		6.0		6.0				7.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0				2.0	
Lane Grp Cap (vph)		433	446		550		354	1753	708		1124	
v/s Ratio Prot							c0.13	0.12				
v/s Ratio Perm		0.18	0.04		c0.20		c0.37		0.00		0.30	
v/c Ratio		0.59	0.13		0.67		0.97	0.24	0.01		0.79	
Uniform Delay, d1		29.8	25.5		30.7		18.5	13.7	12.1		27.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		5.8	0.6		6.4		40.6	0.3	0.0		5.7	
Delay (s)		35.5	26.0		37.0		59.1	14.0	12.1		33.2	
Level of Service		D	C		D		E	B	B		C	
Approach Delay (s)		31.5			37.0			34.0			33.2	
Approach LOS		C			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			33.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			19.0			
Intersection Capacity Utilization			112.9%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												










	→	↖	↑	↗	↓
Lane Group	EBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	14	1236	594	348	256
v/c Ratio	0.07	0.65	0.81	0.18	0.16
Control Delay	0.7	9.1	43.5	10.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	9.1	43.5	10.6	1.7
Queue Length 50th (ft)	0	93	151	35	0
Queue Length 95th (ft)	0	284	265	92	54
Internal Link Dist (ft)	242		474		86
Turn Bay Length (ft)					
Base Capacity (vph)	230	1896	897	1986	1554
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.65	0.66	0.18	0.16
Intersection Summary					



















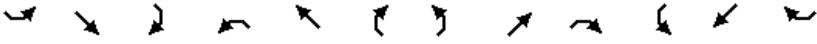
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	0	0	1125	0	525	10	320	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0				5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00				0.88		0.95		0.97	1.00	
Frpb, ped/bikes		0.98				1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00				1.00		1.00		1.00	1.00	
Frt		0.93				0.85		1.00		1.00	0.99	
Flt Protected		0.98				1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1354				2787		3189		3335	1699	
Flt Permitted		0.98				1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1354				2787		3189		3335	1699	
Peak-hour factor, PHF	0.75	0.75	0.75	0.91	0.91	0.91	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	7	0	7	0	0	1236	0	583	11	348	245	11
RTOR Reduction (vph)	0	14	0	0	0	253	0	2	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	0	983	0	592	0	348	255	0
Confl. Peds. (#/hr)	2		5	5		2	18					18
Confl. Bikes (#/hr)									41			9
Heavy Vehicles (%)	50%	0%	0%	0%	0%	2%	50%	13%	0%	5%	11%	9%
Turn Type	Split	NA				Over		NA		Prot	NA	
Protected Phases	6	6				1		5		1	1	5
Permitted Phases							5	5				
Actuated Green, G (s)		3.3				53.9		20.7		53.9	79.6	
Effective Green, g (s)		3.3				53.9		20.7		53.9	79.6	
Actuated g/C Ratio		0.03				0.57		0.22		0.57	0.84	
Clearance Time (s)		7.0				5.0		5.0		5.0		
Vehicle Extension (s)		2.0				2.0		2.0		2.0		
Lane Grp Cap (vph)		47				1582		695		1894	1425	
v/s Ratio Prot		c0.00				c0.35		c0.19		0.10	0.15	
v/s Ratio Perm												
v/c Ratio		0.01				0.62		0.85		0.18	0.18	
Uniform Delay, d1		44.2				13.7		35.6		9.9	1.5	
Progression Factor		1.00				1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.0				1.8		9.5		0.2	0.0	
Delay (s)		44.3				15.5		45.2		10.1	1.5	
Level of Service		D				B		D		B	A	
Approach Delay (s)		44.3			15.5			45.2			6.4	
Approach LOS		D			B			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			94.9			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			75.6%			ICU Level of Service			D			
Analysis Period (min)			15									

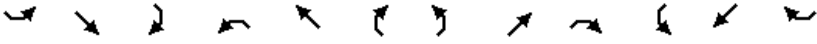




c Critical Lane Group

						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	1500	155	0	555	0	135
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.89	0.89
Hourly flow rate (vph)	1596	165	0	578	0	152
Pedestrians					68	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	166			1241		
pX, platoon unblocked			0.83		0.83	0.83
vC, conflicting volume			1664		2035	948
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1389		1837	526
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			100		100	60
cM capacity (veh/h)			391		54	378
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SW 1	
Volume Total	1064	697	289	289	152	
Volume Left	0	0	0	0	0	
Volume Right	0	165	0	0	152	
cSH	1700	1700	1700	1700	378	
Volume to Capacity	0.63	0.41	0.17	0.17	0.40	
Queue Length 95th (ft)	0	0	0	0	47	
Control Delay (s)	0.0	0.0	0.0	0.0	20.7	
Lane LOS					C	
Approach Delay (s)	0.0		0.0		20.7	
Approach LOS					C	
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			61.9%		ICU Level of Service	B
Analysis Period (min)			15			

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	120	45	145	10	80	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.94	0.94	0.89	0.89
Hourly flow rate (vph)	146	55	154	11	90	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	356	160			165	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	356	160			165	
tC, single (s)	6.5	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	75	94			93	
cM capacity (veh/h)	582	880			1372	
Direction, Lane #	NW 1	NE 1	SW 1			
Volume Total	201	165	107			
Volume Left	146	0	90			
Volume Right	55	11	0			
cSH	641	1700	1372			
Volume to Capacity	0.31	0.10	0.07			
Queue Length 95th (ft)	34	0	5			
Control Delay (s)	13.2	0.0	6.7			
Lane LOS	B		A			
Approach Delay (s)	13.2	0.0	6.7			
Approach LOS	B					
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			32.9%		ICU Level of Service	A
Analysis Period (min)			15			

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	10	0	30	0	190	0	0	85	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.63	0.63	0.63	0.92	0.92	0.92	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	16	0	48	0	207	0	0	100	0
Pedestrians		6			14							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		1			1							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	360	327	106	321	327	221	106			221		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	360	327	106	321	327	221	106			221		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	100	97	100	94	100			100		
cM capacity (veh/h)	549	582	944	602	585	783	1490			1345		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	0	63	207	100								
Volume Left	0	16	0	0								
Volume Right	0	48	0	0								
cSH	1700	728	1490	1700								
Volume to Capacity	0.00	0.09	0.00	0.06								
Queue Length 95th (ft)	0	7	0	0								
Control Delay (s)	0.0	10.4	0.0	0.0								
Lane LOS	A	B										
Approach Delay (s)	0.0	10.4	0.0	0.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			21.2%		ICU Level of Service				A			
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		⬆️						⬆️			⬆️	
Volume (veh/h)	10	5	20	0	0	0	30	170	20	55	65	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88	0.96	0.96	0.96
Hourly flow rate (vph)	12	6	23	0	0	0	34	193	23	57	68	10
Pedestrians		4			20			8			11	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	475	496	85	514	489	236	82			236		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	475	496	85	514	489	236	82			236		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	97	99	98	100	100	100	98			96		
cM capacity (veh/h)	451	446	956	431	449	801	1523			1302		
Direction, Lane #	SE 1	NE 1	SW 1									
Volume Total	41	250	135									
Volume Left	12	34	57									
Volume Right	23	23	10									
cSH	644	1523	1302									
Volume to Capacity	0.06	0.02	0.04									
Queue Length 95th (ft)	5	2	3									
Control Delay (s)	11.0	1.2	3.5									
Lane LOS	B	A	A									
Approach Delay (s)	11.0	1.2	3.5									
Approach LOS	B											
<b>Intersection Summary</b>												
Average Delay			2.9									
Intersection Capacity Utilization			33.7%			ICU Level of Service				A		
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	65	0	60	5	20	0	75	105	0	0	65	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.82	0.82	0.82	0.77	0.77	0.77
Hourly flow rate (vph)	71	0	66	6	25	0	91	128	0	0	84	149
Pedestrians		15			24			22			65	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			5	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	562	509	196	582	584	217	249			152		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	562	509	196	582	584	217	249			152		
tC, single (s)	7.1	6.6	6.4	7.1	6.7	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	80	100	91	98	93	100	93			100		
cM capacity (veh/h)	354	412	770	347	360	767	1289			1412		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	137	31	220	234								
Volume Left	71	6	91	0								
Volume Right	66	0	0	149								
cSH	478	357	1289	1700								
Volume to Capacity	0.29	0.09	0.07	0.14								
Queue Length 95th (ft)	29	7	6	0								
Control Delay (s)	15.5	16.0	3.7	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	15.5	16.0	3.7	0.0								
Approach LOS	C	C										
<b>Intersection Summary</b>												
Average Delay			5.5									
Intersection Capacity Utilization			48.8%		ICU Level of Service				A			
Analysis Period (min)			15									



	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	244	116	489	632	841	5	516
v/c Ratio	1.92	0.30	1.26	0.94	0.40	0.01	1.04
Control Delay	467.4	7.4	168.6	41.2	9.2	0.0	81.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	467.4	7.4	168.6	41.2	9.2	0.0	81.0
Queue Length 50th (ft)	~231	0	~377	234	118	0	~157
Queue Length 95th (ft)	#360	34	#566	#470	155	0	#264
Internal Link Dist (ft)	553		756		1161		668
Turn Bay Length (ft)				180			
Base Capacity (vph)	127	390	389	669	2124	820	496
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.92	0.30	1.26	0.94	0.40	0.01	1.04





















#### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.


















Queue shown is maximum after two cycles.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	155	100	5	400	30	575	765	5	40	285	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0	7.0		7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.94		0.99		1.00	1.00	0.78		0.98	
Flpb, ped/bikes		1.00	1.00		1.00		0.99	1.00	1.00		1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85		0.95	
Flt Protected		0.99	1.00		1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1721	1340		1772		1710	3343	1265		2963	
Flt Permitted		0.33	1.00		0.99		0.37	1.00	1.00		0.52	
Satd. Flow (perm)		582	1340		1763		669	3343	1265		1540	
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	64	180	116	6	449	34	632	841	5	42	297	177
RTOR Reduction (vph)	0	0	91	0	3	0	0	0	2	0	64	0
Lane Group Flow (vph)	0	244	25	0	486	0	632	841	3	0	452	0
Confl. Peds. (#/hr)	48		29	29		48	16		90	90		16
Confl. Bikes (#/hr)			12			8			9			1
Heavy Vehicles (%)	21%	4%	13%	0%	6%	0%	5%	8%	0%	5%	8%	23%
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA	Perm	Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2		2	2			1		1 3	1		
Actuated Green, G (s)		21.0	21.0		21.0		54.0	61.0	61.0		27.0	
Effective Green, g (s)		21.0	21.0		21.0		54.0	61.0	61.0		27.0	
Actuated g/C Ratio		0.22	0.22		0.22		0.56	0.64	0.64		0.28	
Clearance Time (s)		7.0	7.0		7.0		7.0				7.0	
Lane Grp Cap (vph)		127	293		385		669	2124	803		433	
v/s Ratio Prot							c0.27	0.25				
v/s Ratio Perm		c0.42	0.02		0.28		0.27		0.00		c0.29	
v/c Ratio		1.92	0.09		1.26		0.94	0.40	0.00		1.04	
Uniform Delay, d1		37.5	29.9		37.5		15.2	8.5	6.4		34.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		442.3	0.6		137.3		23.6	0.6	0.0		55.2	
Delay (s)		479.8	30.4		174.8		38.8	9.1	6.4		89.7	
Level of Service		F	C		F		D	A	A		F	
Approach Delay (s)		335.0			174.8			21.8			89.7	
Approach LOS		F			F			C			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			100.1				HCM 2000 Level of Service			F		
HCM 2000 Volume to Capacity ratio			1.25									
Actuated Cycle Length (s)			96.0				Sum of lost time (s)			21.0		
Intersection Capacity Utilization			113.7%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

	→	↖	↑	↗	↓
Lane Group	EBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	18	721	416	1027	446
v/c Ratio	0.10	0.33	0.88	0.43	0.28
Control Delay	29.6	0.5	59.8	8.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	0.5	59.8	8.2	2.2
Queue Length 50th (ft)	4	0	110	83	0
Queue Length 95th (ft)	15	0	#244	226	105
Internal Link Dist (ft)	242		474		86
Turn Bay Length (ft)					
Base Capacity (vph)	223	2184	474	2366	1597
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.33	0.88	0.43	0.28










#### Intersection Summary










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

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	5	0	0	620	0	385	10	965	415	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0				5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00				0.88		0.95		0.97	1.00	
Frpb, ped/bikes		0.98				1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00				1.00		1.00		1.00	1.00	
Frt		0.93				0.85		1.00		1.00	1.00	
Flt Protected		1.00				1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1728				2787		3465		3467	1751	
Flt Permitted		1.00				1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1728				2787		3465		3467	1751	
Peak-hour factor, PHF	0.56	0.56	0.56	0.86	0.86	0.86	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	0	9	9	0	0	721	0	405	11	1027	441	5
RTOR Reduction (vph)	0	9	0	0	0	252	0	2	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	469	0	414	0	1027	446	0
Confl. Peds. (#/hr)			7				40		2	2		40
Confl. Bikes (#/hr)									5			37
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	3%	30%	1%	8%	33%
Turn Type		NA				Over		NA		custom	NA	
Protected Phases	6	6				1		5		1	1	5
Permitted Phases							5			1		
Actuated Green, G (s)		3.4				60.5		12.1		60.5	77.6	
Effective Green, g (s)		3.4				60.5		12.1		60.5	77.6	
Actuated g/C Ratio		0.04				0.65		0.13		0.65	0.83	
Clearance Time (s)		7.0				5.0		5.0		5.0		
Vehicle Extension (s)		2.0				2.0		2.0		2.0		
Lane Grp Cap (vph)		63				1813		450		2255	1461	
v/s Ratio Prot		c0.01				0.17		c0.12		c0.30	0.25	
v/s Ratio Perm												
v/c Ratio		0.15				0.26		0.92		0.46	0.31	
Uniform Delay, d1		43.4				6.8		40.0		8.1	1.7	
Progression Factor		1.00				1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.4				0.3		23.8		0.7	0.0	
Delay (s)		43.8				7.2		63.8		8.7	1.8	
Level of Service		D				A		E		A	A	
Approach Delay (s)		43.8			7.2			63.8			6.6	
Approach LOS		D			A			E			A	

















Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
















c Critical Lane Group

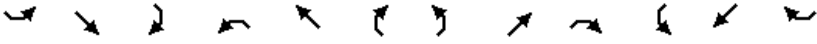




						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	905	100	0	1385	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.94	0.94	0.84	0.84
Hourly flow rate (vph)	995	110	0	1473	0	71
Pedestrians				2	34	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	166			1241		
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			1029		1820	588
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			776		1101	279
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	89
cM capacity (veh/h)			714		181	623
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SW 1	
Volume Total	663	441	737	737	71	
Volume Left	0	0	0	0	0	
Volume Right	0	110	0	0	71	
cSH	1700	1700	1700	1700	623	
Volume to Capacity	0.39	0.26	0.43	0.43	0.11	
Queue Length 95th (ft)	0	0	0	0	10	
Control Delay (s)	0.0	0.0	0.0	0.0	11.5	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		11.5	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			49.5%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	45	20	90	10	100	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	56	25	99	11	119	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	360	104			110	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	360	104			110	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	90	97			92	
cM capacity (veh/h)	587	926			1474	
Direction, Lane #	NW 1	NE 1	SW 1			
Volume Total	81	110	137			
Volume Left	56	0	119			
Volume Right	25	11	0			
cSH	661	1700	1474			
Volume to Capacity	0.12	0.06	0.08			
Queue Length 95th (ft)	10	0	7			
Control Delay (s)	11.2	0.0	6.7			
Lane LOS	B		A			
Approach Delay (s)	11.2	0.0	6.7			
Approach LOS	B					
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			23.4%		ICU Level of Service	A
Analysis Period (min)			15			



												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	5	0	15	0	110	0	0	110	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.86	0.86	0.86	0.75	0.75	0.75	0.88	0.88	0.88
Hourly flow rate (vph)	0	0	0	6	0	17	0	147	0	0	125	0
Pedestrians		15			12			2			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type						None						
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	305	299	142	286	299	160	140				159	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	305	299	142	286	299	160	140				159	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	99	100	98	100				100	
cM capacity (veh/h)	619	603	898	651	603	881	1438				1401	
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	0	23	147	125								
Volume Left	0	6	0	0								
Volume Right	0	17	0	0								
cSH	1700	810	1438	1700								
Volume to Capacity	0.00	0.03	0.00	0.07								
Queue Length 95th (ft)	0	2	0	0								
Control Delay (s)	0.0	9.6	0.0	0.0								
Lane LOS	A	A										
Approach Delay (s)	0.0	9.6	0.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			19.4%	ICU Level of Service				A				
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	10	0	0	0	5	100	20	45	100	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.55	0.55	0.55	0.92	0.92	0.92	0.74	0.74	0.74	0.76	0.76	0.76
Hourly flow rate (vph)	0	0	18	0	0	0	7	135	27	59	132	7
Pedestrians		19			35			11			15	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			0			1			1	
Right turn flare (veh)												
Median type						None						
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	449	483	165	480	473	199	157	197				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	449	483	165	480	473	199	157	197				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.3	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.4	2.2				
p0 queue free %	100	100	98	100	100	100	99	96				
cM capacity (veh/h)	484	456	863	461	462	837	1273	1388				
Direction, Lane #	SE 1	NE 1	SW 1									
Volume Total	18	169	197									
Volume Left	0	7	59									
Volume Right	18	27	7									
cSH	863	1273	1388									
Volume to Capacity	0.02	0.01	0.04									
Queue Length 95th (ft)	2	0	3									
Control Delay (s)	9.3	0.4	2.6									
Lane LOS	A	A	A									
Approach Delay (s)	9.3	0.4	2.6									
Approach LOS	A											
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			28.7%	ICU Level of Service				A				
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	55	0	70	5	15	0	25	75	0	0	75	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.69	0.69	0.69	0.74	0.74	0.74	0.79	0.79	0.79
Hourly flow rate (vph)	62	0	80	7	22	0	34	101	0	0	95	57
Pedestrians		32			22			19			56	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			2			2			5	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	391	346	174	413	375	179	184			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	391	346	174	413	375	179	184			123		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	91	98	96	100	97			100		
cM capacity (veh/h)	481	540	837	458	521	813	1336			1449		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	142	29	135	152								
Volume Left	62	7	34	0								
Volume Right	80	0	0	57								
cSH	631	504	1336	1700								
Volume to Capacity	0.23	0.06	0.03	0.09								
Queue Length 95th (ft)	21	5	2	0								
Control Delay (s)	12.4	12.6	2.1	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	12.4	12.6	2.1	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			33.1%		ICU Level of Service				A			
Analysis Period (min)			15									

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	282	207	400	382	483	11	1049
v/c Ratio	0.69	0.35	0.73	1.21	0.25	0.01	0.91
Control Delay	41.0	5.6	40.1	143.9	11.2	0.6	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	5.6	40.1	143.9	11.2	0.6	40.8
Queue Length 50th (ft)	158	0	227	~237	75	0	316
Queue Length 95th (ft)	254	51	337	#414	103	2	#450
Internal Link Dist (ft)	553		756		1161		668
Turn Bay Length (ft)		80		130		175	
Base Capacity (vph)	409	591	551	317	1959	805	1154
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.35	0.73	1.21	0.25	0.01	0.91





















#### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.


















# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	215	195	10	365	10	340	430	10	40	700	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	7.0	7.0		7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.95		1.00		1.00	1.00	0.86		0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85		1.00		1.00	1.00	0.85		0.96	
Flt Protected		0.99	1.00		1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1805	1488		1853		1751	3438	1389		3263	
Flt Permitted		0.75	1.00		0.99		0.13	1.00	1.00		0.91	
Satd. Flow (perm)		1367	1488		1835		233	3438	1389		2961	
Peak-hour factor, PHF	0.94	0.94	0.94	0.96	0.96	0.96	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	53	229	207	10	380	10	382	483	11	43	761	245
RTOR Reduction (vph)	0	0	145	0	1	0	0	0	5	0	29	0
Lane Group Flow (vph)	0	282	62	0	399	0	382	483	6	0	1020	0
Confl. Peds. (#/hr)	20		32	32		20	34		92	92		34
Confl. Bikes (#/hr)			8			23			2			7
Heavy Vehicles (%)	9%	3%	3%	0%	2%	0%	3%	5%	0%	0%	3%	10%
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA	Perm	Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2		2	2			1		1 3	1		
Actuated Green, G (s)		30.0	30.0		30.0		51.0	57.0	57.0		38.0	
Effective Green, g (s)		30.0	30.0		30.0		51.0	51.0	51.0		38.0	
Actuated g/C Ratio		0.30	0.30		0.30		0.51	0.51	0.51		0.38	
Clearance Time (s)		6.0	6.0		6.0		6.0				7.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0				2.0	
Lane Grp Cap (vph)		410	446		550		316	1753	708		1125	
v/s Ratio Prot							c0.16	0.14				
v/s Ratio Perm		0.21	0.04		c0.22		c0.46		0.00		0.34	
v/c Ratio		0.69	0.14		0.73		1.21	0.28	0.01		0.91	
Uniform Delay, d1		30.9	25.6		31.3		25.5	14.0	12.1		29.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		9.1	0.7		8.1		119.8	0.4	0.0		12.1	
Delay (s)		40.0	26.2		39.5		145.4	14.4	12.1		41.4	
Level of Service		D	C		D		F	B	B		D	
Approach Delay (s)		34.1			39.5			71.5			41.4	
Approach LOS		C			D			E			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			49.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			19.0		
Intersection Capacity Utilization			117.4%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												










	→	↖	↑	↗	↓
Lane Group	EBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	14	1242	594	348	256
v/c Ratio	0.07	0.66	0.81	0.18	0.16
Control Delay	0.7	9.2	43.5	10.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	9.2	43.5	10.6	1.7
Queue Length 50th (ft)	0	94	151	35	0
Queue Length 95th (ft)	0	288	265	92	54
Internal Link Dist (ft)	242		474		86
Turn Bay Length (ft)					
Base Capacity (vph)	230	1896	897	1986	1554
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.66	0.66	0.18	0.16
Intersection Summary					


































												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	0	0	1130	0	525	10	320	225	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0				5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00				0.88		0.95		0.97	1.00	
Frpb, ped/bikes		0.98				1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00				1.00		1.00		1.00	1.00	
Frt		0.93				0.85		1.00		1.00	0.99	
Flt Protected		0.98				1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1354				2787		3189		3335	1699	
Flt Permitted		0.98				1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1354				2787		3189		3335	1699	
Peak-hour factor, PHF	0.75	0.75	0.75	0.91	0.91	0.91	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	7	0	7	0	0	1242	0	583	11	348	245	11
RTOR Reduction (vph)	0	14	0	0	0	253	0	2	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	0	989	0	592	0	348	255	0
Confl. Peds. (#/hr)	2		5	5		2	18					18
Confl. Bikes (#/hr)									41			9
Heavy Vehicles (%)	50%	0%	0%	0%	0%	2%	50%	13%	0%	5%	11%	9%
Turn Type	Split	NA				Over		NA		Prot	NA	
Protected Phases	6	6				1		5		1	1	5
Permitted Phases							5	5				
Actuated Green, G (s)		3.3				53.9		20.7		53.9	79.6	
Effective Green, g (s)		3.3				53.9		20.7		53.9	79.6	
Actuated g/C Ratio		0.03				0.57		0.22		0.57	0.84	
Clearance Time (s)		7.0				5.0		5.0		5.0		
Vehicle Extension (s)		2.0				2.0		2.0		2.0		
Lane Grp Cap (vph)		47				1582		695		1894	1425	
v/s Ratio Prot		c0.00				c0.35		c0.19		0.10	0.15	
v/s Ratio Perm												
v/c Ratio		0.01				0.63		0.85		0.18	0.18	
Uniform Delay, d1		44.2				13.7		35.6		9.9	1.5	
Progression Factor		1.00				1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.0				1.9		9.5		0.2	0.0	
Delay (s)		44.3				15.6		45.2		10.1	1.5	
Level of Service		D				B		D		B	A	
Approach Delay (s)		44.3			15.6			45.2			6.4	
Approach LOS		D			B			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		20.7				HCM 2000 Level of Service		C				
HCM 2000 Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		94.9				Sum of lost time (s)		17.0				
Intersection Capacity Utilization		75.8%				ICU Level of Service		D				
Analysis Period (min)		15										

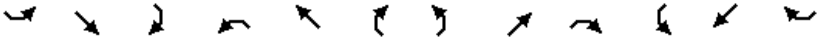




c Critical Lane Group

						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	1500	160	0	555	0	135
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.89	0.89
Hourly flow rate (vph)	1596	170	0	578	0	152
Pedestrians					68	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	166			1241		
pX, platoon unblocked			0.83		0.83	0.83
vC, conflicting volume			1664		2038	951
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1389		1840	529
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			100		100	60
cM capacity (veh/h)			391		53	376
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SW 1	
Volume Total	1064	702	289	289	152	
Volume Left	0	0	0	0	0	
Volume Right	0	170	0	0	152	
cSH	1700	1700	1700	1700	376	
Volume to Capacity	0.63	0.41	0.17	0.17	0.40	
Queue Length 95th (ft)	0	0	0	0	47	
Control Delay (s)	0.0	0.0	0.0	0.0	20.9	
Lane LOS					C	
Approach Delay (s)	0.0		0.0		20.9	
Approach LOS					C	
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			62.1%		ICU Level of Service	B
Analysis Period (min)			15			

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	120	45	150	10	90	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.94	0.94	0.89	0.89
Hourly flow rate (vph)	146	55	160	11	101	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	384	165			170	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	165			170	
tC, single (s)	6.5	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.3	
p0 queue free %	74	94			93	
cM capacity (veh/h)	555	874			1366	
Direction, Lane #	NW 1	NE 1	SW 1			
Volume Total	201	170	118			
Volume Left	146	0	101			
Volume Right	55	11	0			
cSH	617	1700	1366			
Volume to Capacity	0.33	0.10	0.07			
Queue Length 95th (ft)	35	0	6			
Control Delay (s)	13.6	0.0	6.8			
Lane LOS	B		A			
Approach Delay (s)	13.6	0.0	6.8			
Approach LOS	B					
Intersection Summary						
Average Delay			7.2			
Intersection Capacity Utilization			33.7%	ICU Level of Service		A
Analysis Period (min)			15			





















												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	15	0	10	10	0	30	5	190	0	0	85	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.63	0.63	0.63	0.92	0.92	0.92	0.85	0.85	0.85
Hourly flow rate (vph)	16	0	11	16	0	48	5	207	0	0	100	6
Pedestrians		6			14							
Lane Width (ft)		12.0			12.0							
Walking Speed (ft/s)		4.0			4.0							
Percent Blockage		1			1							
Right turn flare (veh)												
Median type						None				None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	374	340	109	345	343	221	112			221		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374	340	109	345	343	221	112			221		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	97	100	99	97	100	94	100			100		
cM capacity (veh/h)	537	570	940	572	571	783	1483			1345		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	27	63	212	106								
Volume Left	16	16	5	0								
Volume Right	11	48	0	6								
cSH	648	717	1483	1700								
Volume to Capacity	0.04	0.09	0.00	0.06								
Queue Length 95th (ft)	3	7	0	0								
Control Delay (s)	10.8	10.5	0.2	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	10.8	10.5	0.2	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay				2.5								
Intersection Capacity Utilization				24.0%	ICU Level of Service				A			
Analysis Period (min)				15								










												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	5	20	0	0	0	30	185	20	55	70	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.92	0.92	0.92	0.88	0.88	0.88	0.96	0.96	0.96
Hourly flow rate (vph)	12	6	23	0	0	0	34	210	23	57	73	10
Pedestrians		4			20			8			11	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	497	518	90	537	512	253	87				253	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	497	518	90	537	512	253	87				253	
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1				4.2	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.3	2.2				2.3	
p0 queue free %	97	99	98	100	100	100	98				96	
cM capacity (veh/h)	436	433	950	416	436	784	1516				1284	
Direction, Lane #	SE 1	NE 1	SW 1									
Volume Total	41	267	141									
Volume Left	12	34	57									
Volume Right	23	23	10									
cSH	630	1516	1284									
Volume to Capacity	0.06	0.02	0.04									
Queue Length 95th (ft)	5	2	4									
Control Delay (s)	11.1	1.1	3.5									
Lane LOS	B	A	A									
Approach Delay (s)	11.1	1.1	3.5									
Approach LOS	B											
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			34.5%	ICU Level of Service				A				
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	65	0	65	5	20	0	85	110	0	0	65	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.81	0.81	0.81	0.82	0.82	0.82	0.77	0.77	0.77
Hourly flow rate (vph)	71	0	71	6	25	0	104	134	0	0	84	149
Pedestrians		15			24			22			65	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			2			2			5	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	593	540	196	618	614	223	249			158		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	593	540	196	618	614	223	249			158		
tC, single (s)	7.1	6.6	6.4	7.1	6.7	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	79	100	91	98	93	100	92			100		
cM capacity (veh/h)	334	392	770	323	342	761	1289			1405		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	143	31	238	234								
Volume Left	71	6	104	0								
Volume Right	71	0	0	149								
cSH	466	338	1289	1700								
Volume to Capacity	0.31	0.09	0.08	0.14								
Queue Length 95th (ft)	32	7	7	0								
Control Delay (s)	16.1	16.7	3.9	0.0								
Lane LOS	C	C	A									
Approach Delay (s)	16.1	16.7	3.9	0.0								
Approach LOS	C	C										
<b>Intersection Summary</b>												
Average Delay			5.8									
Intersection Capacity Utilization			49.5%			ICU Level of Service			A			
Analysis Period (min)			15									

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	250	116	495	632	841	5	516
v/c Ratio	1.98	0.30	1.27	0.94	0.40	0.01	1.04
Control Delay	494.5	7.4	174.7	41.2	9.2	0.0	81.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	494.5	7.4	174.7	41.2	9.2	0.0	81.1
Queue Length 50th (ft)	~239	0	~385	234	118	0	~158
Queue Length 95th (ft)	#369	34	#574	#470	155	0	#264
Internal Link Dist (ft)	553		756		1161		668
Turn Bay Length (ft)				180			
Base Capacity (vph)	126	390	389	669	2124	820	496
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.98	0.30	1.27	0.94	0.40	0.01	1.04
<b>Intersection Summary</b>							
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.							
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.							



												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	160	100	5	405	30	575	765	5	40	285	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0		7.0	7.0	7.0		7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.94		0.99		1.00	1.00	0.78		0.98	
Flpb, ped/bikes		1.00	1.00		1.00		0.99	1.00	1.00		1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85		0.95	
Flt Protected		0.99	1.00		1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1724	1340		1772		1710	3343	1265		2963	
Flt Permitted		0.33	1.00		0.99		0.37	1.00	1.00		0.52	
Satd. Flow (perm)		578	1340		1764		669	3343	1265		1540	
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.91	0.91	0.91	0.96	0.96	0.96
Adj. Flow (vph)	64	186	116	6	455	34	632	841	5	42	297	177
RTOR Reduction (vph)	0	0	91	0	3	0	0	0	2	0	63	0
Lane Group Flow (vph)	0	250	25	0	492	0	632	841	3	0	453	0
Confl. Peds. (#/hr)	48		29	29		48	16		90	90		16
Confl. Bikes (#/hr)			12			8			9			1
Heavy Vehicles (%)	21%	4%	13%	0%	6%	0%	5%	8%	0%	5%	8%	23%
Turn Type	Perm	NA	Perm	Perm	NA		D.P+P	NA	Perm	Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2		2	2			1		1 3	1		
Actuated Green, G (s)		21.0	21.0		21.0		54.0	61.0	61.0		27.0	
Effective Green, g (s)		21.0	21.0		21.0		54.0	61.0	61.0		27.0	
Actuated g/C Ratio		0.22	0.22		0.22		0.56	0.64	0.64		0.28	
Clearance Time (s)		7.0	7.0		7.0		7.0				7.0	
Lane Grp Cap (vph)		126	293		385		669	2124	803		433	
v/s Ratio Prot							c0.27	0.25				
v/s Ratio Perm		c0.43	0.02		0.28		0.27		0.00		c0.29	
v/c Ratio		1.98	0.09		1.28		0.94	0.40	0.00		1.05	
Uniform Delay, d1		37.5	29.9		37.5		15.2	8.5	6.4		34.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		470.0	0.6		143.6		23.6	0.6	0.0		55.7	
Delay (s)		507.5	30.4		181.1		38.8	9.1	6.4		90.2	
Level of Service		F	C		F		D	A	A		F	
Approach Delay (s)		356.3			181.1			21.8			90.2	
Approach LOS		F			F			C			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			104.6				HCM 2000 Level of Service				F	
HCM 2000 Volume to Capacity ratio			1.27									
Actuated Cycle Length (s)			96.0				Sum of lost time (s)				21.0	
Intersection Capacity Utilization			114.0%				ICU Level of Service				H	
Analysis Period (min)			15									
c Critical Lane Group												





						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	30	10	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	33	11	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	22	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	99			
cM capacity (veh/h)	988	1085	1623			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	33	11	0			
Volume Left	0	11	0			
Volume Right	33	0	0			
cSH	1085	1623	1700			
Volume to Capacity	0.03	0.01	0.00			
Queue Length 95th (ft)	2	1	0			
Control Delay (s)	8.4	7.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.4	7.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		8.1				
Intersection Capacity Utilization		13.3%		ICU Level of Service	A	
Analysis Period (min)		15				



Lane Group	EBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	18	738	416	1027	446
v/c Ratio	0.10	0.34	0.88	0.43	0.28
Control Delay	29.6	0.6	59.8	8.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	0.6	59.8	8.2	2.2
Queue Length 50th (ft)	4	0	110	83	0
Queue Length 95th (ft)	15	0	#244	226	105
Internal Link Dist (ft)	242		474		86
Turn Bay Length (ft)					
Base Capacity (vph)	223	2184	474	2366	1597
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.34	0.88	0.43	0.28

#### Intersection Summary










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










Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	5	5	0	0	635	0	385	10	965	415	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0				5.0		5.0		5.0	5.0	
Lane Util. Factor		1.00				0.88		0.95		0.97	1.00	
Frpb, ped/bikes		0.98				1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00				1.00		1.00		1.00	1.00	
Frt		0.93				0.85		1.00		1.00	1.00	
Flt Protected		1.00				1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1728				2787		3465		3467	1751	
Flt Permitted		1.00				1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1728				2787		3465		3467	1751	
Peak-hour factor, PHF	0.56	0.56	0.56	0.86	0.86	0.86	0.95	0.95	0.95	0.94	0.94	0.94
Adj. Flow (vph)	0	9	9	0	0	738	0	405	11	1027	441	5
RTOR Reduction (vph)	0	9	0	0	0	258	0	2	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	0	480	0	414	0	1027	446	0
Confl. Peds. (#/hr)			7				40		2	2		40
Confl. Bikes (#/hr)									5			37
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	3%	30%	1%	8%	33%
Turn Type		NA				Over		NA		custom	NA	
Protected Phases	6	6				1		5		1	1 5	
Permitted Phases							5			1		
Actuated Green, G (s)		3.4				60.5		12.1		60.5	77.6	
Effective Green, g (s)		3.4				60.5		12.1		60.5	77.6	
Actuated g/C Ratio		0.04				0.65		0.13		0.65	0.83	
Clearance Time (s)		7.0				5.0		5.0		5.0		
Vehicle Extension (s)		2.0				2.0		2.0		2.0		
Lane Grp Cap (vph)		63				1813		450		2255	1461	
v/s Ratio Prot		c0.01				0.17		c0.12		c0.30	0.25	
v/s Ratio Perm												
v/c Ratio		0.15				0.26		0.92		0.46	0.31	
Uniform Delay, d1		43.4				6.9		40.0		8.1	1.7	
Progression Factor		1.00				1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.4				0.4		23.8		0.7	0.0	
Delay (s)		43.8				7.2		63.8		8.7	1.8	
Level of Service		D				A		E		A	A	
Approach Delay (s)		43.8			7.2			63.8			6.6	
Approach LOS		D			A			E			A	

















#### Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
















c Critical Lane Group

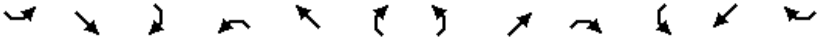




						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Volume (veh/h)	905	115	0	1385	0	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.94	0.94	0.84	0.84
Hourly flow rate (vph)	995	126	0	1473	0	71
Pedestrians				2	34	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	3	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	166			1241		
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			1029		1828	596
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			776		1110	288
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	88
cM capacity (veh/h)			714		179	614
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SW 1	
Volume Total	663	458	737	737	71	
Volume Left	0	0	0	0	0	
Volume Right	0	126	0	0	71	
cSH	1700	1700	1700	1700	614	
Volume to Capacity	0.39	0.27	0.43	0.43	0.12	
Queue Length 95th (ft)	0	0	0	0	10	
Control Delay (s)	0.0	0.0	0.0	0.0	11.6	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		11.6	
Approach LOS					B	
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			49.5%		ICU Level of Service	A
Analysis Period (min)			15			

						
Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Volume (veh/h)	45	20	105	10	110	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.91	0.91	0.84	0.84
Hourly flow rate (vph)	56	25	115	11	131	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	401	121			126	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	401	121			126	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	90	97			91	
cM capacity (veh/h)	551	907			1454	
Direction, Lane #	NW 1	NE 1	SW 1			
Volume Total	81	126	149			
Volume Left	56	0	131			
Volume Right	25	11	0			
cSH	626	1700	1454			
Volume to Capacity	0.13	0.07	0.09			
Queue Length 95th (ft)	11	0	7			
Control Delay (s)	11.6	0.0	6.9			
Lane LOS	B		A			
Approach Delay (s)	11.6	0.0	6.9			
Approach LOS	B					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			23.9%		ICU Level of Service	A
Analysis Period (min)			15			

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	10	5	0	15	15	110	0	0	110	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.86	0.86	0.86	0.75	0.75	0.75	0.88	0.88	0.88
Hourly flow rate (vph)	20	0	20	6	0	17	20	147	0	0	125	23
Pedestrians		15			12			2			1	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	356	350	153	357	361	160	163			159		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	356	350	153	357	361	160	163			159		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	98	99	100	98	99			100		
cM capacity (veh/h)	567	556	885	565	548	881	1410			1401		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	40	23	167	148								
Volume Left	20	6	20	0								
Volume Right	20	17	0	23								
cSH	691	773	1410	1700								
Volume to Capacity	0.06	0.03	0.01	0.09								
Queue Length 95th (ft)	5	2	1	0								
Control Delay (s)	10.5	9.8	1.0	0.0								
Lane LOS	B	A	A									
Approach Delay (s)	10.5	9.8	1.0	0.0								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			2.2									
Intersection Capacity Utilization			29.1%			ICU Level of Service			A			
Analysis Period (min)			15									



												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	10	0	0	0	5	110	20	45	120	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.55	0.55	0.55	0.92	0.92	0.92	0.74	0.74	0.74	0.76	0.76	0.76
Hourly flow rate (vph)	0	0	18	0	0	0	7	149	27	59	158	7
Pedestrians		19			35			11			15	
Lane Width (ft)		12.0			0.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			0			1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	489	523	191	519	513	212	183			211		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	489	523	191	519	513	212	183			211		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.4			2.2		
p0 queue free %	100	100	98	100	100	100	99			96		
cM capacity (veh/h)	455	432	834	434	438	823	1244			1372		
Direction, Lane #	SE 1	NE 1	SW 1									
Volume Total	18	182	224									
Volume Left	0	7	59									
Volume Right	18	27	7									
cSH	834	1244	1372									
Volume to Capacity	0.02	0.01	0.04									
Queue Length 95th (ft)	2	0	3									
Control Delay (s)	9.4	0.3	2.3									
Lane LOS	A	A	A									
Approach Delay (s)	9.4	0.3	2.3									
Approach LOS	A											
<b>Intersection Summary</b>												
Average Delay			1.8									
Intersection Capacity Utilization			40.0%			ICU Level of Service			A			
Analysis Period (min)			15									

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	55	0	80	5	15	0	30	80	0	0	85	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.69	0.69	0.69	0.74	0.74	0.74	0.79	0.79	0.79
Hourly flow rate (vph)	62	0	91	7	22	0	41	108	0	0	108	57
Pedestrians		32			22			19			56	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			2			2			5	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	424	379	187	457	408	186	197			130		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424	379	187	457	408	186	197			130		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	89	98	96	100	97			100		
cM capacity (veh/h)	454	515	824	419	496	806	1322			1441		
Direction, Lane #	SE 1	NW 1	NE 1	SW 1								
Volume Total	153	29	149	165								
Volume Left	62	7	41	0								
Volume Right	91	0	0	57								
cSH	619	475	1322	1700								
Volume to Capacity	0.25	0.06	0.03	0.10								
Queue Length 95th (ft)	24	5	2	0								
Control Delay (s)	12.7	13.1	2.3	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	12.7	13.1	2.3	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			45.6%			ICU Level of Service			A			
Analysis Period (min)			15									

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	292	207	405	382	483	11	1049
v/c Ratio	0.71	0.35	0.74	1.21	0.25	0.01	0.91
Control Delay	42.3	5.6	40.6	143.9	11.2	0.6	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	5.6	40.6	143.9	11.2	0.6	40.8
Queue Length 50th (ft)	165	0	230	~237	75	0	316
Queue Length 95th (ft)	#269	51	343	#414	103	2	#450
Internal Link Dist (ft)	553		756		1161		668
Turn Bay Length (ft)		80		130		175	
Base Capacity (vph)	410	591	551	317	1959	805	1154
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.35	0.74	1.21	0.25	0.01	0.91





















#### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.










Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	225	195	10	370	10	340	430	10	40	700	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	7.0	7.0		7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95	1.00		0.95	
Frpb, ped/bikes		1.00	0.95		1.00		1.00	1.00	0.86		0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Frt		1.00	0.85		1.00		1.00	1.00	0.85		0.96	
Flt Protected		0.99	1.00		1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1806	1488		1853		1751	3438	1389		3263	
Flt Permitted		0.75	1.00		0.99		0.13	1.00	1.00		0.91	
Satd. Flow (perm)		1369	1488		1835		233	3438	1389		2961	
Peak-hour factor, PHF	0.94	0.94	0.94	0.96	0.96	0.96	0.89	0.89	0.89	0.92	0.92	0.92
Adj. Flow (vph)	53	239	207	10	385	10	382	483	11	43	761	245
RTOR Reduction (vph)	0	0	145	0	1	0	0	0	5	0	29	0
Lane Group Flow (vph)	0	292	62	0	404	0	382	483	6	0	1020	0
Confl. Peds. (#/hr)	20		32	32		20	34		92	92		34
Confl. Bikes (#/hr)			8			23			2			7
Heavy Vehicles (%)	9%	3%	3%	0%	2%	0%	3%	5%	0%	0%	3%	10%
Turn Type	Perm	NA	Perm	Perm	NA		D,P+P	NA	Perm	Perm	NA	
Protected Phases		2			2		3	1 3			1	
Permitted Phases	2		2	2			1		1 3	1		
Actuated Green, G (s)		30.0	30.0		30.0		51.0	57.0	57.0		38.0	
Effective Green, g (s)		30.0	30.0		30.0		51.0	51.0	51.0		38.0	
Actuated g/C Ratio		0.30	0.30		0.30		0.51	0.51	0.51		0.38	
Clearance Time (s)		6.0	6.0		6.0		6.0				7.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0				2.0	
Lane Grp Cap (vph)		410	446		550		316	1753	708		1125	
v/s Ratio Prot							c0.16	0.14				
v/s Ratio Perm		0.21	0.04		c0.22		c0.46		0.00		0.34	
v/c Ratio		0.71	0.14		0.74		1.21	0.28	0.01		0.91	
Uniform Delay, d1		31.2	25.6		31.4		25.5	14.0	12.1		29.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2		10.1	0.7		8.5		119.8	0.4	0.0		12.1	
Delay (s)		41.2	26.2		39.9		145.4	14.4	12.1		41.4	
Level of Service		D	C		D		F	B	B		D	
Approach Delay (s)		35.0			39.9			71.5			41.4	
Approach LOS		D			D			E			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			49.4				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			19.0		
Intersection Capacity Utilization			117.9%				ICU Level of Service			H		
Analysis Period (min)			15									

c Critical Lane Group

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	0	0	35	0	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	38	0	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		76	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		76	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	98
cM capacity (veh/h)			1623		905	1085
Direction, Lane #	SE 1	NW 1	NE 1			
Volume Total	0	38	22			
Volume Left	0	38	0			
Volume Right	0	0	22			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.02	0.02			
Queue Length 95th (ft)	0	2	2			
Control Delay (s)	0.0	7.3	8.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.3	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay		7.7				
Intersection Capacity Utilization		6.7%		ICU Level of Service	A	
Analysis Period (min)		15				

## **APPENDIX C: BPDA Checklists**

**Accessibility Checklist**

**LEED Checklist**

**Climate Change Preparedness and Resiliency Checklist**

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## 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](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](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](http://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/](http://www.mbta.com/about_the_mbta/accessibility/)

## Project Information

Project Name:	The Chandlery, 270 Dorchester Avenue
Project Address Primary:	270 Dorchester Avenue
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Mark Edwards, Project Manager - 270 Dorchester Avenue, LLC – <a href="mailto:info@270dorchester.com">info@270dorchester.com</a> - 617-529-4114

## Team Description

Owner / Developer:	270 Dorchester Avenue, LLC – Mark Edwards, Project Manager
Architect:	Pisani & Associates
Engineer (building systems):	M.E.A. Engineering Associates
Sustainability / LEED:	TBD
Permitting:	VHB
Construction Management:	TBD

## Project Permitting and Phase

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

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

## Article 80 | ACCESSIBILITY CHECKLIST

### Building Classification and Description

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

Residential – One to Three Unit	<b>Residential - Multi-unit, Four +</b>	Institutional	Education
Commercial	Office	<b>Retail</b>	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	<b>Residential, Retail, Restaurant, Lobby, Open Space</b>		

What is the Construction Type – select most appropriate type?

<b>Wood Frame</b>	Masonry	<b>Steel Frame</b>	Concrete
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Describe the building?

Site Area:

**21,063 SF**

Building Area:

**119,250 SF**

Building Height:

**90 Ft.**

Number of Stories:

**8 Flrs.**

First Floor Elevation: ?

**25'-6"Elev.**

Are there below grade spaces:

**Yes / No**

**Parking,/**

**Gym Space/**

### Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.

The Project is located in South Boston, and is bounded by Dorchester Avenue, B Street, W 6th Street, and the South Boston Bypass (Haul Road). Destinations within a ten minute walk include the West Broadway Neighborhood Shopping District and the South End's SoWa Arts District. The Site is also easily accessible by car, with direct access to Downtown Boston, Logan Airport, and the Massachusetts Turnpike.

## Article 80 | ACCESSIBILITY CHECKLIST

List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.

The Project Site boasts excellent transit access, located approximately 0.3 miles (a five-minute walk) from the Broadway Red Line station, 0.6 miles from Andrew Station, and within blocks of three MBTA bus routes (9, 11 and 47).

List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.

South Boston Community Health Center (0.7 miles); J F Condon School (0.3 miles); UP Academy Charter School of Boston (0.6 miles); West Broadway Family Public Housing Community (0.1 miles); West 9th Street Elderly/Disabled Public Housing Community (.05 miles)

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.

Condon Community Center (0.3 miles ); Orton Field (0.2 miles); Flaherty Park; 0.3 miles; Sweeney Playground (0.4 miles); Buckley Playground (0.5 miles); St. Augustine Burying Ground (0.5 miles);

### 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.

Existing sidewalks about the Project on Dorchester Avenue, B Street and West Sixth Street. At-grade entrances to the Project are provided on Dorchester Avenue and West Sixth Street. All existing sidewalks will be replaced by new concrete and granite curbs. The sidewalk grades will conform to Code. A total of 4 existing curb cuts will be removed.

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.

All sidewalks and curbs are to be replaced.

Is the development site within a historic district? ***If yes***, please identify.

No.

## Article 80 | ACCESSIBILITY CHECKLIST

### 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 comfortably 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](http://www.bostoncompletestreets.org)

Yes. A description of the proposed public realm can be found in Section 2.5 of the EPNF.

**If yes above**, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.

Neighborhood Connector Street (Dorchester Avenue); Neighborhood Residential Street (B Street).

What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.

The majority of the sidewalk on Dorchester Avenue will be approximately 16 feet wide made possible by the street-level building set-back. The sidewalk on B Street will vary in width from 13 feet to 8 feet. The width of the sidewalk on West 6th Street will remain as is (6 feet).

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?

Sidewalks will be a combination of concrete and paving materials as shown on the Landscape Architectural Plans included in the EPNF.

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?

## Article 80 | ACCESSIBILITY CHECKLIST

### 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?

120 parking spaces will be provided in an underground parking garage, a portion of which is accessed via an automated parking system.

What is the total number of accessible spaces provided at the development site?

One internal accessible parking space will be located on the first level of the parking garage. Access to retail, restaurant and residences is available from this level.

Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?

No.

Where is accessible visitor parking located?

Accessible parking is located on the first level of the parking garage.

Has a drop-off area been identified? **If yes,** will it be accessible?

Yes. It will be accessible.

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.

## Article 80 | ACCESSIBILITY CHECKLIST

### 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.

Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.

- Dorchester Ave: Flush condition
- B Street: Flush condition (residential units), Stairs (public open space)

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, accessible by (2) elevators and (3) egress stairwells.

Has an accessible routes way-finding and signage package been developed? If yes, please describe.

Not at this time, but all future way finding signage will be developed to meet Building Code and Accessibility Board requirements.

### Accessible Units: (If applicable)

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

What is the total number of proposed units for the development?

150 Units

How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?

Not Available at this time. This will be developed during Final Design Plans.

How many accessible units are being proposed?

Not Available at this time. This will be developed during Final Design Plans.

Please provide plan and diagram of the accessible units.

Not Available at this time. This will be developed during Final Design Plans.



## Article 80 | ACCESSIBILITY CHECKLIST

How many accessible units will also be affordable? If none, please describe reason.

Not available at this time. This will be developed during final design.

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?

Review with the BRA and other city agency is ongoing.

Thank you for completing the Accessibility Checklist!

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

[kathryn.quigley@boston.gov](mailto:kathryn.quigley@boston.gov) | Mayors Commission for Persons with Disabilities



# LEED 2009 for New Construction and Major Renovations

## Project Checklist

270 DORCHESTER AVE.

4.6.16

### 23 1 Sustainable Sites Possible Points: 26

Y	?	N			
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
1			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

### 7 Water Efficiency Possible Points: 10

Y	?	N			
Y			Prereq 1	Water Use Reduction—20% Reduction	
3			Credit 1	Water Efficient Landscaping	2 to 4
1			Credit 2	Innovative Wastewater Technologies	2
3			Credit 3	Water Use Reduction	2 to 4

### 8 8 17 Energy and Atmosphere Possible Points: 35

Y	?	N			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5	3	11	Credit 1	Optimize Energy Performance	1 to 19
	1	6	Credit 2	On-Site Renewable Energy	1 to 7
	2		Credit 3	Enhanced Commissioning	2
	2		Credit 4	Enhanced Refrigerant Management	2
1			Credit 5	Measurement and Verification	3
2			Credit 6	Green Power	2

### 4 Materials and Resources Possible Points: 14

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

### 13 2 Indoor Environmental Quality Possible Points: 15

Y	?	N			
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

### 5 1 Innovation and Design Process Possible Points: 6

Y	?	N			
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

Y	?	N			
			Credit 1.1	Regional Priority: Specific Credit	1
			Credit 1.2	Regional Priority: Specific Credit	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1

### 60 11 26 Total Possible Points: 110

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

# 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/](http://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](http://www.bostonredevelopmentauthority.org/planning/Hotspot%20of%20Accelerated%20Sea-level%20Rise%202012.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](http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf))

## Checklist

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

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

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

## Climate Change Resiliency and Preparedness Checklist

### A.1 - Project Information

Project Name:	The Chandlery, 270 Dorchester Avenue
Project Address Primary:	270 Dorchester Avenue
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Mark Edwards, Project Manager - 270 Dorchester Avenue, LLC - <a href="mailto:medwards@cgedwards.com">medwards@cgedwards.com</a> - 617-529-4111

### A.2 - Team Description

Owner / Developer:	270 Dorchester Avenue, LLC – Mark Edwards, Project Manager
Architect:	Pisani & Associates
Engineer (building systems):	M.E.A. Engineering Associates
Sustainability / LEED:	TBD
Permitting:	VHB
Construction Management:	TBD
Climate Change Expert:	VHB

### A.3 - Project Permitting and Phase

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

PNF / <b>Expanded PNF Submission</b>	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, Restaurant, Retail, Parking**

List the First Floor Uses:

**Residential, Retail, Restaurant, Lobby, Open Space**

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

<b>Wood Frame</b>	Masonry	<b>Steel Frame</b>	Concrete
-------------------	---------	--------------------	----------

Describe the building?

Site Area:

**21,063 SF**

Building Area:

**119,250 SF**

Building Height:

**90 Ft.**

Number of Stories:

**8 Flrs.**

First Floor Elevation (reference Boston City Base):

**25'-6" Elev**

Are there below grade spaces/levels, if yes how many:

**Yes, 2 levels No / Number of Levels**

## 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:

<b>New Construction</b>	Core & Shell	Healthcare	Schools
Retail	Homes Midrise	Homes	Other
Select LEED Outcome:	Certified	<b>Silver</b>	Gold
			Platinum

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

Registered:

Yes / <b>No</b>

Certified:

Yes / <b>No</b>

## A.6 - Building Energy

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

Electric:

690 (kW)
40.9 (kWh/SF/yr)

Heating:

2.77 (MMBtu/hr)
215 (Tons)

What is the planned building  
Energy Use Intensity:

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

Electric:

127.3 (kW)
------------

Heating:

0.1 (MMBtu/hr)
0 (Tons)

Cooling:

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

Electrical Generation:

175 (kW)
(1) <b>Combustion Engine</b>

Fuel Source:

<b>Natural Gas</b>
1 (Units)

System Type and Number of Units:

(0) Gas  
Turbine

(0) Combine  
Heat and  
Power

## 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	<b>50 Years</b>	75 Years
----------	----------	-----------------	----------

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

Select most appropriate:

10 Years	<b>25 Years</b>	50 Years	75 Years
----------	-----------------	----------	----------

What time span of future Climate Conditions was considered?

Select most appropriate:

10 Years	<b>25 Years</b>	50 Years	75 Years
----------	-----------------	----------	----------

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

<i>0/100 Deg</i>
------------------

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

<i>95 Deg</i>	<i>5 Days</i>	<i>6 Events / yr.</i>
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What Drought characteristics will be used for project planning – Duration and Frequency?

<i>30-90 Days</i>	<i>0.2 Events / yr.</i>
-------------------	-------------------------

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

<i>45 Inches / yr.</i>	<i>4 Inches</i>	<i>0.5 Events / yr.</i>
------------------------	-----------------	-------------------------

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?

<i>60mph Peak Wind</i>	<i>0.1 Hours</i>	<i>18 Events / yr.</i>
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## 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: *29%*

How is performance determined: **Comcheck Analysis in accordance with 2009 IEEC**

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

Select all appropriate:	High performance building envelope	High performance lighting & controls	Building day lighting	EnergyStar equip. / appliances
	High performance HVAC equipment	Energy recovery ventilation	No active cooling	No active heating
Describe any added measures:	<b>None</b>			

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

Roof:	<i>R = 30</i>	Walls / Curtain Wall Assembly:	<i>R = 30</i>
Foundation:	<i>R = 30</i>	Basement / Slab:	<i>R = 30</i>
Windows:	<i>R = / U = .21</i>	Doors:	<i>R = / U =</i>

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	<b>Ground source heat pump</b>
On-site Solar PV	On-site Solar Thermal	Wind power	None
Describe any added measures:	<b>None</b>		

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

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

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

	Yes / <i>No</i>	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:	<b>None</b>			

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

Select all appropriate:	High reflective paving materials	<b>Shade trees &amp; shrubs</b>	High reflective roof materials	<b>Vegetated roofs</b>
	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:	<b>Hardened building structure &amp; elements</b>	<b>Buried utilities &amp; hardened infrastructure</b>	<b>Hazard removal &amp; protective landscapes</b>	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 / <i>No</i>
-----------------

Describe site conditions?

Site Elevation – Low/High Points:	<b><i>Boston City Base 21.5' to 30.5' elev (feet)</i></b>
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Building Proximity to Water: **2,430 Ft.**

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

Coastal Zone: **Yes / No**

Velocity Zone: **Yes / No**

Flood Zone: **Yes / No**

Area Prone to Flooding: **Yes / No**

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

2013 FEMA Prelim. FIRMs: **Yes / No**

Future floodplain delineation updates: **Yes / No**

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

**950 Ft. (2016 FIRM panel 25025C0083I)**

*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: **BH-FRM**

Sea Level Rise: **3.2 Ft**

Frequency of storms: **1% annual chance flood**

### C.3 - Building Flood Proofing

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

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

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

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

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

**Yes / No**

If Yes, to what elevation **Boston City Base Elev. ( Ft.)**

If Yes, describe:

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

Systems located above 1 <sup>st</sup> Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention
--	------------------------------	----------------------------------	----------------------------------

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

**Yes / No**

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

	<b>Yes / No</b>	If yes, to what height above 100 Year Floodplain:	<b>25' Boston City Base Elev. (Ft.) (7 ft above BFE)</b>
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Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

	<b>Yes / No</b>
--	-----------------

If Yes, describe:

--

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

	<b>Yes / No</b>	If Yes, for how long:	<b>days</b>
--	-----------------	-----------------------	-------------

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

N/A
-----

#### C.4 - Building Resilience and Adaptability

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

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

Select appropriate:

Yes / No <b>N/A</b>	Hardened / Resilient Ground Floor Construction	Temporary shutters and or barricades	Resilient site design, materials and construction
------------------------	--	--------------------------------------	---

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

Select appropriate:

Yes / No <b>N/A</b>	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
------------------------	--	-------------------------------------	------------------------------

Describe additional strategies:

--

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

Select appropriate:

Yes / <b>No</b>	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](mailto:John.Dalzell.BRA@cityofboston.gov)

# **APPENDIX D: Energy Analysis Supporting Documentation**

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MEA ENGINEERING ASSOCIATES, INC.  
20 Felton Street  
Waltham, MA 02453  
781 894-6730 office  
781 647-3542 fax  
mucc96@aol.com

The Chandlery Building  
270 Dorchester Avenue  
Boston, MA

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Design Development  
Energy Modeling Analysis  
October 27, 2016

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## Executive Summary

The Chandlery Building consists of a eight-story 119,250 sf building located at 270 Dorchester Avenue in Boston, MA. The first floor contains retail spaces while the second through eighth floors will be for housing tenants. There are two below grade parking garage levels comprising an additional 36,195 sf.

MEA has completed the Design Development energy analysis. The purpose of this energy analysis is to

- Determine the current anticipated energy and energy cost reduction compared to the ASHRAE 90.1-2007 Appendix G baseline for LEED 2009 and Article 37, Boston's Green Building Standard.
- Identify the energy conservation measures included in the design and energy model and those recommended to investigate for further energy savings.
- Provide source energy and carbon footprint benchmarking for the proposed design.
- Compare the proposed design to the 2030 Challenge.

A list of incorporated ECMs, summary and discussion of results, and description of energy model assumptions are included in this report for the design team to review. Based on current assumptions, the design indicates 29.0% energy cost and 29.0% energy consumption savings compared to the LEED baseline. The results indicate that the project is on track to meet the EAp2 Minimum Energy Performance prerequisite of 10% cost savings and is estimated to achieve 5 points under EAc1 Optimize Energy Performance for LEED Core & Shell. To ensure that the project meets the EAp2 prerequisite, all ECMs currently assumed to be included in the project must be carried forward.

*Please note that all results are subject to change as the project progresses. Results are based on the current design and assumptions described within this report. Please refer to this report in its entirety for ECMs assumed to be in the project and detailed energy model assumptions.*



## Energy Conservation Measures

Energy Conservation Measures (ECMs) currently assumed to be included in the project are shown in the list below in regular typeface. ECMs not currently in the design, and therefore not incorporated into the energy model, are shown in bold. These ECMs are recommended for increased energy and cost savings.

### ARCHITECTURAL

ECM	Details
WALL U	Optimized wall assembly to meet or exceed prescriptive code requirement of U-0.064. The current wall assembly is rated at U-0.033 for the insulated metal panels, and U-0.166 for the spandrel. The spandrel has been de-rated due to thermal bridging at the cladding support system. A truly thermally broken wall assembly will increase the insulation effectiveness and result in lower thermal loads in both heating and cooling seasons.
ROOF U	Optimized roof assembly exceeding prescriptive code requirement of U-0.048. The current roof assembly is rated at U-0.033.
GLASS U+	Optimized glass selection including low-e coatings, low conductivity gas fill and roomside low-e. The current glass selection has a center-of-glass U-value of U-0.21
FRAMING U	Optimized window framing selection with thermal breaks and warm edge spacers. The current curtainwall and framing is assumed to achieve an overall U-value of U-0.21, which exceeds the prescriptive code requirement of U-0.45. Punched window achieve a U-value of 0.21 which exceeds the prescriptive code requirement of U-0.55..
GLASS SHGC+	Optimized glass SHGC based on space conditions and direction. SHGC at 0.35 or less is highly recommended. The current glass selection has a SHGC of 0.32.

### ELECTRICAL

ECM	Details
LPD -20%	Reduce LPD by 20% compared to 90.1-2007 allowances using LED lighting, reducing fixture count, and limiting lighting levels to code minimum.
LIGHTING CTRL	Exceed prescriptive code requirements for daylighting and occupancy-based dimming and/or shutoff. Install a fully addressable lighting control system to allow for increased lighting controllability and easier HVAC tie-in.

### MECHANICAL

ECM	Details
ENERGY RECOVERY	Runaround energy recovery on AHU-1 and - 2 to recover heat from building exhaust.
HR BYPASS	Heat-recovery bypass dampers open for economizer mode.
HP LOAD	Heat Pump units in spaces with high sensible load.
AHU SP	Low static pressure, low velocity across coils and filters in AHU.

DUCT SP	Low static pressure, low velocity in ducts
MOTOR EF	Premium-efficiency pumps and fan motors.
WSE	Enlarged waterside economizer for increased winter free cooling.
COOLING TWR	3 gpm/ton condenser water, VSD on fans.
HW	High efficiency modular condensing boiler plant. 140 °F hot water supply temperature.
EC MOTORS	Electrically commutated motors for heat pump units, pumps, fans, where equipment is available. Can be more efficient than fan with VFD.

ECM	Details
AIRFLW MNTR	Airflow monitoring at central HVAC systems.
MIN VENT	Provide only minimum ventilation as required by ASHRAE 61.1-2010.
SAT RESET	Supply air temperature reset with a fixed dewpoint discharge to meet all dehumidification requirements.
PUMP RESET	Pump pressure reset based on control valve position.
DUAL ENTHALPY	Airside economizer for free cooling controlled by enthalpy of outside air and return air.
HW RESET	Hot water temperature reset based on outdoor air temperature or reheat valve position to maximize condensing boiler efficiency.
CW RESET	Condenser water is reset down to as low as possible based on outdoor wet bulb, floating up to design conditions.
ENERGY ALARM	Automated fault detection "energy alarm" to identify equipment or components that are not functioning as intended.

ECM	Details
DHW REDUC	Reduce domestic hot water usage by using low flow fixtures. Refer to WE LEED credit, currently assumed to be 10% savings.
COND DHW	High efficiency gas-fired condensing hot water heaters. VFD on recirculation loop to allow for variable flow.

## Proposed Design Results

### Overview

Based on the current assumptions, the energy analysis results at the Design Development phase of the The Chandlery Building project indicate 29% energy consumption and 25% energy-cost savings compared to the LEED baseline. The total energy consumption of the proposed building is expected to be approximately 8954 MMBtu per year with a site energy use intensity of approximately 40.9 kBtu/sf. The main contribution to the total energy consumption is space heating energy. The table below compares energy consumption, energy cost, and site energy use intensity.

*Note: These energy modeling results are not predictions of future energy consumption for the Chandlery Building and are to be used for comparison purposes only. MEA cannot guarantee that these results will reflect actual energy consumption due to the uncertainty of actual schedules of use, weather, occupant behavior, and other unforeseen factors.*

ENERGY METRIC	UNIT	BASELINE	PROPOSED	SAVINGS
Total Electricity Consumption	MWh/yr	1047	819	22%
Total Natural Gas Consumption	MMBtu/yr	5382	3507	35%
Total Energy Consumption	MMBtu/yr	8954	6358	29%
Total Energy Cost	\$/yr	206309	154658	25%
Building Site Energy Use Intensity	kBtu/sf	57.6	40.9	29%
Building Energy Cost per SF	\$/sf	1.74	1.24	25%

### Discussion of Results and LEED Performance

Estimated annual energy cost savings and site energy consumption by end-use are shown on the following page for the baseline and proposed cases. As can be seen, substantial savings are achieved in the space heating and space cooling end use categories, which can be attributed to a variety of factors: a high performance envelope and glazing; exhaust air heat recovery; condensing hot water boilers and premium efficiency chillers with a high chilled water delta T. Appreciable savings are also achieved in fan energy due to low velocity air distribution, air handler oversizing, and better turndown control strategies; in domestic hot water due to condensing hot water heaters; and in interior lighting due to a 20% reduction in lighting power density.

Please note that actual energy consumption will be affected by the tenant fit-out in the lab and retail spaces. These spaces have been modeled identically in the baseline and proposed models as savings can only be demonstrated when lighting and HVAC systems are designed.

## Energy Benchmarking

### Source Energy and Carbon Footprint

In addition to site energy and energy cost, source energy and carbon footprint are also important metrics in measuring a building's overall energy performance and environmental impact. Source energy takes into account the energy lost in the production and distribution of electricity and carbon footprint takes into account greenhouse gas emissions. The values and conversion factors used in the source energy and carbon footprint calculations are shown in the table below. The site-to-source ratios and carbon dioxide equivalents are based on region and come from the International Green Construction Code (IgCC 2012).

CONVERSION FACTOR	VALUE
<i>NEWE Region Electricity Site-to-Source Ratio</i>	3.01
<i>Natural Gas Site-to-Source Ratio</i>	1.09
<i>NEWE Region CO<sub>2</sub>E Rate (lbs/MWh)</i>	999
<i>Natural Gas CO<sub>2</sub>E Rate (lbs/MMBtu)</i>	141

The proposed design is estimated to have a source energy consumption of approximately 12,236 MMBtu/yr. The 2030 Challenge baseline and LEED baseline have a source energy consumption of 24,024 and 16,621 MMBtu/yr, respectively, which accounts for grid electricity and natural gas consumption. Compared to the 2030 Challenge baseline, the proposed design achieves a 47% reduction in source energy. In terms of carbon footprint, the proposed design is estimated to produce approximately 1,260 metric tons of CO<sub>2</sub>E per year compared to the 2030 Challenge baseline of 2,385 metric tons and the LEED baseline of 1,755 metric tons. Overall, the proposed design achieves a 47% reduction in carbon footprint compared to the 2030 Challenge baseline. All results are summarized in the table and figures below.

	UNIT	2030 CHALLENGE BASELINE	ASHRAE 90.1-2007 BASELINE	PROPOSED DESIGN
<i>Total Electricity Consumption</i>	MWh/yr	1,859	1,047	819
	MMBtu/yr	6,371	3,572	2,791
<i>Total Gas Consumption</i>	MMBtu/yr	4,447	5,382	3,507
<i>Total Source Energy Consumption</i>	MMBtu/yr	24,024	16,621	12,236
<i>Source Energy Use Intensity</i>	kBtu/sf-yr	154.5	106.9	78.7
<i>Source EUI Percent Savings</i>	%		31%	49%
<i>Total Carbon Footprint Equivalent (CO<sub>2</sub>E)</i>	metric tons/yr	2,385	1,755	1,260
<i>CO<sub>2</sub>E Intensity</i>	lbs/sf-yr	16.0	11.6	8.4
<i>CO<sub>2</sub>E Intensity Percent Savings</i>	%		27%	47%

## Conclusion

The results of the Design Development phase energy analysis indicate that the new Chandlery Building achieves approximately 29.0% energy cost savings compared to the LEED v.2009 Core & Shell baseline, which meets the prerequisite for minimum energy performance and earns 5 points under the optimize energy performance credit in LEED CS. To ensure the project is on track to meet or exceed this level of savings moving forward, the following important steps are recommended for all members of the owner, construction, and design teams prior to the next modeling phase:

1. Review the assumptions listed in the Appendix at the end of this report and provide any revisions to MEA.
2. Review the energy conservation measures list and confirm that all ECMs currently listed as incorporated are included in the official project budget.
3. Perform a COMcheck to ensure the project is on track to be energy-code-compliant in all required aspects.

Beyond design and construction, commissioning and the overall operation of the building play significant roles in the actual performance of the building. The contractors and commissioning agents should ensure the building is constructed as indicated by the design. Facilities staff should be trained and provided with the necessary resources to maintain systems at optimal levels. The staff and occupants should be educated on equipment and control sequences that they would be expected to use.

## APPENDIX A: Energy Model Parameters

### General

Energy model program: eQuest v3.64

Weather data: ASHRAE climate zone 5A

Weather file: DOE 2.2 TMY3 weather file for Boston, MA

Modeled floor area: appx. 119,250 sf

Primary heating source: On-site condensing boiler plant

Primary cooling source: On-site evaporative cooling tower

### Utility Rates

*Based on EIA rates for Massachusetts\**

Electric utility rate: 0.1485 \$/kWh

Natural gas rate: 9.48 \$/MMBtu

\*Energy rates are subject to change based on actual utility rate structure in subsequent design phase

## APPENDIX B: Detailed Energy Model Inputs

The following tables summarize the architectural, electrical, plumbing and HVAC inputs used in the energy model.

### Architectural

MODEL INPUT PARAMETER	BASELINE CASE	PROPOSED CASE
<i>Roof Assembly</i>	U-0.048	<i>Flat Roof Assembly:</i> U-0.033, R-value of 30
<i>Wall Assembly - Above Grade</i>	U-0.064	<i>Insulated Metal Panel:</i> U-0.033, insulation R-30. <i>Curtainwall Spandrel System:</i> U-0.166 per Kawneer thermal charts with nominal insulation de-rated to account for thermal bridging through mullions and framing.
<i>Slab-On-Grade Floor Assembly</i>	F-0.730	Same as Baseline
<i>Vertical Fenestration Area (% of Wall)</i>	Same as Proposed	31.1%
<i>Vertical Glazing U-factor</i>	Curtain-wall U-factor: 0.45 Punched Windows U-factor: 0.55	U-0.21 U-0.21
<i>Vertical Glazing SHGC</i>	0.40	0.32
<i>Building Self-Shading Description</i>	None	Building is self-shaded by its own exterior surfaces.

### Electrical / Lighting

MODEL INPUT PARAMETER	BASELINE CASE	PROPOSED CASE
<i>Automatic Lighting Shutoff Method</i>	Time of day schedule with occupancy sensors in conference rooms, break rooms, and meeting rooms as required by code.	Time of day schedule with occupancy sensors in all enclosed spaces.
<i>Gross Lighted Floor Area (SF)</i>	Same as Proposed	Same as baseline
<i>Interior Lighting Power Calc Method</i>	Same as Proposed	Building Area Method
<i>Interior Lighting Power Density (W/SF)</i>	Space by space per ASHRAE 90.1-2007	Assumed 20% reduction over 90.1-2007 for core and shell spaces. Matches baseline case for all tenant fit-out spaces.
<i>Exterior Lighting Power (kW)</i>	TBD*	TBD*

\* To be calculated once finalized design is available.

### Mechanical (Air-side)

MODEL INPUT PARAMETER	BASELINE CASE	PROPOSED CASE
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<i>Primary HVAC Type</i>	Water source heat pumps	Same as baseline
<i>Fan System Operation</i>	Fans are cycled on at night as necessary to meet unoccupied temperature set points (24/7 in residential corridors)	Same as baseline
<i>Outdoor Air Design Minimum Ventilation</i>	Same as Proposed	Design based on ASHRAE 62.1-2007 ventilation requirements;
<i>Supply Air Design Minimum Ventilation</i>	Same as Proposed 7.5 cfm per person plus 0.12 cfm /sq.ft	Same as baseline
<i>HVAC Air-side Economizer Cycle</i>	Based on OA temperature	Dual Enthalpy
<i>Economizer High-Limit Shutoff</i>	70°F	70°F DB, 30 Btu/lb
<i>Design Outdoor Airflow Rates</i>	12,000 cfm	Same as baseline
<i>Total System Fan Power (Conditioned)</i>	1.2 W/cfm	AHU-1-2: 2.3 W/cfm
<i>Total Supply Fan Power</i>	0.6 W/cfm	AHU-1-2: 1.4 W/cfm
<i>Total Return / Exhaust Fan Power</i>	N/A	
<i>Pressure Drop Adjustments</i>	MERV-14 filtration, enthalpy wheel, and sound attenuators, exhaust filtration.	n/a
<i>Exhaust Air Energy Recovery</i>	NA	Runaround loop on AHU-1-2 (45% sensible effectiveness)
<i>Demand Control Ventilation</i>	N/A No HVAC zone more than 40 occupants	
<i>Supply Air Temperature Reset Parameters</i>	Supply Air Temperature shall reset 5°F higher under minimum cooling load conditions.	Supply Air Temperature shall reset 5°F higher under minimum cooling load conditions.
<i>CHW Loop Temp Reset Parameters</i>	Same as Proposed	Reset based on OA temperature
<i>CHW Loop Configuration</i>	Primary-variable secondary	Variable-primary

#### Mechanical (Waterside – Heating)

MODEL INPUT PARAMETER	BASELINE CASE	PROPOSED CASE
-----------------------	---------------	---------------

<i>Primary Heating Source</i>	2 natural draft boilers	4 condensing boilers
<i>Hot Water Loop Supply Temperature</i>	180°F	140°F
<i>Hot Water Loop Delta-T</i>	50°F	40°F
<i>Hot Water Loop Temp Reset Parameters</i>	Same as Proposed	Reset based on OA temperature
<i>Hot Water Loop Configuration</i>	Same as Proposed	Building distribution pumps only
<i>Number of Hot Water Pumps</i>	1	2 (one on stand-by)
<i>Hot Water Pump Flow</i>	820 gpm	710 gpm (1,500 gpm capacity)
<i>Hot Water Pump Power</i>	19.0 W/gpm	18.8 W/gpm
<i>Hot Water Pump Speed Control</i>	Variable speed drive	Variable speed drive

### Service Water Heating

MODEL INPUT PARAMETER	BASELINE CASE	PROPOSED CASE
<i>Service Hot Water Type</i>	Conventional storage hot water heater, 80% nominal efficiency	Condensing storage hot water heater, 96% nominal efficiency
<i>Temperature</i>	140°F	140°F
<i>Hot Water Consumption</i>	15.5 Peak gpm	Assumed 10% reduction from baseline

## APPENDIX C: Detailed Energy Model Results

The detailed energy model results are shown in the table below. Please note that all results are preliminary and based on the assumptions described in this report and are subject to change as the design progresses.

ENERGY CONSUMPTION	SOURCE	BASELINE ENERGY (MMBTU/YR)	PROPOSED ENERGY (MMBTU/YR)	PERCENT SAVINGS
Space Cooling	Electricity	729	530	27%
Space Heating	Natural Gas	3981	2435	39%
Heat Rejection	Electricity	15	5	67%
Pumps	Electricity	234	140	40%
Fans	Electricity	809	682	16%
Equipment Loads	Electricity	1531	1225	0%
Domestic Hot Water	Natural Gas	1339	1071	20%
Interior Lighting	Electricity	269	214	20%
Total Building Energy Consumption		8954	6358	29%

ENERGY COST	SOURCE	BASELINE COST (\$)	PROPOSED COST (\$)	PERCENT SAVINGS
Space Cooling	Electricity	29515	23245	21%
Space Heating	Natural Gas	37585	22984	39%
Heat Rejection	Electricity	653	218	67%
Pumps	Electricity	7802	6145	21%
Fans	Electricity	37992	29002	24%
Equipment Loads	Electricity	68259	53757	21%
Domestic Hot Water	Natural Gas	13206	10114	23%
Interior Lighting	Electricity	11949	9410	21%
Total Building Energy Cost		206309	154658	25%

Final

Proposed Case

Project Name  
Phase

DOE-2.2-47h2 10/26/2016 16:30:10 BDL RUN 1

REPORT- BEPS Building Energy Performance

WEATHER FILE- BOSTON LOGAN INT' MA

TASK		MISC	SPACE	SPACE	HEAT	PUMPS	VENT	REFRIG	HT PUMP	DOMEST	EXT	TOTAL
LIGHTS	LIGHTS	EQUIP	HEATING	COOLING	REJECT	& AUX	FANS	DISPLAY	SUPPLEM	HOT WTR	USAGE	
EM-1 ELECTRICITY	214	0	1225	0	530	5	140	682	0	0	0	2791
MBTU												
FM1 NATURAL-GAS	0	0	0	2435	0	0	0	0	0	1071	0	3507
MBTU												
MBTU	268	0	1531	1794	662	5	175	852	0	1071	0	6358

TOTAL SITE ENERGY 6358.4 MMBTU 40.9 MBTU/SQFT-YR GROSS-AREA 40.9 MBTU/SQFT-YR NET AREA  
TOTAL SOURCE ENERGY 12236 MMBTU 78.7 MBTU/SQFT-YR GROSS-AREA 78.7 MBTU/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE = 0.24  
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00  
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE = 14  
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE = 7

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

Project Name	DOE-2.2-47h2	10/26/2016	16:30:10	BDL RUN 1
Phase				
REPORT- BEPS Building Utility Performance				
WEATHER FILE- BOSTON LOGAN INT' MA				

ENERGY CONSUMPTION DATA																					
LIGHTS		TASK		SPACE		SPACE		HEAT		PUMPS		VENT		REFRIG		HT PUMP		DOMEST		EXT	
LIGHTS		MISC		HEATING		COOLING		REJECT		& AUX		FANS		DISPLAY		SUPPLEM		HOT WTR		USAGE	
63368		0		0		156529		0		41379		195303		0		0		0		818581	
EM-1 ELECTRICITY		KWH																			
FM1 NATURAL-GAS		0		0		24353		0		0		0		0		0		10717		0	
THERM																					
TOTAL ELECTRICITY				819,234, KWH				5.27 KWH				/SQFT-YR GROSS-AREA		5.27 KWH		/SQFT-YR NET-AREA					
TOTAL NATURAL-GAS				35070, THERM				0.23 THERM				/SQFT-YR GROSS-AREA		0.23 THERM		/SQFT-YR NET-AREA					
PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTTLING RANGE												= 0.24									
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED												= 0.00									
HOURS ANY ZONE ABOVE COOLING THROTTTLING RANGE												= 14									
HOURS ANY ZONE BELOW HEATING THROTTTLING RANGE												= 7									

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

Proposed Case

Project Name  
Phase  
REPORT - ES-D Energy Cost Summary

DOE-2.2-47h2  
10/26/2016  
16:30:10 BDL RUN 1

WEATHER FILE- BOSTON LOGAN INT' MA

UTILITY-RATE	RESOURCE	METERS	METERED ENERGY UNITS/YR	TOTAL CHARGE (\$)	VIRTUAL RATE (\$/unit)	RATE USED ALL YEAR?
Electric Rate	ELECTRICITY	EM-1	818581 KWH	121559	0.1485	YES
Natural Gas Rate	NATURAL-GAS	FM1	35070 THERM	33099	0.9438	YES
=====						
				154658		
				ENERGY COST/GROSS BLDG AREA:	0.99	
				ENERGY COST/NET BLDG AREA	0.99	

# 90.1-2007 Base Case

Project Name  
Phase  
REPORT- BEPS Building Energy Performance

DOE-2.2-47h2 10/26/2016 15:37:44 BDL RUN 1

WEATHER FILE- BOSTON LOGAN INT' MA

TASK	LIGHTS	MISC	SPACE	SPACE	HEAT	PUMPS	VENT	REFRIG	HT PUMP	DOMEST	EXT	TOTAL
		EQUIP	HEATING	COOLING	REJECT	& AUX	FANS	DISPLAY	SUPPLEM	HOT WTR	USAGE	
EM-1 ELECTRICITY	269	0	1531	0	729	15	234	809	0	0	0	3572
MBTU												
FM1 NATURAL-GAS	0	0	0	3981	0	0	0	0	0	1399	0	5382
MBTU												
MBTU	269	0	1531	3981	729	15	234	809	0	1399	0	8954
TOTAL SITE ENERGY	8954	MMBTU	57.6	MMBTU/SQFT-YR GROSS-AREA	57.6	MMBTU/SQFT-YR NET AREA						
TOTAL SOURCE ENERGY	16617	MMBTU	106.9	MMBTU/SQFT-YR GROSS-AREA	106.9	MMBTU/SQFT-YR NET-AREA						
PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTLING RANGE =	0.24											
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED	=	0.00										
HOURS ANY ZONE ABOVE COOLING THROTTLING RANGE	=	14										
HOURS ANY ZONE BELOW HEATING THROTTLING RANGE	=	7										

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



# 90.1-2007 Base Case

Project Name DOE-2.2-47h2 10/26/2016 15 : 37 : 44 BDL RUN 1  
Phase  
REPORT - BEPS Building Utility Performance WEATHER FILE- BOSTON LOGAN INT' MA

TASK	LIGHTS	MISC	SPACE	SPACE	HEATING	COOLING	REJECT	HEAT	PUMPS	VENT	FANS	REFRIG	HT PUMP	DOMEST	EXT	TOTAL
LIGHTS	LIGHTS	EQUIP	HEATING	SPACE	COOLING	REJECT	HEAT	PUMPS	VENT	FANS	REFRIG	DISPLAY	SUPPLEM	HOT WTR	USAGE	USAGE
EM-1 ELECTRICITY	80463	0	459658	0	198755	0	52541	255841	0	0	0	0	0	0	0	1047258
KWH																
FM1 NATURAL-GAS	0	0	0	39823	0	0	0	0	0	0	0	0	0	13992	0	53815
THERM																
TOTAL ELECTRICITY				1047258. KWH			5.27 KWH					/SQFT-YR GROSS-AREA		5.27 KWH		/SQFT-YR NET-AREA
TOTAL NATURAL-GAS				53815. THERM			0.23 THERM					/SQFT-YR GROSS-AREA		0.23 THERM		/SQFT-YR NET-AREA

PERCENT OF HOURS ANY SYSTEM ZONE OUTSIDE OF THROTTTLING RANGE = 0.24  
PERCENT OF HOURS ANY PLANT LOAD NOT SATISFIED = 0.00  
HOURS ANY ZONE ABOVE COOLING THROTTTLING RANGE = 14  
HOURS ANY ZONE BELOW HEATING THROTTTLING RANGE = 7

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

Proposed Case

Project Name DOE-2.2-47h2 10/26/2016 15:37:44 BDL RUN 1  
Phase  
REPORT- ES-D Energy Cost Summary WEATHER FILE- BOSTON LOGAN INT' MA

UTILITY-RATE	RESOURCE	METERS	METERED ENERGY UNITS/YR	TOTAL CHARGE (\$)	VIRTUAL RATE (\$/unit)	RATE USED ALL YEAR?
Electric Rate	ELECTRICITY	EM-1	1047258 KWH	155518	0.1485	YES
Natural Gas Rate	NATURAL-GAS	FM1	53815 THERM	50791	0.9438	YES

=====

206309

ENERGY COST/GROSS BLDG AREA:

0.99

ENERGY COST/NET BLDG AREA

0.99