THE CEINTURE

20 West Fifth Street, South Boston, MA
Multi-Family Residential Development

PROJECT NOTIFICATION FORM June 14, 2017

Submitted Pursuant to Article 80B of the Boston Zoning Code

SUBMITTED BY:

Trinity Green Development, LLC
c/o Mr. Thomas G. Broderick Jr., Manager
180 Canton Ave
Milton, MA 02185

PREPARED BY:

MLF CONSULTING LLC

Mitchell L. Fischman ("MLF Consulting") LLC
41 Brush Hill Road
Newton, MA 02461

SUBMITTED TO:

boston planning & development agency

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

IN ASSOCIATION WITH:
Russell Design Associates
Adams & Morancy, P.C.
Howard Stein Hudson
Tech Environmental, Inc.
Soden Sustainability Consulting
Boston Environmental Corporation

A&M Adams & Morancy
COUNSELORS - AT - LAW

June 14, 2017

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

Re: 20 West Fifth Street Residential Project
The Ceinture — A Multi-Family Residential Development
Project Notification Form (PNF)

Dear Director Golden:

On behalf of the Proponent, **Trinity Green Development, LLC,** we are pleased to submit this Project Notification Form ("PNF") to the Boston Planning and Development Agency ("BPDA") in accordance with the Article 80B-2 Large Project Review requirements of the Boston Zoning Code, with respect to a proposed multi-family residential development at 20 West Fifth Street in South Boston. The public notice for the PNF appears in the June 14, 2017, edition of the *Boston Herald*.

The Project proposes construction of The Ceinture, a multi-family residential building with approximately 54 residential units, 2,184 square feet (sf) of common room space, with a total overall project floor area of approximately 78,432 sf (excluding the parking spaces), and approximately 41 garage spaces on the ground floor accessed from Gold Street (the "Proposed Project"). The project site comprises 0.44 acres (18,991 square feet of land) currently occupied by a 12,585 sf commercial building, and is bounded to the north by Gold Street, to the south by West Fifth Street, to the west by the Mass Bay Credit Union's surface parking lot, and to the east by the South Boston By-Pass (Haul) Road. The scope and scale of the Proponent's residential program is intended to advance the residential policy goals of Mayor Walsh's "Housing Boston 2030" housing strategy.

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

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

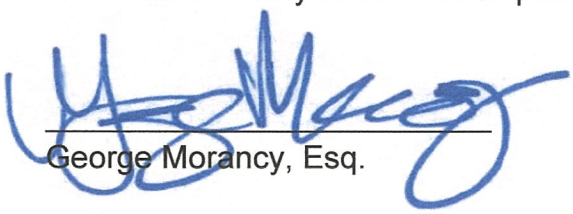
The Proposed Project exceeds the 50,000 square foot size threshold of Article 80 for a project within a Boston neighborhood, and therefore requires several additional filings pursuant to Large Project Review regulations. A Letter of Intent to File a Project Notification Form was filed with the BPDA on April 27, 2017 (attached hereto as Appendix "A").

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

On behalf of the entire project team, we would like to thank you and the BPDA staff assigned to the 20 West Fifth Street Project, particularly the Project Manager, Michael Rooney, and the reviewing Urban Design staff, Michael Cannizzo and Matthew Martin, for their invaluable assistance to date in assisting the development team in shaping the Proposed Project and putting together a comprehensive PNF.

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

Very truly yours,
Adams & Morancy, P.C.,
on behalf of Trinity Green Development, LLC



George Morancy, Esq.

Attachment: 20 West Fifth Street Project Notification Form
(10 Copies Plus CD)

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

Cc: Jonathan Greeley, BPDA
Michael Rooney, BPDA
Thomas G. Broderick, Trinity Green Development LLC
Timothy Russell, Russell Design Associates
Mitchell Fischman, Mitchell L. Fischman ("MLF") Consulting, LLC

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Table of Contents

APPENDICES

List of Tables

List of Figures

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Trinity Green Development, LLC (the "Proponent") is submitting this Project Notification Form ("PNF") for "The Ceinture", a multi-family residential development at 20 West Fifth Street in the South Boston neighborhood in accordance with the Article 80 requirements of the Boston Zoning Code ("Code"). The Project proposes construction of approximately 54 residential units, 2,184 square feet (sf) common room space with a total overall project floor area of approximately 78,432 sf (excluding the parking garage and utility spaces) with approximately 41 garage spaces on the 1st floor accessed from Gold Street (the "Proposed Project"). The proposed site includes 0.44 acres (18,991 sf) of land occupied by an existing 12,585 sf structure, bounded to the north by Gold Street, to the south by West Fifth Street, to the west by the Mass Bay Credit Union's surface parking lot, and to the east by the South Boston By-Pass (Haul) Road. The scope and scale of the Proponent's residential program is also intended to further the residential policy goals of Boston Mayor Martin J. Walsh's 2030 Housing Plan. Please see **Figures 1-1** thru **1-6**.

A Letter of Intent (LOI) to File a Project Notification Form was filed with the Boston Planning and Development Agency for the proposed mixed-use development on April 27, 2017 (See **Appendix A**).

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

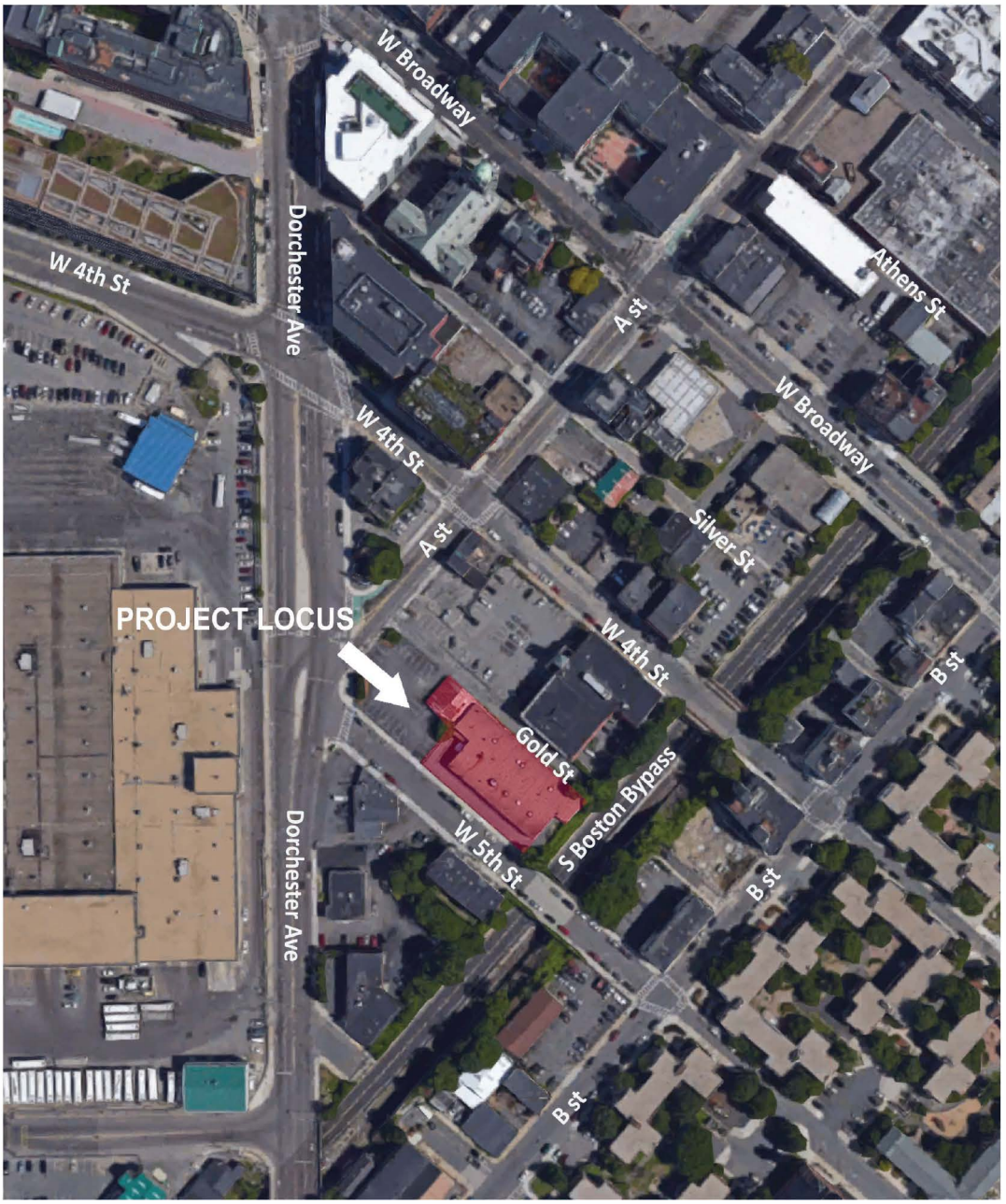


Figure 1-1. Project Locus

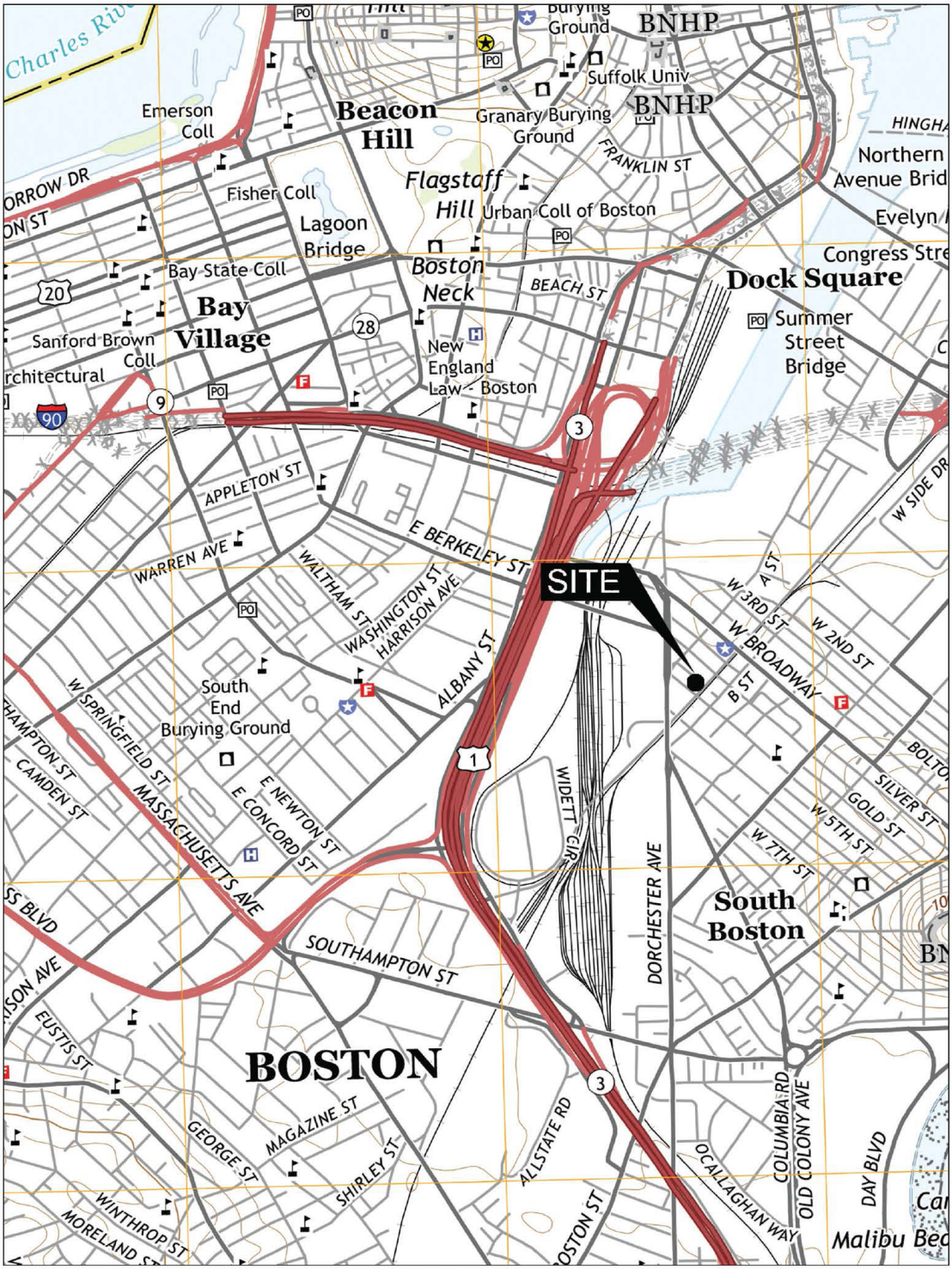


Figure 1-2
USGS Map

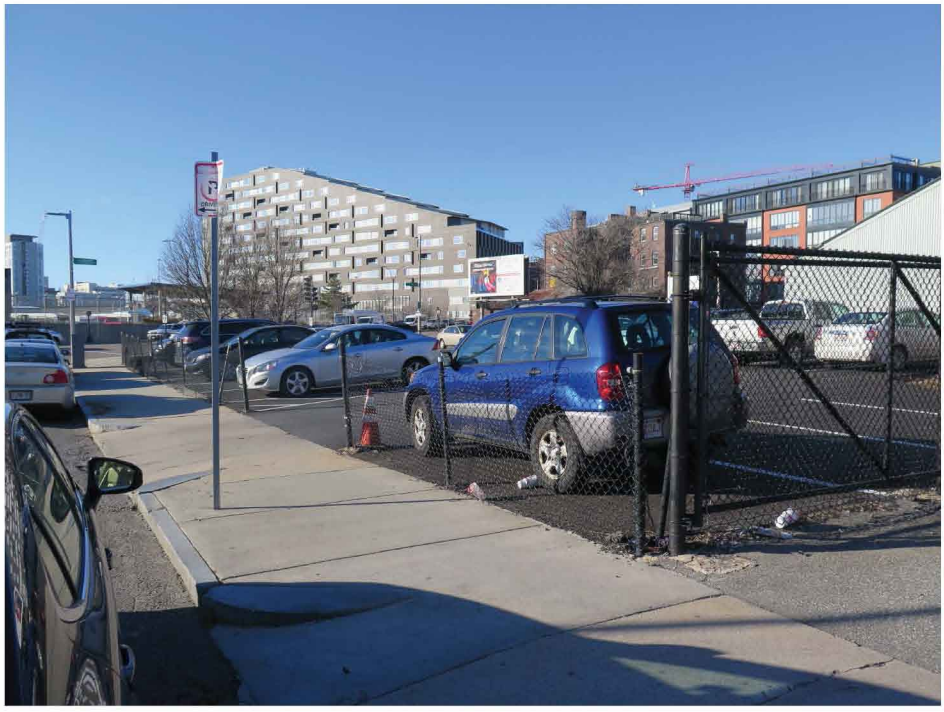
Figure 1-3. Existing Site Photos

Existing Site Warehouse

Loading Dock of Existing Warehouse

Figure 1-4. Existing Site Photos

View Toward Bridge and Haul Road



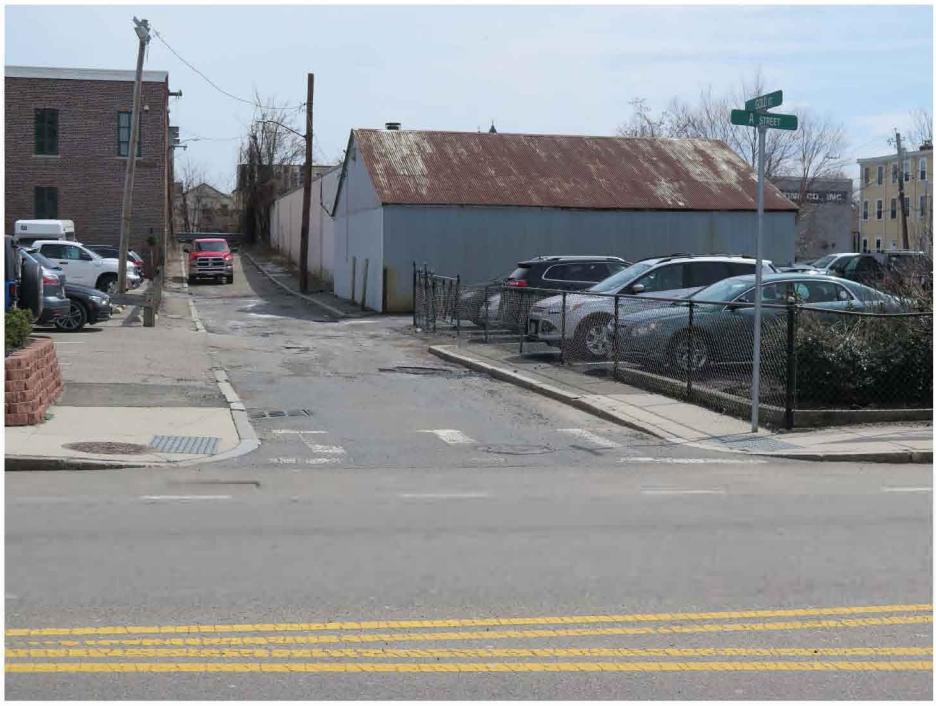
Adjacent MA Bay Credit Union Parking Lot

Figure 1-5. Existing Site Photos

Existing Houses Opposite West 5th Street

Existing Haul Road Next to the Site

Figure 1-6. Existing Site Photos



Gold Street at Rear of Site

MA Bay Credit Union and Parking Lot

1.2 Detailed Project Description

1.2.1 Existing Conditions Plan

The proposed site includes 0.44 acres (18,991 sf) bounded to the north by Gold Street, to the south by West Fifth Street, to the west by the Mass Bay Union's surface parking lot, and to the east by the South Boston By-Pass (Haul) Road. The site is currently occupied by Colmar Belting Co. Inc., a distributor of conveyor belts, since the building's construction in 1970, with access from West Fifth Street from a single curb cut, all of which will be demolished to allow for the new construction to commence. (See **Figure 1-7**. **Existing Conditions Plan.**)

1.2.2 Detailed Project Program

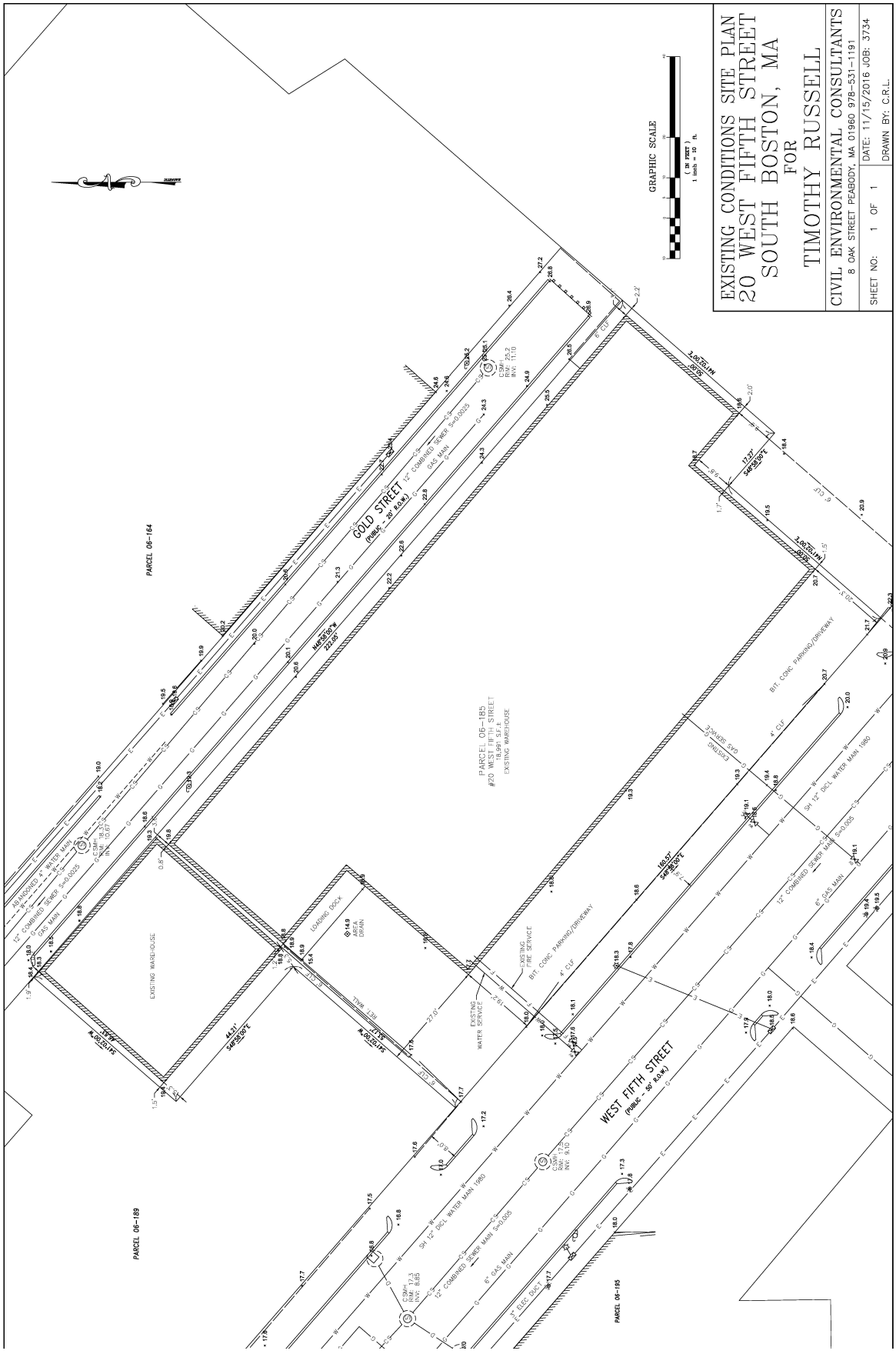
The Project proposes construction of approximately 54 residential units, 2,184 square feet common room space with a total overall project floor area of approximately 78,432 square feet (excluding the parking spaces) with approximately 41 garage spaces on the 1st floor accessed from Gold Street (the "Proposed Project"). The residential units currently planned to include 46 two-bedroom and 8 one-bedroom units). Service vehicle access will be provided from West Fifth Street. The context of the immediate area is supportive and well-suited for the proposed scale and scope of the Proposed Project. It includes several buildings of four (4) to six (6) stories in height, and the Macallen Building with a height of 6-10 stories. See Project Dimensions in **Table 1-1** below.

Table 1-1. Approximate Project Dimensions of Proposed Project

Lot Area	0.44 acres / 18,991 square feet
Total Floor Area	78,432 square feet
Floor Area Ratio	4.1
Number of Floors	6
Height*	70 Feet

*Height from Average Front Grade

Figure 1-7. Existing Conditions Plan



1.3 Summary of Project Impacts and Mitigation

1.3.1 Urban Design

The proposed 20 West Fifth Street Project is a six-story residential building incorporating a total of 54 units. In addition to the residences, the building includes gym, work space, common rooms, outdoor terrace, and garaged parking for bicycles and vehicles.

The building has been designed to be responsive to the planning goals established by the South Boston Dorchester Avenue Planning Initiative (Planning Initiative). The Planning Initiative outlines various "zones" within the planning area. Each zone has prescribed uses, heights, lot coverage ratio and setbacks. Additionally, it prescribes different setbacks along different streets and lot locations.

20 West Fifth Street is located in Use Zone 3, Lot Coverage Zone 1 and Height Zone of 120 feet. The development team believes the building conforms to both the letter and the intent of these planning objectives. The Proponent has elected to limit the building height to 70 feet as the site is close to the 70 foot height zone, and also because the Proponent believes that 6 stories and 70 feet are more appropriate for the initial development in this neighborhood. Additionally, the 70 foot building height is aligned with recent development on the block comprised of A Street, West Fourth Street and Silver Street.

The exterior building "skin" will be a combination of brick, composite metal panels, glass fenestration, painted fiber cement siding, and painted fiber cement trim. The materials and massing are intended to also tie the building into the nearby light industrial area while creating a texture and scale appropriate to residential living. Windows will be a combination of operable and fixed sashes. As referenced, the proposed building height is approximately 70 feet to the highest point of the sixth-story roof. Mechanical equipment and stairway head-houses will rise above that point, but will be set back from the edges of the building so as to not be visible from the street.

The Proponent has already made a number of presentations of the Proposed Project's conceptual design to the neighborhood and Boston Planning and Development Agency as it has continued to complete modifications to its schematic design plans.

1.3.2 Sustainable Design

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

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

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

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

1.3.3 Pedestrian Level Wind Conditions

The height of the proposed structure will not exceed 70 feet. Wind conditions are expected to be similar to that of existing buildings in the neighborhood where buildings range from 4-7 floors.

1.3.4 Shadow Impact Analysis

Russell Design Associates, the Project's architect, prepared a shadow study to assess the potential shadow impacts of the Project on the surrounding neighborhood with the shadow drawings contained in detail in **Section 4.1**. Even with the proposed height of 6-floors, the Proposed Project's shadow impacts are generally not extensive. New shadow is generally limited to the streets surrounding the Site. Late afternoon and evening shadows will extend in an easterly/northeasterly direction toward Gold Street, a minor dead end street and Mass Bay Credit Union. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings.

1.3.5 Daylight Analysis

Although the Proposed Project would cause an increase in daylight obstruction when compared to the existing condition, the Proposed Project was designed to be of a similar massing to existing buildings in the neighborhood. Although the building is higher along the rear of the property adjacent to Gold Street, a non-residential (Credit Union) building is on the other side of Gold Street. Daylight obstruction values for the Proposed Project are expected to be consistent with, and typical to, the surrounding neighborhood.

1.3.6 Solar Glare

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

1.3.7 Air Quality Analysis

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

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

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

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

1.3.8 Noise Analysis

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

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

Nighttime ambient baseline sound level (L_{90}) monitoring was conducted at three locations deemed to be representative of the nearby residential areas, during the time period when human activity is at a minimum and any future noise would be most noticeable. The lowest nighttime L_{90} measured in the Project area was 50.6 dBA.

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

- Fifty four (54) 2.5 ton unit rooftop condensing units for the residential units
- Parking garage exhaust fan

The 20 West Fifth Street project will not create a noise nuisance condition and will fully comply with the most stringent sound level limits set by the Massachusetts DEP Noise Policy and City of Boston Noise Regulations.

1.3.9 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See **Section 4.4**) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The Project will not result in an increase in impervious area, and will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged.

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

1.3.10 Solid and Hazardous Waste

Solid Waste

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

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

Hazardous Waste

Boston Environmental Corporation (BEC) has performed a Phase I Environmental Site Assessment at the property. The Phase I ESA was to investigate for evidence for any recognized environmental conditions (REC), historically recognized environmental conditions (HREC), and/or controlled recognized environmental conditions (CREC) at the site. In BEC's opinion, this assessment has revealed no evidence of RECs, HRECs or CRECs in connection with this Site.

The construction of the proposed building foundations will require the removal of the site soils to a depth ranging up to about 6 to 8 feet below the sub-grade of the existing building. It is estimated that construction for the below-grade area will generate about 4,000 cy of excess natural soil to be disposed off-site.

It is anticipated that the fill and natural soil are to be Unregulated in accordance with the provisions of the Massachusetts Contingency Plan (310 CMR 40.000). If needed, the project proponent will retain a Licensed Site Professional (LSP) to manage the environmental aspects of the project, including proper management and/or off-site disposal of contaminated soil and groundwater encountered during construction. If necessary, the LSP will also prepare the required Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) regulatory submittals.

Evidence of a release of oil or hazardous materials has not been detected at the site. Should evidence of a release be encountered during redevelopment, response actions will be performed in accordance with the provisions of the MCP.

1.3.11 Geotechnical/Groundwater Impacts Analysis

Based on the results of the explorations performed at the subject site by KMM Geotechnical Consultants, LLC, the ground surface across the site is generally underlain by a fill layer that ranges from about 7 to 10 feet below the existing ground surface. The fill layer is underlain by a natural sand deposit.

During our subsurface exploration program, groundwater was observed to be located at depths ranging from about 9 to 12 feet below the existing ground surface.

Based on the anticipated soil conditions described above, foundation support for the proposed building will consist of conventional spread footings. The lowest level floor slab will consist of a soil supported slab-on-grade. The footings will bear directly on the underlying natural sand deposit. Alternatively, final design may require Rammed Earth Piles, RAPs. Temporary earth support along the perimeter of the site is not anticipated to be required or foundation construction.

Excavation for construction of the building foundations and below grade level is anticipated to extend to depths ranging from 10 to 12 feet below the ground surface. Therefore, based on the results of our subsurface exploration program, which indicates groundwater to be present at

depths ranging from about 7 to 12 feet below the existing ground surface, groundwater dewatering during excavation is considering to be minimal. Should groundwater be encountered during excavation of the building foundations, construction dewatering will consist of localized sumps in conjunction with on-site recharge of the groundwater. See **Section 4.6** for additional information.

1.3.12 Construction Impacts Analysis

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

Construction is expected to commence in the 2nd quarter 2018 and will require approximately 18 months to complete.

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

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

1.3.13 Wetlands/Flood Hazard Zone

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

area, floodway area, or other flood area. According to FEMA's Digital Flood Map (25025C00083J, dated March 16, 2016), the Site is located within two Zone X designated areas. The majority of the Site is listed in this flood map as being located within an area outside the 0.2% annual chance flood zone. The western portion of the Site is located within an area of 0.2% annual flood chance.

1.3.14 Historic Resources Component

According to files at the Massachusetts Historical Commission, there are no structures listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth on-site. It is not expected that the Project will cause adverse impacts on the historic or architectural elements of nearby historic resources outside the Project Site (see **Section 5.0**).

1.3.15 Infrastructure Systems Component

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

1.3.16 Transportation Component

Section 7.0 presents the comprehensive transportation study completed by HSH for the proposed Project in conformance with the BTD Transportation Access Plan Guidelines (2001). The study analyzes existing conditions within the Project study area, as well as conditions forecast to be in place under the five-year planning horizon of 2020.

Access to the Site will be provided via Gold Street. The two existing curb cuts along West Fifth Street will be closed. Gold Street will be widened to include a 20 foot wide shared street that will improve pedestrian and vehicular conditions to all parcels located along Gold Street.

The analysis employs mode use data for the area surrounding the Project site based on 2000 U.S. Census data and BTD data for Area 8, and identifies the number of trips generated by the Project. The Project will add approximately 192 vehicle trips on a daily basis, with 13 trips during the a.m. (3 entering/10 exiting) and 16 trips during the p.m. Peak Hour (10 entering/6 exiting).

The Project will contain 41 parking spaces. This results in a parking ratio of approximately 0.75 parking spaces per dwelling unit, consistent with the BTD maximum parking goals for this area. Residential move-in/move-out activity will take place within the parking garage and along the site frontage on West Fifth Street.

The Proponent is committed to implementing a transportation demand management ("TDM") program that supports the City's efforts to reduce dependency on the automobile by encouraging alternatives to driving alone, especially during peak travel periods. Proposed measures include, but are not limited to, providing transit information (schedules, maps, and fare information) to guests and visitors and on-site bicycle storage, providing a guaranteed ride home program to employees, and providing a transit pass program to the employees. The transportation coordinator will oversee all transportation issues including managing vehicular operations, service and loading, and TDM programs.

1.3.17 Response to Climate Change Questionnaire

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

1.3.18 Response to City of Boston Access Guidelines

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

2.0 GENERAL INFORMATION

2.1 Applicant Information

2.1.1 Project Proponent

The Proponent is Trinity Green Development, LLC ("TGD") based in Milton, MA. The principals of TGD are Thomas Broderick, Jr., an attorney with extensive experience in real estate transactions and financing as well as real estate development, and Timothy Russell, a licensed architect with extensive experience in project design and management as well as land use regulation and real estate development.

TGD has operated successfully for more than ten years and has successfully developed numerous projects in South Boston and the City of Boston and has a strong working relationship with several major lenders, a record of proven financial security, and intends to finance the project construction and development using traditional institutional lender financing.

2.1.2 Project Team

Project Name	The Ceinture - 20 West Fifth Street, South Boston
Property Owner / Developer	**Trinity Green Development, LLC** c/o Mr. Thomas G. Broderick, Jr., Manager 180 Milton Avenue Milton, MA 02186 Thomas G. Broderick, Jr. tgbroderick@aol.com Tel: 617-281-1833
Article 80 Permitting Consultant	**Mitchell L. Fischman Consulting ("MLF Consulting") LLC** 41 Brush Hill Road Newton, MA 02461 Mitch Fischman mitchfischman@gmail.com Tel: 781-760-1726 Claudia Zarazua czarazua@gmail.com Tel: 210-843-5276

Legal Counsel	**Adams & Morancy, P.C.** 350 West Broadway South Boston, MA 02127 Tel: 617-269-5800 George Morancy, Esq. gmorancy@admorlaw.com Patrick Mahoney, Esq. pmahoney@admorlaw.com
Architect and Landscape Architect	**Russell Design Associates** 180 Canton Avenue Kingston, MA 02364 Timothy Russell rusdesign@att.net Tel: 781-844-4531 Nick Capone caponenick@hotmail.com Tel: 617-875-0786
Transportation Planner / Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Brian Beisel, P.E. bbeisel@hshassoc.com Tel: 617-348-3357
Civil Engineer/ Infrastructure	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Richard Latini, P.E. rlatini@hshassoc.com James Downing, P.E. jdowning@hshassoc.com
Sustainability Consultant	**Soden Sustainability Consulting** 19 Richardson Street Winchester, MA 01890 Tel: 617-372-7857 Colleen Ryan Soden, LEED AP BD+C colleen@sodensustainability.com

Noise and Air Consultant	**Tech Environmental, Inc.** Hobbs Brook Office Park 303 Wyman Street, Suite 295 Waltham, MA 02451 Tel: 781-890-2220 Marc C. Wallace mwallace@techenv.com Tel: 781-890-2220 x30
Geotechnical/ Environmental / 21E Engineer	**Boston Environmental Corporation** 338 Howard Street Brockton, MA 02302
Surveyor	**Civil Environmental Consultants** 8 Oak Hill Street Peabody, MA 01960 Tel: 978-531-1191
Construction Commencement	2nd Quarter 2018
Construction Completion	4th Quarter 2019
Status of Project Design	Schematic

2.1.3 Legal Information

Site Control
The project site is under agreement to be purchased by the Applicant from the present owner, Commercial Street Trust, under declaration of trust dated December 1, 2004.

Legal Judgments or Actions Pending Concerning the Proposed Project:
None based upon available information and belief.

History of Tax Arrears on Property Owned in Boston by the Applicant:
There is no history of tax arrears on property owned by the Applicant in the City of Boston.

Nature and Extent of Any and All Public Easements:
None of record.

2.2 Public Benefits

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

- Creation of 54 new housing units, including 7 affordable units in accordance with the City's Inclusionary Development Policy (IDP);
- Introduction of new neighborhood residents who will provide support to the local community and utilize local businesses;
- Encouraging the use of alternative modes of transportation, such as mass transit, ride sharing services, and bicycle use;
- Improving the safety and visual appearance of the site and surrounding neighborhood by replacing an unattractive concrete-block commercial building surrounded by open-air parking and periodic storage of industrial stock;
- Exploring the planting of new street trees, improved sidewalks, and other streetscape amenities to improve and enhance the pedestrian landscape and experience;
- Establishing a premier example of sustainable construction and development;
- Temporary creation of many new jobs in the construction and building trade industries; and
- Substantial addition to real property taxes for the City of Boston.

2.3 Regulatory Controls and Permits

2.3.1 Zoning Overview

The Project Site is located within a Restricted Manufacturing (M-1) zoning district under the base Boston Zoning Code, and will therefore require several variances from the terms of the currently applicable code sections. The surrounding neighborhood is a mix of commercial/retail, residential and office uses. More significant, the site is within the area of the South Boston Dorchester Avenue Planning Initiative, a planning initiative commenced by the BPDA and the City of Boston for the purpose of ensuring that the 144 acres of the Study Area are strategically planned for a broader type of uses and a scale of development best suited to the future growth of the Dorchester Avenue corridor. A product of months of intensive participation by a broad group of area residents, property owners, business owners, advocates, public agencies, and other stakeholders, the Plan details a framework for new zoning for the area that will allow for future growth in a manner that is consistent with the community's vision. The development team has taken great care to work within the applicable framework of the Plan, with respect to building height, density, setbacks, parking, and design, in order to achieve a Proposed Project that lives up to the objectives of the Planning Initiative. While 54 off-street garage parking spaces are currently programmed, the final amount of off-street parking and loading will be reviewed and determined by the BPDA pursuant to the provisions of the Article 80 Large Project Review process.

2.3.2 Boston Zoning Code – Use Requirements

Multifamily residential use is a conditional use within the relevant M-1 zoning district.

2.3.3 Boston Zoning Code – Dimensional Requirements

The Proposed Project will include approximately 78,432 feet of gross floor area on a site that consists of 18,991 square feet of land, for a resulting projected floor area ratio of approximately 4.1. Current M-1 zoning establishes a maximum F.A.R of 1.0. The applicable dimensional regulations under zoning require minimum lot size of 58,000 square feet, a front setback as determined by Article 80 review, side setbacks of approximately 15 feet, a rear setback as determined by Article 80, and a maximum building height of 2-½ stories and 35 feet. 400 square feet of usable open space per dwelling unit is required by zoning. It is anticipated that the proposed building will require variances for insufficient minimum lot size for additional dwelling units, excessive building height, excessive F.A.R, insufficient side yard setback and insufficient usable open space. It is important to note that the development team is being responsive to cues about future height, density, and off-street parking goals being discussed as part of the ongoing South Boston Dorchester Avenue Planning Initiative. As a project that is subject to Large Project Review, required off-street parking spaces and off-street loading facilities are expected to be determined as a part of the Large Project Review process in accordance with the provisions of Article 80 of the Boston Zoning Code. Design elements of the Proposed Project will also be reviewed pursuant to Large Project Review.

Table 2-1. M-1 Zoning District - Dimensional and Off-Street Parking Requirements

Dimensional Element	M-1 Zoning (H-1)[1]	Proposed Project*	Expected Zoning Relief Required?
Minimum Lot Size	5,000 sf	18,991 sf	No
Minimum Lot Size (Add'l Dwelling Units)	1,000	18,991 sf total	Yes
Max. Floor Area Ratio	1.0	4.1	Yes
Max. Building Height	35 feet, 2-½ Stories	70 feet, 6-Stories	Yes
Minimum Lot Width	50 feet	160 feet	No
Minimum Lot Frontage	50 feet	165 feet	No
Minimum Front Yard Setback	20 feet	Per Article 80	No
Minimum Side Yard	15 feet	0 feet	Yes
Minimum Rear Yard	Per Article 80	0 feet	No
Required Off-Street Parking	Per Article 80	41	Per Article 80
Minimum Number of Loading Bays	Per Article 80	None	Per Article 80
Minimum Usable Open Space	400 SF/D.U.	100 SF/D.U. (Total 5,625 SF)	Yes

* The dimensions cited in this table may change as the Proposed Project undergoes ongoing review by BPDA staff.

[1] See Section 13-4. Dwellings in Nonresidential Districts. Any dwelling in an L, B, M, I, MER or W district shall conform to the lot area, lot width, usable open space, and yard requirements for the nearest S, R or H district, or in the case of any dwelling in a B-8 or B-10 district, to the lot area, lot width, usable open space and yard requirements for the least restricted residence district; provided however, that if the nearest S, R, or H district, or the least restricted residence district does not specify a minimum lot width, any such dwelling shall have a minimum street frontage of not less than 50 feet.

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

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

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

2.4 Public Review Process and Agency Coordination

In support of the required Article 80 Large Project Review process, the Proponent has conducted, and will continue to conduct, community outreach with neighbors and abutters of the Site, including meetings and discussions with the elected representatives and officials from the area, and with area residents. Specifically, the Proponent presented project plans at a meeting hosted by South Boston's elected officials on March 23, 2017; at a meeting with the West Broadway Neighborhood Association on April 4, 2017; and at a meeting with the Cityside Neighborhood Association on May 1, 2017.

The Proponent has also conducted numerous meetings concerning the Proposed Project with representatives of the Boston Planning and Development Agency prior to the filing this Project Notification Form in order to identify planning and urban design issues and concerns.

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

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

2.5 Development Impact Payment ("DIP") Status

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

3.0 URBAN DESIGN AND SUSTAINABILITY COMPONENT

3.1 Urban Design Overview

The proposed building at 20 West Fifth Street will be an important addition to this neighborhood. The property is currently occupied by a one story concrete block fabrication and distribution facility. The ongoing South Boston Dorchester Avenue Planning Initiative has brought together stakeholders in this area with the consensus being that future development will focus on higher density residential uses and associated commercial uses. This site is well suited to this type of development in that it is proximate to several public transportation options as well as the commercial and transportation node that occurs in the Broadway station area.

The building has been designed to be responsive to the planning goals established by The South Boston Dorchester Avenue Planning Initiative. The Planning Initiative outlines various "zones" with the planning area. Each zone has prescribed uses, heights, lot coverage ratio and setbacks. Additionally, each zone prescribes different setbacks along different streets and lot locations.

20 West Fifth Street is located in Use Zone 3, Lot Coverage Zone 1 and Height Zone of 120 feet. The development team believes the building conforms to both the letter and the intent of these planning objectives. The Proponent has elected to limit the building height to 70 feet as the site is close to the 70 foot height zone, and also because the Proponent believes that 6 stories and 70 feet are more appropriate for the initial development in this neighborhood. Additionally, the 70 foot building height is aligned with recent development on the block comprised of A Street, West Fourth Street and Silver Street.

The exterior building "skin" will be a combination of brick, composite metal panels, glass fenestration, painted fiber cement siding, and painted fiber cement trim. The materials and massing are intended to also tie the building into the nearby light industrial area while creating a texture and scale appropriate to residential living. Windows will be a combination of operable and fixed sashes. As referenced, the proposed building height is approximately 70 feet to the highest point of the sixth-story roof. Mechanical equipment and stairway head-houses will rise above that point, but will be set back from the edges of the building so as to not be visible from the street.

The Proponent has already made a number of presentations of the Proposed Project's conceptual design to the neighborhood and Boston Planning and Development Agency as it has continued to complete modifications to its schematic design plans.

In order to maximize ceiling heights, large windows and open floor plans, the economic ramifications of various structural systems were assessed in close collaboration with contractors and consultant members of the team. This effort resulted in a straightforward, wood-frame construction over a ground-level parking structure of steel and concrete. The mechanical solution avoids ventilation louvers on the exterior

facades and the plumbing stacks are aligned vertically, addressing the necessary economy and efficiency of this building type.

The Urban Design figures as well as the LEED v4 BD+C Checklist, are included at the end of this section **(Figures 3-1** thru **3-20)**.

3.2 Building Design

The proposed 20 West Fifth Street Project is a six-story residential building incorporating a total of 54 units. In addition to the residences, the building includes common rooms, gym, work space, outdoor terrace, and garaged parking for 54 bicycles and 41 vehicles.

The Proponent is committed to adopting materials that are consistent with the surrounding context. The concept of bays on the façade breaks down the massing of the building and introduces vertical elements to compliment the horizontality of the building.

3.3 Landscape Design

As indicated on the Landscape Plan (**Figure 3-3**), street trees will be planted along West Fifth Street. The existing sidewalk is eight feet wide, allowing for a three feet wide, by five foot long planting bed(s). All details, including caliper and species selection, will be approved by the City of Boston Parks and Recreation Commission.

3.4 Sustainable Design/Energy Conservation

The proposed project involves developing a new 78,432 sf residential building with 54 units, on a site located at 20 West Fifth Street. To meet the City of Boston requirements, the project is demonstrating the compliance with the LEED BD&C v4 criteria. The project is currently tracking 44 points in the YES column with 50 in the "maybe" column, with all to be further evaluated over the coming weeks and months will determine final credit achievement. We have outlined in the narrative below how the project will achieve the prerequisites and credits for LEED BD&C v4 certification (see Figure 3-20**. LEED v4 BD+C Checklist** at the end of this section).

3.4.1 Introduction

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

The Proponent and the Project design team are committed to an integrated design approach and are using the LEED Building Design and Construction v4 rating system and intend to meet certification as presented below. This rating will meet or exceed Boston's Green Building standard. The LEED rating system tracks the sustainable features of the Project by achieving

points in following categories: Location & Transportation; Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.

3.4.2 Location and Transportation

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

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

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

The City of Boston requires 1 bicycle parking space per residential unit. With a proposed 45 dwelling units, 45 secure and covered bicycle parking spaces are required and will be provided. Additionally, the City requires one outdoor/open bicycle parking space per 5 dwelling units, meaning this project requires 9 outdoor bicycle parking spaces, which will also be provided onsite.

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

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

3.4.3 Sustainable Sites

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

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

The project will create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan will conform to the erosion and

sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent.

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

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

3.4.4 Water Efficiency

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

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

The project will install permanent water meters that measure the total potable water use for the building and associated grounds.

3.4.5 Energy & Atmosphere

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

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

A whole-building energy simulation will be performed for the project demonstrating a minimum improvement of 20% for new construction according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata. The team will analyze efficiency measures during the design

process and account for the results in design decision making. The team will use energy simulation of efficiency opportunities, and past energy simulation analyses for similar buildings.

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

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

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

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

3.4.6 Materials & Resources

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

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

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

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

3.4.7 Indoor Environmental Quality

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

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

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

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

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

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

3.4.8 Innovation and Design Process

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

Five credits are being pursued and could include the following.

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

Regional Priority:

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

3.5 Urban Design Figures and LEED Checklist

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

Figure 3-1. West Fifth and A Street Rendering
Figure 3-2. Site Context Plan
Figure 3-3. Landscape Plan
Figure 3-4. Ground Floor Plan
Figure 3-5: Second Floor Plan
Figure 3-6. Third Floor Plan
Figure 3-7. Fourth Floor Plan
Figure 3-8. Fifth Floor Plan
Figure 3-9. Sixth Floor Plan
Figure 3-10. Roof Plan
Figure 3-11. Elevations (South and North)
Figure 3-12. Elevations (West and East)
Figure 3-13. Dorchester Avenue View
Figure 3-14. North Aerial
Figure 3-15. South Aerial
Figure 3-16. Zoning Diagram
Figure 3-17. West Fifth Street Rendering
Figure 3-18. Gold Street Rendering
Figure 3-19. Sidewalk Rendering
Figure 3-20. LEED v4 BD+C Checklist

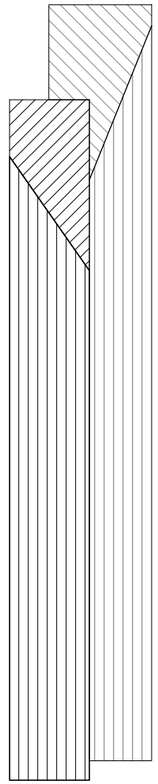
20 WEST FIFTH STREET
SOUTH BOSTON

PROPOSED DEVELOPMENT
JUNE 7, 2017

54 RESIDENTIAL UNITS

RUSSELL DESIGN ASSOCIATES

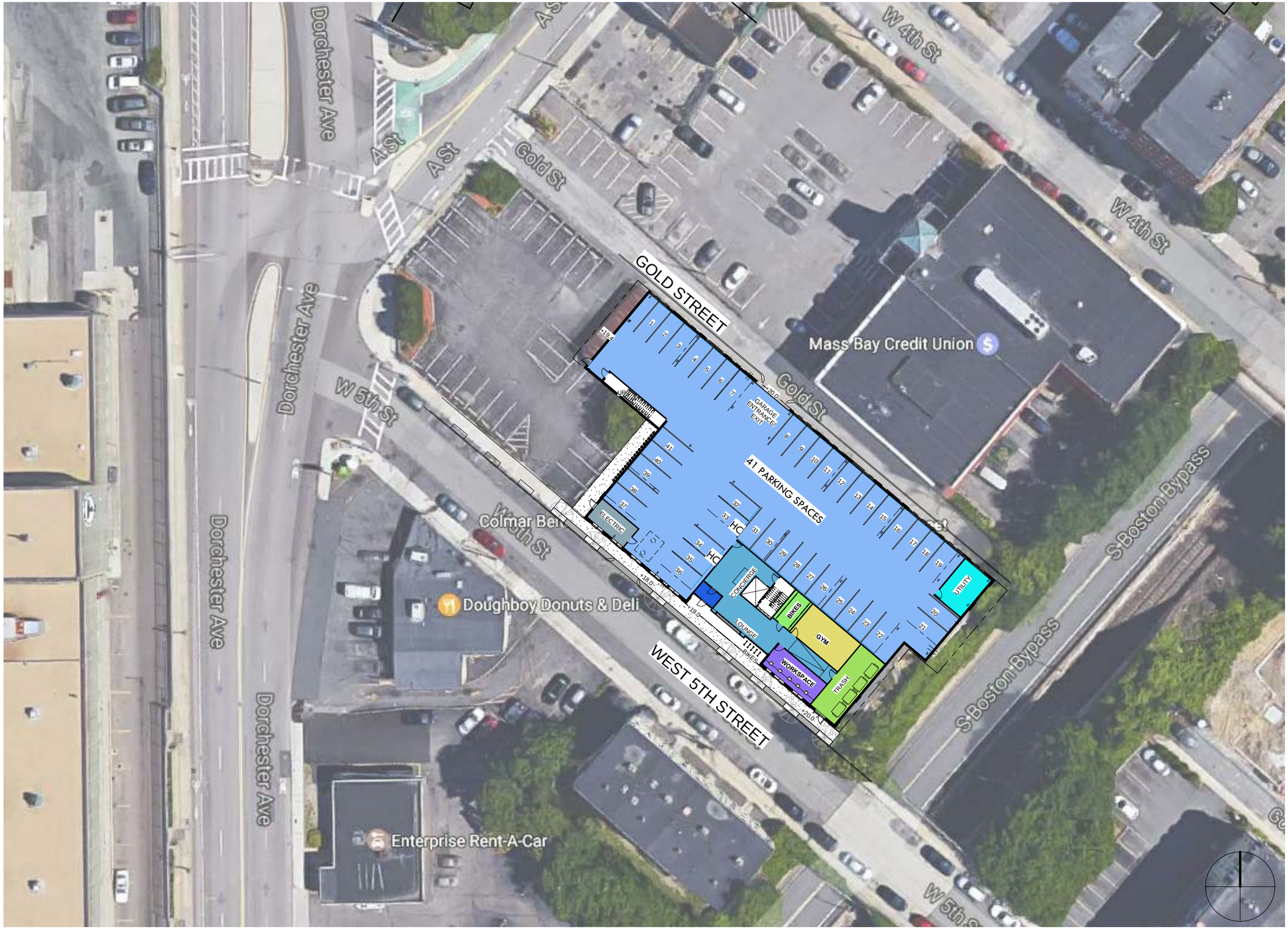
WEST 5TH STREET VIEW



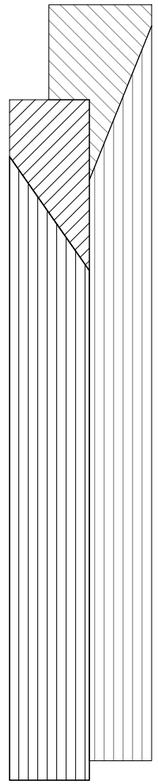
20 WEST 5TH
SOUTH BOSTON

SUMMARY & WEST 5TH RENDER
FIGURE
3-1

RUSSELL DESIGN ASSOCIATES



1 LEVEL 1 SITE PLAN
3/64" = 1'-0"

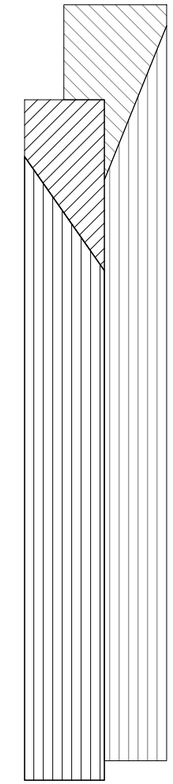


20 WEST 5TH
SOUTH BOSTON

SITE CONTEXT PLAN
FIGURE
3-2

RUSSELL DESIGN ASSOCIATES

1 SITE PLAN
3/32" = 1'-0"



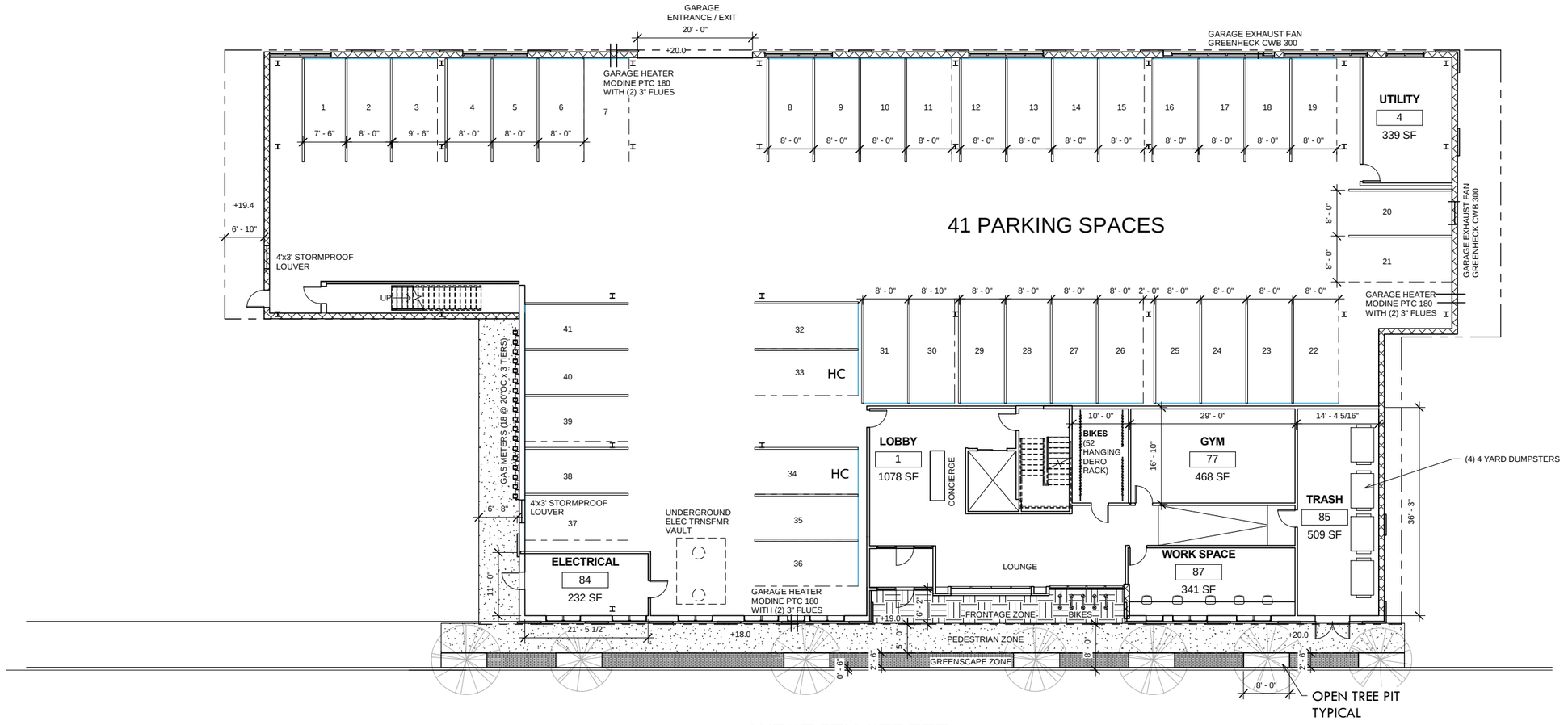
20 WEST 5TH
SOUTH BOSTON

LANDSCAPE PLAN

FIGURE
3-3

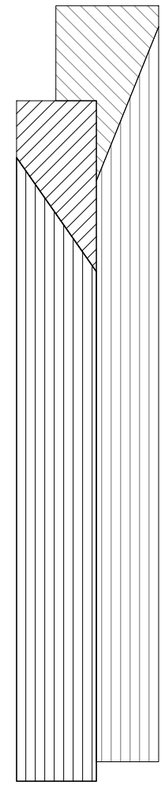
RUSSELL DESIGN ASSOCIATES

GOLD STREET



WEST 5TH STREET

Area Schedule				
Level	Name	Area	Area Type	Comments
Level 1	PARKING/UTILITY	14906 SF	Store Area	
Store Area		14906 SF		
Level 1	GROUND FLOOR	2469 SF	Floor Area	LOBBY & COMMON ROOM
Level 2	SECOND FLOOR	16144 SF	Floor Area	12 UNITS
Level 3	THIRD FLOOR	15928 SF	Floor Area	12 UNITS
Level 4	FOURTH FLOOR	15928 SF	Floor Area	12 UNITS
Level 5	FIFTH FLOOR	11678 SF	Floor Area	9 UNITS
Level 6	SIXTH FLOOR	11678 SF	Floor Area	9 UNITS
ROOF	ROOFTOP	1128 SF	Floor Area	ELEVATOR VESTIBULE
Floor Area		74953 SF		
		89859 SF		

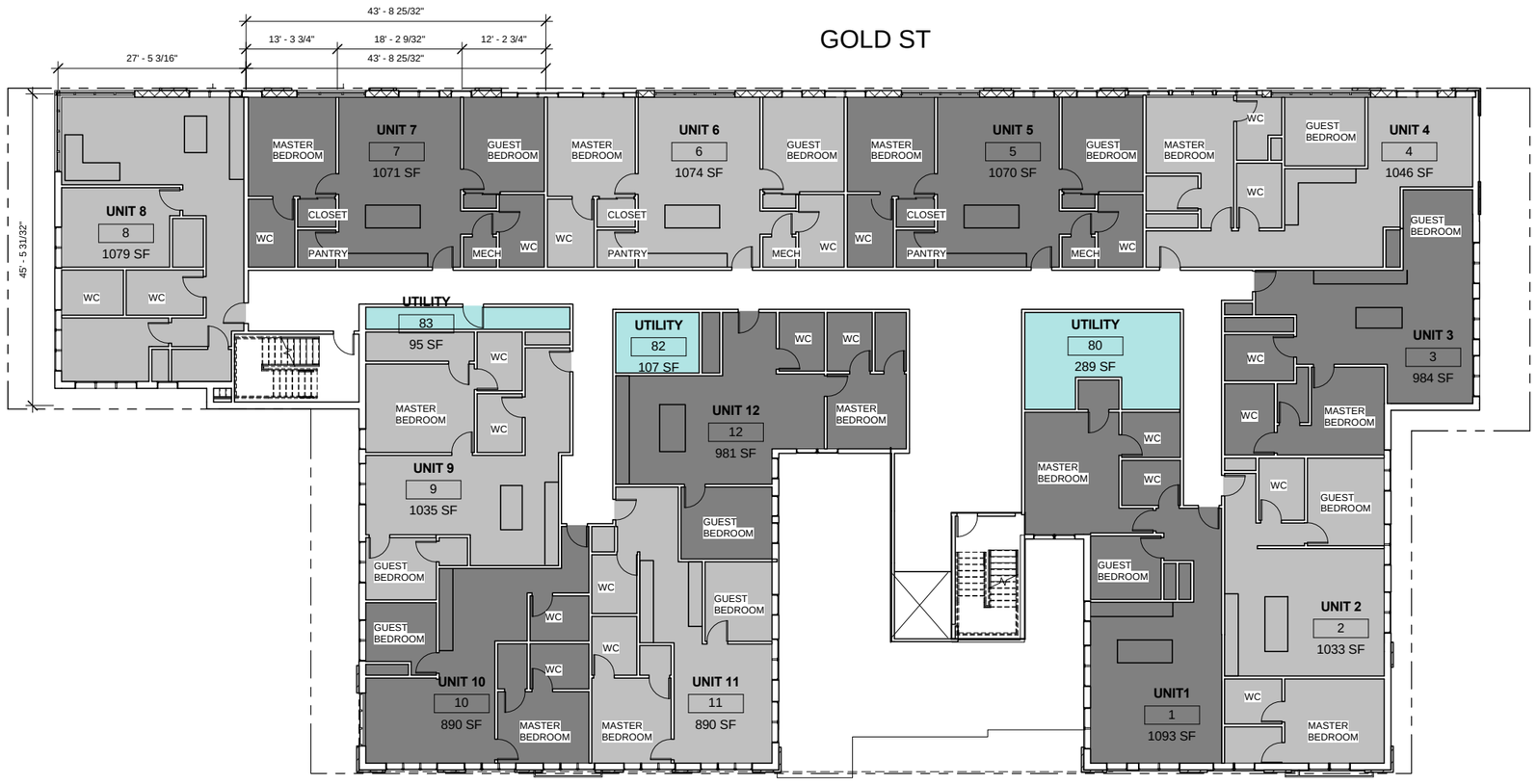


20 WEST 5TH SOUTH BOSTON

GROUND FLOOR

FIGURE 3-4

RUSSELL DESIGN ASSOCIATES



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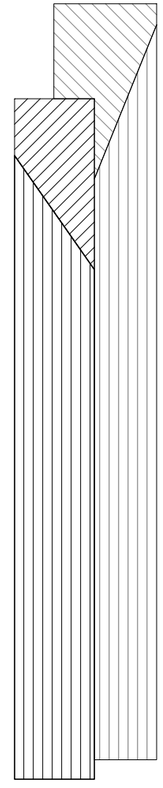
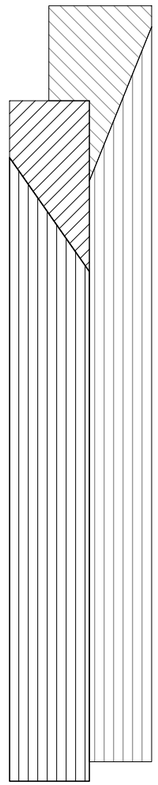


20 WEST 5TH
SOUTH BOSTON

SECOND FLOOR

FIGURE
3-5

RUSSELL DESIGN ASSOCIATES



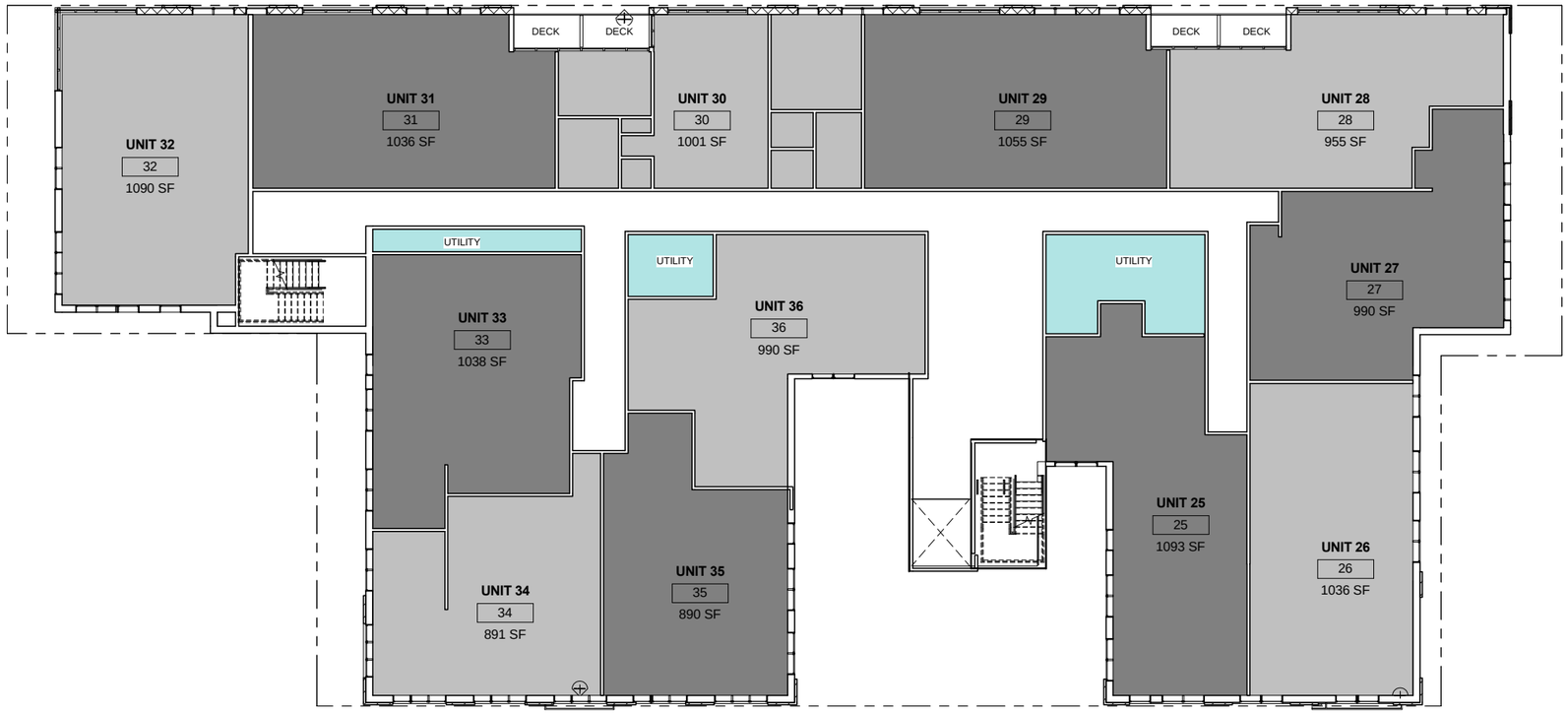
20 WEST 5TH
SOUTH BOSTON

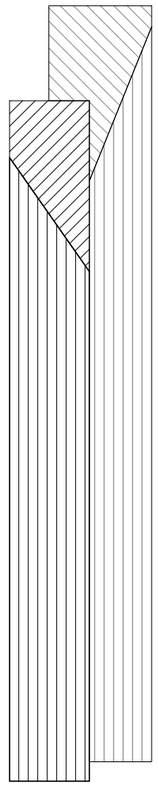
1 Level 3
3/32" = 1'-0"

THIRD FLOOR

FIGURE
3-6

RUSSELL DESIGN ASSOCIATES





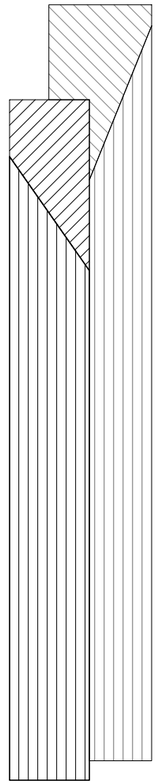
20 WEST 5TH
SOUTH BOSTON

1 Level 4
3/32" = 1'-0"

FOURTH FLOOR

FIGURE
3-7

RUSSELL DESIGN ASSOCIATES



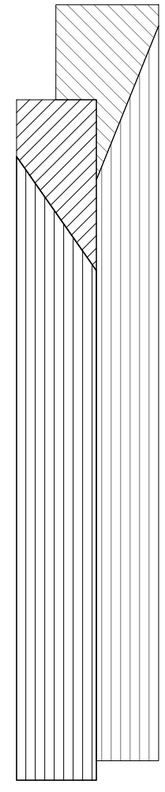
20 WEST 5TH
SOUTH BOSTON

1 Level 5
3/32" = 1'-0"

FIFTH FLOOR

FIGURE
3-8

RUSSELL DESIGN ASSOCIATES



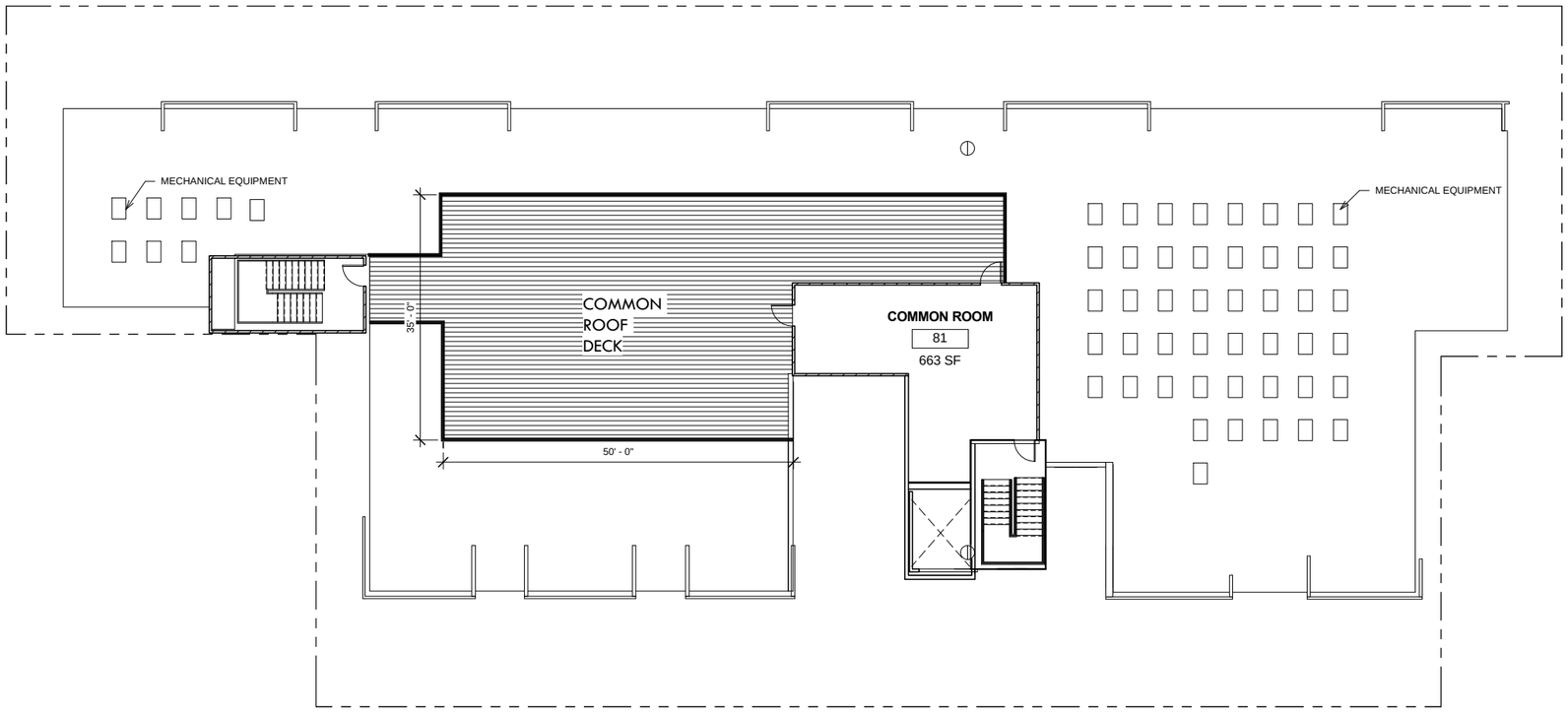
20 WEST 5TH
SOUTH BOSTON

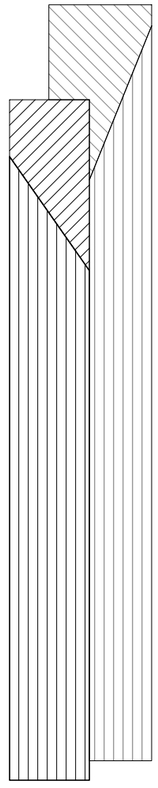
1 Level 6
3/32" = 1'-0"

SIXTH FLOOR

FIGURE
3-9

RUSSELL DESIGN ASSOCIATES





20 WEST 5TH
SOUTH BOSTON

1 ROOF
3/32" = 1'-0"

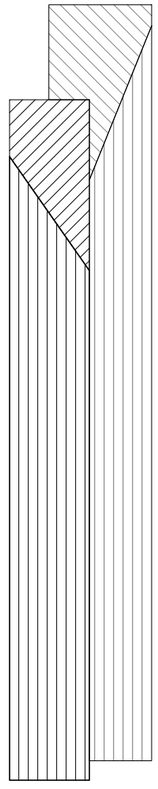
ROOF PLAN

FIGURE
3-10

RUSSELL DESIGN ASSOCIATES

1 SOUTH ELEVATION
3/32" = 1'-0"

2 NORTH ELEVATION
3/32" = 1'-0"



20 WEST 5TH
SOUTH BOSTON

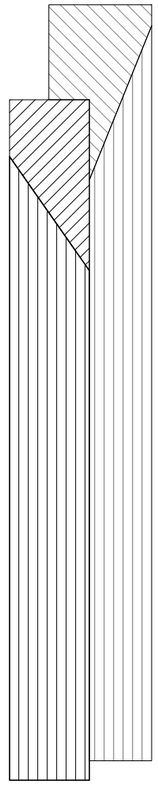
ELEVATIONS

FIGURE
3-11

1 WEST ELEVATION
1/8" = 1'-0"

2 EAST ELEVATION
1/8" = 1'-0"

RUSSELL DESIGN ASSOCIATES

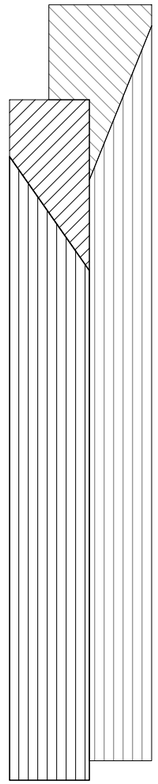


20 WEST 5TH
SOUTH BOSTON

ELEVATIONS

FIGURE
3-12

RUSSELL DESIGN ASSOCIATES



20 WEST 5TH
SOUTH BOSTON

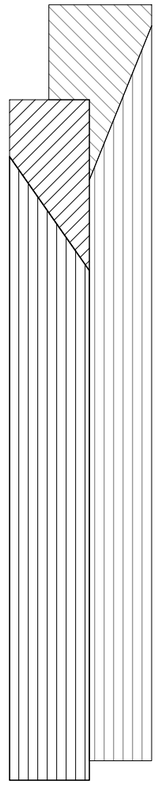
DORCHESTER AVE VIEW

FIGURE
3-13

RUSSELL DESIGN ASSOCIATES

WEST BROADWAY

DORCHESTER AVE



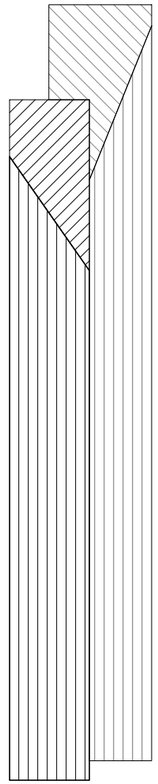
20 WEST 5TH
SOUTH BOSTON

NORTH AERIAL

FIGURE
3-14

RUSSELL DESIGN ASSOCIATES

DORCHESTER AVE

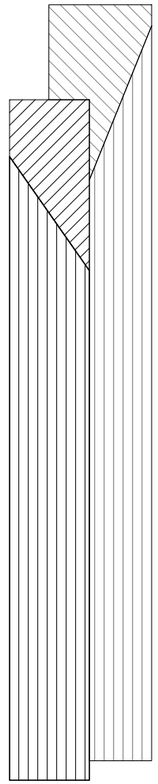


20 WEST 5TH
SOUTH BOSTON

SOUTH AERIAL

FIGURE
3-15

RUSSELL DESIGN ASSOCIATES

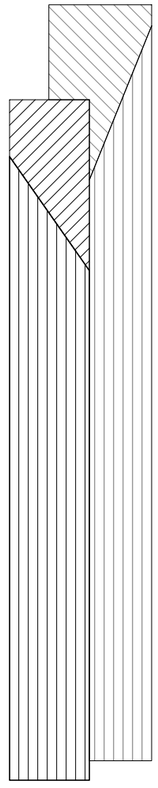


20 WEST 5TH
SOUTH BOSTON

ZONING DIAGRAM

FIGURE
3-16

RUSSELL DESIGN
ASSOCIATES

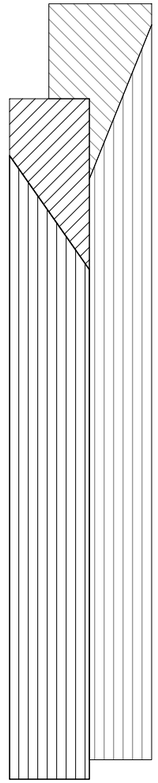


20 WEST 5TH
SOUTH BOSTON

WEST 5TH & A
STREET RENDERING
FIGURE
3-17

RUSSELL DESIGN ASSOCIATES

GOLD STREET VIEW



20 WEST 5TH
SOUTH BOSTON

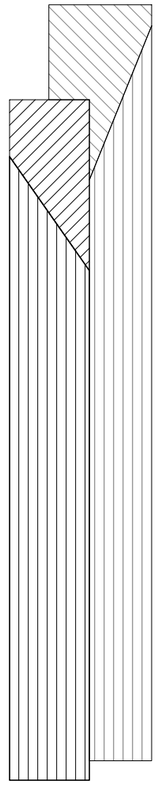
GOLD STREET RENDERING

FIGURE

3-18

RUSSELL DESIGN
ASSOCIATES

① WEST 5TH STREET SIDEWALK
12" = 1'-0"



20 WEST 5TH
SOUTH BOSTON

SIDEWALK RENDER

FIGURE
3-19

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

Project Checklist

Project Name: 20 West Fifth Street
Date: 24-May-17

Y	?	N			
	1		Credit	Integrative Process	1

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

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

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

8	19	6	**Energy and Atmosphere**		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
	6		Credit	Enhanced Commissioning	6
6	6	6	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
	2		Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

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

7	8	1	**Indoor Environmental Quality**		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
	2	1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	2		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
2			Credit	Interior Lighting	2
	3		Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

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

2	2	0	**Regional Priority**		4
1			Credit	Regional Priority: Indoor Water Use	1
1			Credit	Regional Priority: High Priority Site	1
	1		Credit	Regional Priority: Optimize Energy	1
	1		Credit	Regional Priority: Renewable	1

44	50	16	**TOTALS**	Possible Points:	110

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

Figure 3-20. LEED v4 BD+C Checklist

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Shadow Impacts Analysis

4.1.1 Introduction

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

4.1.2 Vernal Equinox (March 21)

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

At 9:00 AM, shadows are cast in a westerly direction onto portions of the adjacent parking lot and on a small portion of A Street.

At 12:00 Noon, new shadow is cast in a northerly direction totally over Gold Street and on a small portion of the adjacent Mass Bay Credit Union.

At 3:00 PM, new shadow from the Project is cast in a northeasterly direction over Gold Street and on a portion of the adjacent Mass Bay Credit Union.

4.1.3 Summer Solstice (June 21)

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

At 9:00 AM, shadows are cast in a westerly direction onto portions of West Fifth Street onto a small portion of the adjacent parking lot.

At 12:00 Noon, new shadow is cast in a northerly direction over Gold Street.

At 3:00 PM, new shadow from the Project is cast in an easterly direction over Gold Street and a small portion of the South Boston Bypass Haul Road.

At 6:00 PM, new shadow extends beyond the South Boston Bypass and onto the other side of B Street.

4.1.4 Autumnal Equinox (September 21)

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

At 9:00 AM, shadows are cast in a northwesterly direction onto portions of the adjacent parking lot.

At 12:00 Noon, new shadow is cast in a northeasterly over Gold Street and onto a small portion of the adjacent Mass Bay Credit Union.

At 3:00 PM, new shadow from the Project is cast in an easterly direction over Gold Street, on adjacent portions of the Mass Bay Credit Union building and parking lot, and onto a small section of the South Boston Bypass.

At 6:00 PM, new shadow extends over the South Boston Bypass Road and onto the other side of B Street.

4.1.5 Winter Solstice (December 21)

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

At 9:00 AM, are cast in a northwesterly direction onto the adjacent parking lot, A Street and a small portion of Dorchester Avenue.

At 12:00 Noon, new shadow is cast in a northeasterly direction over Gold Street and onto the adjacent Mass Bay Credit Union.

At 3:00 PM, new shadow from the Project is cast in an easterly direction over Gold Street, the adjacent Mass Bay Credit Union extending to Silver Street and onto a portion of the lot between Silver Street and West Broadway.

4.1.6 Summary

Even with the proposed height of 6-floors, the Proposed Project's shadow impacts are generally not extensive. New shadow is generally limited to the streets surrounding the Site. Late afternoon and evening shadows will extend in an easterly/northeasterly direction toward Gold Street and the Mass Bay Credit Union. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings.

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

Figure 4-2. March 21 Shadows- 12:00 Noon

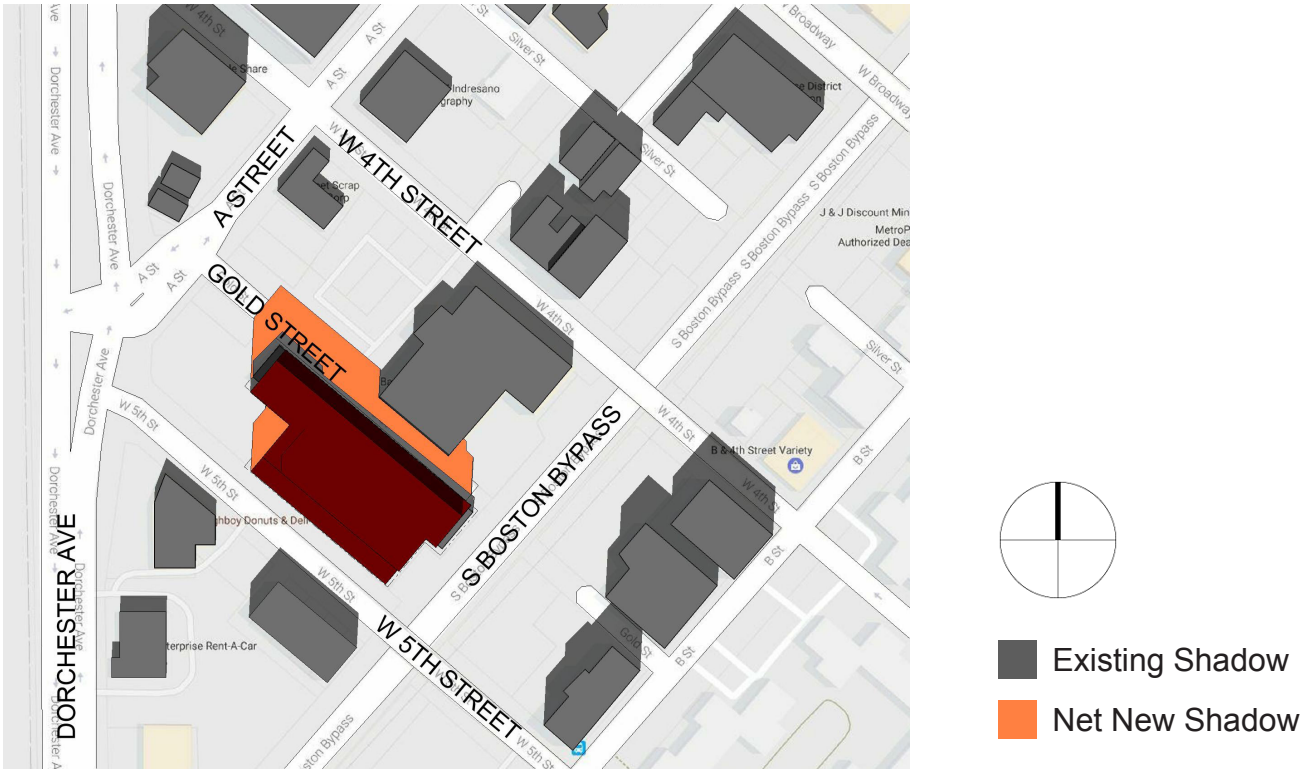


Figure 4-3. March 21 Shadows- 3:00 PM

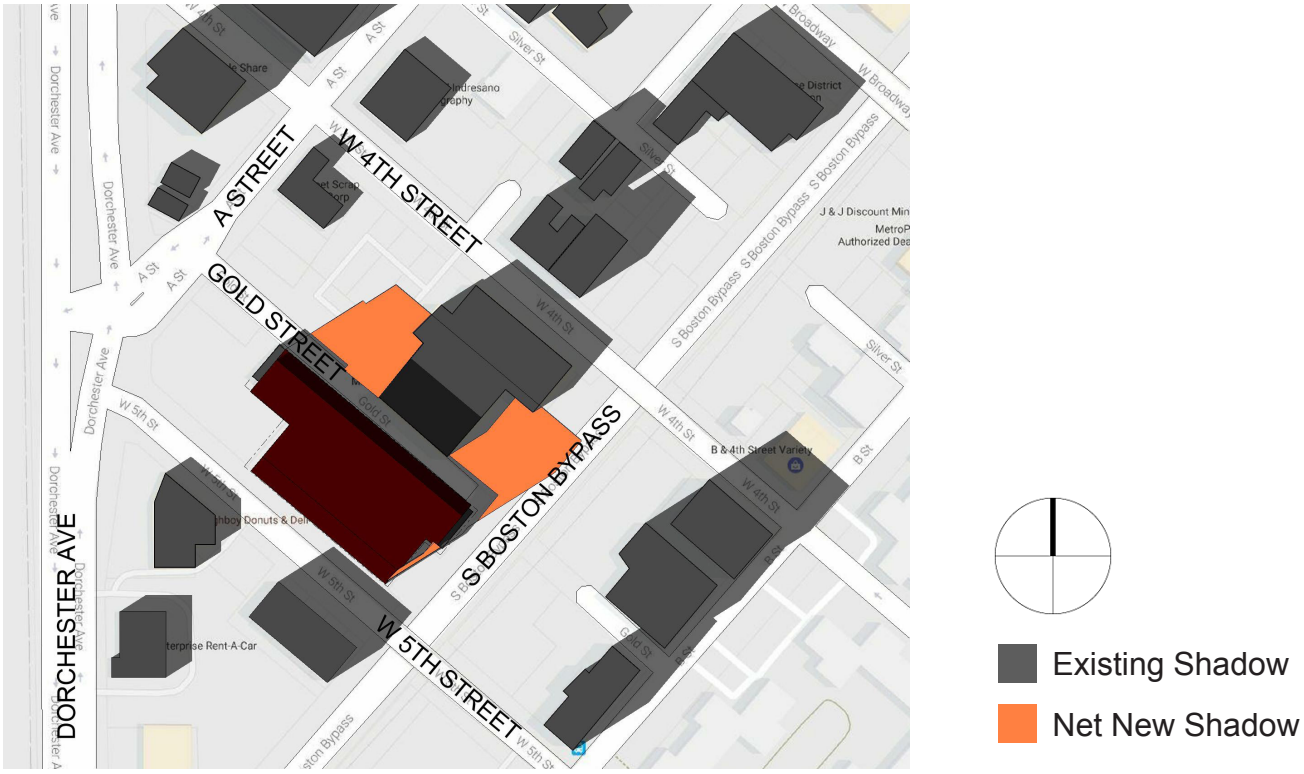


Figure 4-4. June 21 Shadows- 9:00 AM

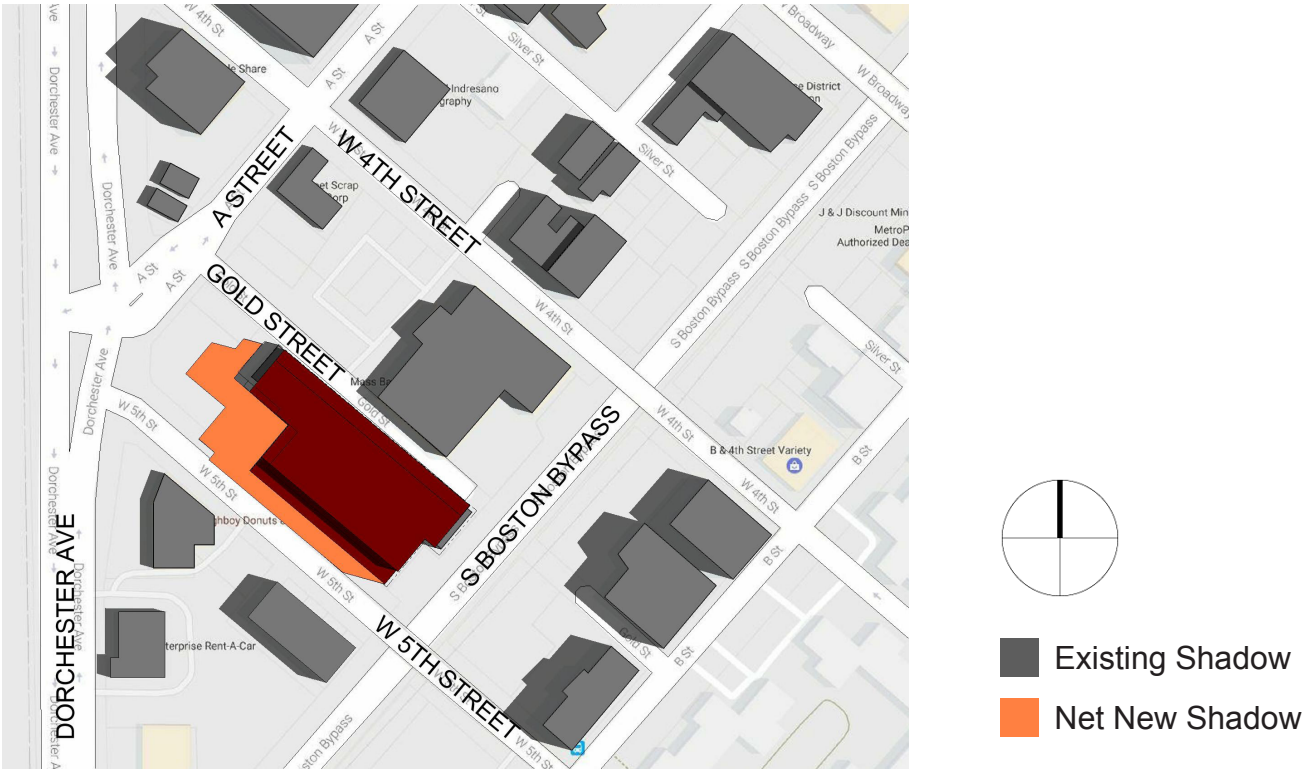


Figure 4-5. June 21 Shadows- 12:00 Noon

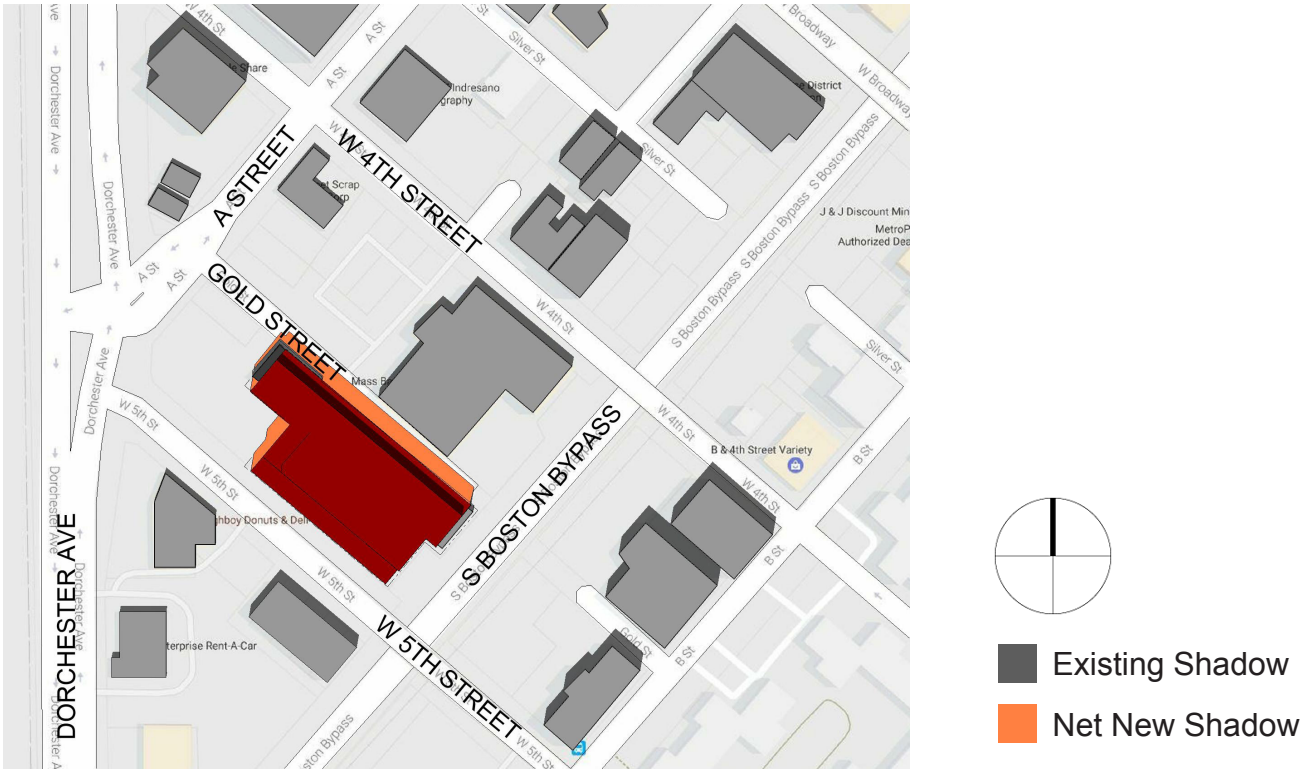


Figure 4-6. June 21 Shadows- 3:00 PM

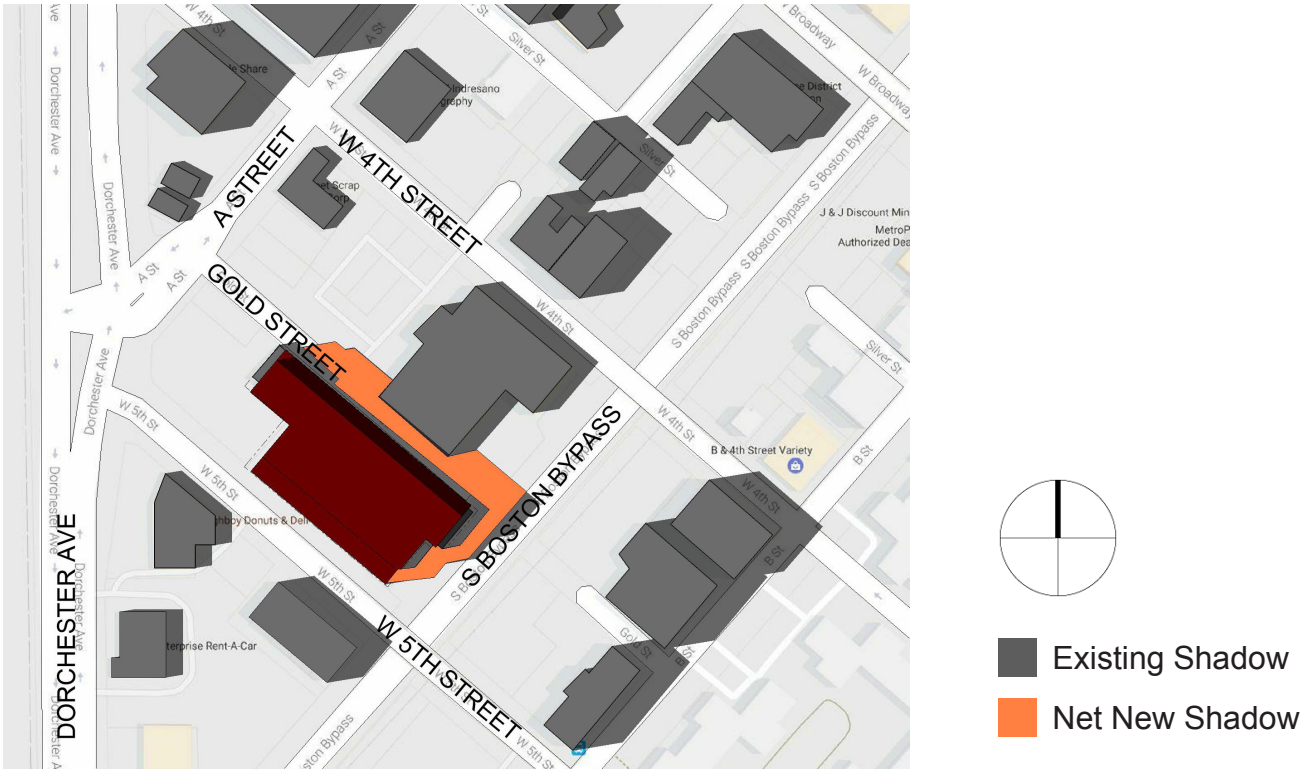


Figure 4-7. June 21 Shadows- 6:00 PM

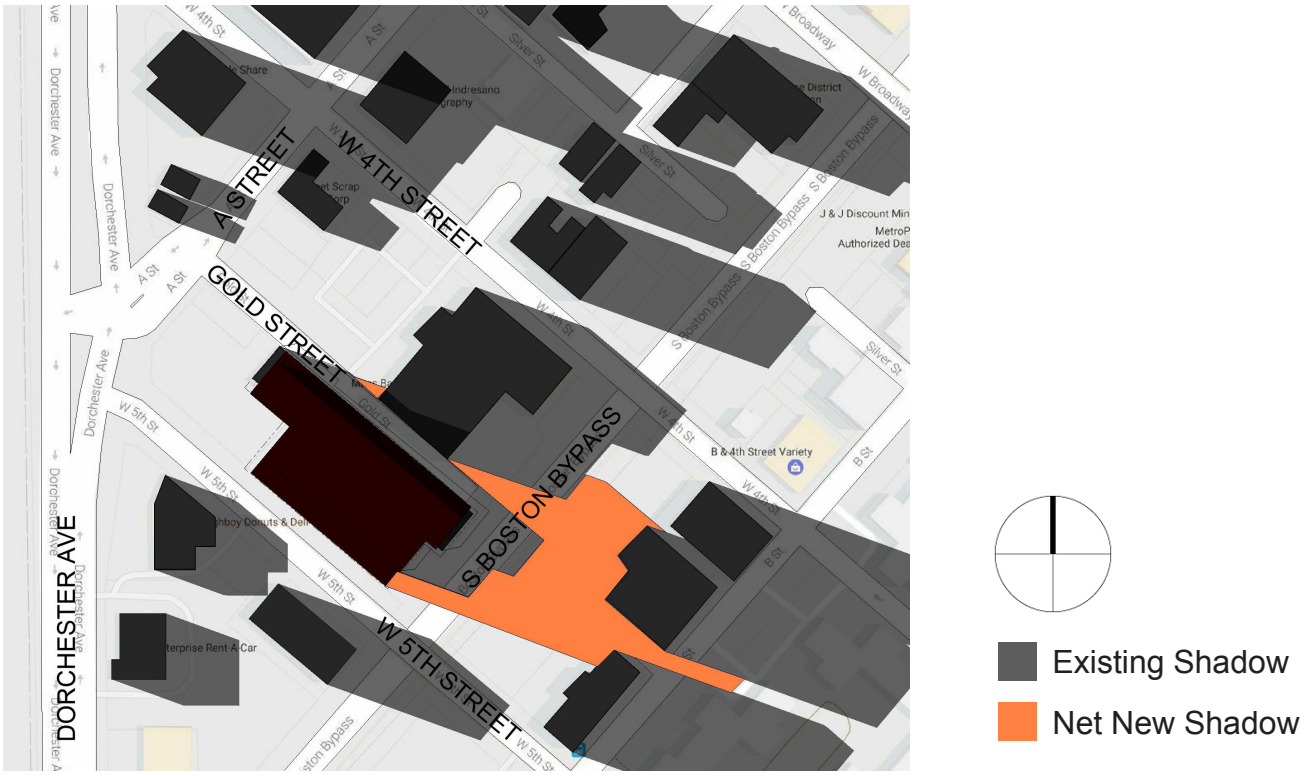


Figure 4-8. September 21 Shadows- 9:00 AM

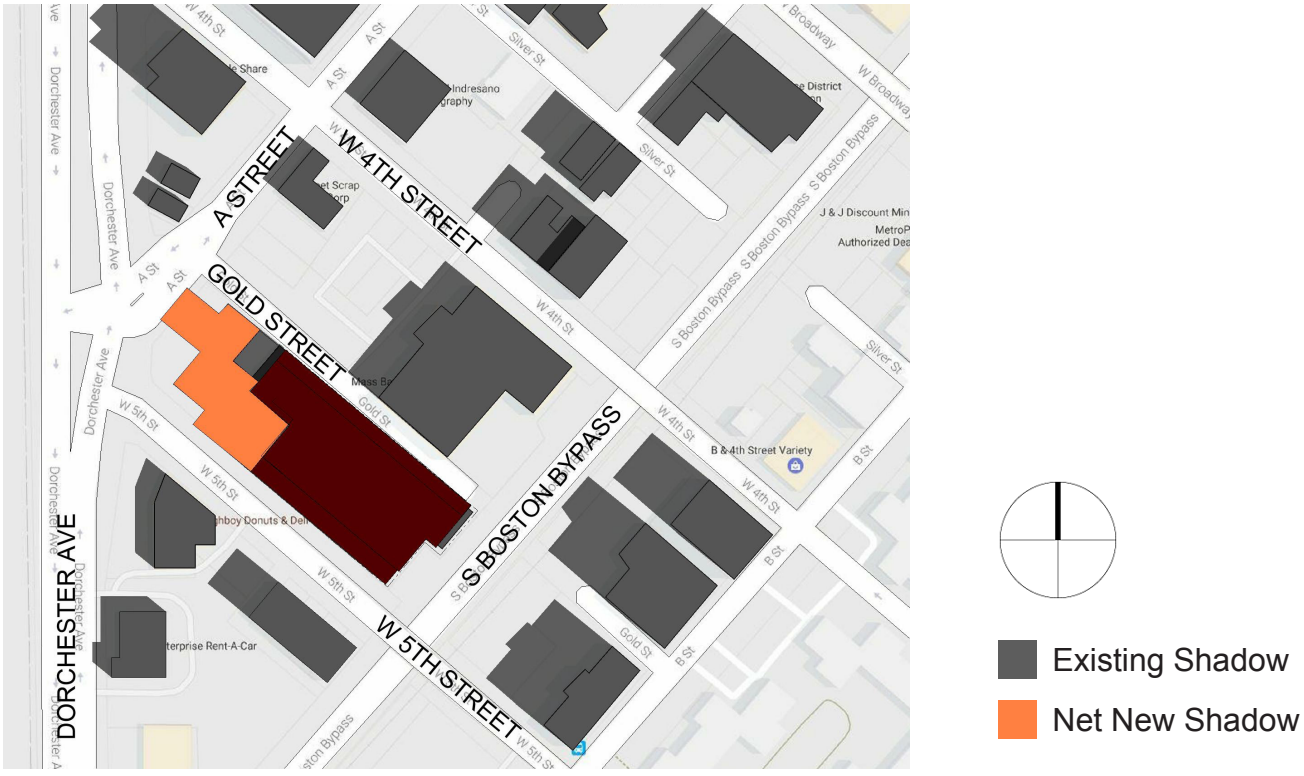


Figure 4-9. September 21 Shadows- 12:00 PM

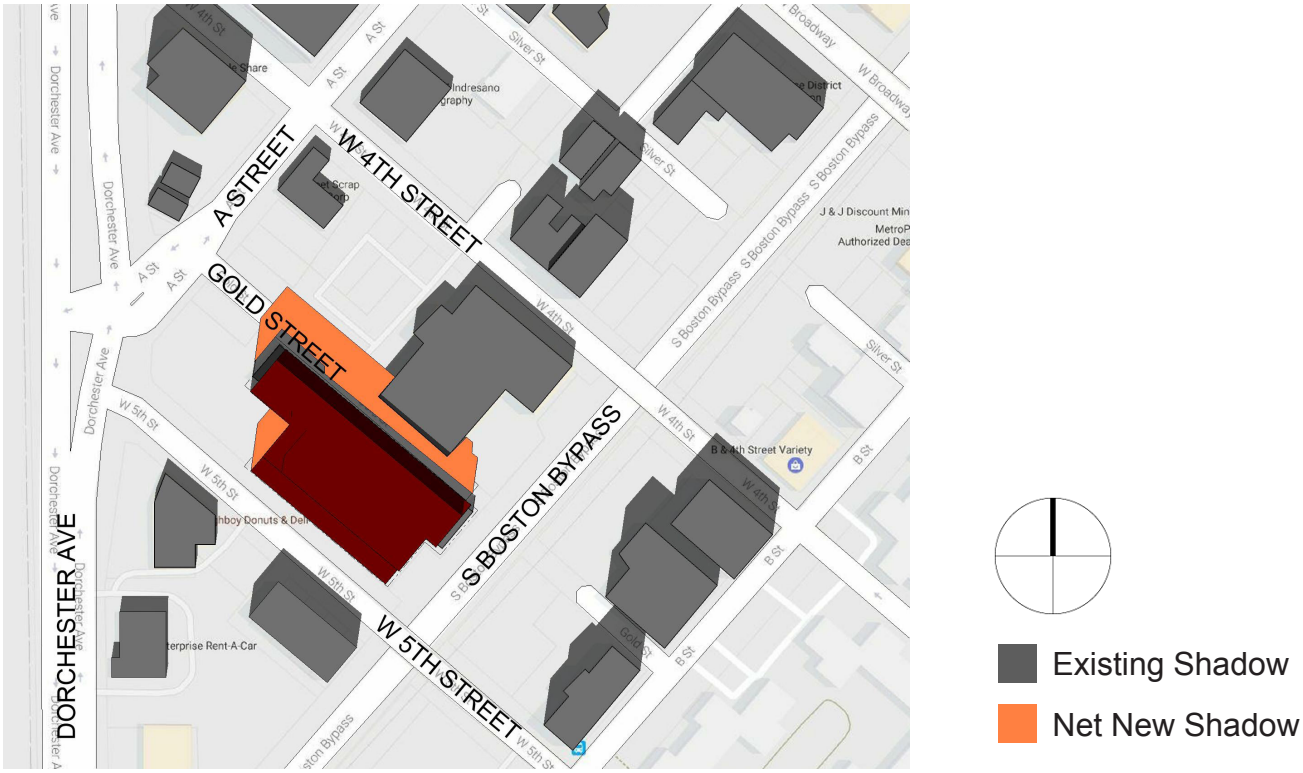


Figure 4-10. September 21 Shadows- 3:00 PM

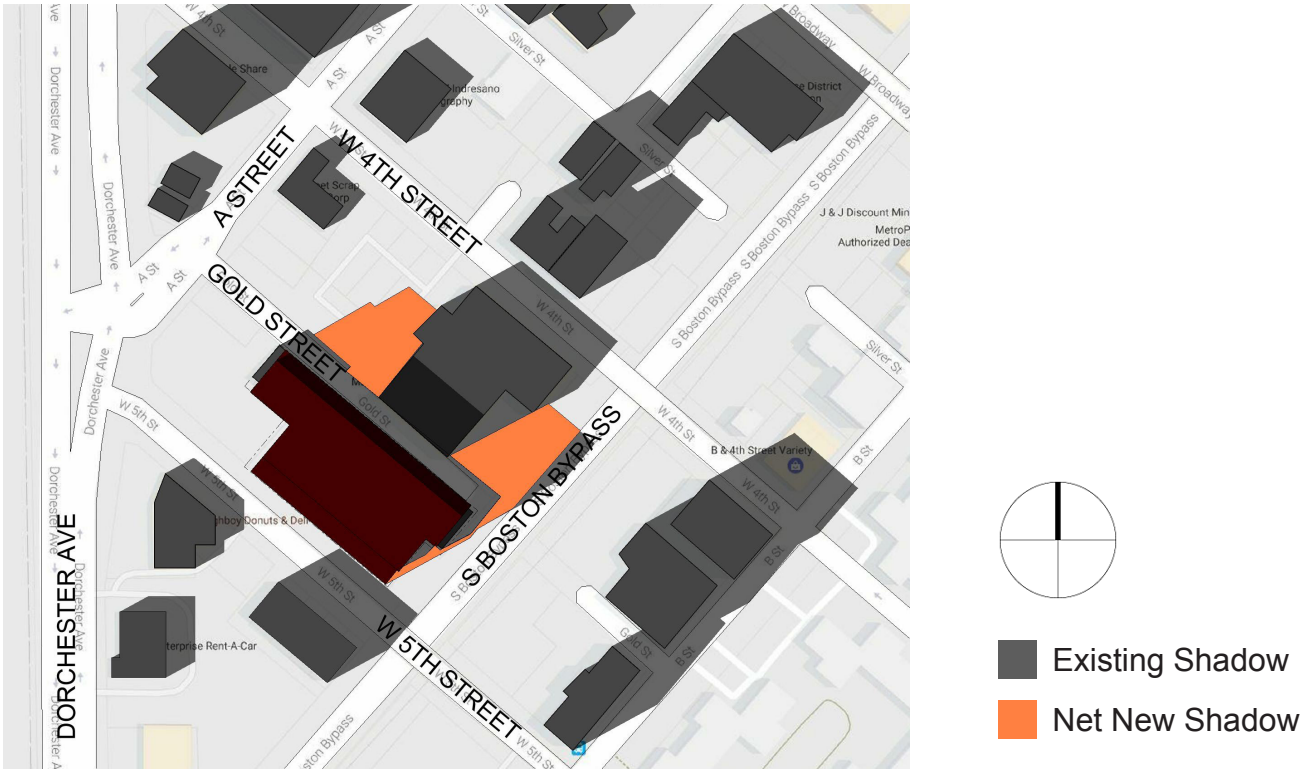


Figure 4-11. September 21 Shadows- 6:00 PM

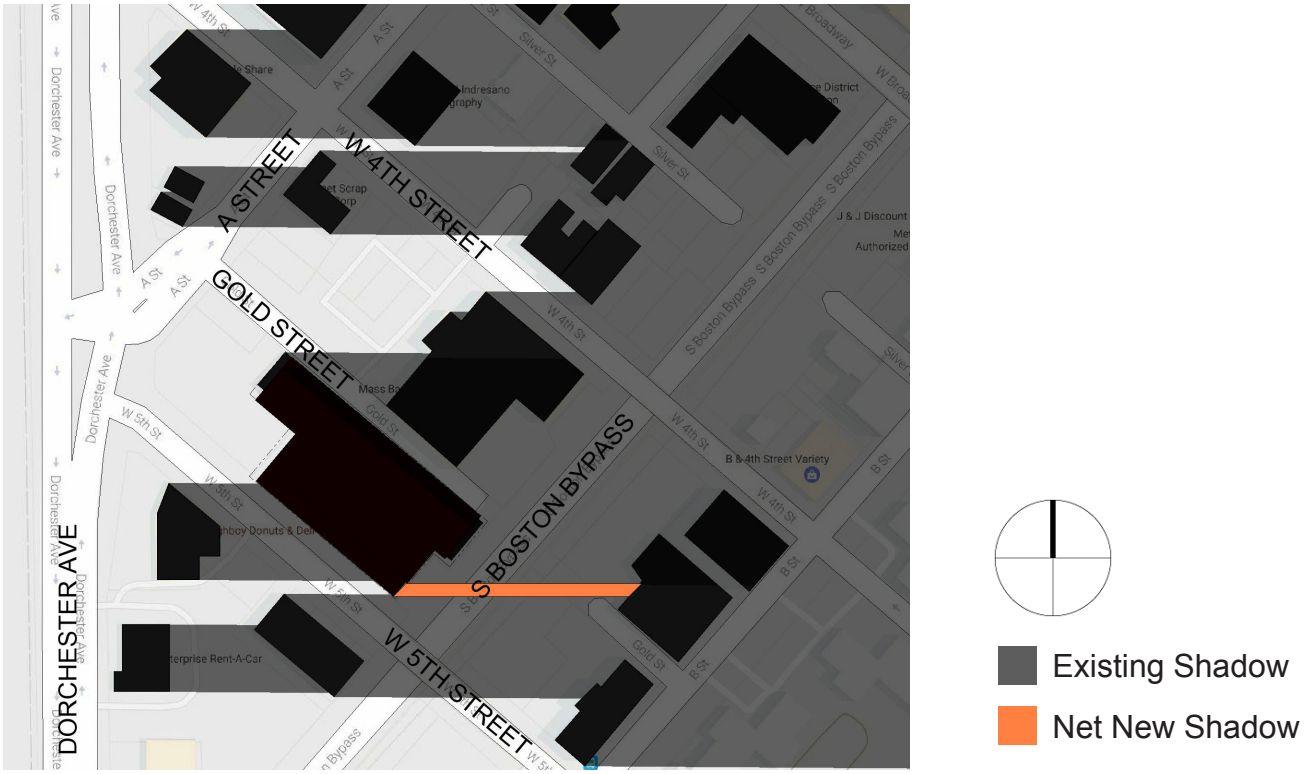


Figure 4-12. December 21 Shadows- 9:00 AM

Figure 4-13. December 21 Shadows- 12:00 Noon

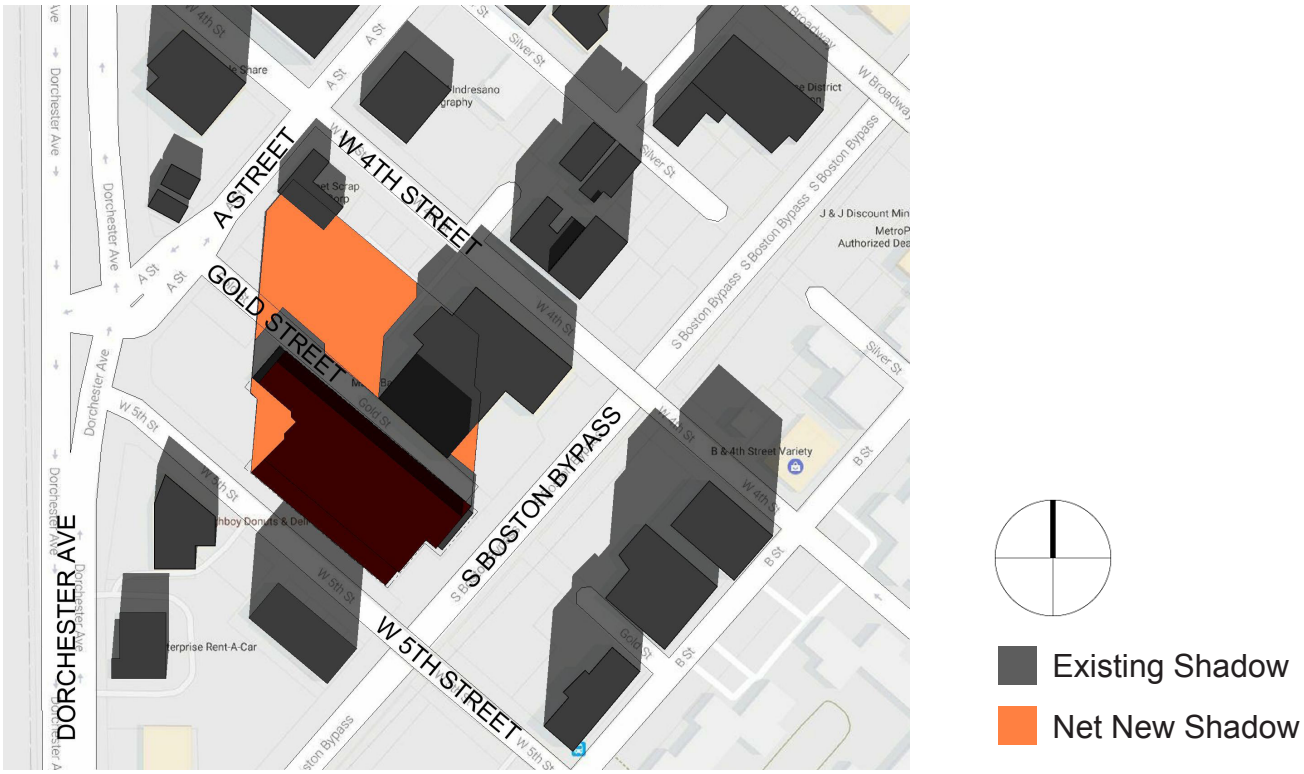
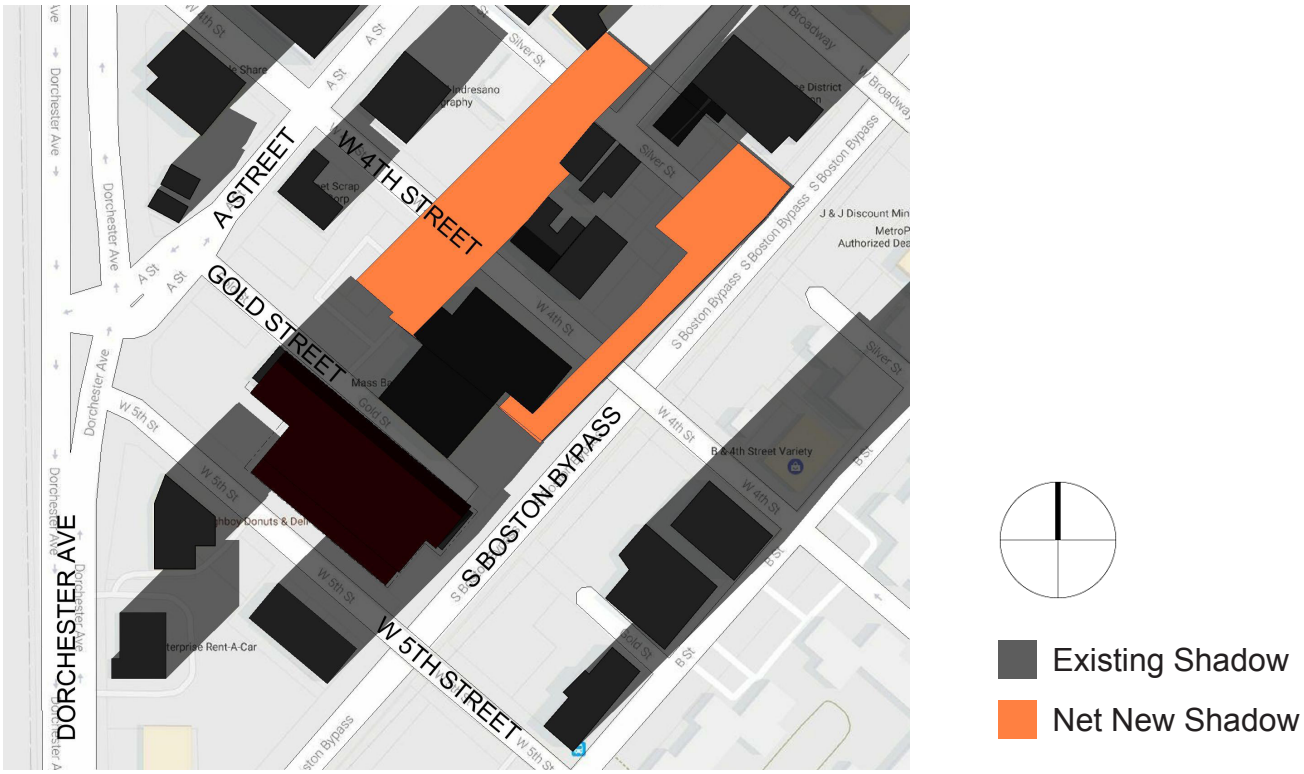


Figure 4-14. December 21 Shadows- 3:00 PM



4.2 Air Quality

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

4.2.1 Existing Air Quality

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

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

Table 4.2-2 summarizes the DEP air monitoring data, for the most recent available, complete, three-year period (2013-2015), that are considered to be representative of the project area. **Table 4.2-2** shows that the existing air quality in the Project area is generally much better than the NAAQS. The highest impacts relative to a NAAQS are for ozone, NO_2 and $PM_{2.5}$. Ozone is a regional air pollutant on which the small amount of additional traffic generated by this Project will have an insignificant impact. The Project's operations will not have a significant impact on local NO_2 and $PM_{2.5}$ concentrations.

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

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

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

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

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

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

Notes:

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

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

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

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

4.2.2 Impacts from Parking Garage

The Project also includes a parking garage designed to provide parking spaces for 41 vehicles. An analysis of the worst-case air quality impacts from the proposed parking garage was performed (see **Appendix B**). The procedures used for this analysis are consistent with U.S. EPA's Volume 9 guidance.[2] CO emissions from motor vehicles operating inside the garage were calculated and the CO concentrations inside the garage and surrounding the Project were based on morning and afternoon peak traffic periods.

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

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

Garage Ventilation System

The proposed parking garage will require mechanical ventilation. The garage ventilation system will be designed to provide adequate dilution of the motor vehicle emissions before they are vented outside. The design of the garage ventilation system will meet all building code requirements. Full ventilation of the garage will require a maximum flow of approximately 16,240 cubic feet per minute (cfm) of fresh air. This quantity of air is designed to meet the building code and will be more than adequate to dilute the emissions inside the parking garage to safe levels before they are vented outside. The garage ventilation exhausts will likely be located at two side vents.

Peak Garage Traffic Volumes

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

Table 4.2-3. Peak-Hour Garage Traffic Volumes

Period	Entering (vehicles/hour)	Exiting (vehicles/hour)	Total (vehicles/hour)
Morning Peak Hour	3	10	13
Afternoon Peak Hour	10	6	16

Source: Howard-Stein Hudson, Inc.

Motor Vehicle Emission Rates

The U.S. Environmental Protection Agency (EPA) MOVES2014 emission factor model was used to calculate single vehicle CO emissions rates, for a vehicle speed of 5 mph. The inputs to the MOVES2014 model followed the latest guidance from the Massachusetts Department of Environmental Protection (DEP) and were performed for the future traffic year of 2024. The CO emission rate calculated by MOVES2014, for vehicles moving at 5 miles per hour (mph), was 2.976 grams per vehicle-mile for each entering and exiting vehicle. These emission rates apply to

wintertime conditions when motor vehicle CO emissions are greatest due to cold temperatures. MOVES2014 model output is provided in the **Appendix B.**

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

Peak Garage CO Emission Rate and CO Concentration Inside the Garage

The peak one-hour CO emission rate for the parking garage was calculated to be 0.054 grams per minute for the morning peak hour and 0.066 grams per minute for the afternoon peak hour. Applying the maximum volumetric garage ventilation flow rate for the parking garage, the peak one-hour CO concentration inside the garage was calculated to be 0.11 parts of CO per million parts of air (ppm) for the morning peak hour and 0.13 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 0.13 ppm with a peak one-hour emission rate of 0.066 grams/minute (0.0011 grams/second), corresponding to the afternoon peak period. These predictions represent conservative estimates of the peak garage CO emissions and concentrations.

Peak Ambient CO Concentration

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

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

AERMOD predicted that the maximum one-hour CO concentration from the parking garage will be 0.0017 ppm (2.02 $\mu g/m^3$). This concentration represents the maximum CO concentration at any location surrounding the Project. AERSCREEN guidance allows the maximum eight-hour CO impact to be conservatively estimated by multiplying the maximum one-hour impact by a factor of 0.9 (i.e. the eight-hour impact is 90% of the one-hour impact). The maximum predicted

eight-hour CO concentration was determined to be approximately 0.0016 ppm (0.0017 ppm x 0.9).

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

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

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

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

4.2.3 Microscale CO Analysis for Selected Intersections

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

A microscale air quality analysis was not performed for this Project due to the Project trip generation having minimal impacts on the overall delays at the four intersections. The Project will generate approximately 13 motor vehicle trips during the morning peak traffic hour and approximately 16 motor vehicle trips during the afternoon traffic hour. Under the Build scenario, the overall LOS will be the same during the morning peak traffic hour for all intersections. Under

the Build scenario, the overall LOS will be the same during the afternoon peak traffic hour for all intersections, except for the A Street/West 4th Street intersection where the overall LOS degrades from D to E. This degradation is due increases in future background traffic. Furthermore, the increase in traffic at this intersection is less than 10%. **Table 4.2-5** shows a comparison of the Existing (2017) and Build (2024) LOS at the four intersections. The motor vehicle trip generation from the Project will not have a significant impact on motor vehicle delays and air pollutant emissions at the analyzed intersections. Therefore, the motor vehicle traffic generated by the Project will not have a significant impact on air quality at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project.

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

Intersection	Existing LOS (AM/PM)	Build LOS (AM/PM)	Requires Analysis?
A Street/West 4th Street – signalized	C/D	C/E	NO*
A Street/Dorchester Avenue – signalized	C/D	C/D	NO
A Street/Gold Street - unsignalized	B/B	B/B	NO
Dorchester Avenue/West Fifth Street -unsignalized	C/C	C/C	NO

The LOS shown represents the overall delay at each signalized intersection and worst-case traffic movement for unsignalized intersections
*Project does not contribute to reduction in level of service.

Source: Howard/Stein-Hudson Associates, Inc.

Conclusions

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

4.3 Noise Impacts

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

4.3.1 Common Measures of Community Noise

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

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

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

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

Sound level measurements typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines nine octave bands from 32 Hz to 8,000 Hz. A source is said to create a pure

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

tone if acoustic energy is concentrated in a narrow frequency range and one octave band has a sound level 3 dB greater than both adjacent octave bands.

The acoustic environment in an urban area such as the Project area results from numerous sources. Observations show that major contributors to the background sound level in the Project area include motor vehicle traffic on local and distant streets, aircraft over-flights, mechanical equipment on nearby buildings, nature noises such as insects, tree frogs, small animals, and general city noises such as street sweepers and police/fire sirens. Typical sound levels associated with various activities and environments are presented in **Table 4.3-2**.

4.3.2 Noise Regulations

Commonwealth Noise Policy

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

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

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

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

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

Local Regulations

The City of Boston Environment Department regulates noise through the Regulations for the Control of Noise as administered by the Air Pollution Control Commission. The Project is located in an area consisting of commercial and residential uses. The Project will have low-rise residential uses to the north, east, and south. The Project must comply with Regulation 2.2 for noise levels in Residential Zoning Districts at these residential locations**. Table 4.3-3** lists the maximum allowable octave band and broadband sound pressure levels for residential and business districts. Daytime is defined by the City of Boston Noise Regulations as occurring

between the hours of 7:00 a.m. and 6:00 p.m. daily except Sunday. Compliance with the most restrictive nighttime residential limits will ensure compliance for other land uses with equal or higher noise limits.

Table 4.3-2. Common Indoor and Outdoor Sound Levels

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

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

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

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

4.3.3 Pre-Construction Sound Level Measurements

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

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

Monitoring Location #1: 25 West Fifth Street

Monitoring Location #2: 150 West Fourth Street

Monitoring Location #3: 105 West Fourth Street

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

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

The sound level monitoring was conducted Wednesday Night, May 3rd, into Friday morning, May 4th, 2017. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was 47°F, the skies were partly cloudy, and the winds were 0 to 6 mph, from the northwest. The microphone of the sound level analyzer was fitted with a 3-inch windscreen to negate any effects of wind-generated noise.

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

The results of the nighttime baseline sound level measurements are presented in **Table 4.3-4**, and the complete measurement printouts are provided in **Appendix C**. The nighttime background L_{90} level was 54.7 dBA at Location #1, 50.6 dBA at Location #2, 46.0 at Location #3, and 55.6 dBA at Location #4. The octave band data in **Table 4.3-4** show that no pure tones were detected in the nighttime noise measurements.

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

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

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

Daytime sound level measurements were taken to help estimate the L_{dn} for the Project Site. A 30-minute sound level measurement was taken during the afternoon, on Wednesday, April 19, 2017 between 12:45 p.m. and 1:15 p.m. at 25 West Fifth Street (Location #1) representing the closest location to the Project Site. The weather conditions during the sound survey were conducive to accurate sound level monitoring: the skies were clear, and the winds were 5-10 mph. The microphone of the sound level analyzer was fitted with a 7-inch windscreen to negate any effects of wind-generated noise.

The daytime sound level measurements taken in the vicinity of the Project Site reveal sound levels that are typical for an urban area. The main sources of noise during the peak morning traffic period sound level measurement were motor vehicle traffic on nearby local streets, construction vehicles in the distance, adjacent MBTA Broadway Street Red Line activity, and aircraft over-flights. The L_{eq} measured during the afternoon period was 59.7 dBA. The L_{eq} sound level measured during the nighttime at the same location was 57.3 dBA. Using both the daytime and nighttime L_{eq} sound levels, the calculated L_{dn} for the site is 64.1 dBA, which is below the HUD guideline noise limit of 65 dBA.

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

Table 4.3-4. Nighttime Baseline Sound Level Measurements, May 3-4, 2017

Sound Level Measurement	(Location #1) 25 West Fifth 11:00 p.m. - 11:30 p.m.	(Location #2) 150 West Fourth Street 11:31 p.m.- 12:01 a.m.	(Location #3) 105 West Fourth Street 12:03 a.m. - 12:33 a.m.
Broadband (dBA)			
Background (L_{90})	54.7	50.6	55.6
Octave Band L_{90} (dB)			
16 Hz	57.3	58.1	60.2
32 Hz	62.2	63.6	64.2
63 Hz	60.7	56.9	60.7
125 Hz	55.5	52.7	57.6
250 Hz	53.8	50.0	56.2
500 Hz	50.7	47.2	51.1
1000 Hz	51.8	47.0	52.0
2000 Hz	43.4	40.1	45.5
4000 Hz	30.6	27.0	34.0
8000 Hz	19.1	15.2	23.0
16000 Hz	14.4	14.1	15.8
Pure Tone?	No	Yes	Yes

4.3.4 Reference Data and Candidate Mitigation Measures

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

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

- Fifty four (54) 2.5 ton unit rooftop condensing units for the residential units, two condensers for common area HVAC; and
- Parking garage ventilation exhausts will likely be located at two side vents on the Gold Street side of the building.

The equipment listed above was included in the noise impact analysis. The Project's traffic was not included in the noise analysis because motor vehicles are exempt under both the City of Boston and Massachusetts DEP noise regulations.

The sound generation profiles for the mechanical equipment noise sources operating concurrently under full-load conditions were used to determine the maximum possible resultant sound levels from the Project Site as a whole, to define a worst-case scenario. To be in compliance with City and DEP regulations, the resultant sound level must not exceed the allowable octave band limits in the City of Boston noise regulation and must be below the allowable incremental noise increase, relative to existing noise levels, as required in the DEP Noise Policy.

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

4.3.5 Calculated Future Sound Levels

Methodology

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

The Cadna-A computer program, a comprehensive 3-dimensional acoustical modeling software package was used to calculate Project generated sound propagation and attenuation.[4] The model is based on ISO 9613, an internationally recognized standard specifically developed to ensure the highly accurate calculation of environmental noise in an outdoor environment. ISO 9613 standard incorporates the propagation and attenuation of sound energy due to divergence with distance, surface and building reflections, air and ground absorption, and sound wave diffraction and shielding effects caused by barriers, buildings, and ground topography.

Receptors

The closest/worst-case sensitive (residential) location is to the east of the project area at 3 Gardner Place. This location was selected based on the proximity of the equipment (smaller distances correspond to larger noise impacts) and the amount of shielding by the project (residences further from the project will experience less shielding from the Project's rooftop mechanical equipment, which may result in larger potential noise impacts from the Project). This location is expected to receive the largest sound level impacts from the Project's rooftop mechanical equipment. It can be classified as a residential zone.

The sound level impacts from the building's mechanical equipment were predicted at the closest residential location, as well as additional residential uses to the north and northeast (99, 139 and 171 West Fourth Street), east (48 Gold Street and 50 B Street), and south (25 West Fifth Street). Figure 1 in **Appendix C** shows the locations of the modeled noise receptors. Noise impacts at

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

other nearby noise-sensitive locations (residences, parks, etc.) farther from the Project Site will be less than those predicted for these receptors.

4.3.6 Compliance with State and Local Noise Standards

The City of Boston and DEP noise standards apply to the operation of the mechanical equipment at the proposed Project. The details of the noise predictions are presented in **Tables 4.3-5** through **4.3-10**. The sound impact analysis includes the simultaneous operation of the Project's rooftop HVAC equipment. The predicted sound levels are worst-case predictions that represent all hours of the day, as the analysis assumes full operation of the mechanical equipment 24-hours a day. The typical sound level impacts from the mechanical equipment will likely be lower than what is presented here, since most of the mechanical equipment will operate at full-load only during certain times of the day and during the warmer months of the year, it is not likely that all of the mechanical equipment will operate at the same time. Sound level impacts at locations farther from the Project (e.g. other residences, etc.) will be lower than those presented in this report.

City of Boston Noise Standards

The noise impact analysis results, presented in **Tables 4.3-5** through **4.3-10**, reveal that the sound level impact at the upper floors of the closest residences will be between 35.7 and 42.7 dBA. The smallest sound level impact of 35.7 dBA is predicted to occur at 99 West Fourth St. The largest sound level impact of 42.7 dBA is predicted to occur at 171 West Fourth Street. Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. Note that sound levels from the Project will be below the residential nighttime limits at all times. The results also demonstrate compliance with the City of Boston, residential, non-daytime, octave band noise limits at both closest locations.

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

Massachusetts DEP Noise Regulations

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

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

largest possible increase in the sound level at each location during the quietest hour at the Project Site.

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

Table 4.3-5. Estimated Future Sound Level Impacts – Anytime, 25 West Fifth Street (Closest/Worst Case Residence) – Location R2

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	47
63 Hz	67	46
125 Hz	61	41
250 Hz	52	37
500 Hz	46	35
1000 Hz	40	30
2000 Hz	33	24
4000 Hz	28	15
8000 Hz	26	8
Broadband (dBA)	**50**	**36**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	54.7
20 West Fifth Street Project*	37.0
Calculated Combined Future Sound Level	52.4
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-6. Estimated Future Sound Level Impacts – Anytime, 50 B Street – Location R1

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	45
63 Hz	67	45
125 Hz	61	40
250 Hz	52	36
500 Hz	46	35
1000 Hz	40	32
2000 Hz	33	28
4000 Hz	28	21
8000 Hz	26	13
Broadband (dBA)	**50**	**37**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	54.7
20 West Fifth Street Project*	36.0
Calculated Combined Future Sound Level	52.8
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-7. Estimated Future Sound Level Impacts – Anytime, 99 West Fourth Street – Location R3

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	44
63 Hz	67	44
125 Hz	61	39
250 Hz	52	35
500 Hz	46	34
1000 Hz	40	31
2000 Hz	33	26
4000 Hz	28	19
8000 Hz	26	9
Broadband (dBA)	**50**	**36**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #1)	50.6
20 West Fifth Street Project*	42.7
Calculated Combined Future Sound Level	55.8
Calculated Incremental Increase	+0.2
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-8. Estimated Future Sound Level Impacts – Anytime, 139 West Fourth Street – Location R4

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	53
63 Hz	67	53
125 Hz	61	48
250 Hz	52	43
500 Hz	46	40
1000 Hz	40	38
2000 Hz	33	33
4000 Hz	28	27
8000 Hz	26	21
Broadband (dBA)	**50**	**43**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	55.6
20 West Fifth Street Project*	42.7
Calculated Combined Future Sound Level	55.8
Calculated Incremental Increase	+0.2
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-9. Estimated Future Sound Level Impacts – Anytime, 171 West Fourth Street– Location R5

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	48
63 Hz	67	48
125 Hz	61	43
250 Hz	52	37
500 Hz	46	35
1000 Hz	40	33
2000 Hz	33	28
4000 Hz	28	21
8000 Hz	26	11
Broadband (dBA)	**50**	**38**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	55.6
20 West Fifth Street Project*	37.6
Calculated Combined Future Sound Level	55.7
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-10. Estimated Future Sound Level Impacts – Anytime, 48 Gold Street– Location R6

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	49
63 Hz	67	49
125 Hz	61	44
250 Hz	52	38
500 Hz	46	36
1000 Hz	40	33
2000 Hz	33	28
4000 Hz	28	21
8000 Hz	26	11
Broadband (dBA)	**50**	**38**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90} (Location #3)	55.6
20 West Fifth Street Project*	38.3
Calculated Combined Future Sound Level	55.7
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

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

4.3.7 Conclusions

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

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

4.4 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The Project will not result in an increase in impervious area, and will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged.

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

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

4.5 Solid and Hazardous Waste Materials

4.5.1 Solid Waste

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

Upon completion of construction, the Project is estimated to generate approximately 76 tons of solid waste per year, based on the assumption that each of the 54 units will each generate approximately 1.4 tons per year. A significant portion of the waste will be recycled. The project will also include ambitious goals for construction waste management in order to meet the requirements for the LEED™ rating system. This strategy will divert demolition and construction waste by reusing and recycling materials.

In order to meet the requirements for the Boston Environmental Department and the LEED™ rating system, the Project will include space dedicated to the storage and collection of recyclables. The recycling program will meet or exceed the City's guidelines, and provide areas for waste paper and newspaper, metal, glass, and plastics.

4.5.2 Hazardous Waste and Materials

Boston Environmental Corporation (BEC) has performed a Phase I Environmental Site Assessment at the property. The Phase I ESA's intent is to investigate for evidence for any recognized environmental conditions (REC), historically recognized environmental conditions

(HREC) and/or controlled recognized environmental conditions (CREC) at the site. In BEC's opinion, this assessment has revealed no evidence of RECs, HRECs or CRECs in connection with this Site.

The construction of the proposed building foundations will require the removal of the site soils to a depth ranging up to about 6 to 8 feet below the sub-grade of the existing building. It is estimated that construction for the below grade will generate about 4,000 cy of excess natural soil to be disposed off-site.

It is anticipated that the fill and natural soil are to be Unregulated in accordance with the provisions of the Massachusetts Contingency Plan (310 CMR 40.000) However, the project proponent will retain a Licensed Site Professional 0). (LSP) to manage the environmental aspects of the project, including proper management and/or off-site disposal of contaminated soil and groundwater encountered during construction. If necessary, the LSP will also prepare the required Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) regulatory submittals.

Evidence of a release of oil or hazardous materials has not been detected at the site. Should evidence of a release be encountered during redevelopment, response actions will be performed in accordance with the provisions of the MCP.

4.6 Geotechnical/Groundwater Impacts Analysis

Based on the results of the explorations performed at the subject site by KMM Geotechnical Consultants, LLC, the ground surface across the site is generally underlain by a fill layer that ranges from about 7 to 10 feet below the existing ground surface. The fill layer is underlain by a natural sand deposit.

During our subsurface exploration program, groundwater was observed to be located at depths ranging from about 9 to 12 feet below the existing ground surface.

Based on the anticipated soil conditions described above, foundation support for the proposed building will consist of conventional spread footings. The lowest level floor slab will consist of a soil supported slab-on-grade. The footings will bear directly on the underlying natural sand deposit. Alternatively, final design may require Rammed Earth Piles, RAPs or temporary support by means of sheet or WF piles. Temporary earth support along the perimeter of the site is not anticipated to be required or foundation construction.

Excavation for construction of the building foundations is anticipated to extend to depths ranging from 7 to 10 feet below the ground surface. Therefore, based on the results of our subsurface exploration program which indicates groundwater to be present at depths ranging from about 9 to 12 feet below the existing ground surface, groundwater dewatering during excavation is considering to be minimal. Should groundwater be encountered during excavation of the building foundations, construction dewatering will consist of localized sumps in conjunction with on-site recharge of the groundwater. A groundwater recharge system, if required, will be installed as part the development of the site.

The construction of the proposed building foundations will require the removal of the site soils to a depth ranging up to about 6 to 8 feet below the sub-grade of the existing building. It is estimated that construction for the below grade will generate about 4,000 cy of excess natural soil to be disposed off-site.

Groundwater and Temporary Construction Dewatering Considerations

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

Based on the results of our subsurface exploration program which indicates groundwater is located, should groundwater be encountered during excavation of the building foundations, construction dewatering will consist of localized sumps in conjunction with on-site recharge of the groundwater.

4.7 Construction Impact

The following section describes impacts likely to result from the 20 West Fifth Street Project construction and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. The Proponent will employ a construction manager who will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

4.7.1 Construction Management Plan

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

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

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

4.7.2 Proposed Construction Program

Construction Activity Schedule

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

Perimeter Protection/Public Safety

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

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

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

4.7.3 Construction Traffic Impacts

Construction Vehicle Routes

Specific truck routes will be established with BTD through the CMP. These established truck routes will prohibit travel on any residential side streets. Construction contracts will include clauses restricting truck travel to BTD requirements. Maps showing approved truck routes will be provided to all suppliers, contractors, and subcontractors. It is anticipated that all deliveries will be via West Fifth Street direct to the site from Dorchester Avenue via B Street.

Construction Worker Parking

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

Limited parking in designated areas of the Project Site and lay-down area(s) will be allowed. Parking will be discouraged in the immediate neighborhood. Further, public transit use will be encouraged with the Proponent and construction manager working to ensure the construction

workers are informed of the public transportation options serving the area. Terms and conditions related to worker parking will be written into each subcontractor's contract. The contractor will provide a weekly orientation with all new personnel to ensure enforcement of this policy.

Pedestrian Traffic

The Site abuts sidewalks on two streets. Pedestrian traffic may be temporarily impacted in these areas. The Construction Manager will minimize the impact the construction of the proposed building will have and the adjacent sidewalks. The contractor will implement a plan that will clearly denote all traffic patterns. Safety measures such as jersey barriers, fencing, and signage will be used to direct pedestrian traffic around the construction site and to secure the work area.

4.7.4 Construction Environmental Impacts and Mitigation

Construction Air Quality

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

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

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

Construction Noise Impacts

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

- Initiating a proactive program for compliance to the City of Boston's noise limitation impact;
- Scheduling of work during regular working hours as much as possible;

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

4.7.5 Rodent Control

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

5.0 HISTORIC RESOURCES COMPONENT

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

5.1 Historic Resources on the Project Site and Property History

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

Based on the historical records researched by Boston Environmental Corporation for the Site's environmental analysis, the Site and surrounding area were first developed for residential and commercial uses sometime prior to 1888. In 1923, according to Sanborn Maps, nine free-standing residential buildings were depicted on the Site. A portion of the Site was occupied by a sheet metal company from at least 1935 to at least 1950. Storage uses occupied the site in the 1950's and 1960's. In 1964, according to Sanborn maps, rail lines were located adjacent to the easterly end of the Site. The site was improved with a 13,585 square foot 1-1/2 story slab on-grade building constructed in 1970. This building is currently occupied as warehouse and office space by Colmar Belting Company, a distributor of conveyor belts and parts (belts, pulleys, rollers, and motors) since 1970.

According to files at the Massachusetts Historical Commission, no on-site structures are listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth. It is not expected that the Project will cause adverse impacts on any historic or architectural elements of nearby historic resources outside the Project Site.

5.2 Historic Districts and Resources

While there are no buildings or districts within a quarter mile of the Project Site that are presently on the National Register of Historic Places, there is one site and district that has previously been recommended for National Register historic designation in the surrounding area, as discussed below:

Church of Saints Peter and Paul and Parochial Residence

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

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

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

It is not expected that the Project will cause adverse impacts on any historic or architectural elements of nearby historic resources outside the Project Site (see **Figure 5-1** for identifications of historic resources in the Project vicinity).

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

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

Key to Historic Resources in Figure 5-1	Historic Resource	Source of Listing
National Register Eligible Properties		
A	Saint Peter (Lithuanian) Roman Catholic Church	MHC Inventory
B	Saints Peter and Paul Roman Catholic Church	MHC Inventory
Properties Included the MA Inventory of Historical and Archaeological Assets		
1	York House - South Boston Hotel	MHC Inventory
2	Hausman, Harry and Joseph Building	MHC Inventory

3	Pike, Jacob - Abbott, Timothy Double House	MHC Inventory
4	Saints Peter and Paul Roman Catholic Rectory	MHC Inventory
5	Saint Peter Lithuanian Roman Catholic Church	MHC Inventory
6	Saints Peter and Paul Roman Catholic Church	MHC Inventory
7	Casey, Thomas Building	MHC Inventory
8	Hausman, Harry and Joseph Building	MHC Inventory

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

5.3 Archaeological Resources

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

Figure 5-1 Historic Resources

Project Site

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

Property on the Massachusetts Inventory of Historic and Archaelogical Assets

Historic Inventoried Areas (A,B)

6.0 INFRASTRUCTURE SYSTEMS COMPONENT

The existing infrastructure surrounding the site appears sufficient to service the needs of the Proposed Project. The following sections describe the existing sewer, water, and drainage systems surrounding the site and explain how these systems will service the development. The analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

A detailed infrastructure analysis will be performed when the Project proceeds into the Design Development Phase. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the new water, sanitary sewer, and storm drain connections. In addition, a Storm Water Pollution Prevention Plan will be submitted specifying best management measures for protecting the BWSC drainage systems during construction.

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

6.1 Sanitary Sewer System

6.1.1 Existing Sewer System

The sanitary sewer system in the vicinity of the Project site is owned, operated, and maintained by BWSC (see **Figure 6-1**). There is an existing 15-inch combined sewer located in West Fifth Street to the south of the Project site. There is also an existing 12-inch combined sewer located in Gold Street North of the Project site. These combined sewers eventually discharges to the 36-inch combined sewer drain northwest in Dorchester Avenue.

The total sewer flow from the existing building is estimated at 300 per day (gpd) based on the existing building uses and design sewer flows provided in 310 CMR 12.203: System Sewage Flow Design Criteria, as summarized in **Table 6-1**.

Table 6-1. Existing Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Warehouse		300 gpd min	300 gpd
Total			**300 gpd**

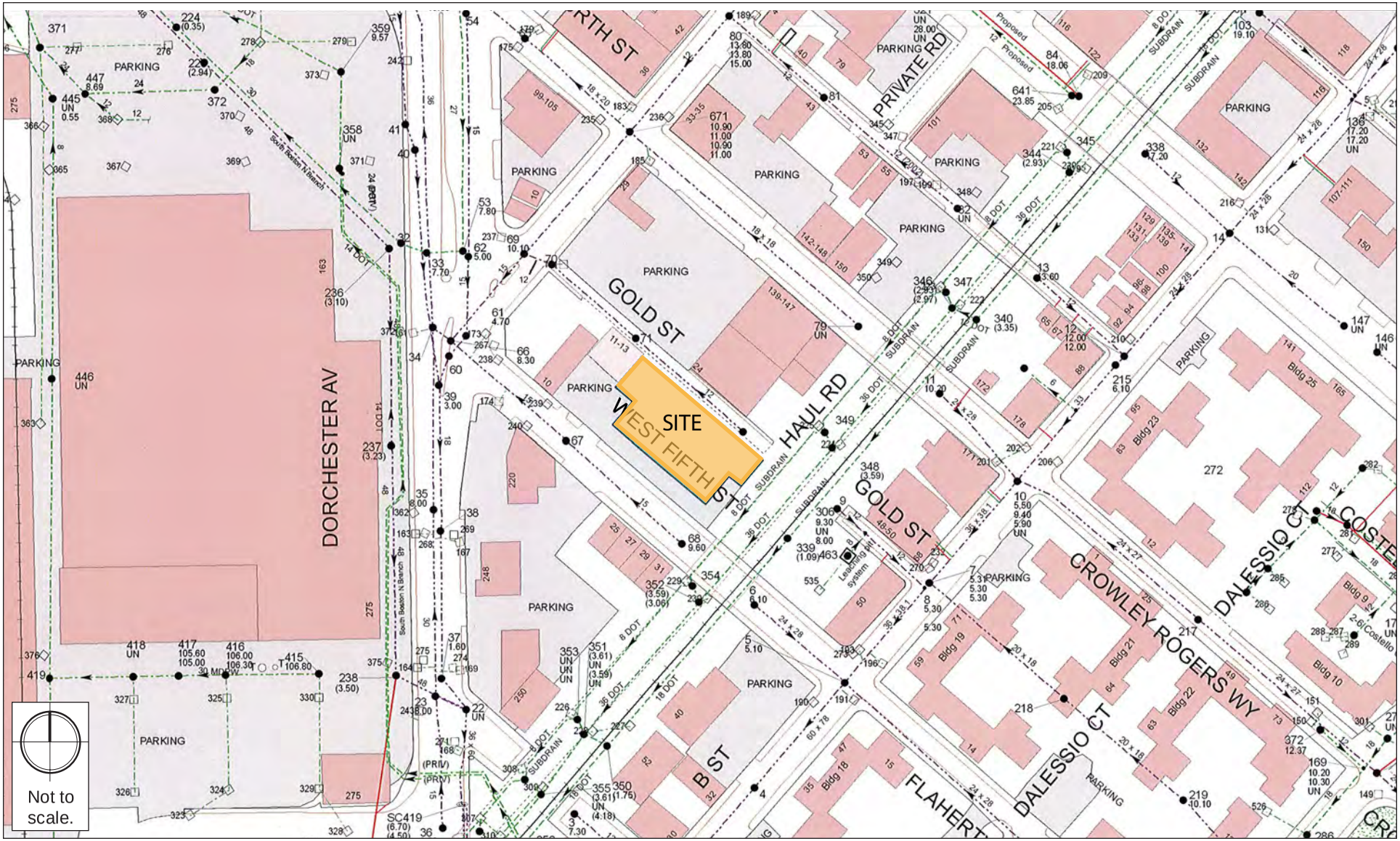


Figure 6-1.
BWSC Drainage, Sewer Map

6.1.2 Project-Generated Sewage Flow

The Project will generate an estimated 10,780 gallons per day (gpd) based on design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program as summarized in **Table 6-2**. This is a net increase of 10,480 gpd over the estimated flows from the existing buildings.

Table 6-2. Projected Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Residential Dwelling	98 bedrooms	110 gpd/bedroom	10,780 gpd
Total			**10,780 gpd**

6.1.3 Sanitary Sewage Connection

It is anticipated that the sanitary services for the Project will tie into the 15-inch sewer in West Fifth Street. It is expected that the building will have one 10-inch sanitary service. The proponent will submit a Site Plan to BWSC for review and approval. All existing building services will be cut and capped at the main if the wyes are not reused.

6.1.4 Sewer System Mitigation

To help conserve water and reduce the amount of wastewater generated by the Proposed Project, the Proponent will investigate the use of water-efficient toilets, aerated shower-heads, and low-flow lavatory faucets in compliance with all pertinent Code requirements to reduce water usage and sewer generation.

6.2 Water System

6.2.1 Existing Water Service

The water distribution system in the vicinity of the Project site is owned and maintained by BWSC (see **Figure 6-2**). There is a 12-inch DICL (1980) line located in West Fifth Street to the south of the Project site.

According to records, the existing building has a separate domestic and fire protection water services that connect to the 12-inch water main in West Fifth Street. The locations of the existing water services will be confirmed as the Project moves to the Design Development phase.

There are two fire hydrants located in the vicinity of the Project site. There is one hydrant on the north side of West Fifth Street located in the sidewalk adjacent to the property (H 144). The other

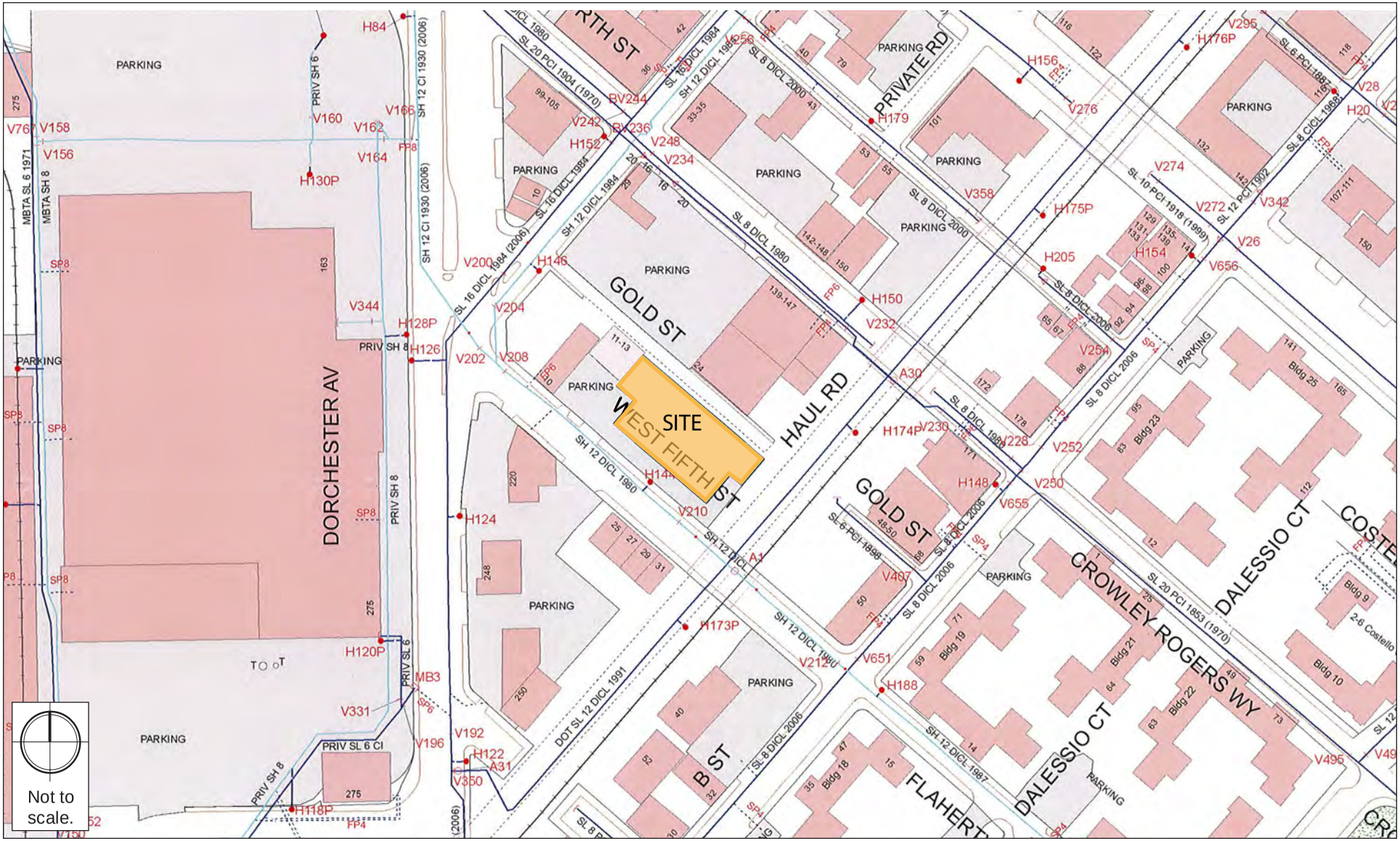


Figure 6-2.
BWSC Drainage, Water Map

hydrant is located at the intersection of A Street and Gold Street. It appears that these hydrants will provide sufficient coverage for the Project. The Proponent will confirm this with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

The BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the site will be requested by the Proponent. If hydrant flow data is not available for any hydrants located near the project site, as the design progresses, the Proponent will request hydrant flows be conducted by the BWSC adjacent to the site. Hydrant flow data must be less than a year old to be used as a design tool. The Proponent will confirm that the flow and pressure is sufficient for the redevelopment and coordinate any proposed changes with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

6.2.2 Anticipated Water Consumption

The maximum daily water demand is estimated to be 11,858 gpd based on the sewage flow estimate and an added factor for system losses including the average requirements for the Project's cooling system. More detailed water use and meter sizing calculations will be submitted to BWSC as part of the Site Plan approval process.

6.2.3 Proposed Water Service

It is anticipated that separate domestic water and fire protection services for the Project will be directly tapped from the 12-inch service main in West Fifth Street. The water supply systems servicing the building will be gated so as to minimize public hazard or inconvenience in the event of a water main break. Final locations and sizes of the services will be provided on a Site Plan during the detailed design phase and submitted to BWSC for review and approval.

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

6.3 Water Supply System Mitigation

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

6.4 Storm Drainage System

6.4.1 Existing Drainage Conditions

The storm drain system in the vicinity of the Project site is owned and maintained by BWSC (see **Figure 6-2**). There are catch basins that collect stormwater on West Fifth Street and Gold Street that connect with the streets combined sewers.

The two existing building occupy a large portion of the site. Rooftop runoff from the existing building is conveyed by building service pipes to the surrounding municipal storm drain system. Runoff from parking lot and paved surfaces around the property is generally captured in off-site catch basins. The stormwater runoff from the Project site eventually discharges to the 36-inch combined sewer drain northwest of the project site. There are no existing stormwater management systems that would attenuate peak flows and the Project site provides little opportunity for recharge. Very little water quality treatment is realized before these areas are drained to the municipal storm drain system.

6.4.2 Proposed Drainage Systems

The proposed building will occupy almost the entire Project site, however, there is an opportunity at the west side of the property to infiltrate stormwater. The overflow from the infiltration system will discharge to the 15-inch combined sewer in West Fifth Street.

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

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

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

6.5 Water Quality

The Proposed Project will improve the quality of stormwater leaving the site through the installation of an on-site infiltration system and therefore is not expected to have negative impacts on the water quality of the Boston Harbor. Erosion and sediment controls will be used during construction to protect adjacent properties and the municipal storm drain system. These controls will be inspected and maintained

throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable EPA and BWSC discharge permits. Once construction is complete, the Proposed Project will be in compliance with BWSC Site Plan requirements.

6.6 Electric Systems

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

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

6.7 Telephone and Cable Systems

Verizon, Comcast, and RCN provide telephone service in the Project area. It is anticipated that telephone service can be provide by any of the providers. Any upgrades will be coordinated with the provider. Telephone systems will be reviewed with the provider as the design progresses.

Comcast and RCN provide cable and internet service in the Project area. It is expected that Comcast and/or RCN can provide services to the Project site. Any upgrade required to the services will be coordinated with the services providers.

6.8 Steam and Gas Systems

National Grid owns and maintains a 6-inch gas main in West Fifth Street. The Project is expected to use natural gas for heating and domestic hot water. The actual size and location of the building services will be coordinated with National Grid during the detailed design phase. Veolia Energy does not own or maintain any steam infrastructure within the vicinity of the Project site.

6.9 Utility Protection During Construction

The Contractor will notify utility companies and call “Dig Safe” prior to excavation. During construction, infrastructure will be protected using sheeting and shoring, temporary relocations, and construction staging as required. The Construction Contractor will be required to coordinate all protection measures, temporary supports, and temporary shutdowns of all utilities with the appropriate utility owners and/or agencies. The Construction Contractor will also be required to provide adequate notification to the utility owner prior to any work commencing on their utility. Also, in the event a utility cannot be maintained in service during switch over to a temporary or permanent system, the Construction Contractor will be required to coordinate the shutdown with the utility owners and project abutters to minimize impacts and inconvenience.

7.0 TRANSPORTATION COMPONENT

7.1 Introduction

Howard Stein Hudson (HSH) has conducted an evaluation of the transportation impacts of the Project.. This transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and the BPDA's Article 80 development review process. The study includes an evaluation of existing conditions, future conditions with and without the Project, projected parking demand, transit services, and pedestrian and bicycle activity.

7.1.1 Project Description

The Project site is located to the east of Dorchester Avenue between Gold Street and West Fifth Street. The site is currently occupied by Colmar Belting Co. Inc. with two curb cuts on West Fifth Street.

The Project will include the construction of approximately 54 residential units, with approximately 41 parking spaces within the building. Vehicular access will be provided via a new curb cut along Gold Street.

7.1.2 Study Area

The transportation study area is generally bounded by West Fourth Street to the east, Dorchester Avenue to the west, A Street to the north, and West Fifth Street to the south. The study area includes the following four intersections:

- A Street/West Fourth Street (signalized);
- A Street/Gold Street (unsignalized);
- A Street/Dorchester Avenue (signalized); and
- Dorchester Avenue/West Fifth Street (unsignalized).

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

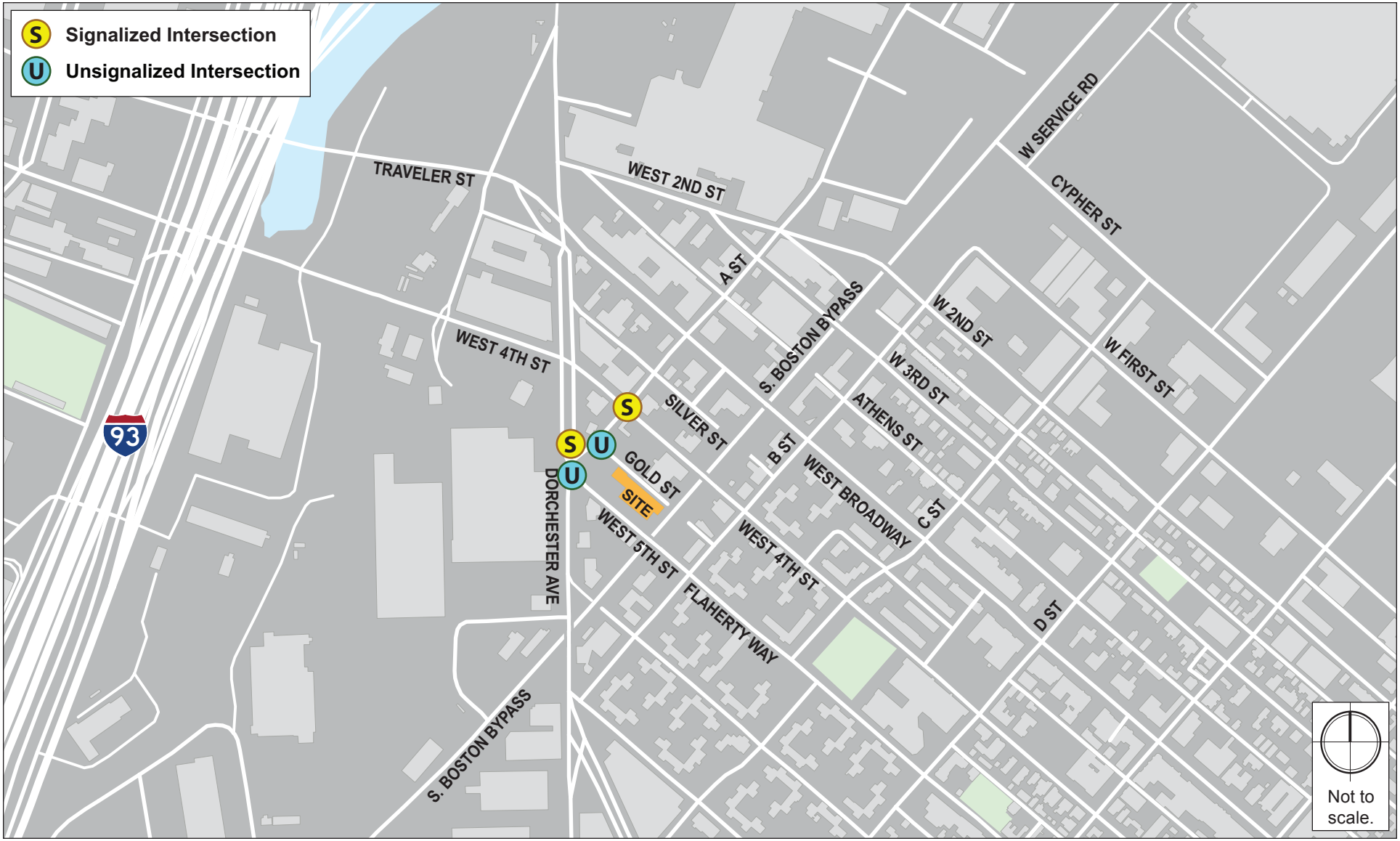


Figure 7-1.
Study Area Intersections

7.1.3 Study Methodology

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

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

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

The Build (2024) Condition includes a net increase in traffic volume due to the addition of Project-generated trip estimates to the traffic volumes developed as part of the No-Build (2024) Condition. Expected roadway, parking, transit, pedestrian, and bicycle accommodations, as well as loading capabilities and deficiencies are identified.

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

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

7.2 Existing (2017) Condition

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

7.2.1 Existing Roadway Conditions

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

A Street is a two-way, two lane roadway located adjacent to the west of the Project site. A Street is classified as an urban minor arterial under BTD jurisdiction and runs in a predominately north-south direction between Congress Street in Seaport to the north and Dorchester Avenue to the

south. In the vicinity of the site on-street parking is not provided on either side of the roadway. Sidewalks are provided on both sides of A Street.

West Fourth Street is a two-way, two lane roadway located to the north of the Project site. West Fourth Street is classified as an urban minor arterial under BTD jurisdiction in the vicinity of the Project site and runs in a predominately northwest to southeast direction between I-93 Frontage Road to the northwest and Dorchester Street to the southeast. In the vicinity of the site on-street parking and sidewalks are provided on both sides of West Fourth Street.

Gold Street is currently a one-lane roadway located adjacent to the north of the Project site. Gold Street is classified as a local roadway under BTD jurisdiction and runs in a predominately east-west direction between Boston Bypass Road to the east and A Street to the west. There is no on-street parking permitted on Gold Street. Sidewalks are provided on both sides of Gold Street.

Dorchester Avenue is a two-way, two lane roadway located to the west of the Project site. Dorchester Avenue is classified as an urban principal arterial under BTD jurisdiction and runs in a predominately north to south direction between Summer Street to the north and Adams Street/Washington Street to the south. In the vicinity there of the Project site there is limited on-street parking on the east side of Dorchester Avenue and there are sidewalks on both sides of the roadway.

West Fifth Street is a two-way, two lane roadway located to the south of the Project site. West Fifth Street is classified as a local roadway under BTD jurisdiction and runs in a predominately northwest to southeast direction between Dorchester Avenue to the northwest and Dorchester Street to the southeast. In the vicinity of the Project site there is on-street parking and sidewalks on both sides of the roadway.

7.2.2 Existing Intersection Conditions

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

A Street/West Fourth Street is a four-legged, signalized intersection with four approaches located to the north of the Project site. The West Fourth Street eastbound and westbound approaches both consist of a shared left-turn/through/right-turn lane. The A Street northbound and southbound approaches both consist of a shared left-turn/through/right-turn lane with designated bicycle lanes. On-street parking is not provided at any of the approaches to the intersection. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across all approaches to the intersection.

A Street/Gold Street is a three legged, unsignalized intersection with three approaches located to the northwest of the Project site. The Gold Street westbound approach consists of a shared left-

turn/right-turn lane. The A Street northbound approach consists of a shared through/right-turn lane and a designated bicycle lane. The A Street southbound approach consists of a shared left-turn/through lane and a designated bicycle lane. On-street parking is not provided at of the approaches to the intersection. The only crosswalk at the intersection is across Gold Street.

A Street/Dorchester Avenue is a three legged, signalized intersection with three approaches, located to the west of the Project site. The A Street westbound approach consists of a shared left-turn/right-turn lane with a bicycle lane. The Dorchester Avenue northbound approach consists of two through lanes and a right turn lane with bicycle sharrows. The Dorchester Avenue southbound approach consists of two through lanes and a designated bicycle lane. On-street parking is not provided at any of the approaches to the intersection. Crosswalks, wheelchair ramps, and pedestrian signal equipment are provided across the westbound and southbound approaches to the intersection.

Dorchester Avenue/West Fifth Street is a three legged, unsignalized intersection with three approaches, located to the west of the Project site. The West Fifth Street westbound approach consists of a right-turn lane only. The Dorchester Avenue northbound approach consists of a through lane and a shared through/right-turn lane with bicycle sharrows. The Dorchester Avenue southbound approach consists of two through lanes and a bicycle lane. On-street parking, crosswalks and wheelchair ramps are only provided across the westbound approach to the intersection.

7.2.3 Existing Parking and Curb Use

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

7.2.4 Car Sharing Services

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

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

Figure 7-2.
On-Street Parking Regulations

Figure 7-3.
Vehicle Sharing Locations

Existing Traffic Data

Traffic volume data was collected in the study area intersections on April 11th, 2017. Turning Movement Counts (TMCs) were conducted during the weekday a.m. and weekday p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively) at the study area intersections.

Turning Movement Counts

Turning Movement Counts (TMCs) were conducted during the weekday a.m. and p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively). The counts were conducted on April 11th, 2017 at all of the study area intersections. The TMCs included traffic classification including car, heavy vehicle, pedestrian, and bicycle movements. The detailed traffic counts are provided in **Appendix D.**

Seasonal Adjustment

In order to account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT were reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the April 2017 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6) during the month of April is 0.92. This indicates that average month traffic volumes are approximately eight percent less than the traffic volumes that were collected. The traffic counts were not adjusted downward to reflect average month conditions in order to provide a conservatively high analysis consistent with the peak season traffic volumes. The MassDOT 2011 Weekday Seasonal Factors table is provided in **Appendix D**.

7.2.5 Existing (2017) Traffic Volumes

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

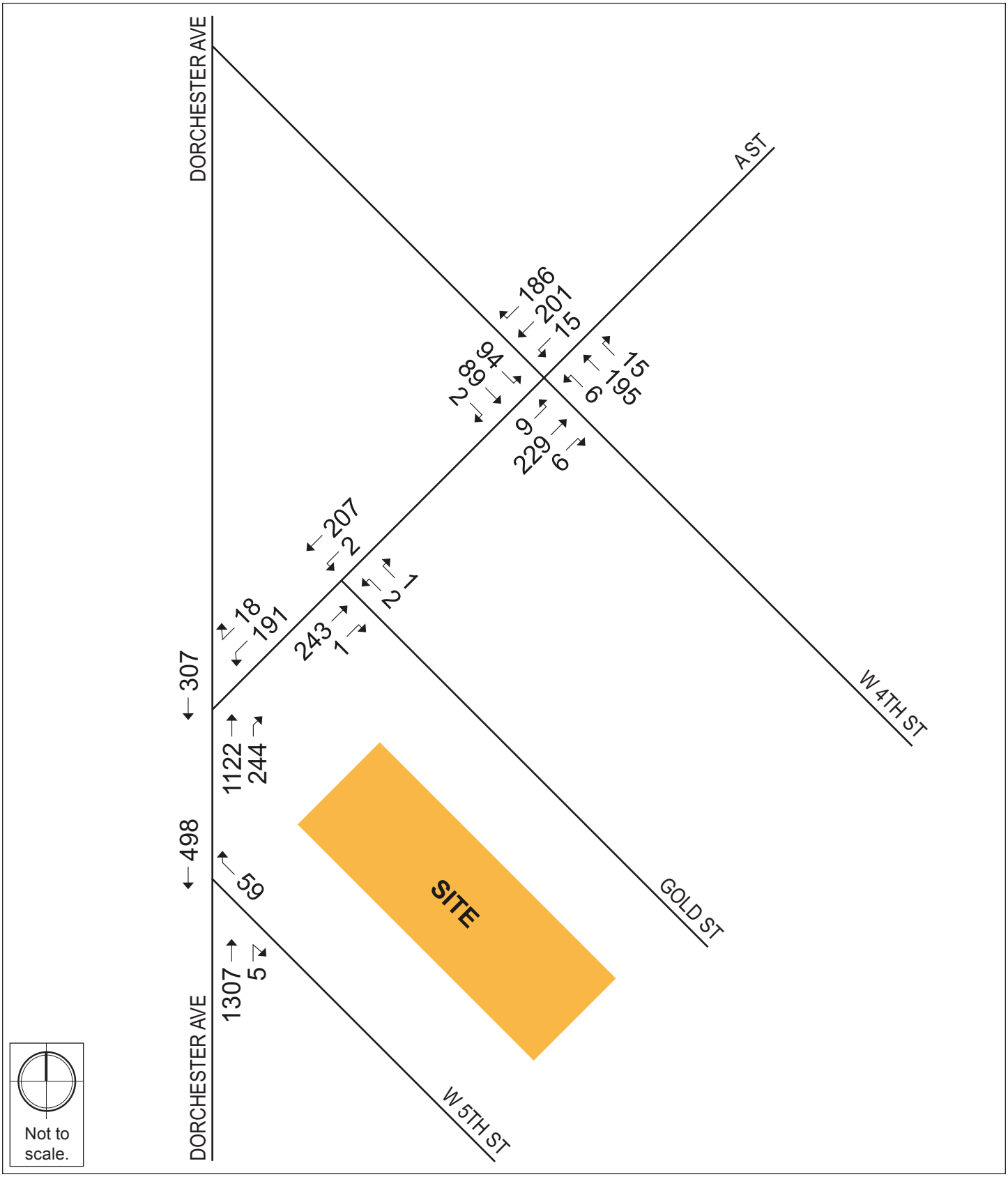


Figure 7-4.
Existing (2017) Condition Traffic Volumes, Weekday a.m. Peak Hour

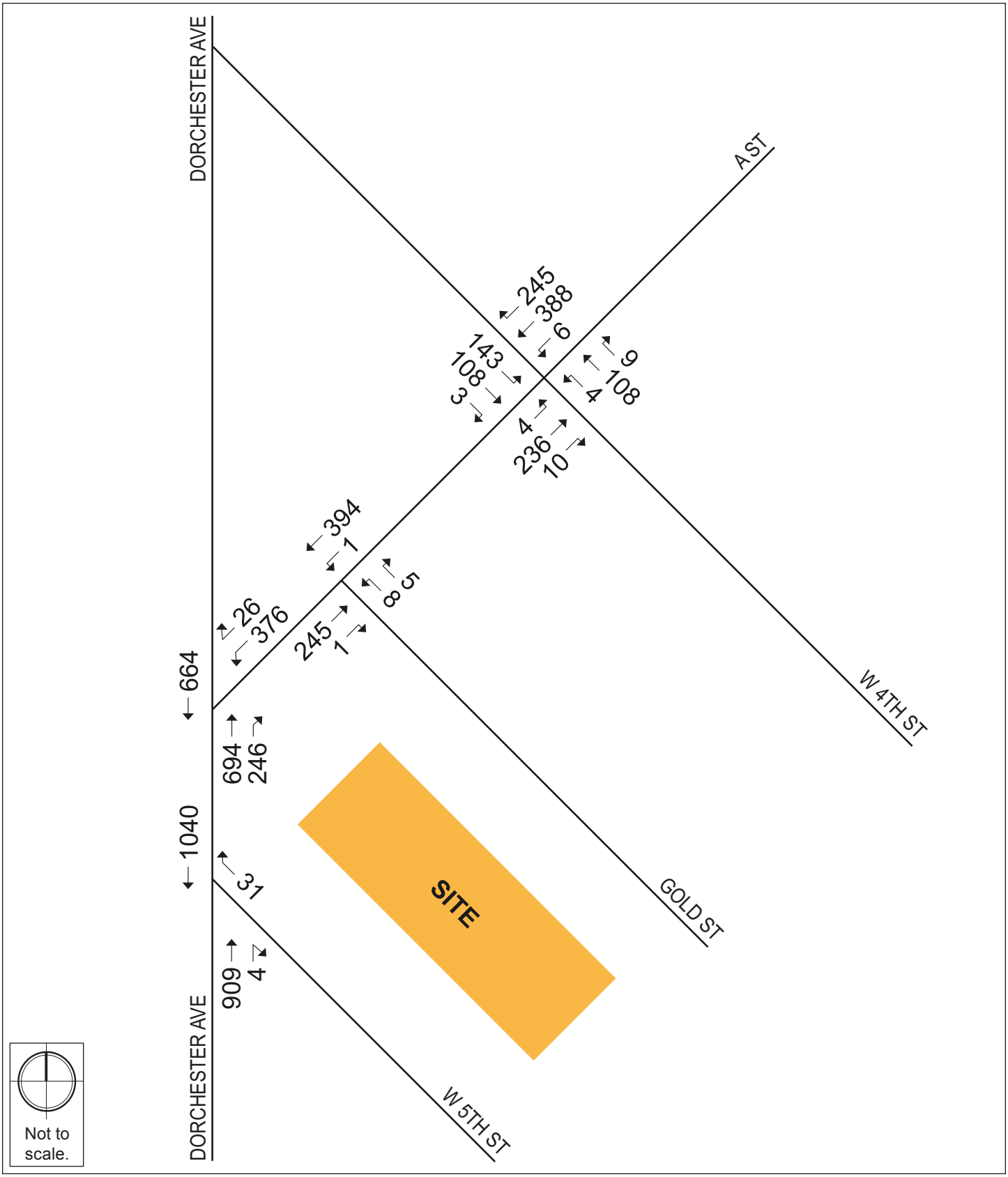


Figure 7-5.
Existing (2017) Condition Traffic Volumes, Weekday p.m. Peak Hour

7.2.6 Existing Pedestrian Conditions

In general, the sidewalks that are provided along the roadways are in good condition. All of the study area roadways have sidewalks on both sides. There are crosswalks and wheelchair ramps provided at all of the study area intersections. Pedestrian signal equipment is provided at both of the signalized study area intersections.

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

7.2.7 Existing Bicycle Conditions

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

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

Bicycle Sharing Services

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

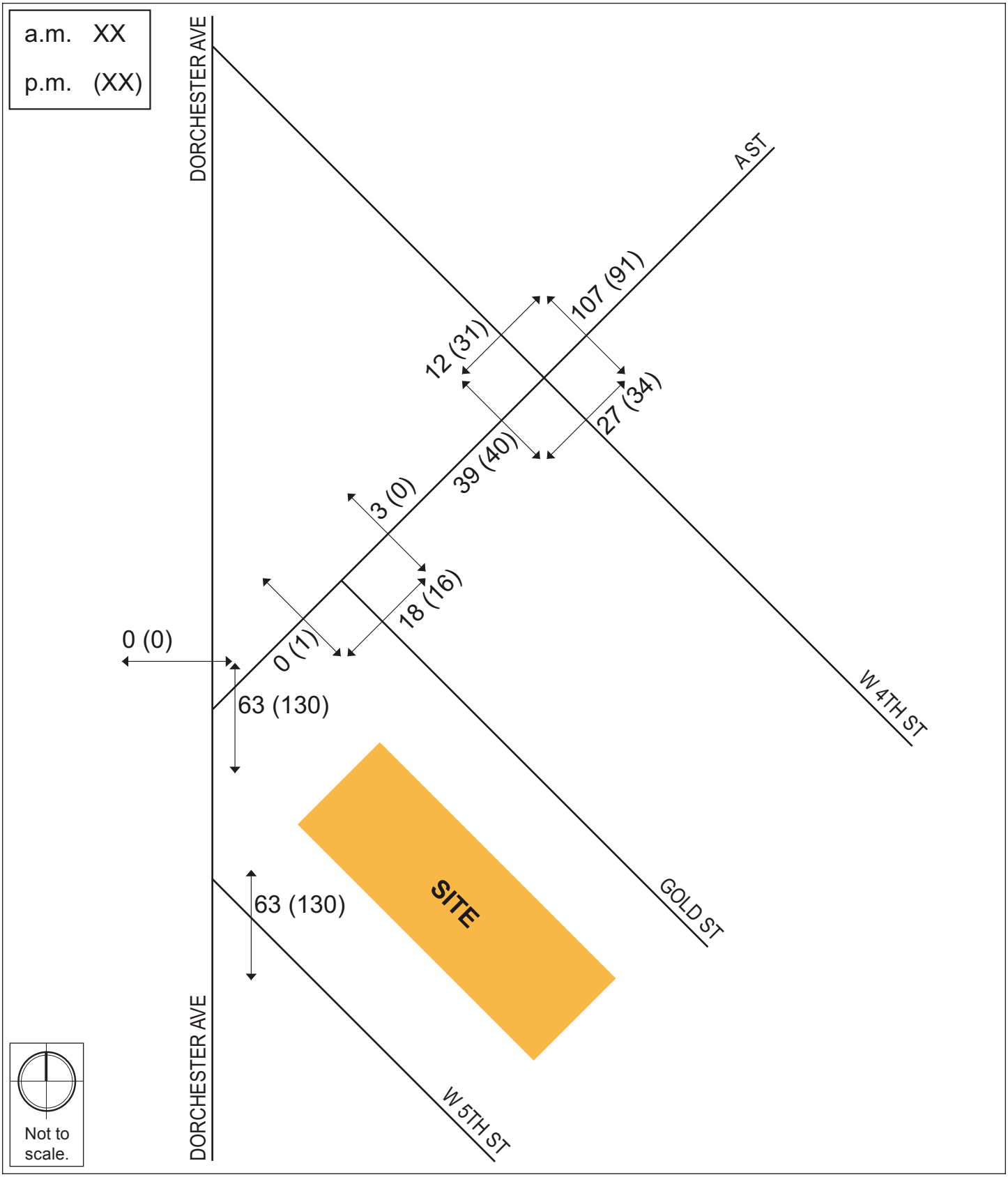


Figure 7-6.
Existing (2017) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hour

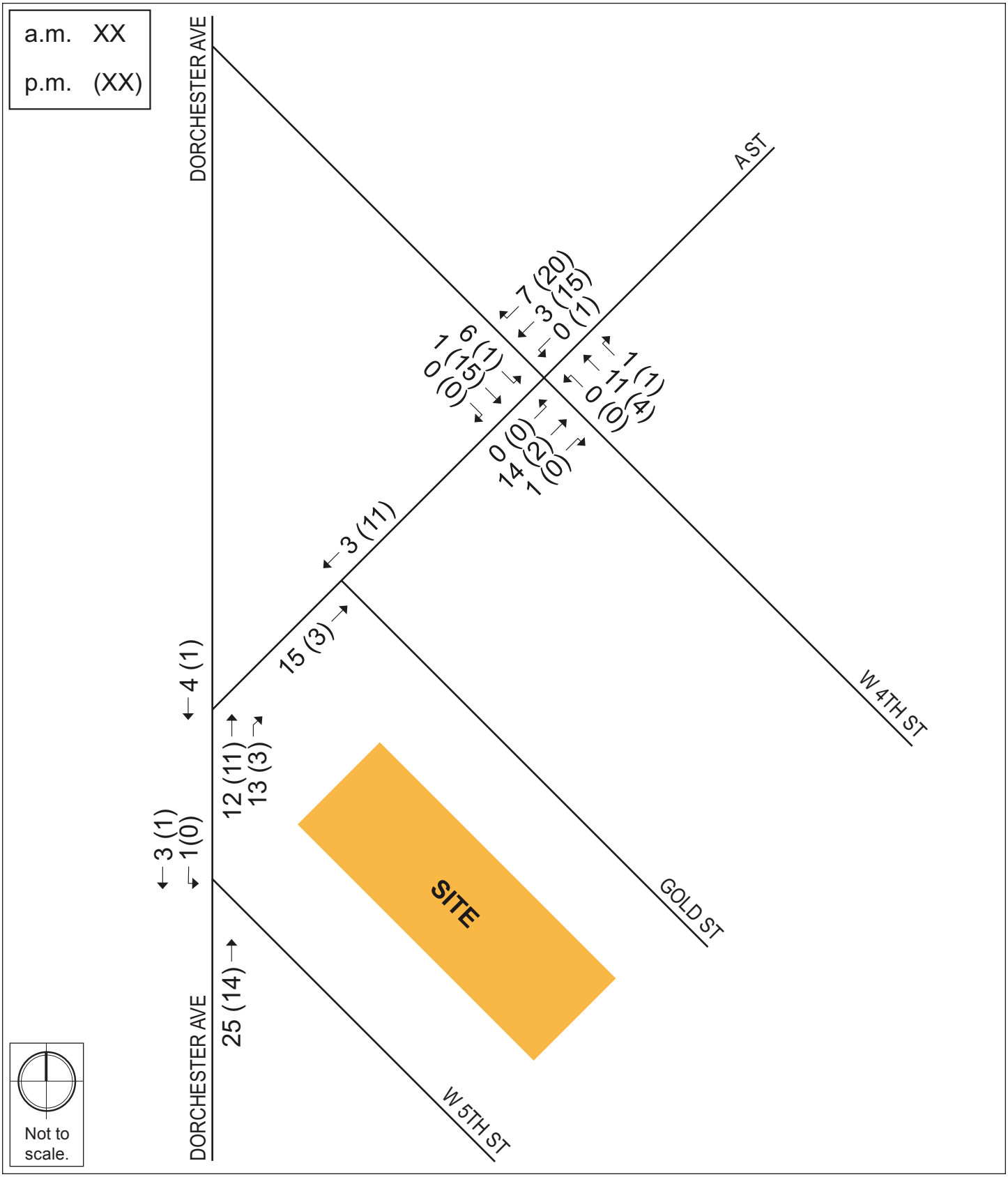


Figure 7-7.
Existing (2017) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hour

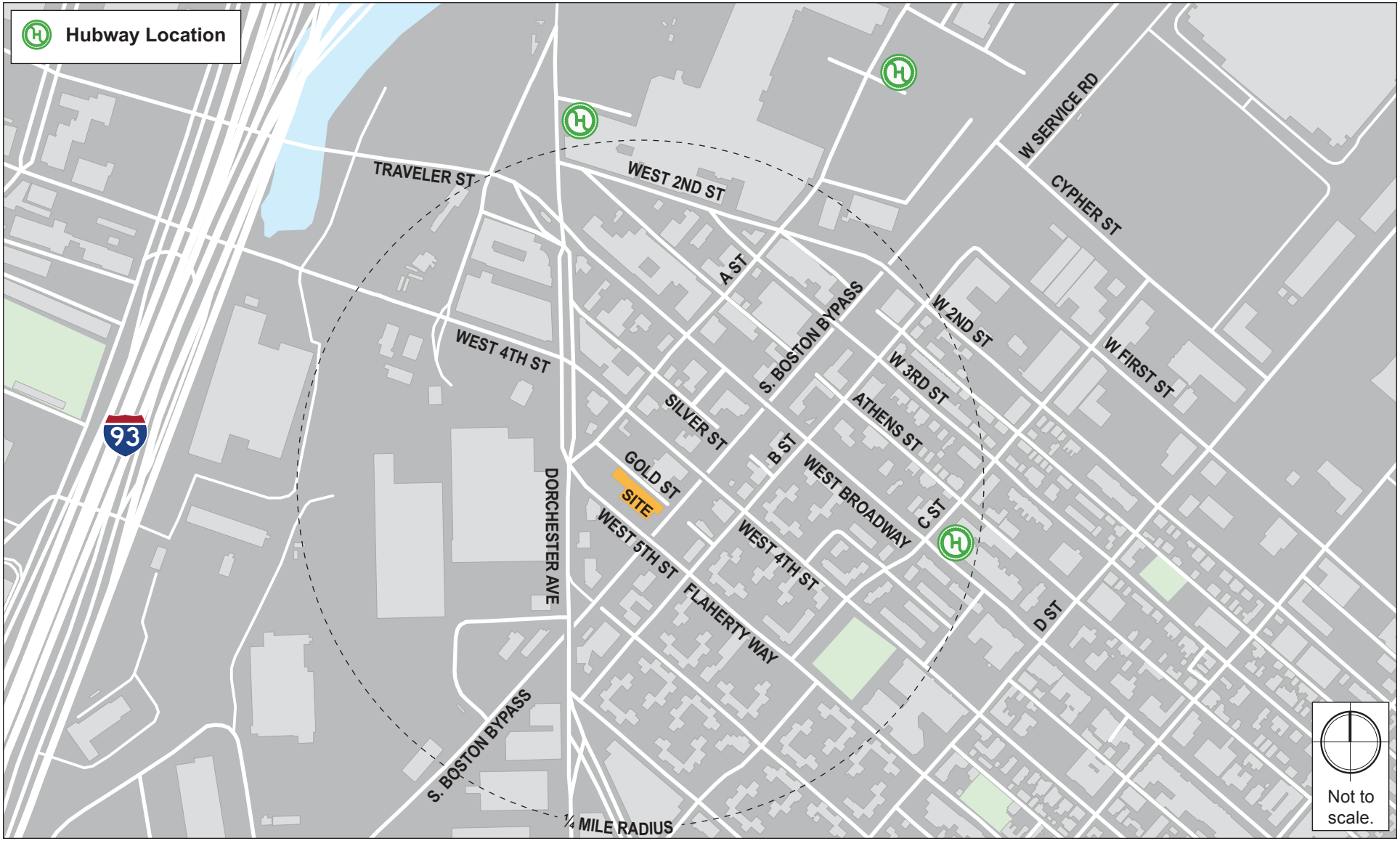


Figure 7-8.
Bicycle Sharing Locations

7.2.8 Existing Public Transportation

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

MBTA Red Line Broadway Station

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

MBTA Bus Routes

There are three bus line that stop in close proximity of the Project site. The MBTA 9 and 11 Routes travel adjacent to the site, and the 47 Route stops at the Broadway Station which is less than a quarter-mile away from the Project site.

Table 7-1. Existing Public Transportation

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

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

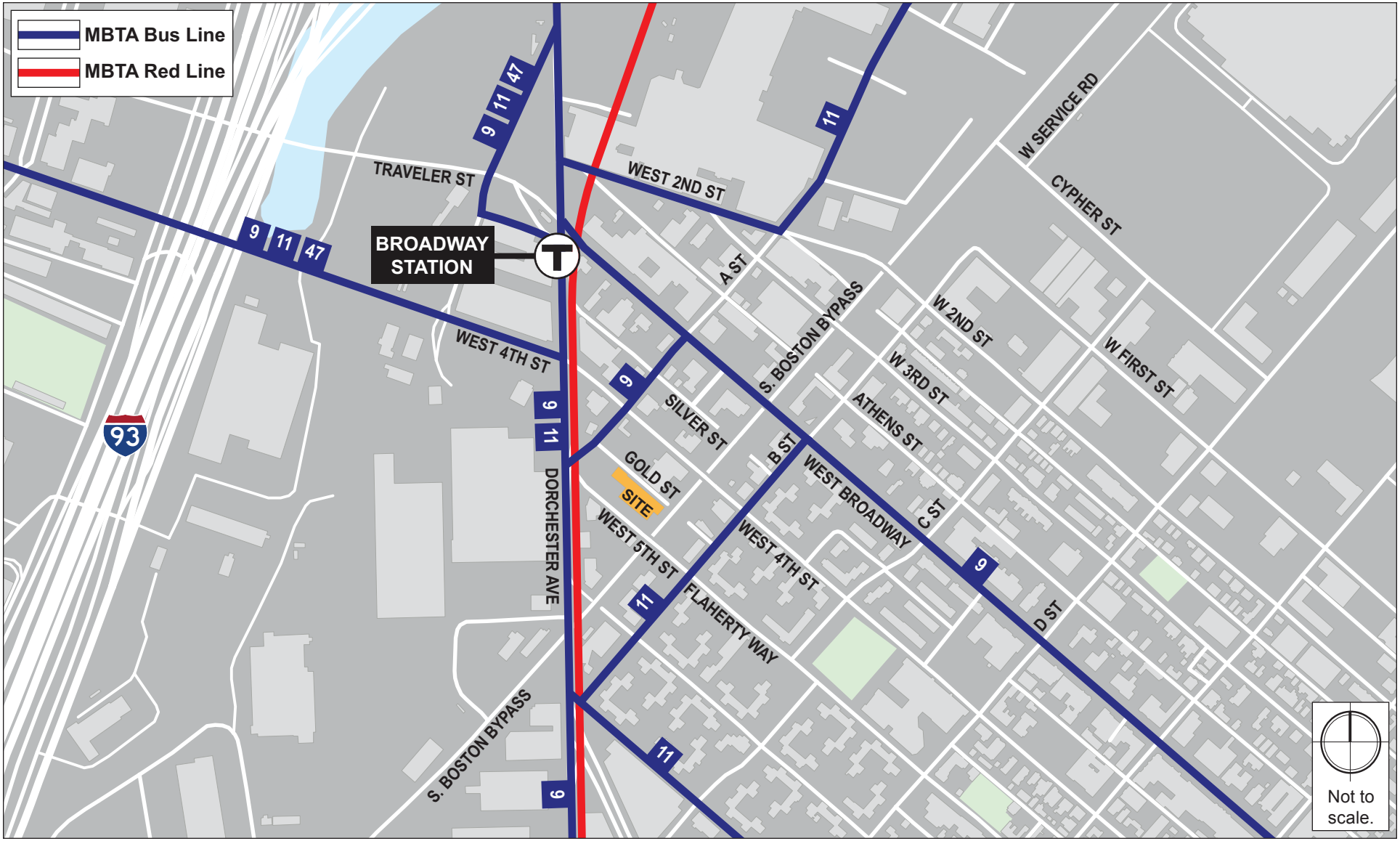


Figure 7-9.
Existing Public Transportation

7.2.9 Traffic Operations Analysis

Trafficware's Synchro (version 9) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 7-2** displays the intersection LOS criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition, with significant traffic delay. LOS D or better is typically considered acceptable in an urban area. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

Table 7-2. Vehicle Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

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

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

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

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

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

7.2.10 Existing (2017) Condition Traffic Operations Analysis

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

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
A Street / West Fourth Street	**C**	**25.7**	**-**	**-**	**-**
W Fourth St EB left/thru/right	C	30.2	0.46	93	163
W Fourth St WB left/thru/right	C	26.3	0.40	113	174
A St NB left/thru/right	C	25.7	0.38	106	170
A St SB left/thru/right	C	23.4	0.61	165	265
A Street / Dorchester Avenue	**C**	**28.6**	**-**	**-**	**-**
A St WB left/right	E	75.4	0.87	136	#263
Dorchester Ave NB thru | thru	C	25.3	0.67	326	411
Dorchester Ave NB right	A	1.5	0.22	0	27
Dorchester Ave SB thru | thru	C	29.0	0.19	100	145
Unsignalized Intersections					
A Street / Gold Street	**-**	**-**	**-**	**-**	**-**
Gold St WB left/right	B	11.2	0.01	-	1
A St NB thru/right	A	0.0	0.16	-	0
A St SB left/thru	A	0.1	0.00	-	0
Dorchester Avenue / West 5th Street	-	-	-	-	-
W 5th St WB right	C	18.4	0.21	-	20
Dorchester Ave NB thru | thru/right	A	0.0	0.52	-	0
Dorchester Ave SB thru | thru	A	0.0	0.15	-	0

~ Volume exceeds capacity, queue is theoretically infinite

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

m Volume for 95th percentile queue is metered by upstream signal

Grey shading indicates LOS E or F.

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
A Street / West Fourth Street	**D**	**40.1**	**-**	**-**	**-**
W Fourth St EB left/thru/right	C	32.8	0.54	128	212
W Fourth St WB left/thru/right	C	23.3	0.20	54	99
A St NB left/thru/right	C	25.5	0.37	107	171
A St SB left/thru/right	D	52.0	0.96	352	#587
A Street / Dorchester Avenue	**D**	**40.2**	**-**	**-**	**-**
A St WB left/right	F	>80.0	0.88	259	358
Dorchester Ave NB thru | thru	C	34.1	0.58	217	#337
Dorchester Ave NB right	A	1.4	0.21	0	27
Dorchester Ave SB thru | thru	B	18.2	0.56	209	#322
Unsignalized Intersections					
A Street / Gold Street	**-**	**-**	**-**	**-**	**-**
Gold St WB left/right	B	11.8	0.04	-	3
A St NB thru/right	A	0.0	0.15	-	0
A St SB left/thru	A	0.0	0.00	-	0
Dorchester Avenue / West 5th Street	-	-	-	-	-
W 5th St WB right	C	15.1	0.10	-	8
Dorchester Ave NB thru | thru/right	A	0.0	0.36	-	0
Dorchester Ave SB thru | thru	A	0.0	0.32	-	0

~ Volume exceeds capacity, queue is theoretically infinite

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

m Volume for 95th percentile queue is metered by upstream signal

Grey shading indicates LOS E or F.

The signalized intersection of A Street / Dorchester Avenue operates at LOS C during the weekday a.m. peak hour and LOS D during the weekday p.m. peak hour under the Existing Condition. The A Street westbound approach operates at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour. The longest queues at the intersection occur at the Dorchester Avenue northbound approach during the a.m. and p.m. peak hours.

All of the approaches for the unsignalized intersections in the study area operate at LOS C or better during both the weekday a.m. and p.m. peak hours under the Existing Condition.

7.3 No-Build (2024) Condition

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

7.3.1 Background Traffic Growth

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

7.3.2 Specific Development Traffic Growth

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

270 Dorchester Avenue: This project calls for the construction of a new 6-story building consisting of 116 residential units and approximately 6,520 sf of commercial space and a two level underground parking garage with 120 spaces. This project is currently under review by the BPDA.

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

Washington Village: This project calls for the construction of eight new buildings consisting of approximately 894,600 sf of space. The total development will include approximately 98,600 sf of retail space, 656 residential units, and 560 parking spaces. This project has been approved by the BPDA.

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

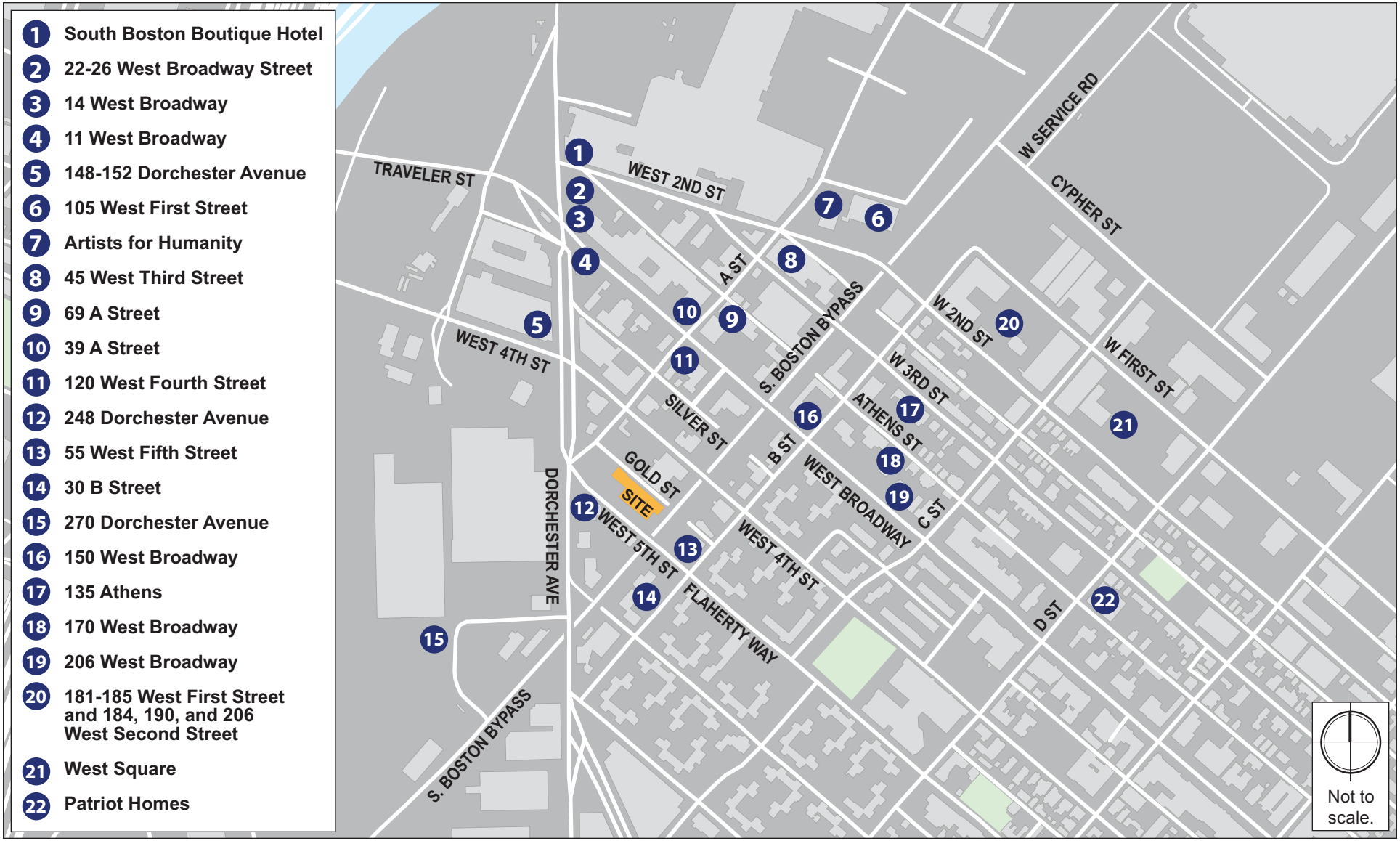


Figure 7-10.
Area Develoment Projects

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

105 West 1st Street: This project involves the construction of an eight story, approximately 266,000 square foot office building containing office/research and development space as well as ground floor retail, café, or retail space. The project will also include 35 parking spaces in an underground parking garage. This project is currently under review by the BPDA.

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

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

Project	Program Description	Status
148-152 Dorchester Avenue, Allele Building Phase II	Project consists of 30 condo units with underground parking	Under Construction
Artists for Humanity	Expansion of existing EpiCenter by adding 57,000 sf of studios, event and retail space	Board Approved
69 A Street	51,700 net square feet of commercial office space and 12,000 net square feet of ground level retail	Board Approved
39 A Street	Demolition of existing structure and the construction of 23 condominium units with 30 parking spaces	Board Approved
120 West 4th Street	Demolition of the existing building and the construction of 9 residential units and parking	Board Approved
248 Dorchester Avenue	A six-story building that includes 4,400 sf of retail and 33 residential units.	Board Approved
55 West 5th Street	Construction of 36 residential units and 2,045 sf of commercial space	Board Approved
30 B Street	Construction of a building containing 32 condominium units and 28 parking spaces	Under Construction
150 West Broadway	Construction of 24 condominiums and a commercial retail space	Under Construction
181-185 West 1st Street and 184,190-206 West 2nd Street	Construction of a multi-family residential development with 104 units and 4,000 sf retail with 115 parking spaces.	Board Approved
135 Athens	Project includes a 15 unit residential condominium and an enclosed at-grade parking garage accommodating a total of 20 cars	Under Construction
170 West Broadway	Project includes 33 condominiums, 39 parking spaces and 4,283sf of retail/restaurant space	Under Construction
206 West Broadway	Construction of 1,000 sf of commercial space and 16 residential rental units	Board Approved
Patriot Homes	Construction of 24 units of affordable housing	Under

7.3.3 Proposed Infrastructure Improvements

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

7.3.4 No-Build (2024) Condition Traffic Volumes

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

7.3.5 No-Build (2024) Condition Traffic Operations Analysis

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

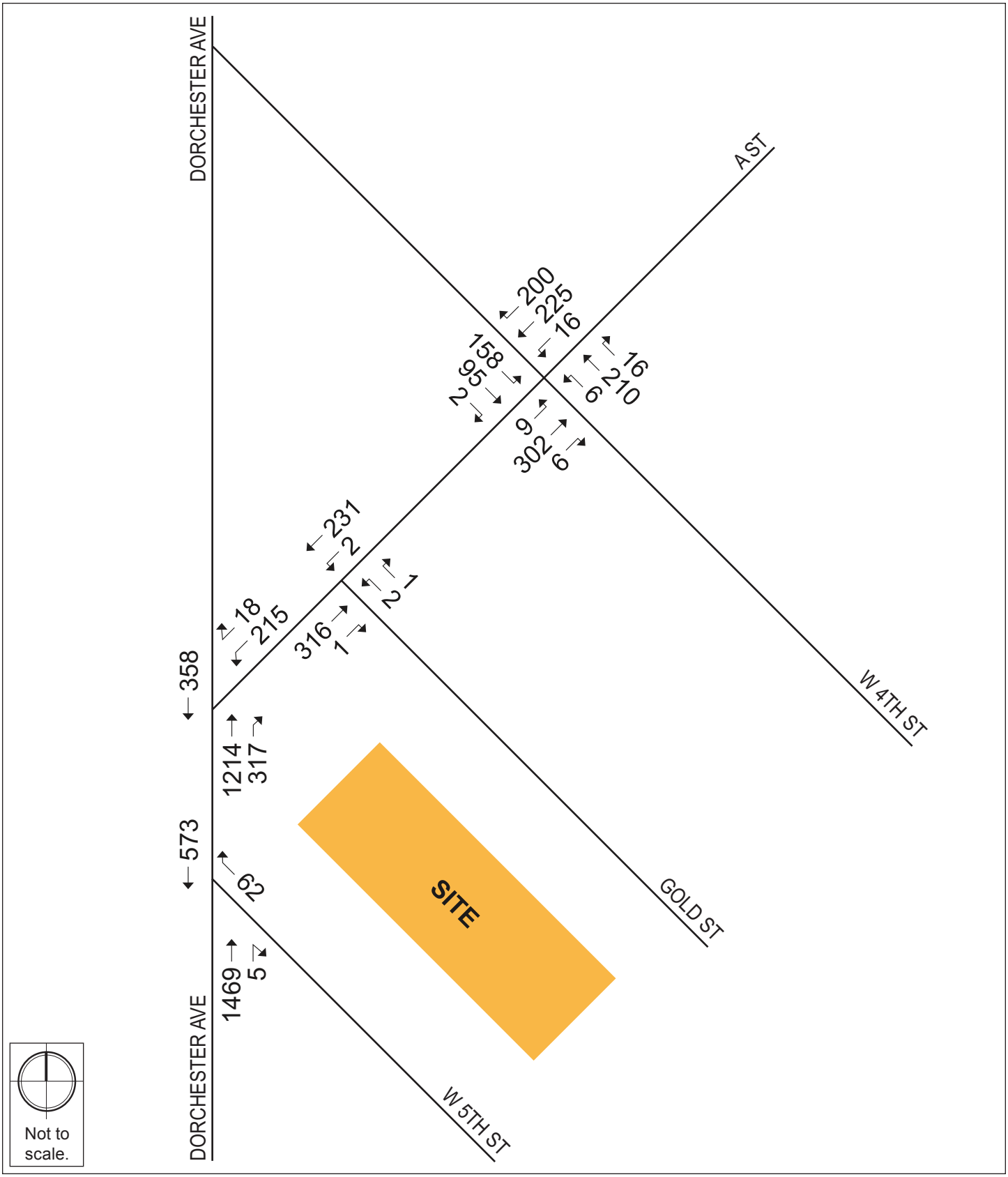


Figure 7-11.
No Build (2024) Condition Traffic Volumes, Weekday a.m. Peak Hour

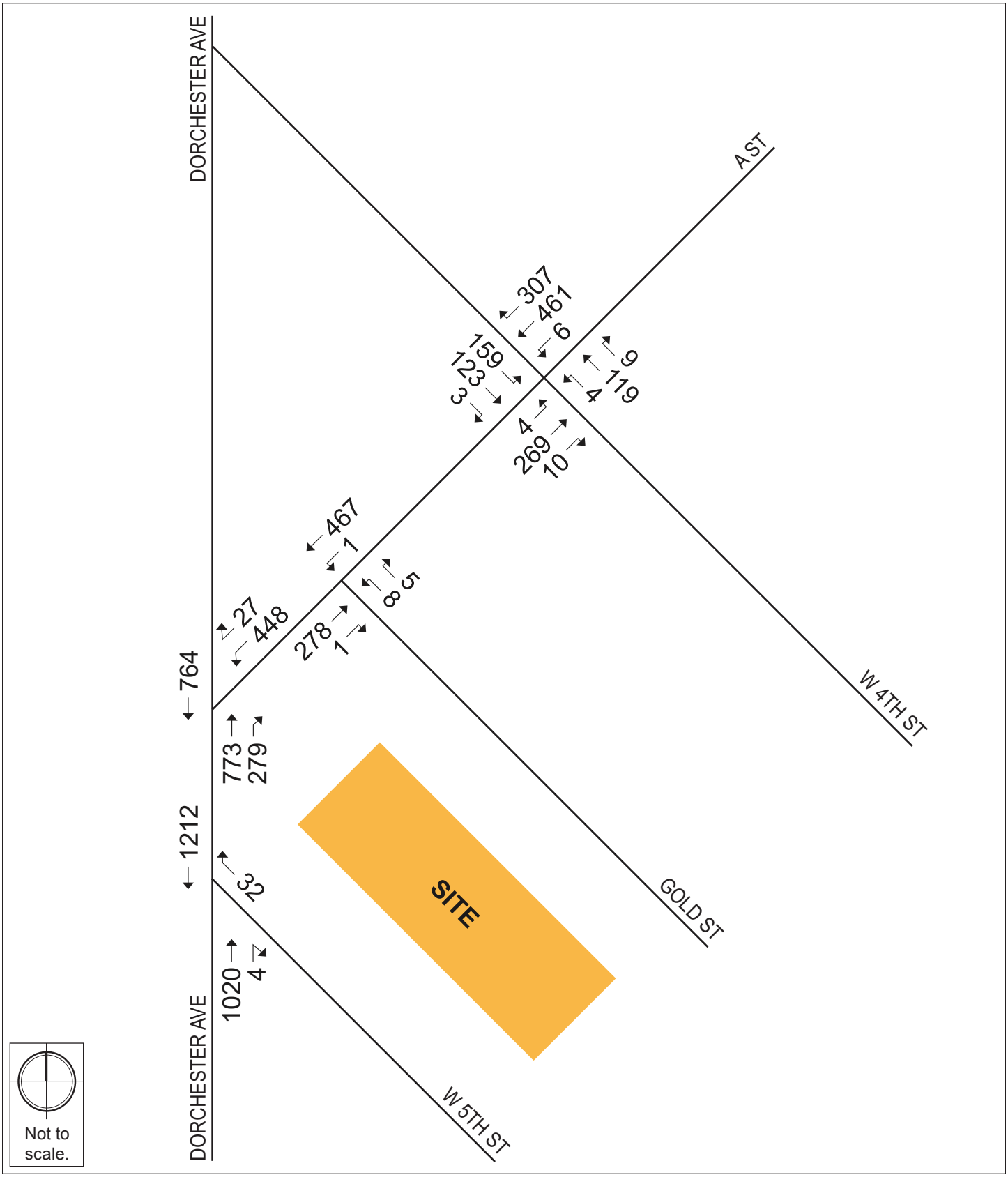


Figure 7-12.
No Build (2024) Condition Traffic Volumes, Weekday p.m. Peak Hour

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
A Street / West Fourth Street	**C**	**32.8**	**-**	**-**	**-**
W Fourth St EB left/thru/right	D	46.4	0.75	146	#289
W Fourth St WB left/thru/right	C	26.9	0.43	123	187
A St NB left/thru/right	D	36.6	0.50	145	226
A St SB left/thru/right	C	25.6	0.67	191	302
A Street / Dorchester Avenue	**C**	**30.7**	**-**	**-**	**-**
A St WB left/right	F	>80.0	0.94	154	#303
Dorchester Ave NB thru | thru	C	27.4	0.73	367	461
Dorchester Ave NB right	A	1.5	0.28	0	30
Dorchester Ave SB thru | thru	C	28.9	0.22	115	166
Unsignalized Intersections					
A Street / Gold Street	**-**	**-**	**-**	**-**	**-**
Gold St WB left/right	B	12.1	0.02	-	1
A St NB thru/right	A	0.0	0.20	-	0
A St SB left/thru	A	0.1	0.00	-	0
Dorchester Avenue / West Fifth Street	-	-	-	-	-
W 5th St WB right	C	21.1	0.25	-	25
Dorchester Ave NB thru | thru/right	A	0.0	0.59	-	0
Dorchester Ave SB thru | thru	A	0.0	0.17	-	0

~ Volume exceeds capacity, queue is theoretically infinite

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

m Volume for 95th percentile queue is metered by upstream signal

Grey shading indicates a decrease to LOS E or F from the Existing (2017) Condition.

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
A Street / West Fourth Street	**E**	**74.3**	**-**	**-**	**-**
W Fourth St EB left/thru/right	D	36.6	0.61	148	#245
W Fourth St WB left/thru/right	C	23.7	0.22	59	107
A St NB left/thru/right	C	22.2	0.42	124	195
A St SB left/thru/right	F	>80.0	>1.00	~546	#773
A Street / Dorchester Avenue	**D**	**44.9**	**-**	**-**	**-**
A St WB left/right	F	>80.0	0.93	303	#491
Dorchester Ave NB thru | thru	D	39.7	0.72	~267	#397
Dorchester Ave NB right	A	1.4	0.24	0	28
Dorchester Ave SB thru | thru	C	23.9	0.72	~267	#401
Unsignalized Intersections					
A Street / Gold Street	**-**	**-**	**-**	**-**	**-**
Gold St WB left/right	B	13.1	0.05	-	4
A St NB thru/right	A	0.0	0.17	-	0
A St SB left/thru	A	0.0	0.00	-	0
Dorchester Avenue / West 5th Street	-	-	-	-	-
W Fifth St WB right	C	16.2	0.11	-	9
Dorchester Ave NB thru | thru/right	A	0.0	0.41	-	0
Dorchester Ave SB thru | thru	A	0.0	0.37	-	0

~ Volume exceeds capacity, queue is theoretically infinite

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

m Volume for 95th percentile queue is metered by upstream signal

Grey shading indicates a decrease to LOS E or F from the Existing (2017) Condition.

The signalized intersection of A Street / West Fourth Street will continue to operate at LOS C during the weekday a.m. peak hour and decrease to LOS E during the weekday p.m. peak hour under the No-Build Condition. During the p.m. peak hour the A Street southbound approach will decrease to LOS F. The longest queues at the intersection will continue to occur at the A Street southbound approach during the a.m. and p.m. peak hours.

The signalized intersection of A Street / Dorchester Avenue will continue to operate at LOS C during the weekday a.m. peak hour and LOS D during the weekday p.m. peak hour under the No-Build Condition. The A Street westbound approach will decrease to LOS F during the a.m. peak hour and continue to operate at LOS F during the p.m. peak hour. The longest queues at the intersection will occur at the Dorchester Avenue northbound approach during the a.m. peak hour and at the A Street westbound approach during the p.m. peak hour.

All of the approaches for the unsignalized intersections in the study area will continue to operate at LOS C or better during both the weekday a.m. and p.m. peak hours under the No-Build Condition.

7.4 Build (2024) Condition

As previously summarized, the Project will include the construction of approximately 54 residential units with approximately 41 ground floor parking spaces. Vehicular access will be provided via a new driveway off of Gold Street.

7.4.1 Vehicle Site Access and Circulation

As shown in the Project site access plan in **Figure 7-13**, vehicular access to the Site will be provided by a curb-cut along Gold Street. The new driveway along Gold Street will provide access to the ground floor parking garage. The existing two curb cuts along West Fifth Street will be closed.

7.4.2 Parking

This section presents the Project's parking supply and an evaluation of the Project's parking demand. As previously mentioned, the Project will contain 41 parking spaces within the building. This results in a parking ratio of approximately 0.75 parking spaces per dwelling units, consistent with the BTD maximum parking goals for this area.

7.4.3 Loading and Service Accommodations

In addition to move-in/move-out operations, residential units primarily generate delivery trips related to small packages and prepared food on a daily basis. Office uses such as work share depend on deliveries from small sized trucks. Loading and service operations will occur along West Fifth Street or Gold Street. This space will accommodate all deliveries, trash pick-up, and residential move-in/move-out activity.

7.4.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking for residents and short-term bicycle racks for visitors. Based on BTD guidelines, the Project will supply a minimum of 54 secure bicycle parking/storage spaces within the parking garage.

7.4.5 Trip Generation Methodology

Determining the future trip generation of the Project is a complex, multi-step process that produces an estimate of vehicle trips, transit trips, walk trips, and bicycle trips associated with a

Figure 7-13.
Site Access

proposed development and a specific land use program. A project's location and proximity to different travel modes determines how people will travel to and from a project site.

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the Trip Generation Manual5 were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

To estimate the unadjusted number of vehicular trips for the Project, ITE land use code (LUC) 220 – Apartment was used. This land use code refers to dwelling units located within the same building with at least three other dwelling units. Calculation of the number of trips uses ITE's average rate per dwelling unit.

7.4.6 Mode Share

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

Table 7-8. Travel Mode Shares

Time Period		Vehicle Occupancy Rate[a]	Walk/Bike Share[b]	Transit Share[b]	Vehicle Share[b]
Daily	In	1.13	24%	23%	53%
	Out	1.13	24%	23%	53%
a.m. Peak Hour	In	1.13	22%	29%	49%
	Out	1.13	30%	26%	44%
p.m. Peak Hour	In	1.13	30%	26%	44%
	Out	1.13	22%	29%	49%

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

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

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

7.4.7 Project Trip Generation

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

Table 7-9. Trip Generation Summary

Time Period		Walk/Bicycle Trips	Transit Trips	Primary Vehicle Trips
Daily				
Apartment [a]	In	48	47	96
	Out	48	47	96
	Total	**96**	**94**	**192**
a.m. Peak Hour				
Apartment	In	2	2	3
	Out	7	7	10
	Total	**9**	**9**	**13**
p.m. Peak Hour				
Apartment	In	7	7	10
	Out	4	3	6
	Total	**11**	**10**	**16**

a Based on ITE LUC 220 – 54 Apartment units, average rate.

7.4.8 Trip Distribution

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

7.4.9 Build (2024) Traffic Volumes

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

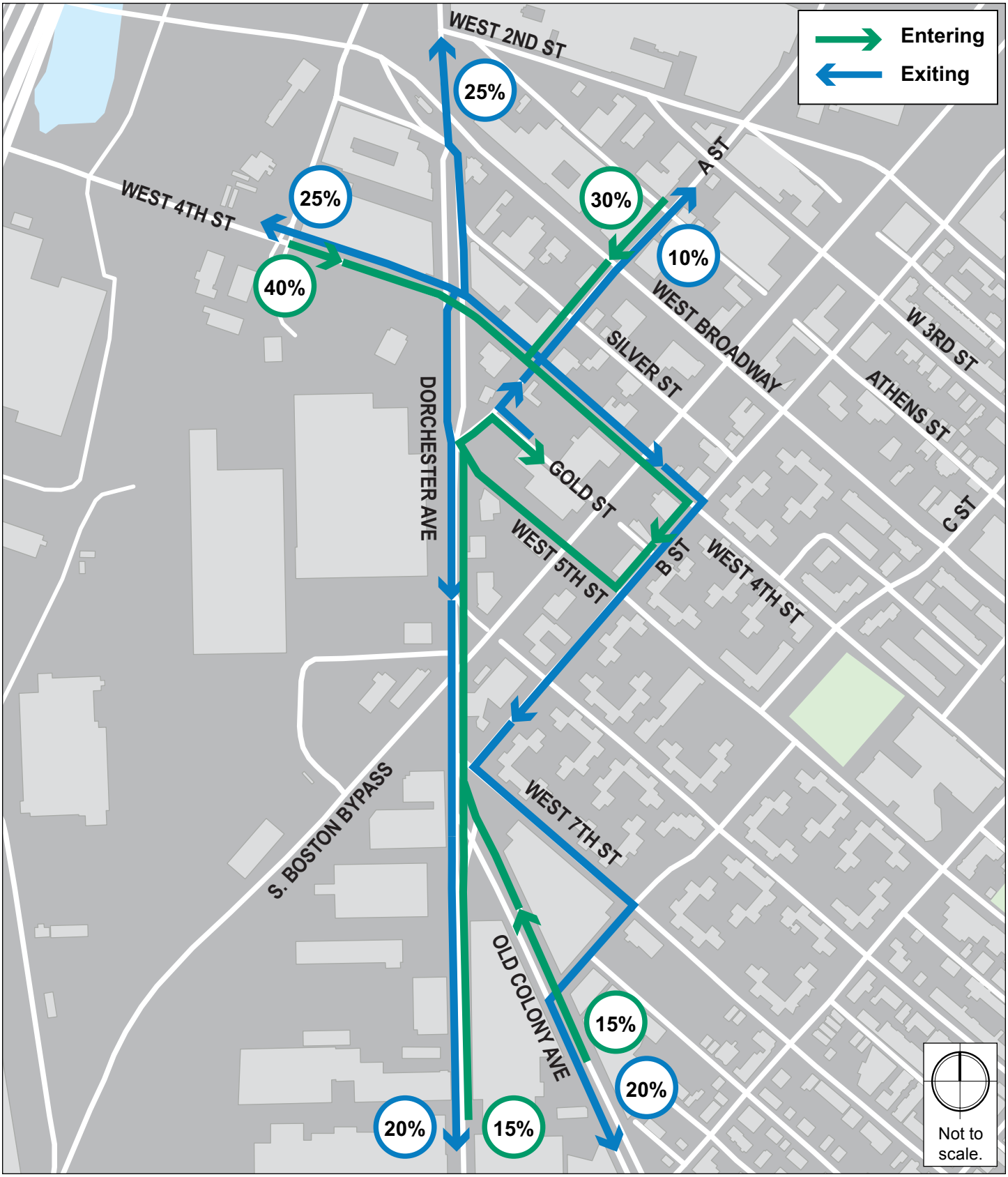


Figure 7-14.
Trip Distribution

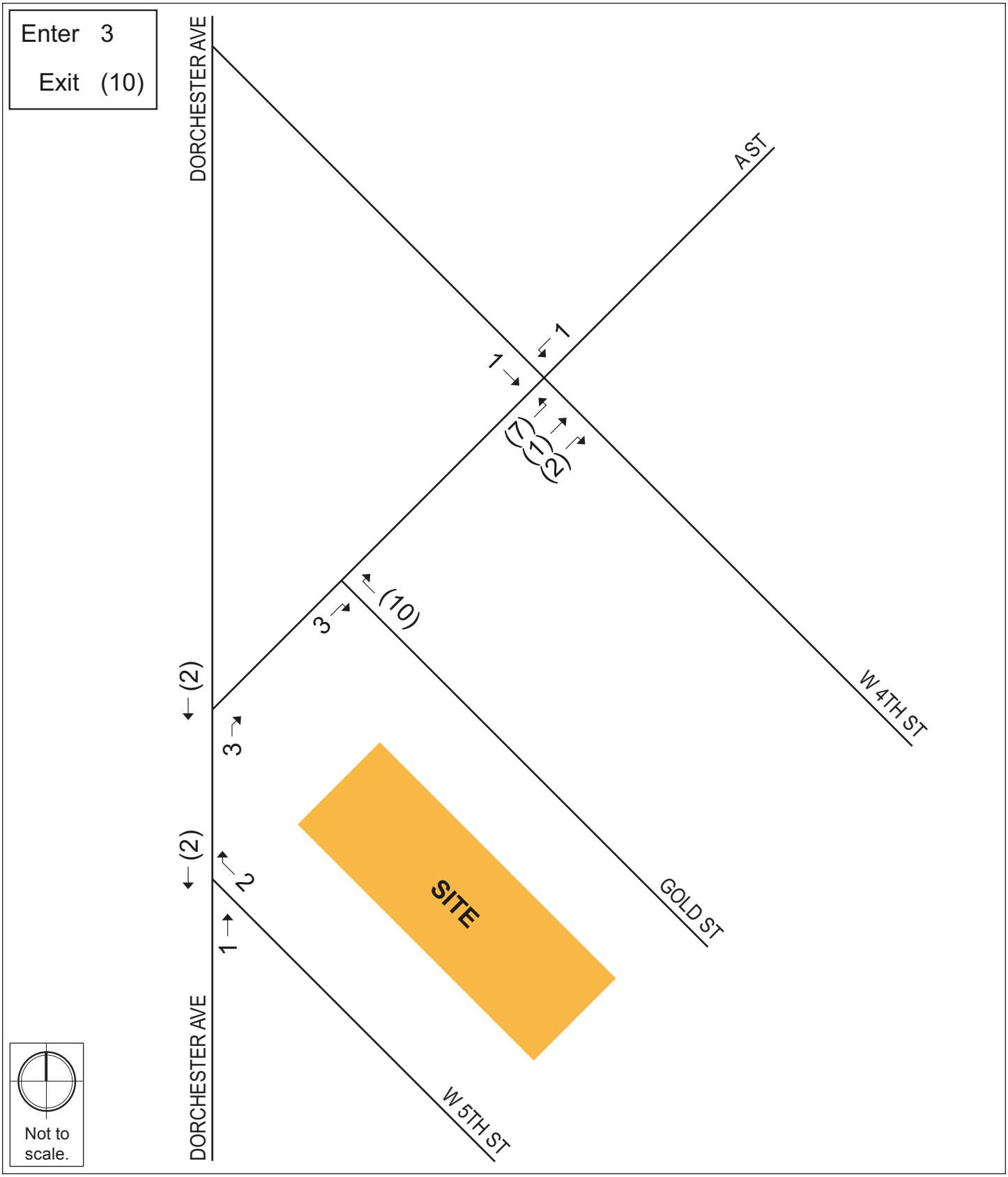


Figure 7-15.
Project Generated Vehicle Trips, Weekday a.m. Peak Hour

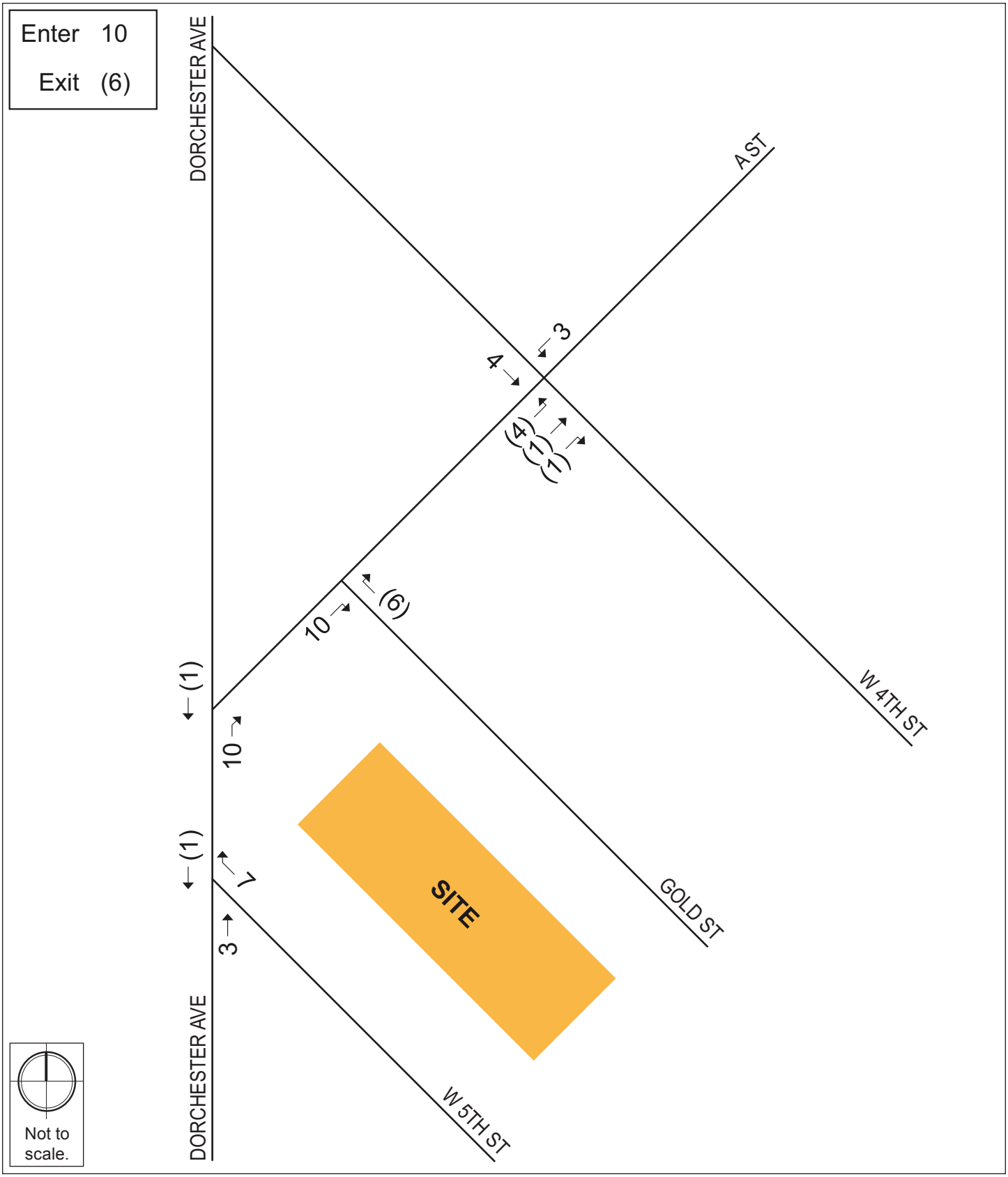


Figure 7-16.
Project Generated Vehicle Trips, Weekday p.m. Peak Hour

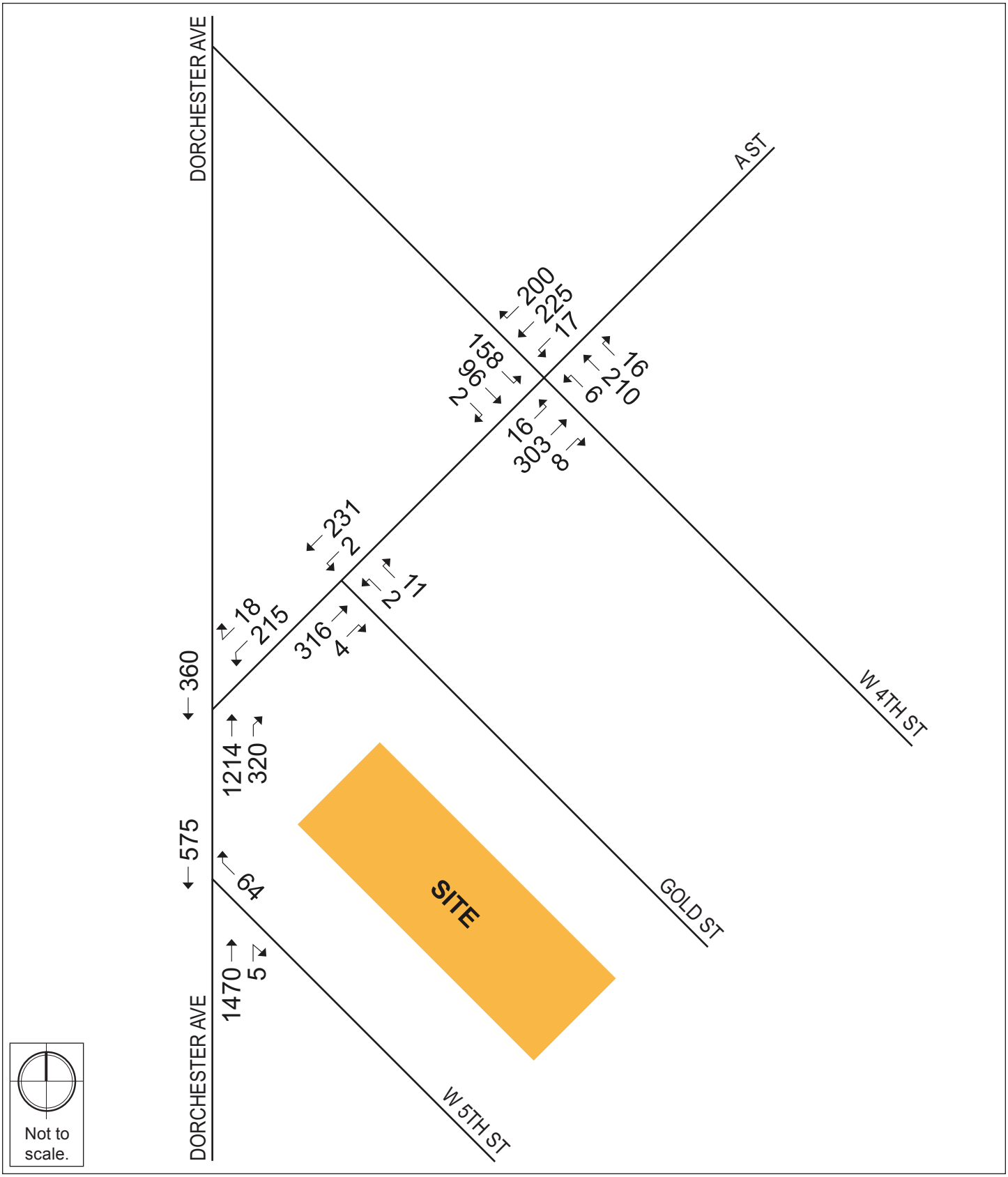


Figure 7-17.
Build (2024) Condition Traffic Volumes, Weekday a.m. Peak Hour

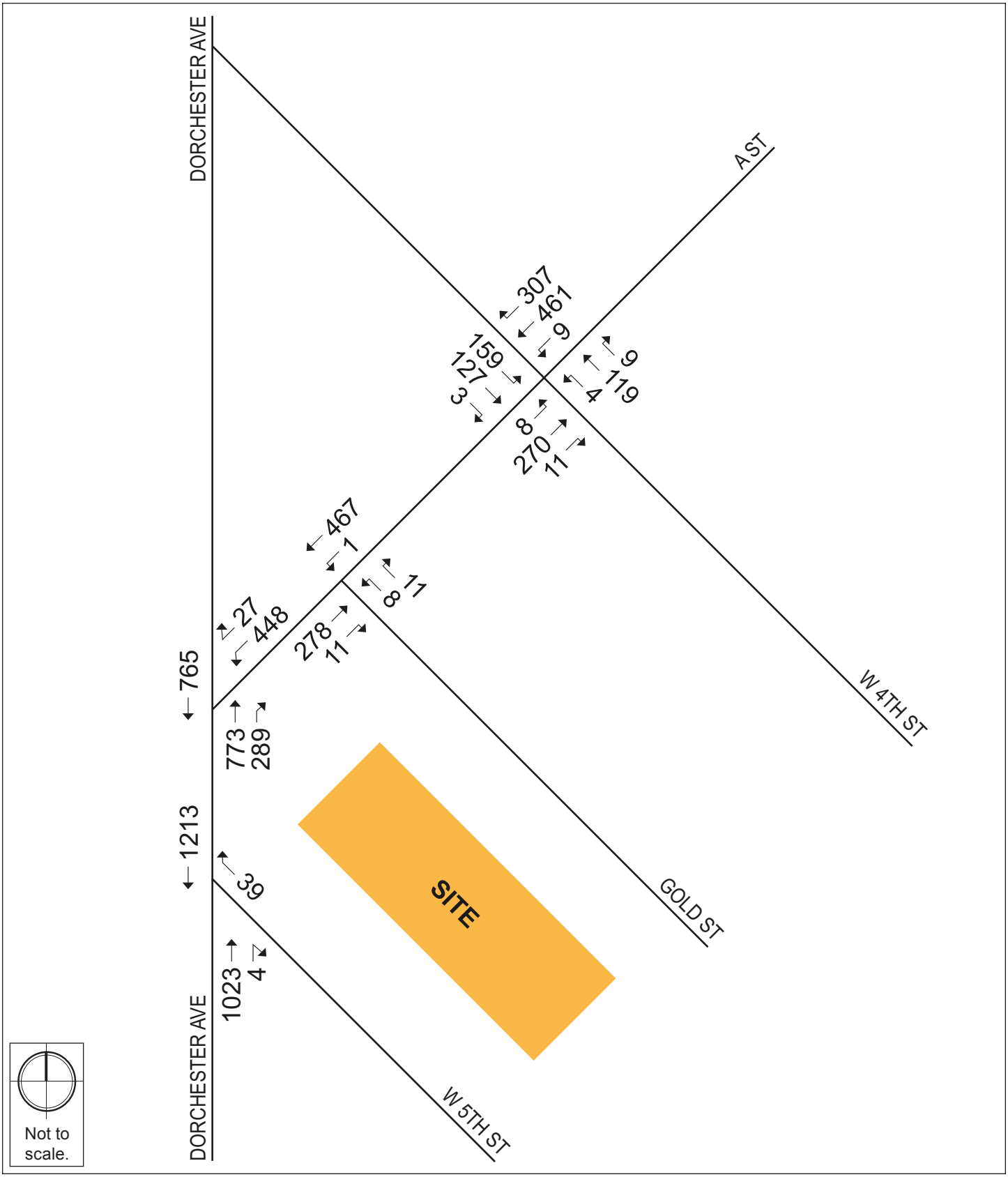


Figure 7-18.
Build (2024) Condition Traffic Volumes, Weekday p.m. Peak Hour

7.4.10 Build (2024) Condition Traffic Operations Analysis

The Build (2024) Condition capacity analysis uses the same methodology as the Existing (2017) Condition capacity analysis and the No-Build (2024) Condition capacity analysis. **Table 7-10** and **Table 7-11** present the Build (2024) Condition capacity analysis for the weekday a.m. Peak Hour and weekday p.m. Peak Hour, respectively. The shaded cells in the tables indicate a worsening of LOS between the No-Build (2024) Condition and the Build (2024) Condition. The detailed analysis sheets are provided in **Appendix D**.

Table 7-10. Build (2024) Condition Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
A Street / West Fourth Street	**C**	**33.7**	**-**	**-**	**-**
W Fourth St EB left/thru/right	D	46.5	0.76	147	#291
W Fourth St WB left/thru/right	C	26.9	0.43	123	187
A St NB left/thru/right	D	39.7	0.52	151	234
A St SB left/thru/right	C	25.7	0.67	192	303
A Street / Dorchester Avenue	**C**	**30.6**	**-**	**-**	**-**
A St WB left/right	F	>80.0	0.94	154	#303
Dorchester Ave NB thru | thru	C	27.4	0.73	367	461
Dorchester Ave NB right	A	1.5	0.28	0	30
Dorchester Ave SB thru | thru	C	28.4	0.22	115	m165
Unsignalized Intersections					
A Street / Gold Street	**-**	**-**	**-**	**-**	**-**
Gold St WB left/right	B	11.1	0.05	-	4
A St NB thru/right	A	0.0	0.20	-	0
A St SB left/thru	A	0.1	0.00	-	0
Dorchester Avenue / West 5th Street	-	-	-	-	-
W 5th St WB right	C	21.2	0.26	-	26
Dorchester Ave NB thru | thru/right	A	0.0	0.59	-	0
Dorchester Ave SB thru | thru	A	0.0	0.17	-	0

~ Volume exceeds capacity, queue is theoretically infinite

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

m Volume for 95th percentile queue is metered by upstream signal

Grey shading indicates a decrease to LOS E or F from the No-Build (2024) Condition.

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

Intersection/Approach	LOS	Delay (s)	V/C Ratio	50th Percentile Queue (ft)	95th Percentile Queue (ft)
Signalized Intersections					
A Street / West Fourth Street	**E**	**75.8**	**-**	**-**	**-**
W Fourth St EB left/thru/right	D	37.1	0.62	151	#253
W Fourth St WB left/thru/right	C	23.7	0.22	59	107
A St NB left/thru/right	C	29.6	0.44	127	200
A St SB left/thru/right	F	>80.0	>1.00	~551	#779
A Street / Dorchester Avenue	**D**	**44.8**	**-**	**-**	**-**
A St WB left/right	F	>80.0	0.93	303	#491
Dorchester Ave NB thru | thru	D	39.7	0.72	~267	#397
Dorchester Ave NB right	A	1.4	0.24	0	29
Dorchester Ave SB thru | thru	C	23.9	0.72	~268	#400
Unsignalized Intersections					
A Street / Gold Street	**-**	**-**	**-**	**-**	**-**
Gold St WB left/right	B	12.4	0.07	-	5
A St NB thru/right	A	0.0	0.18	-	0
A St SB left/thru	A	0.0	0.00	-	0
Dorchester Avenue / West Fifth Street	-	-	-	-	-
W 5th St WB right	C	16.5	0.14	-	12
Dorchester Ave NB thru | thru/right	A	0.0	0.41	-	0
Dorchester Ave SB thru | thru	A	0.0	0.37	-	0

~ Volume exceeds capacity, queue is theoretically infinite

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

m Volume for 95th percentile queue is metered by upstream signal

Grey shading indicates a decrease to LOS E or F from the No-Build (2024) Condition.

The signalized intersection of A Street / West Fourth Street will continue to operate at LOS C during the weekday a.m. peak hour and LOS E during the weekday p.m. peak hour under the Build Condition. All of the approaches will operate the same as under the No-Build condition, with the A Street southbound approach operating at LOS F during the p.m. peak hour. The longest queues at the intersection will continue to occur at the A Street southbound approach during both the a.m. and p.m. peak hours.

The signalized intersection of A Street / Dorchester Avenue will continue to operate at LOS C during the weekday a.m. peak hour and LOS D during the weekday p.m. peak hour under the Build Condition. All of the approaches will operate the same as under the No-Build condition, with the A Street westbound approach operating at LOS F during both the a.m. and p.m. peak hours. The longest queues at the intersection will continue to occur in the Dorchester Avenue

northbound approach during the a.m. peak hour and the A Street westbound approach during the p.m. peak hour.

All of the approaches for the unsignalized intersections in the study area will continue to operate at LOS C or better during both the weekday a.m. and p.m. peak hours under the Build Condition.

7.5 Transportation Demand Management

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

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

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

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

- Orientation Packets: The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby vehicle sharing and bicycle sharing locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.
- Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options.
- Transportation Coordinator: The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries, and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.
- Provide information on travel alternatives for employees and visitors via the Internet and in the building lobby.
- Electric Vehicle Charging: The Proponent will explore the feasibility of providing electric vehicle charging station(s) within the garage.
- Bicycle Sharing: The Proponent will explore the feasibility of providing a Hubway bicycle sharing station on-site.

7.6 Transportation Mitigation Measures

The Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible, the installation of new, accessible ramps, improvements to street lighting where necessary, planting of street trees, and providing bicycle storage racks surrounding the site, where appropriate.

The proposed Project proposes to improve Gold Street to meet the intent of Boston Complete Streets guidelines. Currently the sidewalks are narrow and do not meet ADA standards and the roadway width is not wide enough to accommodate the two way travel that exists. The improvements include creating a shared street that will provide wider pedestrian areas and vehicle areas.

The Proponent is responsible for preparation of the Transportation Access Plan Agreement (TAPA), a formal legal agreement between the Proponent and the BTD. The TAPA formalizes the findings of the transportation study, mitigation commitments, elements of access and physical design, travel demand management measures, and any other responsibilities that are agreed to by both the Proponent and the BTD. Because the TAPA must incorporate the results of the technical analysis, it must be executed after these other processes have been completed. The proposed measures listed above and any additional transportation improvements to be undertaken as part of this Project will be defined and documented in the TAPA.

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

7.7 Evaluation of Short-term Construction Impacts

Most construction activities will be accommodated within the current site boundaries. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan to be filed with BTD in accordance with the City's transportation maintenance plan requirements.

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

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

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

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

8.0 COORDINATION WITH GOVERNMENTAL AGENCIES

8.1 Architectural Access Board Requirements

This Project will comply with the requirements of the Architectural Access Board. The Project will also be designed to comply with the Standards of the Americans with Disabilities Act.

8.2 Massachusetts Environmental Policy Act

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

8.3 Boston Civic Design Commission

The Project is not expected to exceed the 100,000 gross square feet size threshold requirement for review by the Boston Civic Design Commission.

9.0 PROJECT CERTIFICATION

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

Trinity Green Development, LLC

Thomas G. Broderick, Jr., Manager

6/13/17
Date

Mitchell L. Fischman (MLF) Consulting LLC

Signature of Preparer
Mitchell L. Fischman, Principal

6/13/17
Date

APPENDIX A – LETTER OF INTENT (LOI) TO FILE PNF, APRIL 27, 2017

A&M Adams & Morancy
COUNSELORS - AT - LAW

April 27, 2017

Via In-Hand Delivery and By Email

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

Attn: Michael Rooney, Project Manager

RE: Letter of Intent to File Project Notification - Article 80 Large Project Review
20 West Fifth Street, South Boston

Dear Director Golden:

This office represents Trinity Green Development, LLC (the "Proponent"), a Massachusetts limited liability company and proposed owner-developer of the real estate property situated at 20 West Fifth Street in South Boston. The purpose of this letter is to notify the Boston Planning and Development Agency of our client's intent to file an Expanded Project Notification Form with the BPDA pursuant to Article 80B, Large Project Review, of the Boston Zoning Code.

The Proponent's project contemplates the construction of a new building containing approximately 54 residential units and 2,184 square feet of common room space, with a total project floor area of approximately 78,432 gross square feet, excluding the parking spaces, with a planned 41 garage spaces located in a ground-level garage (the "Proposed Project"). The scope and scale of the Proposed Project's residential component is intended to advance the housing creation goals of Mayor Walsh's 2030 Housing Plan.

The site comprises .44 acres (18,991 square feet of land), and is bounded to the north by Gold Street, to the south by West Fifth Street, to the west by the Mass Bay Credit Union's surface parking lot, and to the east by the South Boston Bypass Road. The site is currently occupied by a single-story concrete block building housing The Colmar Belting Co. Inc., a distributor and servicer of conveyor belts, as well as motors and drives, which has been located there since the building's construction in 1970. The business will be relocating and the existing building will be demolished.

The nearby neighborhood is a mix of light industrial, retail, and other commercial uses, as well as residential buildings ranging from a small number of single-family homes to numerous

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

multi-unit condominiums and apartments. MBTA buses run on routes 47, 9 and 11 close to the site on both Dorchester Avenue and West Broadway, and the Broadway Red Line rapid transit station is less than four blocks from the site. Broadway Station provides a direct connection to South Station and downtown Boston, and points north to Cambridge and south to Quincy. The context of the immediate area is supportive of and well-suited to the proposed scale and scope of the Proposed Project, including several buildings of four to six stories in height, and the Macallen Building with a height of up to ten stories at Dorchester Avenue and West Fourth Street. Please see Figure 1, Project Locus, attached hereto.

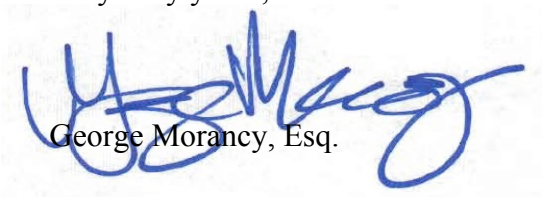
The Proposed Project is located within a Restricted Manufacturing (M-1) zoning district under the base Boston Zoning Code, and will therefore require several variances from the terms of the currently applicable code sections. More significant, the site is within the area of the South Boston Dorchester Avenue Planning Initiative, a planning initiative commenced by the BPDA and the City of Boston for the purpose of ensuring that the 144 acres of the Study Area are strategically planned for a broader type of uses and a scale of development best suited to the future growth of the Dorchester Avenue corridor. A product of months of intensive participation by a broad group of area residents, property owners, business owners, advocates, public agencies, and other stakeholders, the Plan details a framework for new zoning for the area that will allow for future growth in a manner that is consistent with the community's vision. The development team has taken great care to work within the applicable framework of the Plan, with respect to building height, density, setbacks, parking, and design, in order to achieve a Proposed Project that lives up to the objectives of the Planning Initiative.

The size of the Proposed Project, at over 50,000 square feet of gross floor area, will require the preparation and filing of submissions under the Large Project Review requirements of Article 80 of the zoning code. The Expanded PNF filing is expected to address many issues normally presented in a Draft Project Impact Report, including a transportation analysis, and air and noise, shadow, infrastructure, historic resources, and other environmental evaluations, all of which will help explain potential project impacts arising from the Proposed Project, and any needed mitigation measures to reduce these impacts.

Prior to submitting this Letter of Intent, we conducted extensive preliminary community outreach to seek initial input and support for the Proposed Project, including a presentation to the West Broadway Neighborhood Association, and South Boston's elected officials. We are scheduled to present plans to the Cityside Neighborhood Association on May 1. We look forward to continuing to work closely with abutters and other neighbors in order to craft a development project that will be met with considerable public support.

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

Very truly yours,



George Morancy, Esq.

Attachment: Figure 1, Project Locus

cc: Jonathan Greeley, BPDA
Michael Rooney, BPDA
City Councilor Michael F. Flaherty
City Councilor Bill Linehan
John Allison, Mayor's Office of Neighborhood Services
Senator Linda Dorcena Forry
Representative Nick Collins
Thomas J. Broderick, Jr., Esq., Trinity Green Development, LLC
Timothy Russell, Trinity Green Development, LLC
Mitchell L. Fischman, MLF Consulting, LLC

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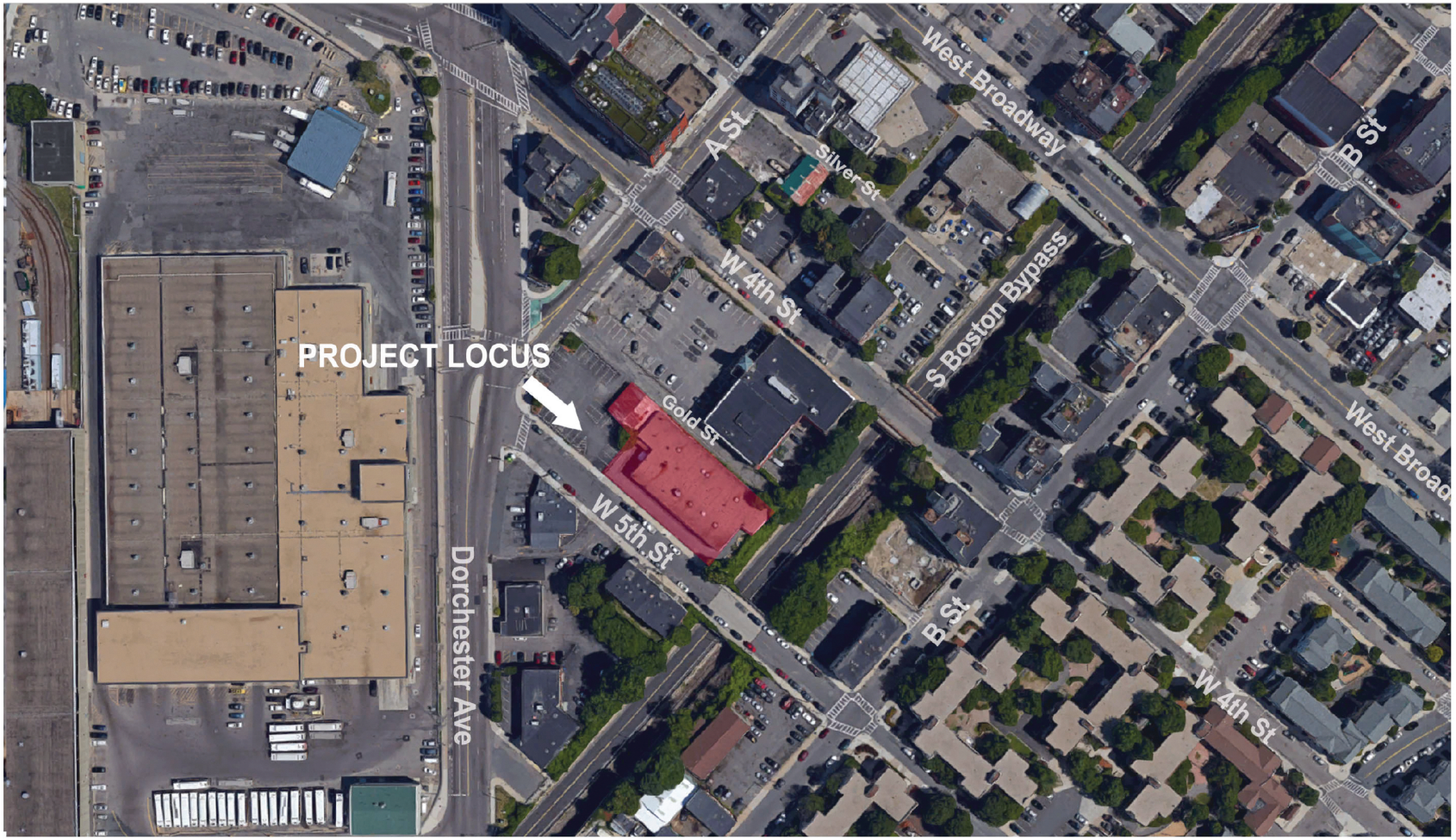


Figure 1. Project Locus
20 West 5th Street, South Boston

FIGURE 1 - PROJECT LOCUS

APPENDIX B – AIR QUALITY APPENDIX

APPENDIX B
AIR QUALITY

20 WEST 5TH STREET
PROJECT NOTIFICATION FORM

Pages **Contents**

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

                                        ***   MODEL SETUP OPTIONS SUMMARY   ***

 -

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

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

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

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

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

 **Model Accepts FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of: CO

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

 **This Run Includes: 1 Source(s);   1 Source Group(s); and   575 Receptor(s)

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

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

 **The AERMET Input Meteorological Data Version Date: 16216

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

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

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

 **Approximate Storage Requirements of Model =   3.6 MB of RAM.

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

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


*** AERMOD - VERSION  16216 ***   *** 20 West 5th Street  Project                                    ***        05/18/17
*** AERMET - VERSION 16216  ***   *** CO 1-hour Screening Modeling                                   ***        13:46:13
                                                                                                                PAGE   2
*** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN

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

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

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



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

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

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

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

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

First 24 hours of scalar data

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

First hour of profile data

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

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

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

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

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

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	2.01600	ON 10011206: AT (236596.30, 898950.60, 5.00, 5.00, 0.00)	DC	

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

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

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

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

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

A Total of 18504 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 0 Missing Hours Identified (0.00 Percent)

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

INDOOR GARAGE ANALYSIS PROGRAM

PROJECT: 20 WEST 5TH STREET GARAGE PEAK PM HOUR - YEAR: 2017

DISTANCE IN: 70 METERS
DISTANCE OUT: 70 METERS

NUMBER OF EXIT LANES: 1 LANE(S)
TOTAL EXIT VOLUME: 16 VEH/HOUR

CO RATE: 2.976 GRAMS CO/MILE

SPEED IN GARAGE: 5.0 M.P.H.

VENT CFM: 16,240 CFM

TOTAL CO EMISSIONS = 0.108 GRAMS/MIN = 0.0018 GRAMS/SEC
TOTAL VENTILATION = 460 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 0.13 PPM

MOVES2014 OUTPUT

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

APPENDIX C – NOISE APPENDIX

APPENDIX C
NOISE

20 WEST 5TH STREET
PROJECT NOTIFICATION FORM

Page Contents

FIGURE 1
Sound Monitoring & Modeling Receptor Locations
20 West Fifth Street
Boston, MA

tech environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Cadna Noise Modeling Results

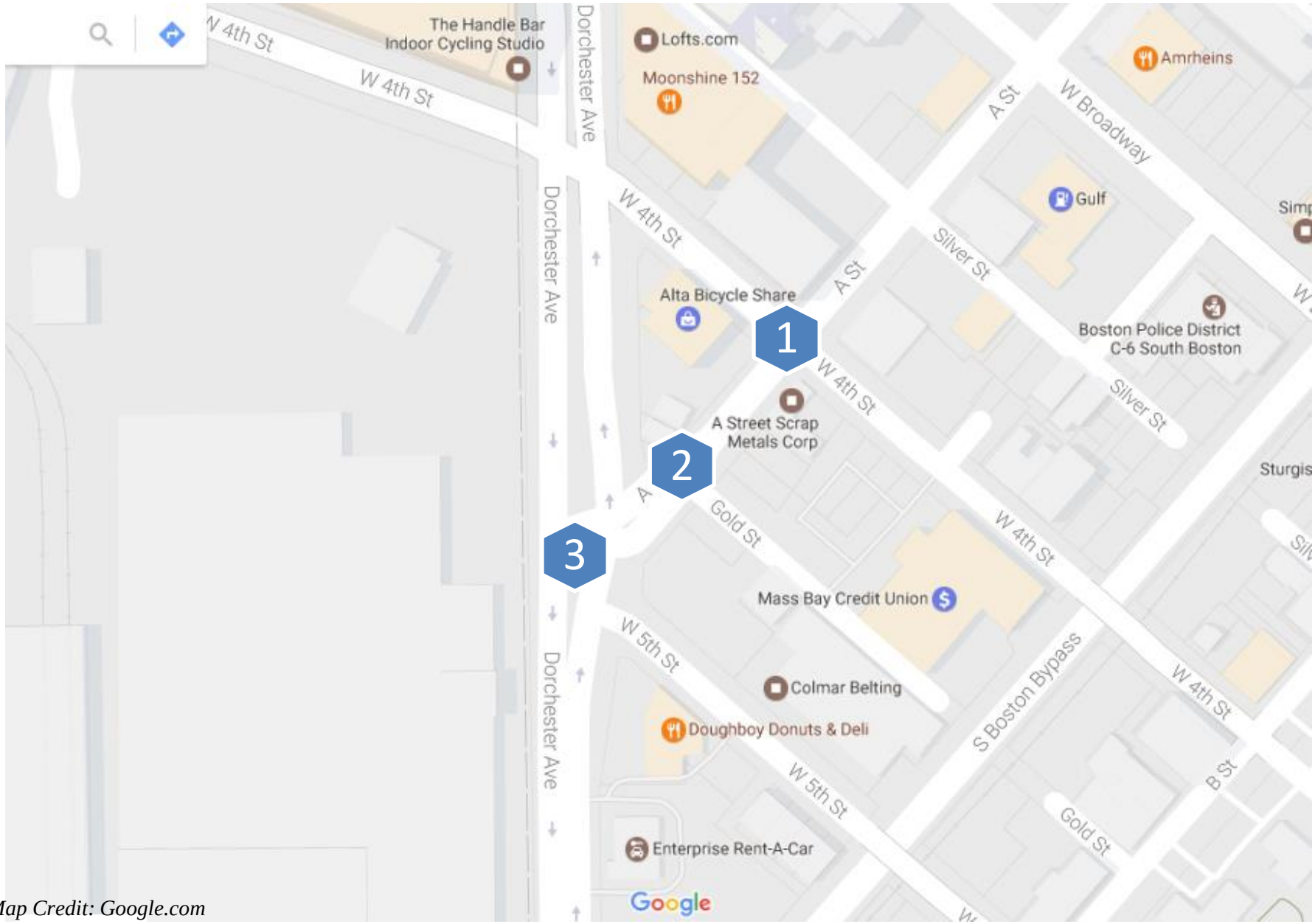
City of Boston Noise Ordinance Analysis

Name	ID	Sound	Octave Band Day								
		Level	31	63	125	250	500	1000	2000	4000	8000
		(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
50 B Street	Top_Floor	37	45.3	44.9	40.1	36.3	34.8	32.3	27.6	20.5	13.2
25 West 5th Street	Top_Floor	36	46.8	45.6	41.0	37.4	34.6	30.3	23.6	15.0	8.0
99 W 4th Street	Top_Floor	35.7	44.0	43.9	39.1	34.9	33.5	31.2	26.4	18.9	9.2
139 West 4th Street	Top_Floor	42.7	52.7	52.7	48.0	42.5	40.1	37.7	33.0	27.0	20.5
171 West 4th Street	Top_Floor	37.6	47.6	47.5	42.6	37.2	35.1	32.8	28.0	20.9	10.9
48 Gold Street	Top_Floor	38.3	49.0	48.9	43.9	38.3	35.8	33.2	28.3	21.2	11.4
Boston Limits		50	68	67	61	52	46	40	33	28	26

MassDEP Noise Policy Analysis

Nighttime					
Name	ID	Project	Background	Total New	Increase Over
		Level	Level	Level	Existing
		(dBA)	(dBA)	(dBA)	(dBA)
50 B Street	Top_Floor	37	52.3	52.4	0.1
25 West 5th Street	Top_Floor	36	52.3	52.4	0.1
99 W 4th Street	Top_Floor	35.7	50.8	50.9	0.1
139 West 4th Street	Top_Floor	42.7	51.1	51.7	0.6
171 West 4th Street	Top_Floor	37.6	51.1	51.3	0.2
48 Gold Street	Top_Floor	38.3	51.1	51.3	0.2
Daytime					
Name	ID	Project	Background	Total New	Increase Over
		Level	Level	Level	Existing
		(dBA)	(dBA)	(dBA)	(dBA)
50 B Street	Top_Floor	37	52.6	52.7	0.1
25 West 5th Street	Top_Floor	36	52.6	52.7	0.1
99 W 4th Street	Top_Floor	35.7	61.2	61.2	0.0
139 West 4th Street	Top_Floor	42.7	60.5	60.6	0.1
171 West 4th Street	Top_Floor	37.6	60.5	60.5	0.0
48 Gold Street	Top_Floor	38.3	60.5	60.5	0.0

APPENDIX D – TRANSPORTATION APPENDIX



Map Credit: Google.com

BOSTON TRAFFIC DATA	BTD ID: 64_021_HSH	South Boston, MA	# of TMC's: 03	Client: Howard Stein Hudson
		Collect on April 11, 2017	# of ATR's: 00	Contact: Andrew Fabiszewski

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 1
Location:	South Boston, MA
Street 1:	A Street
Street 2:	West 4th Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
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TOTAL (CARS & TRUCKS)

	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	47	2	0	2	46	55	0	1	27	2	0	17	15	1
7:15 AM	0	3	50	2	0	3	47	57	0	2	30	2	0	19	19	0
7:30 AM	0	3	57	1	0	4	50	53	0	2	39	3	0	21	22	1
7:45 AM	0	1	56	0	0	4	54	46	0	1	46	3	0	18	24	0
8:00 AM	0	3	60	3	0	3	49	45	0	2	53	4	0	26	22	1
8:15 AM	0	2	56	2	0	4	48	42	0	1	57	5	0	29	21	0
8:30 AM	0	3	49	1	0	3	40	46	0	3	57	4	0	28	19	1
8:45 AM	0	2	43	1	0	1	34	49	0	4	55	2	0	26	18	0

	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	46	2	0	1	93	45	0	3	19	1	0	22	32	0
4:15 PM	0	2	53	1	0	0	94	49	0	5	18	0	0	30	29	1
4:30 PM	0	2	61	0	0	2	98	46	0	3	22	2	0	37	24	1
4:45 PM	0	1	62	1	0	3	100	42	0	0	25	0	0	38	26	0
5:00 PM	0	0	60	2	0	3	91	52	0	1	27	1	0	38	27	1
5:15 PM	0	1	56	3	0	2	80	59	0	1	26	1	0	37	28	0
5:30 PM	0	2	49	3	0	1	87	65	0	0	28	3	0	35	27	1
5:45 PM	0	1	48	2	0	0	90	69	0	2	27	4	0	33	26	1

AM PEAK HOUR 7:30 AM to 8:30 AM	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**9**	**229**	**6**	**0**	**15**	**201**	**186**	**0**	**6**	**195**	**15**	**0**	**94**	**89**	**2**
PHF	**0.92**				**0.94**				**0.86**				**0.93**			
HV %	**0.0%**	**0.0%**	**4.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**3.2%**	**1.1%**	**0.0%**

PM PEAK HOUR 5:00 PM to 6:00 PM	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**4**	**213**	**10**	**0**	**6**	**348**	**245**	**0**	**4**	**108**	**9**	**0**	**143**	**108**	**3**
PHF	**0.92**				**0.94**				**0.92**				**0.96**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 1
Location:	South Boston, MA
Street 1:	A Street
Street 2:	West 4th Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

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

	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0
7:15 AM	0	0	2	0	0	0	1	1	0	0	1	0	0	1	0	0
7:30 AM	0	0	2	0	0	0	0	1	0	0	0	0	0	2	1	0
7:45 AM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	4	0	0	0	0	2	0	0	0	0	0	1	0	0
8:15 AM	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	1	2	0	0	0	0	0	1	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:15 AM to 8:15 AM	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**11**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**1**	**0**	**0**	**4**	**1**	**0**
PHF	**0.69**				**0.63**				**0.25**				**0.42**			

PM PEAK HOUR 4:00 PM to 5:00 PM	A Street Northeastbound				A Street Southwestbound				West 4th Street Northwestbound				West 4th Street Southeastbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**2**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**
PHF	**0.25**				**0.58**				**0.25**				**0.25**			

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 1
Location:	South Boston, MA
Street 1:	A Street
Street 2:	West 4th Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

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PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
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PEDESTRIANS & BICYCLES

	A Street Northeastbound					A Street Southwestbound					West 4th Street Northwestbound					West 4th Street Southeastbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	6	0	2		0	0	0	23		0	4	0	2		1	0	0	2	
7:15 AM	0	3	0	4		0	0	0	20		0	2	0	4		0	0	0	3	
7:30 AM	0	4	0	5		0	0	1	22		0	1	1	3		2	1	0	2	
7:45 AM	0	3	0	11		0	1	2	26		0	3	0	5		1	0	0	3	
8:00 AM	0	3	1	13		0	1	3	31		0	4	0	9		1	0	0	3	
8:15 AM	0	4	0	10		0	1	1	28		0	3	0	10		2	0	0	4	
8:30 AM	0	7	0	6		0	0	2	24		0	7	0	8		1	0	1	3	
8:45 AM	0	5	0	5		0	0	2	21		0	5	0	7		0	0	0	4	

	A Street Northeastbound					A Street Southwestbound					West 4th Street Northwestbound					West 4th Street Southeastbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	5		0	1	1	8		0	1	0	2		0	1	0	1	
4:15 PM	0	0	0	7		0	2	2	12		0	2	0	6		0	2	0	3	
4:30 PM	0	1	0	10		0	3	3	17		0	2	0	8		1	3	0	2	
4:45 PM	0	0	0	9		0	2	4	16		0	0	0	7		0	2	0	4	
5:00 PM	0	2	0	7		1	4	3	19		0	1	1	9		0	2	0	6	
5:15 PM	0	0	0	10		0	3	5	23		0	2	0	10		0	4	0	8	
5:30 PM	0	0	0	12		0	6	8	28		0	1	0	8		1	6	0	10	
5:45 PM	0	0	0	11		0	2	4	21		0	0	0	7		0	3	0	7	

AM PEAK HOUR[1] 7:30 AM to 8:30 AM	A Street Northeastbound					A Street Southwestbound					West 4th Street Northwestbound					West 4th Street Southeastbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	14	1	39		0	3	7	107		0	11	1	27		6	1	0	12	

PM PEAK HOUR[1] 5:00 PM to 6:00 PM	A Street Northeastbound					A Street Southwestbound					West 4th Street Northwestbound					West 4th Street Southeastbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	2	0	40		1	15	20	91		0	4	1	34		1	15	0	31	

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

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 2
Location:	South Boston, MA
Street 1:	A Street
Street 2:	Gold Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

BOSTON TRAFFIC DATA
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Office: 978-746-1259
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TOTAL (CARS & TRUCKS)

	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	50	0	0	0	48	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	54	0	0	0	49	0	0	0	0	1	0	0	0	0
7:30 AM	0	0	59	0	0	0	53	0	0	0	0	1	0	0	0	0
7:45 AM	0	0	57	0	0	0	55	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	66	0	0	1	51	0	0	2	0	0	0	0	0	0
8:15 AM	0	0	60	1	0	1	48	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	53	0	0	0	44	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	46	0	0	1	37	0	0	0	0	0	0	0	0	0

	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	48	0	0	0	96	0	0	1	0	1	0	0	0	0
4:15 PM	0	0	55	0	0	0	99	0	0	2	0	1	0	0	0	0
4:30 PM	0	0	60	1	0	1	102	0	0	3	0	3	0	0	0	0
4:45 PM	0	0	63	0	0	0	100	0	0	1	0	1	0	0	0	0
5:00 PM	0	0	61	0	0	0	93	0	0	2	0	0	0	0	0	0
5:15 PM	0	0	59	0	0	0	81	0	0	1	0	0	0	0	0	0
5:30 PM	0	0	53	0	0	1	87	0	0	1	0	0	0	0	0	0
5:45 PM	0	0	52	0	0	0	93	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:30 AM to 8:30 AM	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**242**	**1**	**0**	**2**	**207**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**
PHF	**0.92**				**0.95**				**0.38**				**0.00**			
HV %	**0.0%**	**0.0%**	**6.2%**	**0.0%**	**0.0%**	**0.0%**	**2.9%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

PM PEAK HOUR 4:15 PM to 5:15 PM	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**239**	**1**	**0**	**1**	**394**	**0**	**0**	**8**	**0**	**5**	**0**	**0**	**0**	**0**
PHF	**0.95**				**0.96**				**0.54**				**0.00**			
HV %	**0.0%**	**0.0%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**3.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 2
Location:	South Boston, MA
Street 1:	A Street
Street 2:	Gold Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
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TRUCKS

	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0

	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0

AM PEAK HOUR	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
7:15 AM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	**0**	**0**	**14**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.70**				**0.58**				**0.00**				**0.00**			

PM PEAK HOUR	A Street Northeastbound				A Street Southwestbound				Gold Street Northwestbound				Southeastbound			
4:00 PM																
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	**0**	**0**	**5**	**0**	**0**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PHF	**0.63**				**0.70**				**0.00**				**0.00**			

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 2
Location:	South Boston, MA
Street 1:	A Street
Street 2:	Gold Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

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PEDESTRIANS & BICYCLES

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

	A Street Northeastbound					A Street Southwestbound					Gold Street Northwestbound					Southeastbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	1		0	1	0	0		0	0	0	2		0	0	0	0	
4:15 PM	0	1	0	0		0	2	0	0		0	0	0	1		0	0	0	0	
4:30 PM	0	0	0	0		0	3	0	0		0	0	0	2		0	0	0	0	
4:45 PM	0	0	0	1		0	2	0	0		0	0	0	5		0	0	0	0	
5:00 PM	0	2	0	0		0	4	0	0		0	0	0	8		0	0	0	0	
5:15 PM	0	1	0	2		0	3	0	0		0	0	0	11		0	0	0	0	
5:30 PM	0	0	0	0		0	5	0	0		0	0	0	9		0	0	0	0	
5:45 PM	0	3	0	0		0	3	0	0		0	0	0	8		0	0	0	0	

AM PEAK HOUR[1]	A Street Northeastbound					A Street Southwestbound					Gold Street Northwestbound					Southeastbound				
7:30 AM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:30 AM	0	15	0	0		0	3	0	3		0	0	0	18		0	0	0	0	

PM PEAK HOUR[1]	A Street Northeastbound					A Street Southwestbound					Gold Street Northwestbound					Southeastbound				
4:15 PM																				
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
5:15 PM	0	3	0	1		0	11	0	0		0	0	0	16		0	0	0	0	

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

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 3
Location:	South Boston, MA
Street 1:	Dorchester Avenue
Street 2:	A Street & West 5th Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

BOSTON TRAFFIC DATA
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TOTAL (CARS & TRUCKS)

	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
Start Time	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
7:00 AM	0	274	49	1	0	0	0	60	0	0	12	1	0	0	45	4
7:15 AM	1	281	51	0	0	0	0	76	0	0	11	3	0	0	44	4
7:30 AM	0	276	55	1	0	0	0	78	0	0	10	4	0	0	48	5
7:45 AM	0	269	56	2	0	0	0	77	0	0	11	2	0	0	51	4
8:00 AM	0	252	61	2	0	0	0	76	0	0	12	6	0	0	47	5
8:15 AM	1	241	55	2	0	1	1	74	0	0	11	5	0	0	43	6
8:30 AM	0	221	48	1	0	0	0	72	0	0	10	4	0	0	37	7
8:45 AM	0	215	43	1	0	0	0	67	0	0	9	3	0	0	30	6

	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
Start Time	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
4:00 PM	0	132	46	0	0	0	0	131	0	0	2	3	0	0	90	6
4:15 PM	0	150	54	1	0	0	0	136	0	0	6	2	0	0	93	7
4:30 PM	0	163	62	0	0	0	0	156	0	0	9	1	0	0	96	7
4:45 PM	0	167	61	1	0	0	0	169	0	0	7	2	0	0	94	6
5:00 PM	0	165	60	1	0	0	0	171	0	0	4	1	0	0	87	6
5:15 PM	0	174	57	2	0	0	0	168	0	0	5	2	0	0	76	5
5:30 PM	0	177	51	0	0	0	0	155	0	0	4	2	0	0	82	6
5:45 PM	0	171	48	1	0	0	0	135	0	0	3	2	0	0	87	5

AM PEAK HOUR 7:15 AM to 8:15 AM	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
	1	**1078**	**223**	**5**	**0**	**0**	**0**	**307**	**0**	**0**	**44**	**15**	**0**	**0**	**190**	**18**
PHF		**0.98**				**0.98**				**0.82**				**0.95**		
HV %	**0.0%**	**1.1%**	**6.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.9%**	**0.0%**	**0.0%**	**2.3%**	**6.7%**	**0.0%**	**0.0%**	**3.7%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
	0	**669**	**240**	**4**	**0**	**0**	**0**	**664**	**0**	**0**	**25**	**6**	**0**	**0**	**353**	**24**
PHF		**0.98**				**0.97**				**0.78**				**0.92**		
HV %	**0.0%**	**0.3%**	**1.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.1%**	**0.0%**

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 3
Location:	South Boston, MA
Street 1:	Dorchester Avenue
Street 2:	A Street & West 5th Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

BOSTON TRAFFIC DATA
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TRUCKS

	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
Start Time	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
7:00 AM	0	5	2	0	0	0	0	2	0	0	0	0	0	0	1	0
7:15 AM	0	4	2	0	0	0	0	3	0	0	0	0	0	0	3	0
7:30 AM	0	3	4	0	0	0	0	4	0	0	0	1	0	0	1	0
7:45 AM	0	3	3	0	0	0	0	3	0	0	0	0	0	0	3	0
8:00 AM	0	2	5	0	0	0	0	2	0	0	1	0	0	0	0	0
8:15 AM	0	4	3	0	0	0	0	2	0	0	0	0	0	0	2	0
8:30 AM	0	3	1	0	0	0	0	3	0	0	0	0	0	0	2	1
8:45 AM	0	3	3	0	0	0	0	2	0	0	0	0	0	0	1	0

	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
Start Time	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
4:00 PM	0	1	2	0	0	0	0	2	0	0	0	2	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
4:30 PM	0	1	1	0	0	0	0	1	0	0	0	0	0	0	5	0
4:45 PM	0	0	2	0	0	0	0	1	0	0	0	0	0	0	4	0
5:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
	0	**15**	**11**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	**0**
PHF	**0.93**				**0.75**				**0.25**				**0.67**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Dorchester Avenue Northbound				Dorchester Avenue Southbound				West 5th Street Northwestbound				A Street Southwestbound			
	U-Turn	Thru	Soft Right	Hard Right	U-Turn	Hard Left	Soft Left	Thru	U-Turn	Hard Left	Soft Right	Right	U-Turn	Left	Soft Left	Hard Right
	0	**2**	**5**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**2**	**0**	**0**	**14**	**0**
PHF	**0.58**				**0.50**				**0.25**				**0.70**			

Client:	Andrew Fabiszewski
Project #:	64_021_HSH_South Boston
BTD #:	Location 3
Location:	South Boston, MA
Street 1:	Dorchester Avenue
Street 2:	A Street & West 5th Street
Count Date:	4/11/2017
Day of Week:	Tuesday
Weather:	Mostly sunny, 75°F

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PEDESTRIANS & BICYCLES

	Dorchester Avenue Northbound					Dorchester Avenue Southbound					West 5th Street Northwestbound					A Street Southwestbound				
Start Time	Thru	Soft Right	Hard Right	PED		Hard Left	Soft Left	Thru	PED		Hard Left	Soft Right	Right	PED		Left	Soft Left	Hard Right	PED	
7:00 AM	2	6	0	0		0	0	1	2		0	0	0	24		0	0	0	24	
7:15 AM	3	3	0	0		0	0	0	0		0	0	0	19		0	0	0	19	
7:30 AM	4	4	0	0		0	0	2	0		0	0	0	17		0	0	0	17	
7:45 AM	2	3	0	0		0	0	1	0		0	0	0	15		0	0	0	15	
8:00 AM	3	3	0	0		0	1	0	0		0	0	0	12		0	0	0	12	
8:15 AM	4	4	0	0		0	0	1	0		0	0	0	15		0	0	0	15	
8:30 AM	5	7	0	0		0	0	0	1		0	0	0	16		0	0	0	16	
8:45 AM	3	6	0	0		0	0	0	0		0	0	0	13		0	0	0	13	

	Dorchester Avenue Northbound					Dorchester Avenue Southbound					West 5th Street Northwestbound					A Street Southwestbound				
Start Time	Thru	Soft Right	Hard Right	PED		Hard Left	Soft Left	Thru	PED		Hard Left	Soft Right	Right	PED		Left	Soft Left	Hard Right	PED	
4:00 PM	0	0	0	0		0	0	0	0		0	0	0	11		0	0	0	11	
4:15 PM	0	1	0	0		0	0	0	0		0	0	0	15		0	0	0	15	
4:30 PM	1	0	0	0		0	0	1	0		0	0	0	32		0	0	0	32	
4:45 PM	3	0	0	0		0	0	0	0		0	0	0	29		0	0	0	29	
5:00 PM	5	2	0	0		0	0	0	0		0	0	0	33		0	0	0	33	
5:15 PM	2	1	0	0		0	0	0	0		0	0	0	36		0	0	0	36	
5:30 PM	1	0	0	0		0	0	1	0		0	0	0	42		0	0	0	42	
5:45 PM	0	3	0	0		0	0	0	0		0	0	0	28		0	0	0	28	

AM PEAK HOUR[1] 7:15 AM to 8:15 AM	Dorchester Avenue Northbound					Dorchester Avenue Southbound					West 5th Street Northwestbound					A Street Southwestbound				
	Thru	Soft Right	Hard Right	PED		Hard Left	Soft Left	Thru	PED		Hard Left	Soft Right	Right	PED		Left	Soft Left	Hard Right	PED	
	12	13	0	0		0	1	3	0		0	0	0	63		0	0	0	63	

PM PEAK HOUR[1] 4:30 PM to 5:30 PM	Dorchester Avenue Northbound					Dorchester Avenue Southbound					West 5th Street Northwestbound					A Street Southwestbound				
	Thru	Soft Right	Hard Right	PED		Hard Left	Soft Left	Thru	PED		Hard Left	Soft Right	Right	PED		Left	Soft Left	Hard Right	PED	
	11	3	0	0		0	0	1	0		0	0	0	130		0	0	0	130	

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

MASSACHUSETTS HIGHWAY DEPARTMENT - STATEWIDE TRAFFIC DATA COLLECTION

2011 WEEKDAY SEASONAL FACTORS *

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

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

RECREATIONAL: (ALL YEARS)

**GROUP 3A:

1. CAPE COD (ALL TOWNS)

2.PLYMOUTH(SOUTH OF RTE.3A)

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

3.MARTHA'S VINEYARD

4.NANTUCKET

***GROUP 3B:

5.PERMANENTS 2 & 189

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

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

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

2011 AXLE CORRECTION FACTORS

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

ROUND OFF

0 - 999.....10

> 1,000.....100

Apply I-84 factor to stations:

3290, 3921, 3929

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	94	89	2	6	195	15	9	229	6	15	201	186	
Future Volume (vph)	94	89	2	6	195	15	9	229	6	15	201	186	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00			1.00			1.00			0.99		
Frt		0.999			0.991			0.996			0.938		
Flt Protected		0.975			0.999			0.998			0.998		
Satd. Flow (prot)	0	1814	0	0	1860	0	0	1803	0	0	1744	0	
Flt Permitted		0.684			0.992			0.983			0.985		
Satd. Flow (perm)	0	1272	0	0	1847	0	0	1775	0	0	1721	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		1			4			2			56		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		275			506			130			402		
Travel Time (s)		6.3			11.5			3.0			9.1		
Confl. Bikes (#/hr)			15			11			14			3	
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.94	0.94	0.94	
Heavy Vehicles (%)	3%	1%	0%	0%	1%	0%	0%	5%	0%	0%	0%	2%	
Adj. Flow (vph)	101	96	2	7	227	17	10	249	7	16	214	198	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	199	0	0	251	0	0	266	0	0	428	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		5			5			1			1		2
Permitted Phases	5			5			1			1			
Detector Phase	5	5		5	5		1	1		1	1		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		1.0
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0		19.0
Total Split (s)	32.0	32.0		32.0	32.0		39.0	39.0		39.0	39.0		19.0
Total Split (%)	35.6%	35.6%		35.6%	35.6%		43.3%	43.3%		43.3%	43.3%		21%
Maximum Green (s)	27.0	27.0		27.0	27.0		35.0	35.0		35.0	35.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			4.0			4.0		
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													107
Act Effct Green (s)		30.8			30.8			35.0			35.0		
Actuated g/C Ratio		0.34			0.34			0.39			0.39		
v/c Ratio		0.46			0.40			0.38			0.61		
Control Delay		29.3			26.3			21.7			23.4		
Queue Delay		0.9			0.0			4.0			0.0		
Total Delay		30.2			26.3			25.7			23.4		
LOS		C			C			C			C		
Approach Delay		30.2			26.3			25.7			23.4		
Approach LOS		C			C			C			C		
Stops (vph)		147			164			170			277		
Fuel Used(gal)		2			3			2			5		
CO Emissions (g/hr)		162			204			159			329		
NOx Emissions (g/hr)		31			40			31			64		
VOC Emissions (g/hr)		37			47			37			76		
Dilemma Vehicles (#)		0			0			0			0		
Queue Length 50th (ft)		93			113			106			165		
Queue Length 95th (ft)		163			174			170			265		
Internal Link Dist (ft)		195			426			50			322		
Turn Bay Length (ft)													
Base Capacity (vph)		436			634			691			703		
Starvation Cap Reductn		83			0			338			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.56			0.40			0.75			0.61		

Intersection Summary

Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 9 (10%), Referenced to phase 1:NBSB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 25.7		Intersection LOS: C	
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: A Street & West 4th Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	1	243	1	2	207
Future Volume (Veh/h)	2	1	243	1	2	207
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.38	0.38	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	5	3	264	1	2	218
Pedestrians	18					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			135			130
pX, platoon unblocked						
vC, conflicting volume	504	286			283	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	504	286			283	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	521	743			1269	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	265	220
Volume Left	5	0	2
Volume Right	3	1	0
cSH	587	1700	1269
Volume to Capacity	0.01	0.16	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	11.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	0.1
Approach LOS	B		

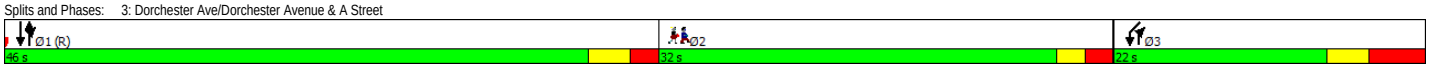
Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		24.0%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2
Lane Configurations							
Traffic Volume (vph)	1122	244	0	307	191	18	
Future Volume (vph)	1122	244	0	307	191	18	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.988		
Flt Protected					0.956		
Satd. Flow (prot)	3574	1524	0	3471	1731	0	
Flt Permitted					0.956		
Satd. Flow (perm)	3574	1524	0	3471	1731	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		249			4		
Link Speed (mph)	30			30	30		
Link Distance (ft)	86			356	135		
Travel Time (s)	2.0			8.1	3.1		
Confl. Bikes (#/hr)		12					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.95	0.95	
Heavy Vehicles (%)	1%	6%	0%	4%	4%	0%	
Adj. Flow (vph)	1145	249	0	313	201	19	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1145	249	0	313	220	0	
Turn Type	NA	pt+ov		NA	Prot		
Protected Phases	1	1 3		1	3		2
Permitted Phases							
Detector Phase	1	1 3		1	3		
Switch Phase							
Minimum Initial (s)	8.0			8.0	8.0		1.0
Minimum Split (s)	13.0			13.0	15.0		32.0
Total Split (s)	46.0			46.0	22.0		32.0
Total Split (%)	46.0%			46.0%	22.0%		32%
Maximum Green (s)	41.0			41.0	15.0		28.0
Yellow Time (s)	3.0			3.0	3.0		2.0
All-Red Time (s)	2.0			2.0	4.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0		
Total Lost Time (s)	5.0			5.0	7.0		
Lead/Lag	Lead			Lead			Lag
Lead-Lag Optimize?	Yes			Yes			Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0
Recall Mode	C-Max			C-Max	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							21.0
Pedestrian Calls (#/hr)							63
Act Effct Green (s)	48.1	70.4		48.1	14.3		
Actuated g/C Ratio	0.48	0.70		0.48	0.14		
v/c Ratio	0.67	0.22		0.19	0.87		
Control Delay	25.1	1.5		29.0	74.0		
Queue Delay	0.2	0.0		0.0	1.4		
Total Delay	25.3	1.5		29.0	75.4		
LOS	C	A		C	E		
Approach Delay	21.1			29.0	75.4		
Approach LOS	C			C	E		
Stops (vph)	861	14		268	184		
Fuel Used(gal)	11	0		4	4		
CO Emissions (g/hr)	786	22		290	307		
NOx Emissions (g/hr)	153	4		56	60		
VOC Emissions (g/hr)	182	5		67	71		
Dilemma Vehicles (#)	0	0		0	0		
Queue Length 50th (ft)	326	0		100	136		
Queue Length 95th (ft)	411	27		145	#263		
Internal Link Dist (ft)	6			276	55		
Turn Bay Length (ft)							
Base Capacity (vph)	1717	1142		1668	263		
Starvation Cap Reductn	0	0		0	6		
Spillback Cap Reductn	112	0		0	0		
Storage Cap Reductn	0	0		0	0		
Reduced v/c Ratio	0.71	0.22		0.19	0.86		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 22 (22%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 28.6 Intersection LOS: C
Intersection Capacity Utilization 52.7% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Dorchester Ave/Dorchester Avenue & A Street



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1307	5	0	498	0	59
Future Volume (Veh/h)	1307	5	0	498	0	59
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.82	0.82
Hourly flow rate (vph)	1334	5	0	508	0	72
Pedestrians					63	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				86		
pX, platoon unblocked					0.95	
vC, conflicting volume			1402		1654	732
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1402		1583	732
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	79
cM capacity (veh/h)			464		91	339

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total	889	450	254	254	72
Volume Left	0	0	0	0	0
Volume Right	0	5	0	0	72
cSH	1700	1700	1700	1700	339
Volume to Capacity	0.52	0.26	0.15	0.15	0.21
Queue Length 95th (ft)	0	0	0	0	20
Control Delay (s)	0.0	0.0	0.0	0.0	18.4
Lane LOS					C
Approach Delay (s)	0.0		0.0		18.4
Approach LOS					C

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			46.6%	ICU Level of Service	A
Analysis Period (min)			15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	143	108	3	4	108	9	4	236	10	6	388	245	
Future Volume (vph)	143	108	3	4	108	9	4	236	10	6	388	245	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00			1.00			1.00			0.99		
Frt		0.998			0.990			0.995			0.948		
Flt Protected		0.973			0.998			0.999					
Satd. Flow (prot)	0	1844	0	0	1874	0	0	1887	0	0	1767	0	
Flt Permitted		0.760			0.992			0.993			0.997		
Satd. Flow (perm)	0	1440	0	0	1862	0	0	1876	0	0	1761	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		1			5			3			41		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		275			506			130			402		
Travel Time (s)		6.3			11.5			3.0			9.1		
Confl. Bikes (#/hr)			15			4			2			15	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	149	113	3	4	117	10	4	257	11	6	413	261	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	265	0	0	131	0	0	272	0	0	680	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		5			5			1			1		2
Permitted Phases	5			5			1			1			
Detector Phase	5	5		5	5		1	1		1	1		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		1.0
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0		19.0
Total Split (s)	32.0	32.0		32.0	32.0		39.0	39.0		39.0	39.0		19.0
Total Split (%)	35.6%	35.6%		35.6%	35.6%		43.3%	43.3%		43.3%	43.3%		21%
Maximum Green (s)	27.0	27.0		27.0	27.0		35.0	35.0		35.0	35.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			4.0			4.0		
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													91
Act Effct Green (s)		30.8			30.8			35.0			35.0		
Actuated g/C Ratio		0.34			0.34			0.39			0.39		
v/c Ratio		0.54			0.20			0.37			0.96		
Control Delay		30.7			23.3			21.3			52.0		
Queue Delay		2.2			0.0			4.2			0.0		
Total Delay		32.8			23.3			25.5			52.0		
LOS		C			C			C			D		
Approach Delay		32.8			23.3			25.5			52.0		
Approach LOS		C			C			C			D		
Stops (vph)		209			83			170			517		
Fuel Used(gal)		3			2			2			12		
CO Emissions (g/hr)		230			106			159			813		
NOx Emissions (g/hr)		45			21			31			158		
VOC Emissions (g/hr)		53			24			37			188		
Dilemma Vehicles (#)		0			0			0			0		
Queue Length 50th (ft)		128			54			107			352		
Queue Length 95th (ft)		212			99			171			#587		
Internal Link Dist (ft)		195			426			50			322		
Turn Bay Length (ft)													
Base Capacity (vph)		493			640			731			709		
Starvation Cap Reductn		119			0			374			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.71			0.20			0.76			0.96		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 84 (93%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 40.1 Intersection LOS: D
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West 4th Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	5	245	1	1	394
Future Volume (Veh/h)	8	5	245	1	1	394
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.54	0.54	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	15	9	258	1	1	410
Pedestrians	16					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			135			130
pX, platoon unblocked	0.66					
vC, conflicting volume	686	276			275	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264	276			275	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	472	756			1280	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	259	411
Volume Left	15	0	1
Volume Right	9	1	0
cSH	550	1700	1280
Volume to Capacity	0.04	0.15	0.00
Queue Length 95th (ft)	3	0	0
Control Delay (s)	11.8	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	11.8	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		31.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2
Lane Configurations							
Traffic Volume (vph)	694	246	0	664	376	26	
Future Volume (vph)	694	246	0	664	376	26	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.991		
Flt Protected					0.955		
Satd. Flow (prot)	3574	1599	0	3574	1749	0	
Flt Permitted					0.955		
Satd. Flow (perm)	3574	1599	0	3574	1749	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		251			4		
Link Speed (mph)	30			30	30		
Link Distance (ft)	86			356	135		
Travel Time (s)	2.0			8.1	3.1		
Confl. Bikes (#/hr)		11					
Peak Hour Factor	0.98	0.98	0.97	0.97	0.92	0.92	
Heavy Vehicles (%)	1%	1%	0%	1%	3%	0%	
Adj. Flow (vph)	708	251	0	685	409	28	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	708	251	0	685	437	0	
Turn Type	NA	pt+ov		NA	Prot		
Protected Phases	1	1 3		1	3		2
Permitted Phases							
Detector Phase	1	1 3		1	3		
Switch Phase							
Minimum Initial (s)	8.0			8.0	8.0		1.0
Minimum Split (s)	13.0			13.0	15.0		32.0
Total Split (s)	27.0			27.0	41.0		32.0
Total Split (%)	27.0%			27.0%	41.0%		32%
Maximum Green (s)	22.0			22.0	34.0		28.0
Yellow Time (s)	3.0			3.0	3.0		2.0
All-Red Time (s)	2.0			2.0	4.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0		
Total Lost Time (s)	5.0			5.0	7.0		
Lead/Lag	Lead			Lead			Lag
Lead-Lag Optimize?	Yes			Yes			Yes
Vehicle Extension (s)	2.0			2.0	2.0		3.0
Recall Mode	C-Max			C-Max	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							21.0
Pedestrian Calls (#/hr)							63
Act Effct Green (s)	34.0	70.4		34.0	28.4		
Actuated g/C Ratio	0.34	0.70		0.34	0.28		
v/c Ratio	0.58	0.21		0.56	0.88		
Control Delay	34.1	1.4		18.1	52.3		
Queue Delay	0.0	0.0		0.1	54.6		
Total Delay	34.1	1.4		18.2	106.9		
LOS	C	A		B	F		
Approach Delay	25.5			18.2	106.9		
Approach LOS	C			B	F		
Stops (vph)	550	14		498	370		
Fuel Used(gal)	8	0		7	7		
CO Emissions (g/hr)	581	22		492	472		
NOx Emissions (g/hr)	113	4		96	92		
VOC Emissions (g/hr)	135	5		114	109		
Dilemma Vehicles (#)	0	0		0	0		
Queue Length 50th (ft)	217	0		209	259		
Queue Length 95th (ft)	#337	27		#322	358		
Internal Link Dist (ft)	6			276	55		
Turn Bay Length (ft)							
Base Capacity (vph)	1215	1189		1215	597		
Starvation Cap Reductn	0	0		34	206		
Spillback Cap Reductn	0	0		0	25		
Storage Cap Reductn	0	0		0	0		
Reduced v/c Ratio	0.58	0.21		0.58	1.12		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 78 (78%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 40.2 Intersection LOS: D
Intersection Capacity Utilization 51.6% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Dorchester Ave & A Street

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	909	4	0	1040	0	31
Future Volume (Veh/h)	909	4	0	1040	0	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.97	0.97	0.78	0.78
Hourly flow rate (vph)	928	4	0	1072	0	40
Pedestrians					130	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					12	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				86		
pX, platoon unblocked					0.84	
vC, conflicting volume			1062		1596	596
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1062		1333	596
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	90
cM capacity (veh/h)			581		109	396

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total	619	313	536	536	40
Volume Left	0	0	0	0	0
Volume Right	0	4	0	0	40
cSH	1700	1700	1700	1700	396
Volume to Capacity	0.36	0.18	0.32	0.32	0.10
Queue Length 95th (ft)	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	15.1
Lane LOS					C
Approach Delay (s)	0.0		0.0		15.1
Approach LOS					C

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	35.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	158	95	2	6	210	16	9	302	6	16	225	200	
Future Volume (vph)	158	95	2	6	210	16	9	302	6	16	225	200	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00			1.00			1.00			0.99		
Frt		0.999			0.990			0.997			0.939		
Flt Protected		0.970			0.999			0.999			0.998		
Satd. Flow (prot)	0	1800	0	0	1858	0	0	1805	0	0	1746	0	
Flt Permitted		0.572			0.991			0.986			0.983		
Satd. Flow (perm)	0	1062	0	0	1843	0	0	1782	0	0	1720	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)					4			1			54		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		275			506			130			402		
Travel Time (s)		6.3			11.5			3.0			9.1		
Confl. Bikes (#/hr)			15			11			14			3	
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.94	0.94	0.94	
Heavy Vehicles (%)	3%	1%	0%	0%	1%	0%	0%	5%	0%	0%	0%	2%	
Adj. Flow (vph)	170	102	2	7	244	19	10	328	7	17	239	213	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	274	0	0	270	0	0	345	0	0	469	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		5			5			1			1		2
Permitted Phases	5			5			1			1			
Detector Phase	5	5		5	5		1	1		1	1		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		1.0
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0		19.0
Total Split (s)	32.0	32.0		32.0	32.0		39.0	39.0		39.0	39.0		19.0
Total Split (%)	35.6%	35.6%		35.6%	35.6%		43.3%	43.3%		43.3%	43.3%		21%
Maximum Green (s)	27.0	27.0		27.0	27.0		35.0	35.0		35.0	35.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			4.0			4.0		
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													107
Act Effct Green (s)		30.8			30.8			35.0			35.0		
Actuated g/C Ratio		0.34			0.34			0.39			0.39		
v/c Ratio		0.75			0.43			0.50			0.67		
Control Delay		44.3			26.9			23.9			25.6		
Queue Delay		2.1			0.0			12.7			0.0		
Total Delay		46.4			26.9			36.6			25.6		
LOS		D			C			D			C		
Approach Delay		46.4			26.9			36.6			25.6		
Approach LOS		D			C			D			C		
Stops (vph)		209			178			232			322		
Fuel Used(gal)		4			3			3			5		
CO Emissions (g/hr)		280			221			220			381		
NOx Emissions (g/hr)		54			43			43			74		
VOC Emissions (g/hr)		65			51			51			88		
Dilemma Vehicles (#)		0			0			0			0		
Queue Length 50th (ft)		146			123			145			191		
Queue Length 95th (ft)		#289			187			226			302		
Internal Link Dist (ft)		195			426			50			322		
Turn Bay Length (ft)													
Base Capacity (vph)		363			633			693			701		
Starvation Cap Reductn		26			0			322			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.81			0.43			0.93			0.67		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 32.8 Intersection LOS: C
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West 4th Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	1	316	1	2	231
Future Volume (Veh/h)	2	1	316	1	2	231
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.38	0.38	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	5	3	343	1	2	243
Pedestrians	18					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			135			130
pX, platoon unblocked						
vC, conflicting volume	608	364			362	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	608	364			362	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	453	671			1187	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	344	245
Volume Left	5	0	2
Volume Right	3	1	0
cSH	516	1700	1187
Volume to Capacity	0.02	0.20	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	12.1	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.1	0.0	0.1
Approach LOS	B		

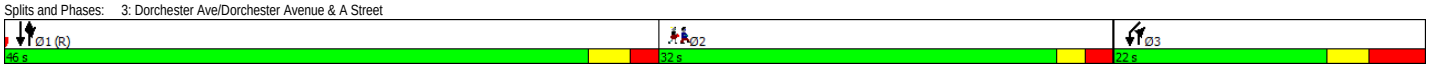
Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		27.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2
Lane Configurations							
Traffic Volume (vph)	1214	317	0	358	215	18	
Future Volume (vph)	1214	317	0	358	215	18	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.990		
Flt Protected					0.956		
Satd. Flow (prot)	3574	1524	0	3471	1734	0	
Flt Permitted					0.956		
Satd. Flow (perm)	3574	1524	0	3471	1734	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		323			4		
Link Speed (mph)	30			30	30		
Link Distance (ft)	86			356	135		
Travel Time (s)	2.0			8.1	3.1		
Confl. Bikes (#/hr)		12					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.95	0.95	
Heavy Vehicles (%)	1%	6%	0%	4%	4%	0%	
Adj. Flow (vph)	1239	323	0	365	226	19	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1239	323	0	365	245	0	
Turn Type	NA	pt+ov		NA	Prot		
Protected Phases	1	1 3		1	3		2
Permitted Phases							
Detector Phase	1	1 3		1	3		
Switch Phase							
Minimum Initial (s)	8.0			8.0	8.0		1.0
Minimum Split (s)	13.0			13.0	15.0		32.0
Total Split (s)	46.0			46.0	22.0		32.0
Total Split (%)	46.0%			46.0%	22.0%		32%
Maximum Green (s)	41.0			41.0	15.0		28.0
Yellow Time (s)	3.0			3.0	3.0		2.0
All-Red Time (s)	2.0			2.0	4.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0		
Total Lost Time (s)	5.0			5.0	7.0		
Lead/Lag	Lead			Lead			Lag
Lead-Lag Optimize?	Yes			Yes			Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0
Recall Mode	C-Max			C-Max	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							21.0
Pedestrian Calls (#/hr)							63
Act Effct Green (s)	47.5	70.4		47.5	14.9		
Actuated g/C Ratio	0.48	0.70		0.48	0.15		
v/c Ratio	0.73	0.28		0.22	0.94		
Control Delay	27.0	1.5		28.9	84.4		
Queue Delay	0.4	0.0		0.0	4.2		
Total Delay	27.4	1.5		28.9	88.6		
LOS	C	A		C	F		
Approach Delay	22.0			28.9	88.6		
Approach LOS	C			C	F		
Stops (vph)	964	15		313	198		
Fuel Used(gal)	13	0		5	5		
CO Emissions (g/hr)	896	27		338	373		
NOx Emissions (g/hr)	174	5		66	73		
VOC Emissions (g/hr)	208	6		78	87		
Dilemma Vehicles (#)	0	0		0	0		
Queue Length 50th (ft)	367	0		115	154		
Queue Length 95th (ft)	461	30		166	#303		
Internal Link Dist (ft)	6			276	55		
Turn Bay Length (ft)							
Base Capacity (vph)	1697	1157		1648	263		
Starvation Cap Reductn	0	0		0	7		
Spillback Cap Reductn	115	0		0	0		
Storage Cap Reductn	0	0		0	0		
Reduced v/c Ratio	0.78	0.28		0.22	0.96		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 22 (22%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 30.7 Intersection LOS: C
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Dorchester Ave/Dorchester Avenue & A Street



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1469	5	0	573	0	62
Future Volume (Veh/h)	1469	5	0	573	0	62
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.82	0.82
Hourly flow rate (vph)	1499	5	0	585	0	76
Pedestrians					63	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				86		
pX, platoon unblocked					0.94	
vC, conflicting volume			1567		1857	815
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1567		1784	815
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	75
cM capacity (veh/h)			401		66	299

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total	999	505	292	292	76
Volume Left	0	0	0	0	0
Volume Right	0	5	0	0	76
cSH	1700	1700	1700	1700	299
Volume to Capacity	0.59	0.30	0.17	0.17	0.25
Queue Length 95th (ft)	0	0	0	0	25
Control Delay (s)	0.0	0.0	0.0	0.0	21.1
Lane LOS					C
Approach Delay (s)	0.0		0.0		21.1
Approach LOS					C

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	159	123	3	4	119	9	4	269	10	6	461	307	
Future Volume (vph)	159	123	3	4	119	9	4	269	10	6	461	307	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00			1.00			1.00			0.99		
Frt		0.999			0.991			0.995			0.946		
Flt Protected		0.973			0.999			0.999					
Satd. Flow (prot)	0	1846	0	0	1878	0	0	1887	0	0	1762	0	
Flt Permitted		0.746			0.992			0.993			0.998		
Satd. Flow (perm)	0	1415	0	0	1865	0	0	1876	0	0	1759	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		1			4			2			43		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		275			506			130			402		
Travel Time (s)		6.3			11.5			3.0			9.1		
Confl. Bikes (#/hr)			15			4			2			15	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	166	128	3	4	129	10	4	292	11	6	490	327	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	297	0	0	143	0	0	307	0	0	823	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		5			5			1			1		2
Permitted Phases	5			5			1			1			
Detector Phase	5	5		5	5		1	1		1	1		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		1.0
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0		19.0
Total Split (s)	32.0	32.0		32.0	32.0		39.0	39.0		39.0	39.0		19.0
Total Split (%)	35.6%	35.6%		35.6%	35.6%		43.3%	43.3%		43.3%	43.3%		21%
Maximum Green (s)	27.0	27.0		27.0	27.0		35.0	35.0		35.0	35.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			4.0			4.0		
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													91
Act Effct Green (s)		30.8			30.8			35.0			35.0		
Actuated g/C Ratio		0.34			0.34			0.39			0.39		
v/c Ratio		0.61			0.22			0.42			1.16		
Control Delay		33.2			23.7			22.2			113.7		
Queue Delay		3.4			0.0			6.6			0.0		
Total Delay		36.6			23.7			28.8			113.7		
LOS		D			C			C			F		
Approach Delay		36.6			23.7			28.8			113.7		
Approach LOS		D			C			C			F		
Stops (vph)		239			92			198			609		
Fuel Used(gal)		4			2			3			24		
CO Emissions (g/hr)		270			117			185			1657		
NOx Emissions (g/hr)		53			23			36			322		
VOC Emissions (g/hr)		63			27			43			384		
Dilemma Vehicles (#)		0			0			0			0		
Queue Length 50th (ft)		148			59			124			~546		
Queue Length 95th (ft)		#245			107			195			#773		
Internal Link Dist (ft)		195			426			50			322		
Turn Bay Length (ft)													
Base Capacity (vph)		485			641			730			710		
Starvation Cap Reductn		109			0			365			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.79			0.22			0.84			1.16		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 84 (93%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 74.3 Intersection LOS: E
Intersection Capacity Utilization 80.7% ICU Level of Service D
Analysis Period (min) 15

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

Splits and Phases: 1: A Street & West 4th Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	5	278	1	1	467
Future Volume (Veh/h)	8	5	278	1	1	467
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.54	0.54	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	15	9	293	1	1	486
Pedestrians	16					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			135			130
pX, platoon unblocked	0.64					
vC, conflicting volume	798	310			310	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	395	310			310	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			100	
cM capacity (veh/h)	384	722			1243	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	294	487
Volume Left	15	0	1
Volume Right	9	1	0
cSH	466	1700	1243
Volume to Capacity	0.05	0.17	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	13.1	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	13.1	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay			0.4	
Intersection Capacity Utilization			35.7%	ICU Level of Service A
Analysis Period (min)			15	

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2
Lane Configurations							
Traffic Volume (vph)	773	279	0	764	448	27	
Future Volume (vph)	773	279	0	764	448	27	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.992		
Flt Protected					0.955		
Satd. Flow (prot)	3574	1599	0	3574	1750	0	
Flt Permitted					0.955		
Satd. Flow (perm)	3574	1599	0	3574	1750	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		285			3		
Link Speed (mph)	30			30	30		
Link Distance (ft)	86			356	135		
Travel Time (s)	2.0			8.1	3.1		
Confl. Bikes (#/hr)		11					
Peak Hour Factor	0.98	0.98	0.97	0.97	0.92	0.92	
Heavy Vehicles (%)	1%	1%	0%	1%	3%	0%	
Adj. Flow (vph)	789	285	0	788	487	29	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	789	285	0	788	516	0	
Turn Type	NA	pt+ov		NA	Prot		
Protected Phases	1	1 3		1	3		2
Permitted Phases							
Detector Phase	1	1 3		1	3		
Switch Phase							
Minimum Initial (s)	8.0			8.0	8.0		1.0
Minimum Split (s)	13.0			13.0	15.0		32.0
Total Split (s)	27.0			27.0	41.0		32.0
Total Split (%)	27.0%			27.0%	41.0%		32%
Maximum Green (s)	22.0			22.0	34.0		28.0
Yellow Time (s)	3.0			3.0	3.0		2.0
All-Red Time (s)	2.0			2.0	4.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0		
Total Lost Time (s)	5.0			5.0	7.0		
Lead/Lag	Lead			Lead			Lag
Lead-Lag Optimize?	Yes			Yes			Yes
Vehicle Extension (s)	2.0			2.0	2.0		3.0
Recall Mode	C-Max			C-Max	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							21.0
Pedestrian Calls (#/hr)							63
Act Effct Green (s)	30.6	70.4		30.6	31.8		
Actuated g/C Ratio	0.31	0.70		0.31	0.32		
v/c Ratio	0.72	0.24		0.72	0.93		
Control Delay	39.6	1.4		23.9	56.9		
Queue Delay	0.1	0.0		0.0	52.3		
Total Delay	39.7	1.4		23.9	109.2		
LOS	D	A		C	F		
Approach Delay	29.5			23.9	109.2		
Approach LOS	C			C	F		
Stops (vph)	615	14		575	423		
Fuel Used(gal)	10	0		9	8		
CO Emissions (g/hr)	710	24		630	583		
NOx Emissions (g/hr)	138	5		123	113		
VOC Emissions (g/hr)	164	6		146	135		
Dilemma Vehicles (#)	0	0		0	0		
Queue Length 50th (ft)	~267	0		~267	303		
Queue Length 95th (ft)	#397	28		#401	#491		
Internal Link Dist (ft)	6			276	55		
Turn Bay Length (ft)							
Base Capacity (vph)	1095	1204		1095	596		
Starvation Cap Reductn	0	0		0	229		
Spillback Cap Reductn	11	0		0	25		
Storage Cap Reductn	0	0		0	0		
Reduced v/c Ratio	0.73	0.24		0.72	1.41		

Intersection Summary

Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 78 (78%), Referenced to phase 1:NBSB, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 44.9		Intersection LOS: D	
Intersection Capacity Utilization 57.8%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 3: Dorchester Ave & A Street

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1020	4	0	1212	0	32
Future Volume (Veh/h)	1020	4	0	1212	0	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.97	0.97	0.78	0.78
Hourly flow rate (vph)	1041	4	0	1249	0	41
Pedestrians					130	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					12	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				86		
pX, platoon unblocked					0.80	
vC, conflicting volume			1175		1798	652
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1175		1500	652
tC, single (s)			4.1		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)			527		81	364

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total	694	351	624	624	41
Volume Left	0	0	0	0	0
Volume Right	0	4	0	0	41
cSH	1700	1700	1700	1700	364
Volume to Capacity	0.41	0.21	0.37	0.37	0.11
Queue Length 95th (ft)	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	16.2
Lane LOS					C
Approach Delay (s)	0.0		0.0		16.2
Approach LOS					C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	158	96	2	6	210	16	16	303	8	17	225	200	
Future Volume (vph)	158	96	2	6	210	16	16	303	8	17	225	200	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00			1.00			1.00			0.99		
Frt		0.999			0.990			0.997			0.939		
Flt Protected		0.970			0.999			0.998			0.998		
Satd. Flow (prot)	0	1801	0	0	1858	0	0	1805	0	0	1746	0	
Flt Permitted		0.573			0.991			0.972			0.981		
Satd. Flow (perm)	0	1064	0	0	1843	0	0	1758	0	0	1717	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)					4			2			54		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		275			506			130			402		
Travel Time (s)		6.3			11.5			3.0			9.1		
Confl. Bikes (#/hr)			15			11			14			3	
Peak Hour Factor	0.93	0.93	0.93	0.86	0.86	0.86	0.92	0.92	0.92	0.94	0.94	0.94	
Heavy Vehicles (%)	3%	1%	0%	0%	1%	0%	0%	5%	0%	0%	0%	2%	
Adj. Flow (vph)	170	103	2	7	244	19	17	329	9	18	239	213	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	275	0	0	270	0	0	355	0	0	470	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		5			5			1			1		2
Permitted Phases	5			5			1			1			
Detector Phase	5	5		5	5		1	1		1	1		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		1.0
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0		19.0
Total Split (s)	32.0	32.0		32.0	32.0		39.0	39.0		39.0	39.0		19.0
Total Split (%)	35.6%	35.6%		35.6%	35.6%		43.3%	43.3%		43.3%	43.3%		21%
Maximum Green (s)	27.0	27.0		27.0	27.0		35.0	35.0		35.0	35.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			4.0			4.0		
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													107
Act Effct Green (s)		30.8			30.8			35.0			35.0		
Actuated g/C Ratio		0.34			0.34			0.39			0.39		
v/c Ratio		0.76			0.43			0.52			0.67		
Control Delay		44.3			26.9			24.3			25.7		
Queue Delay		2.2			0.0			15.5			0.0		
Total Delay		46.5			26.9			39.7			25.7		
LOS		D			C			D			C		
Approach Delay		46.5			26.9			39.7			25.7		
Approach LOS		D			C			D			C		
Stops (vph)		210			178			241			322		
Fuel Used(gal)		4			3			3			5		
CO Emissions (g/hr)		281			221			229			383		
NOx Emissions (g/hr)		55			43			45			74		
VOC Emissions (g/hr)		65			51			53			89		
Dilemma Vehicles (#)		0			0			0			0		
Queue Length 50th (ft)		147			123			151			192		
Queue Length 95th (ft)		#291			187			234			303		
Internal Link Dist (ft)		195			426			50			322		
Turn Bay Length (ft)													
Base Capacity (vph)		364			633			684			700		
Starvation Cap Reductn		27			0			311			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.82			0.43			0.95			0.67		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 33.7 Intersection LOS: C
Intersection Capacity Utilization 68.1% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West 4th Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	11	316	4	2	231
Future Volume (Veh/h)	2	11	316	4	2	231
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.38	0.38	0.92	0.92	0.95	0.95
Hourly flow rate (vph)	5	29	343	4	2	243
Pedestrians	18					3
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			135			130
pX, platoon unblocked						
vC, conflicting volume	610	366			365	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	610	366			365	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			100	
cM capacity (veh/h)	452	670			1184	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	34	347	245
Volume Left	5	0	2
Volume Right	29	4	0
cSH	626	1700	1184
Volume to Capacity	0.05	0.20	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.1	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.1	0.0	0.1
Approach LOS	B		

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		27.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2
Lane Configurations							
Traffic Volume (vph)	1214	320	0	360	215	18	
Future Volume (vph)	1214	320	0	360	215	18	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.990		
Flt Protected					0.956		
Satd. Flow (prot)	3574	1524	0	3471	1734	0	
Flt Permitted					0.956		
Satd. Flow (perm)	3574	1524	0	3471	1734	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		327			4		
Link Speed (mph)	30			30	30		
Link Distance (ft)	86			356	135		
Travel Time (s)	2.0			8.1	3.1		
Confl. Bikes (#/hr)		12					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.95	0.95	
Heavy Vehicles (%)	1%	6%	0%	4%	4%	0%	
Adj. Flow (vph)	1239	327	0	367	226	19	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1239	327	0	367	245	0	
Turn Type	NA	pt+ov		NA	Prot		
Protected Phases	1	1 3		1	3		2
Permitted Phases							
Detector Phase	1	1 3		1	3		
Switch Phase							
Minimum Initial (s)	8.0			8.0	8.0		1.0
Minimum Split (s)	13.0			13.0	15.0		32.0
Total Split (s)	46.0			46.0	22.0		32.0
Total Split (%)	46.0%			46.0%	22.0%		32%
Maximum Green (s)	41.0			41.0	15.0		28.0
Yellow Time (s)	3.0			3.0	3.0		2.0
All-Red Time (s)	2.0			2.0	4.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0		
Total Lost Time (s)	5.0			5.0	7.0		
Lead/Lag	Lead			Lead			Lag
Lead-Lag Optimize?	Yes			Yes			Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0
Recall Mode	C-Max			C-Max	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							21.0
Pedestrian Calls (#/hr)							63
Act Effct Green (s)	47.5	70.4		47.5	14.9		
Actuated g/C Ratio	0.48	0.70		0.48	0.15		
v/c Ratio	0.73	0.28		0.22	0.94		
Control Delay	27.0	1.5		28.4	84.4		
Queue Delay	0.4	0.0		0.0	4.2		
Total Delay	27.4	1.5		28.4	88.6		
LOS	C	A		C	F		
Approach Delay	22.0			28.4	88.6		
Approach LOS	C			C	F		
Stops (vph)	964	16		313	198		
Fuel Used(gal)	13	0		5	5		
CO Emissions (g/hr)	896	28		336	373		
NOx Emissions (g/hr)	174	5		65	73		
VOC Emissions (g/hr)	208	6		78	87		
Dilemma Vehicles (#)	0	0		0	0		
Queue Length 50th (ft)	367	0		115	154		
Queue Length 95th (ft)	461	30		m165	#303		
Internal Link Dist (ft)	6			276	55		
Turn Bay Length (ft)							
Base Capacity (vph)	1697	1158		1648	263		
Starvation Cap Reductn	0	0		0	7		
Spillback Cap Reductn	115	0		0	0		
Storage Cap Reductn	0	0		0	0		
Reduced v/c Ratio	0.78	0.28		0.22	0.96		

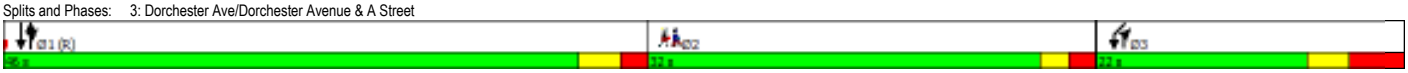
Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 22 (22%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 30.6 Intersection LOS: C
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15

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

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Dorchester Ave/Dorchester Avenue & A Street



Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1470	5	0	575	0	64
Future Volume (Veh/h)	1470	5	0	575	0	64
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.82	0.82
Hourly flow rate (vph)	1500	5	0	587	0	78
Pedestrians					63	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					6	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				86		
pX, platoon unblocked					0.94	
vC, conflicting volume			1568		1859	816
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1568		1785	816
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	74
cM capacity (veh/h)			401		66	299

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total	1000	505	294	294	78
Volume Left	0	0	0	0	0
Volume Right	0	5	0	0	78
cSH	1700	1700	1700	1700	299
Volume to Capacity	0.59	0.30	0.17	0.17	0.26
Queue Length 95th (ft)	0	0	0	0	26
Control Delay (s)	0.0	0.0	0.0	0.0	21.2
Lane LOS					C
Approach Delay (s)	0.0		0.0		21.2
Approach LOS					C

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	51.4%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	159	127	3	4	119	9	8	270	11	9	461	307	
Future Volume (vph)	159	127	3	4	119	9	8	270	11	9	461	307	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor		1.00			1.00			1.00			0.99		
Frt		0.999			0.991			0.995			0.947		
Flt Protected		0.973			0.999			0.999			0.999		
Satd. Flow (prot)	0	1846	0	0	1878	0	0	1887	0	0	1763	0	
Flt Permitted		0.749			0.992			0.979			0.995		
Satd. Flow (perm)	0	1421	0	0	1865	0	0	1849	0	0	1756	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		1			4			3			43		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		275			506			130			402		
Travel Time (s)		6.3			11.5			3.0			9.1		
Confl. Bikes (#/hr)			15			4			2			15	
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	166	132	3	4	129	10	9	293	12	10	490	327	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	301	0	0	143	0	0	314	0	0	827	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		5			5			1			1		2
Permitted Phases	5			5			1			1			
Detector Phase	5	5		5	5		1	1		1	1		
Switch Phase													
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0		1.0
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0		19.0
Total Split (s)	32.0	32.0		32.0	32.0		39.0	39.0		39.0	39.0		19.0
Total Split (%)	35.6%	35.6%		35.6%	35.6%		43.3%	43.3%		43.3%	43.3%		21%
Maximum Green (s)	27.0	27.0		27.0	27.0		35.0	35.0		35.0	35.0		17.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		2.0
All-Red Time (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0		0.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0		
Total Lost Time (s)		5.0			5.0			4.0			4.0		
Lead/Lag							Lead	Lead		Lead	Lead		Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		2.0
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max		None
Walk Time (s)													7.0
Flash Dont Walk (s)													10.0
Pedestrian Calls (#/hr)													91
Act Effct Green (s)		30.8			30.8			35.0			35.0		
Actuated g/C Ratio		0.34			0.34			0.39			0.39		
v/c Ratio		0.62			0.22			0.44			1.17		
Control Delay		33.4			23.7			22.4			116.5		
Queue Delay		3.7			0.0			7.2			0.0		
Total Delay		37.1			23.7			29.6			116.5		
LOS		D			C			C			F		
Approach Delay		37.1			23.7			29.6			116.5		
Approach LOS		D			C			C			F		
Stops (vph)		242			92			204			611		
Fuel Used(gal)		4			2			3			24		
CO Emissions (g/hr)		274			117			191			1695		
NOx Emissions (g/hr)		53			23			37			330		
VOC Emissions (g/hr)		64			27			44			393		
Dilemma Vehicles (#)		0			0			0			0		
Queue Length 50th (ft)		151			59			127			~551		
Queue Length 95th (ft)		#253			107			200			#779		
Internal Link Dist (ft)		195			426			50			322		
Turn Bay Length (ft)													
Base Capacity (vph)		487			641			720			709		
Starvation Cap Reductn		111			0			353			0		
Spillback Cap Reductn		0			0			0			0		
Storage Cap Reductn		0			0			0			0		
Reduced v/c Ratio		0.80			0.22			0.86			1.17		

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 84 (93%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 75.8 Intersection LOS: E
Intersection Capacity Utilization 81.5% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: A Street & West 4th Street

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	11	278	11	1	467
Future Volume (Veh/h)	8	11	278	11	1	467
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.54	0.54	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	15	20	293	12	1	486
Pedestrians	16					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			135			130
pX, platoon unblocked	0.64					
vC, conflicting volume	803	316			321	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	403	316			321	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	97			100	
cM capacity (veh/h)	380	717			1231	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	35	305	487
Volume Left	15	0	1
Volume Right	20	12	0
cSH	519	1700	1231
Volume to Capacity	0.07	0.18	0.00
Queue Length 95th (ft)	5	0	0
Control Delay (s)	12.4	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		35.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	Ø2
Lane Configurations							
Traffic Volume (vph)	773	289	0	765	448	27	
Future Volume (vph)	773	289	0	765	448	27	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.992		
Flt Protected					0.955		
Satd. Flow (prot)	3574	1599	0	3574	1750	0	
Flt Permitted					0.955		
Satd. Flow (perm)	3574	1599	0	3574	1750	0	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		295			3		
Link Speed (mph)	30			30	30		
Link Distance (ft)	86			356	135		
Travel Time (s)	2.0			8.1	3.1		
Confl. Bikes (#/hr)		11					
Peak Hour Factor	0.98	0.98	0.97	0.97	0.92	0.92	
Heavy Vehicles (%)	1%	1%	0%	1%	3%	0%	
Adj. Flow (vph)	789	295	0	789	487	29	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	789	295	0	789	516	0	
Turn Type	NA	pt+ov		NA	Prot		
Protected Phases	1	1 3		1	3		2
Permitted Phases							
Detector Phase	1	1 3		1	3		
Switch Phase							
Minimum Initial (s)	8.0			8.0	8.0		1.0
Minimum Split (s)	13.0			13.0	15.0		32.0
Total Split (s)	27.0			27.0	41.0		32.0
Total Split (%)	27.0%			27.0%	41.0%		32%
Maximum Green (s)	22.0			22.0	34.0		28.0
Yellow Time (s)	3.0			3.0	3.0		2.0
All-Red Time (s)	2.0			2.0	4.0		2.0
Lost Time Adjust (s)	0.0			0.0	0.0		
Total Lost Time (s)	5.0			5.0	7.0		
Lead/Lag	Lead			Lead			Lag
Lead-Lag Optimize?	Yes			Yes			Yes
Vehicle Extension (s)	2.0			2.0	2.0		3.0
Recall Mode	C-Max			C-Max	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							21.0
Pedestrian Calls (#/hr)							63
Act Effct Green (s)	30.6	70.4		30.6	31.8		
Actuated g/C Ratio	0.31	0.70		0.31	0.32		
v/c Ratio	0.72	0.24		0.72	0.93		
Control Delay	39.6	1.4		23.9	56.9		
Queue Delay	0.1	0.0		0.0	52.3		
Total Delay	39.7	1.4		23.9	109.2		
LOS	D	A		C	F		
Approach Delay	29.3			23.9	109.2		
Approach LOS	C			C	F		
Stops (vph)	615	15		574	423		
Fuel Used(gal)	10	0		9	8		
CO Emissions (g/hr)	710	25		631	583		
NOx Emissions (g/hr)	138	5		123	113		
VOC Emissions (g/hr)	164	6		146	135		
Dilemma Vehicles (#)	0	0		0	0		
Queue Length 50th (ft)	~267	0		~268	303		
Queue Length 95th (ft)	#397	29		#400	#491		
Internal Link Dist (ft)	6			276	55		
Turn Bay Length (ft)							
Base Capacity (vph)	1095	1207		1095	596		
Starvation Cap Reductn	0	0		0	229		
Spillback Cap Reductn	11	0		0	25		
Storage Cap Reductn	0	0		0	0		
Reduced v/c Ratio	0.73	0.24		0.72	1.41		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 78 (78%), Referenced to phase 1:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 44.8 Intersection LOS: D
Intersection Capacity Utilization 57.8% ICU Level of Service B
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Dorchester Ave & A Street

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1023	4	0	1213	0	39
Future Volume (Veh/h)	1023	4	0	1213	0	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.97	0.97	0.78	0.78
Hourly flow rate (vph)	1044	4	0	1251	0	50
Pedestrians					130	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					12	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				86		
pX, platoon unblocked					0.80	
vC, conflicting volume			1178		1802	654
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1178		1505	654
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	86
cM capacity (veh/h)			526		80	363

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total	696	352	626	626	50
Volume Left	0	0	0	0	0
Volume Right	0	4	0	0	50
cSH	1700	1700	1700	1700	363
Volume to Capacity	0.41	0.21	0.37	0.37	0.14
Queue Length 95th (ft)	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	16.5
Lane LOS					C
Approach Delay (s)	0.0		0.0		16.5
Approach LOS					C

Intersection Summary					
Average Delay	0.4				
Intersection Capacity Utilization	38.4%	ICU Level of Service	A		
Analysis Period (min)	15				

20 West Fifth Street, South Boston

Trip Generation Assessment

HOWARD STEIN HUDSON
20-Apr-2017

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate[1]	Unadjusted Person-Trips	Transit Share[3]	Transit Person-Trips	Walk/Bike/ Other Share[3]	Walk/ Bike/ Other Trips	Auto Share[3]	Auto Person-Trips	Assumed Local Auto Occupancy Rate[4]	Total Adjusted Auto Trips
Daily Peak Hour															
Apartment[5]	54	Total		6.650	360	1.13	**406**	23%	**94**	24%	**96**	53%	**216**	1.13	**192**
	units	In	50%	3.325	180	1.13	**203**	23%	**47**	24%	**48**	53%	**108**	1.13	**96**
		Out	50%	3.325	180	1.13	**203**	23%	**47**	24%	**48**	53%	**108**	1.13	**96**
Total		Total			**360**		**406**		**94**		**96**		**216**		**192**
		In			**180**		**203**		**47**		**48**		**108**		**96**
		Out			**180**		**203**		**47**		**48**		**108**		**96**
AM Peak Hour															
Apartment[5]	54	Total		0.51	28	1.13	**32**		**9**		**9**		**14**	1.13	**13**
	units	In	20%	0.102	6	1.13	**7**	29%	**2**	22%	**2**	49%	**3**	1.13	**3**
		Out	80%	0.408	22	1.13	**25**	26%	**7**	30%	**7**	44%	**11**	1.13	**10**
Total		Total			**28**		**32**		**9**		**9**		**14**		**13**
		In			**6**		**7**		**2**		**2**		**3**		**3**
		Out			**22**		**25**		**7**		**7**		**11**		**10**
PM Peak Hour															
Apartment[5]	54	Total		0.62	34	1.13	**39**		**11**		**10**		**18**	1.13	**16**
	units	In	65%	0.403	22	1.13	**25**	26%	**7**	30%	**7**	44%	**11**	1.13	**10**
		Out	35%	0.217	12	1.13	**14**	29%	**4**	22%	**3**	49%	**7**	1.13	**6**
Total		Total			**34**		**39**		**11**		**10**		**18**		**16**
		In			**22**		**25**		**7**		**7**		**11**		**10**
		Out			**12**		**14**		**4**		**3**		**7**		**6**

1. 2009 National vehicle occupancy rates - 1.13:home to work; 1.84: family/personal business; 1.78: shopping; 2.2 social/recreational
2. Based on ITE Trip Generation Handbook, 3rd Edition method
3. Mode shares based on peak-hour BTD Data for Area 8
4. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates
5. ITE Trip Generation Manual, 9th Edition, LUC 220 (Apartment), average rate

APPENDIX E – RESPONSE TO CLIMATE CHANGE QUESTIONNAIRE

Climate Change Preparedness and Resiliency Checklist for New Construction

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

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

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

Climate Change Analysis and Information Sources:

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

Checklist

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

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

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

Climate Change Resiliency and Preparedness Checklist

A.1 - Project Information

Project Name:	**The Ceinture**
Project Address Primary:	**20 West Fifth Street, South Boston, MA**
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	**Trinity Green Development LLC / Tim Russell/ Principal Rusdesign@att.net**

A.2 - Team Description

Owner / Developer:	**Trinity Green Development LLC**
Architect:	**Russell Design Associates**
Engineer (building systems):	**Not hired at this date**
Sustainability / LEED:	**Soden Sustainability**
Permitting:	**MLF Consulting LLC**
Construction Management:	**Trinity Green Development**
Climate Change Expert:	**Soden Sustainability Consulting**

A.3 - Project Permitting and Phase

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

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

A.4 - Building Classification and Description

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

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

☑ Wood Frame	☐ Masonry	☐ Steel Frame	☐ Concrete

Describe the building?

Site Area:	*18,991 SF*	Building Area:	*74,953 SF*
Building Height:	*70 Ft.*	Number of Stories:	*6 Flrs.*
First Floor Elevation (reference Boston City Base):	*17.0'-20' Elev.*	Are there below grade spaces/levels, if yes how many:	*No*

A.5 - Green Building

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

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

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

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

A.6 - Building Energy-

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

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

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

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

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

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

B - Extreme Weather and Heat Events

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

B.1 - Analysis

What is the full expected life of the project?

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

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

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

What time span of future Climate Conditions was considered?

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

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

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

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

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

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

30-90 Days	*0.2 Events / yr.*

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

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

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

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

B.2 - Mitigation Strategies

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

Building energy use below code:	***ASHRAE 90.1-2013***
How is performance determined:	Energy Modeling

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

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

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

Roof:	*R = 54*	Walls / Curtain Wall Assembly:	*R = 21*
Foundation:	*R = 10*	Basement / Slab:	*NA*
Windows:	*U =.29*	Doors:	*U =.29*

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

☐ On-site clean energy / CHP system(s)	☐ Building-wide power dimming	☐ Thermal energy storage systems	☐ Ground source heat pump
☐ On-site Solar PV	☐ On-site Solar Thermal	☐ Wind power	☑ None
Describe any added measures:	Study of solar will be performed		

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

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

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

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

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

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

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

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

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

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

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

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

C - Sea-Level Rise and Storms

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

C.1 - Location Description and Classification:

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

	No

Describe site conditions?

Site Elevation – Low/High Points:	*17.0'-20' Elev.(Ft.)*
Building Proximity to Water:	1,477ft

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

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

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

2013 FEMA Prelim. FIRMs:	*No*	Future floodplain delineation updates:	*No*

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

	1,477ft

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

C - Sea-Level Rise and Storms

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

C.2 - Analysis

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

Sea Level Rise:	*3 Ft.*	Frequency of storms:	*0.25 per year*

C.3 - Building Flood Proofing

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

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

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

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

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

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

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

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

Yes / No

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

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

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

Yes / No

If Yes, describe:

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

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

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

C.4 - Building Resilience and Adaptability

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

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

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

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

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

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

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

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

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

APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

Accessibility Checklist

(to be added to the BRA Development Review Guidelines)

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

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

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

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

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

Accessibility Analysis Information Sources:

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

Project Information

Project Name:	The Ceinture
Project Address Primary:	20 West Fifth Street, South Boston, MA
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	Trinity Green Development LLC/ Thomas G. Broderick, Jr/ Principal 617-281-1833

Team Description

Owner / Developer:	Trinity Green Development LLC
Architect:	Russell Design Associates
Engineer (building systems):	n/a
Sustainability / LEED:	Soden Sustainability
Permitting:	MLF Consulting LLC
Construction Management:	Trinity Green Development

Project Permitting and Phase

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

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

Building Classification and Description

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

	Residential – One to Three Unit	☑ Residential - Multi-unit, Four +	Institutional	Education
	Commercial	Office	Retail	Assembly
	Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)	*Residential, Amenity Space, Accessory Retail Space*			

What is the Construction Type – select most appropriate type?

	☑ Wood Frame	Masonry	Steel Frame	Concrete

Describe the building?

Site Area:	18,991 SF	Building Area:	Approx. 74,953 GSF +/-
Building Height:	70'	Number of Stories:	6
First Floor Elevation:	Varying, 17.0'-20.0' +/- across the site. *Final Elevation to be determined during Construction Drawing phase*	Are there below grade spaces:	*Yes / ☑No*

Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the development neighborhood and identifying characteristics.	The Ceinture at 20 West Fifth is located in South Boston. South Boston has an interesting blend of socio-economic and cultural diversity that is reflected in local businesses and residents. The parcel is bounded by West Fifth Street, a small parcel fronting on A Street, Gold Street and South Boston Haul Road. The proportion of the site is approximately 220' x 100'. The site is approximately flat, with a steep slope to the haul road to the South. West Fifth and Gold Street slope to the South, West Fifth to a bridge over the Haul Road, Gold to a bridge that has been demolished. The existing sidewalk along West Fifth Street is in good condition and there is a bus stop located along Dorchester Avenue just south of the Site. The urban context that surrounds the site is a mix of apartment, local business, and industrial uses as well as the MBTA Broadway Station.
List the surrounding ADA compliant MBTA transit lines and the proximity to the development site: Commuter rail, subway, bus, etc.	Broadway MBTA Station (0.25 miles away – three blocks away along Dorchester Avenue) • Red Line Subway • Busses 9, 11, 47
List the surrounding institutions: hospitals, public housing and elderly and disabled housing developments, educational facilities, etc.	**Affordable/Public Housing:** West Broadway **School:** J F Condon School **Public Library:** Boston Public Library (South Boston Branch) **Community Centers:** Condon Community Center, Action Center **Police:** Boston Police District C-6 South Boston **Hospital:** South Boston Community Health Center
Is the proposed development on a priority accessible route to a key public use facility? List the surrounding: government buildings, libraries, community centers and recreational facilities and other related facilities.	Site is located 0.25 miles from Broadway Station that links the site to major Boston public facilities.

Surrounding Site Conditions – Existing:

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

Are there sidewalks and pedestrian ramps existing at the development site?	Yes, an existing sidewalk abuts the project site to the west and east. The existing sidewalk includes pedestrian ramps.
If yes above, list the existing sidewalk and pedestrian ramp materials and physical condition at the development site.	The existing sidewalk material is concrete with granite curbing. The physical condition of the existing concrete sidewalk and pedestrian ramps is good.
Are the sidewalks and pedestrian ramps existing-to-remain? If yes, have the sidewalks and pedestrian ramps been verified as compliant? If yes, please provide surveyors report.	Yes with modifications for new driveway entrances into the property. No, the existing sidewalks and pedestrian ramps have not been verified as being in compliance at this time but will be verified during the project design.
Is the development site within a historic district? If yes, please identify.	No

Surrounding Site Conditions – Proposed

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

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

If yes above, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, Boulevard.	Neighborhood Connector
What is the total width of the proposed sidewalk? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone.	The sidewalk along West Fifth is approximately 8 feet (including the curb) depending on the location in the project. All other items are not applicable.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	The paving material for the sidewalk will be poured in place concrete.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the City of Boston Public Improvement Commission?	NA
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way?	No
If yes above, what are the proposed dimensions of the sidewalk café or furnishings and what will the right-of-way clearance be?	

Proposed Accessible Parking:

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

What is the total number of parking spaces provided at the development site parking lot or garage?	41 spaces

What is the total number of accessible spaces provided at the development site?	2 spaces
Will any on street accessible parking spaces be required? **If yes,** has the proponent contacted the Commission for Persons with Disabilities and City of Boston Transportation Department regarding this need?	No
Where is accessible visitor parking located?	In enclosed garage
Has a drop-off area been identified? **If yes,** will it be accessible?	No drop-off area.
Include a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations. Please include route distances.	See attached F1 – F7 drawings

Circulation and Accessible Routes:

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

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

Provide a diagram of the accessible route connections through the site.	The accessible route is along the West Fifth Street sidewalk. All entryways to the building will be accessible. See attached first floor plan for reference.
Describe accessibility at each entryway: Flush Condition, Stairs, Ramp Elevator.	Flush Condition at most if not all entryway locations. Ramps to be added where/if needed. This will enable access and promote “Visit-ability”. The apartment building is serviced by an elevator and flush condition at the entryway. All common areas are accessible and all units will have good “Visit-ability”.
Are the accessible entrance and the standard entrance integrated?	Yes

If no above, what is the reason?	
Will there be a roof deck or outdoor courtyard space? If yes, include diagram of the accessible route.	Yes
Has an accessible routes way-finding and signage package been developed? If yes, please describe.	Not yet but all future way finding signage will be developed to meet Building Code and Accessibility Board Requirements

Accessible Units: (If applicable)

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

What is the total number of proposed units for the development?	54units +/-
How many units are for sale; how many are for rent? What is the market value vs. affordable breakdown?	All units are for sale.
How many accessible units are being proposed?	As prescribed by 521 CMR AAB all units are Group I Dwelling Units.
Please provide plan and diagram of the accessible units.	NA
How many accessible units will also be affordable? If none, please describe reason.	NA
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

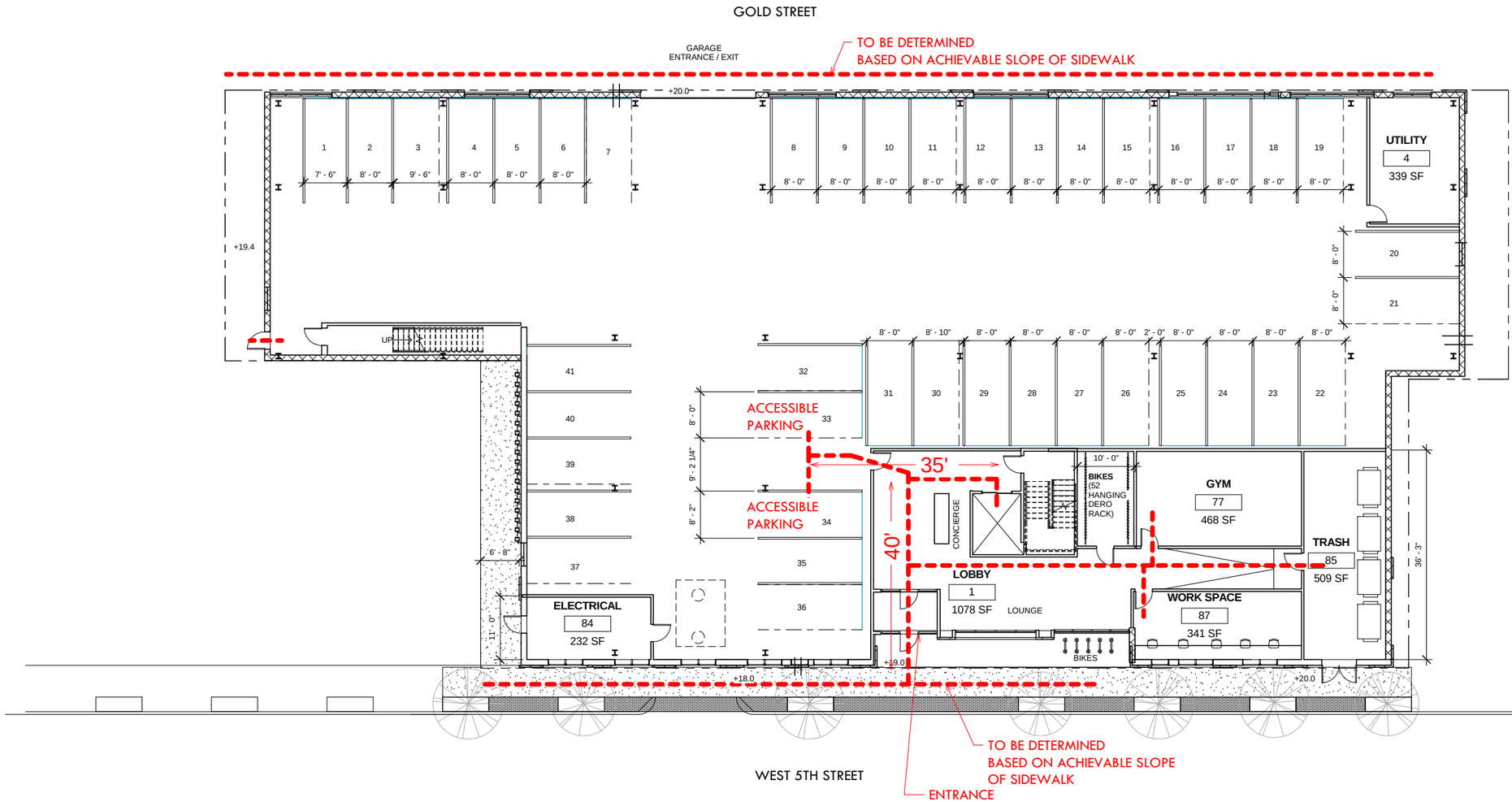
Has the proponent reviewed or presented the proposed plan to the City of Boston Mayor's Commission for Persons with Disabilities Advisory Board?	No,
Did the Advisory Board vote to support this project? **If no,** what recommendations did the Advisory Board give to make this project more accessible?	NA

Thank you for completing the Accessibility Checklist!

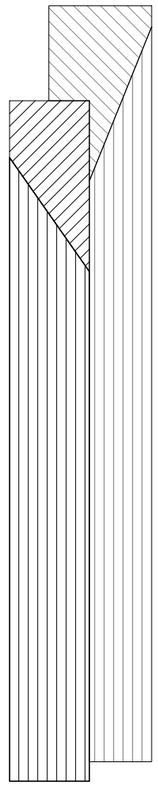
For questions or comments about this checklist or accessibility practices, please contact:

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

RUSSELL DESIGN
ASSOCIATES



ACCESSIBLE ROUTE

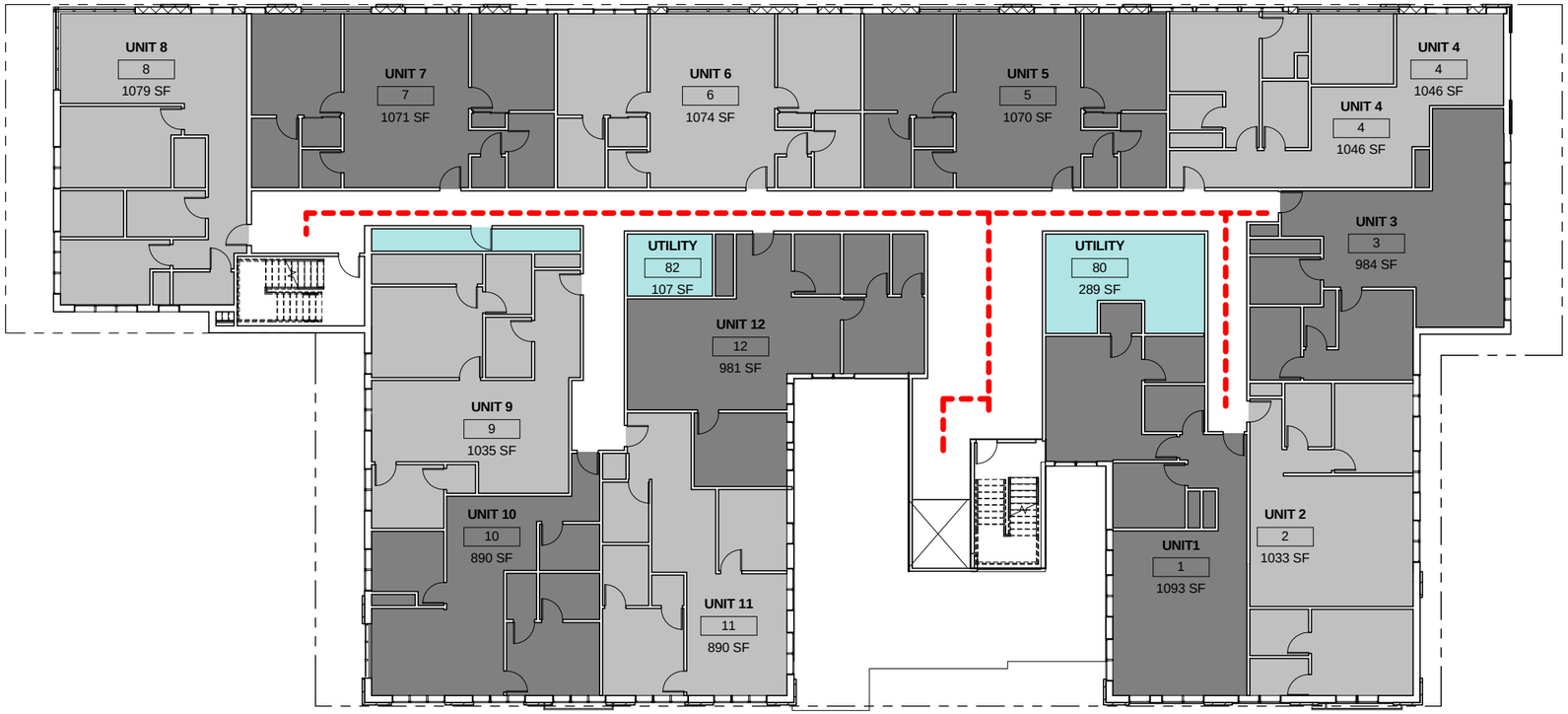


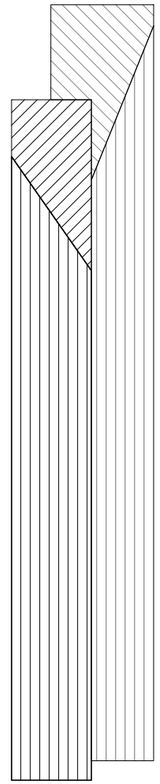
20 WEST 5TH
SOUTH BOSTON

① Level 1 Accessibility
3/32" = 1'-0"

LEVEL 1
ACCESSIBLE ROUTE
FIGURE
F-1

RUSSELL DESIGN ASSOCIATES





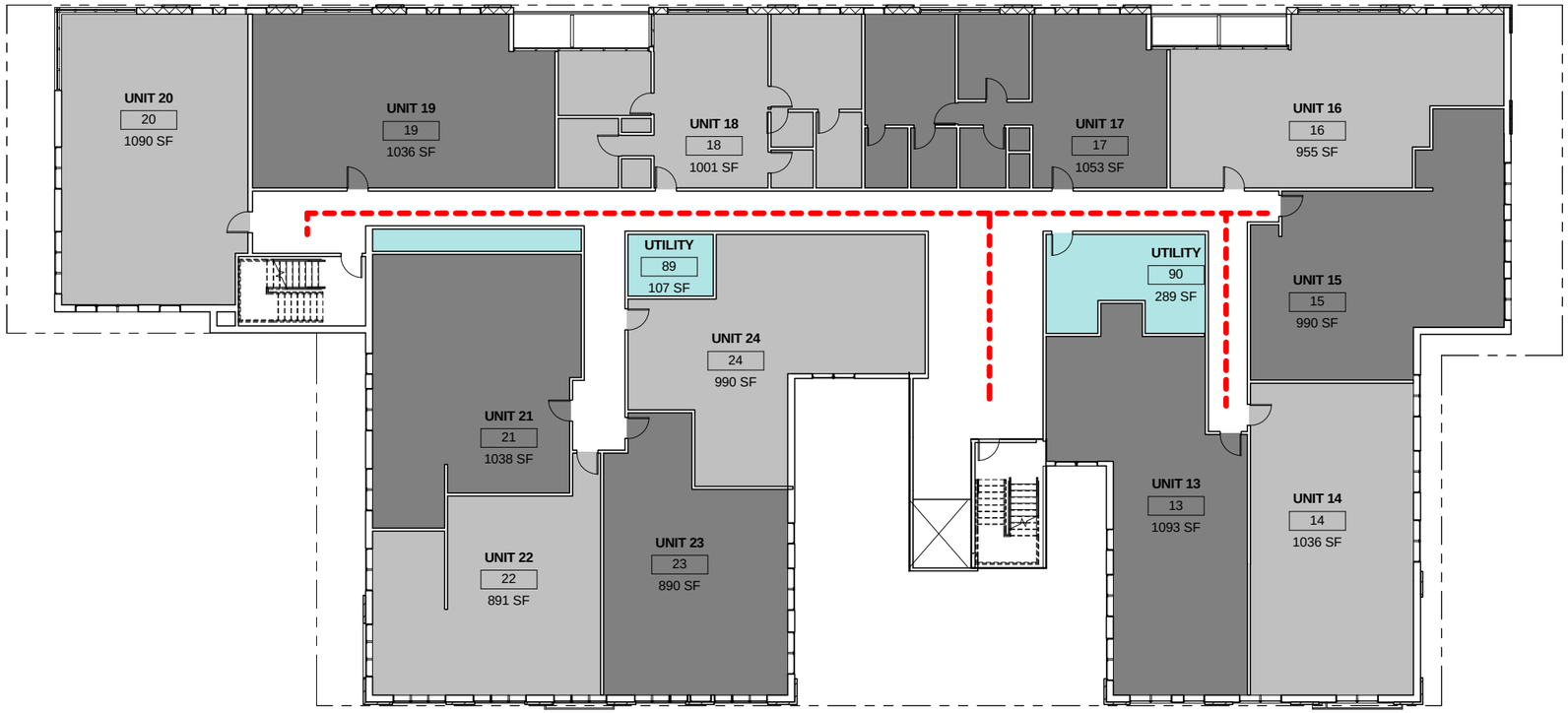
20 WEST 5TH
SOUTH BOSTON

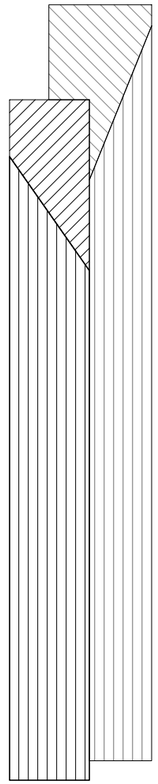
ACCESSIBLE ROUTE

① Level 2 Accessibility
3/32" = 1'-0"

LEVEL 2
ACCESSIBLE ROUTE
FIGURE
F-2

RUSSELL DESIGN ASSOCIATES





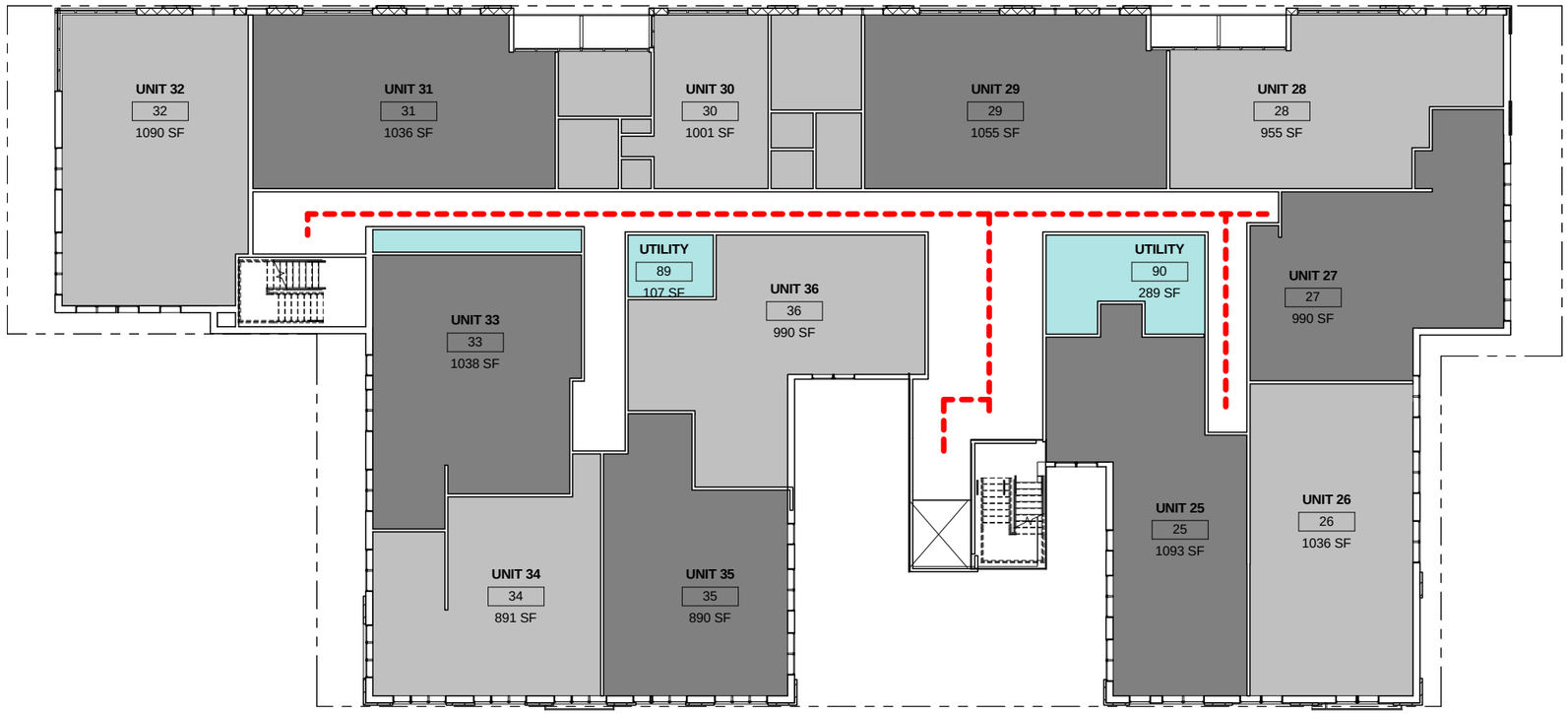
20 WEST 5TH
SOUTH BOSTON

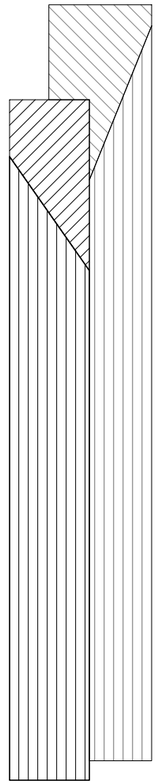
ACCESSIBLE ROUTE

① Level 3 Accessibility
3/32" = 1'-0"

LEVEL 3
ACCESSIBLE ROUTE
FIGURE
F-3

RUSSELL DESIGN ASSOCIATES





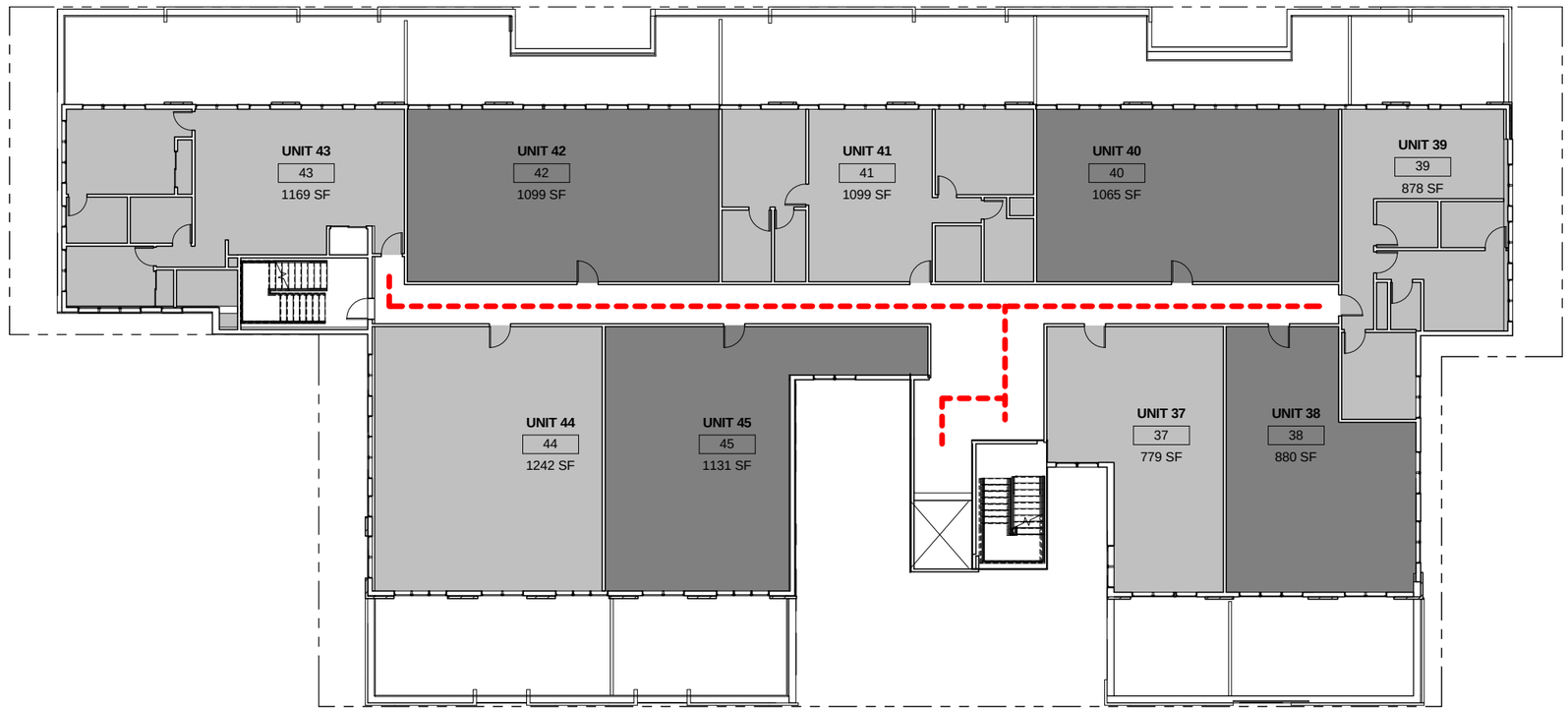
20 WEST 5TH
SOUTH BOSTON

ACCESSIBLE ROUTE

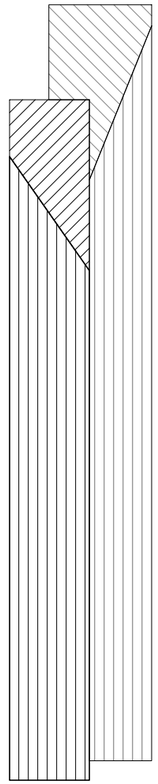
1 Level 4 Accessibility
3/32" = 1'-0"

LEVEL 4
ACCESSIBLE ROUTE
FIGURE
F-4

RUSSELL DESIGN ASSOCIATES



ACCESSIBLE ROUTE

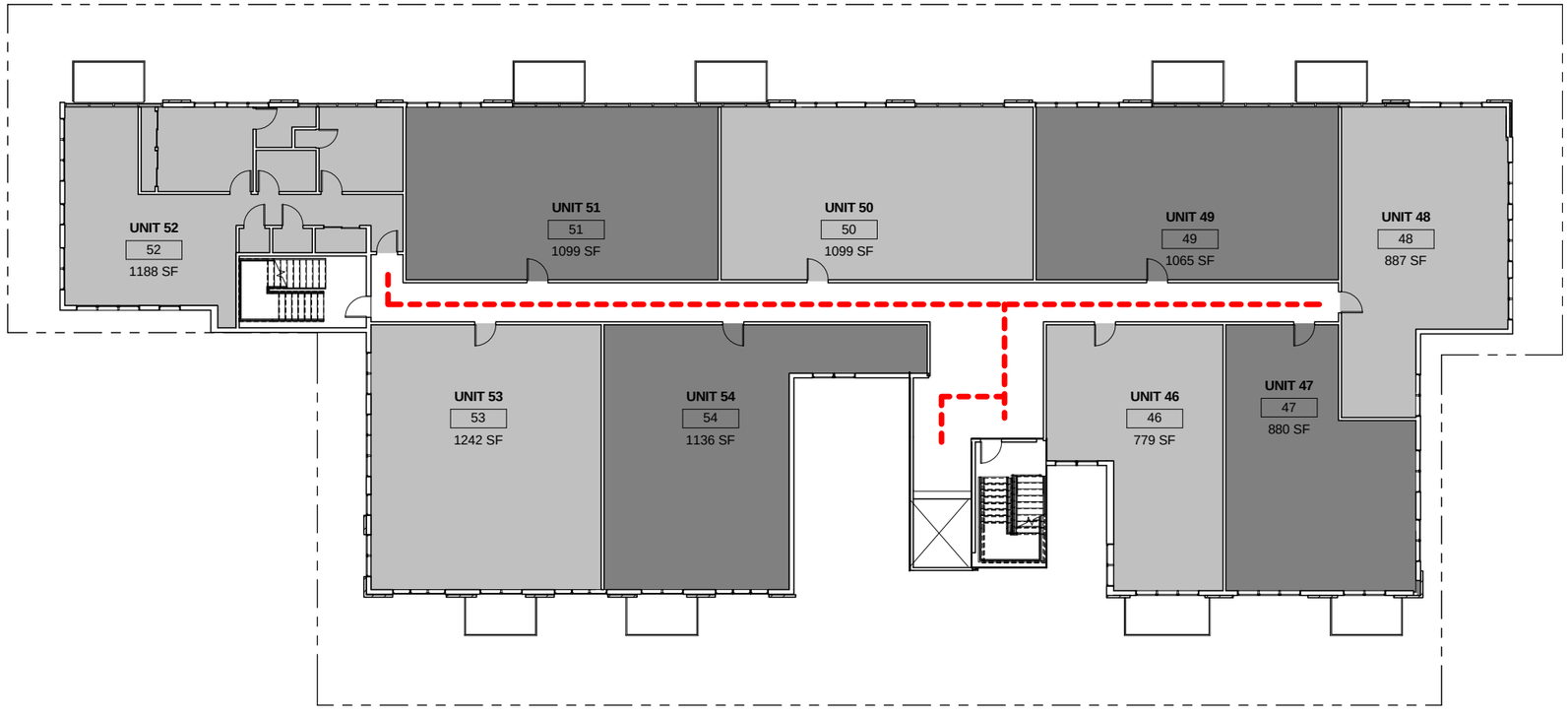


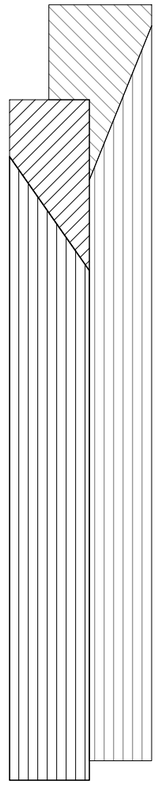
20 WEST 5TH
SOUTH BOSTON

1 Level 5 Accessibility
3/32" = 1'-0"

LEVEL 5
ACCESSIBLE ROUTE
FIGURE
F-5

RUSSELL DESIGN ASSOCIATES





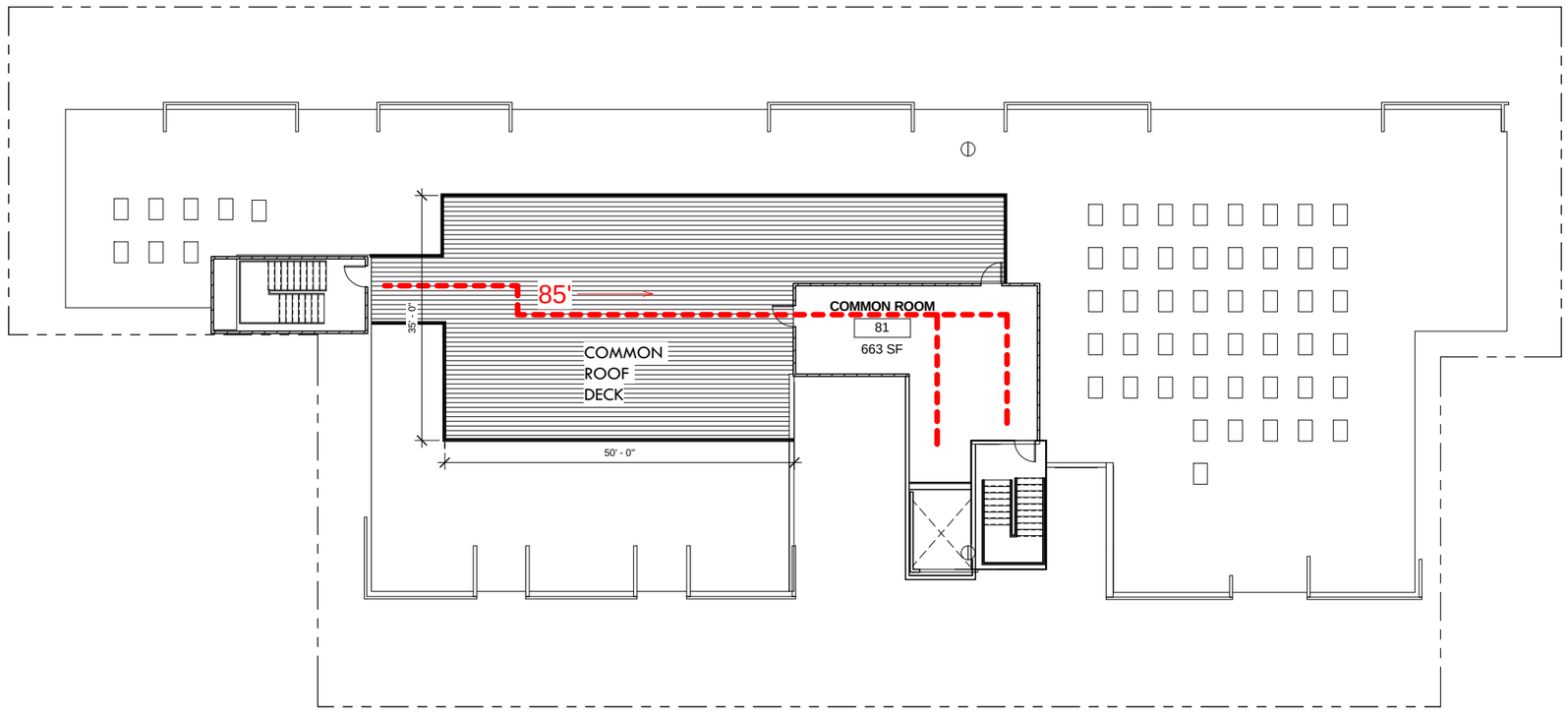
20 WEST 5TH
SOUTH BOSTON

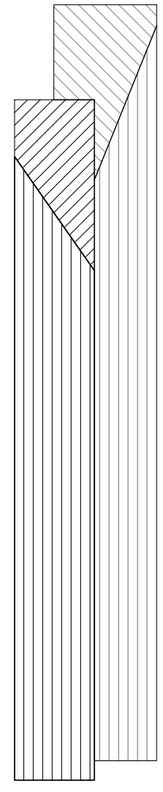
ACCESSIBLE ROUTE

① Level 6 Accessibility
3/32" = 1'-0"

LEVEL 6
ACCESSIBLE ROUTE
FIGURE
F-6

RUSSELL DESIGN ASSOCIATES





20 WEST 5TH
SOUTH BOSTON

ACCESSIBLE ROUTE

① ROOF Accessibility
3/32" = 1'-0"

ROOF LEVEL
ACCESSIBLE ROUTE
FIGURE
F-7

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ASSOCIATES