150 Kneeland Street
Leather District

PROJECT NOTIFICATION FORM **June 25, 2018**

Submitted Pursuant to Article 80B
of the Boston Zoning Code

SUBMITTED BY

HUDSON GROUP

Hudson 150K Real Estate Trust
(an affiliate of Hudson Group)
120 Kingston Street, Suite 610
Boston, MA 02111

SUBMITTED TO

boston planning & development agency

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

PREPARED BY

MLF CONSULTING LLC

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

IN ASSOCIATION WITH

RODE ARCHITECTS INC

RODE Architects Inc.
Dain, Torpy, LeRay, Wiest & Garner
Howard Stein Hudson
Soden Sustainability
Tremont Preservation Services
Haley & Aldrich, Inc.
RWDI
Cosentini Associates
Tech Environmental, Inc.

HUDSON GROUP

June 25, 2018

Mr. Brian Golden, Director
Boston Planning & Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201
Attention: Michael Sinatra, Project Manager

Re: Project Notification Form
150 Kneeland Street | Leather District Hotel Development

Dear Director Golden:

Hudson Group has been dedicated to the Leather District for 25 years, having undertaken a mix of rental, condominium, office, and retail projects in the immediate area. These include adaptive reuse redevelopments on South and Lincoln Streets and a new-construction multifamily development at 120 Kingston Street (Radian), which resulted in the creation of 72 affordable housing units in Chinatown. Through our affiliate, Hudson 150K Real Estate Trust, and in accordance with the applicable Executive Orders governing development projects in Boston subject to Large Project Review under the Boston Zoning Code, we are now pleased to submit this Project Notification Form ("PNF") to redevelop the property at 150 Kneeland Street in the Leather District neighborhood of Boston.

As outlined in a Letter of Intent (LOI) dated March 20, 2018, Hudson proposes to develop a new boutique hotel comprising approximately 230 rooms and featuring active ground level retail and hospitality support space (the "Project"). The site is currently occupied by a vacant structure that is in disrepair, which will be demolished in its entirety to allow the project to proceed.

As further discussed in the PNF, the slender building proportions, small footprint, and close proximity to South Station create a project with minimal impact on the neighborhood. The proposed design will enhance the public realm and contribute to better quality of life and safety for the community.

120 KINGSTON STREET, SUITE 610
BOSTON, MASSACHUSETTS 02111
OFFICE: 617 314 7379
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The Project site is a compact parcel with land area of approximately 4,824 square feet. Our goal is to develop a striking mid-rise tower housing a well-designed, top-quality hospitality facility. The Project will supply sorely needed hotel rooms to the immediate South Station area, which currently does not have a single hotel.

The proposed hotel will complement the mixed-use fabric of the historic Leather District while positioning the Kneeland Street development corridor as a modern urban thoroughfare with a vibrant pedestrian realm. The Project will generate public benefits including job creation, infrastructure and security upgrades, visual streetscape improvements, a new destination for locals and tourists, and a dramatic improvement on current conditions that will help spur additional investment.

The new building will be contemporary in style, featuring facade, fenestration, and materiality elements that relate to the surrounding area. The following PNF outlines the hotel project which is expected to be twenty-one (21) stories high, with a height of approximately two hundred eighteen (218) feet, and efficient floor plates of approximately 4,320 square feet. The Project will contain approximately 96,500 gross square feet ("gsf") overall including 81,600 gsf of useable interior space. In addition to guest rooms it will include lounges, meeting spaces, and other amenities as well as a dramatic, double height ground floor with a stylish food and beverage amenity open to the public.

Since filing the LOI in March of this year, we have continued the process of engaging with the community including multiple conversations with residents, neighborhood stakeholders, immediate abutters, and elected officials. The Project was presented before the Leather District Neighborhood Association ("LDNA") at a pre-filing meeting on March 14, 2018, with follow-up meetings on May 16, 2018, and June 13, 2018.

The outcome of the well-attended June 13th LDNA meeting and the extensive discussion that took place there was an overwhelming show of approval in the form of a vote of 46-4 in favor of supporting the Project. In addition, the Project was presented before the Chinatown Safety Committee and the Chinatown Neighborhood Council. It has now received approximately 30 support letters as part of this process.

On behalf of the entire project team, we would like to thank you and the BPDA staff assigned to the 150 Kneeland Street Project, particularly Project Manager Michael Sinatra, and the reviewing BPDA Urban Designers for their invaluable assistance to date in assisting the development team in shaping the Proposed Project and in completing this comprehensive PNF filing.

We believe that the Project will constitute a significant positive addition to the Leather District neighborhood by revitalizing this underutilized site with a much-needed new hotel in an attractive and thoughtfully designed building. We look forward to continuing the dialogue with the neighborhood and advancing the Project through public review with the BPDA, city agencies, our abutters, the community, other stakeholders, and the appointed Impact Advisory Group throughout the review process.

In accordance with BPDA requirements, please find attached fifteen (15) copies of the PNF.

Thank you.

Very truly yours,

Noam Ron, Partner

cc: Councilor Edward Flynn
Chris Betke, Chair, Leather District Neighborhood Association
Ori Ron, Hudson Group
Donald Wiest, Dain Torpy
Mitchell Fischman, MLF Consulting LLC

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

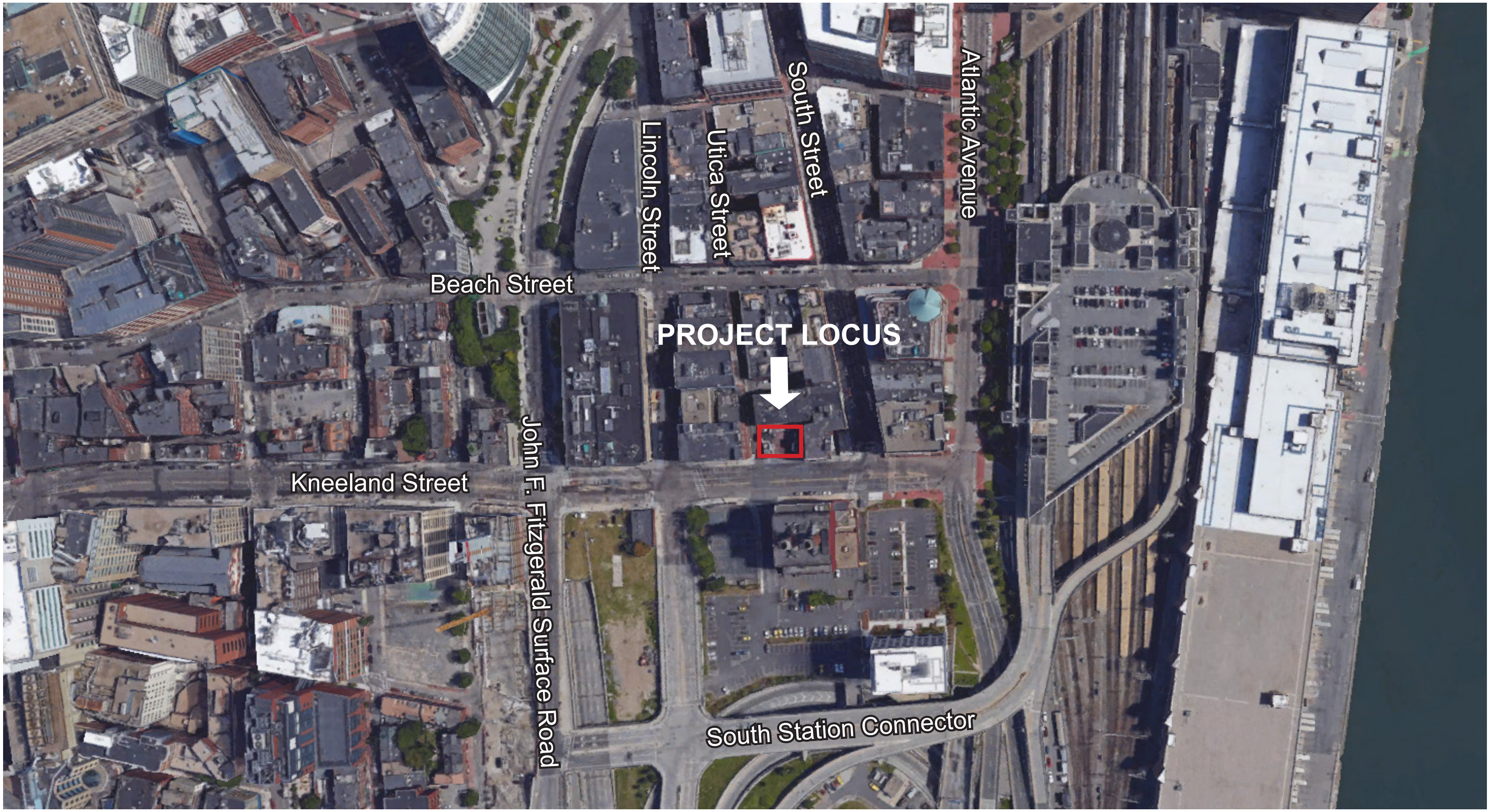
Hudson 150K Real Estate Trust, an affiliate of Hudson Group (the "Proponent") is submitting this Project Notification Form ("PNF") for a boutique hotel development at 150 Kneeland Street in the Leather District neighborhood in accordance with the Article 80B requirements of the Boston Zoning Code ("Code"). The Project proposes construction of a 21-story hotel (218 feet high plus mechanical floor) with approximately 230 rooms including approximately 3,000 gross square feet (gsf) of neighborhood serving and hospitality amenities, including a food and beverage destination and lounge, all totaling approximately 96,500 gross square feet with 81,600 gsf of interior useable space (the "Proposed Project"). The Proposed Project will be a limited service, upscale hotel with demand expected from short stay mid-week business travel and weekend visitors to Boston.

A Letter of Intent ("LOI") to File a Project Notification Form was filed with the BPDA for the proposed hotel development March 20, 2018 (See **Appendix A**). As further discussed in this PNF the Project's edge location, small footprint, and immediate access to South Station result in a project with minimal impacts to neighboring properties that has the potential to add direct benefits to the wider district.

The Project site is a compact parcel with land area of approximately 4,824 square feet. The existing site is composed of two contiguous irregularly shaped parcels occupied by vacant commercial structures which are in disrepair and will be removed. The property was formerly used as a restaurant and night club, which presented a significant nuisance to the neighborhood, while subsequent neglect of the site has resulted in serious blight. Please see **Figures 1-1** thru **1-4**.

The new building will be a striking, slender, mid-rise tower housing a well-designed, top-quality hospitality facility. The Project will supply sorely needed hotel rooms to the immediate South Station area, which currently does not have a single hotel. The proposed hotel will complement the mixed-use fabric of the historic Leather District while positioning the Kneeland Street development corridor as a modern urban thoroughfare with a vibrant pedestrian realm. The Project will generate public benefits including job creation, infrastructure upgrades, visual streetscape improvements, a new destination for locals and tourists, and a dramatic improvement on current conditions that will help spur additional investment in the area.

The new building will be contemporary in style, featuring facade, fenestration, and materiality elements that relate to the surrounding area. The following PNF outlines the hotel project which is expected to be twenty-one (21) stories high, with a height of approximately two hundred eighteen (218) feet, and efficient floor plates of approximately 4,320 square feet. The Project will contain approximately 96,500 gsf, with interior useable gross floor area of approximately 81,600 square feet. In addition to guest rooms it will include lounges, meeting spaces, a dramatic, double height ground floor with publicly accessible food and beverage, and other amenities.



150 Kneeland Street

Figure 1-1. Project Locus-
150 Kneeland Street, Leather District

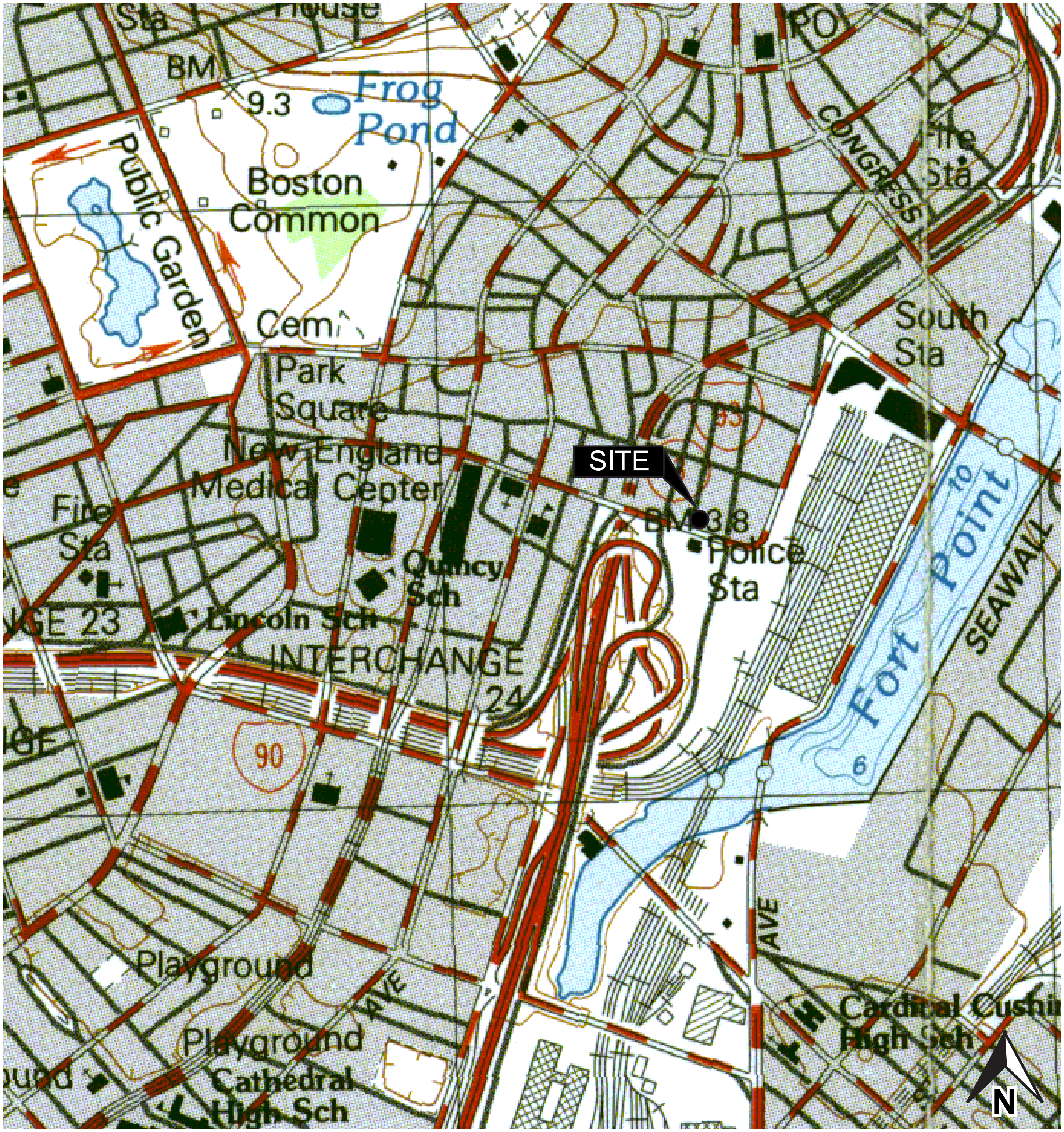


Figure 1-2. USGS Map-
150 Kneeland Street, Leather District

MLF CONSULTING LLC

Figure 1-3. Existing Site Photos

Views of Existing Buildings and their Neighborhood Context

Figure 1-4. Existing Site Photos

Views of Existing Buildings and their Neighborhood Context

The Project is located on the southern edge of the Leather District, is situated mid-block between South and Lincoln Streets, across Kneeland Street from the Veolia steam facility and the 5-acre MassDOT properties, a future development area ("SouthGate"). The development is one block east of South Station, Boston's central, multi-modal transit hub, and one block south from a direct HOV lane to Logan International Airport. The site's walkability to Chinatown, the Central Business District, and Theater District, as well as proximity to Fort Point and the Seaport, represent additional demand drivers.

The site is in the Leather District Zoning District, bordering the South Station Economic Development Area, governed by Article 44 of the Boston Zoning Code. The Project requires filings pursuant to Large Project Review under Article 80B of the Boston Zoning Code.

Hudson Group has been dedicated to the Leather District for twenty-five years, having undertaken a mix of rental, condominium, office, and retail projects in the immediate area. These include adaptive reuse redevelopments on South and Lincoln Streets and new construction multifamily at 120 Kingston Street (Radian) which resulted in the creation of 72 affordable housing units in Chinatown.

Since acquiring the property in early 2018 and filing the LOI in March of this year, the Proponent has continued the process of engaging with the community including multiple conversations with residents, neighborhood stakeholders, and immediate abutters. The Project was presented before the Leather District Neighborhood Association ("LDNA") at a pre-filing meeting on March 14, 2018, with follow-up meetings on May 16, 2018 and June 13, 2018. The outcome of the well-attended June 13th meeting and extensive discussion was an overwhelming show of approval through a vote of 46-4 in favor of supporting the Project (see LDNA vote in **Appendix I**). In addition, the Project received approximately 30 support letters as part of this process and was presented before the Chinatown Safety Committee and the Chinatown Neighborhood Council.

The proponent looks forward to continuing the dialogue with the neighborhood and working with the BPDA, city agencies, abutters, the community, other stakeholders, and the appointed Impact Advisory Group throughout the review process.

1.2 Detailed Project Description

The Project proposes construction of a new hotel comprising approximately 230 rooms and featuring approximately 3,000 gsf of neighborhood serving and hospitality amenities, including a food and beverage destination and lounge (the "Project"). The site is currently occupied by a vacant, blighted structure that is in disrepair and will be demolished in its entirety.

The edge location, small footprint, and immediate access to South Station result in a structure with minimal impacts to the neighboring properties that has the potential to add direct benefits to the wider district.

The proposed hotel will complement the mixed-use fabric of the historic Leather District while positioning the Kneeland Street development corridor as a modern urban thoroughfare with a vibrant pedestrian realm. The new building will be contemporary in style, featuring facade, fenestration, and materiality elements that relate to the surrounding area.

The new hotel will be twenty-one (21) stories, with a height of approximately two hundred and eighteen (218) feet to the top of the highest occupiable floor, and efficient floor plates of approximately 4,320 square feet. The Project will contain approximately 96,500 Gross Square Feet with interior useable space of approximately 81,600 square feet. In addition to guest rooms across eighteen (18) floors, it will include lounges, meeting spaces, and other amenities as well as a dramatic, double height ground floor with publicly accessible food and beverage.

The Proposed Project will provide a distinct hospitality use at a design-forward development that activates the street frontage along Kneeland Street with enhanced pedestrian amenities and increased foot traffic attracting local residents, guests and visitors within a short walk from the multi modal South Station.

Mechanical systems will be housed on the third floor and mechanical penthouse. Automobile access including service vehicles will be from Utica Street. The context of the immediate area is supportive of, and well-suited to the proposed scale and scope of the Proposed Project. See Project Dimensions in **Table 1-1** below.

Table 1-1. Approximate Dimensions of Proposed Project – 150 Kneeland Street

Lot Area	0.11 Acres (4,824 sf)
Gross Square Feet of Floor Area	96,500 gross square feet with 81,600 of useable interior space
Floor Area Ratio (FAR)	16.9
Number of Floors	21 + Mechanical
Total Height	218 feet

1.3 Existing Conditions Plan

The existing site is composed of two contiguous irregularly shaped parcels totaling approximately 0.11 acres (4,824 sf) and occupied by two vacant structures with a gross floor area of 7,252 sf. The existing one-story and three-story buildings were constructed around 1915 and 1920 and most recently occupied as a restaurant and nightclub, a use that became a nuisance to the adjacent neighborhood. The vacant structures are in disrepair and have contributed to blight and negative activity in the area since the former nightclub was closed in 2014. Since acquiring the property in early 2018 the Proponent has taken measures to secure and monitor the site. (See **Figure 1-5.** Existing Conditions Plan.)

SCALED FROM L-5739

REFERENCES

SUFFOLK COUNTY REGISTRY OF DEEDS

BOOK 18045 PAGE 33

PLAN BOOK 454 PAGE END
PLAN BOOK 493 PAGE 3
PLAN BOOK 4208 PAGE 165
PLAN BOOK 4292 PAGE 147

MASSACHUSETTS LAND COURT

LCC NO.5659A

CITY OF BOSTON ENGINEERING DEPARTMENT

FIELD BOOK 482 PAGE 134
FIELD BOOK 757 PAGE 110
FIELD BOOK 772 PAGE 3-15

PLAN NO. L-5738, L-5739, L-6322

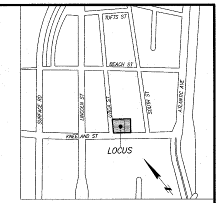
LIST OF ENCROACHMENTS:

[A] – BUILDING ENCROACHES 0.2'–0.3' INTO KNEELAND STREET.

[B] – A SIGN, WINDOW SILL, FIRE ALARM, CANOPY, BANNER, CORNICE, TWO COLUMNS AND METAL FENCE ENCROACH INTO KNEELAND STREET.

[C] – AN EMERGENCY SIGN, METAL PIPE AND AWNING ENCROACH INTO THE 4' PASSAGEWAY.

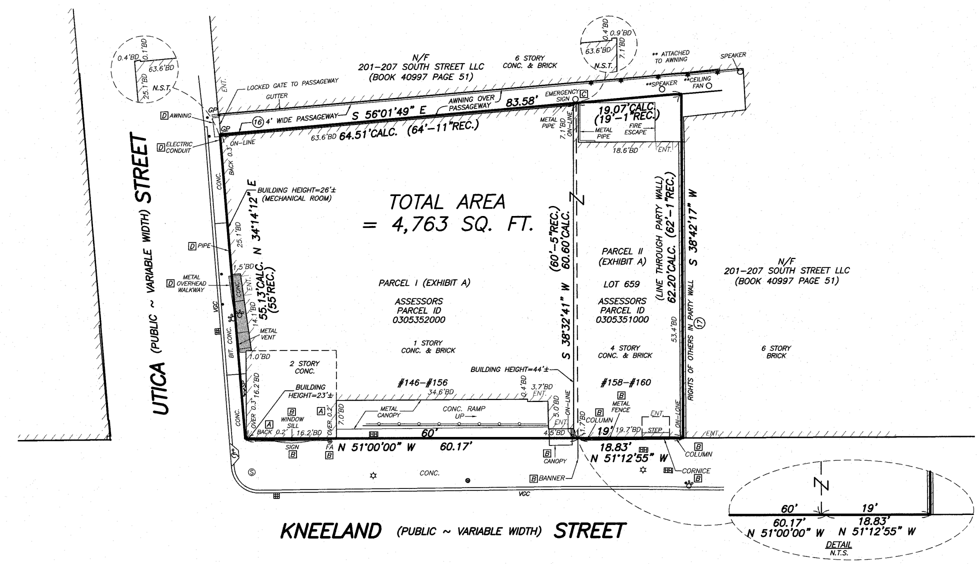
[D] – AN AWNING, ELECTRIC CONDUIT, PIPE, METAL OVERHEAD WALKWAY ENCROACH INTO UTICA STREET.



LOCUS MAP
NOT TO SCALE

LEGEND

- SEWER MANHOLE
- WATER SHUT OFF/WATER GATE
- GAS SHUT OFF/GAS GATE
- OBSERVATION WELL
- CATCH BASIN
- LIGHT POLE
- WALK LIGHT
- ELECTRIC HANDHOLE
- FA — FIRE ALARM
- STAND PIPE/SIAMESE CONNECTION
- HANDICAP RAMP
- GP — GATE POST
- BOLLARD
- EXCEPTION ITEM
- [A] — ENCROACHMENT ITEM
- CONC — CONCRETE
- ENT — ENTRANCE
- N/F — NOW OR FORMERLY
- SQ. FT. — SQUARE FEET
- VGC — VERTICAL GRANITE CURB
- BD — BUILDING DIMENSION
- NTS — NOT TO SCALE



BOUNDARY DESCRIPTION: PER EXHIBIT A OF FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO.:SSTM001, HAVING AN EFFECTIVE DATE: JANUARY 23, 2018.

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF SUFFOLK, STATE OF MASSACHUSETTS, AND IS DESCRIBED AS FOLLOWS:

PARCEL I

PROPERTY ADDRESS: 146–156 KNEELAND STREET, BOSTON, MA

A CERTAIN PARCEL OF LAND WITH THE IMPROVEMENTS THEREON ON THE NORTHERLY SIDE OF KNEELAND STREET IN THE CITY OF BOSTON, COUNTY OF SUFFOLK, COMMONWEALTH OF MASSACHUSETTS, NOW KNOWN AS 146–156 KNEELAND STREET, DESCRIBED AS FOLLOWS:

SOUTHERLY: 60 FEET BY KNEELAND STREET;
WESTERLY: 55 FEET BY UTICA STREET;
NORTHERLY: 64 FEET, 11 INCHES BY A PASSAGEWAY; AND
EASTERLY: 60 FEET, 5 INCHES BY LAND OF OTHERS.

BEING ALL AND THE SAME PREMISES DESCRIBED IN A DEED DATED FEBRUARY 25, 2003 AND RECORDED WITH THE SUFFOLK COUNTY REGISTRY OF DEEDS AT BOOK 30889 PAGE 236.

PARCEL II

PROPERTY ADDRESS: 158–160 KNEELAND STREET, BOSTON, MA

THE LAND IN THAT PART OF BOSTON IN THE COUNTY OF SUFFOLK WITH THE BUILDINGS THEREON CALLED SOUTH COVE BEING LOT NUMBERED 659 ON A PLAN OF LANDS OF THE SOUTH COVE CORPORATION RECORDED AT THE END OF BOOK 454, SUFFOLK REGISTRY OF DEEDS CONTAINING 1163½ SQUARE FEET OF LAND AND BOUNDED:

SOUTHERLY: BY KNEELAND STREET FORMERLY ELIOT STREET, NINETEEN (19) FEET;
WESTERLY: BY LOT NUMBERED 658 ON SAID PLAN, SIXTY (60) FEET FIVE (5) INCHES;
NORTHERLY: BY A COMMON PASSAGEWAY FOUR (4) FEET WIDE THERE MEASURING NINETEEN (19) FEET ONE (1) INCH; AND
EASTERLY: BY LOT NUMBERED 660 THERE MEASURING SIXTY–TWO (62) FEET AND ONE (1) INCH.

TOGETHER WITH A RIGHT IN COMMON IN SAID PASSAGEWAY.

ALSO ALL THAT PARCEL OF LAND WITH THE STRUCTURE THEREON SITUATED IN SAID BOSTON BOUNDED AND DESCRIBED AS SET FORTH IN THE DEED TO JOEL M. ADAMS FROM JOSEPH ARNOLD RECORDED WITH THE SUFFO1K DEEDS LIBRO 541, FOLIO 196. (LOCATION UNKNOWN)

AND ALSO ALL THE RIGHT, TITLE AND INTEREST OF OWEN MULDOON AT THE TIME OF HIS DEATH AND TO ONE–HALF OF THE PARTY WALL OR THE USE THEREOF ON THE WESTERLY SIDE OF THE PREMISES CONVEYED TO SAID MULDOON BY SAID ADAMS BY DEED RECORDED WITH SUFFOLK DEEDS LIBRO 945, FOLIO 50.

BEING ALL AND THE SAME PREMISES DESCRIBED IN A DEED DATED FEBRUARY 25, 2003 AND RECORDED WITH THE SUFFOLK COUNTY REGISTRY OF DEEDS AT BOOK 30889 PAGE 272.

NOTES:

1) BY GRAPHIC PLOTTING ONLY, THE PARCEL SHOWN HEREON LIES WITHIN A ZONE "X" (UNSHADED), AN AREA OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD, AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A) FLOOD INSURANCE RATE MAP (F.I.R.M.) FOR SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0081J, CITY OF BOSTON COMMUNITY NUMBER 250286, PANEL NUMBER 0081, SUFFIX "J", HAVING AN EFFECTIVE DATE OF MARCH 16, 2016.

2) ZONING INFORMATION AS SHOWN HEREON WAS NOT PROVIDED BY THE TITLE INSURER AS REQUIRED BY ITEM 6 (A OR B) OF TABLE "A" IN THE 2016 ALTA SURVEY REQUIREMENTS.

3) THERE WAS NO OBSERVED EVIDENCE OF CURRENT EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS.

4) TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO PROPOSED CHANGES IN STREET RIGHT OF WAY LINES.

5) THERE WAS NO OBSERVED PARKING SPACES ON THE INSURED PROPERTY.

6) BUILDING HEIGHT SHOWN HEREON IS CALCULATED FROM THE AVERAGE GRADE PLANE AND THE TOP OF ROOF. BY CITY OF BOSTON ZONING CODE, THE DEFINITION OF BUILDING HEIGHT IS TO THE TOP OF THE HIGHEST ROOF BEAM; THIS WAS INACCESSIBLE AT TIME OF SURVEY. THEREFORE THE BUILDING HEIGHT BY DEFINITION WOULD BE LESS THAN THE HEIGHT SHOWN HEREON.

ZONING DISTRICT:

LEATHER DISTRICT
RESTRICTED PARKING OVERLAY DISTRICT
GROUNDWATER CONSERVATION OVERLAY DISTRICT

DIMENSIONAL REQUIREMENTS:

MAXIMUM FLOOR AREA RATIO 6/8
MAXIMUM BUILDING HEIGHT .... 80'/100'

* SEE SEE ARTICLE 44 OF CITY OF BOSTON ZONING BY–LAWS

EXCEPTIONS: PER SCHEDULE B, PART II OF FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NO.:SSTM001, HAVING AN EFFECTIVE DATE: JANUARY 23, 2018.

(16) RIGHTS OF OTHERS IN PASSAGEWAY AT REAR OF BOTH PROPERTIES. (AS SHOWN HEREON)

(17) RIGHTS OF OTHERS IN PARTY WALLS. (AS SHOWN HEREON)

TO: FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 7(A), 7(B)(1), 7(c), 8, 9, 10(A), 13, 14, 16, 17, 19, AND 20 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON JANUARY 12, 2018.

FEELDMAN LAND SURVEYORS

KARL A. MCCARTHY, PLS (MA# 38714)
kam@feldmansurveyors.com

02-02-2018
DATE

COMMONWEALTH OF MASSACHUSETTS — KARL A. McCARTHY NO. 38714 — REGISTERED PROFESSIONAL LAND SURVEYOR

ALTA/NSPS LAND TITLE SURVEY
146–160 KNEELAND STREET
BOSTON, MASS.

FELDMAN LAND SURVEYORS
152 HAMPDEN STREET
BOSTON, MASS. 02119

JANUARY 12, 2017
PHONE: (617)357–9740
www.feldmansurveyors.com

FELDMAN LAND SURVEYORS

10 0 5 10 20 40

SCALE: 1"=10'

RESEARCH SMD	FIELD CHIEF JLF	PROJ MGR SMD	APPROVED	SHEET NO. 1 OF 1
CALC SMD	CADD TMT	FIELD CHECKED	CRD FILE 16002	JOB NO. 16002

FILENAME: S:\PROJECTS\16000's\16002\DWG\16002.dwg

1.4 Summary of Project Impacts and Mitigation

1.4.1 Urban Design

The proposed hotel will complement the mixed-use fabric of the historic Leather District while positioning the Kneeland Street development corridor as a modern urban thoroughfare with a vibrant pedestrian realm. The Project will generate public befits including visual streetscape improvements and a dramatic improvement on the current conditions that will help spur additional investment in the area.

The project will relate to the large-scale ground floor display windows set in sturdy cast iron columns which are a prominent feature of the adjacent buildings and throughout the historic Leather District. The strong street wall created by the existing neighboring buildings will be enhanced by the massing of the project.

The Project will feature a dramatic double height ground floor with high visual access to the publicly accessible lobby and lounges. The main reception area will be located along Kneeland Street, with lounges and meeting spaces also visible from Kneeland Street to further activate the lower floors of the Project.

The pedestrian realm and experience will be enhanced by a setback at the building entrance, material enhancements to Utica Street and Kneeland Street paving and sidewalks, and a drastic upgrade from the blighted existing conditions.

The project will meet Stretch Code and achieve a high level of energy efficiency. See **Section 3.1** for a more detailed discussion of the Project's urban design approach.

1.4.2 Sustainable Design

The Proponent and the project design team are committed to an integrated design approach and the proposed design will meet the Massachusetts Stretch Energy Code, achieving a high level of energy efficiency. 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 53 points in the YES column with 27 in the study column. Further study over the coming weeks and months will determine final credit achievement. The narrative contained in **Section 3-5** outlines how the project intends to achieve the prerequisites and credits for the LEED BD&C v4 certification. For the detailed list of projected sustainable strategies please see the attached LEED checklist (**Figure 3-19** at the end of **Section 3.5**).

1.4.3 Pedestrian Level Wind Conditions

RWDI completed a Pedestrian Wind Assessment (Assessment) which is found in **Appendix G.** The Assessment concludes that annual pedestrian level wind speeds along Kneeland Street, Utica

Street, Lincoln Street, South Street, and at the main entrance to the Project will be suitable for pedestrian activities.

Conditions are expected to be comfortable for walking or better throughout the year. The large canopy along the south façade of the building will allow redirection of winds away from the ground, resulting in calmer conditions along the sidewalks of Kneeland Street. The tall buildings to the west through northeast of the site will provide blockage from the strong winds from those directions, while the building itself will provide additional blockage to the sidewalks from the strong northeasterly winds.

The large canopy along the west façade is a positive feature which will help to redirect winds downwashing off the west façade away from the ground.

It is predicted in the Assessment that wind speeds at most areas around the Project will be suitable for pedestrian activities on an annual basis. Wind conditions with the Project added to the existing surroundings are expected to be similar to those that exist currently in the neighborhood.

1.4.4 Shadow Impact Analysis

RODE Architects, Inc., the Project's architect, prepared a shadow study to assess the potential shadow impacts of the Project on the surrounding neighborhood with the shadow drawings contained in detail in **Section 4.1**. Adjacent public ways and sidewalks will be minimally impacted and there will be no impact to public spaces including the Rose Kennedy Greenway, Reggie Wong Park, and informally identified "Leather District Park". **New shadows are minimal and move quickly due to the hotel's small footprint and slender floor plates.**

1.4.5 Daylight Analysis

Daylight obstruction values from the Proposed Project are expected to be minimal due to the compact footprint of the building and the small floor plates. Although the Proposed Project would cause an increase in daylight obstruction when compared to the existing blighted structure on site, the Proposed Project was designed with slender floor plates averaging 4,320 sf, which will limit daylight obstruction to surrounding areas. As a result, daylight obstruction values from the Proposed Project are expected to be consistent with, and sometimes better than other higher buildings within the Leather District and immediate environs.

1.4.6 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.

1.4.7 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, 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 building heating and ventilation will not have an adverse impact on air quality. The maximum one-hour and eight-hour ambient CO impacts from the building heating and ventilation 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 five 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.

1.4.8 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, and the Housing Urban Development (HUD) noise guideline (See **Section 4.3**).

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

Nighttime ambient baseline sound level (L_{90}) monitoring was conducted at four locations deemed to be representative of the nearby residential areas, during the time period when human activity is at a minimum and any future noise would be most noticeable. The lowest nighttime L_{90} measured in the Project area was 55.8 dBA.

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

- One (1) CAT Model C15 diesel generator set enclosed in an aluminum sound attenuated enclosure,
- Two (2) York 105 Ton Chillers
- One (1) Innovent Energy Recovery Unit
- Two (2) Baltimore Aircoil Company 100 Ton Cooling Towers

The Proposed 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, City of Boston Noise Regulations and the HUD Noise Guideline.

1.4.9 Stormwater Management and Water Quality

The Proposed Project is expected to substantially improve the water quality (See **Section 4.6**) 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.

1.4.10 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 loading area. The recycling program will meet or exceed the City's guidelines, and provide-areas for waste paper and newspaper, metal, glass, and plastics (1 through 7, co-mingled).

Hazardous Waste

A Phase I Environmental Site Assessment was completed for the property in January 2018. The report was reviewed to evaluate the potential for encountering Oil and/or Hazardous Material in subsurface soil or groundwater during construction. The property is not a listed Disposal site under the Massachusetts Contingency Plan (MCP) at 310 CMR 40.000. The presence of urban fill soils containing concentrations of chemical constituents ubiquitous in fill soils was identified at nearby sites. Additional information is presented in **Section 4.5.2.**

1.4.11 Geotechnical / Groundwater Impacts Analysis

Based upon available subsurface and geologic information, the Project Site is anticipated to be underlain by approximately 10 to 20 ft of man-placed fill, followed by a 10 to 25 ft layer of organic soils consisting of organic silt and peat. A relatively thick deposit of marine sand and clay about 50 to 65 ft thick is anticipated beneath, followed by about 2 to 25 ft of dense to very dense glacial deposits over bedrock, Bedrock is anticipated at depths of 90 to 120 feet below the ground surface.

Groundwater is anticipated at a depth of about 6 to 9 feet below ground surface.

Based on the soil conditions described above, it is anticipated that deep foundation support will be required for the new structure. The deep foundations will need to extend to bear in the underlying glacial soils and/or bedrock. Options for the deep foundations include driven piles, drilled micropiles and drilled shafts. The final foundation system will be determined during project design.

No basement is planned beyond the existing basement footprint such that excavation will be limited to that required for pile caps, grade beams, and mechanical pits. Excavation depths are anticipated to be on the order of 4 ft below the ground surface and above site groundwater levels.

1.4.12 Construction Impacts Analysis

Section 4.8 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 that 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 of 2019 and be completed in the 4th quarter of 2020.

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

Most construction activities will be accommodated within the current site boundaries or require use of a small portion of Kneeland Street. 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.

1.4.13 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 FEMA flood maps for Suffolk County (Sheet No. 25025C081J, Effective 03/16/16), the Project site is located in an Area of Minimal Flooding (Hazard Zone X).

1.4.14 Historic Resources Component

The existing structure on site is not compatible in scale, materials or fenestration with other buildings in the Leather District and it has lost its architectural integrity. It also falls outside of the Leather District's period of significance.

Based on these conditions, mainly dating from alterations in 1990, **the building is not considered a contributing building in the Leather District**. In addition, neglect and disrepair have left the existing structures in a blighted condition which negatively impacts the historic district today, to the detriment of neighboring properties.

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**).

1.4.15 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.

1.4.16 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. The study analyzes existing conditions within the Project study area, as well as conditions forecast to be in place under the seven-year planning horizon of 2025.

Access to the Site will be provided by a pick-up and drop-off zone along Utica Street, adjacent to the Site. Loading and service operations will also occur along Utica Street for vehicles up to the size of a 36-foot box truck (SU-36).

The analysis identifies the number of trips expected to be generated by the Project and mode share based on data collected at local hotels. The Project is estimated to generate approximately 20 trips during the a.m. peak hour (10 entering/10 exiting) and 34 trips during the p.m. peak hour (17 entering/17 exiting).

Due to the Project's small scale and proximity to approximately 3,500 garage parking spaces, the Project will not provide any on-site parking or valet service.

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, employing an on-site transportation coordinator, providing transit information (schedules, maps, and fare information) to hotel guests and visitors, providing on-site bicycle storage, and providing a transit pass program to the employees. The transportation coordinator will oversee all transportation issues including managing service and loading, and TDM programs.

1.4.17 Response to Climate Change Questionnaire

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

1.4.18 Response to City of Boston Access Guidelines

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

1.4.19 Response to BPDA Broadband Questionnaire

Please see **Appendix H** for the Proponent's Response to the BPDA Broadband Questionnaire.

2.0 General Information

2.1 Applicant Information

2.1.1 Project Proponent

The Proponent is Hudson 150K Real Estate Trust, an affiliate of Hudson Group, a boutique, privately owned real estate development firm, active in urban development across select markets. The principals of Hudson Group have been in the development and construction business since 1976. Based in Boston, the group has extensive experience in residential and commercial developments, construction, and investments including adaptive reuse and new construction in the United States, Canada, Europe, and Israel.

Hudson played an integral role in enhancing the Leather District and Chinatown neighborhoods of Boston by developing nearly 300 units in the area including residences, offices, and retail. Hudson Group has been dedicated to improvements and quality developments in the Leather District for twenty-five years, with a strong track record of working with city agencies and neighborhood associations.

Hudson co-developed Radian at 120 Kingston Street, a new construction, 26-story, 240-unit apartment building along the Rose Kennedy Greenway. The project contributed significant benefits to the community including park and infrastructure improvements and the creation of a combined 72 affordable housing units between on-site and off-site contributions, in partnership with a local Chinatown based non-profit, the Chinese Economic Development Council (“CEDC”). Their adaptive reuse experience in the Leather District include the redevelopments of 107 South Street and 108 Lincoln Street.

Hudson Group prides themselves in a long-term approach and real estate philosophy with particular attention to local, independently operated retail. The firm is led by Ori Ron and Noam Ron (a Leather District resident of ten years).

2.1.2 Project Team

Project Name	150 Kneeland Street, Leather District
Property Owner / Developer	**Hudson 150K Real Estate Trust** **(an affiliate of Hudson Group)** 120 Kingston Street, Suite 610 Boston, MA 02111 Tel: 617-314-7379 Noam Ron noam@hudsongroupna.com Ori Ron ori@hudsongroupna.com

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
Legal Counsel	**Dain, Torpy, Le Ray, Wiest & Garner** 745 Atlantic Avenue, 5th Floor Boston, MA 02111 Tel: (617) 542-4874 Donald Wiest dwiest@daintorpy.com
Architect	**RODE ARCHITECTS Inc.** 535 Albany Street #405 Boston, MA 02118 Rodearchitects.com Tel: 617-422-0090 Kevin S. Deabler Kevin@rodearchitects.com Lucas Herringshaw lucas@rodearchitects.com John Gilbert john@rodearchitects.com Nick Ruggeri nick@rodearchitects.com
Sustainable Consultant	**Soden Sustainability Consulting** 19 Richardson Street Winchester, MA 01890 Tel: 617-372-7857 Colleen Ryan Soden, LEED AP BD+C colleen@sodensustainability.com
Transportation Planner / Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Brian J. Beisel, PTP bbeisel@hasassoc.com Tel: 617-482-7080 Thomas Tinlin ttinlin@hshassoc.com

Civil Engineer	**Howard Stein Hudson** 11 Beacon Street, Suite 1010 Boston, MA 02108 Tel: 617-482-7080 Rick Latini, P.E. rlatini@hshassoc.com
Public Relations Consultant	**Goldstein Pierce PR** 171 Clinton Road Brookline, MA 02445 Wendy Pierce wendy@goldsteinpierce.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
Wind Engineer	**RWDI** 600 Southgate Drive Guelph, Canada N1G4P6 Tel: 519-823-1311 Jordan Gilmour jordan.gilmour@rwdi.com
Geotechnical Engineer	**Haley & Aldrich. Inc.** 465 Medford Street Suite 2200 Boston, MA 02142 Marya E. Gorczyca, P.E. (MA) Mgorczyca@haleyaldrich.com Tel: 617-886-7408

Historic Resources Consultant	**Tremont Preservation Services** 374 Congress Street Boston, MA 02210 Tel: 617-482-0910 Leslie Donovan donovan1@erols.com
MEP	**Cosentini Associates** 101 Federal Street Boston, MA 02110 Tel: 617-494-9090 Robert Leber rleber@cosentini.com Vladimir Yarmarkovich vyarmarkovich@cosentini-ma.com
Environmental Consultant	**EBI Consulting** 21 B Street Burlington, MA 01801 Tel: 781-710-7280

2.1.3 Legal Information

Site Control

The project site is owned by the Proponent, Hudson 150K Real Estate Trust.

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. The Site is bounded by utility easements for sewer, electric, telephone and gas. Additionally, the team is currently evaluating whether there are any utilities that cross the Site.

2.1.4 Public Benefits

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

- Creation of up to 230 hotel rooms and approximately 3,000 gross square feet of hospitality amenities, including a publicly accessible food and beverage destination, in close proximity to South Station, Boston largest transportation hub;
- The proponent will work closely with the Leather District neighborhood on multiple improvements that will enhance the quality of life in the area, including the installation of CCTV security cameras, contributing to the funding of Project Place, a nonprofit hired by the neighborhood for street and sidewalk cleaning, sidewalks repairs, and contributing to the enhanced design and improvements of Leather District Park;
- The proponent will collaborate with a Boston based nonprofit to provide free hotel accommodation to those in need of assistance;
- Introduction of new neighborhood visitors who will provide support to the local community and utilize local businesses;
- Establishment of a design forward, sustainable development that activates the street frontage along Kneeland and Utica Streets, upgrades pedestrian amenities, increases positive foot traffic, enhances public safety, and removes blight;
- Introduction of new street plantings, improved sidewalks, raised bike lanes and other streetscape amenities to improve and enhance the pedestrian landscape and experience;
- Significant streetscape, lighting, and security improvements to Utica Street between Kneeland and Tufts Streets, an area that has long been neglected and underutilized;
- Implementation of publicly accessible art throughout the development, both interior and exterior;
- Temporary creation of many new jobs in the construction and building trade industries;
- Permanent creation of new jobs in the hospitality and property management trades;
- Substantial addition to real property taxes for the City of Boston; and
- Spurring additional investment and development along the Kneeland Street corridor.

2.2 Regulatory Controls and Permits

2.2.1 Zoning Overview

Land use within Boston's Leather District is governed by Article 44 of the Zoning Code. Map 1C/1G/1N of the series of Boston Zoning Maps indicates that the Site is located within the Restricted Parking Overlay District and the Groundwater Conservation Overlay District, or GCOD.

As a development project within the Leather District for a new building in excess of 50,000 square feet of gross floor area, the Proposed Project is subject to Article 80's Large Project Review. The Proposed Project's design will also be reviewed through the Article 80 process. The Proposed Project is further subject to Article 37 (Green Buildings) of the Zoning Code.

2.2.2 Boston Zoning Code – Use Requirements

A hotel is an allowed principal use at the Project site. Restaurant use is also allowed within this district. The Proposed Project is expected to require zoning relief for building height and floor area ratio. The hotel will not supply off-street parking. Because hotel parking is not subject to the limitations imposed by the Restricted Parking District on other types of accessory parking, zoning relief for this project component will be required. Pursuant to Article 44, the Proposed Project's required loading facilities will be determined through the Large Project Review.

The Project will require a conditional use permit pursuant to Articles 6 and 32 due to its location within the Groundwater Conservation Overlay District ("GCOD").

2.2.3 Boston Zoning Code – Dimensional Requirements

The Proposed Project will comprise approximately 96,500 feet of gross floor area including 81,600 gsf of usable interior space on a site containing approximately 4,824 square feet of land, for a resulting anticipated floor area ratio ("FAR") of approximately 16.9. Article 44 establishes a maximum FAR of 8.0. The building height of the Proposed Project is expected to be approximately 218 feet. The applicable dimensional regulations require a maximum building height of 100 feet. It is therefore expected that zoning relief for the proposed building will include variances for building height and FAR.

Table 2-1. Article 44 - Leather District - Dimensional and Off-Street Parking Requirements

Dimensional Element	Leather District Zoning (*Other Use*)	Proposed Project*	Expected Zoning Relief Required?
Minimum Lot Size	None	4,824 sf	No
Minimum Lot Size (Add'l Dwelling Units)	None	4,824 sf total	No
Max. Floor Area Ratio	8.0	16.9	Yes
Max. Building Height	100 feet	218 feet 21-Stories + Mechanical	Yes
Minimum Lot Width	None	55.13 feet	No
Minimum Lot Frontage	None	79 feet	No
Minimum Front Yard Setback	None	Varies 1' – 6'-6"	No
Minimum Side Yard	None	Varies (0- 2'-4")	No
Minimum Rear Yard	None	Varies (1'- 10'-5")	No
Minimum Usable Open Space	None	125 sf	No
Required Off-Street Parking	46 per Sec.23-1 (per Sec.23-6 FAR Greater than 8 No parking req.)	0	To Confirm Sec. 23-6
Minimum Number of Loading Bays	Per Article 80	0	Per Article 80

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

2.2.4 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 Civic Design Commission	Possible Schematic Design Review
Boston Landmarks Commission	Article 85 Review
Boston Zoning Board of Appeal	Variances/Zoning Relief, as Required; Conditional Use Permit for GCOD
Boston Public Safety Commission Committee on Licenses	Garage Permit and Fuel Storage Permit
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; Possible Marquee Licenses
Boston Fire Department	Approval of Fire Safety Equipment
Boston Water and Sewer Commission	Site Plan Approval; 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
Federal Agencies	
Federal Environmental Protection Agency	Notice of Intent for EPA Construction Activities General Discharge Permit with Associated SWPPP
State Agencies	
MA Department of Environmental Protection Division of Water Pollution Control	Sewer Connection Permit
MA Department of Environmental Protection Division of Air Quality Control	Fossil Fuel Permit
MA Historic Commission	State Register Review

*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.

2.3 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. Over the past year, the Proponent has worked closely with neighborhood interests, local elected and appointed officials and the BPDA, and obtained detailed input and guidance from community stakeholders and the BPDA for the resulting new development proposal.

Since acquiring the property in early 2018 and filing the LOI in March of this year, the Proponent has continued the process of engaging with the community including multiple conversations with residents, neighborhood stakeholders, and immediate abutters. The Project was presented before the Leather District Neighborhood Association at a pre-filing meeting on March 14, 2018, with follow-ups on May 16, 2018 and June 13, 2018. The outcome of the well-attended June 13th meeting and extensive discussion was an overwhelming show of approval through a vote of 46-4 in favor of supporting the Project (See **Appendix I** for support letter). In addition, the Project received approximately 30 support letters as part of this process and was presented before the Chinatown Safety Committee and the Chinatown Neighborhood Council.

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 a 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 also 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.

2.4 Development Impact Payment ("DIP") Status

Based on current schematic design plans and the floor area estimate, it is <u>not</u> 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 Introduction

The proposed project will have many positive impacts on the surrounding neighborhood. Key components such as active ground and second floor uses, generous public space along Kneeland Street, improvements to Utica Street, and carefully located vehicle access and proximity to public transportation have all been thoughtfully considered to reduce the negative impacts and maximize the benefits to the public realm. The pedestrian realm and experience will be enhanced by a setback at the building entrance, material enhancements to Utica and Kneeland Streets' pavements and sidewalks, and a drastic upgrade from the blighted existing conditions.

3.2 Urban Design Principles

3.2.1 Place Making Opportunities – Small Business, Visual Access to Ground Floor Use

The proposed hotel will complement the mixed-use fabric of the historic Leather District while positioning the Kneeland Street development corridor as a modern urban thoroughfare with a vibrant pedestrian realm. The Project will generate public benefits including visual streetscape improvements and a dramatic improvement on the current conditions that will help spur additional investment in the area.

The project will relate to the large scale ground floor display windows set in sturdy cast iron columns which are a prominent feature of the adjacent buildings and throughout the historic Leather District. The strong street wall created by the existing neighboring buildings will be enhanced by the massing of the project.

The Project will feature a dramatic double height ground floor with high visual access to the publicly accessible lobby and lounges. The main reception area will be located along Kneeland Streets; food and beverage use, lounges, and meeting spaces visible from Kneeland Street will also activate the lower floors of the Project.

The entrance on the corner of Kneeland and Utica Streets will be set back from the street wall created by the adjacent buildings. This widened entrance zone will provide relief along Utica Street where the existing sidewalks narrow. The volume of pedestrians coming and going from the hotel and various publicly accessible spaces on site will further bolster the overall activity along this stretch of Kneeland Street and create a strong pedestrian presence at its edge.

3.2.2 Open Space and Green Space Connections

The Project is located directly across Kneeland Street from the Reggie Wong Memorial Park and in close proximity to the Rose Kennedy Greenway, Chinatown Park, and Mary Soo Hoo Park. The South Bay Harbor Trail, Rolling Bridge Park, and Harbor Walk along the Fort Point Channel are also within close proximity. Leather District Park is two blocks away, adjacent to the corner of South Street and Essex Street, presenting an opportunity for the Project to contribute to the design and improvements of an off site public space.

3.2.3 Streetscape Improvements

As stated above, the Project will provide widened sidewalks along Kneeland and Utica Streets. This will be in keeping with the City's stated goal of improving the pedestrian realm and will create a usable, accessible street level activity hub which will serve as a touchstone for new active uses along this stretch of Kneeland Street. The Project will provide an improved raised bike lane extending beyond the project boundaries, planters, and accessible pathways.

3.2.4 Proximity to Public Transit and Alternative Transportation

The Project will take full advantage of its proximity to public transit and is within one block of South Station and a host of rideshare and Blue Bike locations. South Station itself is a major transit hub offering local and regional bus and rail service.

The Project will be a limited service, upscale hotel. With an average stay of 1.5 nights, demand is expected to come from short-stay midweek business travel and weekend tourists. Vehicle traffic will be minimal and reliance on public transit will be significant.

The approach to transportation will begin with direct guest communication during reservation. Guests will be directed to South Station for rail and MBTA service and the Silver Line and HOV lane to and from Logan Airport. Guests with vehicles will be directed to park at nearby garages and arrive on foot. On site staff will direct guests to public transit and pickup areas.

The Proponent will work with Taxis and TNC's (Transportation Network Companies) on establishing a specific Pick Up / Drop Off zone on Utica Street and is in the process of assessing possible relationships with nearby garages and lots. Guests arriving by vehicle will be encouraged to park nearby and arrive to the hotel on foot.

3.3 Exterior Building Design Principals

3.3.1 Summary

The site sits within the Leather District neighborhood and adjacent to both Chinatown and South Station subdistricts. It is unique in that the existing, vacated structure remains one of the last undeveloped parcels within the Leather District. Aside from this project site, all lots are well defined against the inside edge of the sidewalks they abut. The result is a series of well-articulated facades with cast-iron ornament and regularized window patterns. This architectural definition is one of the clearest and most consistent among all of Boston's neighborhoods. There also exists a vibrant mix of uses generally with ground floor retail and public lobbies serving office and residential uses above. The residential dwellings are generally adapted to historic industrial structures making this a neighborhood of urban loft living.

3.3.2 Exterior Materials

As the Leather District transformed during the industrial revolution, the downtown locale made for a dense extrusion up from the busy sidewalks. Given this density and the era of vertical construction the most notable historic buildings used cast-iron and brick facades to express their urban presence. A wonderful array of cast-iron relief and ornamentation exists throughout the vicinity. Most of this expression is subtle, given the basic flatness that resulted. The proposed building will reinforce this narrative with modern materials that combine to create a play of elements that are ornate in a contemporary language. Instead of using sleek glass and light metal, this project will use dark metal frames consistent with the cast-iron texture around the Leather District. These frames will also have depth to enhance the subtle play of light across the facade. Further, a slight bevel and mitered corner expression will play up each opening. With this expression, the facade is intended to celebrate the classic proportions offered by a highly regularized pattern all the way up to the top of the building.

At the base of the building, a connection to the sidewalk is translated with a slight setback at the entry and canopy overhang at level 3. Beneath this datum will be a more transparent glass and metal facade system that connects to the pedestrian environment with its openness. Also, within the first few floors, the facade and interior spaces plan to use art and graphics to enhance the streetscape.

3.3.3 Building Scale

The height of the new building will celebrate the new era of construction in Boston. The Leather District is defined by a strong adherence to the street wall. Key setbacks along Utica Street and the north property line will help alleviate pressures felt along those edges. Setbacks range from 1’ to 10’-5” and help to express a more slender proportion up the facade. The adjacent buildings along Kneeland range from 75’ to 127’. Across Kneeland there is an active a steam plant with smokestacks extending over 300’. Future development has been planned and as of this date has been considering heights of 300’ across Kneeland Street. The proposed 218’ height of this project connects between these scales, and given its small, constrained footprint, will be a slender expression of its edge location.

The ground floors are conceived in a manner to alleviate any pressure of a tall building meeting the sidewalk. The simple, strong facade above transitions to something more appropriate for public engagement at the sidewalk.

3.4 Landscape Design

In accordance with Boston’s Complete Street Guidelines, the proposed project landscape plans will enhance the public realm experience at the sidewalks along Kneeland and Utica Streets. This entails attention to setbacks for entry on Kneeland and the drop-off zone on Utica Street. One of the key landscape features is the improvement of the paving surfaces along Utica Street. This improved zone will stretch up Utica Street to the north corner of the property. Special paving will differentiate from typical asphalt and announce to pedestrians that Utica is not a back alley. Additionally, raised planters along the edge of the glass facade will add visual interest and animation at the sidewalk level. These planters create a slight buffer between the public and private zones on the ground floor.

Lighting and bollards will also be effective in distinguishing a new Utica Street streetscape that is friendly and more welcoming to the public while discouraging the negative activity which has persisted at this edge location for many years.

3.5 Sustainable Design/Energy Conservation

The proposed project involves developing a new approximately 96,500 sq. ft. hotel with 230 rooms on a site located at 150 Kneeland 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 53 points in the YES column with 27 in the study column. Further study over the coming weeks and months will determine final credit achievement. The Proponent has outlined in the narrative below, how the project intends to achieve the prerequisites and credits for the LEED BD&C v4 certification.

3.5.1 Introduction

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

The Proponent and the Project design team are committed to an integrated design approach and are using the LEED v4 for BD+C: New Construction and Major Renovation rating system and intend to meet certification as presented in **Figure 3-19** at the end of this section. 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: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.

3.5.2 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, and smart transportation choices.

The Site has been previously developed earning sensitive land protection. The Site also shows that some soil contamination may be present. The Project is undergoing a Phase II assessment. If contamination is found remediation will be performed to the satisfaction of the reviewing agency.

The Site is in a neighborhood with surrounding existing density with ¼-mile [400 meter] radius and provides dozens of amenities within 0.5 miles of the project site.

Based on BTD guidelines, the Project will supply a minimum of 28 secure bicycle parking/storage spaces within the building at a rate of 0.3 secure indoor bicycle parking spaces per 1,000 sf of development. Additional storage will be provided by outdoor bicycle racks accessible to visitors to the site in accordance with BTD guidelines.

The Site provides access to quality transit. MBTA buses run on Routes SL 4, SL5, 4, 7, 11, 43, and 55 close to the site on both Kneeland Street and Atlantic Avenue, and the South Station Redline Line MBTA station is less than two blocks from the site. The South Station transportation hub provides a direct connection to points north to Cambridge and south to Quincy and regional destinations.

The project is providing bicycle facilities and showers for the occupants of the building along with bicycle parking spots for visitors, far exceeding the LEED requirement.

3.5.3 Sustainable Sites

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

The project will create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan will conform to the erosion and sedimentation requirements of the 2012 U.S. Environmental Protection Agency (EPA) Construction General Permit (CGP) or local equivalent, whichever is more stringent.

In order to reduce the impact of urban heat island effect, more than 50% of the parking spaces will be below grade under an SRI compliant roof. The project is evaluating compliance with Light Pollution Reduction.

3.5.4 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 in addition to water meters for two or more of the following water subsystems, as applicable to the project: Irrigation, Indoor plumbing fixtures and fittings, Domestic hot water, Boiler. Metering data will be compiled into monthly and annual summaries; and will be shared with USGBC the resulting whole-project water usage data.

The project will evaluate the ability to conserve water used for cooling tower makeup while controlling microbes, corrosion, and scale in the condenser water system.

3.5.5 Energy & Atmosphere

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

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

A whole-building energy simulation will be performed for the projects demonstrating a minimum improvement of 25% for new construction according to ANSI/ASHRAE/IESNA Standard 90.1–2010, Appendix G, with errata. The team will analyze efficiency measures during the design process and account for the results in design decision making. The team will use energy simulation of efficiency opportunities, past energy simulation analyses for similar buildings.

The project will install new or use existing building-level energy meters, or submeters that can be aggregated to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc). Prereq 4-Fundamental refrigerant management. The project will not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems.

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

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

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

3.5.6 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.

3.5.7 Indoor Environmental Quality

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

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

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

The project 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 absorptive materials stored on-site and installed from moisture damage.

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.

3.5.8 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 Performance Quality Transit
- Innovation in Design: Green Housekeeping
- Innovation in Design: Modern Mobility
- Innovation in Design: Integrated Pest Management
- Innovation in Design: Education

<u>Regional Priority</u>

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

3.6 Urban Design and LEED Drawings

Urban design drawings and renderings depicting the Proposed Project, and the LEED Checklist include:

Figure 3-1. Surrounding Urban Context
Figure 3-2. Surrounding Building Heights
Figure 3-3. Mobility
Figure 3-4. Full Height Axon
Figure 3-5. Perspective Across Kneeland Street
Figure 3-6. Perspective from Lincoln Street and Kneeland Street Intersection
Figure 3-7. Perspective from Atlantic Avenue and Kneeland Street Intersection
Figure 3-8. Proposed Site Plan
Figure 3-9. Ground Floor Plan
Figure 3-10. Second Floor Plan
Figure 3-11. Third Floor Plan
Figure 3-12. Fourth Floor Plan
Figure 3-13. Typical Floor Plan
Figure 3-14. South Elevation
Figure 3-15. East Elevation
Figure 3-16. North Elevation
Figure 3-17. West Elevation
Figure 3-18. Surrounding Building Heights Section
Figure 3-19. Project Checklist: LEED v4 for BC+D: New Construction and Major Renovations

Figure 3- 1

Surrounding Urban Context

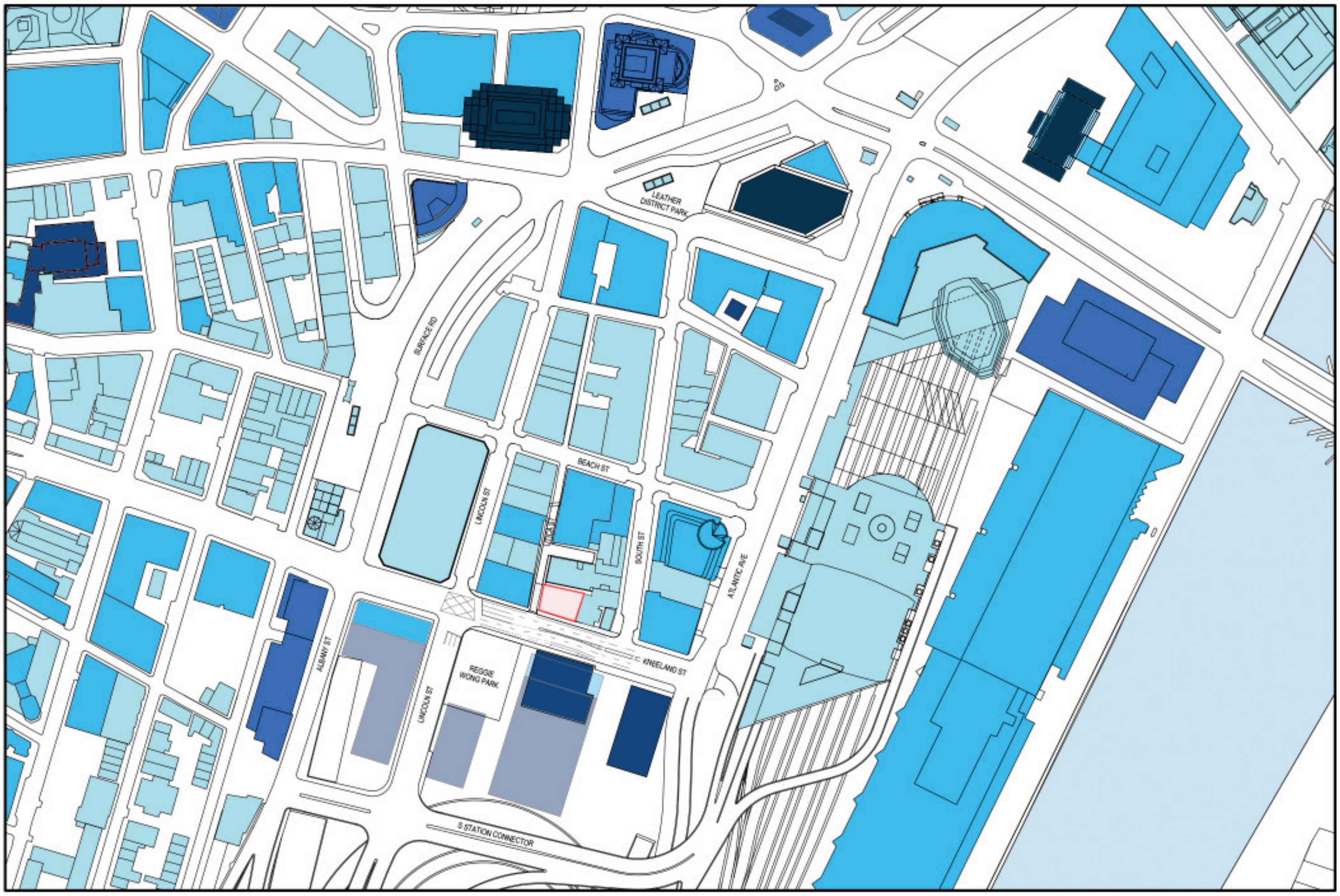
- MIXED USE
- RETAIL
- RESIDENTIAL
- CULTURAL/CIVIC
- INSTITUTIONAL / OFFICE
- TRANSPORTATION
- GREEN SPACE
- SITE

0' 25' 50' 100' 200'

N

Figure 3- 2

Surrounding Building Heights



- 100’ -
- 200’
- 300’
- 400’
- 500 ’ +
- SITE

0' 25' 50' 100' 200'

N

Figure 3- 3

Mobility

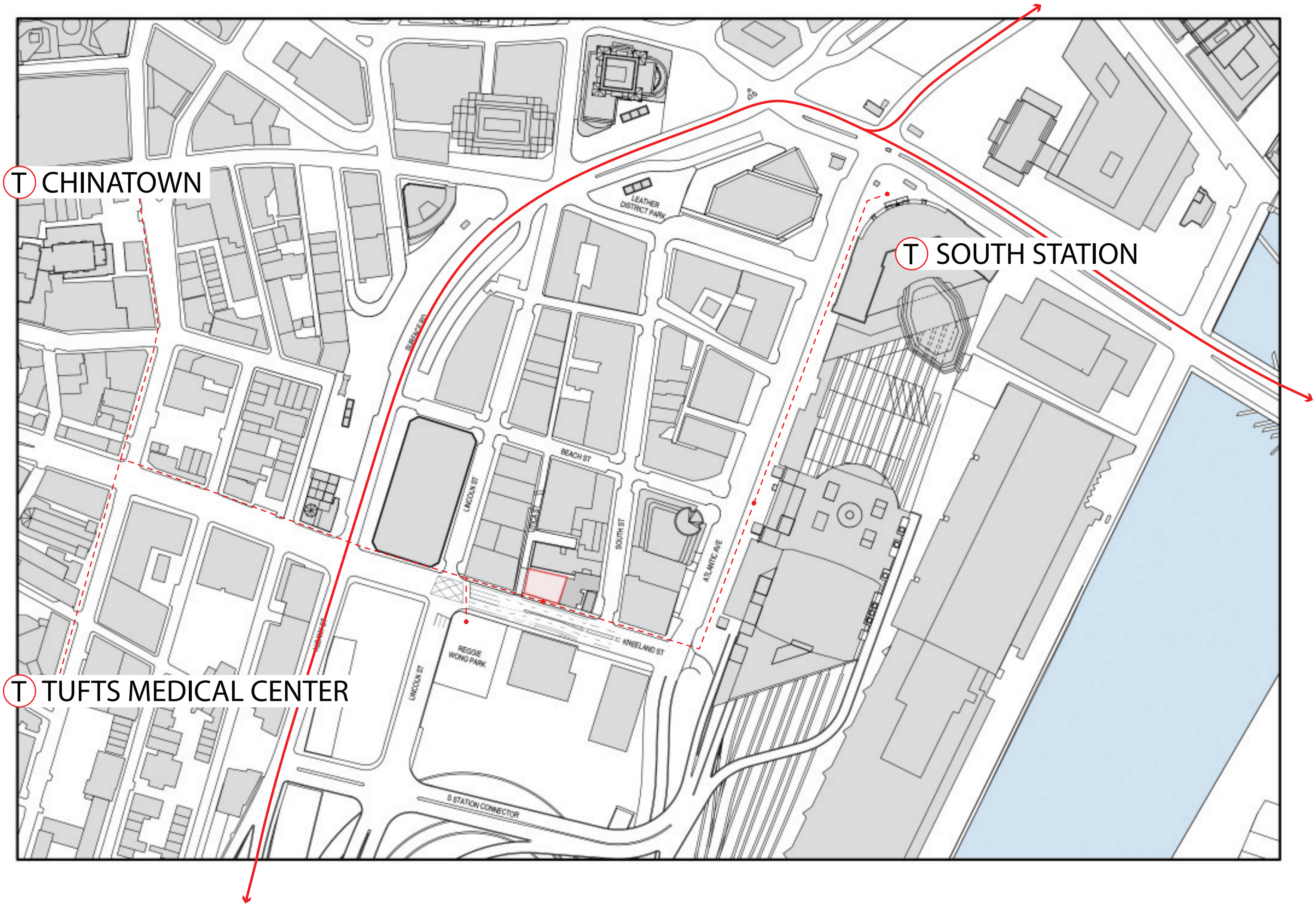


Figure 3- 4

Full Height Axon

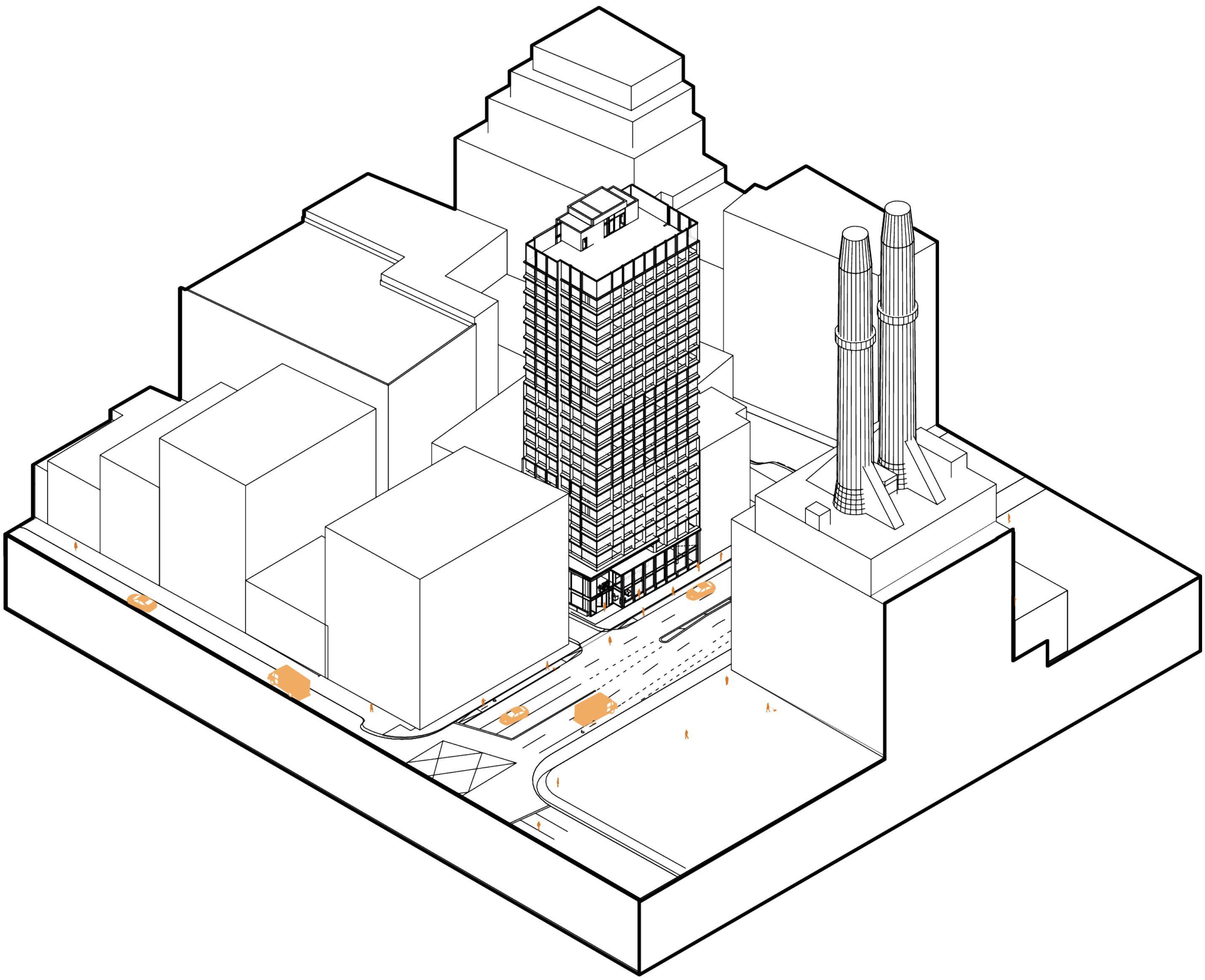


Figure 3- 5

Perspective Across Kneeland Street

Figure 3- 6

Perspective from Lincoln St and Kneeland St intersection

Figure 3- 7

Perspective from Atlantic Ave and Kneeland St intersection

Figure 3- 8

Proposed Site Plan

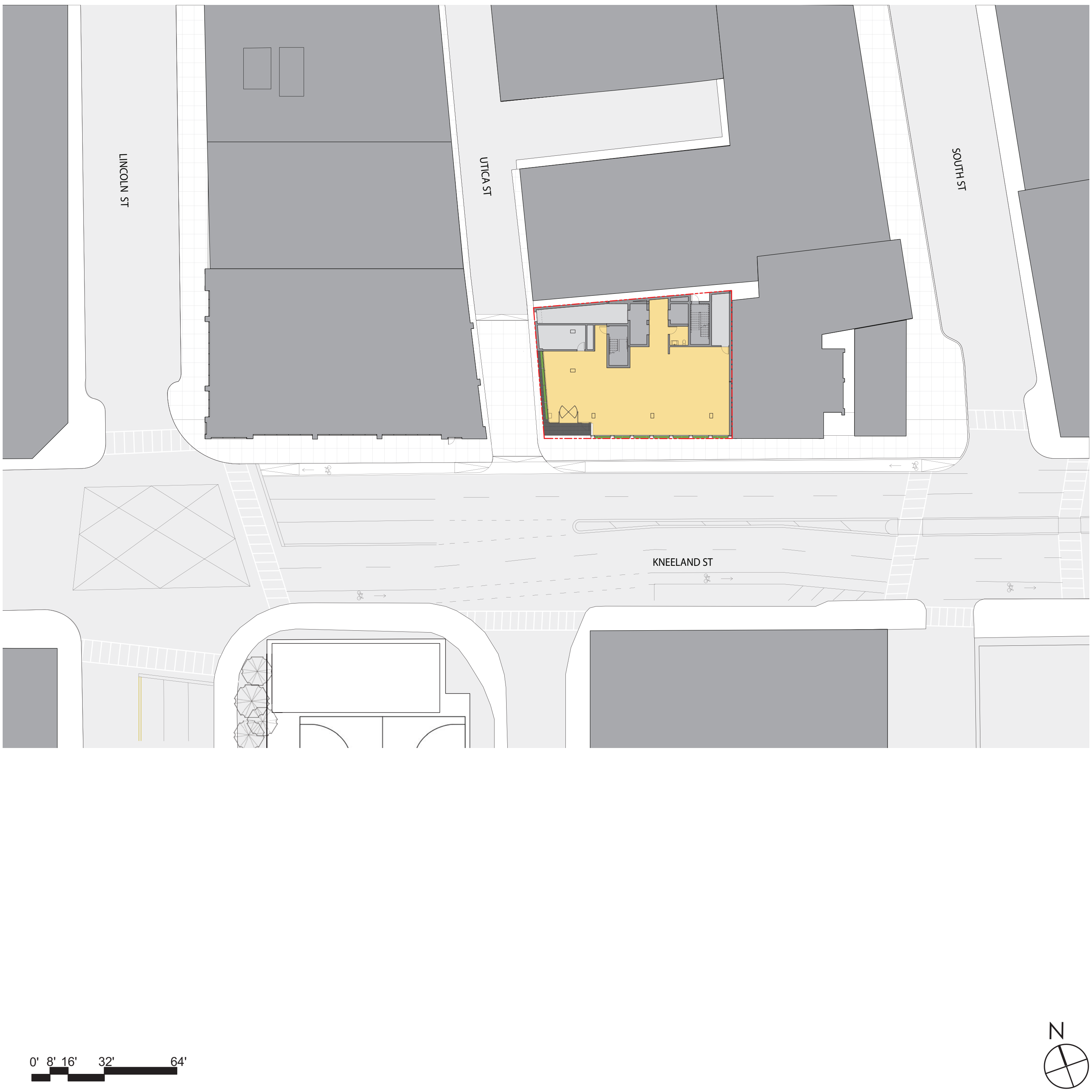


Figure 3- 9

Ground Floor Plan

Figure 3- 10

Second Floor Plan

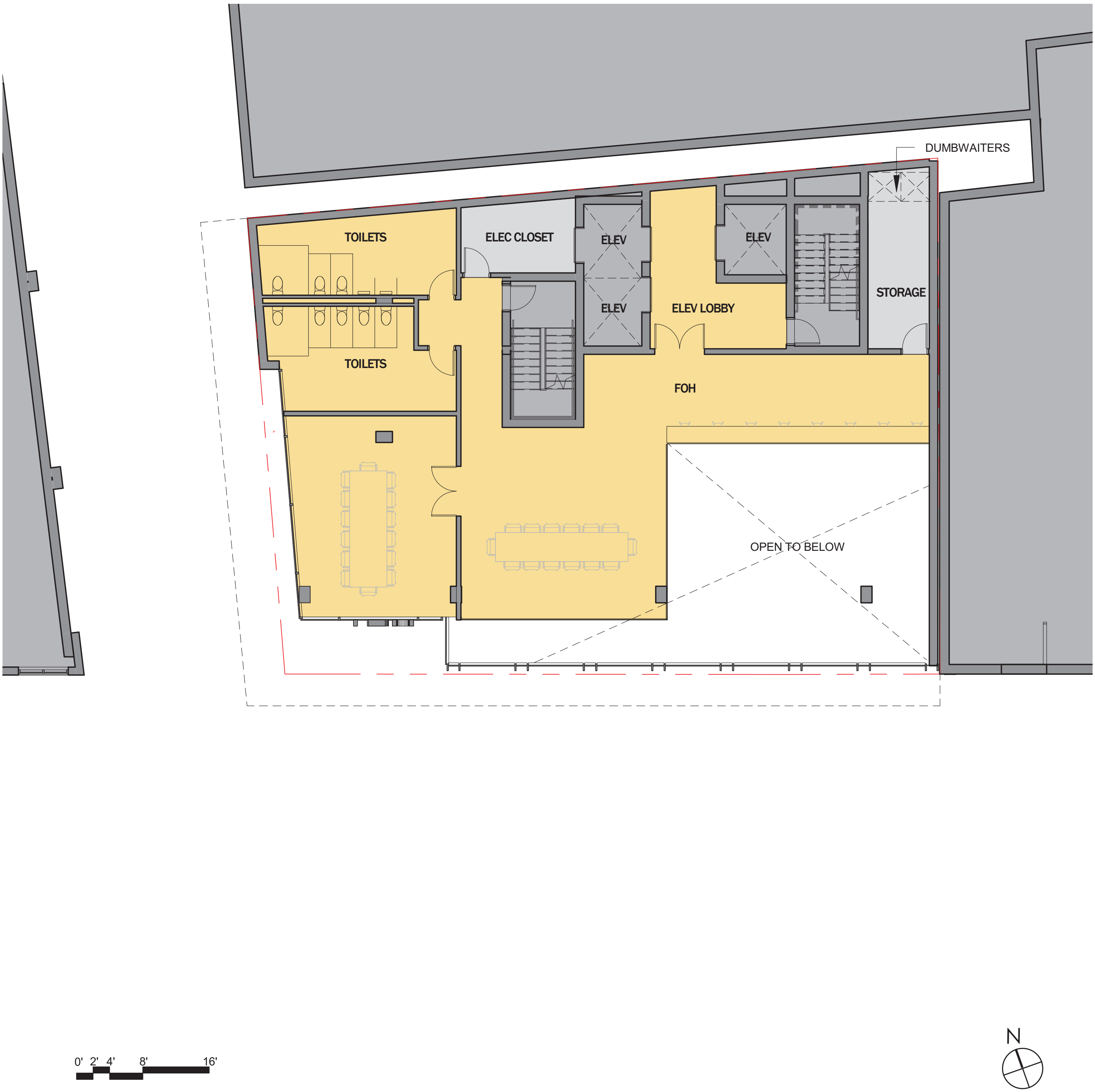


Figure 3- 11

Third Floor Plan

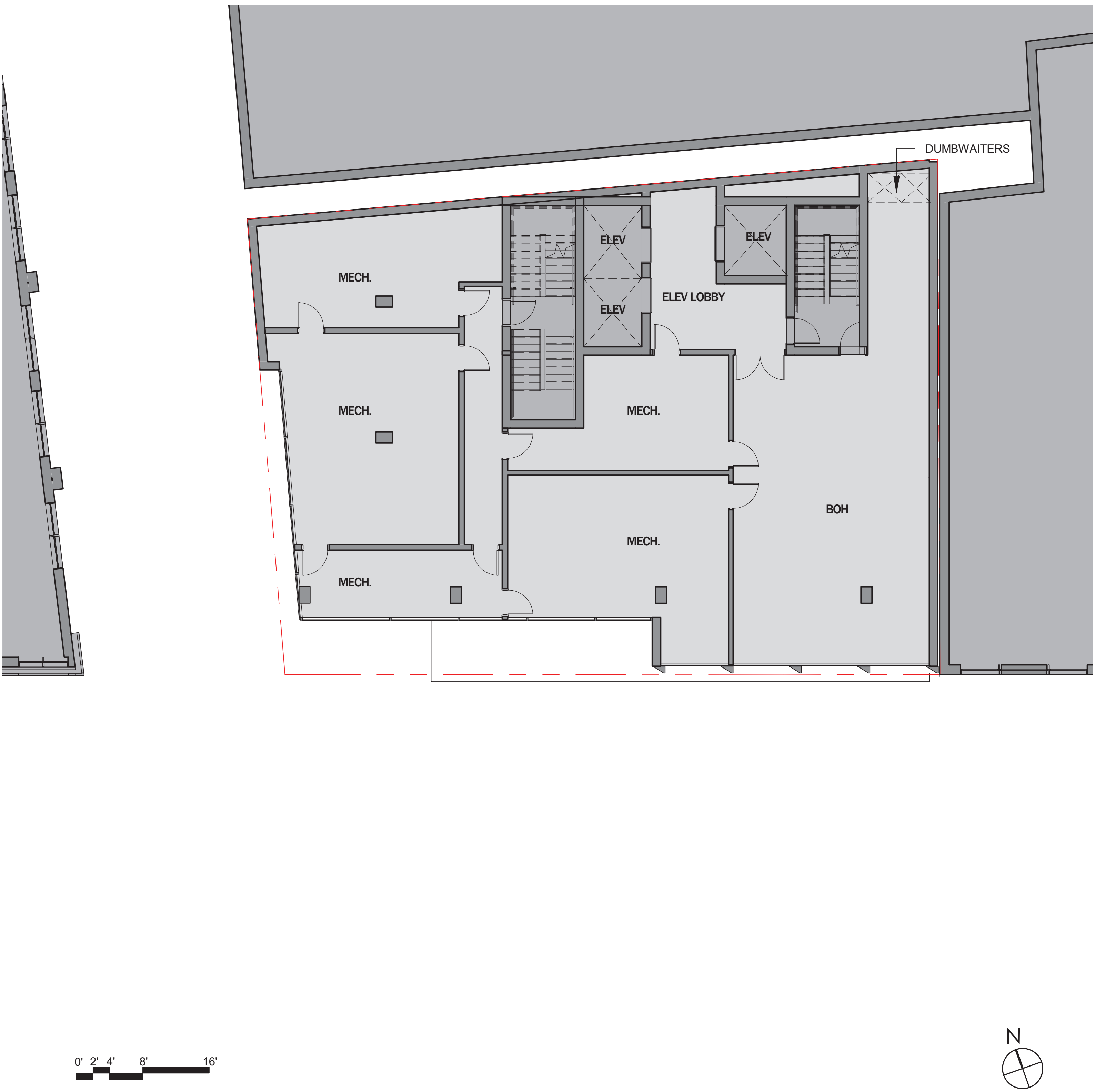


Figure 3- 12

Fourth Floor Plan

Figure 3- 13

Typical Floor Plan

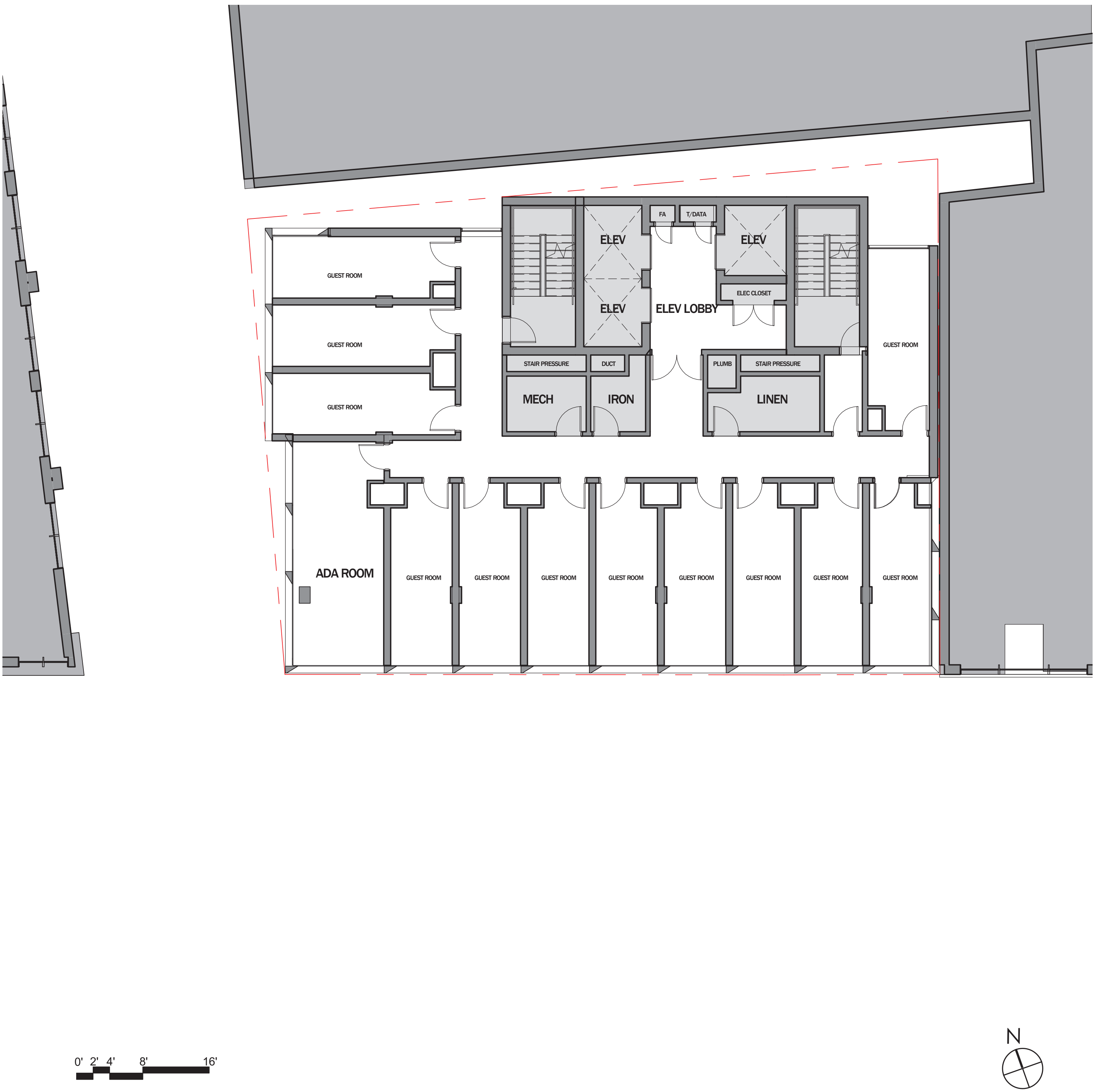


Figure 3- 14

South Elevation

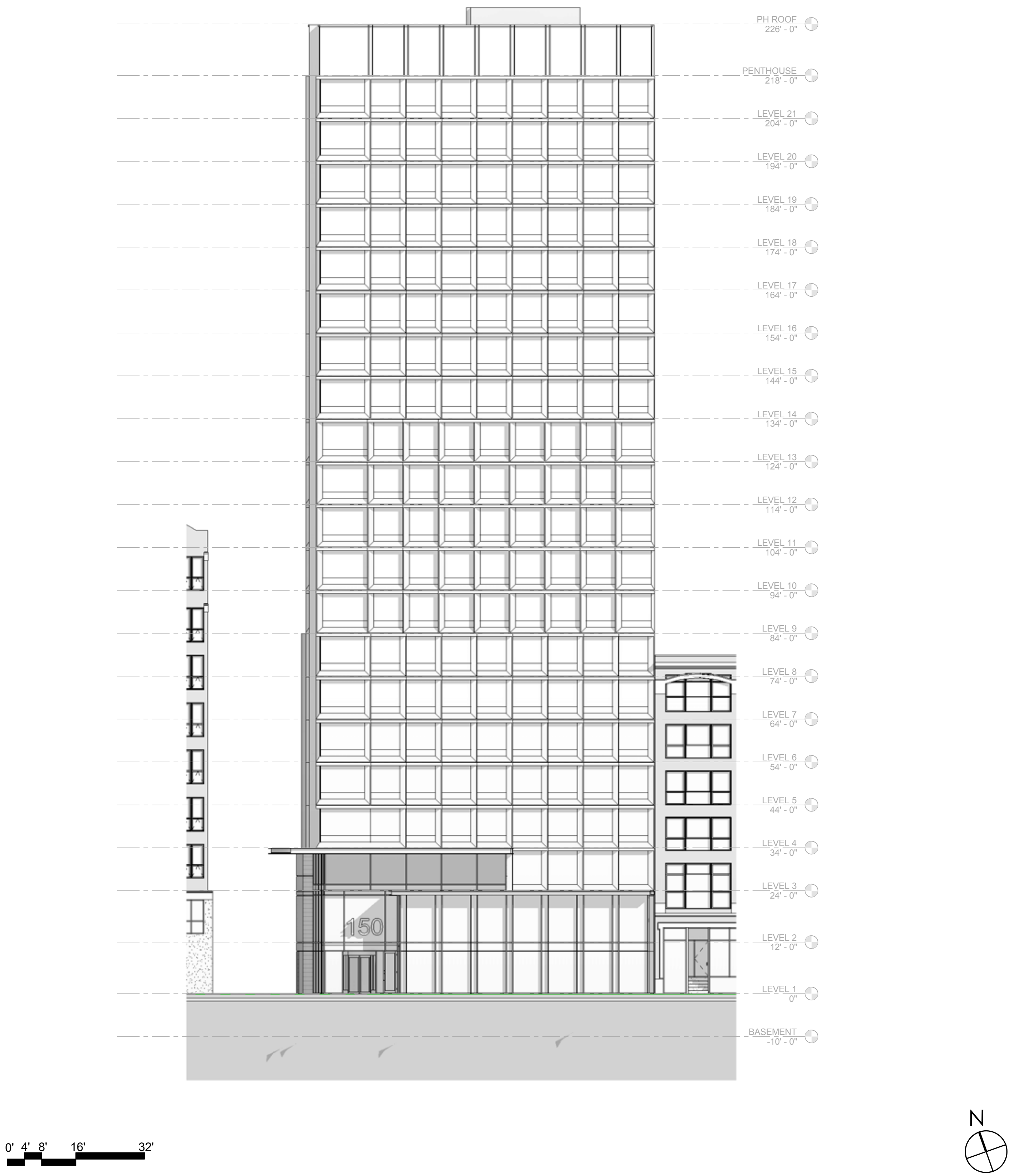


Figure 3- 15

East Elevation

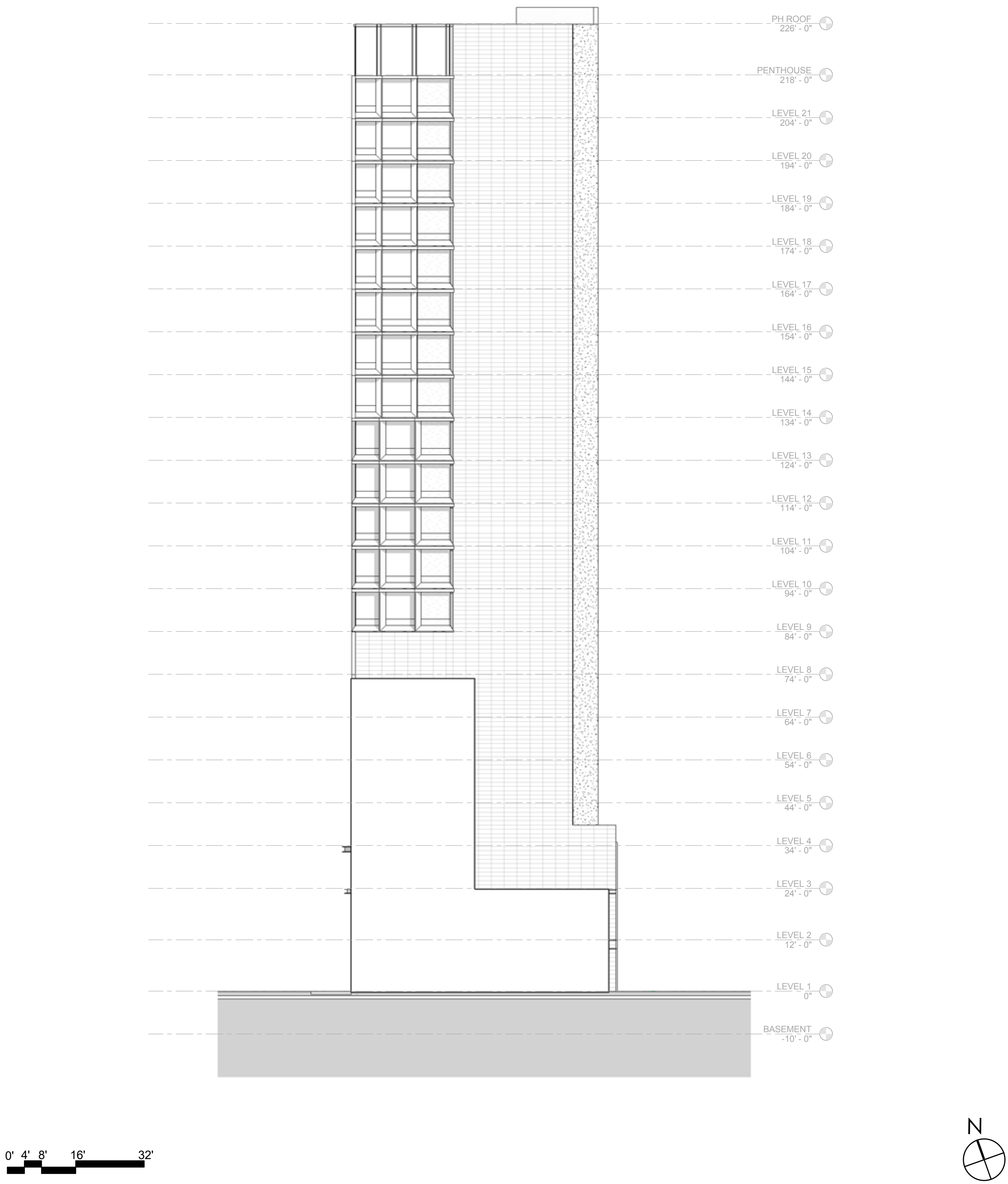


Figure 3- 16

North Elevation

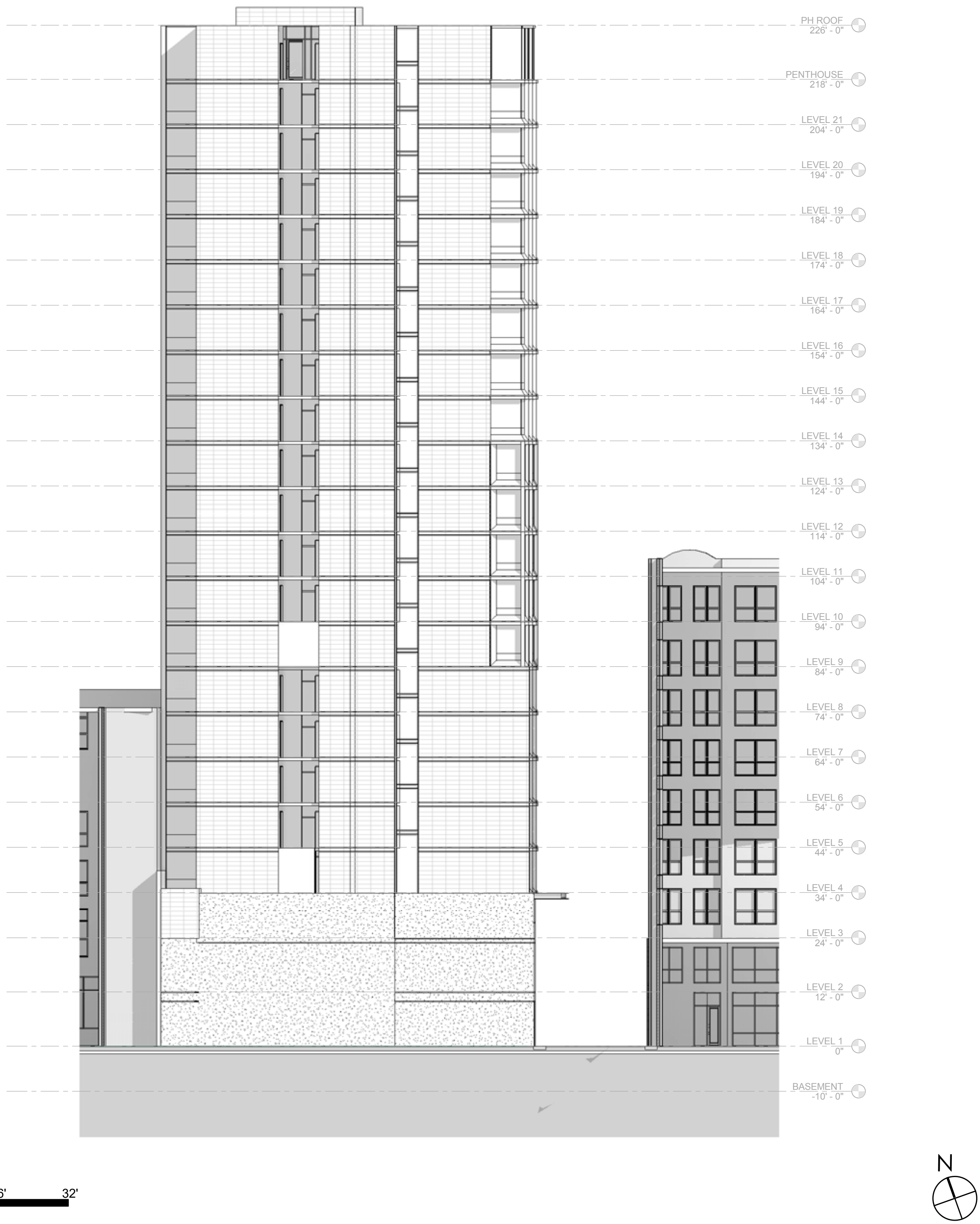


Figure 3- 17

West Elevation

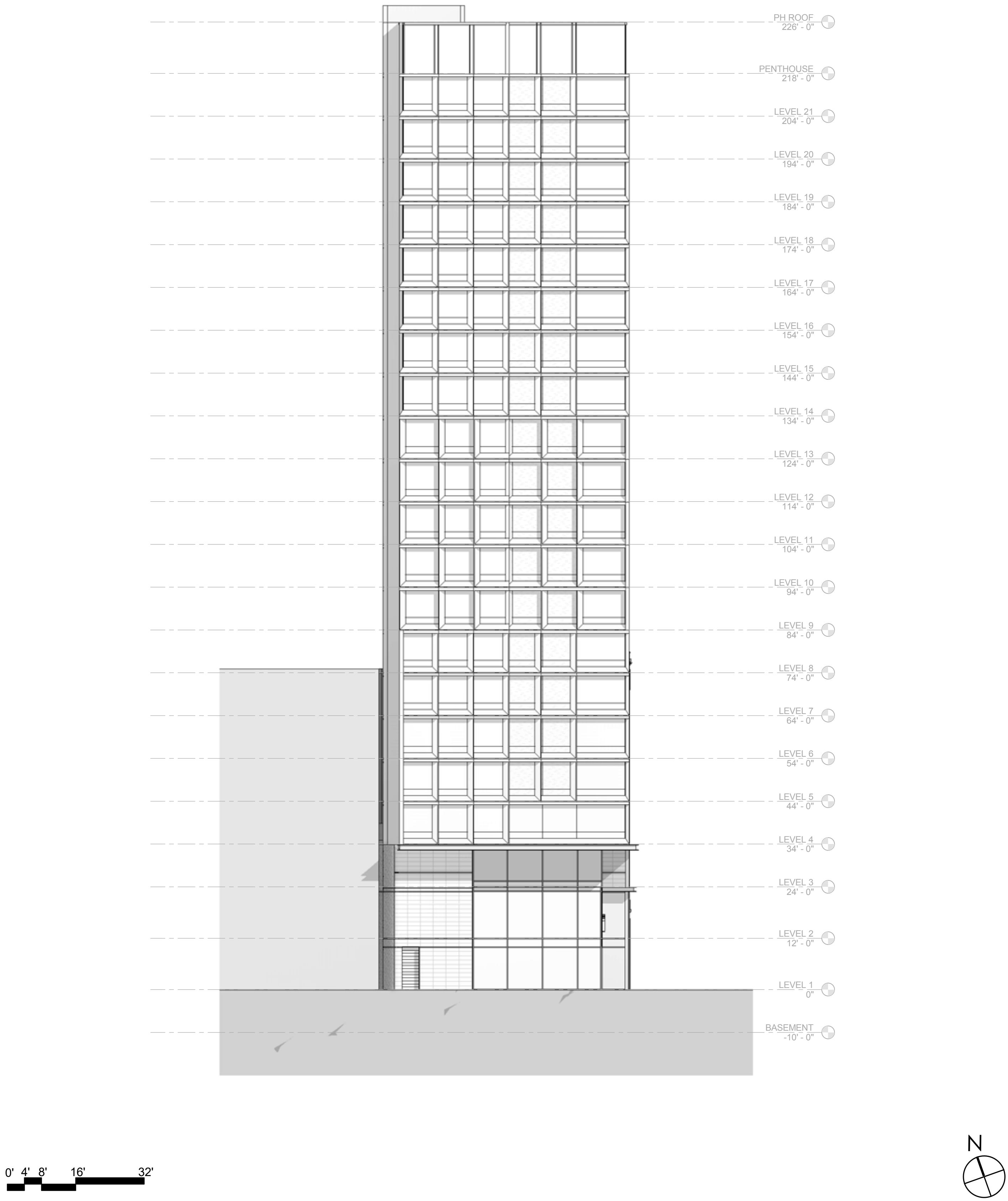


Figure 3- 18

Surrounding Building Heights Section

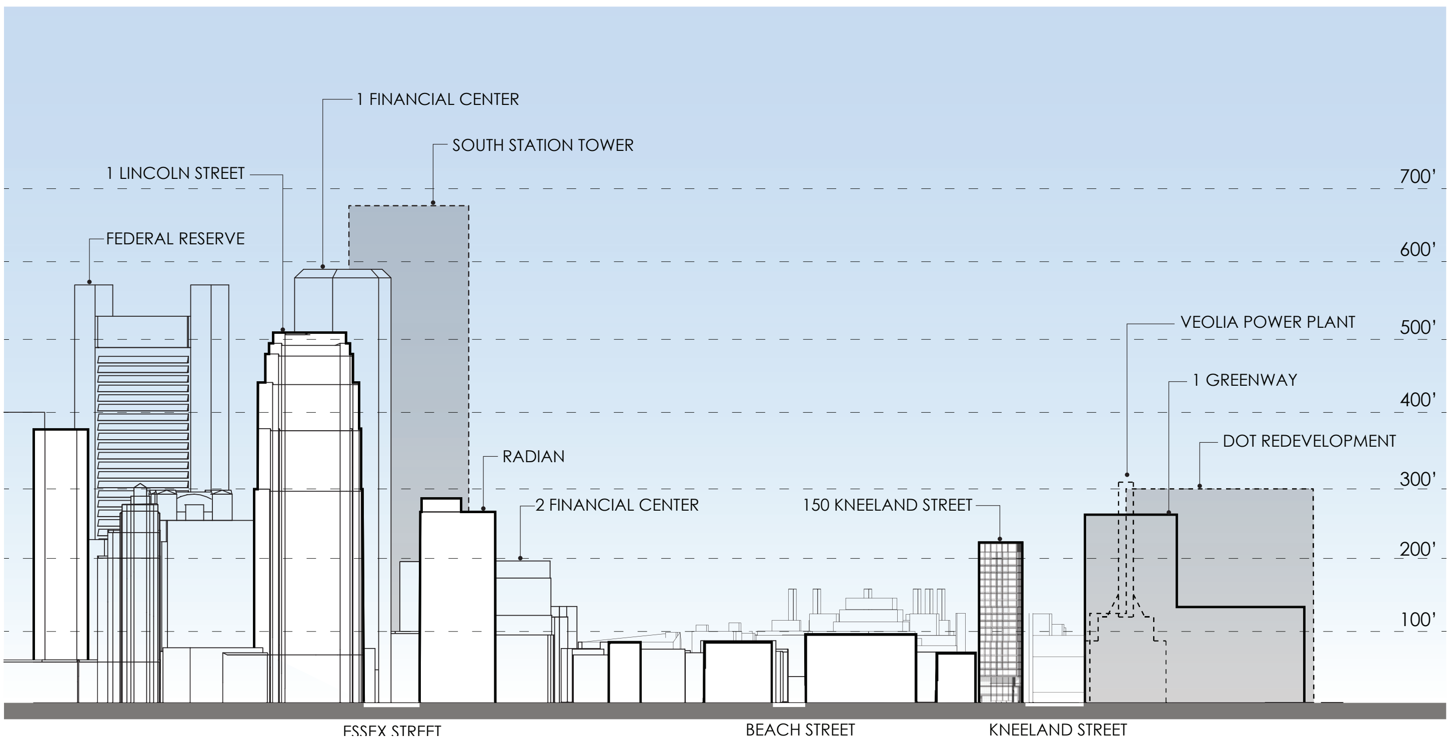


Figure 3-19

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

Project Checklist

Project Name: 150 Kneeland Street
Date: 2-Jun-18

Y	?	N			
	1		Credit	Integrative Process	1

Y	?	N			
12	**3**	**1**		**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

Y	?	N			
2	**1**	**7**		**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

Y	?	N			
8	**3**	**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
2			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

Y	?	N			
16	**9**	**8**		**Energy and Atmosphere**	**33**
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
4	2		Credit	Enhanced Commissioning	6
10	4	4	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
		2	Credit	Demand Response	2
	1	2	Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

Y	?	N			
2	**2**	**9**		**Materials and Resources**	**13**
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
	1	1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
		2	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	1	1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

Y	?	N			
5	**6**	**5**		**Indoor Environmental Quality**	**16**
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
	1	2	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	1	1	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1	1		Credit	Interior Lighting	2
	1	2	Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

Y	?	N			
6	**0**	**0**		**Innovation**	**6**
5			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

Y	?	N			
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

Y	?	N			
53	**27**	**30**	**TOTALS**	Possible Points:	**110**

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

4.0 ENVIRONMENTAL PROTECTION COMPONENT

4.1 Shadow Impacts Analysis

4.1.1 Introduction

A shadow impact analysis was conducted in order to illustrate new shadow created from the proposed project on the surrounding area. The study presents both existing and new shadow impact 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. There are no new shadows on public parks and open spaces including the Rose Kennedy Greenway, Reggie Wong Park, and so called “Leather District Park”. The impact of new shadows on public streets is minimal. ***New shadows are minimal and move quickly due to the hotel’s small footprint and slender floor plates.***

4.1.2 Vernal Equinox (March 21)

Figures 4.1-1 through **4.1-3** depict shadows on March 21.

At 9:00 AM, new shadows are cast in a northwesterly direction on the roof of adjacent buildings and a small portion of Utica Street. At 12:00 Noon, new shadows are cast in a northerly direction on the roof tops of adjacent buildings and a small portion of Utica Street.

At 3:00 PM, new shadows are cast in a northeasterly direction on the rooftops of adjacent buildings.

4.1.3 Summer Solstice (June 21)

Figures 4.1-4 through **4.1-7** depict shadow impacts on June 21.

At 9:00 AM, new shadows are cast in a westerly direction on a small portion of Utica Street and the rooftops of the adjacent building.

At 12:00 Noon, new shadows are cast in a northerly direction on the rooftop of the adjacent building.

At 3:00 PM, new shadows are cast in a northeasterly direction on the rooftops of adjacent buildings and a small portion of South Street.

At 6:00 PM, new shadows are cast in an easterly direction on the rooftops of adjacent buildings. Additional shadows are cast on the South Station Bus Terminal.

4.1.4 Autumnal Equinox (September 21)

Figures 4.1-8 through **4.1-11** depict shadow impacts on September 21.

At 9:00 AM, new shadows are cast in a northwesterly direction on the roof of adjacent buildings and a small portion of Utica Street.

12:00 Noon, new shadows are cast in a northerly direction on the rooftops of adjacent buildings and a small portion of Utica Street.

At 3:00 PM, new shadows are cast in a northeasterly direction on the rooftops of adjacent buildings.

At 6:00 PM, new shadows are cast in an easterly direction on the rooftops of adjacent buildings. Additional shadows are cast on the South Station Bus Terminal.

4.1.5 Winter Solstice (December 21)

Figures 4.1-12 through **4.1-14** depict shadow impacts on December 21. Winter sun casts the longest shadows of the year.

At 9:00 AM, new shadows are cast in a northwesterly direction on the rooftops of adjacent buildings.

At 12:00 Noon, new shadows are cast in a northerly direction on the rooftops of adjacent buildings. Additional shadows are cast on a small portion of Utica and Beach Streets.

At 3:00 PM, new shadows are cast in a northeasterly direction on the rooftops of adjacent buildings. Additional shadows extend to the rooftops of buildings on Atlantic Avenue and East Street.

4.1.6 Summary

New shadows from the project will be primarily limited to the immediate surrounding adjacent properties' rooftops to the north and northeast. Shadows will not cause significant impact due to existing buildings in the area. ***There are no new shadows on public parks and open spaces*** including the Rose Kennedy Greenway, Reggie Wong Park, and informally identified "Leather District Park". The impact of new shadows on public streets is minimal. New shadows are minimal and move quickly due to the hotel's small footprint and slender floor plates.

Figure 4.1- 1

Shadow Study- Vernal Equinox (March 21) 9 AM

Figure 4.1- 2

Shadow Study- Vernal Equinox (March 21) 12 PM

Figure 4.1- 3

Shadow Study- Vernal Equinox (March 21) 3 PM

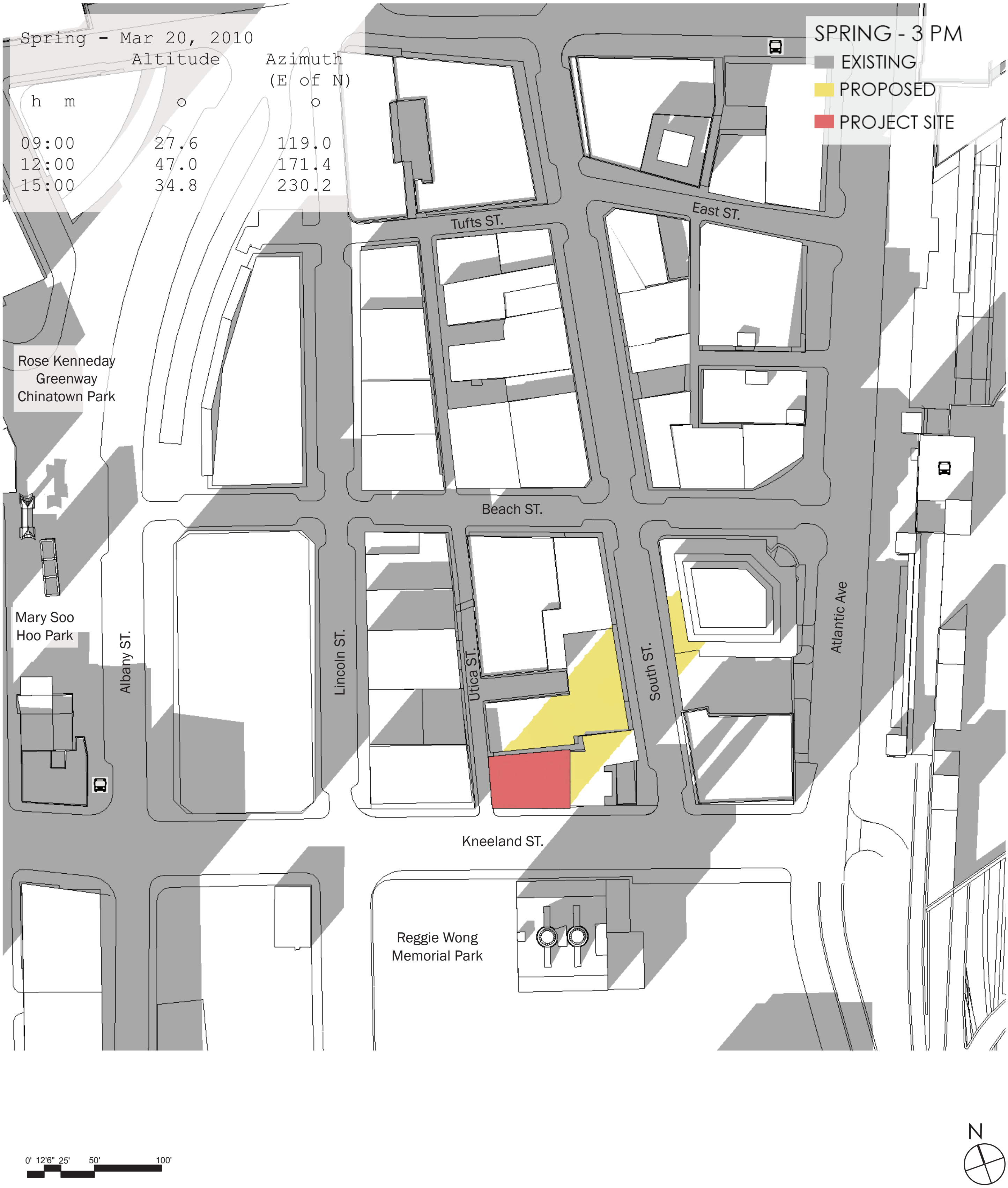


Figure 4.1- 4

Shadow Study- Summer Solstice (June 21) 9 AM

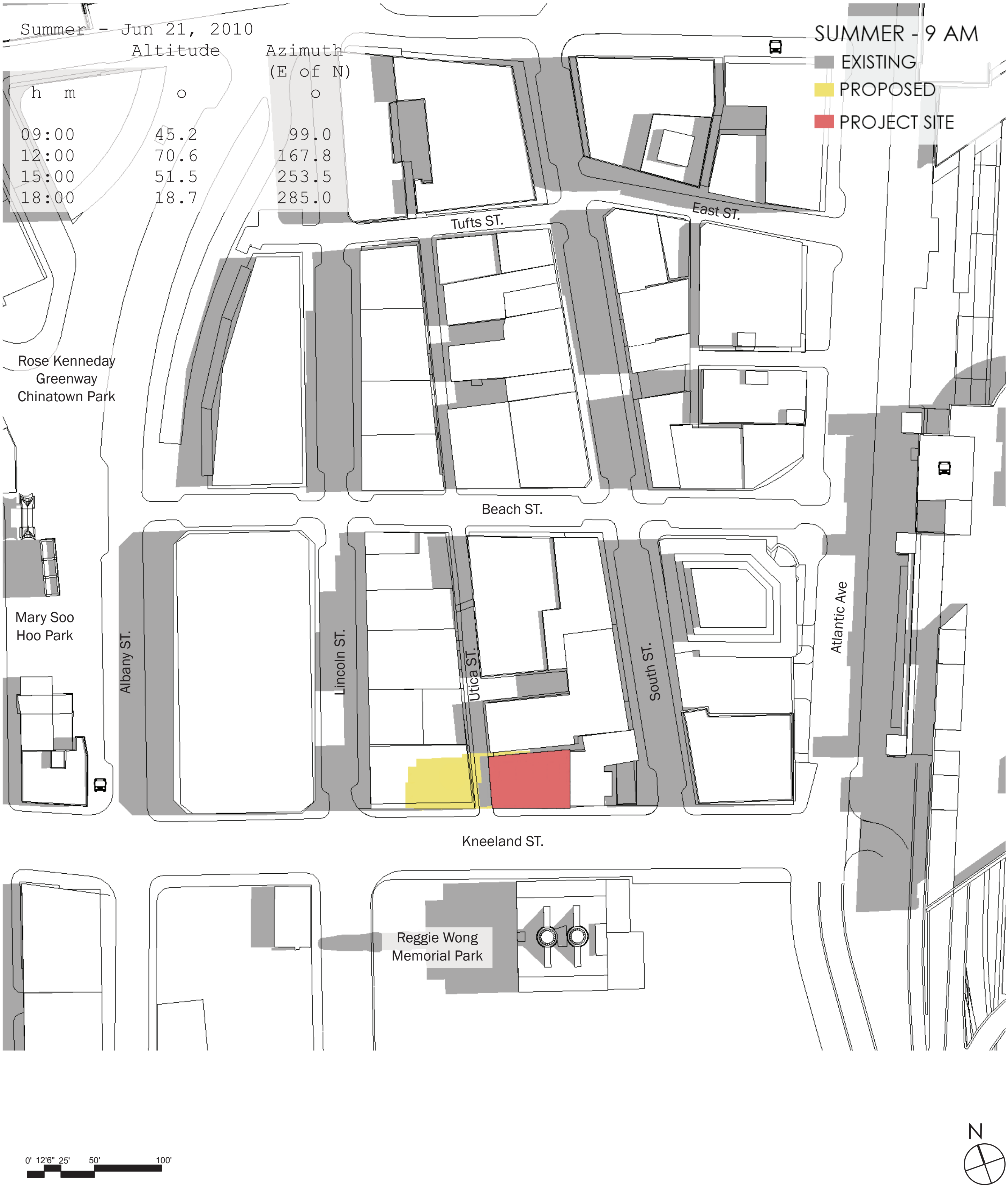


Figure 4.1- 5

Shadow Study- Summer Solstice (June 21) 12 PM

Figure 4.1- 6

Shadow Study- Summer Solstice (June 21) 3 PM

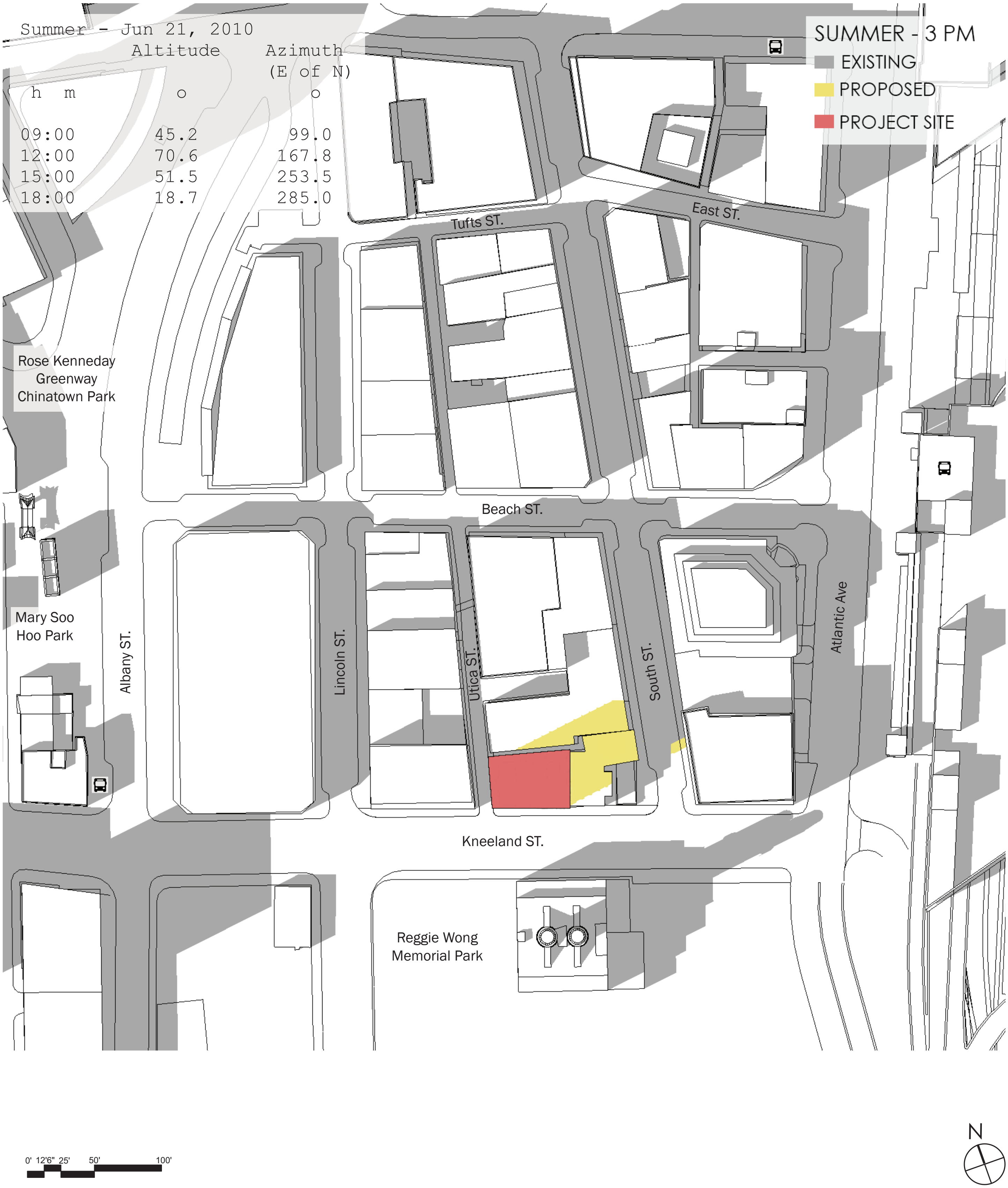


Figure 4.1- 7

Shadow Study- Summer Solstice (June 21) 6 PM

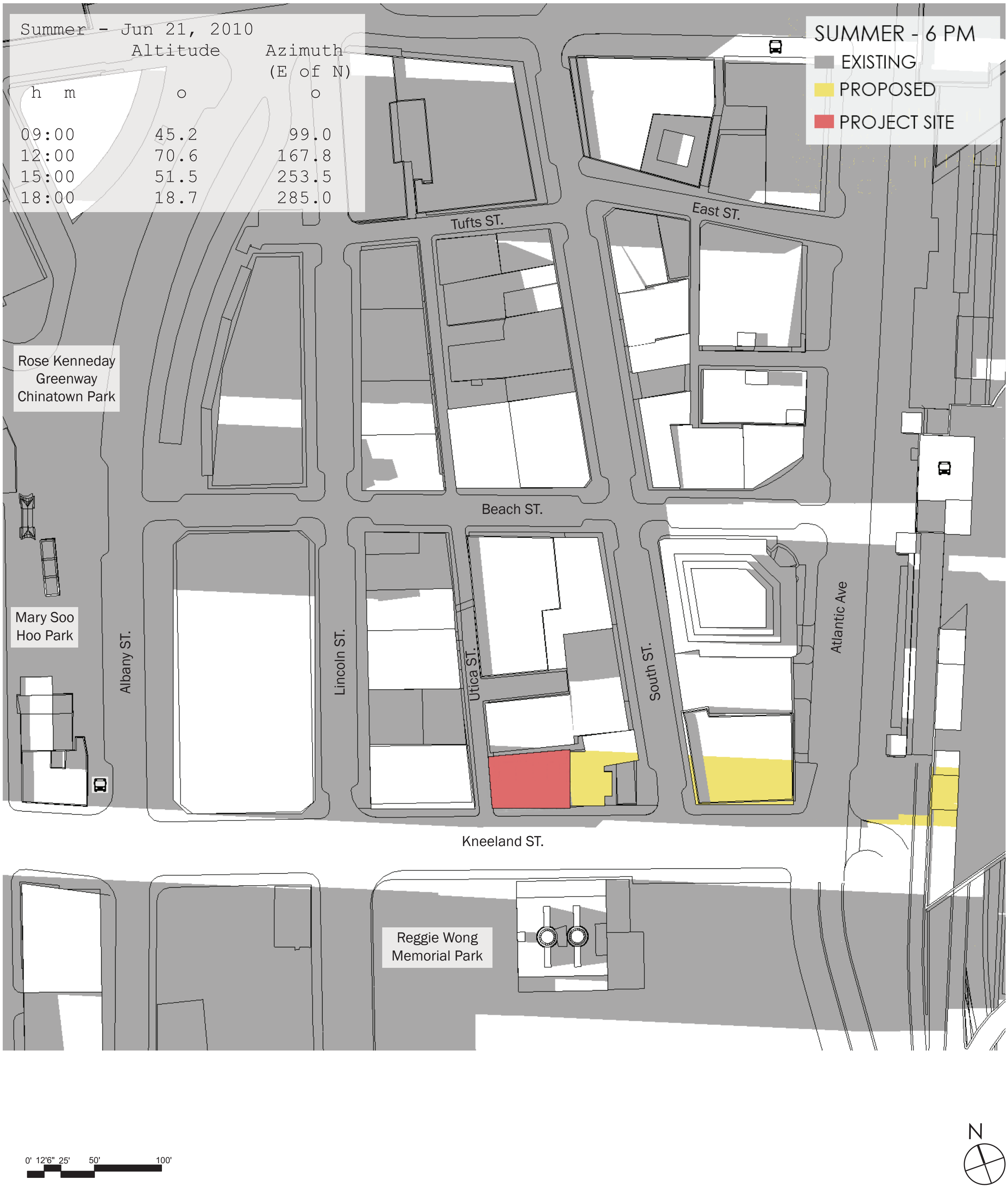


Figure 4.1- 8

Shadow Study- Autumnal Equinox (September 21) 9 AM

Figure 4.1- 9

Shadow Study- Autumnal Equinox (September 21) 12 PM

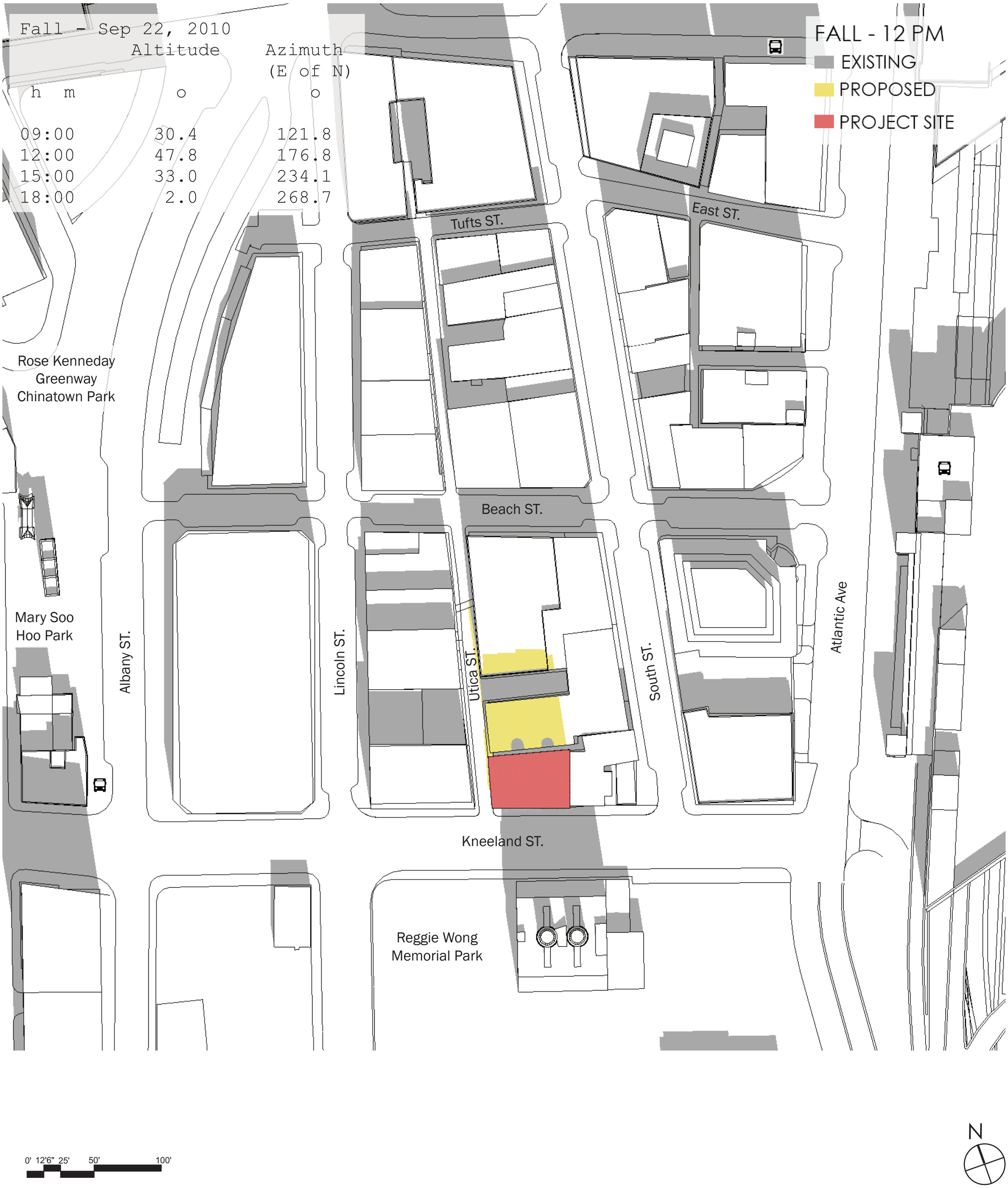


Figure 4.1- 10

Shadow Study- Autumnal Equinox (September 21) 3 PM

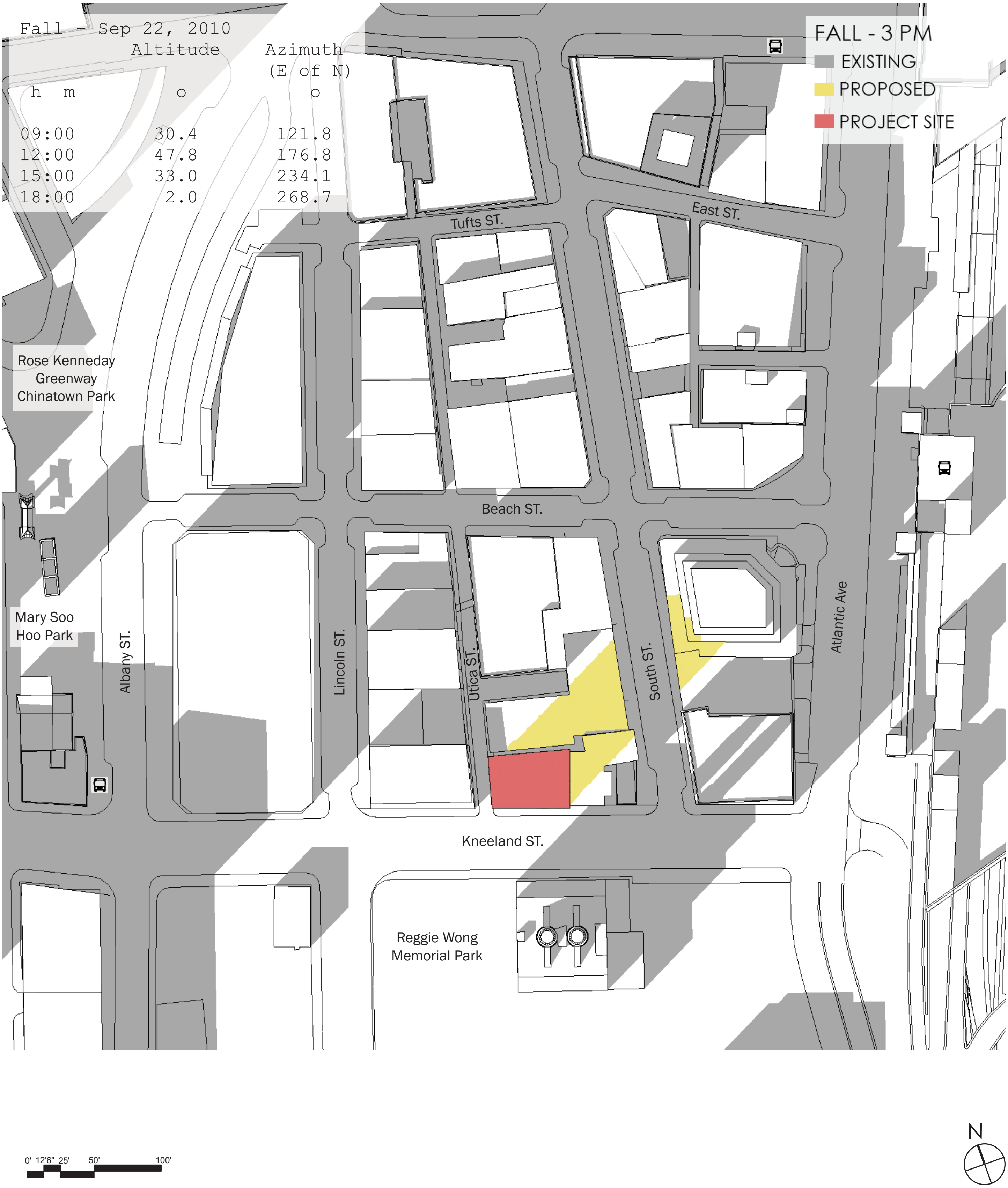


Figure 4.1- 11

Shadow Study- Autumnal Equinox (September 21) 6 PM

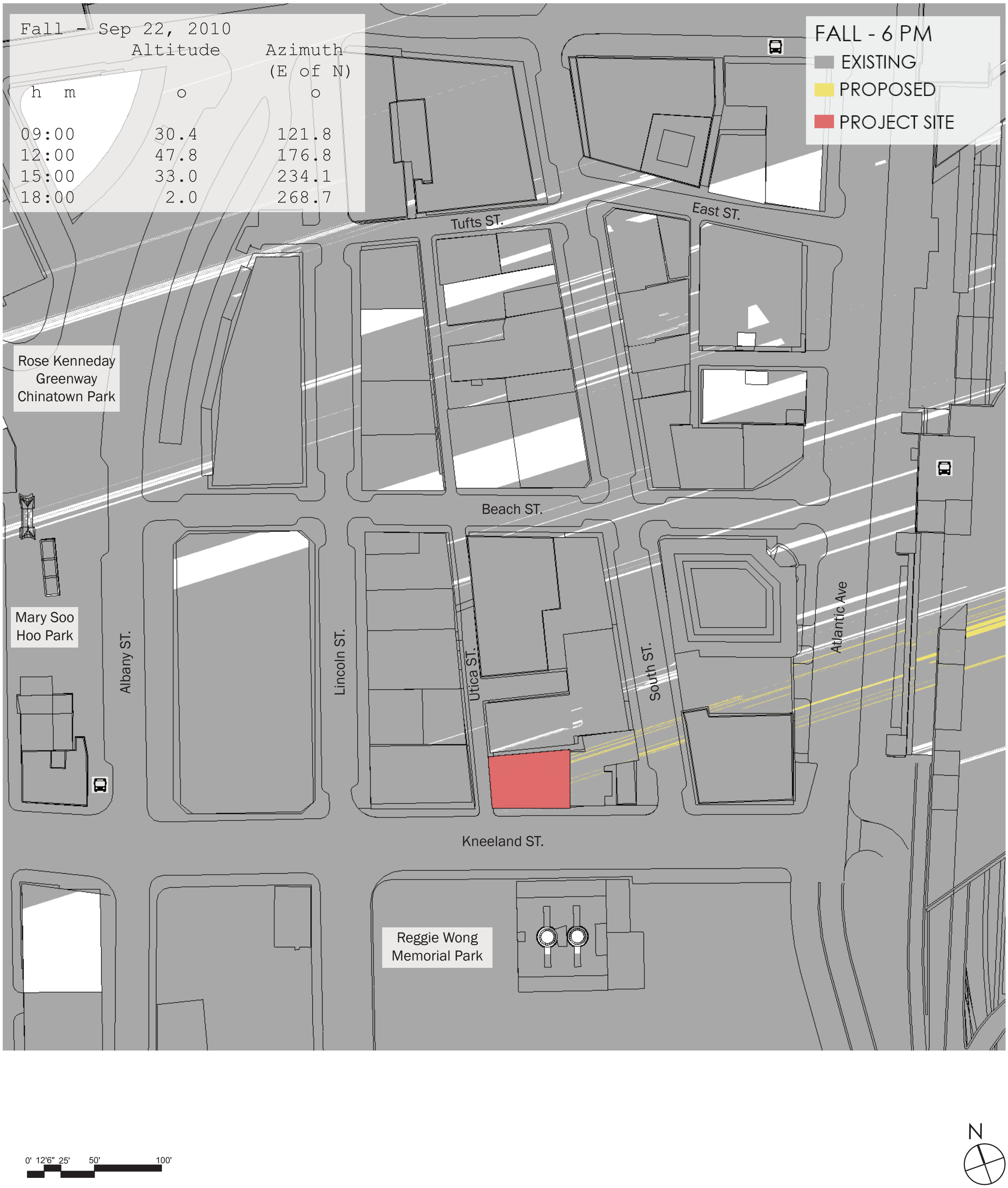


Figure 4.1- 12

Shadow Study- Winter Solstice (December 21) 9 AM

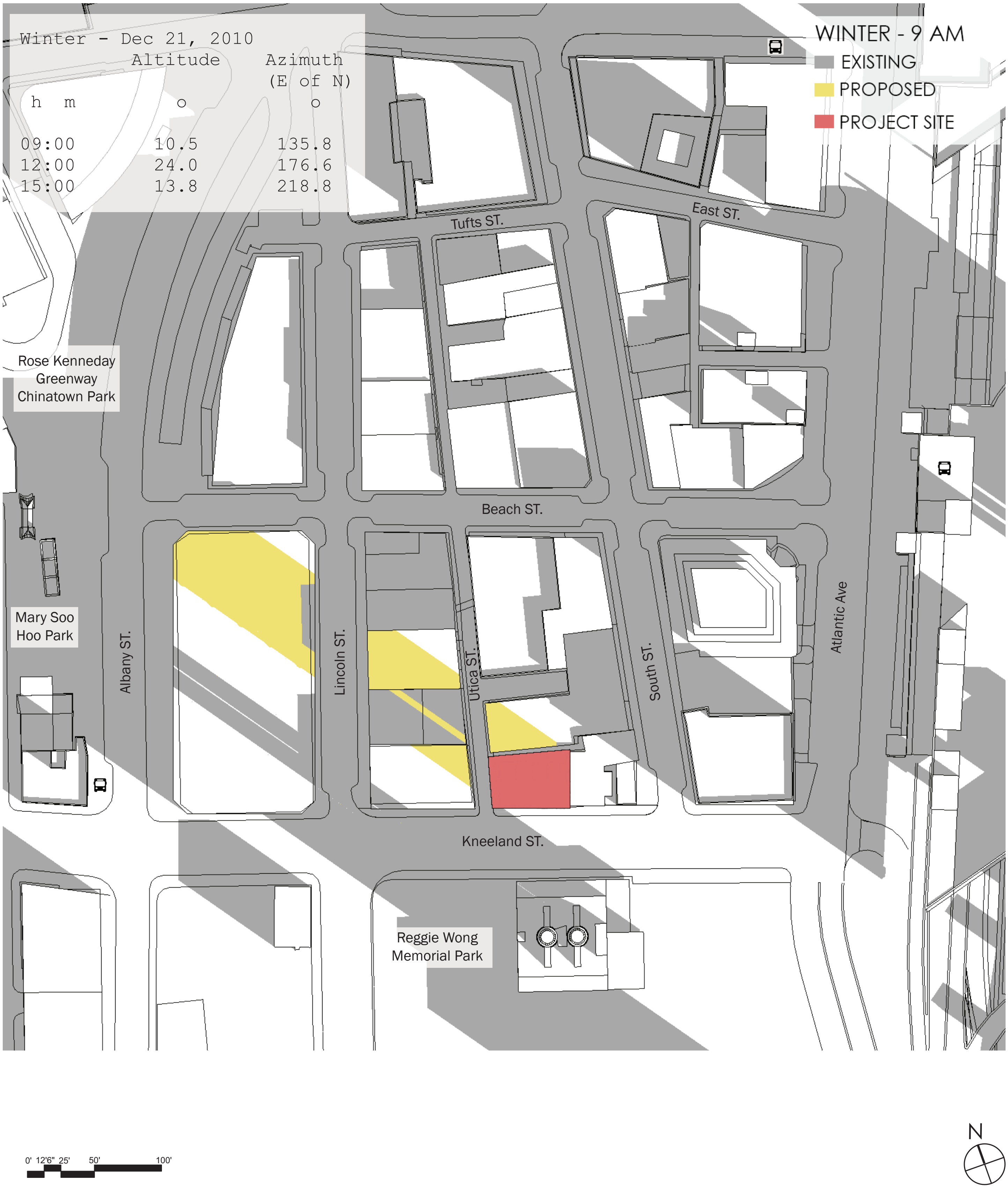


Figure 4.1- 13

Shadow Study- Winter Solstice (December 21) 12 PM

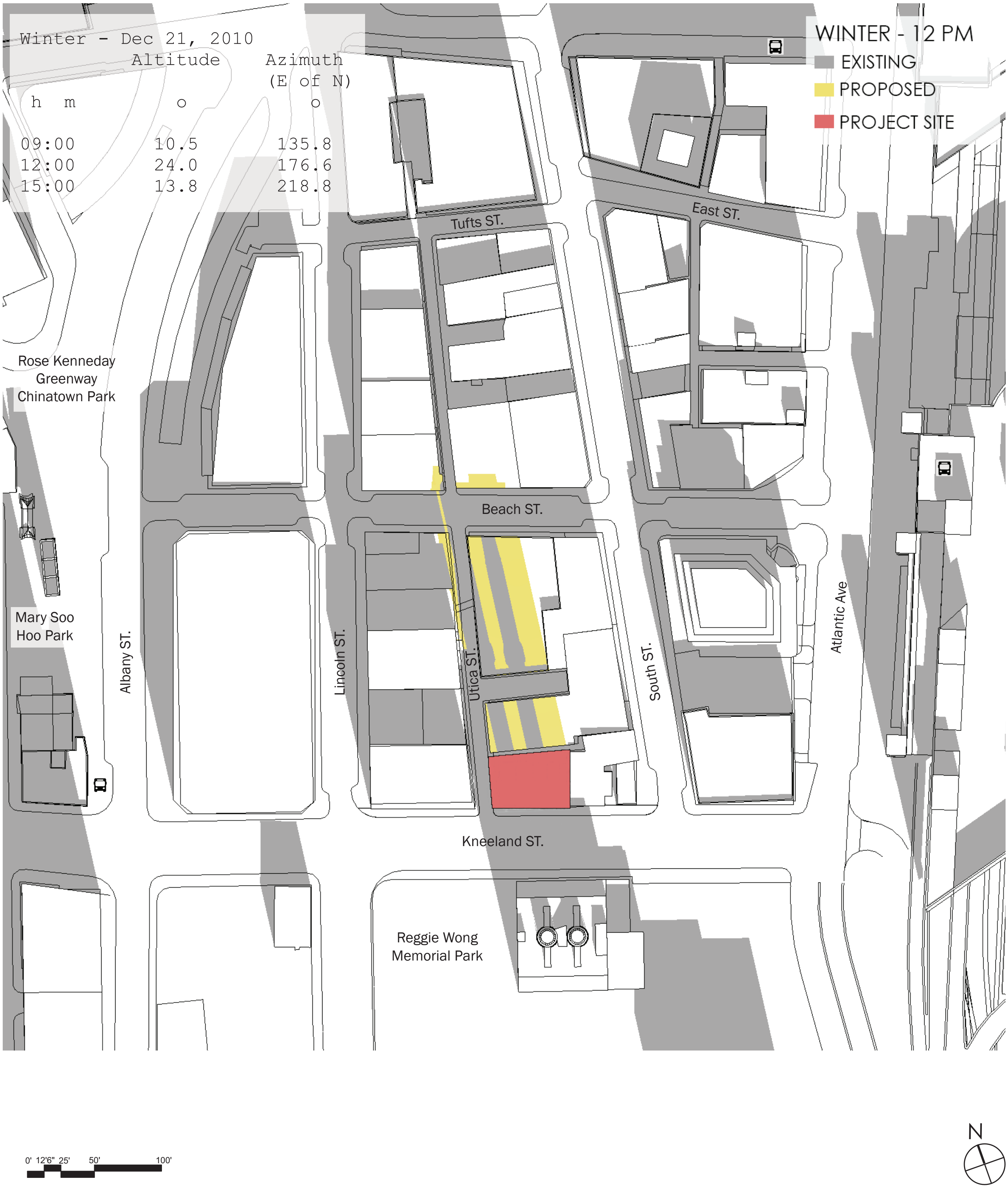
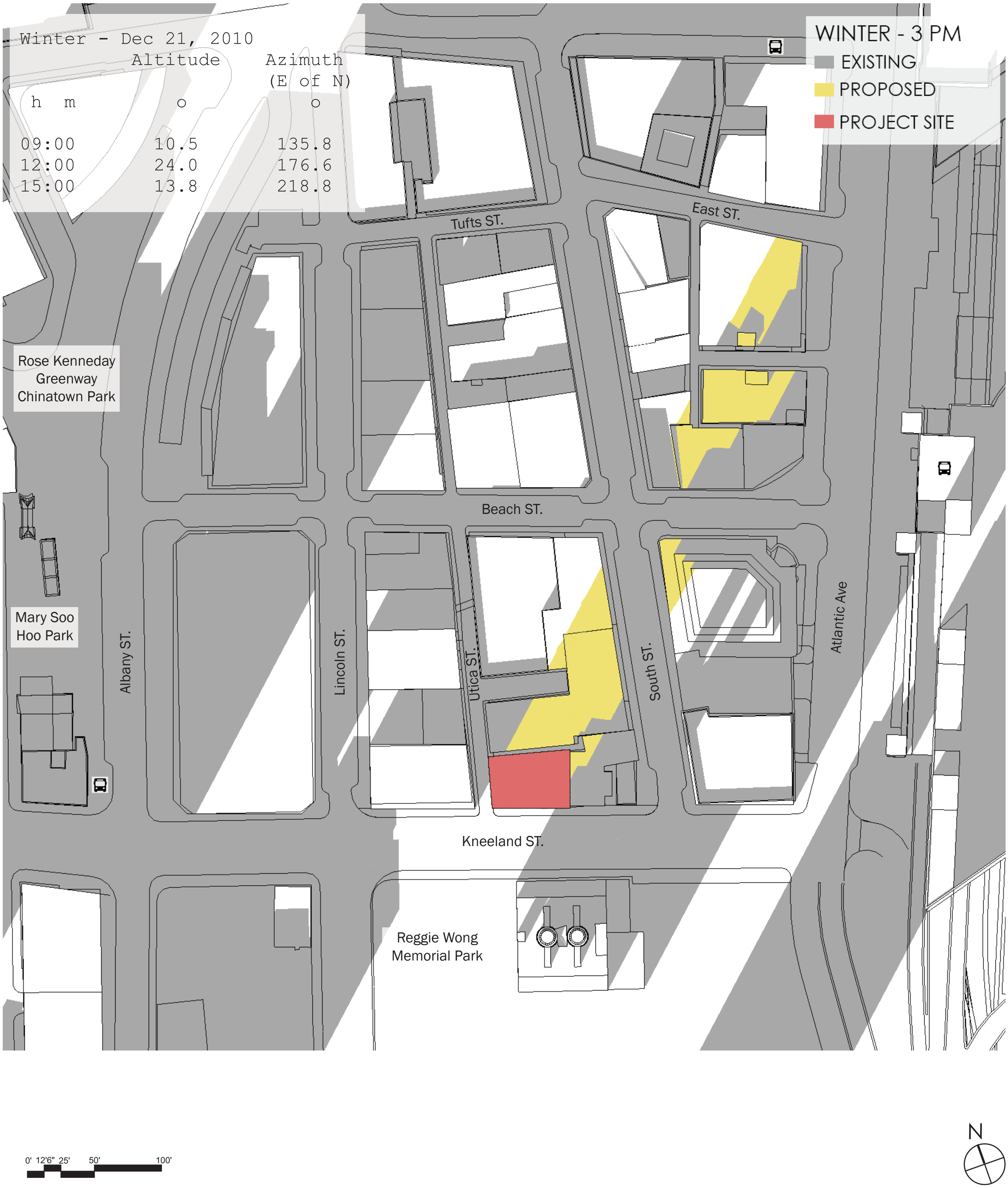


Figure 4.1- 14

Shadow Study- Winter Solstice (December 21) 3 PM



4.2 Air Quality

Tech Environmental, Inc. performed air quality analyses for the 150 Kneeland Street 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 building heating and ventilation, and 3) a microscale CO analysis for intersections in the Project area that meet the BPDA 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}), ozone (O_3), and lead are 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 (2014-2016), 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 ($\mu g/m^3$)
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 (µg/m³)	NAAQS (µg/m³)	Percent of NAAQS
CO, 1-hour	Harrison Avenue, Boston	2,760	40,000	7%
CO, 8-hour	Harrison Avenue, Boston	1,375	10,000	14%
NO_2, 1-hour	Harrison Avenue, Boston	96.0	188	51%
NO_2, Annual	Harrison Avenue, Boston	29.7	100	30%
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	14.0	35	40%
$PM_{2.5}$, Annual	Harrison Avenue, Boston	6.0	12	50%
Lead, Quarterly	Harrison Avenue, Boston	0.017	1.5	1%
SO_2, 1-hour	Harrison Avenue, Boston	23.1	196	12%

Source: MassDEP, http://www.mass.gov/eea/agencies/massdep/air/quality/air-monitoring-reports-and-studies.html, downloaded September 29, 2017.

Notes:

(1) Annual averages are highest measured during the most recent three-year period for which data are available (2014 - 2016). Values for periods of 24-hours or less are highest, second-highest over the three-year period unless otherwise noted.

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

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

(4) Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m³) (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 Building Heating and Ventilation

The Project will include fuel combustion equipment that will emit air pollutants to the atmosphere when operating. Fuel combustion equipment for the Project will include two individual gas-fired boilers (each with a heat input capacity of 3.0 million Btu per hour (MMBtu/hour) and one 500 kW emergency generator.

EPA's AP-42 document was used to determine the uncontrolled CO emission rate for the gas-fired boilers. The gas-fired boiler heat input capacity for the project will be 6.0 MMBtu/hour. Assuming a heating value of 1,020 Btu/cubic foot of natural gas this translates to approximately 5,882 cubic feet of natural gas burned per hour. Using a CO emission factor of 0.084

lb/MMBtu,[1] the maximum CO emissions from the boilers will be 0.50 lbs/hour (0.06 gram/second).

The manufacturer's emissions data was used to determine the CO emission rate for the emergency generator. The power rating of 500 kW translates to approximately 671 bhp. Using the manufacturer's CO emission factor of 0.4 grams g/bhp-hr, the maximum total CO emissions from the emergency generator will be 0.59 lbs/hour (0.07 grams/second).

Together, the maximum CO emissions from the project will be 1.1 lbs/hour (0.14 grams/second). This calculation conservatively assumes that all of the gas-fired fuel combustion equipment is operating simultaneously at its full design capacity.

Worst-case concentration of CO from the rooftop equipment was predicted for locations around the building by using AERMOD model (Version 18081) in screening mode. The results of the air quality analysis for locations outside and around the building are summarized in **Table 4.2-3**. The results in **Table 4.2-3** represent all outside locations on and near the Project Site, including 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 gas-fired boilers as a volume source on the rooftop using worst-case meteorological conditions for an urban area. The predicted concentrations presented here represent the worst-case air quality impacts from the gas-fired boilers at all locations on and around the Project. AERMOD predicted one-hour average concentrations of CO.

AERMOD predicted that the maximum one-hour CO concentration from the gas-fired boilers will be 1.33 ppm. The maximum predicted eight-hour CO concentration at any ambient (outside) location will be significantly smaller than the one-hour prediction. This is because: 1) all fuel combustion equipment will not be operating at their maximum load simultaneously for eight hours, and 2) the worst-case meteorological conditions used to predict the peak one-hour impact will not persist for eight consecutive hours. 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 1.20 ppm (1.33 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 2.4 ppm for a one-hour period and 1.2 ppm for an eight-hour period were added to the maximum predicted

[1] US EPA, "Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition Volume I: Stationary Point and Area Sources", Table 1.4-1, January 1995 (revised July 1998).

fuel combustion 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 fuel combustion equipment, at any location around the building, will be no larger than 3.73 ppm and 2.40 ppm, respectively. These maximum predicted total CO concentrations (fuel combustion equipment and parking garage plus background) are safely in compliance with the NAAQS. **This analysis demonstrates that the operation of the gas-fired boilers will not have an adverse impact on air quality**.

Table 4.2-3. Building Heating and Ventilation 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*	3.73**	35 (NAAQS)	2.40**	9 (NAAQS)

N

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 2.4 ppm for the one-hour period and 1.2 ppm for the eight-hour period.

4.2.3 Microscale CO Analysis for Selected Intersections

The Boston Planning & Development Agency (BPDA) and the 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 LOS is E or F and the project contributes to a reduction in LOS. For such intersections, a microscale air quality analysis is required to examine the carbon monoxide (CO) concentrations at sensitive receptors near the intersection.

A microscale air quality analysis was not performed for this Project due to the Project trip generation having minimal impacts on the overall delays at the five intersections. **Table 4.2-4** shows a comparison of the Existing (2017) and Build (2025) LOS at the five intersections. The motor vehicle trip generation from the Project will not have a significant impact on motor vehicle delays and air pollutant emissions at the analyzed intersections. Therefore, ***the motor vehicle traffic generated by the Project will not have a significant impact on air quality*** at any intersection in the Project area and a microscale air quality analysis is not necessary for this Project.

Table 4.2-4. Summary of Build Case Level of Service

Intersection	Existing LOS (AM/PM)	Build LOS (AM/PM)	Requires Analysis?
Albany Street/Surface Road/Kneeland Street	C/C	C/C	NO
Lincoln Street/Kneeland Street	D/C	E/D	NO*
Frontage Road/Atlantic Avenue/I-90 Ramps/Kneeland Street	C/C	D/D	NO
Utica Street /Kneeland Street	C/B	C/B	NO
Kneeland Street/South Street	B/B	B/B	NO

The LOS shown represents the overall delay at each intersection
*Project does not contribute to reduction in level of service.
Source: Howard/Stein-Hudson Associates, Inc.

Conclusions

The microscale CO air quality dispersion modeling analysis clearly indicates that the worst-case traffic generated by the Project will not cause or contribute to any violations of the NAAQS for CO and will not significantly affect air quality. Total CO impacts at the intersections with the largest delays and at the Project site, including the impacts from the building heating and ventilation, 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.

As further detailed below, it was determined that 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. The acoustic analysis demonstrates that the Project's design will meet the applicable acoustic criteria.

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 only increases by 3 dB (or 73 dB), it does not double to 140 dB. Thus, every 3 dB increase represents a doubling of sound energy. For broadband sounds, a 3 dB change is the minimum change perceptible to the human ear. **Table 4.3-1** gives the perceived change in loudness of different changes in sound pressure levels.[2]

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

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

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

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

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

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.

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).

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 on Sundays. Compliance with the most restrictive nighttime residential limits will ensure compliance for other land uses with equal or higher noise limits.

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: 150 Kneeland Street

Monitoring Location #2: 123 Beach 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 from 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 on Monday night May 7th, 2018. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was 52^{o}F, the skies were clear, and the winds were 4 mph, from the east southeast. 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 revealed 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, and train horns.

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 61.8 dBA at Location #1, and 55.8 dBA at Location #2. The octave band data in **Table 4.3-4** show that there were no pure tones detected in the nighttime noise measurements.

Table 4.3-4. Nighttime Baseline Sound Level Measurements, May 7th, 2018

Sound Level Measurement	Location #1 150 Kneeland Street 11:30 p.m. - 12:00 a.m.	Location #2 123 Beach Street 11:00 p.m. - 11:30 p.m.
Broadband (dBA) Background (L_{90})	 61.8	 55.8
Octave Band L_{90} (dB) 16 Hz 32 Hz 63 Hz 125 Hz 250 Hz 500 Hz 1000 Hz 2000 Hz 4000 Hz 8000 Hz 16000 Hz	 68.1 67.6 65.4 63.5 62.1 57.0 58.0 52.8 44.0 34.6 19.8	 62.1 63.3 61.4 56.8 53.5 52.3 51.8 46.5 38.9 27.1 16.2
Pure Tone?	No	No

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 Project site Acceptability Standards established by the United States Department of Housing and Urban Development (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 the 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 morning, on Wednesday, April 26th, 2018 between 10:00 a.m. and 10:30 a.m. at 150 Kneeland Street (Location #1) which was used to represent the closest residential use 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 11 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 from motor vehicle traffic on nearby local streets, construction vehicles in the distance, adjacent South Station Bus Terminal, and aircraft over-flights. The L_{eq} measured during the morning period was 71.8 dBA. The L_{eq} sound level measured during the nighttime at the same location was 66.7 dBA. Using both the daytime and nighttime L_{eq} sound levels, the calculated L_{dn} for the site is 74.3 dBA, which is above the HUD guideline noise limit of 65 dBA.

It is assumed that standard building construction practices will result in at least a 30 dBA reduction of sound from outdoor sound levels. The Proponent will incorporate sound mitigation, as necessary, to assure that motor vehicle sound sources do not result in noise impacts greater than 45 dBA inside the residential units closest to the neighboring streets.

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:

- One (1) CAT Model C15 diesel generator set enclosed in an aluminum sound attenuated enclosure,
- Two (2) York 105 Ton Chillers
- One (1) Innovent Energy Recovery Unit
- Two (2) Baltimore Aircoil Company 100 Ton Cooling Towers

The equipment listed above, which will be located on the building rooftop mechanical yard, was included in the noise impact analysis. The two chillers will be located inside on the first floor of the mechanical yard, and the remaining equipment will be located on the top floor. The Project's traffic was not included in the noise analysis because motor vehicles are exempt under both the City of Boston and 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 were calculated with acoustic modeling software assuming simultaneous operation of all mechanical equipment at their maximum loads.

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

Receptors

The closest/worst-case sensitive (residential) location is to the west of the project area at 216 Lincoln Street. This location was selected based on the proximity of the equipment (smaller distances correspond to larger noise impacts). 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 (216 Lincoln Street), as well as additional residential uses to the east (210 South Street), north (109 Beach St), northeast (122 South St) and west (99 Kneeland St). Noise impacts at other nearby noise-sensitive locations (residences, parks, etc.) farther from the Project Site will be less than those predicted for these receptors.

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

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

4.3-9. 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 **4.3-9**, reveal that the sound level impact at the upper floors of the closest residences will be between 33.1 and 40.9 dBA. The smallest sound level impact of 33.1 dBA is predicted to occur at 99 Kneeland St. The largest sound level impact of 40.9 dBA is predicted to occur at 210 South Street. Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime noise limit (50 dBA) for a residential area. Note that sound levels from the Project will be below the residential nighttime limits at all times. The results also demonstrate compliance with the City of Boston, residential, non-daytime, octave band noise limits at both closest locations.

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

Massachusetts DEP Noise Regulations

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

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

As shown in **Tables 4.3-5** through **4.3-9**, the Project is predicted to produce a less than 1 dBA change in the background sound levels at all modeled locations. Therefore, the Project's worst-case sound level impacts during the quietest nighttime periods will be in compliance with the

Massachusetts DEP allowed noise increase of 10 dBA. The noise predictions for each octave band indicate that the mechanical equipment will not create a pure tone condition at any location.

Table 4.3-5. Estimated Future Sound Level Impacts – Anytime, 216 Lincoln St (Closest/Worst Case Residence) – Location R1

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	53
63 Hz	67	50
125 Hz	61	46
250 Hz	52	38
500 Hz	46	34
1000 Hz	40	29
2000 Hz	33	23
4000 Hz	28	17
8000 Hz	26	9
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}	61.8
150 Kneeland Street Project*	36.5
Calculated Combined Future Sound Level	61.8
Calculated Incremental Increase	+0.0
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-6. Estimated Future Sound Level Impacts – Anytime, 109 Beach Street – Location R2

Octave Bands	Residential Nighttime	Maximum Predicted Sound Levels*
32 Hz	68	53
63 Hz	67	52
125 Hz	61	50
250 Hz	52	42
500 Hz	46	37
1000 Hz	40	32
2000 Hz	33	26
4000 Hz	28	20
8000 Hz	26	12
Broadband (dBA)	**50**	**40**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90}	55.8
150 Kneeland Street Project*	39.9
Calculated Combined Future Sound Level	55.8
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, 122 South St – Location R3

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	51
63 Hz	67	50
125 Hz	61	48
250 Hz	52	41
500 Hz	46	36
1000 Hz	40	30
2000 Hz	33	23
4000 Hz	28	15
8000 Hz	26	2
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}	55.8
150 Kneeland Street Project*	38.4
Calculated Combined Future Sound Level	55.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.

Table 4.3-8. Estimated Future Sound Level Impacts – Anytime, 210 South St – Location R4

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	53
63 Hz	67	52
125 Hz	61	50
250 Hz	52	44
500 Hz	46	39
1000 Hz	40	33
2000 Hz	33	26
4000 Hz	28	19
8000 Hz	26	11
Broadband (dBA)	**50**	**41**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90}	60.5
150 Kneeland Street Project*	40.9
Calculated Combined Future Sound Level	55.9
Calculated Incremental Increase	+0.1
Compliance with DEP Noise Policy?	Yes

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

Table 4.3-9. Estimated Future Sound Level Impacts – Anytime, 99 Kneeland St – Location R5

Octave Bands	Residential Nighttime Noise Standards	Maximum Predicted Sound Levels*
32 Hz	68	46
63 Hz	67	45
125 Hz	61	42
250 Hz	52	36
500 Hz	46	31
1000 Hz	40	25
2000 Hz	33	17
4000 Hz	28	8
8000 Hz	26	--
Broadband (dBA)	**50**	**33**
Compliance with the City of Boston Noise Regulation?		Yes

Sound Level Metric	Maximum Sound Levels* (dBA)
Existing Nighttime Background, L_{90}	61.8
150 Kneeland Street Project*	33.1
Calculated Combined Future Sound Level	61.8
Calculated Incremental Increase	+0.0
Compliance with DEP Noise Policy?	Yes

*Assumes full-load operation of all mechanical equipment.

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 (See **Section 4.6**) and will meet the Boston Water and Sewer Commission (BWSC) Site Plan requirements. The existing storm drain utility and combined sewer infrastructure surrounding the Site appears to be of adequate capacity to service the needs of the Project. The Project will not result in an increase in impervious area but will improve the quality and attenuate the quantity of stormwater runoff being discharged to BWSC storm drain system through the installation of an on-site infiltration system. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged.

In addition to the installation of an on-site underground infiltration system, stormwater runoff will be treated through the use of deep sump drainage inlets prior to entering the infiltration system. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

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

4.5 Solid and Hazardous Waste Materials

4.5.1 Solid Waste

During the preparation of the Site, debris from the existing building(s) 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 376 tons of solid waste per year, based on the assumption that each of the 230 hotel rooms will generate approximately 4 lbs of solid waste per day or 920 tons per year, and the ground and second floors with approximately 9,000 gsf will generate 5.5 tons per 1,000 gsf or approximately 50 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 (1 through 7, co-mingled).

4.5.2 Hazardous Waste and Materials

A Phase I Environmental Site Assessment was completed for the property in January 2018 for the Proponent. The report was reviewed to evaluate the potential for encountering Oil and/or Hazardous Material in subsurface soil or groundwater during construction. The property is not a listed Disposal site under the Massachusetts Contingency Plan (MCP) at 310 CMR 40.000. However, the presence of urban fill soils containing concentrations of chemical constituents ubiquitous in fill soils was identified at nearby sites.

A soil characterization program, as required by receiving facilities, will be undertaken during design to define environmental quality of any excess materials generated during construction to be transported off site. Management of any material excavated and removed from the site will be in accordance with applicable laws and regulations.

A Hazardous Building Materials Survey will be conducted in advance of existing building demolition to assess the presence of asbestos, PCBs, lead and other potentially hazardous materials. Abatement will be undertaken for hazardous building materials identified and appropriate permits and approvals obtained prior to demolition.

4.6 Geotechnical / Groundwater Impacts Analysis

4.6.1 Existing Site Conditions

The property is generally bound by a nine-story brick building across Utica Street to the west, one six-story brick structure to the north, another to the east, and the 300+ foot Veolia Energy plant to the south across Kneeland Street. Ground surface immediately around the site ranges from about El. 15 to El. 16 ft, Boston City Base (BCB).

4.6.2 Subsurface Soil and Bedrock Conditions

The site was formerly part of the Fort Point Channel and was filled circa 1835 to 1838 as part of the land filling and development of South Cove. Site and subsurface conditions at the site are based on available test boring data and geologic information for the area. A comprehensive subsurface investigation including test borings and test pits will be performed at the site during subsequent project design phases and prior to construction.

Generalized subsurface conditions are summarized below in order of increasing depth below ground surface:

Stratum/ Subsurface Unit	Estimate Depth (ft) to Top of Stratum	Estimated Thickness (ft)
Fill	0	10 to 20
Organic Deposits	10 to 20	10 to 25
Marine Deposits (Sand/Clay)	25 to 35	50 to 65
Glacial Deposits	85 to 100	2 to 25
Bedrock	90 to 120	-

4.6.3 Groundwater

Data from a Boston Groundwater Trust well located in the sidewalk along the south side of the property, on Kneeland St, indicate groundwater measured at about El. 7 to 9 ft BCB since June 2010. Variations in groundwater levels are possible as they are influenced by precipitation, local construction activities, and leakage into and out of utilities and other below-grade structures.

The Project site is located within the Groundwater Conservation Overlay District (GCOD) and accordingly, the Project will comply with requirements of Article 32 of the City of Boston Zoning Code. The Project will promote infiltration of stormwater into the ground by capturing within a suitably-designed system, a volume of rainfall equivalent to no less than 1-inch across the impervious portion of the site. The Project will result in no negative impact on groundwater levels in the surrounding area.

Dewatering is not anticipated to be required for building construction. Any dewatering efforts are anticipated to be limited to control of surface water runoff from precipitation. The Project is expected to have negligible long-term impacts on groundwater levels.

4.6.4 Proposed Foundation Construction

New foundations required for the Project are anticipated to be either end-bearing piles driven to bedrock or drilled-in deep foundations (drilled shafts or micropiles) bearing in the dense glacial soils or bedrock underlying the site. Specific design and construction performance criteria will be established to be protective of adjacent structures.

4.6.5 Monitoring Program

Due to the Project location and proximity to surrounding buildings, a monitoring program will be developed and implemented prior to the start of construction. Prior to implementation of the monitoring program, performance criteria will be established to protect adjacent structures and included in the contract documents. Construction activities will be required to comply with the established criteria based on the data collected from the monitoring. The monitoring program is anticipated to include the following items, at a minimum, consistent with local practice and the proposed construction: 1.) Preconstruction Condition Surveys of interior and exterior portions of adjacent structures; 2.) Vibration Monitoring, depending on foundation methodology selected; 3.) Groundwater Level monitoring; and 4.) Movement Monitoring of the adjacent buildings.

4.7 Construction Impact

4.7.1 Construction Impact

The following section describes impacts likely to result from the 150 Kneeland 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.

4.7.2 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 and signage will include construction manager contact information with emergency contact numbers. The Proponent will also coordinate construction with other ongoing projects in the neighborhood.

4.7.3 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 2019, and reaching completion in the 4th Quarter 2020. The City of Boston Noise and Work Ordinances will dictate the normal work hours, which will be from 7:00 AM to 6:00 PM, Monday through Friday.

Perimeter Protection/Public Safety

The CMP will describe any necessary sidewalk closures, pedestrian re-routings, and barrier placements and/or fencing deemed necessary to ensure safety around the Site perimeter. If possible, the sidewalk will remain open to pedestrian traffic during the construction period. Barricades and secure fencing will be used to isolate construction areas from pedestrian traffic. In addition, sidewalk areas and walkways near construction activities will be well marked and lighted to ensure pedestrian safety. Proper signage will be placed at every corner of the Project as well as those areas that may be confusing to pedestrians and automobile traffic. The Proponent will continue to coordinate with all pertinent regulatory agencies and representatives of the surrounding neighborhoods to ensure they are informed of any changes in construction activities.

4.7.4 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 Kneeland Street.

4.7.5 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.

4.7.6 Pedestrian Traffic

The Site abuts sidewalks on Kneeland Street. Pedestrian traffic may be temporarily impacted in this area. The Construction Manager will minimize the impact on the adjacent sidewalk. 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.

4.7.7 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.

4.7.8 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 (Strict “No Idling” Policy);
- 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.

4.7.9 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

5.1 Historic Resources on the Project Site and Property / Site History

The Project Site (154- 156 Kneeland Street) is located within an area of man-made land that had formerly been under water. Formerly known as South Cove, it was filled between 1833 and 1839. Following a mid-nineteenth-century wave of development of low-cost housing for immigrants, the district took its current form from the 1880s and 1890s through the first quarter of the 20th century. The National Register Nomination for the Leather District identified the period of significance as 1883 – 1919. The district is characterized by five- and six-story masonry buildings with brick exterior walls and stone trim. South Street and parts of Lincoln Street are exceptionally intact featuring buildings with raised basements, with commercial windows and storefronts at the 1st story, and 4 or 5 stories above.

154- 156 Kneeland Street falls outside of the district's period of significance. **The building is not compatible in scale, materials or fenestration with other buildings in the district and it has lost its architectural integrity**. Based on these conditions, mainly dating from the 1990 exterior alterations, the building should not be considered a contributing building in the Leather District. In addition, neglect and disrepair have left the existing structures in a blighted condition which negatively impacts the historic district today, to the detriment of neighboring properties.

5.1.1 Existing Conditions

The Project site is essentially level; it is approximately trapezoidal in plan, and is bounded to the south by Kneeland Street, by Utica Street to the west, by a four foot wide passageway to the north and by a 6-story brick building to the east. It is located along the southern boundary of the Leather District, facing south on Kneeland Street. See **Figure 1-1** (Project Locus), aerial view of the existing site**.**

In 1908, the site contained a series of four connected, four-story brick buildings, which appear to be the same buildings shown on the 1883 Bromley Atlas. Three of the four buildings occupying the entire site were owned by the heirs of William Evans in 1883 and in 1908. The fourth building had different owners. The three buildings were converted in 1955 to a five-bay red-brick, one-story building with loading doors in each bay facing Kneeland Street. In 1990, that building was renovated for use as a restaurant by a New York architectural firm. The 1990 design added a two-story tower at the southwest corner, applied a parged coating to all four buildings, installed commercial wood doors and an accessible ramp at the south elevation of three buildings and significantly altering the appearance and feel of the 1955 building. The fourth building remains a four-story building and was also parged in 1990. At each story, there is a large commercial window set within recessed, parged infill.

154-156 Kneeland Street falls outside of the district's period of significance. The building is not compatible in scale, materials or fenestration with other buildings in the district and it has lost its architectural integrity. Based on these conditions, mainly dating from the 1990 exterior alterations, **the building should not be considered a contributing building to the Leather District**.

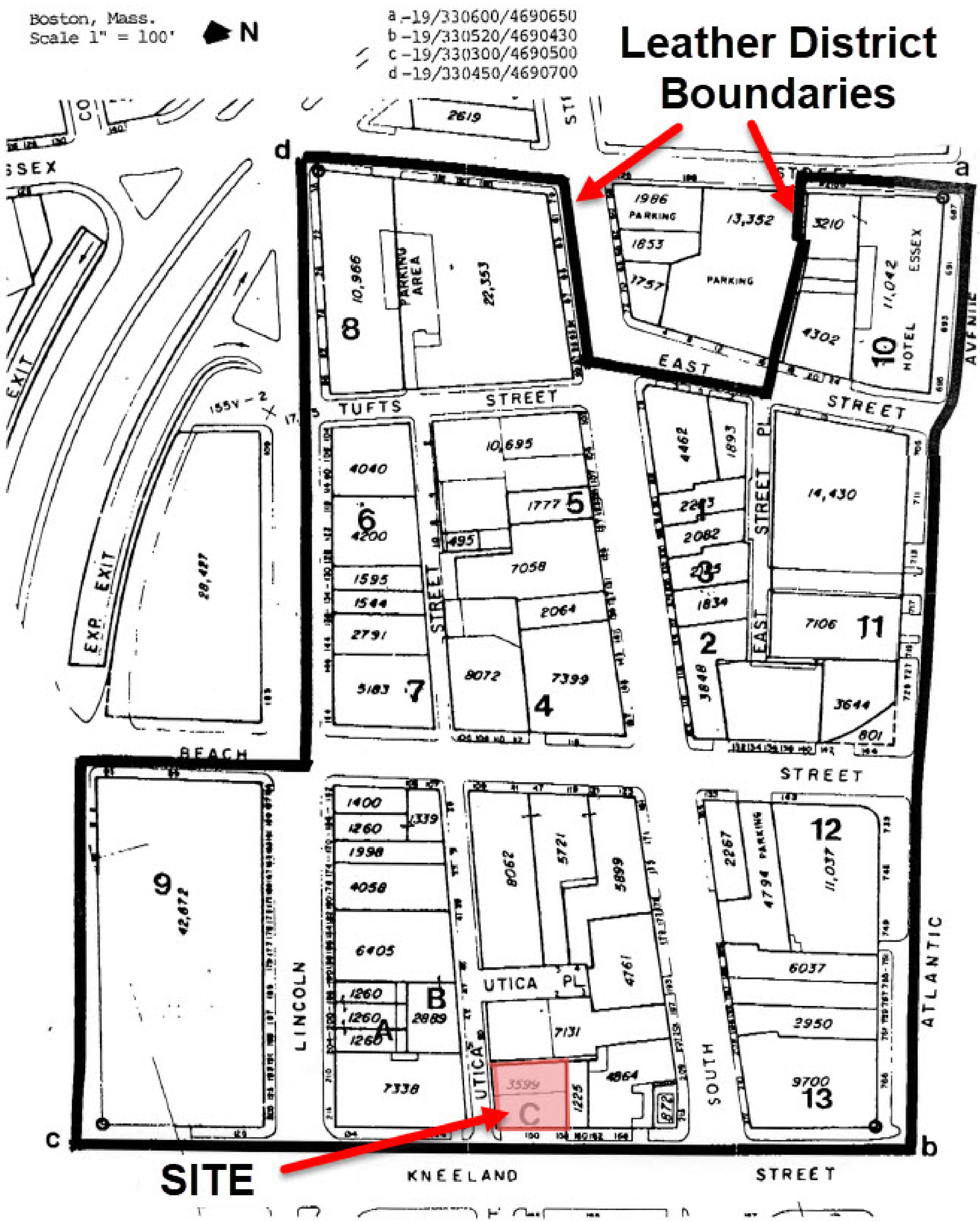


Figure 5-1. Leather District Boundaries

5.1.2 Historic Resources Within One-Eighth (1/8) Mile of the Project Site

Irregular in plan, the Leather District is bounded (very approximately) by Kneeland Street to the south, Atlantic Avenue to the east, Essex Street to the North and the Surface Artery and Lincoln Street to the west. See the Leather District boundary map, **Figure 5-1.**

Table 5-1. Historic Resources Shown on Figure 5-1

Identified on Figure 5-1	Building/ District Name	Address	Designation
A	Leather District	Approximately bounded by Kneeland Street, Atlantic Ave, Surface Artery and Essex Street	NRDIS

LHD – Local Historic District
LPA – Local Protection Area
NRDIS – National Register District
NRDOE – Determined Eligible for National Register Listing
BOS.XXX – MHC Inventory Number

5.2 Archeological Resources

The existing building sits on the same footprint as the four late 19th-century buildings that were located here as early as 1883. It is assumed that the buildings had a one-story basement. The ground disturbance caused by previous development on this site makes it unlikely there are undisturbed archeological resources within the area of excavation for the new construction.

There are no known archaeological sites listed in the State Register of Historic Places on the Project Site.

5.3 Impacts to Historic Resources

Impacts to historic resources include short-term impacts, typically those associated with demolition and construction, and long-term impacts, typically related to impacts after construction. Review by the Boston Landmarks Commission (BLC) will center on two phases of the project. First, BLC will consider demolition of the existing building and will make a determination whether the building contributes to the architectural or historical significance of the Protection Area. Second, BLC will consider the existing conditions of the building.

The existing structures on the site are not compatible with the Leather District National Register District in terms of fenestration, materials, height and massing. **In general, the current buildings and site development conflict with the character-defining features of the Leather District which are its extremely consistent building heights, brick and stone construction, and fenestration (specifically the cast iron storefronts), especially at the first story.**

In addition, neglect and disrepair have left the existing structures in a blighted condition which negatively impacts the historic district today, to the detriment of neighboring properties.

5.3.1 Short-Term Impacts

Potential geotechnical impacts during construction are related to vibration, dewatering and settlement. These are discussed in **Section 4.6.**

Existing subsurface conditions and geotechnical impacts of the Project have been assessed by the Project’s geotechnical consultant. Haley and Aldrich will provide design recommendations with respect to foundation design, will prepare geotechnical specifications, and will review the Construction Contractor's proposed procedures. Project design criteria will be established to avoid negative impacts that could be caused by lowering area groundwater levels.

Based on the design and construction methodology to be developed for the project, potential impacts to nearby buildings from foundation construction, such as ground movement, vibration, and groundwater lowering are anticipated to be negligible.

5.3.2 Long-Term Impacts

Potential long-term impacts are related to architectural compatibility with the historic district, wind, shadows, solar glare, and historic view corridors.

Review of the design will consider the architectural compatibility of the project with the Leather District and will be evaluated to protect light and air circulation within the district.

5.3.3 Project Planning

Measures will be proposed as needed to address potential impacts to historic resources from the Project. Construction impacts with respect to lowering of groundwater, vibration, or ground movement due to excavation are expected to be minimal. A geotechnical instrumentation and monitoring program with performance criteria will be implemented as needed. Refer to **Sections 4.6.3** and **4.7.7**.

As the design moves forward, mitigation measures to protect historic buildings and to avoid, minimize or mitigate potential impacts to such buildings during construction will be incorporated as needed into project planning and design.

5.4 Project Review with Historical Agencies

State laws protecting historic and archeological resources are typically triggered when a proposed project is to be undertaken, funded, licensed or permitted by a state agency. Depending upon the status of the resource and the nature of the impact, the extent of the regulatory process will vary. A possible state or city preservation reviews are outlined in **Table 5-2** below and are discussed in this section.

In order to comply with preservation regulations, the project proponent will begin the review process early in the planning phase of the project. This will help to avoid delays and unexpected costs once the project has begun. Some of the laws that are most likely to apply to are discussed in this section.

As no federal agency action or approval is required, the Project is not subject to the requirements for federal review under Sec. 106 of the National Historic Preservation Act of 1966, as amended.

The Project is subject to review by the Boston Landmarks Commission and the Massachusetts Historical Commission.

Table 5-2. Potential Regulatory Reviews- Historic Preservation – Related Review and Agencies

	Threshold	Review Agencies	First Submission	Review Period
Local				
Article 85: Review by BLC	Proposed demolition of a property over 50 years within a National Register District	Review by Boston Landmarks District Commission	Article 85 Application	Varies
State				
MEPA	Demolition of all or part of a Property listed in the State Register of Historic Places or in the MHC Inventory of the Historic and Archeological Assets of the Commonwealth	MHC; MEPA	ENF (consultation with MHC required - PNF)	ENF - 30 days for first submission

BLC Boston Landmarks Commission
MEPA Massachusetts Environmental Protection Agency
ENF Environmental Notification Form
MHC Massachusetts Historical Commission
PNF Project Notification Form

5.4.1 State Laws

Chapter 254 – Massachusetts Historical Commission

A permit must be obtained from the State Archeologist before conducting any field investigation of sensitive archeological sites.

Massachusetts Environmental Policy Act (MEPA)

The Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30 ss. 61 – 62H) and its regulations (301 CMR 11.00), apply to projects where a state agency is the project proponent or where a state agency provides financing, licensing or permits to the project, and where review thresholds are exceeded. MEPA requires review of such projects to identify impacts and to determine all feasible alternatives to minimize damage to the environment. The review of environmental impacts under MEPA must include a discussion of impacts and mitigation measures for significant historic and archeological properties. It also requires that all feasible means and measures be used to avoid or minimize damage to the environment.

The MEPA process, administered by the Executive Office of Energy and Environmental Affairs, also facilitates review and comment by the Massachusetts Historical Commission (MHC) regarding demolition or destruction of and impacts of new projects on historic properties and archaeological sites listed in the State Register of Historic Places or in the Inventory of Historic and Archaeological Assets of the Commonwealth.

5.4.2 Local Preservation Laws

Boston Landmarks Commission

Boston is a Certified Local Government (CLG) as defined in Sec 101 (d) (1) of the National Historic Preservation Act of 1966, as amended. As a CLG, BLC participates as an interested party during Chap 254 (state) reviews.

The Boston Landmarks Commission also designates historic resources such as, structures, sites, or objects, man-made or natural, as local landmarks and landmark districts. Design changes to individual landmarks and to properties within local landmark districts are reviewed and administered by the BLC staff and Commission and by the local historic district commissions.

The Boston Landmark Commission is responsible for review of proposed demolition of historic structures over 50 years old in accordance with the City's demolition delay ordinance. The demolition of the existing structure will be submitted to BLC.

5.4.3 Coordination with Historical Agencies

Submittal of a PNF will initiate the State Register review process. Both the Massachusetts Historical Commission and the Boston Landmarks Commission will review the Project, if it is subject to Chapter 254/9. Submission of an Article 85 Application to the BLC will comply with the requirement under the City's Demolition Delay Ordinance. Throughout the advancement of the Project, the Proponent will coordinate with MHC and BLC to assess potential impacts to historic and archaeological resources. Mitigation measures will be established if adverse impacts to said resources are unavoidable.

5.5 Conclusion

154- 156 Kneeland Street falls outside of the district's period of significance. The building is not compatible in scale, materials or fenestration with other buildings in the district and it has lost its architectural integrity. Based on these conditions, mainly dating from the 1990 exterior alterations, the building is not considered a contributing building in the Leather District. In addition, neglect and disrepair have left the existing structures in a blighted condition which negatively impacts the historic district today, to the detriment of neighboring properties.

6.0 INFRASTRUCTURE SYSTEMS COMPONENT

6.1 Introduction

The existing infrastructure surrounding the site of 150 Kneeland Street appears of adequate capacity to service the needs of the Project. The following sections describe the existing sanitary sewer, water, and storm drain systems surrounding the site and explain how these systems will service the development. The analysis also discusses any anticipated Project-related impacts on the utilities and identifies mitigation measures to address these potential impacts.

The Project is moving into the Design Development phase where a detailed infrastructure analysis will be performed. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the proposed new water, sanitary sewer, and storm drain connections.

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

6.2 Wastewater

6.2.1 Existing Sanitary Sewer System

The sanitary sewer system in the vicinity of the Project site is owned, operated, and maintained by BWSC (see **Figure 6-1**). There is an existing 48 x 66-inch and 18-inch combined sewer located in Kneeland Street to the south of the Project site.

The total sewer flow from the existing building is estimated at 4,000 gallons per day (gpd) based on the existing building uses and design sewer flows provided in 310 CMR 15.203: System Sewage Flow Design Criteria, as summarized in **Table 6-1.**

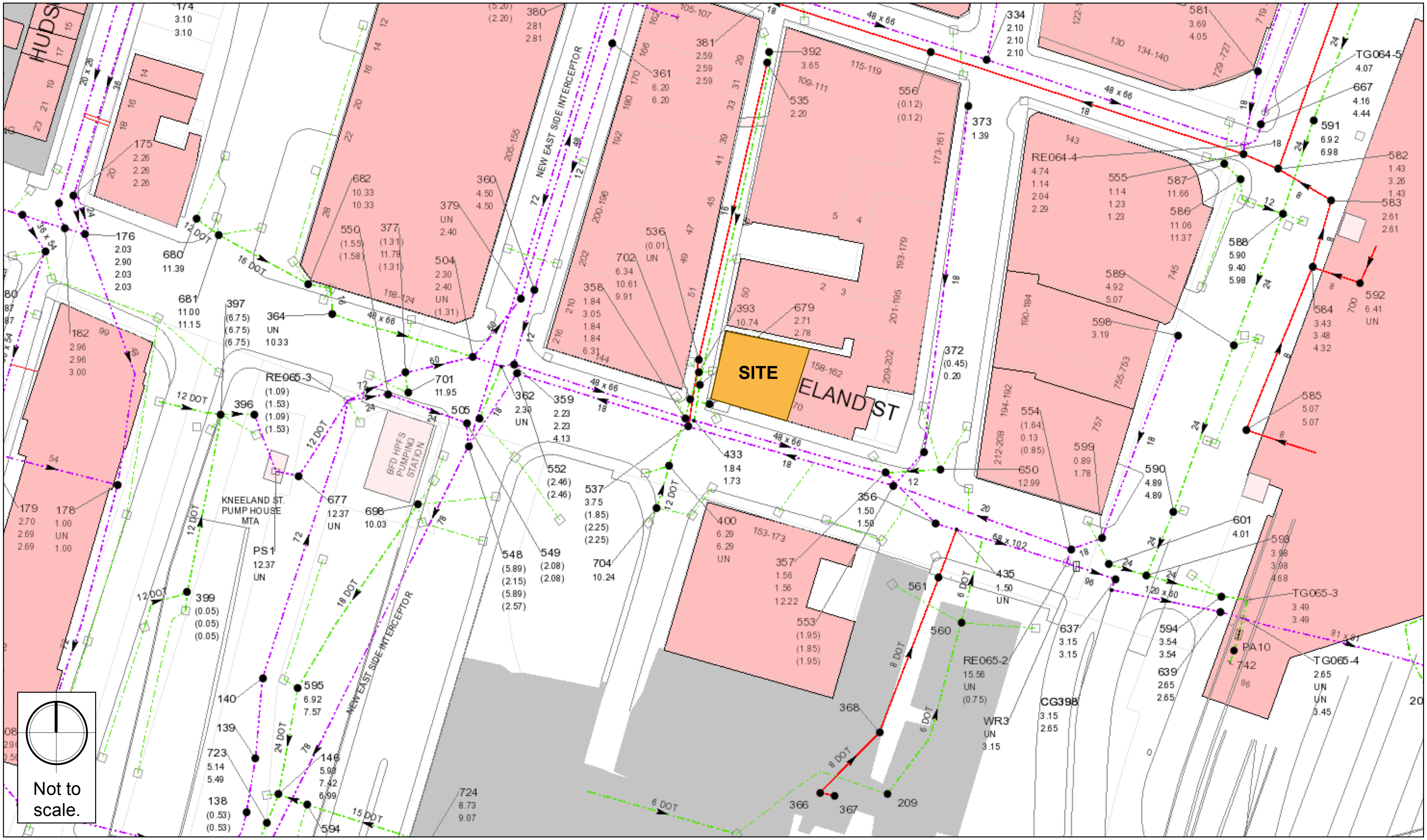


Figure 6-1.
BWSC Sanitary Sewer Map

Table 6-1. Existing Sanitary Sewer Flows

Use	Quantity	Unit Flow Rate	Estimated Maximum Daily Flow (gpd)
Lounge/Tavern	200 seats	20 gpd/seat	4,000 gpd
Total			**4,000 gpd**

6.2.2 Project-Generated Sanitary Sewer Flow

The Project will generate an estimated 27,725 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 23,650 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)
Hotel	230 bedrooms	110 gpd/bedroom	27,500 gpd
Retail/ Hospitality Amenities	3,000 sf	50 gpd/1,000 sf	150 gpd
Total			**27,650 gpd**

6.2.3 Sanitary Sewer Connection

It is anticipated that the sanitary services for the Project will tie into the 48 x 66-inch sewer in Kneeland 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.

6.2.4 Effluent Quality

The Project is not expected to generate industrial wastes.

6.2.5 Sewer System Mitigation

The environmental design goals for the Proposed Project include reducing wastewater volumes by incorporating efficient fixtures into the design. Low-flow faucets, aerated shower-heads, and dual-flush toilets are being considered to reduce water usage and sewer generation.

The Project shall be designed, constructed and maintained so as to minimize all inflow and infiltration into the BWSC's sanitary sewer system and to meet the needs of the Commission's ongoing Infiltration and Inflow reduction program.

6.3 Water System

6.3.1 Existing Water Service

The water distribution system in the vicinity of the Project site is owned and maintained by BWSC (see **Figure 6-2**). There is a 16-inch DICL (2015) and a 12-inch DICL (2015) distribution lines located in Kneeland Street to the south of the Project site. There is also a 16-inch PCI HPFS and a 30-inch PCI The 10-inch pit cast iron line was originally installed in 1918 and cleaned and cement-lined in 1999. There is also an 8-inch ductile iron line in Silver Street to the south of the Project site. The 8-inch ductile iron line was installed in 2000.

The locations of the existing water services will be confirmed as the Project moves to the Design Development phase. The services are not expected to be reused and will be cut and capped at the main.

There are three fire hydrants located in the vicinity of the Project site. There is one hydrant located to the east of the property on the north side of Kneeland Street (H194). Hydrant (H182) is located to the south of the project site on Utica Street. Another hydrant is located to the west of the project site on the north side of Kneeland Street (H1004). The Proponent will confirm this with BWSC and the Boston Fire Department (BDF) during the detailed design phase.

6.3.2 Anticipated Water Consumption

The maximum daily water demand is estimated to be approximately 30,420 gpd based on the sewage flow estimate and an added factor for system losses including the average requirements for the Project's cooling system. More detailed water use and meter sizing calculations will be submitted to BWSC as part of the Site Plan approval process.

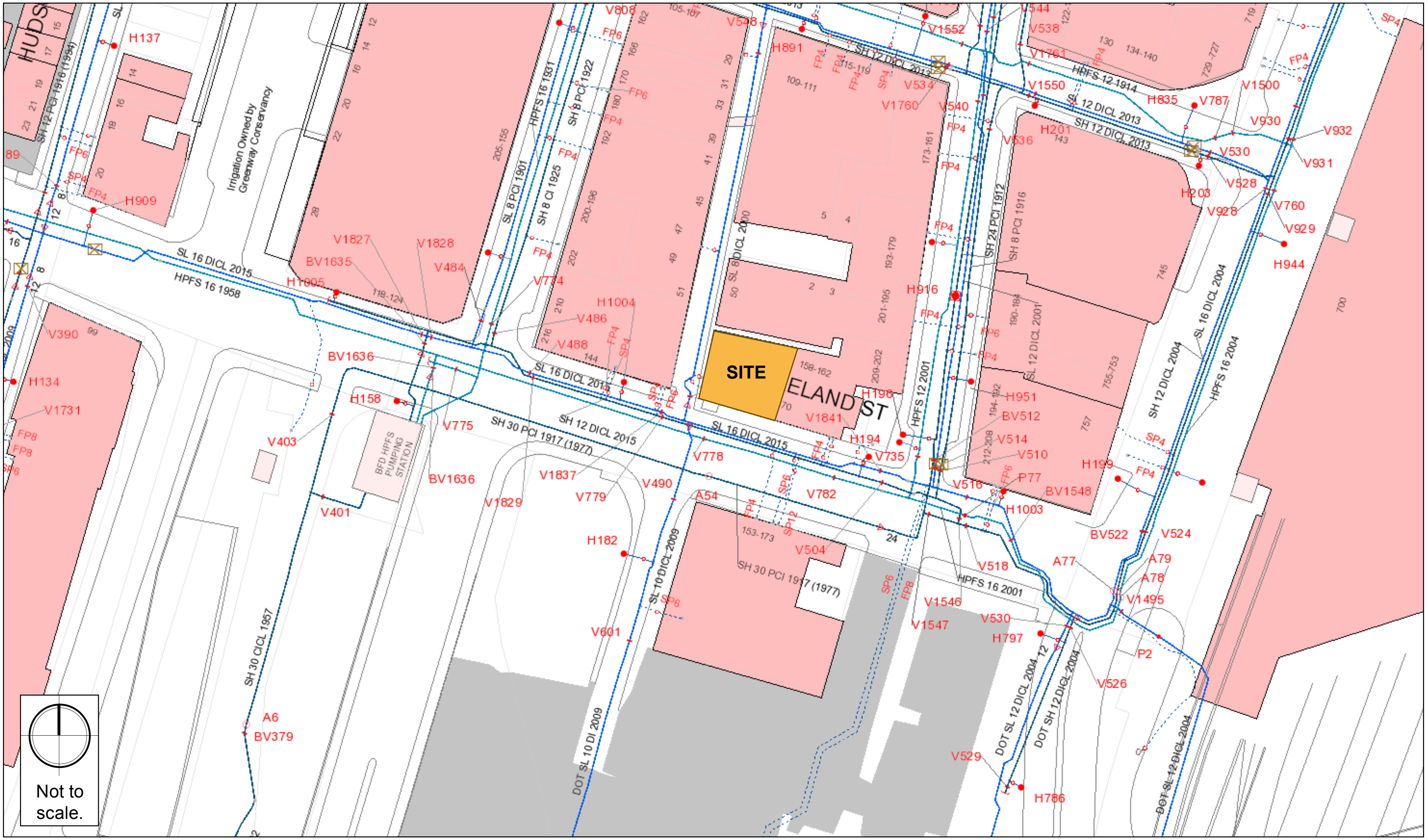


Figure 6-2.
BWSC Water Supply Map

MLF CONSULTING LLC

HOWARD STEIN HUDSON
Engineers + Planners

150 Kneeland Street

6.3.3 Proposed Water Service

It is anticipated that separate domestic water and fire protection services for the Project will be directly tapped from the 16-inch service main in Kneeland 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.

6.3.4 Water Supply Conservation and Mitigation Measures

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

6.4 Storm Drainage System

6.4.1 Existing Storm Drainage System

The storm drain system in the vicinity of the Project site is owned and maintained by BWSC (see **Figure 6-1**). There is an existing 48 x 66-inch and 18-inch combined sewer line Kneeland Street to the south of the Project site.

The existing building occupies a large portion of the site. Rooftop runoff from the existing building is conveyed by building service pipes to the municipal storm drain system. Runoff from paved surfaces around the property is generally captured in off-site catch basins. 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 Storm Water System

The proposed building will occupy almost the entire Project site. All roof runoff will discharge to the 18-inch combined sewer in Kneeland 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 Electrical Service

Eversource owns and maintains the electrical transmission system located in Boston's Leather District. 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 third floor of the proposed building.

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

6.6 Telecommunications Systems

Verizon owns and maintains infrastructure in the vicinity of the Project site. It is anticipated Verizon will supply telephone and high-speed internet service to the proposed building. The actual size and location of the proposed building services will be coordinated with Verizon during the detailed design phase.

6.7 Gas Systems

National Grid owns and maintains two 12-inch gas mains and one 20-inch gas main in Kneeland Street as well as a 6-inch gas main and 30-inch gas main in South Street. The Project is expected to use natural gas for heating and domestic hot water. The actual size and location of the building services will be coordinated with National Grid during the detailed design phase.

6.8 Steam Systems

Veolia Energy owns and maintains a 16-inch steam pipe in Kneeland Street. It is anticipated the Project will not use natural gas for heating and domestic hot water.

6.9 Utility Protection During Construction

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

7.0 TRANSPORTATION COMPONENT

7.1 Project Description

The Project site is located at 150 Kneeland Street along the north side of Kneeland Street bounded by Utica Street to the west and adjacent to office buildings to the east and north. South Station of the MBTA Red Line is located approximately one-third of a mile to the northeast of the Project site. The Project site currently consists of a vacant structure, formerly used a restaurant and night club.

The Project will include the demolition of the existing structure and the construction of a new hotel with approximately 230 rooms and ground floor retail. Demand for this limited service, upscale hotel, with an average stay of 1.5 nights, is expected to come from short-stay midweek business travel and weekend tourists. Vehicle traffic will be minimal and reliance on public transit will be significant.

The Project will take full advantage of its proximity to public transit and is within one block of South Station and a host of rideshare and Blue Bike locations. South Station itself is a major transit hub offering local and regional bus and rail service.

The approach to transportation will begin with direct guest communication during reservation. Guests will be directed to South Station for rail and MBTA service and the Silver Line and HOV lane to and from Logan Airport. Guests with vehicles will be directed to park at nearby garages and arrive on foot. On site staff will direct guests to public transit and pickup areas.

The Proponent will work with Taxis and TNC’s (Transportation Network Companies) on establishing a specific Pick Up / Drop Off zone on Utica Street and is in the process of assessing possible relationships with nearby garages and lots. Guests arriving by vehicle will be encouraged to park nearby and arrive to the hotel on foot.

7.1.1 Study Area

The transportation study area is generally bounded by Utica Street to the west, Beach Street to the north, Kneeland Street to the south, and South Street to the east. The study area includes the following five intersections, shown in **Figure 7-1:**

- Kneeland Street/Albany Street/Surface Road (signalized);
- Kneeland Street/Lincoln Street (signalized);
- Kneeland Street/Utica Street (unsignalized);
- Kneeland Street/South Street (unsignalized); and
- Kneeland Street/Atlantic Avenue (signalized).

7.1.2 Study Methodology

The Existing (2018) Condition analysis includes an inventory of the existing transportation condition such as traffic characteristics, parking, curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site condition. Existing counts for vehicles, bicycles, and pedestrians were collected at the study area intersections. The traffic data collection effort forms the basis for the transportation analysis conducted as part of this evaluation.

The future transportation condition analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2025, based on a seven-year horizon from the year of the filing of this traffic study.

The No-Build (2025) Condition includes 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 (2025) Condition includes a modest 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 (2025) 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.

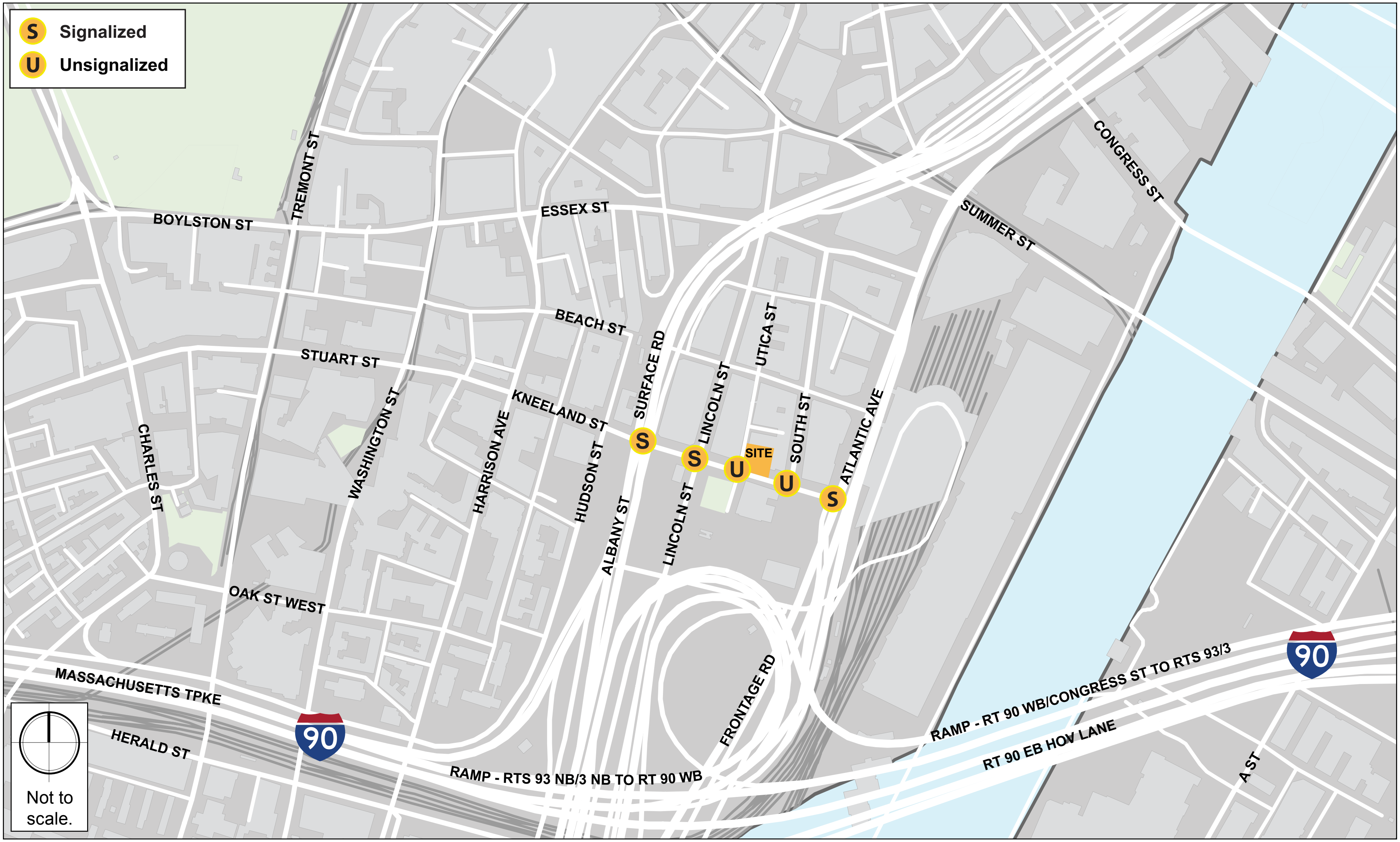


Figure 7-1.
Study Area Intersections

7.2 Existing (2018) Condition

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

7.2.1 Existing Roadway Condition

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

Kneeland Street is a two-way, four-lane roadway located to the south of the Project site. Kneeland Street is classified as an urban minor arterial roadway under BTD jurisdiction and runs between Washington Street to the west and Atlantic Avenue to the east. In the vicinity of the site, limited on-street parking is available along the south side of Kneeland Street. Sidewalks are provided on both sides of the roadway.

Albany Street is a one-way southbound, two to three lane roadway located to the southwest of the Project site. Albany Street is classified as an urban principal arterial roadway under MassDOT jurisdiction and runs between Kneeland Street to the north and Eustis Street to the south. In the vicinity of the site, on-street parking is prohibited along both sides of the roadway. Sidewalks are provided on both sides of the road.

Surface Road is a one-way southbound, three lane roadway located to the west of the Project site. Surface Road is classified as an urban principal arterial roadway under BTD jurisdiction and runs between Summer Street to the north and Kneeland Street to the south. In the vicinity of the site, on-street parking is provided along the west side of the roadway. Sidewalks are provided on both sides of Surface Road.

Lincoln Street is a one-way northbound, two-lane roadway located to the west of the Project site. However, between Kneeland Street and South Station Connector, Lincoln Street is a two-way roadway. Lincoln Street is classified as an urban minor arterial under BTD jurisdiction and runs between Summer Street to the north and South Station Connector to the south. In the vicinity of the site, on-street parking and sidewalks are provided along both sides of the roadway.

Utica Street is a two-way, one-lane roadway between Tufts Street to the north and Kneeland Street to the south, located adjacent to the Project site. Between Kneeland Street and MassDOT District 6 parking lot, Utica Street provides one travel lane in each direction. Utica Street is classified as local roadway under BTD jurisdiction. In the vicinity of the site, on-street parking is prohibited along both sides of the roadway. Sidewalks are only provided along both sides of the road on the segment between Kneeland Street and MassDOT District 6 parking lot.

South Street is a one-way southbound, unmarked two-lane roadway located to the east of the Project site. South Street is classified as an urban minor arterial roadway under BTD jurisdiction and runs between Essex Street to the north and Kneeland Street to the south. In the vicinity of the site, on-street parking and sidewalks are provided along both sides of the roadway.

Atlantic Avenue is a one-way northbound, three-lane roadway located to the east of the Project site. Atlantic Avenue is classified as an urban principal arterial roadway under BTD jurisdiction and runs between Battery Street to the northeast, where it turns into Commercial Street, and Kneeland Street to the south. In the vicinity of the site, on-street parking and sidewalks are provided along both sides of the roadway.

7.2.2 Existing Intersection Condition

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.

Kneeland Street/Surface Road/Albany Street is a four-legged, signalized intersection located to the west of the Project site. The Kneeland Street eastbound approach consists of two through lanes and an exclusive right-turn lane with approximately 70-feet storage. The Kneeland Street westbound approach consists of a shared left-turn/through lane and through lane. The Surface Road southbound approach consists of shared left-turn/through lane, a through lane, an exclusive right-turn lane, and a designated bike lane. On-street parking is not provided in the immediate area of the intersection. Crosswalks and wheelchair ramps are provided across all approaches and a bike box is provided on the Surface Road southbound approach.

Kneeland Street/Lincoln Street is a four-legged, signalized intersection located to the west of the Project site. The Kneeland Street eastbound consists of a shared left-turn/through lane and a shared through/right-turn lane. The Kneeland Street westbound consists of a shared left-turn/through lane, one through lane, and a shared through/right-turn lane. The Lincoln Street northbound approach consists of an exclusive left-turn lane with approximately 160-feet of storage, one through lane, and a shared through/right-turn lane. On-street parking is provided on the north side of the intersection, along Lincoln Street. Crosswalks and wheelchair ramps are provided at all approaches.

Kneeland Street/Atlantic Avenue/Frontage Road/I-90 EB Off-Ramp is a five-legged, signalized intersection located to the east of the Project site. The Kneeland Street eastbound consists of an exclusive left-turn lane and a shared left-turn/through lane. The MBTA Driveway westbound consists of a shared through/right-turn lane. The Frontage Road northbound approach consists of an exclusive left-turn lane and a shared left-turn/through lane. The I-90 EB Off-Ramp northbound approach consists of an exclusive left-turn lane and an exclusive through lane. On-street parking is provided along both sides of Atlantic Avenue. Crosswalks and wheelchair ramps are provided at all approaches.

Kneeland Street/Utica Street is a four-legged, unsignalized intersection located adjacent to the Project site. The Kneeland Street eastbound approach consists of a shared left-turn/through lane and a shared through/right-turn lane. The Kneeland Street westbound approach consists of a shared left-turn/through lane and a shared through/right-turn lane. Both Kneeland Street approaches are free-movements. The Utica Street northbound approach is stop-controlled and consists of a shared left-turn/through/right-turn lane. The Utica Street southbound approach consists of a shared left-turn/through/right-turn lane and operates as a stop-controlled approach. On-street parking is provided on the east side of the intersection, along Kneeland Street eastbound approach. A crosswalk is provided across the Utica Street northbound approach and wheelchair ramps are provided across both Utica Street approaches.

Kneeland Street/South Street is a three-legged, unsignalized intersection located to the east of the Project site. The Kneeland Street eastbound and westbound approaches consist of two through lanes. There is a concrete median separating traffic along Kneeland Street. The South Street southbound approach is stop-controlled and consists of a right-turn only lane. Crosswalks and wheelchair ramps are provided across all approaches.

7.2.3 Existing Parking and Curb Use

An inventory of the on-street and off-street parking was conducted in the vicinity of the Project.

On-street parking surrounding the site consists of predominately commercial parking, no-parking, metered parking, and resident permit parking. The existing on-street parking regulations within the study area are shown in **Figure 7-2**.

More than 3,700 off-street public parking spaces are available within a five-minute walk from the Project site. Of these, approximately 186 are found in parking lots and 3,516 are in parking garages. A detailed summary of all parking lots and garages are shown in **Table 7-1**. Public surface lots and garages within a quarter-mile of the Project site are shown in **Figure 7-3**.

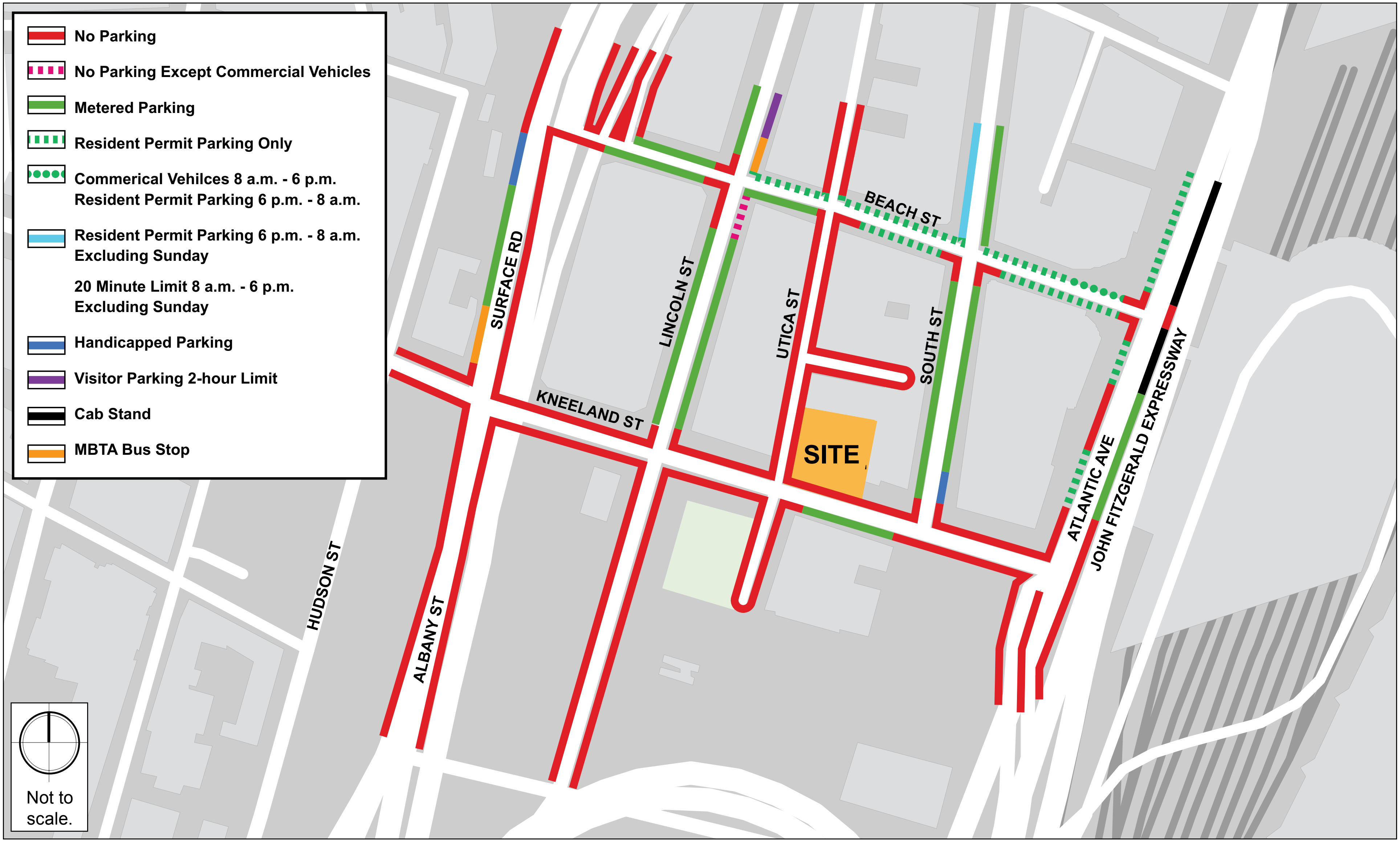


Figure 7-2.
On-street Parking Regulations

Figure 7-3.
Off-street Parking

Table 7-1. Existing Off-Street Parking Lots and Garages

Map ID	Facility	Capacity (Public Spaces)	Map ID	Facility	Capacity (Public Space)
Parking Garages			**Parking Lots**		
A	Lafayette Garage	1,276	1	23 Kingston Street	9
B	101 Arch Street	80	2	5 Harrison Street	53
C	99 Summer Street	130	3	Chau Chow City Parking	50
D	Archstone	177	4	Bradford Auto Parks	11
E	75/101 Federal Street	150	5	78 Harrison Avenue	63
F	125 Summer Street	250			
G	40 Beach Street	500			
H	Two Financial Center	200			
I	745 Atlantic Avenue	137			
J	125 Lincoln Street	120			
K	State Street Financial	400			
L	One Greenway Garage	96			
Parking Garage Spaces Subtotal		3,516	Parking Lot Spaces Subtotal		186
Total Public Parking Spaces			**3,702**		

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. There are four nearby car sharing locations within a five-minute walk from the Project site and two just outside the quarter-mile radius, as mapped in **Figure 7-4.**

Figure 7-4.
Car Sharing Locations

7.2.5 Existing Traffic Data

Traffic volume data was collected in the study area intersections on April 10, 2018. 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) at the study area intersections. The TMCs collected vehicle classification including car, heavy vehicle, pedestrian, and bicycle movements. Based on the TMC data, the vehicular traffic peak hours for the study area intersection are generally 7:30 a.m. – 8:30 a.m. and 4:45 p.m. – 5:45 p.m. The detailed traffic counts are provided in **Appendix D.**

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 2018 TMCs. The seasonal adjustment factor for roadways similar to the study area (Group 6 – Urban Arterials) during the month of April is 0.92. This indicates that average month traffic volumes are approximately eight percent lower than the traffic volumes that were collected. The traffic counts were not adjusted to reflect average month condition 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**.

7.2.6 Existing (2018) Traffic Volumes

Existing traffic volumes were balanced, where necessary, to develop the Existing (2018) Condition vehicular traffic volumes. The Existing (2018) Condition weekday a.m. and p.m. peak hour traffic volumes are shown in **Figure 7-5** and **Figure 7-6**, respectively.

7.2.7 Existing Pedestrian Condition

Sidewalks are provided along both sides of all the roadways in the study area, with the exception of Utica Street. In general, the sidewalks provided along nearby roadways are in good condition with few cracks and level grades. The closest crosswalks across Kneeland Street are located at the signalized intersection with Lincoln Street (approximately 130 ft to the west) or at the unsignalized intersection with South Street (approximately 150 ft to the east). Wheelchair ramps are typically provided along Kneeland Street to cross the minor streets.

To determine the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs on April 10, 2018 at the study area intersection. The weekday a.m. and p.m. peak hours pedestrian volumes are presented in **Figure 7-7**.

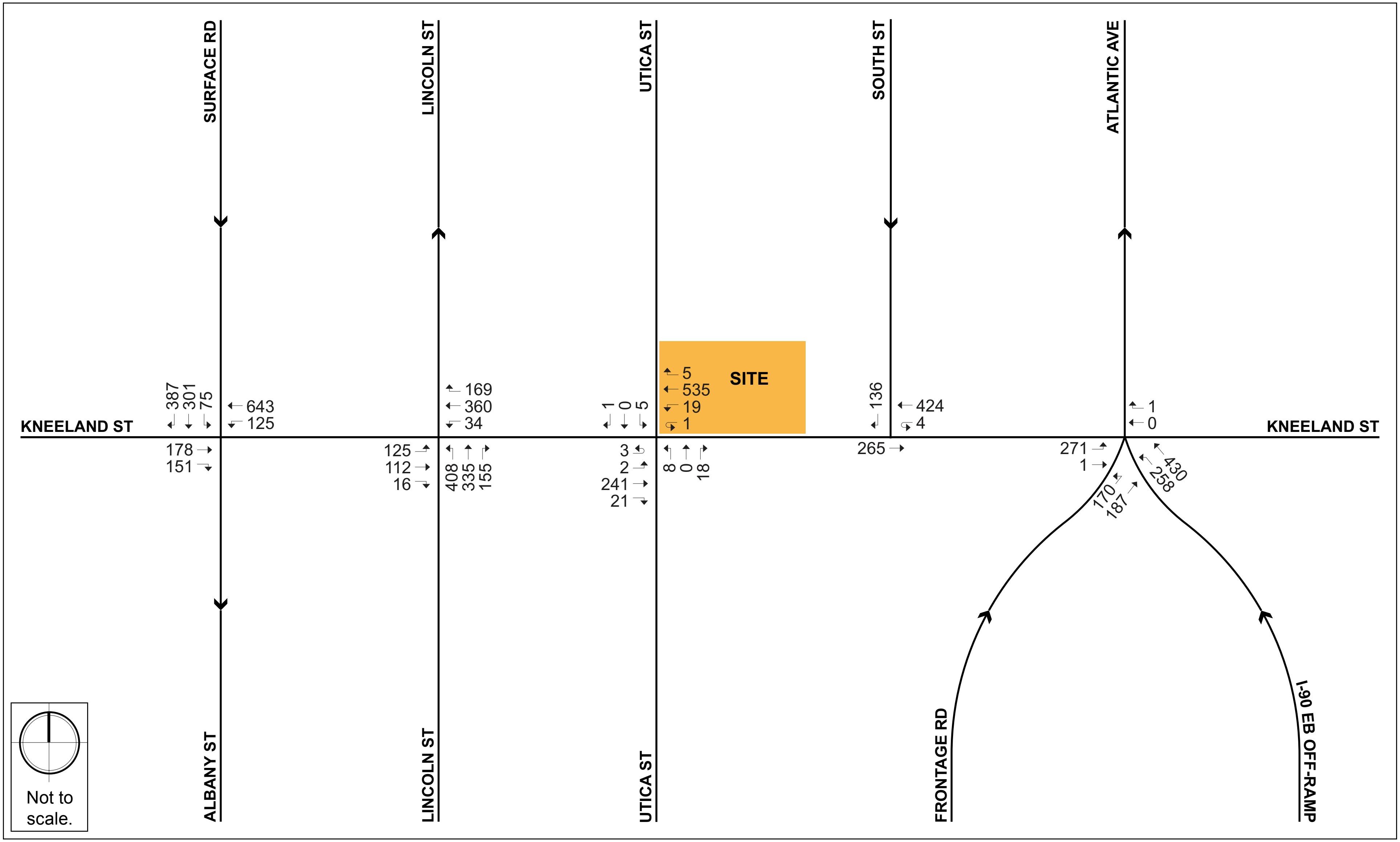


Figure 7-5.
Existing (2018) Condition Traffic Volumes, Weekday a.m. Peak Hour

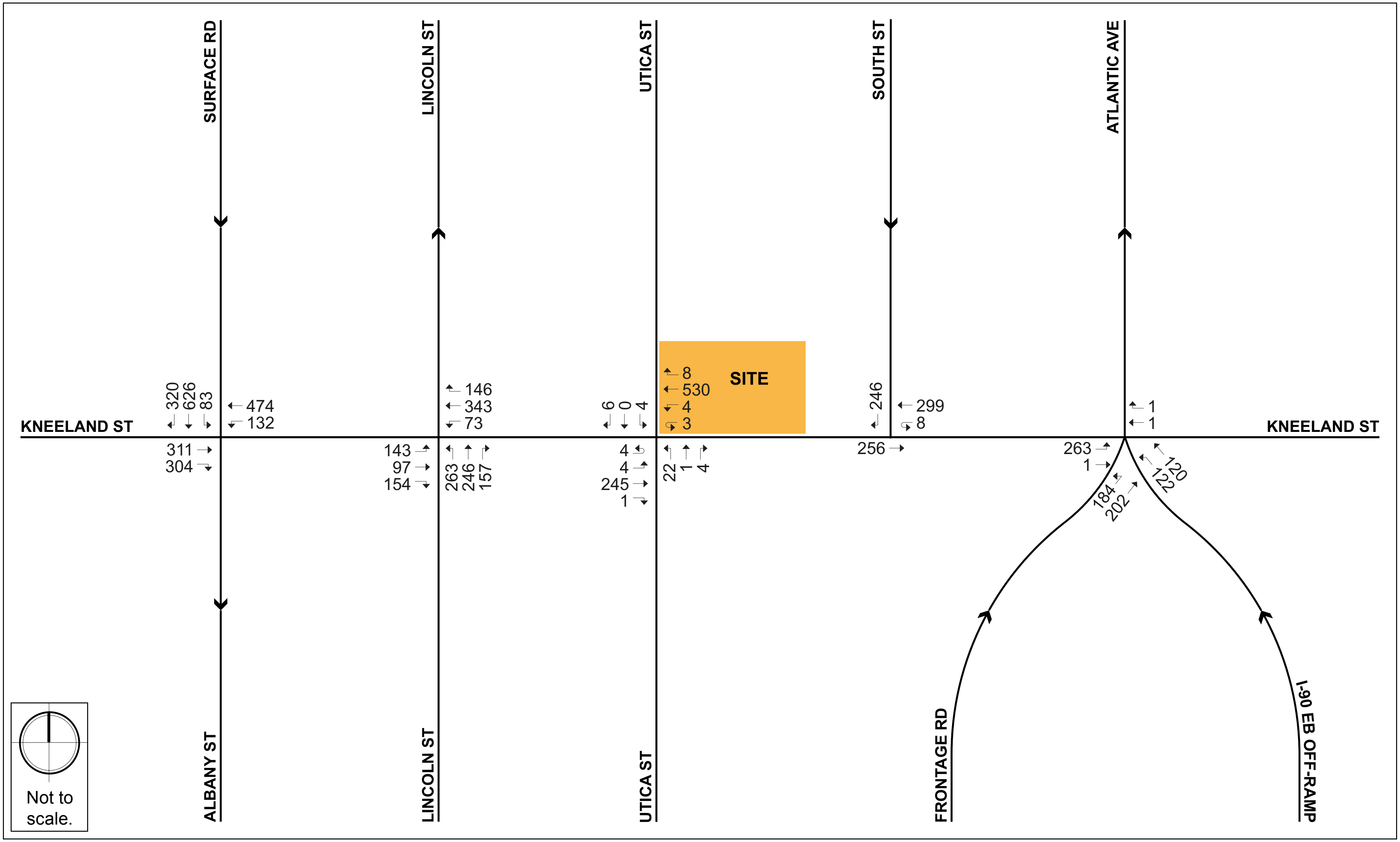


Figure 7-6.
Existing (2018) Condition Traffic Volumes, Weekday p.m. Peak Hour

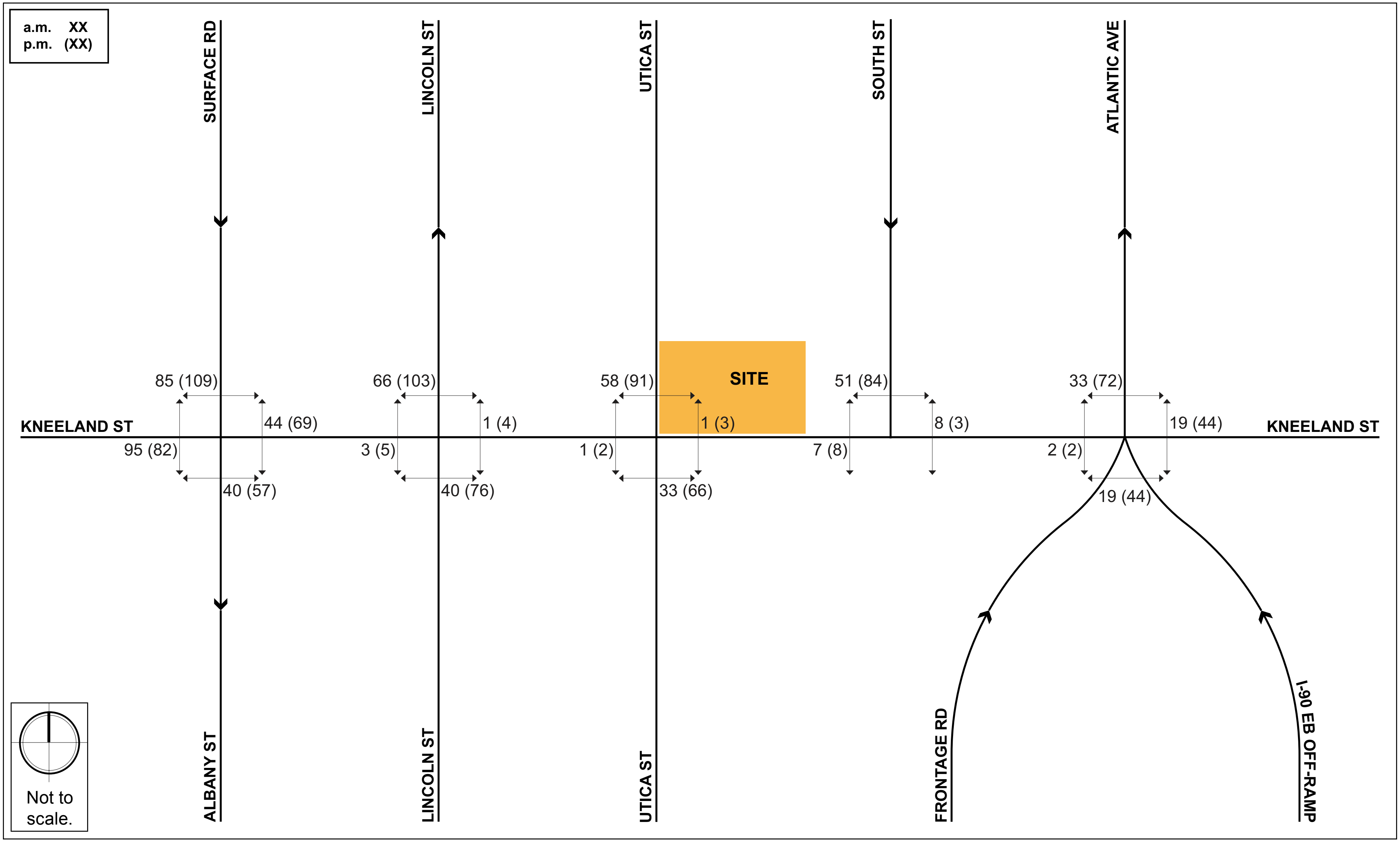


Figure 7-7.
Existing (2018) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hours

7.2.8 Existing Bicycle Condition

In recent years, bicycle use has increased dramatically throughout the City of Boston. The following roadways within the study area are designated bicycle routes on the City of Boston's "Bike Routes of Boston" map. Surface Road and Atlantic Avenue are designated as intermediate routes. Intermediate routes are suitable for riders with some road-experience. Kneeland Street is designated as an advanced route. Advanced routes are suitable for more traffic-confident cyclists.

Bicycle counts, presented in **Figure 7-8**, were conducted concurrent with the vehicular TMCs. As shown, bicycle volumes are low along all the study area intersections during both the peak hours.

The Project site is also located in proximity to three bicycle sharing stations provided by Hubway. Hubway is the Boston area's largest bicycle sharing service, which was launched in 2011 and currently consists of more than 3,400 shared bicycles at more than 190 stations throughout Boston, Brookline, Cambridge, and Somerville. The nearest Hubway stations to the Project site are located at Chinatown Gate Plaza and 700 Atlantic Avenue – South Station, which are both located approximately less than one-third of mile way from the Project site. The Hubway stations located in proximity to the Project site are shown in **Figure 7-9**.

7.2.9 Existing Public Transportation

The Project site is located in Boston's Leather District neighborhood with robust transit options including several public transportation opportunities provided by the Massachusetts Bay Transportation Authority (MBTA), regional bus at train service nearby at South Station, and efficient connections to Logan Airport via the Silver Line and a dedicated HOV lane on Lincoln Street. The Project site is located in walking distance to South Station with access to the Red Line, Silver Line, and Commuter Rail (approximately 0.3 miles away), the Chinatown Station and Tufts Medical Center on the Orange Line (both approximately 0.4 miles away), and Boylston Street on the Green Line (approximately 0.4 miles away).

Additionally, the MBTA operates seven bus routes, including two of the rapid transit Silver Line route, in close proximity to the Project. **Figure 7-10** maps all of the public transportation services located in the vicinity of the site, and **Table 7-2** provides a summary of those routes.

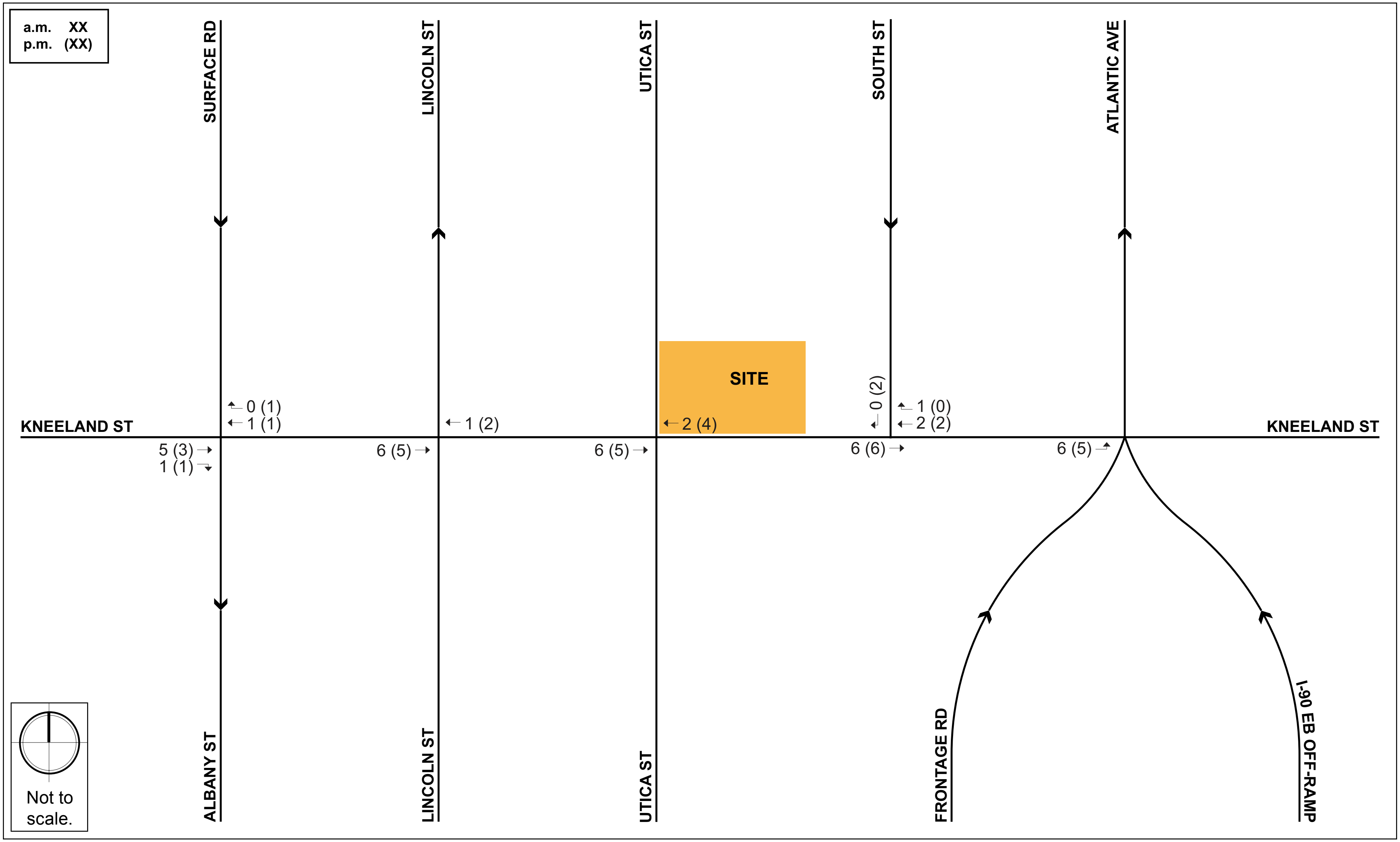


Figure 7-8.
Existing (2018) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hours

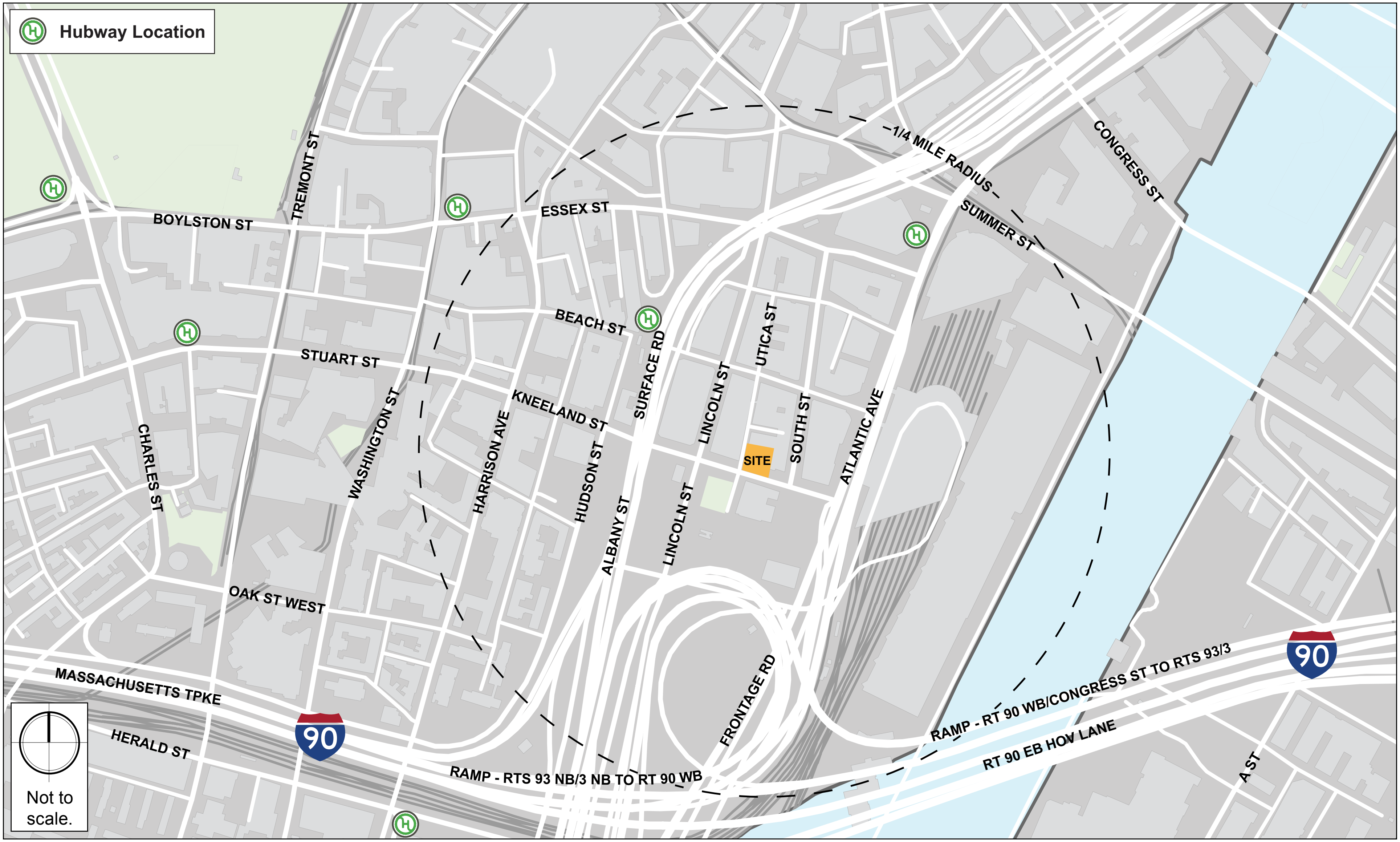


Figure 7-9.
Bicycle Sharing Locations

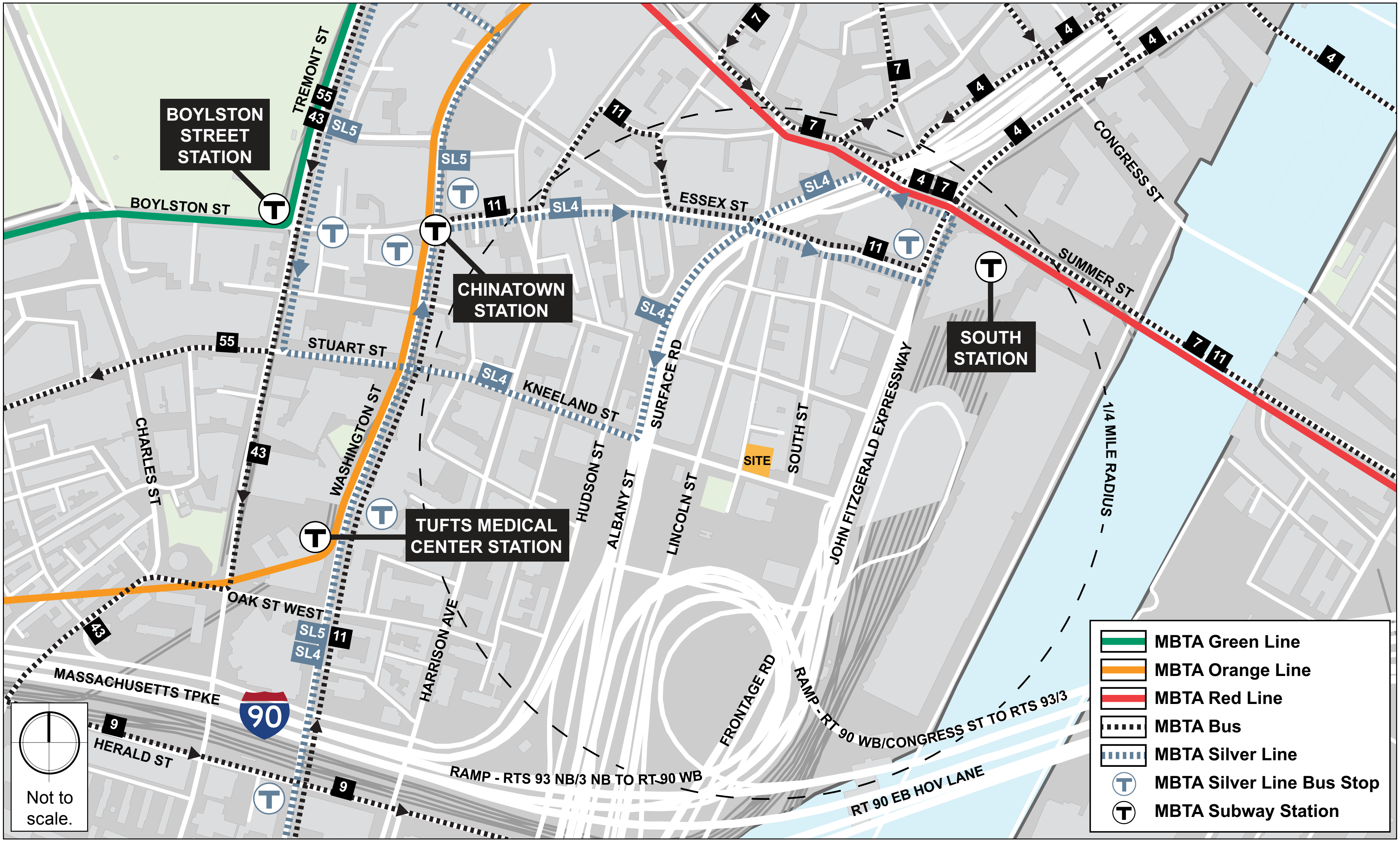


Figure 7-10.
Existing Public Transportation

Table 7-2. Existing Public Transportation

Transit Service	Description	Weekday Service Duration	Peak-Hour Headway (minutes)
	Subway		
Red Line	Alewife – Ashmont Alewife – Braintree	5:16 a.m.-12:30 a.m. 5:15 a.m.-12:17 a.m.	9 9
Orange Line	Oak Grove Station	5:16 a.m.-12:30 a.m.	6
Green Line	"B" Boston College – Park Street "C" Cleveland Circle – North Station "D" Riverside – Government Center "E" Heath Street - Lechmere	5:01 a.m.-12:52 a.m. 5:01 a.m.-12:46 a.m. 4:56 a.m.-12:49 a.m. 5:01 a.m.-12:47 a.m.	6 6 6 6
	Bus Routes		
SL4	Dudley Station – South Station	5:20 a.m.-12:39 a.m.	12-14
SL5	Dudley Station – Downtown Crossing	5:15 a.m.-1:07 a.m.	8
4	North Station – Tide Street	6:25 a.m.- 6:52 p.m.	10-20
7	City Point – Otis & Summer Streets	5:15 a.m.-10:33 p.m.	8
11	City Point – Downtown Bay View Route	5:11 a.m.-1:24 a.m.	10
43	Ruggles Station – Park & Tremont Streets	5:00 a.m.-12:52 a.m.	15-20
55	Jersey St. & Queensberry St. – Copley Sq. or Park St.	5:48 a.m.-11:11 p.m.	15-30

Headway is the time between service, Headways vary. Source: MBTA April 2018.

7.3 No-Build (2025) Condition

The No-Build (2025) 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. Infrastructure improvements include roadway, public transportation, pedestrian, and bicycle improvements. The No-Build (2025) Condition does not include the impact of the Project.

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. Two projects have been identified and were specifically accounted for in the future traffic. **Figure 7-11** show the specific development programs accounted for, which are summarized as follows:

2 Oxford Street – The proposed project consists of the demolition of the existing structure at 73-79 Essex Street and the construction of a 17-story hotel with approximately 250 keys and amenity spaces. This project is currently under BPDA review.

47-55 Lagrange Street – The proposed project consists of a multifamily residential building with up to 21 residential stories, including approximately 176 dwelling units and 20 accessory parking spaces. This project has been approved by the BPDA.

South Station Air Rights – This project is located to the east of the Project site and includes the construction of three buildings containing approximately 435-550 residential units, 1.2 million sf of office space, up to 780,000 sf of retail space, and a 360-room hotel. A five-story parking garage containing 895 parking spaces will be built to accommodate parking demands. The construction will be completed in three phases. The project has been approved by the BPDA.

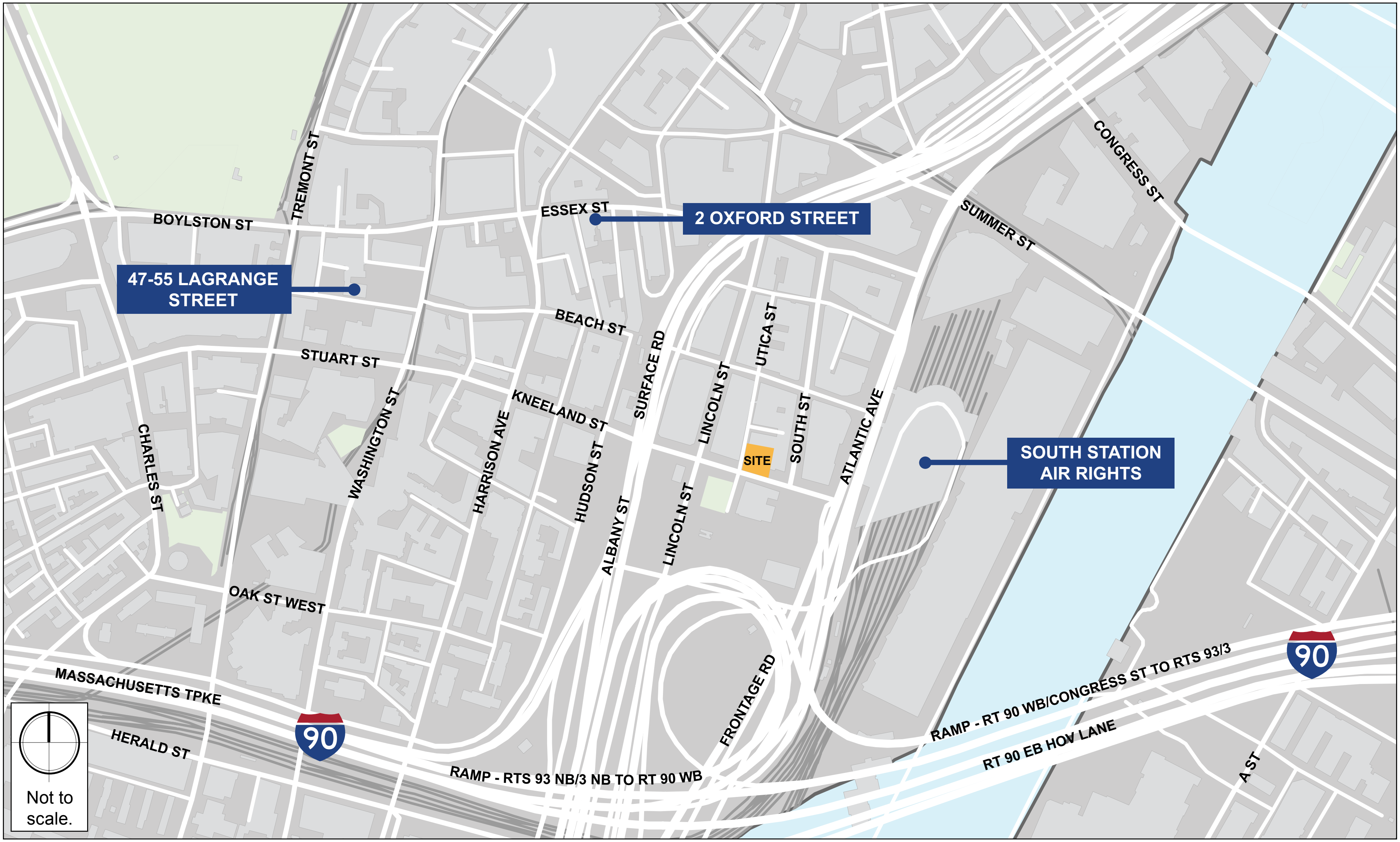


Figure 7-11.
Specific Development Projects

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. The following improvement projects have been identified that could affect future travel patterns in the area:

- Improve Bicycle Conditions:
  - Adding a bicycle lane along the west side of Atlantic Avenue from Kneeland Street to Essex Street for better connectivity to Dewey Square.
  - Providing a bicycle lane along the north side of Kneeland Street westbound.

7.3.4 No-Build (2025) Condition Traffic Volumes

The one-half percent per year annual growth rate was applied to the Existing (2018) Condition traffic volumes, then the traffic volumes associated with the background development project listed above was added to develop the No-Build (2025) Condition traffic volumes. The No-Build (2025) weekday a.m. and p.m. peak hour traffic volumes are shown on **Figure 7-12** and **Figure 7-13**, respectively.

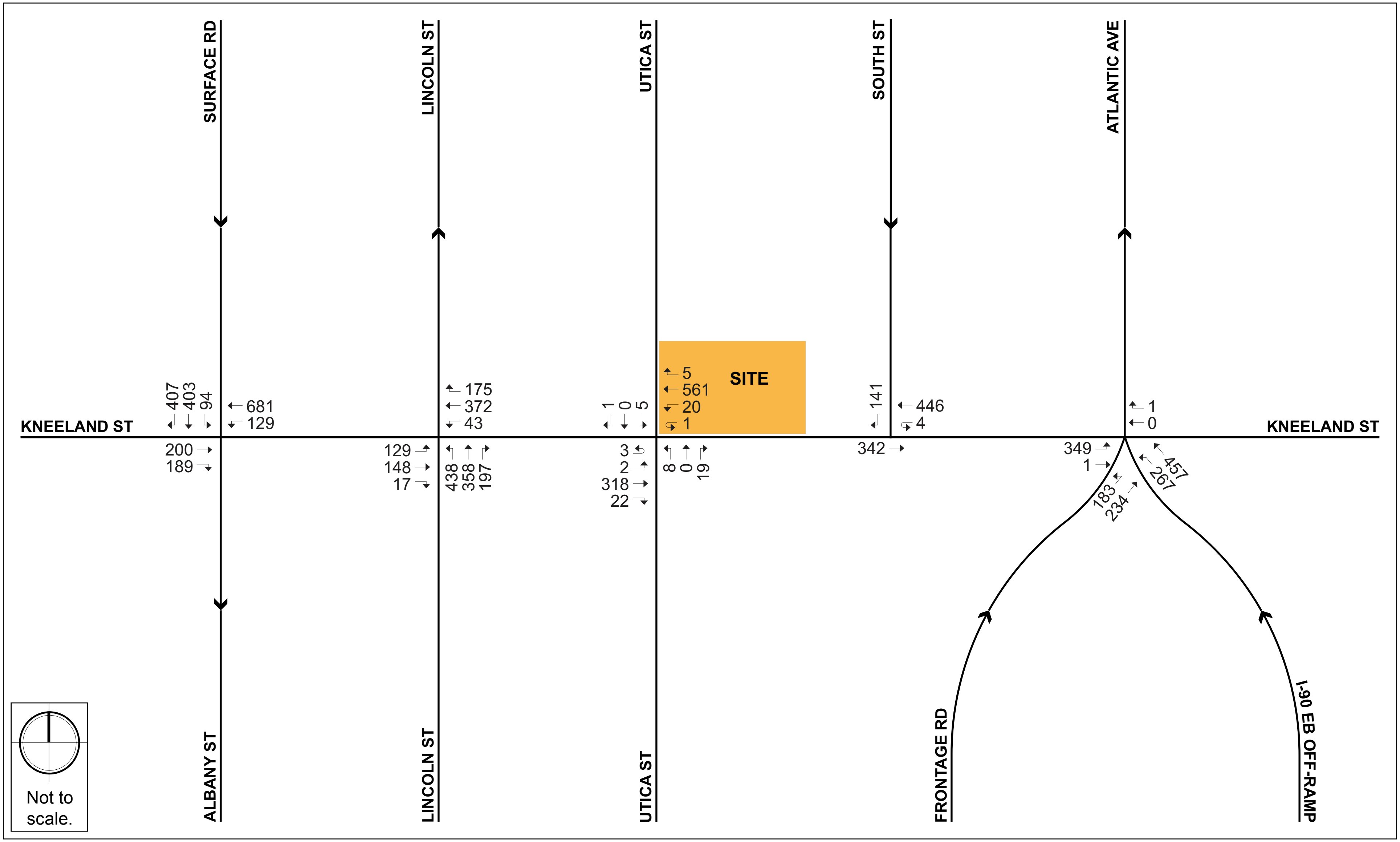


Figure 7-12.
No-Build (2025) Condition Traffic Volumes, Weekday a.m. Peak Hour

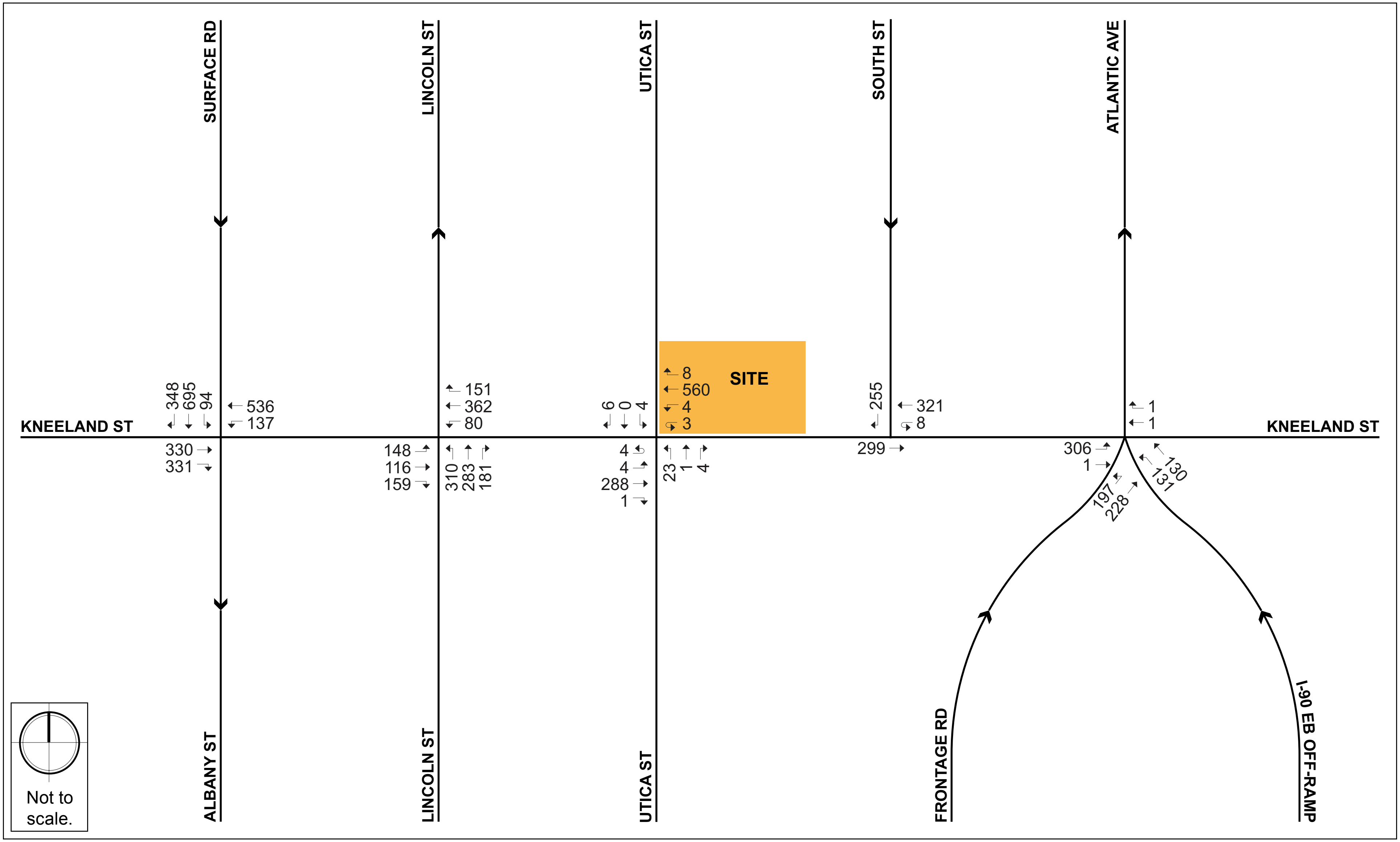


Figure 7-13.
No-Build (2025) Condition Traffic Volumes, Weekday p.m. Peak Hour

7.4 Build (2025) Condition

As previously summarized, the Project will include the demolition of the existing building and the construction of a new 21-story hotel with ground floor retail. Parking will not be provided at the Project site.

7.4.1 Site Access and Circulation

Vehicular access will be provided along Utica Street, adjacent to the site, where a pick-up and drop-off zone will be designated. Pedestrian access to the main lobby will be located along Kneeland Street. The site plan is shown in **Figure 7-14**.

7.4.2 Parking

The Project will not provide on-site parking. BTD has set parking space goals and guidelines throughout the City to establish the parking supply to be provided with new developments. The BTD maximum guideline ratios for hotels in the Leather District is 0.40 spaces per room (or key). However, due to the Project's small scale and proximity to the major transportation hub of South Station, hotel guests will have the option to self-park at any nearby parking facility, as presented in **Table 7-1** or arrive by public transit. With approximately 3,500 garage parking spaces within a quarter-mile of the Project site, sufficient parking capacity will be available to meet the parking demand of this Project.

7.4.3 Loading and Service Accommodations

The urban, minimal service hotel primarily generates delivery trips related to small packages and prepared food. Deliveries to the Project site will be limited to SU-36 (36 foot box truck) trucks and smaller delivery vehicles. Loading and service operations will occur on the shared street portion of Utica Street. Through the redesign of this section of Utica Street, delivery vehicles will be able access the site while still maintaining approximately 18 feet for vehicles traveling along Utica Street.

7.4.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements to provide secure bicycle parking employees, as well as short-term bicycle racks for hotel guests and visitors. Based on BTD guidelines, the Project will supply a minimum of 28 secure bicycle parking/storage spaces within the building at a rate of 0.3 secure indoor bicycle parking spaces per 1,000 sf of development. Additional storage will be provided by outdoor bicycle racks accessible to visitors to the site in accordance with BTD guidelines.

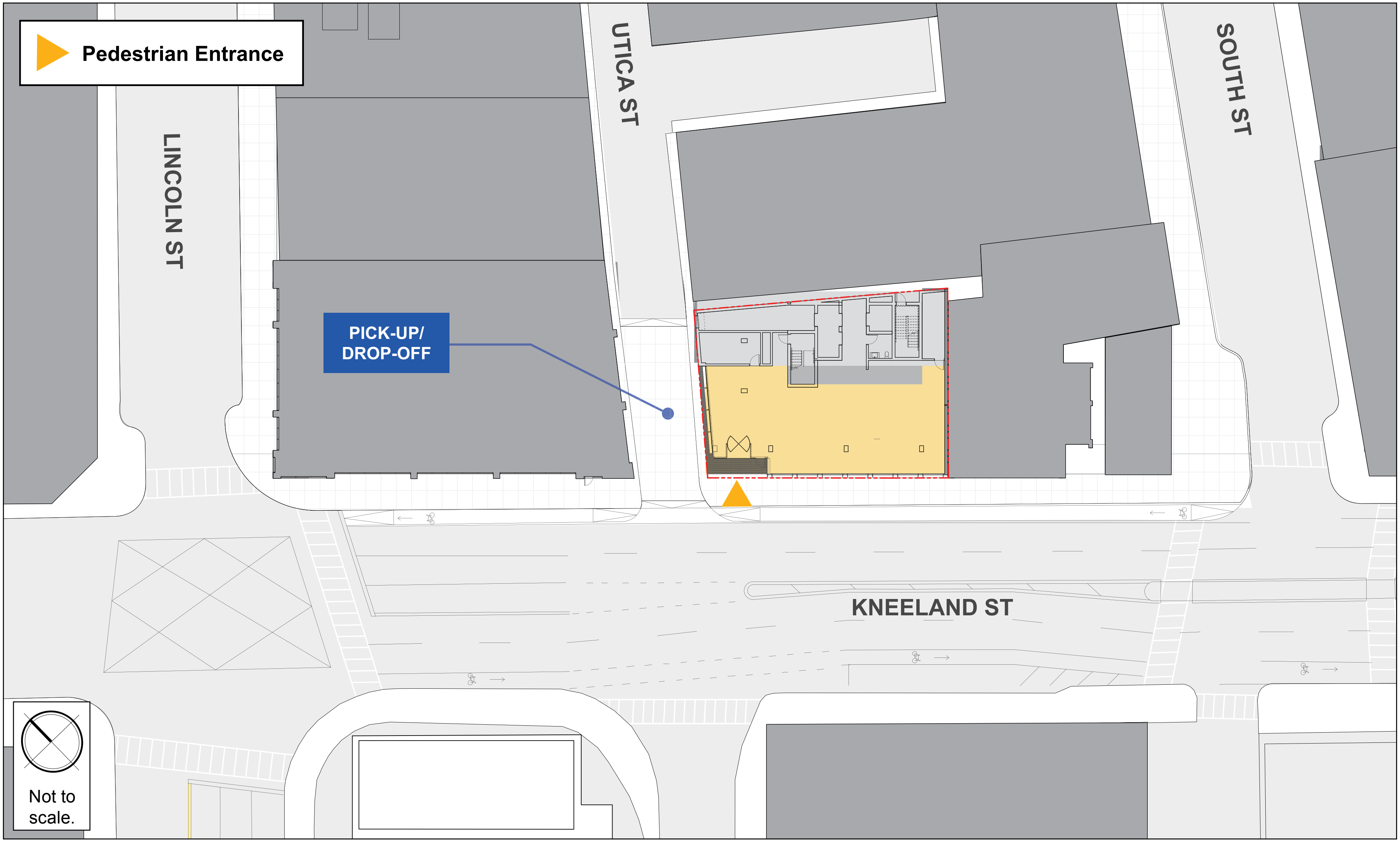


Figure 7-14.
Site Access Plan

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 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.

After reviewing the rates provided in the Institute of Transportation Engineers' (ITE) manual, Trip Generation, the HSH determined the rates were not applicable to the proposed hotel due to its location and the nature of the hotel. Therefore, the study team used local hotel data to estimate the number of trips expected to be generated by the Project during the morning and afternoon peak hour.

7.4.6 Mode Shares

BTD provides vehicle, transit, and walking mode share rates for different areas of Boston. However, since the Project team used local hotel data to estimate the number of trips generated by the proposed Project, BTD more shares were not used. Based on data collected at local hotels, the vehicle mode share in the Boston area is 24% and the pedestrian mode share is 76% during the a.m. peak hour. During the p.m. peak hour, the vehicle mode share is 39% and pedestrian mode share is 61%. It should be noted, the pedestrian mode share percentage include guests that utilize public transportation to get the immediate area, but ultimately arrive to the hotel as a pedestrian from the nearest T station.

7.4.7 Project Trip Generation

The mode share percentages described were applied to the number of person trips to develop pedestrian and vehicle trip generation estimates as shown in **Table 7-3**.

Table 7-3. Trip Generation Summary

Land Use[1]		Pedestrian Trips[2]	Vehicle Trips[3]
		a.m. Peak Hour	
	In	22	10
Hotel	Out	42	10
	Total	64	20
		p.m. Peak Hour	
	In	26	17
Hotel	Out	26	17
	Total	53	34

1. Based on 230 Hotel rooms.
2. Includes walk, bicycle, and transit trips.
3. Includes private auto and taxi/uber/lyft trips.

As indicated in **Table 7-3**, the peak hour of the hotel vehicular activity is expected to be the weekday p.m. peak hour, with approximately 17 vehicles entering and exiting the Project site. The Project is expected to generate approximately 20 new vehicle trips (10 entering and 10 exiting) during the weekday a.m. peak hour. The detailed trip generation information is provided in **Appendix D.**

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 2 – Central Core and trip distribution patterns presented in traffic studies for nearby projects. The trip distribution patterns for the Project are illustrated in **Figure 7-15** and **Figure 7-16**.

7.4.9 Build (2025) Traffic Volumes

The vehicle trips were distributed through the study area. The project-generated trips for the weekday a.m. and p.m. peak hours are shown in **Figure 7-17** and **Figure 7-18**, respectively. The trip assignments were added to the No-Build (2025) Condition vehicular traffic volumes to develop the Build (2025) Condition vehicular traffic volumes. The Build (2025) weekday a.m. and p.m. peak hour traffic volumes are shown on **Figure 7-19** and **Figure 7-20**, respectively.

7.5 Traffic Operation Analysis

Trafficware's Synchro (version 9) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2010 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 7-4** 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.

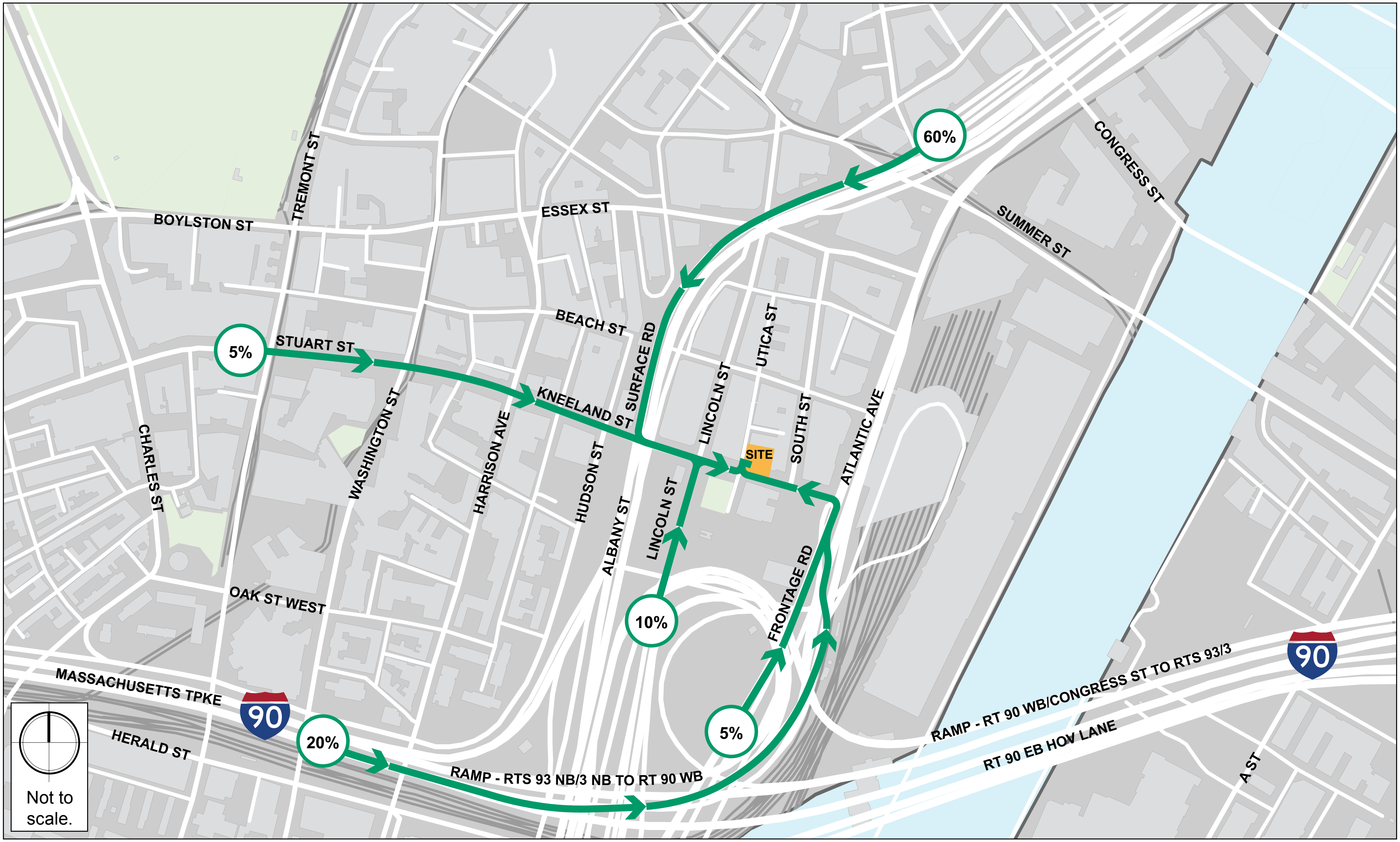


Figure 7-15.
Trip Distribution - Entering

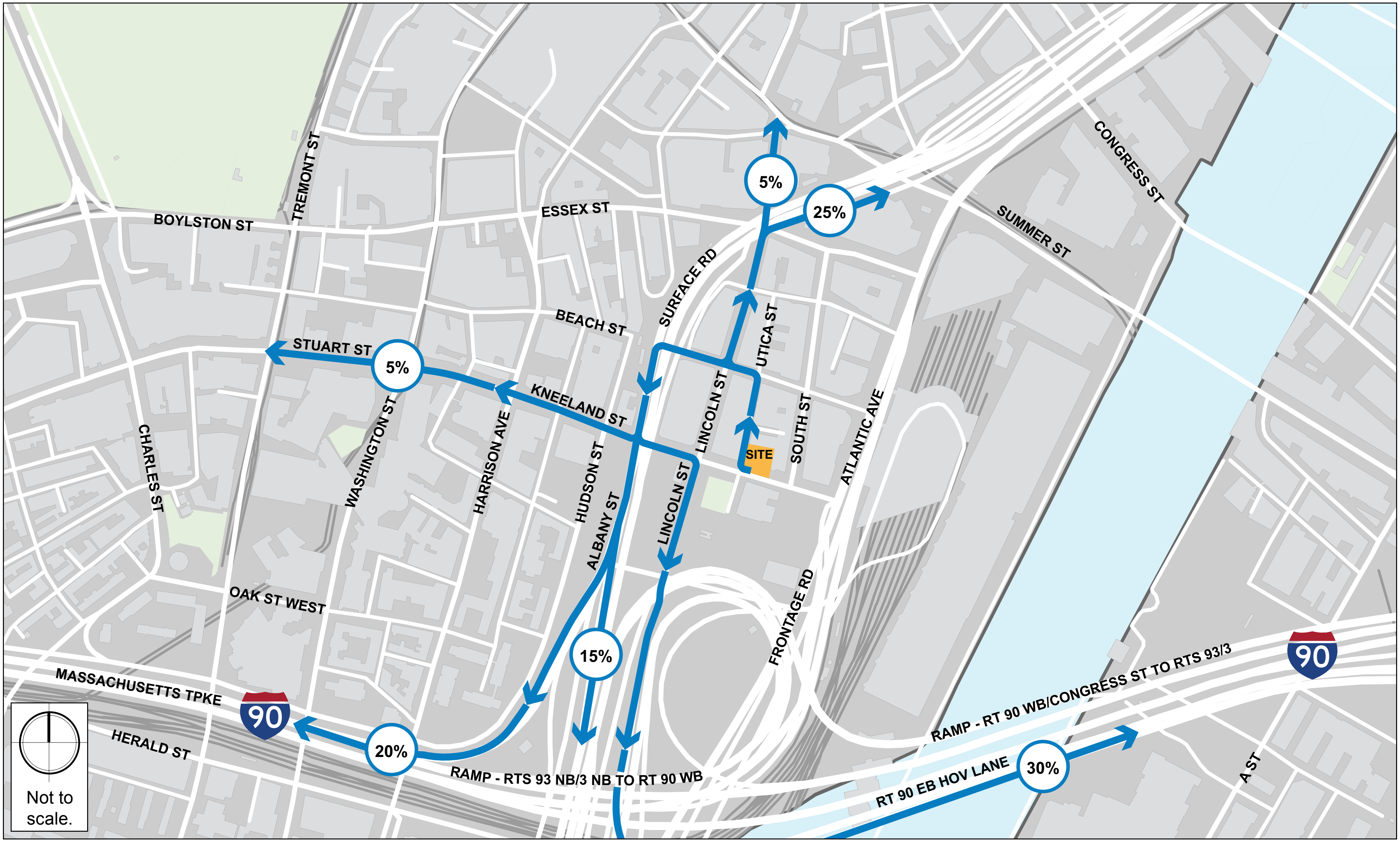


Figure 7-16.
Trip Distribution - Exiting

Figure 7-17.
Project-Generated Vehicle Trip Assignment, Weekday a.m. Peak Hour

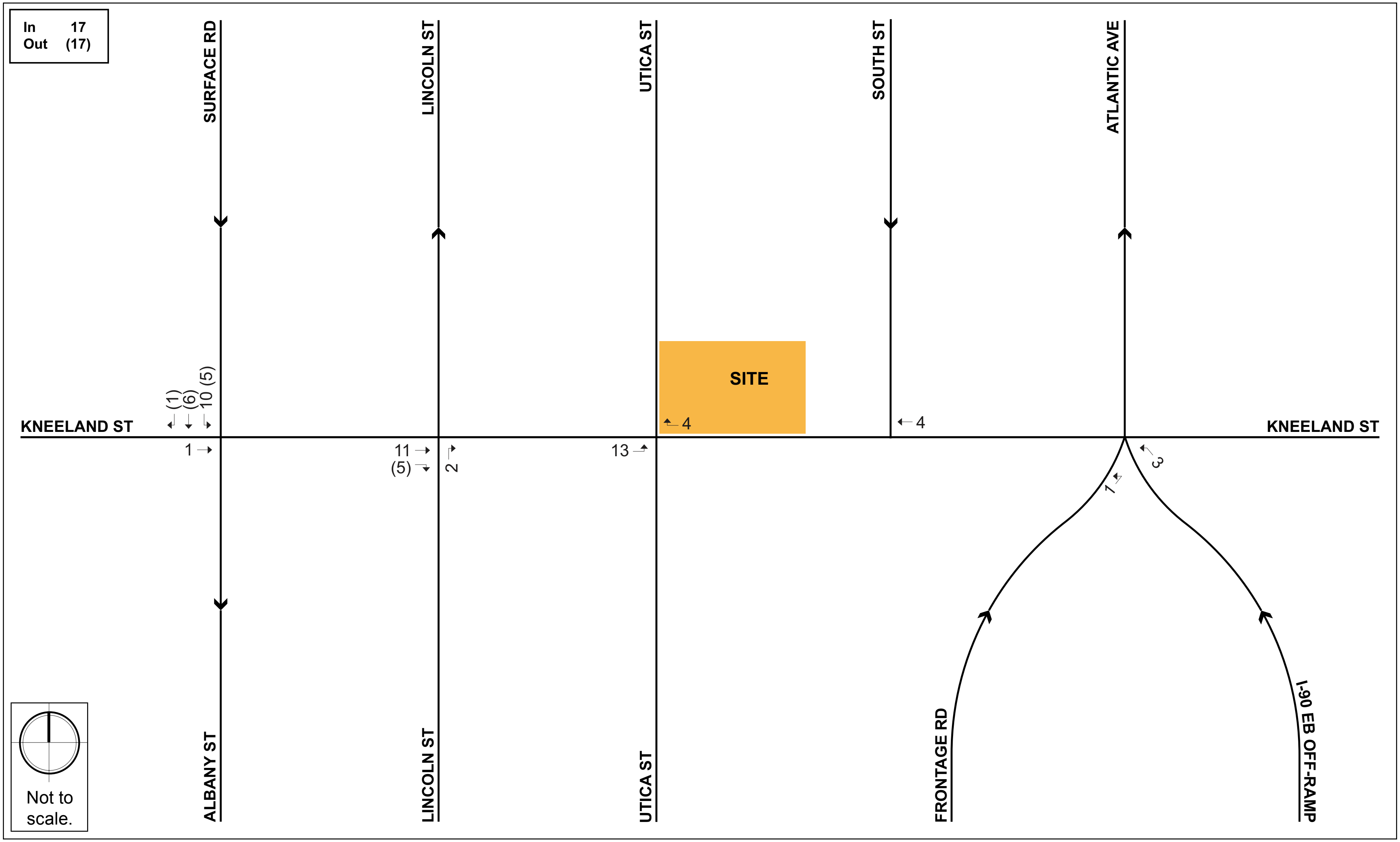


Figure 7-18.
Project-Generated Vehicle Trip Assignment, Weekday p.m. Peak Hour

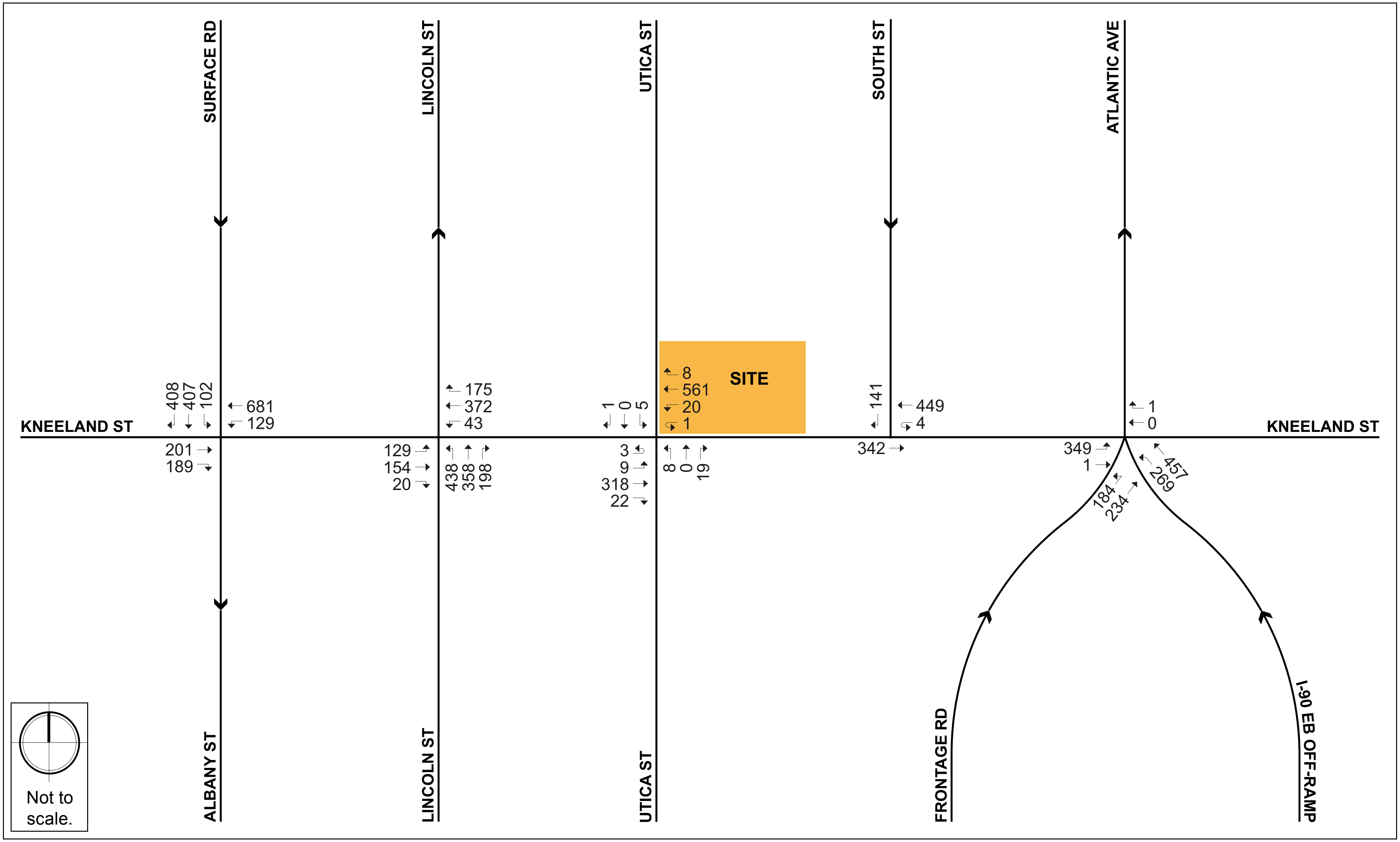


Figure 7-19.
Build (2025) Condition Traffic Volumes, Weekday a.m. Peak Hour

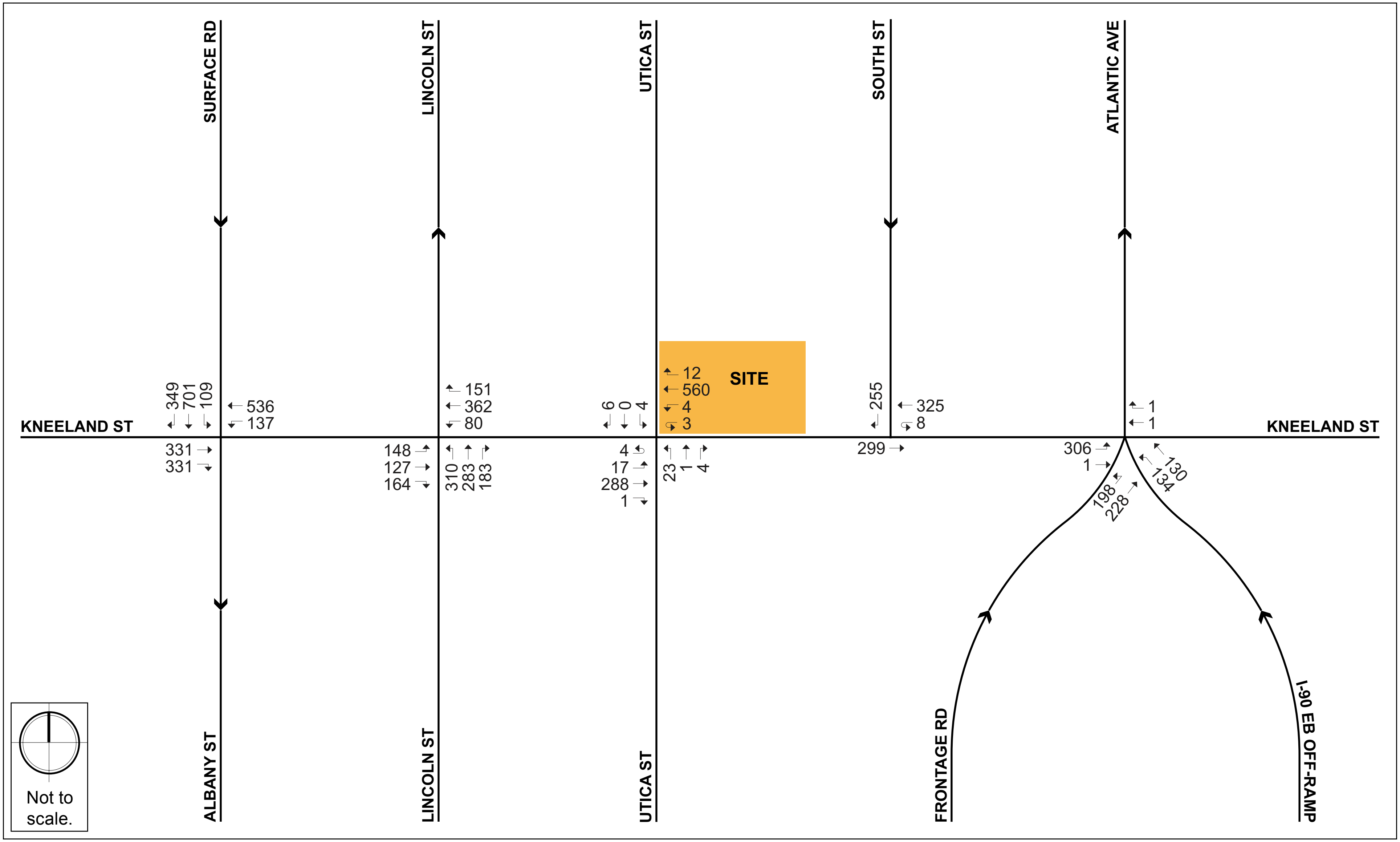


Figure 7-20.
Build (2025) Condition Traffic Volumes, Weekday p.m. Peak Hour

Table 7-4. Vehicle Level of Service Criteria

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

Source: 2010 Highway Capacity Manual, Transportation Research Board.

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

Table 7-5 and **Table 7-6** summarize the Existing (2018) Condition, the No-Build (2025) Condition, and the Build (2025) Condition capacity analysis for the study area intersection during the weekday a.m. and p.m. peak hours, respectively. The detailed analysis of the Synchro results is provided in **Appendix D.**

7.5.1 Existing (2018) Condition Traffic Operation Analysis

Under Existing (2018) Condition, each intersection operates at an acceptable level of service (LOS) D or better, with the exception of the following movements:

- The Lincoln Street northbound left-turn lane, at the **Kneeland Street/Lincoln Street** intersection, operates at a LOS E during the a.m. peak hour.
- At the **Kneeland Street/Atlantic Avenue/Frontage Road/I-90 EB Off-Ramp**, the I-90 EB Off-Ramp northbound left-turn lane operates at a LOS E during the p.m. peak hour

7.5.2 No-Build (2025) Condition Traffic Operation Analysis

All intersections continue to operate at the same overall LOS under the No-Build (2025) Condition as the Existing (2018) Condition, except for the following intersections and movements:

- The signalized intersection of **Kneeland Street/Lincoln Street** decreases from LOS D to E during the a.m. peak hour and continues to operate at LOS D during the p.m. peak hour. The Lincoln Street northbound left-turn lane decrease from LOS E to F during the a.m. peak hour and from LOS D to E during the p.m. peak hour.

7.5.3 Build (2025) Condition Traffic Operation Analysis

All intersections and movements continue to operate at the same LOS as under the No-Build (2025) Condition. The Project is expected to generate minimal new trips throughout the study area when compared to the existing uses and will not have a material impact on traffic operations at the study area intersection.

7.6 Transportation Demand Management

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

On-site management will keep a supply of transit information (schedules, maps, and fare information) to be made available to the hotel guests as well as staff. 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 patrons by working with them to implement the following TDM measures to encourage the use of non-vehicular modes of travel.

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

- **Transportation Coordinator**: The Proponent will encourage building to designate a full-time, on-site employee as the transportation coordinator for the site. The transportation coordinator will oversee all transportation issues. This includes managing vehicular operations, service and loading operations, and TDM programs.

- **Information and Promotion of Travel Alternatives**: The Proponent will encourage the building to provide public transit system maps, schedules, and other information on transit services in the area;
- **Annual Newsletter**: The Proponent will encourage the building to provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options;
- **Real Time Transit Info**: The Proponent will encourage the building to provide real-time information on travel alternatives via the Internet in the building lobby.
- **Transit Pass Programs**: The Proponent will encourage the hotel employees to use public transit or travel alternatives and will offer on-site transit pass sales and MBTA pass subsidies to full-time employees.
- **Bicycle Accommodation**: The Proponent will provide bicycle storage in secure, sheltered areas for hotel guests and employees to encourage bicycling as an alternative mode of transportation. Subject to necessary approvals, public use bicycle racks for visitors will be placed near building entrances.

7.7 Transportation Mitigation Measures

While the traffic impacts associated with the new trips are minimal, the Proponent will continue to work with the City of Boston to create a Project that efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use. As part of the Project, the Proponent will bring all abutting sidewalks and pedestrian ramps to the City of Boston standards in accordance with the Boston Complete Streets design guidelines. This will include the reconstruction and widening of the sidewalks where possible, the installation of new, accessible ramps, improvements to street lighting where necessary, planting of street trees, and providing bicycle storage racks surrounding the site, where appropriate. In addition to the reconstruction of Utica Street along the site frontage, the Project will also improve the bicycle accommodations in front of the site along Kneeland Street by converting the existing bicycle lane that is at street grade delineated by pavement markings into a bike lane at sidewalk grade, known as a cycle track, providing more protection for the bicyclists.

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

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

7.8 Evaluation of Short-Term Construction Impacts

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

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

- Limited construction worker parking on-site;
- Encouragement of worker carpooling;
- The avoidance of residential streets for deliveries and construction vehicles where possible;
- 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.

Table 7-5. Capacity Analysis Summary, Weekday a.m. Peak Hour

Intersection/Movement	Existing (2018) Condition				No-Build (2025) Condition				Build (2025) Condition			
	LOS	Delay (s)	V/C ratio	95th % Queue (ft)	LOS	Delay (s)	V/C ratio	95th % Queue (ft)	LOS	Delay (s)	V/C ratio	95th % Queue (ft)
Signalized Intersections												
1. Kneeland Street/Surface Road/Albany	**C**	**25.4**	**-**	**-**	**C**	**29.3**	**-**	**-**	**C**	**29.7**	**-**	**-**
EB Kneeland Street thru | thru	C	26.4	0.18	73	C	26.7	0.20	82	C	26.7	0.20	82
EB Kneeland Street right	A	5.2	0.27	43	A	5.4	0.32	50	A	5.4	0.32	50
WB Kneeland Street left	C	20.2	0.27	89	C	20.4	0.29	91	C	20.4	0.29	91
WB Kneeland Street left/thru | thru	C	27.9	0.56	217	C	30.0	0.59	231	C	30.0	0.59	231
SB Surface Road left/thru | thru | thru/right	C	27.8	0.66	160	D	35.8	0.80	216	D	36.6	0.81	221
2. Kneeland Street/Lincoln Street	**D**	**41.1**	**-**	**-**	**E**	**55.1**	**-**	**-**	**E**	**55.2**	**-**	**-**
EB Kneeland Street left/thru | thru/right	D	41.2	0.72	113	D	46.0	0.79	#145	D	46.7	0.81	#151
WB Kneeland Street left/thru | thru | thru/right	C	21.3	0.47	122	C	21.1	0.46	137	C	21.1	0.46	137
NB Lincoln Street left	E	74.9	0.95	#516	F	128.3	1.14	#566	F	128.3	1.14	#566
NB Lincoln Street thru | thru/right	D	35.7	0.57	205	D	38.8	0.70	228	D	38.7	0.70	228
3. Kneeland Street/Atlantic Avenue/ Frontage Road/I-90 EB Off-Ramp	**C**	**32.7**	**-**	**-**	**D**	**35.2**	**-**	**-**	**D**	**35.3**	**-**	**-**
EB Kneeland Street left	D	49.7	0.67	m123	D	51.5	0.73	m145	D	51.5	0.73	m145
EB Kneeland Street left/thru	D	50.2	0.68	m126	D	51.5	0.73	m146	D	51.5	0.73	m145
WB Kneeland Street thru/right	A	0.0	0.01	0	A	0.0	0.01	0	A	0.0	0.01	0
NB Frontage Road left	C	30.8	0.24	184	D	35.2	0.28	#245	D	35.2	0.28	#246
NB Frontage Road left/thru	C	31.4	0.30	#260	D	36.6	0.41	#404	D	36.6	0.41	#404
NB I-90 EB Off-Ramp left	D	50.2	0.72	232	D	47.3	0.69	238	D	47.5	0.70	238
NB I-90 EB Off-Ramp thru	B	13.1	0.42	284	B	15.3	0.47	332	B	15.3	0.47	332

Intersection/Movement	Existing (2018) Condition				No-Build (2025) Condition				Build (2025) Condition			
Unsignalized Intersections												
4. Kneeland Street/Utica Street	-	-	-	-	-	-	-	-	-	-	-	-
EB Kneeland Street left/thru | thru/right	A	0.4	0.00	0	A	0.3	0.01	0	A	0.7	0.01	1
WB Kneeland Street left/thru | thru | thru/right	A	1.1	0.02	1	A	1.2	0.02	1	A	1.2	0.02	1
NB Utica Street left/thru/right	B	10.7	0.07	5	B	11.3	0.07	6	B	11.5	0.08	6
SB Utica Street left/thru/right	C	17.3	0.03	2	C	18.9	0.03	2	C	19.4	0.03	2
5. Kneeland Street/South Street	-	-	-	-	-	-	-	-	-	-	-	-
EB Kneeland Street thru | thru	A	0.0	0.08	0	A	0.0	0.11	0	A	0.0	0.11	0
WB Kneeland Street thru | thru	A	0.0	0.13	0	A	0.0	0.14	0	A	0.0	0.14	0
SB South Street right	B	10.7	0.19	18	B	10.9	0.20	19	B	10.9	0.20	19

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

Table 7-6. Capacity Analysis Summary, Weekday p.m. Peak Hour

Intersection/Movement	Existing (2018) Condition				No-Build (2025) Condition				Build (2025) Condition			
	LOS	Delay (s)	V/C ratio	95th % Queue (ft)	LOS	Delay (s)	V/C ratio	95th % Queue (ft)	LOS	Delay (s)	V/C ratio	95th % Queue (ft)
Signalized Intersections												
1. Kneeland Street/Surface Road/Albany	**C**	**27.9**	**-**	**-**	**C**	**29.5**	**-**	**-**	**C**	**29.8**	**-**	**-**
EB Kneeland Street thru | thru	D	37.4	0.44	137	D	37.9	0.47	144	D	37.9	0.47	145
EB Kneeland Street right	A	8.0	0.54	71	A	8.1	0.57	74	A	8.1	0.57	74
WB Kneeland Street left	C	30.7	0.44	110	C	31.8	0.47	114	C	31.8	0.48	114
WB Kneeland Street left/thru | thru	C	32.5	0.57	187	D	35.2	0.64	213	D	35.2	0.64	213
SB Surface Road left/thru | thru | thru/right	C	28.4	0.65	232	C	30.3	0.71	265	C	30.8	0.73	272
2. Kneeland Street/Lincoln Street	**C**	**34.9**	**-**	**-**	**D**	**40.8**	**-**	**-**	**D**	**41.6**	**-**	**-**
EB Kneeland Street left/thru | thru/right	D	39.3	0.82	#145	D	50.7	0.89	#186	D	53.9	0.91	#199
WB Kneeland Street left/thru | thru | thru/right	C	27.1	0.50	158	C	27.6	0.54	168	C	27.8	0.54	168
NB Lincoln Street left	D	53.0	0.73	#292	E	64.3	0.86	#375	E	64.3	0.86	#375
NB Lincoln Street thru | thru/right	C	30.0	0.53	150	C	33.1	0.61	180	C	32.8	0.61	178
3. Kneeland Street/Atlantic Avenue/ Frontage Road/I-90 EB Off-Ramp	**C**	**34.8**	**-**	**-**	**D**	**35.8**	**-**	**-**	**D**	**35.9**	**-**	**-**
EB Kneeland Street left	D	51.6	0.67	m98	D	50.7	0.69	m107	D	50.5	0.69	m107
EB Kneeland Street left/thru	D	51.6	0.67	m100	D	51.1	0.70	m108	D	50.8	0.70	m109
WB Kneeland Street thru/right	C	34.0	0.02	6	C	34.0	0.02	6	C	34.0	0.02	6
NB Frontage Road left	C	22.9	0.22	157	C	24.6	0.25	174	C	24.7	0.25	175
NB Frontage Road left/thru	C	23.5	0.28	206	C	25.6	0.33	241	C	25.7	0.33	242
NB I-90 EB Off-Ramp left	E	58.8	0.28	144	E	59.7	0.65	153	E	60.1	0.66	156
NB I-90 EB Off-Ramp thru	B	10.8	0.13	74	B	11.6	0.14	83	B	11.6	0.14	83

Intersection/Movement	Existing (2018) Condition				No-Build (2025) Condition				Build (2025) Condition			
					Unsignalized Intersections							
4. Kneeland Street/Utica Street	-	-	-	-	-	-	-	-	-	-	-	-
EB Kneeland Street left/thru | thru/right	A	0.6	0.01	1	A	0.5	0.01	1	A	1.3	0.02	2
WB Kneeland Street left/thru | thru | thru/right	A	0.4	0.01	0	A	0.4	0.01	0	A	0.4	0.01	0
NB Utica Street left/thru/right	B	12.9	0.07	6	B	13.8	0.08	7	B	14.3	0.09	7
SB Utica Street left/thru/right	B	12.2	0.03	2	B	12.6	0.03	3	B	12.9	0.03	3
5. Kneeland Street/South Street	-	-	-	-	-	-	-	-	-	-	-	-
EB Kneeland Street thru | thru	A	0.0	0.08	0	A	0.0	0.09	0	A	0.0	0.09	0
WB Kneeland Street thru | thru	A	0.0	0.10	0	A	0.0	0.11	0	A	0.0	0.11	0
SB South Street right	B	11.6	0.36	41	B	11.9	0.38	44	B	11.9	0.38	44

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

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 (MEPA)

Based on information currently available, development of the Proposed Project is not expected to 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

While the Project is not expected to exceed the 100,000 gross square feet size threshold requirement for review by the Boston Civic Design Commission (BCDC), further dialogue with the BCDC is expected to determine if there will be review.

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.

Hudson 150K Real Estate Trust
(an Affiliate of the Hudson Group)

Noam Ron, Partner

June 25, 2018
Date

Mitchell L. Fischman Consulting LLC

Mitchell L. Fischman, Principal

06/25/18
Date

APPENDIX A – LETTER OF INTENT TO FILE PNF, MARCH 20, 2018

HUDSON GROUP

March 20, 2018

Brian Golden, Director
Boston Planning & Development Agency
One City Hall Square, 9th Floor
Boston, MA 02201

Re: Letter of Intent
150 Kneeland Street | Leather District Hotel Development

Dear Director Golden,

On behalf of Hudson 150K Real Estate Trust (an affiliate of Hudson Group), and in accordance with the applicable Executive Orders governing development projects in Boston subject to Large Project Review under the Boston Zoning Code, I am pleased to submit this Letter of Intent to develop the property at 150 Kneeland Street in the Leather District.

We propose to develop a new hotel comprising approximately 250 rooms and featuring active ground level retail (the "Project"). The site is currently occupied by a vacant structure that is in disrepair and will be demolished in its entirety. The property was formerly used as a restaurant and night club, which presented a significant nuisance to the neighborhood, while subsequent neglect of the site has resulted in serious blight.

Our goal is to develop a striking, slender, mid-rise tower housing a well-designed, top-quality hospitality facility. The Project will supply sorely needed hotel rooms to the immediate South Station area, which currently does not have a single hotel. The proposed hotel will complement the mixed-use fabric of the historic Leather District while positioning the Kneeland Street development corridor as a modern urban thoroughfare with a vibrant pedestrian realm. The Project will generate public benefits including job creation, infrastructure upgrades, visual streetscape improvements, and a dramatic improvement on current conditions that will help spur additional investment in the area.

120 KINGSTON STREET, SUITE 610
BOSTON, MASSACHUSETTS 02111
OFFICE: 617 314 7379
WWW.HUDSONGROUPNA.COM

The Project site is a compact parcel with land area of approximately 4,824 square feet. Located on the southern edge of the Leather District, it is situated mid-block between South and Lincoln Streets, across Kneeland Street from the Veolia steam facility and the 5-acre MassDOT properties, a future development area ("SouthGate"). The development is one block east of South Station, Boston's central, multi-modal transit hub, and one block south from a direct HOV lane to Logan International Airport. The site's walkability to Chinatown, the Central Business District, and Theater District, as well as proximity to Fort Point and the Seaport, represent additional demand drivers.

The site is in the Leather District Zoning District, bordering the South Station Economic Development Area, governed by Article 44 of the Boston Zoning Code. The Project will require Large Project Review pursuant to Article 80 of the Boston Zoning Code.

The new building will be contemporary in style, featuring facade, fenestration, and materiality elements that will relate to the surrounding area. The hotel is expected to be twenty (20) stories high, with a height of approximately two hundred fifteen (215) feet, and efficient floor plates of approximately 4,700 square feet. The Project will contain approximately 94,000 Gross Square Feet with a Gross Floor Area of approximately 88,500 square feet. In addition to guest rooms it will include lounges, meeting spaces, and other amenities as well as a dramatic, double height ground floor with publicly accessible food and beverage. No on-site parking will be provided. The site benefits from multiple nearby parking options including adjacent lots and garages. These alternatives will be finalized as part of the BPDA and community process.

Hudson Group has been dedicated to the Leather District for twenty-five years, having undertaken a mix of rental, condominium, office, and retail projects in the immediate area. These include adaptive reuse redevelopments on South and Lincoln Streets and new construction multifamily at 120 Kingston Street (Radian) which resulted in the creation of 72 affordable housing units in Chinatown.

120 KINGSTON STREET, SUITE 610
BOSTON, MASSACHUSETTS 02111
OFFICE: 617 314 7379
WWW.HUDSONGROUPNA.COM

We have begun the process of engaging with the community and have had multiple conversations with residents, neighborhood stakeholders, and immediate abutters. The Project was presented before the Leather District Neighborhood Association at a pre-filing meeting on March 14, 2018. The outcome of the well attended meeting and extensive discussion was a non-binding "show of hands" in support of Hudson Group's initial presentation. In addition, the Project received numerous support letters as part of this process.

We look forward to continuing the dialogue with the neighborhood and working with the BPDA, city agencies, our abutters, the community, other stakeholders, and the appointed Impact Advisory Group throughout the review process.

Please do not hesitate to contact me directly at 617-314-7379. Thank you.

Very truly yours,

Noam Ron, Partner

cc: Councilor Ed Flynn
Chris Betke, Chair, Leather District Neighborhood Association
Ori Ron, Hudson Group
Donald Wiest, Dain Torpy

APPENDIX B – AIR QUALITY APPENDIX

APPENDIX B
AIR QUALITY

150 KNEELAND STREET
PROJECT NOTIFICATION FORM

Pages **Contents**

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

                                           ***     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 =     35270.0 ;  Urban Roughness Length =  1.000 m
 **Non-DFAULT option to ignore morning transition from nighttime urban boundary layer (NoUrbTran) selected.

 **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. Full Conversion Assumed for NO2.
         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     506 Receptor(s)

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


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

 **The AERMET Input Meteorological Data Version Date: 16126

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

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

```
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     0.00 ;  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\4349\CO_5yrs_CO.SUM
*** AERMOD - VERSION  18081 ***   *** 150 Kneeland Development Project                                  ***        06/05/18
*** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                      ***        11:26:28
                                                                                                                   PAGE   2
*** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran

                                         *** 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,
*** AERMOD - VERSION  18081 ***   *** 150 Kneeland Development Project                                  ***        06/05/18
*** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                      ***        11:26:28
                                                                                                                   PAGE   3
*** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran

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

  Surface file:   Urban.sfc                                                                           Met Version: 16126
  Profile file:   Urban.PFL
  Surface format: FREE
  Profile format: FREE
  Surface station no.:    11111                 Upper air station no.:    22222
                 Name: UNKNOWN                                   Name: UNKNOWN
                 Year:   2010                                    Year:   2010

First 24 hours of scalar data
```

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
10	01	01	1	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	10.	10.0	255.2	2.0
10	01	02	2	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	20.	10.0	255.2	2.0
10	01	03	3	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	30.	10.0	255.2	2.0
10	01	04	4	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	40.	10.0	255.2	2.0
10	01	05	5	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	50.	10.0	255.2	2.0
10	01	06	6	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	60.	10.0	255.2	2.0
10	01	07	7	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	70.	10.0	255.2	2.0
10	01	08	8	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	80.	10.0	255.2	2.0
10	01	09	9	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	90.	10.0	255.2	2.0
10	01	10	10	01	-1.2	0.043	-9.000	0.020	-999.	21.	5.5	1.00	1.62	0.21	0.50	100.	10.0	255.2	2.0

```
 10 01 11  11 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  110.   10.0  255.2    2.0
 10 01 12  12 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  120.   10.0  255.2    2.0
 10 01 13  13 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  130.   10.0  255.2    2.0
 10 01 14  14 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  140.   10.0  255.2    2.0
 10 01 15  15 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  150.   10.0  255.2    2.0
 10 01 16  16 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  160.   10.0  255.2    2.0
 10 01 17  17 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  170.   10.0  255.2    2.0
 10 01 18  18 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  180.   10.0  255.2    2.0
 10 01 19  19 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  190.   10.0  255.2    2.0
 10 01 20  20 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  200.   10.0  255.2    2.0
 10 01 21  21 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  210.   10.0  255.2    2.0
 10 01 22  22 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  220.   10.0  255.2    2.0
 10 01 23  23 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  230.   10.0  255.2    2.0
 10 01 24  24 01   -1.2  0.043 -9.000  0.020 -999.   21.      5.5  1.00   1.62   0.21    0.50  240.   10.0  255.2    2.0


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

 F indicates top of profile (=1) or below (=0)
 *** AERMOD - VERSION  18081 ***   *** 150 Kneeland Development Project                                       ***        06/05/18
 *** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                           ***        11:26:28
                                                                                                                          PAGE   4
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran

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

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

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

ALL      HIGH   1ST HIGH VALUE IS    1547.93856  ON 10010112: AT (  330481.58,  4690695.06,     0.00,     0.00,   66.46)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION  18081 ***   *** 150 Kneeland Development Project                                       ***        06/05/18
 *** AERMET - VERSION 16126  ***   *** CO 1-Hour Screening Modeling                                           ***        11:26:28
                                                                                                                          PAGE   5
 *** MODELOPTs:    NonDFAULT  CONC  FLAT  FLGPOL  NOCHKD  SCREEN  NODRYDPLT  NOWETDPLT  URBAN  NoUrbTran

 *** 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  ***
```

150 Kneeland Street Heating and Ventilation Calculations											
AERCO BMK3.0 or equal											
	3,000,000	**BTU/hr**									
	2	**residential units**									
	2	X	3,000,000	~~BTU~~	X	1	mmBTU	=	**6**	**mmBTU**	
			1	hr		1000000	~~BTU~~			**hr**	
NG heating value:	1,020	BTU									
		ft3									
AP-42 CO emission factor:	0.084	lbs									
		mmBTU									
	6	~~mmBTU~~	X	0.084	lbs	=	**0.504**	**lbs**			
	1	hr		1	~~mmBTU~~			**hr**			
	0.504	~~lb~~	X	454	g	X	1	~~hr~~	=	**0.06356**	**g**
	1	~~hr~~		1	~~lb~~		3600	sec			**sec**

150 Kneeland Street Heating and Ventilation Calculations													
Caterpillar C15 ACERT 500 kW or equal													
	671	**bhp**											
	0.4	**g CO/bhp-hr**											
	1	**residential units**											
	1	X	671	~~bhp~~	X	0.4	grams CO	=	**268.2044**	**grams CO**	=	**0.591332**	**lbs**
						1	~~bhp~~-hr			**hr**			**hr**
	268.2044	grams CO	X	1	~~hr~~	=	**0.074501**	**grams CO**					
		~~hr~~		3600	sec			**sec**					

APPENDIX C – NOISE APPENDIX

APPENDIX C
NOISE

150 KNEELAND STREET
PROJECT NOTIFICATION FORM

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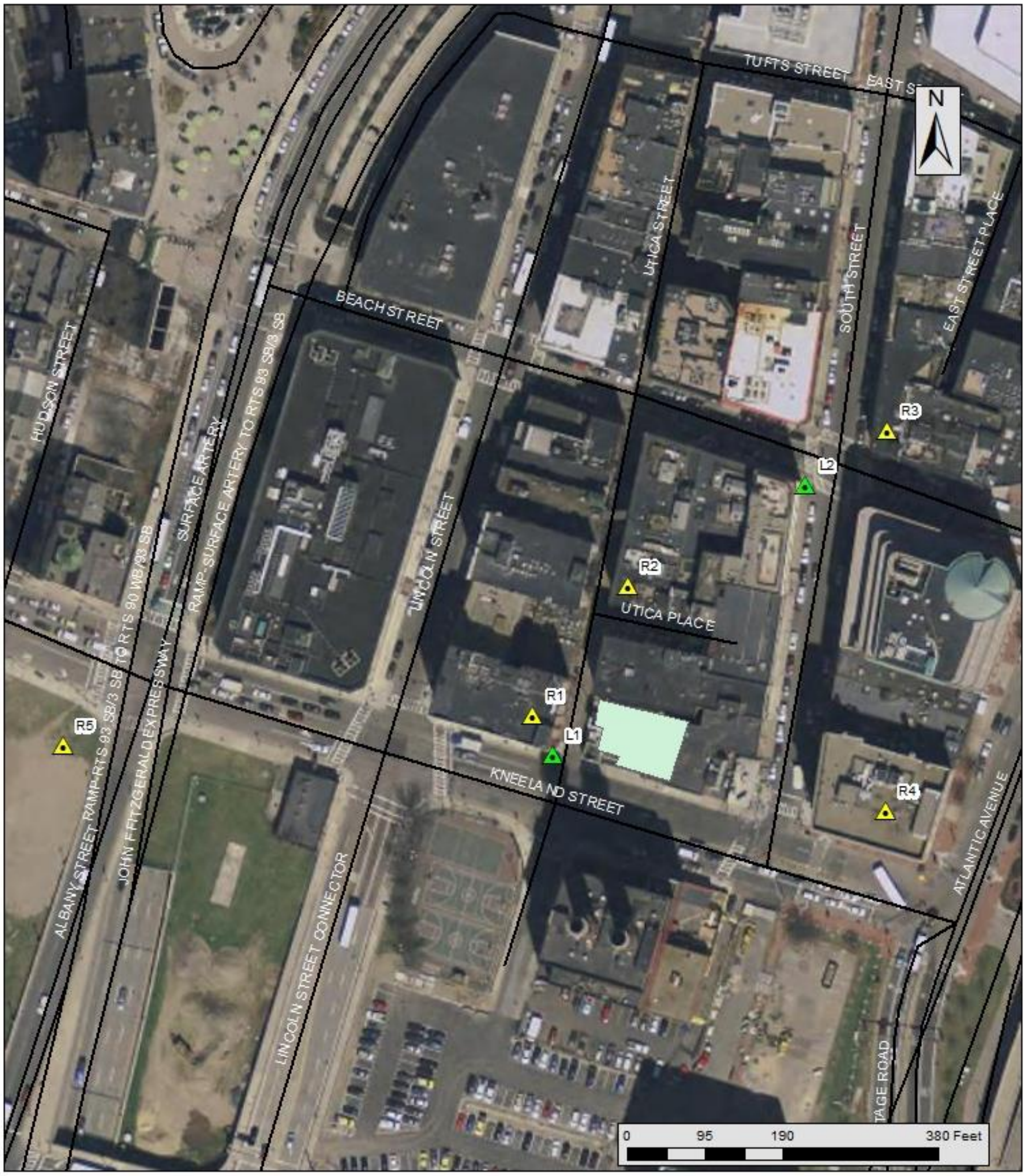

Figure 1
Sound Monitoring & Modeling Locations
150 Kneeland Street Boston, MA

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

Cadna Noise Modeling Results

City of Boston Noise Ordinance Analysis

Name	ID	Level Lr	Octave Band Day									
		Day	Night	31	63	125	250	500	1000	2000	4000	8000
		(dBA)	(dBA)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
216 Lincoln St	Receiver	36.5	36.5	52.8	50.4	46.3	38.2	33.7	28.7	22.8	16.6	9
109 Beach St	Receiver	39.9	39.9	53.1	52.4	50.1	42.3	36.9	31.5	25.9	19.8	11.5
122 South St	Receiver	38.4	38.4	50.6	50.2	48	41.2	36.3	30.1	22.8	14.7	2
210 South St	Receiver	40.9	40.9	52.8	52	50	43.6	38.9	32.8	26	19.2	10.5
99 Kneeland St	Receiver	33.1	33.1	45.5	44.6	42.4	35.8	31.3	24.9	17.3	7.8	-

MassDEP Noise Policy Analysis

Nighttime

	Name	ID	Project Level (dBA)	Background Level (dBA)	Total New Level (dBA)	Increase Over Existing (dBA)
R1	216 Lincoln St	Top_Floor	36.5	61.8	61.8	0.0
R2	109 Beach St	Top_Floor	39.9	55.8	55.9	0.1
R3	122 South St	Top_Floor	38.4	55.8	55.9	0.1
R4	210 South St	Top_Floor	40.9	55.8	55.9	0.1
R5	99 Kneeland St	Top_Floor	33.1	61.8	61.8	0.0

Daytime

	Name	ID	Project Level (dBA)	Background Level (dBA)	Total New Level (dBA)	Increase Over Existing (dBA)
R1	216 Lincoln St	Top_Floor	36.5	67.8	67.8	0.0
R2	109 Beach St	Top_Floor	39.9	60.5	60.5	0.0
R3	122 South St	Top_Floor	38.4	60.5	60.5	0.0
R4	210 South St	Top_Floor	40.9	60.5	60.5	0.0
R5	99 Kneeland St	Top_Floor	33.1	67.8	67.8	0.0

APPENDIX D – TRANSPORTATION APPENDIX

APPENDIX D – TRANSPORTATION APPENDIX

D1 – Detailed Traffic Counts

D2 – MassDOT Weekday Seasonal Adjustment Factors

D3 – Synchro Analysis

APPENDIX D1 – Detailed Traffic Counts

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 1
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	Albany Street/Surface Road
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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

TOTAL (CARS & TRUCKS)

	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	14	55	78	0	0	45	22	0	27	114	0
7:15 AM	0	0	0	0	0	13	59	85	0	0	47	29	0	29	119	0
7:30 AM	0	0	0	0	0	14	65	89	0	0	48	34	0	33	134	0
7:45 AM	0	0	0	0	0	15	68	97	0	0	45	38	0	31	143	0
8:00 AM	0	0	0	0	0	17	74	101	0	0	46	40	0	33	157	0
8:15 AM	0	0	0	0	0	18	77	98	0	0	48	39	0	32	165	0
8:30 AM	0	0	0	0	0	17	76	95	0	0	43	37	0	31	164	0
8:45 AM	0	0	0	0	0	16	74	93	0	0	41	35	0	29	157	0

	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	19	143	80	0	0	79	51	0	21	105	0
4:15 PM	0	0	0	0	0	21	148	83	0	0	82	59	0	23	109	0
4:30 PM	0	0	0	0	0	22	154	82	0	0	81	64	0	26	115	0
4:45 PM	0	0	0	0	0	23	153	83	0	0	77	73	0	28	116	0
5:00 PM	0	0	0	0	0	21	158	81	0	0	78	79	0	33	118	0
5:15 PM	0	0	0	0	0	19	157	80	0	0	80	77	0	36	120	0
5:30 PM	0	0	0	0	0	20	158	76	0	0	76	75	0	35	119	0
5:45 PM	0	0	0	0	0	21	152	74	0	0	73	72	0	33	117	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**68**	**301**	**387**	**0**	**0**	**178**	**151**	**0**	**125**	**643**	**0**
PHF	**0.00**				**0.98**				**0.95**				**0.97**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**1.3%**	**0.0%**	**1.6%**	**1.2%**	**0.0%**

PM PEAK HOUR 4:45 PM to 5:45 PM	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**83**	**626**	**320**	**0**	**0**	**311**	**304**	**0**	**132**	**473**	**0**
PHF	**0.00**				**0.99**				**0.98**				**0.97**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.3%**	**0.0%**	**0.8%**	**0.8%**	**0.0%**

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 1
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	Albany Street/Surface Road
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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

TRUCKS

	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	1	0	0	0	1	1	0	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:30 AM	0	0	0	0	0	1	1	1	0	0	1	1	0	1	6	0
7:45 AM	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8:30 AM	0	0	0	0	0	0	2	0	0	0	1	0	0	1	3	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0

	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**1**	**4**	**1**	**0**	**0**	**3**	**2**	**0**	**1**	**13**	**0**
PHF	**0.00**				**0.50**				**0.63**				**0.50**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**1**	**0**	**1**	**3**	**0**
PHF	**0.00**				**0.50**				**0.33**				**0.50**			

Client: Melissa Restrepo
Project #: 187_058_HSH
BTD #: Location 1
Location: Boston, MA (Leather District)
Street 1: Kneeland Street
Street 2: Albany Street/Surface Road
Count Date: 4/10/2018
Day of Week: Tuesday
Weather: Mostly Cloudy, 45°F

BOSTON
TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	8	0	0	0	12	0	1	0	8	0	0	0	5
7:15 AM	0	0	0	10	0	0	0	15	0	1	0	12	0	0	0	8
7:30 AM	0	0	0	12	0	0	0	16	0	1	0	14	0	1	0	7
7:45 AM	0	0	0	14	0	0	0	22	0	1	0	28	0	0	0	9
8:00 AM	0	0	0	11	0	0	0	25	0	2	0	26	0	0	0	12
8:15 AM	0	0	0	10	0	0	0	20	0	1	0	24	0	0	0	14
8:30 AM	0	0	0	9	0	0	0	18	1	2	1	20	0	1	0	10
8:45 AM	0	0	0	10	0	0	0	22	0	0	0	25	0	0	0	8

	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	6	0	1	1	25	0	1	0	22	0	1	0	16
4:15 PM	0	0	0	14	0	0	0	27	0	2	1	20	0	0	0	14
4:30 PM	0	0	0	12	0	0	0	24	0	1	0	18	0	0	0	12
4:45 PM	0	0	0	15	0	0	0	28	0	0	1	22	0	0	0	18
5:00 PM	0	0	0	16	0	1	0	25	0	2	0	20	0	1	1	15
5:15 PM	0	0	0	14	0	0	0	30	0	0	0	18	0	0	0	16
5:30 PM	0	0	0	12	0	0	0	26	0	1	0	22	0	0	0	20
5:45 PM	0	0	0	15	0	0	0	28	0	0	0	19	0	0	0	18

AM PEAK HOUR[1] 8:00 AM to 9:00 AM	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	40	0	0	0	85	1	5	1	95	0	1	0	44

PM PEAK HOUR[1] 4:45 PM to 5:45 PM	Albany Street Northbound				Surface Road Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	57	0	1	0	109	0	3	1	82	0	1	1	69

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

Client: Melissa Restrepo
Project #: 187_058_HSH
BTD #: Location 2
Location: Boston, MA (Leather District)
Street 1: Kneeland Street
Street 2: Lincoln Street
Count Date: 4/10/2018
Day of Week: Tuesday
Weather: Mostly Cloudy, 45°F

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TOTAL (CARS & TRUCKS)

	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	71	58	33	0	0	0	0	0	16	37	5	0	5	70	38
7:15 AM	0	73	66	36	0	0	0	0	0	15	39	6	0	6	75	40
7:30 AM	0	88	72	35	0	0	0	0	0	21	35	6	0	7	78	41
7:45 AM	0	89	81	36	0	0	0	0	0	26	31	5	0	8	85	44
8:00 AM	0	101	86	34	0	0	0	0	0	30	30	4	0	9	89	43
8:15 AM	0	105	85	33	0	0	0	0	0	35	28	3	0	9	92	42
8:30 AM	0	109	83	32	0	0	0	0	0	34	23	4	0	8	86	40
8:45 AM	0	103	81	30	0	0	0	0	0	31	21	5	0	7	83	38

	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	74	41	22	0	0	0	0	0	40	17	41	0	17	51	21
4:15 PM	0	70	50	27	0	0	0	0	0	42	18	43	0	18	63	27
4:30 PM	0	69	57	31	0	0	0	0	0	41	20	42	0	16	72	32
4:45 PM	0	63	61	36	0	0	0	0	0	38	22	40	0	17	82	36
5:00 PM	0	62	62	39	0	0	0	0	0	36	24	39	0	18	89	38
5:15 PM	0	68	64	40	0	0	0	0	0	35	26	38	0	19	88	37
5:30 PM	0	70	59	37	0	0	0	0	0	34	25	37	0	17	84	35
5:45 PM	0	69	56	35	0	0	0	0	0	32	26	35	0	16	81	33

AM PEAK HOUR 7:45 AM to 8:45 AM	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**404**	**335**	**135**	**0**	**0**	**0**	**0**	**0**	**125**	**112**	**16**	**0**	**34**	**352**	**169**
PHF	**0.98**				**0.00**				**0.96**				**0.97**			
HV %	**0.0%**	**0.5%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**2.7%**	**0.0%**	**0.0%**	**0.0%**	**2.8%**	**0.0%**

PM PEAK HOUR 4:45 PM to 5:45 PM	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**263**	**246**	**152**	**0**	**0**	**0**	**0**	**0**	**143**	**97**	**154**	**0**	**71**	**343**	**146**
PHF	**0.96**				**0.00**				**0.99**				**0.97**			
HV %	**0.0%**	**0.4%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.1%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**

Client: Melissa Restrepo
Project #: 187_058_HSH
BTD #: Location 2
Location: Boston, MA (Leather District)
Street 1: Kneeland Street
Street 2: Lincoln Street
Count Date: 4/10/2018
Day of Week: Tuesday
Weather: Mostly Cloudy, 45°F

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TRUCKS

	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
7:15 AM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2	0
7:30 AM	0	2	0	1	0	0	0	0	0	0	3	0	0	0	5	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:00 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	3	0
8:15 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
8:30 AM	0	1	1	0	0	0	0	0	0	0	1	0	0	0	4	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4:30 PM	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	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	1	0	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:15 AM to 8:15 AM	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**5**	**0**	**0**	**0**	**12**	**0**
PHF	**0.33**				**0.00**				**0.58**				**0.60**			

PM PEAK HOUR 4:15 PM to 5:15 PM	Lincoln Street Northbound				Lincoln Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**4**	**0**
PHF	**0.75**				**0.00**				**0.50**				**0.50**			

Client: Melissa Restrepo
Project #: 187_058_HSH
BTD #: Location 2
Location: Boston, MA (Leather District)
Street 1: Kneeland Street
Street 2: Lincoln Street
Count Date: 4/10/2018
Day of Week: Tuesday
Weather: Mostly Cloudy, 45°F

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PEDESTRIANS & BICYCLES

	Lincoln Street Northbound					Lincoln Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	14		0	0	0	15		0	1	0	0		0	0	0	0	
7:15 AM	0	0	0	12		0	0	0	14		0	1	0	1		0	0	0	0	
7:30 AM	0	0	0	10		0	0	0	12		0	1	0	3		0	1	0	1	
7:45 AM	0	0	0	13		0	0	0	15		0	2	0	0		0	0	0	0	
8:00 AM	0	0	0	8		0	0	0	18		0	1	0	2		0	0	0	0	
8:15 AM	0	0	0	10		0	0	0	16		0	1	0	0		0	0	0	1	
8:30 AM	0	0	0	9		0	0	0	17		0	2	0	1		0	1	0	0	
8:45 AM	0	0	0	6		0	0	0	15		0	0	0	1		0	0	0	1	

	Lincoln Street Northbound					Lincoln Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	28		0	0	0	36		0	1	0	2		0	1	0	5	
4:15 PM	0	0	0	12		0	0	0	28		0	2	0	1		0	0	0	2	
4:30 PM	0	0	0	10		0	0	0	30		0	0	0	3		0	0	0	4	
4:45 PM	0	0	0	16		0	0	0	26		0	1	0	1		0	0	0	0	
5:00 PM	0	0	0	22		0	0	0	24		0	3	0	2		0	2	0	1	
5:15 PM	0	0	0	18		0	0	0	28		0	0	0	1		0	0	0	2	
5:30 PM	0	0	0	20		0	0	0	25		0	1	0	1		0	0	0	1	
5:45 PM	0	0	0	16		0	0	0	26		0	0	0	0		0	0	0	0	

AM PEAK HOUR[1]	Lincoln Street Northbound					Lincoln Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
7:45 AM to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:45 AM	0	0	0	40		0	0	0	66		0	6	0	3		0	1	0	1	

PM PEAK HOUR[1]	Lincoln Street Northbound					Lincoln Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
4:45 PM to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
5:45 PM	0	0	0	76		0	0	0	103		0	5	0	5		0	2	0	4	

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

Client: Melissa Restrepo
Project #: 187_058_HSH
BTD #: Location 3
Location: Boston, MA (Leather District)
Street 1: Kneeland Street
Street 2: Utica Street/ MassDOT Driveway
Count Date: 4/10/2018
Day of Week: Tuesday
Weather: Mostly Cloudy, 45°F

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TOTAL (CARS & TRUCKS)

	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	3	0	1	0	0	0	1	0	0	65	3	0	1	109	1
7:15 AM	0	2	0	1	0	0	0	1	0	0	66	9	0	2	118	1
7:30 AM	0	1	0	0	0	1	0	1	1	1	64	5	0	3	124	0
7:45 AM	0	2	0	4	0	1	0	0	0	0	62	5	0	5	133	1
8:00 AM	0	3	0	8	0	2	0	0	2	1	59	6	1	6	137	2
8:15 AM	0	2	0	6	0	1	0	0	0	0	56	5	0	5	141	2
8:30 AM	0	3	0	3	0	1	0	1	1	1	50	4	0	4	130	1
8:45 AM	0	2	0	2	0	0	0	1	0	1	45	5	0	3	125	1

	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	9	0	1	0	1	0	1	0	1	36	2	1	1	81	0
4:15 PM	0	7	0	2	0	1	0	1	1	1	42	2	0	2	99	1
4:30 PM	0	5	1	2	0	1	0	2	0	2	48	1	0	2	113	2
4:45 PM	0	7	0	1	0	1	0	1	1	2	56	0	1	2	127	4
5:00 PM	0	8	1	0	0	2	0	2	1	1	63	1	0	1	134	1
5:15 PM	0	5	0	1	0	0	0	2	2	0	65	0	1	1	136	1
5:30 PM	0	2	0	2	0	1	0	1	0	1	61	0	1	0	133	2
5:45 PM	0	2	0	1	0	0	0	2	0	3	58	0	0	0	126	2

AM PEAK HOUR 7:30 AM to 8:30 AM	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**8**	**0**	**18**	**0**	**5**	**0**	**1**	**3**	**2**	**241**	**21**	**1**	**19**	**535**	**5**
PHF	**0.59**				**0.75**				**0.94**				**0.95**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**0.0%**	**0.0%**	**0.0%**	**2.1%**	**0.0%**

PM PEAK HOUR 4:45 PM to 5:45 PM	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**22**	**1**	**4**	**0**	**4**	**0**	**6**	**4**	**4**	**245**	**1**	**3**	**4**	**530**	**8**
PHF	**0.75**				**0.63**				**0.95**				**0.98**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 3
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	Utica Street/ MassDOT Driveway
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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

	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:00 AM to 8:00 AM	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**12**	**0**
PHF	**0.00**				**0.00**				**0.63**				**0.75**			

PM PEAK HOUR 4:15 PM to 5:15 PM	MassDOT Driveway Northbound				Utica Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**0**
PHF	**0.00**				**0.25**				**0.50**				**0.50**			

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 3
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	Utica Street/ MassDOT Driveway
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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PEDESTRIANS & BICYCLES

	MassDOT Driveway Northbound					Utica Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	12		0	0	0	14		0	1	0	0		0	0	0	0	
7:15 AM	0	0	0	9		0	0	0	12		0	1	0	0		0	0	0	0	
7:30 AM	0	0	0	8		0	0	0	15		0	2	0	0		0	1	0	0	
7:45 AM	0	0	0	10		0	0	0	13		0	2	0	0		0	0	0	1	
8:00 AM	0	0	0	7		0	0	0	16		0	1	0	1		0	0	0	0	
8:15 AM	0	0	0	8		0	0	0	14		0	1	0	0		0	1	0	0	
8:30 AM	0	0	0	7		0	0	0	15		0	2	0	0		0	0	0	2	
8:45 AM	0	0	0	8		0	0	0	12		0	0	0	0		0	0	0	0	

	MassDOT Driveway Northbound					Utica Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	22		0	0	0	32		0	1	0	1		0	2	0	0	
4:15 PM	0	0	0	14		1	0	0	25		0	2	0	0		0	1	0	1	
4:30 PM	0	0	0	12		0	0	0	26		0	0	0	1		0	0	0	1	
4:45 PM	0	0	0	15		0	0	0	24		0	1	0	0		0	0	0	0	
5:00 PM	0	0	0	20		0	0	0	22		0	2	0	1		0	3	0	2	
5:15 PM	0	0	0	16		0	0	0	25		0	1	0	1		0	0	0	0	
5:30 PM	0	0	0	15		0	0	0	20		0	1	0	0		0	1	0	1	
5:45 PM	0	0	0	14		0	0	0	24		0	0	0	0		0	0	0	0	

AM PEAK HOUR[1] 7:30 AM to 8:30 AM	MassDOT Driveway Northbound					Utica Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	0	0	33		0	0	0	58		0	6	0	1		0	2	0	1	

PM PEAK HOUR[1] 4:45 PM to 5:45 PM	MassDOT Driveway Northbound					Utica Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound				
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	0	0	66		0	0	0	91		0	5	0	2		0	4	0	3	

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

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 4
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	South Street
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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TOTAL (CARS & TRUCKS)

	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	28	0	0	66	0	1	0	83	0
7:15 AM	0	0	0	0	0	0	0	31	0	0	67	0	0	0	90	0
7:30 AM	0	0	0	0	0	0	0	30	0	0	65	0	1	0	97	0
7:45 AM	0	0	0	0	0	0	0	34	0	0	67	0	1	0	105	0
8:00 AM	0	0	0	0	0	0	0	37	0	0	70	0	0	0	109	0
8:15 AM	0	0	0	0	0	0	0	35	0	0	63	0	2	0	113	0
8:30 AM	0	0	0	0	0	0	0	36	0	0	54	0	1	0	99	0
8:45 AM	0	0	0	0	0	0	0	33	0	0	47	0	0	0	96	0

	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	52	0	0	39	0	6	0	31	0
4:15 PM	0	0	0	0	0	0	0	46	0	0	45	0	2	0	56	0
4:30 PM	0	0	0	0	0	0	0	39	0	0	51	0	3	0	78	0
4:45 PM	0	0	0	0	0	0	0	48	0	0	59	0	0	0	86	0
5:00 PM	0	0	0	0	0	0	0	55	0	0	65	0	1	0	81	0
5:15 PM	0	0	0	0	0	0	0	67	0	0	67	0	2	0	72	0
5:30 PM	0	0	0	0	0	0	0	76	0	0	65	0	1	0	60	0
5:45 PM	0	0	0	0	0	0	0	69	0	0	59	0	1	0	59	0

AM PEAK HOUR 7:30 AM to 8:30 AM	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**136**	**0**	**0**	**265**	**0**	**4**	**0**	**424**	**0**
PHF	**0.00**				**0.92**				**0.95**				**0.93**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**0.0%**	**0.0%**	**2.4%**	**0.0%**

PM PEAK HOUR 4:45 PM to 5:45 PM	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**246**	**0**	**0**	**256**	**0**	**4**	**0**	**299**	**0**
PHF	**0.00**				**0.81**				**0.96**				**0.88**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**1.3%**	**0.0%**

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 4
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	South Street
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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TRUCKS

	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	3	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:30 AM	0	0	0	0	0	0	0	3	0	0	1	0	0	0	1	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0

	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

AM PEAK HOUR 7:00 AM to 8:00 AM	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**0**	**12**	**0**
PHF	**0.00**				**0.25**				**0.63**				**0.75**			

PM PEAK HOUR 4:00 PM to 5:00 PM	Northbound				South Street Southbound				Kneeland Street Eastbound				Kneeland Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**
PHF	**0.00**				**0.00**				**0.38**				**0.50**			

Client: Melissa Restrepo
Project #: 187_058_HSH
BTD #: Location 4
Location: Boston, MA (Leather District)
Street 1: Kneeland Street
Street 2: South Street
Count Date: 4/10/2018
Day of Week: Tuesday
Weather: Mostly Cloudy, 45°F

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PEDESTRIANS & BICYCLES

		Northbound					South Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound			
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
7:00 AM	0	0	0	0		0	0	0	11		0	1	0	4		0	0	0	1	
7:15 AM	0	0	0	0		0	0	0	13		0	1	0	2		0	0	0	0	
7:30 AM	0	0	0	0		0	0	0	14		0	2	0	1		0	1	1	1	
7:45 AM	0	0	0	0		0	0	0	12		0	1	0	3		0	0	0	2	
8:00 AM	0	0	0	0		0	0	0	10		0	2	0	2		0	0	0	4	
8:15 AM	0	0	0	0		0	0	0	15		0	1	0	1		0	1	0	1	
8:30 AM	0	0	0	0		0	0	1	14		0	2	0	2		0	0	0	2	
8:45 AM	0	0	0	0		0	0	0	12		0	0	0	3		0	0	0	1	

		Northbound					South Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound			
Start Time	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
4:00 PM	0	0	0	0		0	0	2	28		0	1	0	14		0	0	0	3	
4:15 PM	0	0	0	0		0	0	0	26		0	1	0	2		0	1	0	1	
4:30 PM	0	0	0	0		0	0	0	24		0	1	0	4		0	0	0	2	
4:45 PM	0	0	0	0		0	0	0	20		0	2	0	2		0	0	0	1	
5:00 PM	0	0	0	0		0	0	2	24		0	2	0	3		0	1	0	0	
5:15 PM	0	0	0	0		0	0	0	22		0	1	0	1		0	0	0	1	
5:30 PM	0	0	0	0		0	0	0	18		0	1	0	2		0	1	0	1	
5:45 PM	0	0	0	0		0	0	0	20		0	0	0	1		0	0	0	0	

AM PEAK HOUR[1] 7:30 AM to 8:30 AM		Northbound					South Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound			
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	0	0	0		0	0	0	51		0	6	0	7		0	2	1	8	

PM PEAK HOUR[1] 4:45 PM to 5:45 PM		Northbound					South Street Southbound					Kneeland Street Eastbound					Kneeland Street Westbound			
	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
	0	0	0	0		0	0	2	84		0	6	0	8		0	2	0	3	

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

Client:	Melissa Restrepo
Project #:	187_058_HSH
BTD #:	Location 5
Location:	Boston, MA (Leather District)
Street 1:	Kneeland Street
Street 2:	Atlantic Avenue
Count Date:	4/10/2018
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 45°F

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TOTAL (CARS & TRUCKS)

	Atlantic Avenue Northbound (I-93 Off-Ramp) Left Side				Atlantic Avenue Northbound (I-90 Off-Ramp) Right Side			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	37	43	0	0	48	99	0
7:15 AM	0	39	45	0	0	52	102	0
7:30 AM	0	43	42	0	0	55	104	0
7:45 AM	0	40	48	0	0	63	107	0
8:00 AM	0	38	46	1	0	69	111	0
8:15 AM	0	46	50	0	0	65	108	0
8:30 AM	0	41	51	0	0	61	101	0
8:45 AM	0	40	45	0	0	58	102	0

	Atlantic Avenue Northbound				Atlantic Avenue Southbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	25	34	0	0	11	25	0
4:15 PM	0	41	41	0	0	17	26	0
4:30 PM	0	54	45	0	0	23	27	0
4:45 PM	0	58	49	0	0	29	30	0
5:00 PM	0	49	51	0	0	34	32	0
5:15 PM	0	42	52	0	0	31	30	0
5:30 PM	0	35	50	0	0	28	28	0
5:45 PM	0	37	49	0	0	24	31	0

APPENDIX D2 – MassDOT Weekday Seasonal Adjustment Factors

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

APPENDIX D3 – Detailed Synchro Analysis

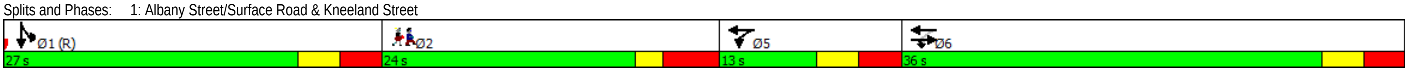
APPENDIX D3 – Existing (2018) Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	178	151	125	643	0	0	0	0	75	301	387	
Future Volume (vph)	0	178	151	125	643	0	0	0	0	75	301	387	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91	
Ped Bike Factor				0.97	1.00								
Frt			0.850								0.924		
Flt Protected				0.950	0.999						0.995		
Satd. Flow (prot)	0	3539	1599	1610	3420	0	0	0	0	0	4750	0	
Flt Permitted				0.634	0.950						0.995		
Satd. Flow (perm)	0	3539	1599	1042	3250	0	0	0	0	0	4750	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			164								237		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		216			240			297			185		
Travel Time (s)		4.9			5.5			6.8			4.2		
Confl. Peds. (#/hr)			40	40									
Peak Hour Factor	0.95	0.95	0.95	0.97	0.97	0.97	0.92	0.92	0.92	0.98	0.98	0.98	
Heavy Vehicles (%)	0%	2%	1%	2%	1%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	0	187	159	129	663	0	0	0	0	77	307	395	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	187	159	116	676	0	0	0	0	0	779	0	
Turn Type		NA	Prot	D.P+P	NA					Split	NA		
Protected Phases		6	6	5	5 6					1	1		2
Permitted Phases				6									
Detector Phase		6	6	5	5 6					1	1		
Switch Phase													
Minimum Initial (s)		8.0	8.0	4.0						8.0	8.0		1.0
Minimum Split (s)		36.0	36.0	13.0						14.0	14.0		24.0
Total Split (s)		36.0	36.0	13.0						27.0	27.0		24.0
Total Split (%)		36.0%	36.0%	13.0%						27.0%	27.0%		24%
Maximum Green (s)		30.0	30.0	7.0						21.0	21.0		18.0
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0		2.0
All-Red Time (s)		3.0	3.0	3.0						3.0	3.0		4.0
Lost Time Adjust (s)		0.0	0.0	0.0							0.0		
Total Lost Time (s)		6.0	6.0	6.0							6.0		
Lead/Lag		Lag	Lag	Lead						Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes	Yes						Yes	Yes		Yes
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0		0.2
Recall Mode		Max	Max	None						C-Max	C-Max		None
Walk Time (s)		7.0	7.0	3.0									5.0
Flash Dont Walk (s)		23.0	23.0	4.0									13.0
Pedestrian Calls (#/hr)		0	0	0									261
Act Effct Green (s)		30.0	30.0	37.0	37.0						21.0		
Actuated g/C Ratio		0.30	0.30	0.37	0.37						0.21		
v/c Ratio		0.18	0.27	0.27	0.56						0.66		
Control Delay		26.4	5.2	19.8	24.9						27.8		
Queue Delay		0.0	0.0	0.3	3.1						0.0		
Total Delay		26.4	5.2	20.2	27.9						27.8		
LOS		C	A	C	C						C		
Approach Delay		16.7			26.8						27.8		
Approach LOS		B			C						C		
Queue Length 50th (ft)		46	0	48	164						116		
Queue Length 95th (ft)		73	43	89	217						160		
Internal Link Dist (ft)		136			160			217			105		
Turn Bay Length (ft)													
Base Capacity (vph)		1061	594	425	1214						1184		
Starvation Cap Reductn		0	0	83	418						0		
Spillback Cap Reductn		0	0	0	0						0		
Storage Cap Reductn		0	0	0	0						0		
Reduced v/c Ratio		0.18	0.27	0.34	0.85						0.66		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 25.4 Intersection LOS: C
Intersection Capacity Utilization 73.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Albany Street/Surface Road & Kneeland Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	125	112	16	34	360	169	408	335	155	0	0	0	
Future Volume (vph)	125	112	16	34	360	169	408	335	155	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	160		0	0		0	
Storage Lanes	0		0	0		0	1		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.91	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt		0.990			0.955			0.953					
Flt Protected		0.976			0.997		0.950						
Satd. Flow (prot)	0	3426	0	0	4846	0	1805	3403	0	0	0	0	
Flt Permitted		0.577			0.898		0.950						
Satd. Flow (perm)	0	2025	0	0	4365	0	1805	3403	0	0	0	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		7			99			63					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		240			161			347			216		
Travel Time (s)		5.5			3.7			7.9			4.9		
Confl. Peds. (#/hr)									1				
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.98	0.98	0.98	0.92	0.92	0.92	
Heavy Vehicles (%)	1%	3%	0%	0%	3%	0%	0%	1%	0%	0%	0%	0%	
Adj. Flow (vph)	130	117	17	35	371	174	416	342	158	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	264	0	0	580	0	416	500	0	0	0	0	
Turn Type	Prot	NA		Perm	NA		Split	NA					
Protected Phases	5	5 6			6		1	1					2
Permitted Phases				6									
Detector Phase	5	5 6		6	6		1	1					
Switch Phase													
Minimum Initial (s)	8.0			8.0	8.0		8.0	8.0					1.0
Minimum Split (s)	14.5			14.5	14.5		31.0	31.0					24.0
Total Split (s)	16.0			38.0	38.0		31.0	31.0					25.0
Total Split (%)	14.5%			34.5%	34.5%		28.2%	28.2%					23%
Maximum Green (s)	9.5			31.5	31.5		24.0	24.0					20.0
Yellow Time (s)	3.5			3.5	3.5		4.0	4.0					3.0
All-Red Time (s)	3.0			3.0	3.0		3.0	3.0					2.0
Lost Time Adjust (s)					0.0		0.0	0.0					
Total Lost Time (s)					6.5		7.0	7.0					
Lead/Lag							Lead	Lead					Lag
Lead-Lag Optimize?							Yes	Yes					Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0					0.2
Recall Mode	None			None	None		C-Max	C-Max					None
Walk Time (s)							7.0	7.0					4.0
Flash Dont Walk (s)							17.0	17.0					15.0
Pedestrian Calls (#/hr)							0	0					109
Act Effct Green (s)		39.2			29.5		26.8	26.8					
Actuated g/C Ratio		0.36			0.27		0.24	0.24					
v/c Ratio		0.72			0.47		0.95	0.57					
Control Delay		41.2			21.3		74.9	35.7					
Queue Delay		0.0			0.0		0.0	0.0					
Total Delay		41.2			21.3		74.9	35.7					
LOS		D			C		E	D					
Approach Delay		41.2			21.3			53.5					
Approach LOS		D			C			D					
Queue Length 50th (ft)		67			89		~323	148					
Queue Length 95th (ft)		113			122		#516	205					
Internal Link Dist (ft)		160			81			267			136		
Turn Bay Length (ft)							160						
Base Capacity (vph)		383			1332		439	875					
Starvation Cap Reductn		0			0		0	0					
Spillback Cap Reductn		0			0		0	0					
Storage Cap Reductn		0			0		0	0					
Reduced v/c Ratio		0.69			0.44		0.95	0.57					

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 12 (11%), Referenced to phase 1:NBTL, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 41.1 — Intersection LOS: D

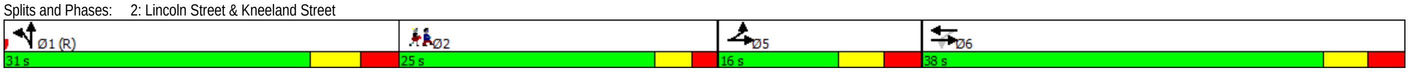
Intersection Capacity Utilization 57.9% — ICU Level of Service B

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: 2: Lincoln Street & Kneeland Street



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NWL	NWR
Lane Configurations								
Traffic Volume (vph)	271	1	0	1	170	187	258	430
Future Volume (vph)	271	1	0	1	170	187	258	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor			0.92					
Frt			0.865					0.850
Flt Protected	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (prot)	1681	1687	1507	0	1698	1780	1787	1599
Flt Permitted	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (perm)	1681	1687	1507	0	1698	1780	1787	1599
Right Turn on Red				Yes				
Satd. Flow (RTOR)			232					
Link Speed (mph)		30	30			30	30	
Link Distance (ft)		153	132			264	263	
Travel Time (s)		3.5	3.0			6.0	6.0	
Confl. Peds. (#/hr)				33				
Peak Hour Factor	0.97	0.97	0.25	0.25	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	279	1	0	4	177	195	269	448
Shared Lane Traffic (%)	50%				10%			
Lane Group Flow (vph)	139	141	4	0	159	213	269	448
Turn Type	Split	NA	NA		Split	NA	Prot	custom
Protected Phases	3	3	2		1	1	4	4
Permitted Phases								1
Detector Phase	3	3	2		1	1	4	4
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	20.0		14.0	14.0	19.5	19.5
Total Split (s)	33.0	33.0	21.0		20.0	20.0	36.0	36.0
Total Split (%)	30.0%	30.0%	19.1%		18.2%	18.2%	32.7%	32.7%
Maximum Green (s)	27.0	27.0	16.0		14.0	14.0	30.5	30.5
Yellow Time (s)	3.5	3.5	4.0		3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	1.0		2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0		6.0	6.0	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Recall Mode	None	None	None		C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	8.0				7.0	7.0
Flash Dont Walk (s)	13.0	13.0	7.0				7.0	7.0
Pedestrian Calls (#/hr)	0	0	33				19	19
Act Effct Green (s)	13.6	13.6	12.2		43.8	43.8	23.1	72.9
Actuated g/C Ratio	0.12	0.12	0.11		0.40	0.40	0.21	0.66
v/c Ratio	0.67	0.68	0.01		0.24	0.30	0.72	0.42
Control Delay	49.7	50.2	0.0		30.8	31.4	50.2	13.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	49.7	50.2	0.0		30.8	31.4	50.2	13.1
LOS	D	D	A		C	C	D	B
Approach Delay		49.9				31.2	27.0	
Approach LOS		D				C	C	
Queue Length 50th (ft)	77	78	0		86	118	180	169
Queue Length 95th (ft)	m123	m126	0		184	#260	232	284
Internal Link Dist (ft)		73	52			184	183	
Turn Bay Length (ft)								
Base Capacity (vph)	412	414	417		676	709	510	1054
Starvation Cap Reductn	0	0	0		0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0
Reduced v/c Ratio	0.34	0.34	0.01		0.24	0.30	0.53	0.43

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 97 (88%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 32.7 Intersection LOS: C
Intersection Capacity Utilization 65.3% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Frontage Road/Atlantic Avenue & I-90 EB Off-Ramp & Kneeland Street/MBTA Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	241	21	20	535	5	8	0	18	5	0	1
Future Volume (Veh/h)	5	241	21	20	535	5	8	0	18	5	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.59	0.59	0.59	0.75	0.75	0.75
Hourly flow rate (vph)	5	256	22	21	563	5	14	0	31	7	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		161			342							
pX, platoon unblocked												
vC, conflicting volume	568			278			508	887	139	776	896	190
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568			278			508	887	139	776	896	190
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			97	100	97	97	100	100
cM capacity (veh/h)	1014			1296			445	279	890	276	276	826

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	133	150	162	282	146	45	8
Volume Left	5	0	21	0	0	14	7
Volume Right	0	22	0	0	5	31	1
cSH	1014	1700	1296	1700	1700	679	301
Volume to Capacity	0.00	0.09	0.02	0.17	0.09	0.07	0.03
Queue Length 95th (ft)	0	0	1	0	0	5	2
Control Delay (s)	0.4	0.0	1.1	0.0	0.0	10.7	17.3
Lane LOS	A		A			B	C
Approach Delay (s)	0.2		0.3			10.7	17.3
Approach LOS						B	C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations		↑↑		↑↑			↱
Traffic Volume (veh/h)	0	265	4	424	0	0	136
Future Volume (Veh/h)	0	265	4	424	0	0	136
Sign Control		Free		Free		Stop	
Grade		0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.92	0.93	0.93	0.92	0.92
Hourly flow rate (vph)	0	279	0	456	0	0	148
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None		None			
Median storage veh)							
Upstream signal (ft)		350		153			
pX, platoon unblocked			0.00				
vC, conflicting volume	456		0			596	228
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	456		0			596	228
tC, single (s)	4.1		0.0			6.8	6.9
tC, 2 stage (s)							
tF (s)	2.2		0.0			3.5	3.3
p0 queue free %	100		0			100	81
cM capacity (veh/h)	1115		0			440	775

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	140	140	228	228	148
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	148
cSH	1700	1700	1700	1700	775
Volume to Capacity	0.08	0.08	0.13	0.13	0.19
Queue Length 95th (ft)	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	10.7
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.7
Approach LOS					B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.9%	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)	0	311	304	132	474	0	0	0	0	83	626	320	
Future Volume (vph)	0	311	304	132	474	0	0	0	0	83	626	320	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91	
Ped Bike Factor				0.95	1.00								
Frt			0.850								0.953		
Flt Protected				0.950	0.999						0.996		
Satd. Flow (prot)	0	3574	1615	1626	3420	0	0	0	0	0	4923	0	
Flt Permitted				0.499	0.944						0.996		
Satd. Flow (perm)	0	3574	1615	810	3227	0	0	0	0	0	4923	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			310								118		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		216			240			297			185		
Travel Time (s)		4.9			5.5			6.8			4.2		
Confl. Peds. (#/hr)			57	57									
Peak Hour Factor	0.98	0.98	0.98	0.97	0.97	0.97	0.92	0.92	0.92	0.99	0.99	0.99	
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	2%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	0	317	310	136	489	0	0	0	0	84	632	323	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	317	310	122	503	0	0	0	0	0	1039	0	
Turn Type		NA	Prot	D.P+P	NA					Split	NA		
Protected Phases		6	6	5	5 6					1	1		2
Permitted Phases				6									
Detector Phase		6	6	5	5 6					1	1		
Switch Phase													
Minimum Initial (s)		8.0	8.0	4.0						8.0	8.0		1.0
Minimum Split (s)		26.0	26.0	13.0						14.0	14.0		24.0
Total Split (s)		26.0	26.0	13.0						37.0	37.0		24.0
Total Split (%)		26.0%	26.0%	13.0%						37.0%	37.0%		24%
Maximum Green (s)		20.0	20.0	7.0						31.0	31.0		18.0
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0		2.0
All-Red Time (s)		3.0	3.0	3.0						3.0	3.0		4.0
Lost Time Adjust (s)		0.0	0.0	0.0							0.0		
Total Lost Time (s)		6.0	6.0	6.0							6.0		
Lead/Lag		Lag	Lag	Lead						Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes	Yes						Yes	Yes		Yes
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0		0.2
Recall Mode		Max	Max	None						C-Max	C-Max		None
Walk Time (s)		5.0	5.0	3.0									5.0
Flash Dont Walk (s)		15.0	15.0	4.0									13.0
Pedestrian Calls (#/hr)		0	0	0									317
Act Effct Green (s)		20.0	20.0	27.0	27.0						31.0		
Actuated g/C Ratio		0.20	0.20	0.27	0.27						0.31		
v/c Ratio		0.44	0.54	0.44	0.57						0.65		
Control Delay		37.4	8.0	30.7	31.5						28.4		
Queue Delay		0.0	0.0	0.0	1.0						0.0		
Total Delay		37.4	8.0	30.7	32.5						28.4		
LOS		D	A	C	C						C		
Approach Delay		22.9			32.2						28.4		
Approach LOS		C			C						C		
Queue Length 50th (ft)		94	0	61	137						184		
Queue Length 95th (ft)		137	71	110	187						232		
Internal Link Dist (ft)		136			160			217			105		
Turn Bay Length (ft)													
Base Capacity (vph)		714	571	275	884						1607		
Starvation Cap Reductn		0	0	0	175						0		
Spillback Cap Reductn		0	0	0	0						0		
Storage Cap Reductn		0	0	0	0						0		
Reduced v/c Ratio		0.44	0.54	0.44	0.71						0.65		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 80 (80%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 27.9 Intersection LOS: C
Intersection Capacity Utilization 72.2% ICU Level of Service C
Analysis Period (min) 15

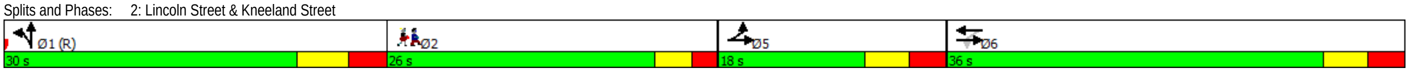
Splits and Phases: 1: Albany Street/Surface Road & Kneeland Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations		↰↑↱			↰↑↑↱		↰	↑↱					
Traffic Volume (vph)	143	97	154	73	343	146	263	246	157	0	0	0	
Future Volume (vph)	143	97	154	73	343	146	263	246	157	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	160		0	0		0	
Storage Lanes	0		0	0		0	1		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.91	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor								0.99					
Frt		0.941			0.961			0.941					
Flt Protected		0.982			0.994		0.950						
Satd. Flow (prot)	0	3320	0	0	4925	0	1805	3374	0	0	0	0	
Flt Permitted		0.606			0.812		0.950						
Satd. Flow (perm)	0	2048	0	0	4023	0	1805	3374	0	0	0	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		154			79			119					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		240			161			347			216		
Travel Time (s)		5.5			3.7			7.9			4.9		
Confl. Peds. (#/hr)									4				
Peak Hour Factor	0.99	0.99	0.99	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	144	98	156	75	354	151	274	256	164	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	398	0	0	580	0	274	420	0	0	0	0	
Turn Type	Prot	NA		Perm	NA		Split	NA					
Protected Phases	5	5 6			6		1	1					2
Permitted Phases				6									
Detector Phase	5	5 6		6	6		1	1					
Switch Phase													
Minimum Initial (s)	8.0			8.0	8.0		8.0	8.0					1.0
Minimum Split (s)	14.5			24.5	24.5		30.0	30.0					26.0
Total Split (s)	18.0			36.0	36.0		30.0	30.0					26.0
Total Split (%)	16.4%			32.7%	32.7%		27.3%	27.3%					24%
Maximum Green (s)	11.5			29.5	29.5		23.0	23.0					21.0
Yellow Time (s)	3.5			3.5	3.5		4.0	4.0					3.0
All-Red Time (s)	3.0			3.0	3.0		3.0	3.0					2.0
Lost Time Adjust (s)					0.0		0.0	0.0					
Total Lost Time (s)					6.5		7.0	7.0					
Lead/Lag							Lead	Lead					Lag
Lead-Lag Optimize?							Yes	Yes					Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0					0.2
Recall Mode	None			None	None		C-Max	C-Max					None
Walk Time (s)							7.0	7.0					6.0
Flash Dont Walk (s)							16.0	16.0					15.0
Pedestrian Calls (#/hr)							0	0					184
Act Effct Green (s)		41.0			30.5		23.0	23.0					
Actuated g/C Ratio		0.37			0.28		0.21	0.21					
v/c Ratio		0.82			0.50		0.73	0.53					
Control Delay		39.3			27.1		53.0	30.0					
Queue Delay		0.0			0.0		0.0	0.0					
Total Delay		39.3			27.1		53.0	30.0					
LOS		D			C		D	C					
Approach Delay		39.3			27.1			39.1					
Approach LOS		D			C			D					
Queue Length 50th (ft)		78			118		182	98					
Queue Length 95th (ft)		#145			158		#292	150					
Internal Link Dist (ft)		160			81			267			136		
Turn Bay Length (ft)							160						
Base Capacity (vph)		511			1171		377	799					
Starvation Cap Reductn		0			0		0	0					
Spillback Cap Reductn		0			0		0	0					
Storage Cap Reductn		0			0		0	0					
Reduced v/c Ratio		0.78			0.50		0.73	0.53					

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 94 (85%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 34.9 Intersection LOS: C
Intersection Capacity Utilization 59.0% 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: 2: Lincoln Street & Kneeland Street



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NWL	NWR
Lane Configurations								
Traffic Volume (vph)	263	1	1	1	184	202	122	120
Future Volume (vph)	263	1	1	1	184	202	122	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor			0.92					
Frt			0.932					0.850
Flt Protected	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (prot)	1715	1720	1623	0	1698	1780	1787	1599
Flt Permitted	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (perm)	1715	1720	1623	0	1698	1780	1787	1599
Right Turn on Red				Yes				
Satd. Flow (RTOR)			2					
Link Speed (mph)		30	30			30	30	
Link Distance (ft)		137	130			266	242	
Travel Time (s)		3.1	3.0			6.0	5.5	
Confl. Peds. (#/hr)				72				
Peak Hour Factor	0.96	0.96	0.50	0.50	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	274	1	2	2	194	213	128	126
Shared Lane Traffic (%)	50%				10%			
Lane Group Flow (vph)	137	138	4	0	175	232	128	126
Turn Type	Split	NA	NA		Split	NA	Prot	custom
Protected Phases	3	3	2		1	1	4	4
Permitted Phases								1
Detector Phase	3	3	2		1	1	4	4
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	20.0		14.0	14.0	19.5	19.5
Total Split (s)	34.0	34.0	21.0		27.0	27.0	28.0	28.0
Total Split (%)	30.9%	30.9%	19.1%		24.5%	24.5%	25.5%	25.5%
Maximum Green (s)	28.0	28.0	16.0		21.0	21.0	22.5	22.5
Yellow Time (s)	3.5	3.5	4.0		3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	1.0		2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0		6.0	6.0	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Recall Mode	None	None	None		C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	8.0				7.0	7.0
Flash Dont Walk (s)	13.0	13.0	7.0				7.0	7.0
Pedestrian Calls (#/hr)	0	0	72				44	44
Act Effct Green (s)	13.3	13.3	13.6		50.5	50.5	12.8	69.2
Actuated g/C Ratio	0.12	0.12	0.12		0.46	0.46	0.12	0.63
v/c Ratio	0.67	0.67	0.02		0.22	0.28	0.62	0.13
Control Delay	51.6	51.6	34.0		22.9	23.5	58.8	10.8
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	51.6	51.6	34.0		22.9	23.5	58.8	10.8
LOS	D	D	C		C	C	E	B
Approach Delay		51.6	34.0			23.2	35.0	
Approach LOS		D	C			C	C	
Queue Length 50th (ft)	74	75	1		84	114	86	37
Queue Length 95th (ft)	m98	m100	6		157	206	144	74
Internal Link Dist (ft)		57	50			186	162	
Turn Bay Length (ft)								
Base Capacity (vph)	436	437	237		778	816	365	1005
Starvation Cap Reductn	0	0	0		0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0
Reduced v/c Ratio	0.31	0.32	0.02		0.22	0.28	0.35	0.13

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 52 (47%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 34.8 Intersection LOS: C
Intersection Capacity Utilization 46.6% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Frontage Road/Atlantic Avenue & I-90 EB Off-Ramp & Kneeland Street/MBTA Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	245	1	7	530	8	22	1	4	4	0	6
Future Volume (Veh/h)	8	245	1	7	530	8	22	1	4	4	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.98	0.98	0.98	0.75	0.75	0.75	0.63	0.63	0.63
Hourly flow rate (vph)	8	258	1	7	541	8	29	1	5	6	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		161			341							
pX, platoon unblocked												
vC, conflicting volume	549			259			479	838	130	710	834	184
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	549			259			479	838	130	710	834	184
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			94	100	99	98	100	99
cM capacity (veh/h)	1031			1317			464	301	903	319	302	833

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	137	130	142	270	143	35	16
Volume Left	8	0	7	0	0	29	6
Volume Right	0	1	0	0	8	5	10
cSH	1031	1700	1317	1700	1700	491	519
Volume to Capacity	0.01	0.08	0.01	0.16	0.08	0.07	0.03
Queue Length 95th (ft)	1	0	0	0	0	6	2
Control Delay (s)	0.6	0.0	0.4	0.0	0.0	12.9	12.2
Lane LOS	A		A			B	B
Approach Delay (s)	0.3		0.1			12.9	12.2
Approach LOS						B	B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	0	256	8	299	0	0	246
Future Volume (Veh/h)	0	256	8	299	0	0	246
Sign Control		Free		Free		Stop	
Grade		0%		0%		0%	
Peak Hour Factor	0.96	0.96	0.92	0.88	0.88	0.81	0.81
Hourly flow rate (vph)	0	267	0	340	0	0	304
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None		None			
Median storage veh)							
Upstream signal (ft)		365		137			
pX, platoon unblocked			0.00				
vC, conflicting volume	340		0			474	170
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	340		0			474	170
tC, single (s)	4.1		0.0			6.8	6.9
tC, 2 stage (s)							
tF (s)	2.2		0.0			3.5	3.3
p0 queue free %	100		0			100	64
cM capacity (veh/h)	1230		0			525	851

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	134	134	170	170	304
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	304
cSH	1700	1700	1700	1700	851
Volume to Capacity	0.08	0.08	0.10	0.10	0.36
Queue Length 95th (ft)	0	0	0	0	41
Control Delay (s)	0.0	0.0	0.0	0.0	11.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.6
Approach LOS					B

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

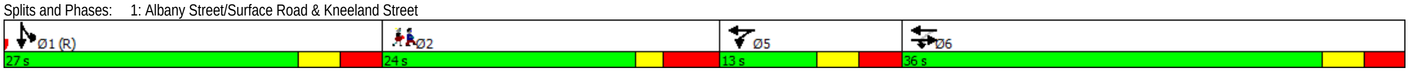
APPENDIX D3 – No-Build (2025) Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations		↑↑	↱	↰	↰↑						↰↑↑↱		
Traffic Volume (vph)	0	200	189	129	681	0	0	0	0	94	403	407	
Future Volume (vph)	0	200	189	129	681	0	0	0	0	94	403	407	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91	
Ped Bike Factor				0.97	1.00								
Frt			0.850								0.932		
Flt Protected				0.950	0.999						0.995		
Satd. Flow (prot)	0	3539	1599	1610	3420	0	0	0	0	0	4789	0	
Flt Permitted				0.620	0.950						0.995		
Satd. Flow (perm)	0	3539	1599	1020	3250	0	0	0	0	0	4789	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			199								187		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		216			240			297			185		
Travel Time (s)		4.9			5.5			6.8			4.2		
Confl. Peds. (#/hr)			40	40									
Peak Hour Factor	0.95	0.95	0.95	0.97	0.97	0.97	0.92	0.92	0.92	0.98	0.98	0.98	
Heavy Vehicles (%)	0%	2%	1%	2%	1%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	0	211	199	133	702	0	0	0	0	96	411	415	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	211	199	120	715	0	0	0	0	0	922	0	
Turn Type		NA	Prot	D.P+P	NA					Split	NA		
Protected Phases		6	6	5	5 6					1	1		2
Permitted Phases				6									
Detector Phase		6	6	5	5 6					1	1		
Switch Phase													
Minimum Initial (s)		8.0	8.0	4.0						8.0	8.0		1.0
Minimum Split (s)		36.0	36.0	13.0						14.0	14.0		24.0
Total Split (s)		36.0	36.0	13.0						27.0	27.0		24.0
Total Split (%)		36.0%	36.0%	13.0%						27.0%	27.0%		24%
Maximum Green (s)		30.0	30.0	7.0						21.0	21.0		18.0
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0		2.0
All-Red Time (s)		3.0	3.0	3.0						3.0	3.0		4.0
Lost Time Adjust (s)		0.0	0.0	0.0							0.0		
Total Lost Time (s)		6.0	6.0	6.0							6.0		
Lead/Lag		Lag	Lag	Lead						Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes	Yes						Yes	Yes		Yes
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0		0.2
Recall Mode		Max	Max	None						C-Max	C-Max		None
Walk Time (s)		7.0	7.0	3.0									5.0
Flash Dont Walk (s)		23.0	23.0	4.0									13.0
Pedestrian Calls (#/hr)		0	0	0									261
Act Effct Green (s)		30.0	30.0	37.0	37.0						21.0		
Actuated g/C Ratio		0.30	0.30	0.37	0.37						0.21		
v/c Ratio		0.20	0.32	0.29	0.59						0.80		
Control Delay		26.7	5.4	20.1	25.6						35.8		
Queue Delay		0.0	0.0	0.3	4.3						0.0		
Total Delay		26.7	5.4	20.4	30.0						35.8		
LOS		C	A	C	C						D		
Approach Delay		16.4			28.6						35.8		
Approach LOS		B			C						D		
Queue Length 50th (ft)		52	0	50	176						165		
Queue Length 95th (ft)		82	50	91	231						216		
Internal Link Dist (ft)		136			160			217			105		
Turn Bay Length (ft)													
Base Capacity (vph)		1061	619	418	1214						1153		
Starvation Cap Reductn		0	0	76	411						0		
Spillback Cap Reductn		0	0	0	0						0		
Storage Cap Reductn		0	0	0	0						0		
Reduced v/c Ratio		0.20	0.32	0.35	0.89						0.80		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 29.3 Intersection LOS: C
Intersection Capacity Utilization 77.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Albany Street/Surface Road & Kneeland Street

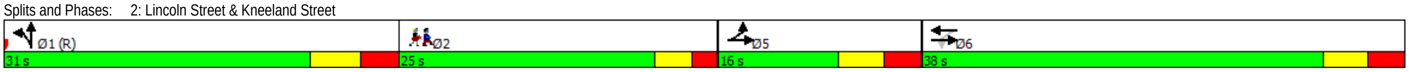


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	129	148	17	43	372	176	438	358	197	0	0	0	
Future Volume (vph)	129	148	17	43	372	176	438	358	197	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	160		0	0		0	
Storage Lanes	0		0	0		0	1		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.91	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt		0.991			0.955			0.947					
Flt Protected		0.979			0.996		0.950						
Satd. Flow (prot)	0	3435	0	0	4842	0	1805	3381	0	0	0	0	
Flt Permitted		0.580			0.882		0.950						
Satd. Flow (perm)	0	2035	0	0	4288	0	1805	3381	0	0	0	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		7			98			87					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		240			161			347			216		
Travel Time (s)		5.5			3.7			7.9			4.9		
Confl. Peds. (#/hr)									1				
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.98	0.98	0.98	0.92	0.92	0.92	
Heavy Vehicles (%)	1%	3%	0%	0%	3%	0%	0%	1%	0%	0%	0%	0%	
Adj. Flow (vph)	134	154	18	44	384	181	447	365	201	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	306	0	0	609	0	447	566	0	0	0	0	
Turn Type	Prot	NA		Perm	NA		Split	NA					
Protected Phases	5	5 6			6		1	1					2
Permitted Phases				6									
Detector Phase	5	5 6		6	6		1	1					
Switch Phase													
Minimum Initial (s)	8.0			8.0	8.0		8.0	8.0					1.0
Minimum Split (s)	14.5			14.5	14.5		31.0	31.0					24.0
Total Split (s)	16.0			38.0	38.0		31.0	31.0					25.0
Total Split (%)	14.5%			34.5%	34.5%		28.2%	28.2%					23%
Maximum Green (s)	9.5			31.5	31.5		24.0	24.0					20.0
Yellow Time (s)	3.5			3.5	3.5		4.0	4.0					3.0
All-Red Time (s)	3.0			3.0	3.0		3.0	3.0					2.0
Lost Time Adjust (s)					0.0		0.0	0.0					
Total Lost Time (s)					6.5		7.0	7.0					
Lead/Lag							Lead	Lead					Lag
Lead-Lag Optimize?							Yes	Yes					Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0					0.2
Recall Mode	None			None	None		C-Max	C-Max					None
Walk Time (s)							7.0	7.0					4.0
Flash Dont Walk (s)							17.0	17.0					15.0
Pedestrian Calls (#/hr)							0	0					109
Act Effct Green (s)		42.0			31.9		24.0	24.0					
Actuated g/C Ratio		0.38			0.29		0.22	0.22					
v/c Ratio		0.79			0.46		1.14	0.70					
Control Delay		46.0			21.1		128.3	38.8					
Queue Delay		0.0			0.0		0.0	0.0					
Total Delay		46.0			21.1		128.3	38.8					
LOS		D			C		F	D					
Approach Delay		46.0			21.1			78.3					
Approach LOS		D			C			E					
Queue Length 50th (ft)		83			91		~368	165					
Queue Length 95th (ft)		#145			137		#566	228					
Internal Link Dist (ft)		160			81			267			136		
Turn Bay Length (ft)							160						
Base Capacity (vph)		394			1314		393	805					
Starvation Cap Reductn		0			0		0	0					
Spillback Cap Reductn		0			0		0	0					
Storage Cap Reductn		0			0		0	0					
Reduced v/c Ratio		0.78			0.46		1.14	0.70					

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 12 (11%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 55.1 Intersection LOS: E
Intersection Capacity Utilization 61.3% 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: 2: Lincoln Street & Kneeland Street



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NWL	NWR
Lane Configurations								
Traffic Volume (vph)	349	1	0	1	183	234	267	457
Future Volume (vph)	349	1	0	1	183	234	267	457
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor			0.92					
Frt			0.865					0.850
Flt Protected	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (prot)	1681	1687	1507	0	1698	1780	1787	1599
Flt Permitted	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (perm)	1681	1687	1507	0	1698	1780	1787	1599
Right Turn on Red				Yes				
Satd. Flow (RTOR)			185					
Link Speed (mph)		30	30			30	30	
Link Distance (ft)		153	132			264	263	
Travel Time (s)		3.5	3.0			6.0	6.0	
Confl. Peds. (#/hr)				33				
Peak Hour Factor	0.97	0.97	0.25	0.25	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	360	1	0	4	191	244	278	476
Shared Lane Traffic (%)	50%				10%			
Lane Group Flow (vph)	180	181	4	0	172	263	278	476
Turn Type	Split	NA	NA		Split	NA	Prot	custom
Protected Phases	3	3	2		1	1	4	4
Permitted Phases								1
Detector Phase	3	3	2		1	1	4	4
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	20.0		14.0	14.0	19.5	19.5
Total Split (s)	33.0	33.0	21.0		20.0	20.0	36.0	36.0
Total Split (%)	30.0%	30.0%	19.1%		18.2%	18.2%	32.7%	32.7%
Maximum Green (s)	27.0	27.0	16.0		14.0	14.0	30.5	30.5
Yellow Time (s)	3.5	3.5	4.0		3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	1.0		2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0		6.0	6.0	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Recall Mode	None	None	None		C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	8.0				7.0	7.0
Flash Dont Walk (s)	13.0	13.0	7.0				7.0	7.0
Pedestrian Calls (#/hr)	0	0	33				19	19
Act Effct Green (s)	16.2	16.2	12.2		39.6	39.6	24.7	70.3
Actuated g/C Ratio	0.15	0.15	0.11		0.36	0.36	0.22	0.64
v/c Ratio	0.73	0.73	0.01		0.28	0.41	0.69	0.47
Control Delay	51.5	51.5	0.0		35.2	36.6	47.3	15.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	51.5	51.5	0.0		35.2	36.6	47.3	15.3
LOS	D	D	A		D	D	D	B
Approach Delay		51.5				36.0	27.1	
Approach LOS		D				D	C	
Queue Length 50th (ft)	106	107	0		101	163	181	197
Queue Length 95th (ft)	m145	m146	0		#245	#404	238	332
Internal Link Dist (ft)		73	52			184	183	
Turn Bay Length (ft)								
Base Capacity (vph)	412	414	377		611	641	513	1006
Starvation Cap Reductn	0	0	0		0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0
Reduced v/c Ratio	0.44	0.44	0.01		0.28	0.41	0.54	0.47

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 97 (88%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 35.2 — Intersection LOS: D
Intersection Capacity Utilization 71.6% — 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Frontage Road/Atlantic Avenue & I-90 EB Off-Ramp & Kneeland Street/MBTA Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	318	22	21	561	5	8	0	19	5	0	1
Future Volume (Veh/h)	5	318	22	21	561	5	8	0	19	5	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.59	0.59	0.59	0.75	0.75	0.75
Hourly flow rate (vph)	5	338	23	22	591	5	14	0	32	7	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		161			342							
pX, platoon unblocked												
vC, conflicting volume	596			361			602	1000	180	848	1008	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	596			361			602	1000	180	848	1008	200
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			96	100	96	97	100	100
cM capacity (veh/h)	990			1209			381	240	837	244	237	814

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	174	192	170	296	153	46	8
Volume Left	5	0	22	0	0	14	7
Volume Right	0	23	0	0	5	32	1
cSH	990	1700	1209	1700	1700	613	267
Volume to Capacity	0.01	0.11	0.02	0.17	0.09	0.07	0.03
Queue Length 95th (ft)	0	0	1	0	0	6	2
Control Delay (s)	0.3	0.0	1.2	0.0	0.0	11.3	18.9
Lane LOS	A		A			B	C
Approach Delay (s)	0.1		0.3			11.3	18.9
Approach LOS						B	C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations		↑↑		↑↑			↱
Traffic Volume (veh/h)	0	342	4	446	0	0	141
Future Volume (Veh/h)	0	342	4	446	0	0	141
Sign Control		Free		Free		Stop	
Grade		0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.92	0.93	0.93	0.92	0.92
Hourly flow rate (vph)	0	360	0	480	0	0	153
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None		None			
Median storage veh)							
Upstream signal (ft)		350		153			
pX, platoon unblocked			0.00				
vC, conflicting volume	480		0			660	240
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	480		0			660	240
tC, single (s)	4.1		0.0			6.8	6.9
tC, 2 stage (s)							
tF (s)	2.2		0.0			3.5	3.3
p0 queue free %	100		0			100	80
cM capacity (veh/h)	1093		0			401	761

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	180	180	240	240	153
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	153
cSH	1700	1700	1700	1700	761
Volume to Capacity	0.11	0.11	0.14	0.14	0.20
Queue Length 95th (ft)	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	10.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.9
Approach LOS					B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	330	331	137	536	0	0	0	0	94	695	348	
Future Volume (vph)	0	330	331	137	536	0	0	0	0	94	695	348	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91	
Ped Bike Factor				0.95	1.00								
Frt			0.850								0.954		
Flt Protected				0.950	0.999						0.996		
Satd. Flow (prot)	0	3574	1615	1626	3420	0	0	0	0	0	4929	0	
Flt Permitted				0.474	0.945						0.996		
Satd. Flow (perm)	0	3574	1615	771	3231	0	0	0	0	0	4929	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			338								116		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		216			240			297			185		
Travel Time (s)		4.9			5.5			6.8			4.2		
Confl. Peds. (#/hr)			57	57									
Peak Hour Factor	0.98	0.98	0.98	0.97	0.97	0.97	0.92	0.92	0.92	0.99	0.99	0.99	
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	2%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	0	337	338	141	553	0	0	0	0	95	702	352	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	337	338	127	567	0	0	0	0	0	1149	0	
Turn Type		NA	Prot	D.P+P	NA					Split	NA		
Protected Phases		6	6	5	5 6					1	1		2
Permitted Phases				6									
Detector Phase		6	6	5	5 6					1	1		
Switch Phase													
Minimum Initial (s)		8.0	8.0	4.0						8.0	8.0		1.0
Minimum Split (s)		26.0	26.0	13.0						14.0	14.0		24.0
Total Split (s)		26.0	26.0	13.0						37.0	37.0		24.0
Total Split (%)		26.0%	26.0%	13.0%						37.0%	37.0%		24%
Maximum Green (s)		20.0	20.0	7.0						31.0	31.0		18.0
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0		2.0
All-Red Time (s)		3.0	3.0	3.0						3.0	3.0		4.0
Lost Time Adjust (s)		0.0	0.0	0.0							0.0		
Total Lost Time (s)		6.0	6.0	6.0							6.0		
Lead/Lag		Lag	Lag	Lead						Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes	Yes						Yes	Yes		Yes
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0		0.2
Recall Mode		Max	Max	None						C-Max	C-Max		None
Walk Time (s)		5.0	5.0	3.0									5.0
Flash Dont Walk (s)		15.0	15.0	4.0									13.0
Pedestrian Calls (#/hr)		0	0	0									317
Act Effct Green (s)		20.0	20.0	27.0	27.0						31.0		
Actuated g/C Ratio		0.20	0.20	0.27	0.27						0.31		
v/c Ratio		0.47	0.57	0.47	0.64						0.71		
Control Delay		37.9	8.1	31.8	33.4						30.3		
Queue Delay		0.0	0.0	0.0	1.8						0.0		
Total Delay		37.9	8.1	31.8	35.2						30.3		
LOS		D	A	C	D						C		
Approach Delay		23.0			34.6						30.3		
Approach LOS		C			C						C		
Queue Length 50th (ft)		100	0	63	158						213		
Queue Length 95th (ft)		144	74	114	213						265		
Internal Link Dist (ft)		136			160			217			105		
Turn Bay Length (ft)													
Base Capacity (vph)		714	593	268	885						1608		
Starvation Cap Reductn		0	0	0	172						0		
Spillback Cap Reductn		0	0	0	0						0		
Storage Cap Reductn		0	0	0	0						0		
Reduced v/c Ratio		0.47	0.57	0.47	0.80						0.71		

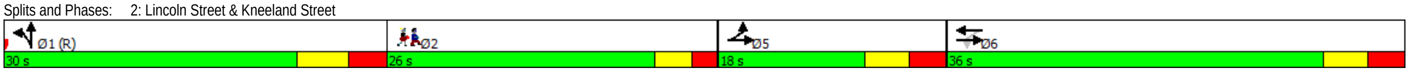
Intersection Summary	
Area Type: Other	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 80 (80%), Referenced to phase 1:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Albany Street/Surface Road & Kneeland Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	148	116	159	80	362	151	310	283	181	0	0	0	
Future Volume (vph)	148	116	159	80	362	151	310	283	181	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	160		0	0		0	
Storage Lanes	0		0	0		0	1		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.91	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor								0.99					
Frt		0.943			0.962			0.941					
Flt Protected		0.983			0.993		0.950						
Satd. Flow (prot)	0	3328	0	0	4925	0	1805	3374	0	0	0	0	
Flt Permitted		0.598			0.804		0.950						
Satd. Flow (perm)	0	2025	0	0	3988	0	1805	3374	0	0	0	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		131			77			118					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		240			161			347			216		
Travel Time (s)		5.5			3.7			7.9			4.9		
Confl. Peds. (#/hr)									4				
Peak Hour Factor	0.99	0.99	0.99	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	149	117	161	82	373	156	323	295	189	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	427	0	0	611	0	323	484	0	0	0	0	
Turn Type	Prot	NA		Perm	NA		Split	NA					
Protected Phases	5	5 6			6		1	1					2
Permitted Phases				6									
Detector Phase	5	5 6		6	6		1	1					
Switch Phase													
Minimum Initial (s)	8.0			8.0	8.0		8.0	8.0					1.0
Minimum Split (s)	14.5			24.5	24.5		30.0	30.0					26.0
Total Split (s)	18.0			36.0	36.0		30.0	30.0					26.0
Total Split (%)	16.4%			32.7%	32.7%		27.3%	27.3%					24%
Maximum Green (s)	11.5			29.5	29.5		23.0	23.0					21.0
Yellow Time (s)	3.5			3.5	3.5		4.0	4.0					3.0
All-Red Time (s)	3.0			3.0	3.0		3.0	3.0					2.0
Lost Time Adjust (s)					0.0		0.0	0.0					
Total Lost Time (s)					6.5		7.0	7.0					
Lead/Lag							Lead	Lead					Lag
Lead-Lag Optimize?							Yes	Yes					Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0					0.2
Recall Mode	None			None	None		C-Max	C-Max					None
Walk Time (s)							7.0	7.0					6.0
Flash Dont Walk (s)							16.0	16.0					15.0
Pedestrian Calls (#/hr)							0	0					184
Act Effct Green (s)		41.0			29.9		23.0	23.0					
Actuated g/C Ratio		0.37			0.27		0.21	0.21					
v/c Ratio		0.89			0.54		0.86	0.61					
Control Delay		50.7			27.6		64.3	33.1					
Queue Delay		0.0			0.0		0.0	0.0					
Total Delay		50.7			27.6		64.3	33.1					
LOS		D			C		E	C					
Approach Delay		50.7			27.6			45.6					
Approach LOS		D			C			D					
Queue Length 50th (ft)		100			127		221	123					
Queue Length 95th (ft)		#186			168		#375	180					
Internal Link Dist (ft)		160			81			267			136		
Turn Bay Length (ft)							160						
Base Capacity (vph)		490			1139		377	798					
Starvation Cap Reductn		0			0		0	0					
Spillback Cap Reductn		0			0		0	0					
Storage Cap Reductn		0			0		0	0					
Reduced v/c Ratio		0.87			0.54		0.86	0.61					

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 94 (85%), Referenced to phase 1:NBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 40.8	Intersection LOS: D
Intersection Capacity Utilization 60.4%	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: 2: Lincoln Street & Kneeland Street



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NWL	NWR
Lane Configurations								
Traffic Volume (vph)	306	1	1	1	197	228	131	130
Future Volume (vph)	306	1	1	1	197	228	131	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor			0.92					
Frt			0.932					0.850
Flt Protected	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (prot)	1715	1720	1623	0	1698	1780	1787	1599
Flt Permitted	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (perm)	1715	1720	1623	0	1698	1780	1787	1599
Right Turn on Red				Yes				
Satd. Flow (RTOR)			2					
Link Speed (mph)		30	30			30	30	
Link Distance (ft)		137	130			266	242	
Travel Time (s)		3.1	3.0			6.0	5.5	
Confl. Peds. (#/hr)				72				
Peak Hour Factor	0.96	0.96	0.50	0.50	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	319	1	2	2	207	240	138	137
Shared Lane Traffic (%)	50%				10%			
Lane Group Flow (vph)	159	161	4	0	186	261	138	137
Turn Type	Split	NA	NA		Split	NA	Prot	custom
Protected Phases	3	3	2		1	1	4	4
Permitted Phases								1
Detector Phase	3	3	2		1	1	4	4
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	20.0		14.0	14.0	19.5	19.5
Total Split (s)	34.0	34.0	21.0		27.0	27.0	28.0	28.0
Total Split (%)	30.9%	30.9%	19.1%		24.5%	24.5%	25.5%	25.5%
Maximum Green (s)	28.0	28.0	16.0		21.0	21.0	22.5	22.5
Yellow Time (s)	3.5	3.5	4.0		3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	1.0		2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0		6.0	6.0	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Recall Mode	None	None	None		C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	8.0				7.0	7.0
Flash Dont Walk (s)	13.0	13.0	7.0				7.0	7.0
Pedestrian Calls (#/hr)	0	0	72				44	44
Act Effct Green (s)	14.7	14.7	13.6		48.6	48.6	13.2	67.8
Actuated g/C Ratio	0.13	0.13	0.12		0.44	0.44	0.12	0.62
v/c Ratio	0.69	0.70	0.02		0.25	0.33	0.65	0.14
Control Delay	50.7	51.1	34.0		24.6	25.6	59.7	11.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	50.7	51.1	34.0		24.6	25.6	59.7	11.6
LOS	D	D	C		C	C	E	B
Approach Delay		50.9	34.0			25.2	35.7	
Approach LOS		D	C			C	D	
Queue Length 50th (ft)	86	87	1		91	134	93	42
Queue Length 95th (ft)	m107	m108	6		174	241	153	83
Internal Link Dist (ft)		57	50			186	162	
Turn Bay Length (ft)								
Base Capacity (vph)	436	437	237		750	786	365	982
Starvation Cap Reductn	0	0	0		0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0
Reduced v/c Ratio	0.36	0.37	0.02		0.25	0.33	0.38	0.14

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 52 (47%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 35.8 Intersection LOS: D
Intersection Capacity Utilization 49.8% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Frontage Road/Atlantic Avenue & I-90 EB Off-Ramp & Kneeland Street/MBTA Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	288	1	7	560	8	23	1	4	4	0	6
Future Volume (Veh/h)	8	288	1	7	560	8	23	1	4	4	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.98	0.98	0.98	0.75	0.75	0.75	0.63	0.63	0.63
Hourly flow rate (vph)	8	303	1	7	571	8	31	1	5	6	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		161			341							
pX, platoon unblocked												
vC, conflicting volume	579			304			534	912	152	762	909	194
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	579			304			534	912	152	762	909	194
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			93	100	99	98	100	99
cM capacity (veh/h)	1005			1268			424	272	873	292	273	821

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	160	152	150	286	151	37	16
Volume Left	8	0	7	0	0	31	6
Volume Right	0	1	0	0	8	5	10
cSH	1005	1700	1268	1700	1700	448	489
Volume to Capacity	0.01	0.09	0.01	0.17	0.09	0.08	0.03
Queue Length 95th (ft)	1	0	0	0	0	7	3
Control Delay (s)	0.5	0.0	0.4	0.0	0.0	13.8	12.6
Lane LOS	A		A			B	B
Approach Delay (s)	0.3		0.1			13.8	12.6
Approach LOS						B	B

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	25.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	0	299	8	321	0	0	255
Future Volume (Veh/h)	0	299	8	321	0	0	255
Sign Control		Free		Free		Stop	
Grade		0%		0%		0%	
Peak Hour Factor	0.96	0.96	0.92	0.88	0.88	0.81	0.81
Hourly flow rate (vph)	0	311	0	365	0	0	315
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None		None			
Median storage veh)							
Upstream signal (ft)		365		137			
pX, platoon unblocked			0.00				
vC, conflicting volume	365		0			520	182
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	365		0			520	182
tC, single (s)	4.1		0.0			6.8	6.9
tC, 2 stage (s)							
tF (s)	2.2		0.0			3.5	3.3
p0 queue free %	100		0			100	62
cM capacity (veh/h)	1205		0			490	835

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	156	156	182	182	315
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	315
cSH	1700	1700	1700	1700	835
Volume to Capacity	0.09	0.09	0.11	0.11	0.38
Queue Length 95th (ft)	0	0	0	0	44
Control Delay (s)	0.0	0.0	0.0	0.0	11.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.9
Approach LOS					B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

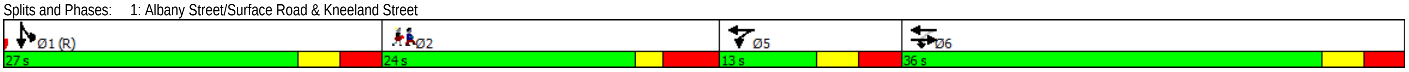
APPENDIX D3 – Build (2025) Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	0	201	189	129	681	0	0	0	0	102	407	408	
Future Volume (vph)	0	201	189	129	681	0	0	0	0	102	407	408	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91	
Ped Bike Factor				0.97	1.00								
Frt			0.850								0.933		
Flt Protected				0.950	0.999						0.994		
Satd. Flow (prot)	0	3539	1599	1610	3420	0	0	0	0	0	4789	0	
Flt Permitted				0.619	0.950						0.994		
Satd. Flow (perm)	0	3539	1599	1018	3250	0	0	0	0	0	4789	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			199								184		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		216			240			297			185		
Travel Time (s)		4.9			5.5			6.8			4.2		
Confl. Peds. (#/hr)			40	40									
Peak Hour Factor	0.95	0.95	0.95	0.97	0.97	0.97	0.92	0.92	0.92	0.98	0.98	0.98	
Heavy Vehicles (%)	0%	2%	1%	2%	1%	0%	0%	0%	0%	0%	1%	0%	
Adj. Flow (vph)	0	212	199	133	702	0	0	0	0	104	415	416	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	212	199	120	715	0	0	0	0	0	935	0	
Turn Type		NA	Prot	D.P+P	NA					Split	NA		
Protected Phases		6	6	5	5 6					1	1		2
Permitted Phases				6									
Detector Phase		6	6	5	5 6					1	1		
Switch Phase													
Minimum Initial (s)		8.0	8.0	4.0						8.0	8.0		1.0
Minimum Split (s)		36.0	36.0	13.0						14.0	14.0		24.0
Total Split (s)		36.0	36.0	13.0						27.0	27.0		24.0
Total Split (%)		36.0%	36.0%	13.0%						27.0%	27.0%		24%
Maximum Green (s)		30.0	30.0	7.0						21.0	21.0		18.0
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0		2.0
All-Red Time (s)		3.0	3.0	3.0						3.0	3.0		4.0
Lost Time Adjust (s)		0.0	0.0	0.0							0.0		
Total Lost Time (s)		6.0	6.0	6.0							6.0		
Lead/Lag		Lag	Lag	Lead						Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes	Yes						Yes	Yes		Yes
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0		0.2
Recall Mode		Max	Max	None						C-Max	C-Max		None
Walk Time (s)		7.0	7.0	3.0									5.0
Flash Dont Walk (s)		23.0	23.0	4.0									13.0
Pedestrian Calls (#/hr)		0	0	0									261
Act Effct Green (s)		30.0	30.0	37.0	37.0						21.0		
Actuated g/C Ratio		0.30	0.30	0.37	0.37						0.21		
v/c Ratio		0.20	0.32	0.29	0.59						0.81		
Control Delay		26.7	5.4	20.1	25.6						36.6		
Queue Delay		0.0	0.0	0.3	4.3						0.0		
Total Delay		26.7	5.4	20.4	30.0						36.6		
LOS		C	A	C	C						D		
Approach Delay		16.4			28.6						36.6		
Approach LOS		B			C						D		
Queue Length 50th (ft)		52	0	50	176						169		
Queue Length 95th (ft)		82	50	91	231						221		
Internal Link Dist (ft)		136			160			217			105		
Turn Bay Length (ft)													
Base Capacity (vph)		1061	619	418	1214						1151		
Starvation Cap Reductn		0	0	76	411						0		
Spillback Cap Reductn		0	0	0	0						0		
Storage Cap Reductn		0	0	0	0						0		
Reduced v/c Ratio		0.20	0.32	0.35	0.89						0.81		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 52 (52%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 29.7 — Intersection LOS: C
Intersection Capacity Utilization 77.9% — ICU Level of Service D
Analysis Period (min) 15

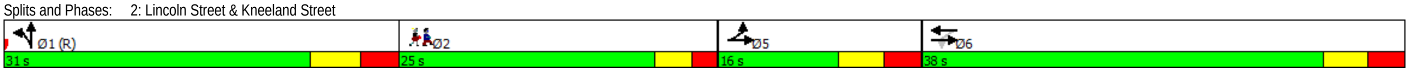
Splits and Phases: 1: Albany Street/Surface Road & Kneeland Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations													
Traffic Volume (vph)	129	154	20	43	372	175	438	358	198	0	0	0	
Future Volume (vph)	129	154	20	43	372	175	438	358	198	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	160		0	0		0	
Storage Lanes	0		0	0		0	1		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.91	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor								1.00					
Frt		0.990			0.956			0.947					
Flt Protected		0.979			0.996		0.950						
Satd. Flow (prot)	0	3432	0	0	4847	0	1805	3381	0	0	0	0	
Flt Permitted		0.583			0.880		0.950						
Satd. Flow (perm)	0	2044	0	0	4283	0	1805	3381	0	0	0	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		8			97			88					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		240			161			347			216		
Travel Time (s)		5.5			3.7			7.9			4.9		
Confl. Peds. (#/hr)									1				
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.98	0.98	0.98	0.92	0.92	0.92	
Heavy Vehicles (%)	1%	3%	0%	0%	3%	0%	0%	1%	0%	0%	0%	0%	
Adj. Flow (vph)	134	160	21	44	384	180	447	365	202	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	315	0	0	608	0	447	567	0	0	0	0	
Turn Type	Prot	NA		Perm	NA		Split	NA					
Protected Phases	5	5 6			6		1	1					2
Permitted Phases				6									
Detector Phase	5	5 6		6	6		1	1					
Switch Phase													
Minimum Initial (s)	8.0			8.0	8.0		8.0	8.0					1.0
Minimum Split (s)	14.5			14.5	14.5		31.0	31.0					24.0
Total Split (s)	16.0			38.0	38.0		31.0	31.0					25.0
Total Split (%)	14.5%			34.5%	34.5%		28.2%	28.2%					23%
Maximum Green (s)	9.5			31.5	31.5		24.0	24.0					20.0
Yellow Time (s)	3.5			3.5	3.5		4.0	4.0					3.0
All-Red Time (s)	3.0			3.0	3.0		3.0	3.0					2.0
Lost Time Adjust (s)					0.0		0.0	0.0					
Total Lost Time (s)					6.5		7.0	7.0					
Lead/Lag							Lead	Lead					Lag
Lead-Lag Optimize?							Yes	Yes					Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0					0.2
Recall Mode	None			None	None		C-Max	C-Max					None
Walk Time (s)							7.0	7.0					4.0
Flash Dont Walk (s)							17.0	17.0					15.0
Pedestrian Calls (#/hr)							0	0					109
Act Effct Green (s)		42.0			31.9		24.0	24.0					
Actuated g/C Ratio		0.38			0.29		0.22	0.22					
v/c Ratio		0.81			0.46		1.14	0.70					
Control Delay		46.7			21.1		128.3	38.7					
Queue Delay		0.0			0.0		0.0	0.0					
Total Delay		46.7			21.1		128.3	38.7					
LOS		D			C		F	D					
Approach Delay		46.7			21.1			78.2					
Approach LOS		D			C			E					
Queue Length 50th (ft)		85			91		~368	165					
Queue Length 95th (ft)		#151			137		#566	228					
Internal Link Dist (ft)		160			81			267			136		
Turn Bay Length (ft)							160						
Base Capacity (vph)		397			1310		393	806					
Starvation Cap Reductn		0			0		0	0					
Spillback Cap Reductn		0			0		0	0					
Storage Cap Reductn		0			0		0	0					
Reduced v/c Ratio		0.79			0.46		1.14	0.70					

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 12 (11%), Referenced to phase 1:NBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 55.2	Intersection LOS: E
Intersection Capacity Utilization 61.6%	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: 2: Lincoln Street & Kneeland Street



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NWL	NWR
Lane Configurations								
Traffic Volume (vph)	349	1	0	1	184	234	269	457
Future Volume (vph)	349	1	0	1	184	234	269	457
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor			0.92					
Frt			0.865					0.850
Flt Protected	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (prot)	1681	1687	1507	0	1698	1780	1787	1599
Flt Permitted	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (perm)	1681	1687	1507	0	1698	1780	1787	1599
Right Turn on Red				Yes				
Satd. Flow (RTOR)			185					
Link Speed (mph)		30	30			30	30	
Link Distance (ft)		153	132			264	263	
Travel Time (s)		3.5	3.0			6.0	6.0	
Confl. Peds. (#/hr)				33				
Peak Hour Factor	0.97	0.97	0.25	0.25	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	360	1	0	4	192	244	280	476
Shared Lane Traffic (%)	50%				10%			
Lane Group Flow (vph)	180	181	4	0	173	263	280	476
Turn Type	Split	NA	NA		Split	NA	Prot	custom
Protected Phases	3	3	2		1	1	4	4
Permitted Phases								1
Detector Phase	3	3	2		1	1	4	4
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	20.0		14.0	14.0	19.5	19.5
Total Split (s)	33.0	33.0	21.0		20.0	20.0	36.0	36.0
Total Split (%)	30.0%	30.0%	19.1%		18.2%	18.2%	32.7%	32.7%
Maximum Green (s)	27.0	27.0	16.0		14.0	14.0	30.5	30.5
Yellow Time (s)	3.5	3.5	4.0		3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	1.0		2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0		6.0	6.0	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Recall Mode	None	None	None		C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	8.0				7.0	7.0
Flash Dont Walk (s)	13.0	13.0	7.0				7.0	7.0
Pedestrian Calls (#/hr)	0	0	33				19	19
Act Effct Green (s)	16.2	16.2	12.2		39.6	39.6	24.7	70.3
Actuated g/C Ratio	0.15	0.15	0.11		0.36	0.36	0.22	0.64
v/c Ratio	0.73	0.73	0.01		0.28	0.41	0.70	0.47
Control Delay	51.5	51.5	0.0		35.2	36.6	47.5	15.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	51.5	51.5	0.0		35.2	36.6	47.5	15.3
LOS	D	D	A		D	D	D	B
Approach Delay		51.5				36.1	27.2	
Approach LOS		D				D	C	
Queue Length 50th (ft)	107	108	0		102	163	183	197
Queue Length 95th (ft)	m145	m145	0		#246	#404	238	332
Internal Link Dist (ft)		73	52			184	183	
Turn Bay Length (ft)								
Base Capacity (vph)	412	414	377		611	640	513	1006
Starvation Cap Reductn	0	0	0		0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0
Reduced v/c Ratio	0.44	0.44	0.01		0.28	0.41	0.55	0.47

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 97 (88%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 35.3 — Intersection LOS: D
Intersection Capacity Utilization 71.6% — 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Frontage Road/Atlantic Avenue & I-90 EB Off-Ramp & Kneeland Street/MBTA Driveway

Ø1 (R)	Ø2	Ø3	Ø4
20 s	21 s	33 s	36 s

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	318	22	21	561	8	8	0	19	5	0	1
Future Volume (Veh/h)	12	318	22	21	561	8	8	0	19	5	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.59	0.59	0.59	0.75	0.75	0.75
Hourly flow rate (vph)	13	338	23	22	591	8	14	0	32	7	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		161			342							
pX, platoon unblocked												
vC, conflicting volume	599			361			618	1018	180	866	1026	201
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	599			361			618	1018	180	866	1026	201
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			96	100	96	97	100	100
cM capacity (veh/h)	988			1209			368	232	837	235	229	813

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	182	192	170	296	156	46	8
Volume Left	13	0	22	0	0	14	7
Volume Right	0	23	0	0	8	32	1
cSH	988	1700	1209	1700	1700	604	258
Volume to Capacity	0.01	0.11	0.02	0.17	0.09	0.08	0.03
Queue Length 95th (ft)	1	0	1	0	0	6	2
Control Delay (s)	0.7	0.0	1.2	0.0	0.0	11.5	19.4
Lane LOS	A		A			B	C
Approach Delay (s)	0.4		0.3			11.5	19.4
Approach LOS						B	C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (veh/h)	0	342	4	449	0	0	141
Future Volume (Veh/h)	0	342	4	449	0	0	141
Sign Control		Free		Free		Stop	
Grade		0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.92	0.93	0.93	0.92	0.92
Hourly flow rate (vph)	0	360	0	483	0	0	153
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None		None			
Median storage veh)							
Upstream signal (ft)		350		153			
pX, platoon unblocked			0.00				
vC, conflicting volume	483		0			663	242
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	483		0			663	242
tC, single (s)	4.1		0.0			6.8	6.9
tC, 2 stage (s)							
tF (s)	2.2		0.0			3.5	3.3
p0 queue free %	100		0			100	80
cM capacity (veh/h)	1090		0			399	759

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	180	180	242	242	153
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	153
cSH	1700	1700	1700	1700	759
Volume to Capacity	0.11	0.11	0.14	0.14	0.20
Queue Length 95th (ft)	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	10.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.9
Approach LOS					B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	27.9%	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)	0	331	331	137	536	0	0	0	0	109	701	349	
Future Volume (vph)	0	331	331	137	536	0	0	0	0	109	701	349	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.95	1.00	0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	0.91	
Ped Bike Factor				0.95	1.00								
Frt			0.850								0.955		
Flt Protected				0.950	0.999						0.995		
Satd. Flow (prot)	0	3574	1615	1626	3420	0	0	0	0	0	4929	0	
Flt Permitted				0.472	0.945						0.995		
Satd. Flow (perm)	0	3574	1615	768	3231	0	0	0	0	0	4929	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)			338								113		
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		216			240			297			185		
Travel Time (s)		4.9			5.5			6.8			4.2		
Confl. Peds. (#/hr)			57	57									
Peak Hour Factor	0.98	0.98	0.98	0.97	0.97	0.97	0.92	0.92	0.92	0.99	0.99	0.99	
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	2%	2%	2%	0%	0%	0%	
Adj. Flow (vph)	0	338	338	141	553	0	0	0	0	110	708	353	
Shared Lane Traffic (%)				10%									
Lane Group Flow (vph)	0	338	338	127	567	0	0	0	0	0	1171	0	
Turn Type		NA	Prot	D.P+P	NA					Split	NA		
Protected Phases		6	6	5	5 6					1	1		2
Permitted Phases				6									
Detector Phase		6	6	5	5 6					1	1		
Switch Phase													
Minimum Initial (s)		8.0	8.0	4.0						8.0	8.0		1.0
Minimum Split (s)		26.0	26.0	13.0						14.0	14.0		24.0
Total Split (s)		26.0	26.0	13.0						37.0	37.0		24.0
Total Split (%)		26.0%	26.0%	13.0%						37.0%	37.0%		24%
Maximum Green (s)		20.0	20.0	7.0						31.0	31.0		18.0
Yellow Time (s)		3.0	3.0	3.0						3.0	3.0		2.0
All-Red Time (s)		3.0	3.0	3.0						3.0	3.0		4.0
Lost Time Adjust (s)		0.0	0.0	0.0							0.0		
Total Lost Time (s)		6.0	6.0	6.0							6.0		
Lead/Lag		Lag	Lag	Lead						Lead	Lead		Lag
Lead-Lag Optimize?		Yes	Yes	Yes						Yes	Yes		Yes
Vehicle Extension (s)		2.0	2.0	2.0						2.0	2.0		0.2
Recall Mode		Max	Max	None						C-Max	C-Max		None
Walk Time (s)		5.0	5.0	3.0									5.0
Flash Dont Walk (s)		15.0	15.0	4.0									13.0
Pedestrian Calls (#/hr)		0	0	0									317
Act Effct Green (s)		20.0	20.0	27.0	27.0						31.0		
Actuated g/C Ratio		0.20	0.20	0.27	0.27						0.31		
v/c Ratio		0.47	0.57	0.48	0.64						0.73		
Control Delay		37.9	8.1	31.8	33.4						30.8		
Queue Delay		0.0	0.0	0.0	1.8						0.0		
Total Delay		37.9	8.1	31.8	35.2						30.8		
LOS		D	A	C	D						C		
Approach Delay		23.0			34.6						30.8		
Approach LOS		C			C						C		
Queue Length 50th (ft)		101	0	63	158						220		
Queue Length 95th (ft)		145	74	114	213						272		
Internal Link Dist (ft)		136			160			217			105		
Turn Bay Length (ft)													
Base Capacity (vph)		714	593	267	885						1605		
Starvation Cap Reductn		0	0	0	172						0		
Spillback Cap Reductn		0	0	0	0						0		
Storage Cap Reductn		0	0	0	0						0		
Reduced v/c Ratio		0.47	0.57	0.48	0.80						0.73		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 80 (80%), Referenced to phase 1:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 29.8 Intersection LOS: C
Intersection Capacity Utilization 78.2% ICU Level of Service D
Analysis Period (min) 15

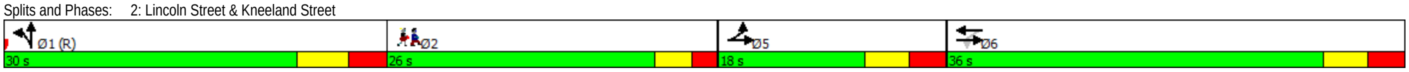
Splits and Phases: 1: Albany Street/Surface Road & Kneeland Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø2
Lane Configurations		↰↑↱			↰↑↑↱		↰	↑↱					
Traffic Volume (vph)	148	127	164	80	362	151	310	283	183	0	0	0	
Future Volume (vph)	148	127	164	80	362	151	310	283	183	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	160		0	0		0	
Storage Lanes	0		0	0		0	1		0	0		0	
Taper Length (ft)	25			25			25			25			
Lane Util. Factor	0.95	0.95	0.95	0.91	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	
Ped Bike Factor								0.99					
Frt		0.944			0.962			0.941					
Flt Protected		0.983			0.993		0.950						
Satd. Flow (prot)	0	3331	0	0	4925	0	1805	3373	0	0	0	0	
Flt Permitted		0.601			0.801		0.950						
Satd. Flow (perm)	0	2036	0	0	3973	0	1805	3373	0	0	0	0	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		129			77			122					
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		240			161			347			216		
Travel Time (s)		5.5			3.7			7.9			4.9		
Confl. Peds. (#/hr)									4				
Peak Hour Factor	0.99	0.99	0.99	0.97	0.97	0.97	0.96	0.96	0.96	0.92	0.92	0.92	
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	
Adj. Flow (vph)	149	128	166	82	373	156	323	295	191	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	443	0	0	611	0	323	486	0	0	0	0	
Turn Type	Prot	NA		Perm	NA		Split	NA					
Protected Phases	5	5 6			6		1	1					2
Permitted Phases				6									
Detector Phase	5	5 6		6	6		1	1					
Switch Phase													
Minimum Initial (s)	8.0			8.0	8.0		8.0	8.0					1.0
Minimum Split (s)	14.5			24.5	24.5		30.0	30.0					26.0
Total Split (s)	18.0			36.0	36.0		30.0	30.0					26.0
Total Split (%)	16.4%			32.7%	32.7%		27.3%	27.3%					24%
Maximum Green (s)	11.5			29.5	29.5		23.0	23.0					21.0
Yellow Time (s)	3.5			3.5	3.5		4.0	4.0					3.0
All-Red Time (s)	3.0			3.0	3.0		3.0	3.0					2.0
Lost Time Adjust (s)					0.0		0.0	0.0					
Total Lost Time (s)					6.5		7.0	7.0					
Lead/Lag							Lead	Lead					Lag
Lead-Lag Optimize?							Yes	Yes					Yes
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.0					0.2
Recall Mode	None			None	None		C-Max	C-Max					None
Walk Time (s)							7.0	7.0					6.0
Flash Dont Walk (s)							16.0	16.0					15.0
Pedestrian Calls (#/hr)							0	0					184
Act Effct Green (s)		41.0			29.8		23.0	23.0					
Actuated g/C Ratio		0.37			0.27		0.21	0.21					
v/c Ratio		0.91			0.54		0.86	0.61					
Control Delay		53.9			27.8		64.3	32.8					
Queue Delay		0.0			0.0		0.0	0.0					
Total Delay		53.9			27.8		64.3	32.8					
LOS		D			C		E	C					
Approach Delay		53.9			27.8			45.4					
Approach LOS		D			C			D					
Queue Length 50th (ft)		105			127		221	122					
Queue Length 95th (ft)		#199			168		#375	178					
Internal Link Dist (ft)		160			81			267			136		
Turn Bay Length (ft)							160						
Base Capacity (vph)		492			1130		377	801					
Starvation Cap Reductn		0			0		0	0					
Spillback Cap Reductn		0			0		0	0					
Storage Cap Reductn		0			0		0	0					
Reduced v/c Ratio		0.90			0.54		0.86	0.61					

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 94 (85%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 41.6 Intersection LOS: D
Intersection Capacity Utilization 60.9% 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: 2: Lincoln Street & Kneeland Street



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NWL	NWR
Lane Configurations								
Traffic Volume (vph)	306	1	1	1	198	228	134	130
Future Volume (vph)	306	1	1	1	198	228	134	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor			0.92					
Frt			0.932					0.850
Flt Protected	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (prot)	1715	1720	1623	0	1698	1780	1787	1599
Flt Permitted	0.950	0.953			0.950	0.996	0.950	
Satd. Flow (perm)	1715	1720	1623	0	1698	1780	1787	1599
Right Turn on Red				Yes				
Satd. Flow (RTOR)			2					
Link Speed (mph)		30	30			30	30	
Link Distance (ft)		137	130			266	242	
Travel Time (s)		3.1	3.0			6.0	5.5	
Confl. Peds. (#/hr)				72				
Peak Hour Factor	0.96	0.96	0.50	0.50	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	1%	1%
Adj. Flow (vph)	319	1	2	2	208	240	141	137
Shared Lane Traffic (%)	50%				10%			
Lane Group Flow (vph)	159	161	4	0	187	261	141	137
Turn Type	Split	NA	NA		Split	NA	Prot	custom
Protected Phases	3	3	2		1	1	4	4
Permitted Phases								1
Detector Phase	3	3	2		1	1	4	4
Switch Phase								
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	26.0	26.0	20.0		14.0	14.0	19.5	19.5
Total Split (s)	34.0	34.0	21.0		27.0	27.0	28.0	28.0
Total Split (%)	30.9%	30.9%	19.1%		24.5%	24.5%	25.5%	25.5%
Maximum Green (s)	28.0	28.0	16.0		21.0	21.0	22.5	22.5
Yellow Time (s)	3.5	3.5	4.0		3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	1.0		2.5	2.5	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0		6.0	6.0	5.5	5.5
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Recall Mode	None	None	None		C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	8.0				7.0	7.0
Flash Dont Walk (s)	13.0	13.0	7.0				7.0	7.0
Pedestrian Calls (#/hr)	0	0	72				44	44
Act Effct Green (s)	14.7	14.7	13.6		48.5	48.5	13.3	67.8
Actuated g/C Ratio	0.13	0.13	0.12		0.44	0.44	0.12	0.62
v/c Ratio	0.69	0.70	0.02		0.25	0.33	0.66	0.14
Control Delay	50.5	50.8	34.0		24.7	25.7	60.1	11.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay	50.5	50.8	34.0		24.7	25.7	60.1	11.6
LOS	D	D	C		C	C	E	B
Approach Delay		50.7	34.0			25.3	36.2	
Approach LOS		D	C			C	D	
Queue Length 50th (ft)	87	88	1		92	134	96	42
Queue Length 95th (ft)	m107	m109	6		175	242	156	83
Internal Link Dist (ft)		57	50			186	162	
Turn Bay Length (ft)								
Base Capacity (vph)	436	437	237		749	785	365	981
Starvation Cap Reductn	0	0	0		0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0
Reduced v/c Ratio	0.36	0.37	0.02		0.25	0.33	0.39	0.14

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 52 (47%), Referenced to phase 1:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 35.9 — Intersection LOS: D
Intersection Capacity Utilization 49.8% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Frontage Road/Atlantic Avenue & I-90 EB Off-Ramp & Kneeland Street/MBTA Driveway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	288	1	7	560	12	23	1	4	4	0	6
Future Volume (Veh/h)	21	288	1	7	560	12	23	1	4	4	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.98	0.98	0.98	0.75	0.75	0.75	0.63	0.63	0.63
Hourly flow rate (vph)	22	303	1	7	571	12	31	1	5	6	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		161			341							
pX, platoon unblocked												
vC, conflicting volume	583			304			562	944	152	792	939	196
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	583			304			562	944	152	792	939	196
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			92	100	99	98	100	99
cM capacity (veh/h)	1001			1268			401	257	873	275	259	818

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	174	152	150	286	155	37	16
Volume Left	22	0	7	0	0	31	6
Volume Right	0	1	0	0	12	5	10
cSH	1001	1700	1268	1700	1700	425	470
Volume to Capacity	0.02	0.09	0.01	0.17	0.09	0.09	0.03
Queue Length 95th (ft)	2	0	0	0	0	7	3
Control Delay (s)	1.3	0.0	0.4	0.0	0.0	14.3	12.9
Lane LOS	A		A			B	B
Approach Delay (s)	0.7		0.1			14.3	12.9
Approach LOS						B	B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations		↑↑		↑↑			↱
Traffic Volume (veh/h)	0	299	8	325	0	0	255
Future Volume (Veh/h)	0	299	8	325	0	0	255
Sign Control		Free		Free		Stop	
Grade		0%		0%		0%	
Peak Hour Factor	0.96	0.96	0.92	0.88	0.88	0.81	0.81
Hourly flow rate (vph)	0	311	0	369	0	0	315
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None		None			
Median storage veh)							
Upstream signal (ft)		365		137			
pX, platoon unblocked			0.00				
vC, conflicting volume	369		0			524	184
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	369		0			524	184
tC, single (s)	4.1		0.0			6.8	6.9
tC, 2 stage (s)							
tF (s)	2.2		0.0			3.5	3.3
p0 queue free %	100		0			100	62
cM capacity (veh/h)	1201		0			488	833

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	156	156	184	184	315
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	315
cSH	1700	1700	1700	1700	833
Volume to Capacity	0.09	0.09	0.11	0.11	0.38
Queue Length 95th (ft)	0	0	0	0	44
Control Delay (s)	0.0	0.0	0.0	0.0	11.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.9
Approach LOS					B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E – RESPONSE TO CLIMATE CHANGE QUESTIONNAIRE

NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

A.1 - Project Information

Project Name:	150 Kneeland Street, Boston			
Project Address:	150 Kneeland Street, Boston			
Project Address Additional:				
Filing Type (*select*)	*Initial (PNF, **PNF**, NPC or other substantial filing)* *Design / Building Permit (prior to final design approval), or* *Construction / Certificate of Occupancy (post construction completion)*			
Filing Contact	Mitchell Fischman	MLF Consulting LLC	Mitchfischman @gmail.com	t: 781-760-1726
Is MEPA approval required	*Yes/**No***		*Date: 06/15/18*	

A.3 - Project Team

Owner / Developer:	Hudson Group
Architect:	RODE Architects, Inc
Engineer:	Cosentini
Sustainability / LEED:	Soden Sustainability Consulting
Permitting:	MLF Consulting Mitch Fischman MLF Consulting LLC t: 781-760-1726 mitchfischman@gmail.com
Construction Management:	TBD

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Hotel
List the First Floor Uses:	Hotel Lobby
List any Critical Site Infrastructure and or Building Uses:	n/a

Site and Building:

Site Area:	*4,763 SF*	Building Area:	*94,000SF*
Building Height:	*226 Ft*	Building Height:	*22-Stories*
Existing Site Elevation – Low:	*15± Ft BCB*	Existing Site Elevation – High:	*15± Ft BCB*
Proposed Site Elevation – Low:	*15± Ft BCB*	Proposed Site Elevation – High:	*15± Ft BCB*
Proposed First Floor Elevation:	*15± Ft BCB*	Below grade levels:	*1*

Article 37 Green Building:

LEED Version - Rating System :	LEED V4 BD&C	LEED Certification:	*Yes / **No***
Proposed LEED rating:	*Certified/ **Silver**/ Gold/Platinum*	Proposed LEED point score:	*53 Pts.*

Building Envelope

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

Per ASHRAE 90.1 - 2013 Appendix G & 780 CMR

Roof:	R-30 c.i.	Exposed Floor:	R-30 c.i.
Foundation Wall:	R-19	Slab Edge (at or below grade):	R-20 c.i.

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

Area of Opaque Curtain Wall & Spandrel Assembly:	*11.4 (%)*	Wall & Spandrel Assembly Value:	*U- .055*
Area of Framed & Insulated / Standard Wall:	*55.7 (%)*	Wall Value	R-20 c.i.
Area of Vision Window:	*32.5 %*	Window Glazing Assembly Value:	*U- .42*
		Window Glazing SHGC:	*.4 (SHGC)*
Area of Doors:	*.4 %*	Door Assembly Value:	*U - .37*

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	The energy loads and performance were determined by the project team from the database of energy models and load calculations for the buildings of a comparable size and program in Boston with similar envelope parameters and MEP systems		
Annual Electric:	*(1,230,000 kWh)*	Peak Electric:	*(1300 kW)*
Annual Heating:	*(1,800 MMbtu)*	Peak Heating:	*(2500 MMbtu/hr)*
Annual Cooling:	*(44,200 Tons)*	Peak Cooling:	*(250 Tons/hr)*
Energy Use - Below ASHRAE 90.1 - 2013:	*25 %*	Have the local utilities reviewed the building energy performance?:	*Yes / no*
Energy Use - Below Mass. Code:	*25 %*	Energy Use Intensity:	*(75 kBtu/SF)*

Back-up / Emergency Power System

Electrical Generation Output:	*500 (kW)*	Number of Power Units:	1
System Type:	*Combustion engine*	Fuel Source:	Fuel oil

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

Electric:	*(500 kW)*	Heating:	*(2500 MMbtu/hr)*
		Cooling:	*(100 Tons/hr)*

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

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

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions: *(100 Tons)*

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

Energy Modeling will be performed in the coming weeks.

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

This building aims to maximize daylighting to reduce the need for artificial lighting.

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

Improved envelope, high efficiency HVAC: chilled beams, high condensing boilers and water heaters, energy recovery ventilation units, low flow fixtures, complete facility management system with modulating controls and resets.

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

On-site renewable is being evaluated for this project.

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

None at this point

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

The project will be pursuing utility incentives through the MA Save Program.

B.2 - GHG Reduction - Adaptation Strategies

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

The project is argeting an aggressive energy reduction through building systems and a high efficenecy enveleope.

C - Extreme Heat Events

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

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low:	*7 Deg.*	Temperature Range - High:	*91 Deg.*
Annual Heating Degree Days:	5621 (HDD65)	Annual Cooling Degree Days	2938 (CDD50)

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

Days - Above 90°:	*12*	Days – Above 100°:	*4*
Number of Heatwaves / Year:	*3*	Average Duration of Heatwave (Days):	*3*

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

The project is specifying high SRI roofing and paving materials.

C.2 - Extreme Heat – Adaptation Strategies

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

The mechanical systems will be modular in nature with an ability to expand heating and cooling capacities in the future

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

All heating and 50% of cooling capacity as well as lighting will be connected to generator power.

D - Extreme Precipitation Events

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

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm:	*6 In.*

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

The project site will not result in an increase in impervious areas. Storm water infiltration will be designed on-site to the greatest extent practicable.

D.2 - Extreme Precipitation - Adaptation Strategies

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

Design adaptations to efficiently accommodate future, more significant rain events will be discussed with the project team.

E – Sea Level Rise and Storms

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

Is any portion of the site in a FEMA SFHA?	*No*	What Zone:	n/a
		Current FEMA SFHA Zone Base Flood Elevation:	*n/a*

Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online BPDA SLR-FHA Mapping Tool to assess the susceptibility of the project site.	*Yes*

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

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

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online BPDA SLR-FHA Mapping Tool to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24" of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12" of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*18.9 Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*19.9 Ft BCB*	First Floor Elevation:	*15± Ft BCB*
Site Elevations at Building:	*15± Ft BCB*	Accessible Route Elevation:	*15± Ft BCB*

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

The project site is not located within the 100-year floodplain, necessary design measures will be discussed with the project team.

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

Protection for critical systems and utilities will be discussed with the project team and designed accordingly.

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

Shelter accommodations for building occupants will be discussed with the project team.

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

Rapid recovery strategies will be discussed with the project team.

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

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

Project team will review future site design and adaptation strategies.

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

Project team will review future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation.

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

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

APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

Article 80 – Accessibility Checklist

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

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

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

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

Accessibility Analysis Information Sources:

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

Glossary of Terms:

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

1. Project Information: *If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*			
Project Name:	150 Kneeland St, Boston		
Primary Project Address:	150 Kneeland St, Boston		
Total Number of Phases/Buildings:	1		
Primary Contact (Name / Title / Company / Email / Phone):	Noam Ron, Hudson Group, noam@hudsongroupna.com, 617 314 7379		
Owner / Developer:	Hudson Group		
Architect:	RODE Architects		
Civil Engineer:	Howard Stein Hudson		
Landscape Architect:			
Permitting:	MLF Consulting, LLC		
Construction Management:			
At what stage is the project at time of this questionnaire? Select below:			
	Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:
Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? *If yes,* identify and explain.	No		
2. Building Classification and Description: *This section identifies preliminary construction information about the project including size and uses.*			
What are the dimensions of the project?			
Site Area:	*4,763 SF*	Building Area:	*94,000 GSF*
Building Height:	*226 FT.*	Number of Stories:	*22 Flrs.*
First Floor Elevation:	0’	Is there below grade space:	*Yes* / No

What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	Steel Frame	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	Residential - Multi-unit, Four +	Institutional	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	*Lobby, lounge, bar/food, loading, and trash*			

3. Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	150 Kneeland St is a small corner lot bound to the north and east by 201 South St, a 6-story mixed use building, to the south by Kneeland St, and to the west by Utica St. Kneeland St is a busy commercial corridor terminating at South Station and consists of office spaces, retail, restaurants, and the Veolia power plant directly across from the site. The site and its surrounds are generally topographically flat.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	The site is one block (.1 miles) from South Station providing access to the MBTA Red Line, rapid transit Silver Line, Commuter Rail, Amtrak, Acela, local bus lines, as well as several commercial bus lines. It is .3 miles and .4 miles away from the Tufts and Chinatown MBTA Orange Line stops respectively and 2 blocks from access to 501, 504, 505, 553, 554, 556, and 558 bus lines.
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	**Affordable/Public Housing:** Boston Housing Authority on 52 Chauncy St **School:** Josiah Quincy School **Police:** Amtrak Police Department **Fire:** Engine 10 on 125 Purchase St **Hospitals:** Tufts Medical Center
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	**Public Library:** Boston Public Library Chinatown **Community Center:** Jonathan Spack Community Center **US Postal Service:** 25 Dorchester Ave

	Rose Kennedy Greenway
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? ***If yes,*** identify which district:	No
Are there sidewalks and pedestrian ramps existing at the development site? ***If yes***, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	Kneeland St sidewalk dimensions vary from 8'-9" to 9'-1" wide. The existing sidewalk material is concrete with granite curbing. The physical condition of the existing sidewalks and pedestrian ramps with tactile warning markings are good. Utica St sidewalk dimensions: vary from 2'-5" to 2'-2" The existing sidewalk material is concrete and asphalt with granite curbing. The physical condition of the existing sidewalk is poor.
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	Yes, with modifications on Utica St. for a raised flush curb condition at the crosswalk and extending down Utica St. to the end of the property line. No, the existing sidewalks and pedestrian ramps have not been verified as being in compliance at this time but will be verified during the project design.
5. Surrounding Site Conditions – Proposed *This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.*	
Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes (pending confirmation of existing cross slopes and clearances). Downtown Commercial
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones:	Along Kneeland St sidewalks will be 9'6". Concrete walkway paving will include an 8' clear width pedestrian zone, a 1'-6" greenscape/ site furnishing zone and a 6" curb. Along the property line on Utica St the

Frontage, Pedestrian and Furnishing Zone:	sidewalk will be improved to a raised flush curb condition.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	The paving material for the pedestrian zone will be poured in place concrete with a separate accessibly compliant paving material flush with the sidewalk and within the property line directly in front of the building entry. A majority of the pedestrian zone will reuse the existing concrete sidewalk and is in the City of Boston right-of-way.
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	No
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	Not Applicable
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	Yes, we are proposing a canopy at the hotel entrance.
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*.	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	0 parking spaces provided. Drop off zone for hotel guests will be located on Utica St.
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot	0 accessible parking spaces provided. Drop off zone for hotel guests will be located on Utica St.

access aisle?	
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No
Where is the accessible visitor parking located?	Drop off zone for hotel guests will be located on Utica St.
Has a drop-off area been identified? ***If yes,*** will it be accessible?	Yes, accessible drop off zone for hotel guests will be located on Utica St.
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.*	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	Flush Condition at all entryways. The ground floor access will be flush with the sidewalk grade. This will enable access and promote "Visit-ability". The building is serviced by elevators and flush condition at the entryway. All common areas are accessible.
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no***, what is the reason?	Yes. The ground floor access will be flush with the sidewalk grade.
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	All future way finding signage will be developed to meet Building Code and Accessibility Board Requirements
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	230 hotel rooms.
If a residential development, how many units are for sale? How many are for rent? What is the breakdown of market value units vs. IDP	Not applicable.

(Inclusionary Development Policy) units?	
If a residential development, how many accessible Group 2 units are being proposed?	Not applicable.
If a residential development, how many accessible Group 2 units will also be IDP units? ***If none***, describe reason.	Not applicable.
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? ***If yes,*** provide amount and location of equipment.	18 ADA accessible rooms will be provided.
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes***, provide reason.	No
Are there interior elevators, ramps or lifts located in the development for access around architectural barriers and/or to separate floors? ***If yes***, describe:	Yes, elevators are provided to access each floor.
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community.*	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	Yes, modifications proposed on Utica St for a raised flush curb condition at the crosswalk and extending down Utica St to the end of the property line. Proponent is also engaged in supporting the Leather District sidewalk improvement initiative.

What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	All guest and common public areas of the building are accessible including lounge and bar/food areas on level 1 and lounge on level 2. These areas will accommodate accessible access and seating.
Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and designated as "Family"/ "Companion" restrooms? ***If no***, explain why not.	Yes on level 1 there is planned to be single stall ADA compliant unisex restroom. Level 2 common spaces will include larger multi-stall accessible gender specific bathrooms.
Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments?	Not at this time. This will be done during the review period for the PNF.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible?	Not at this time. This will be done during the review period for the PNF.

10. Attachments

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

See Appendix F-1

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

See Appendix F-1

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

See Appendix F-1

Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) **Not Applicable**
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. **See Appendix F for accessible route to typical ADA Guest Room**
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project.

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

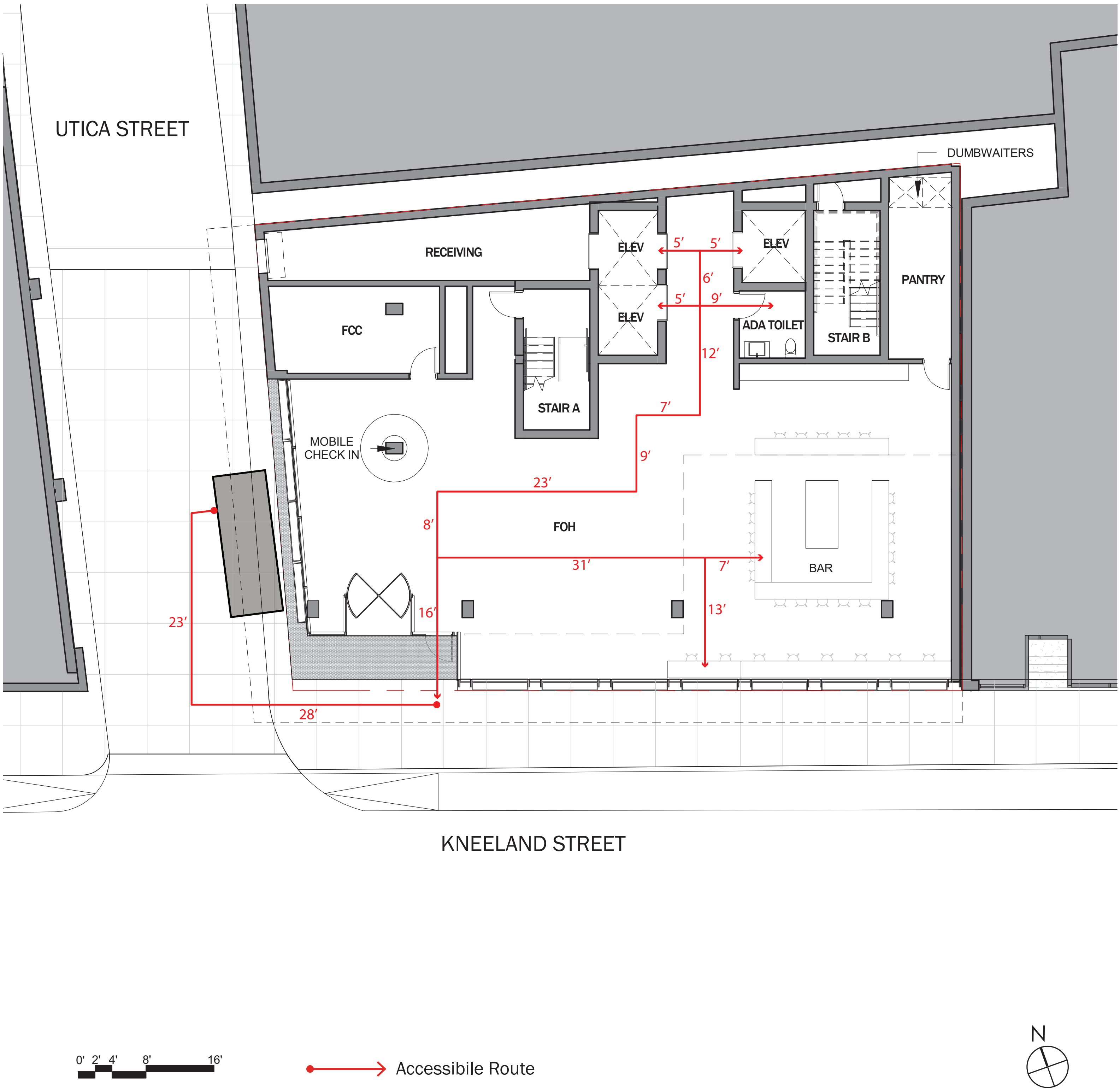
For questions or comments about this checklist, or for more information on best practices for improving accessibility and inclusion, visit www.boston.gov/disability, or our office:

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

Architectural Access staff can be reached at: accessibility@boston.gov | patricia.mendez@boston.gov | sarah.leung@boston.gov | 617-635-3682

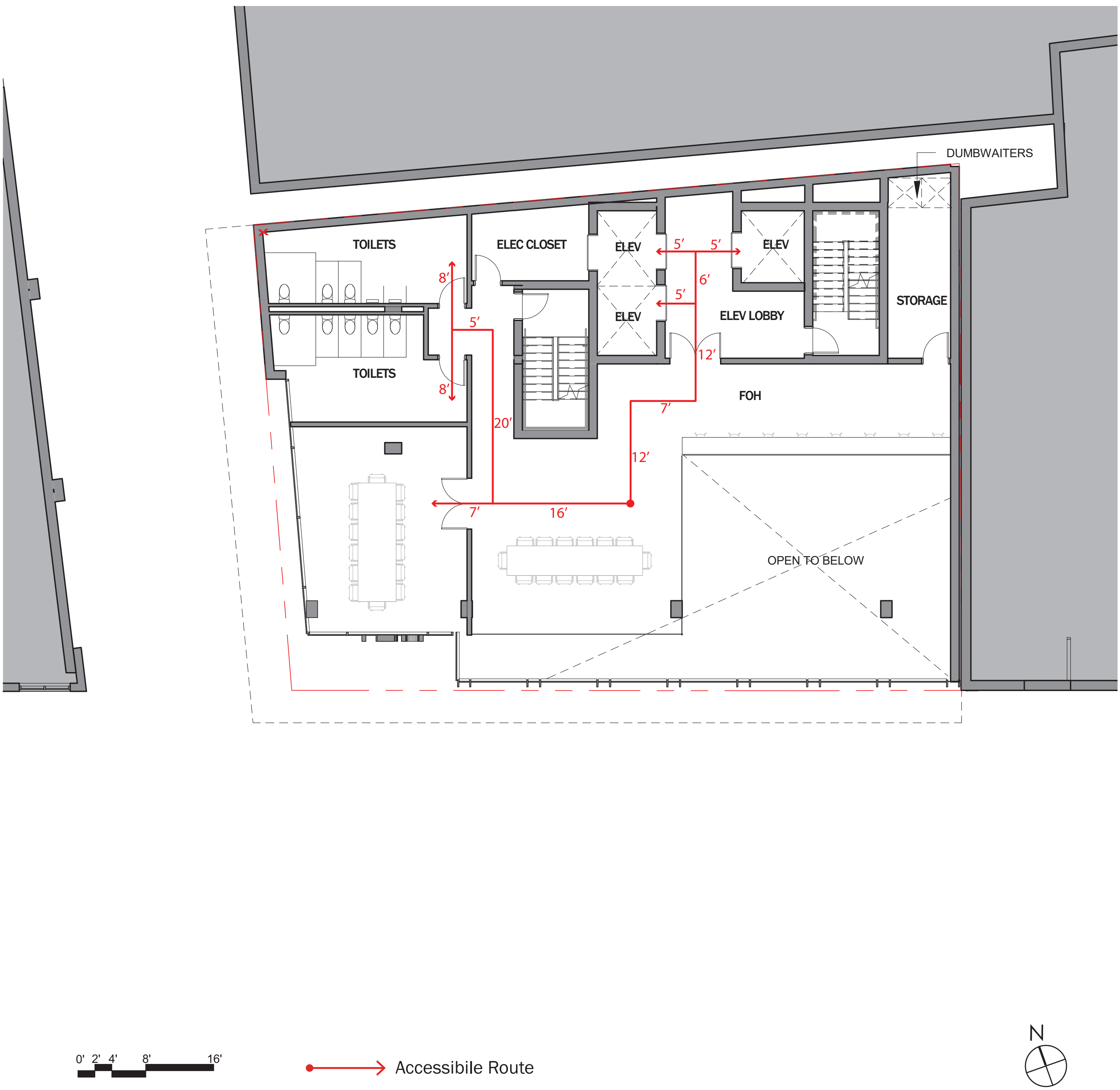
APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

Ground Floor Accessibile Route



APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

Second Floor Accessibile Route



APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

Fourth Floor Accessibile Route

APPENDIX F – RESPONSE TO COB ACCESS GUIDELINES

Typical Floor Accessibile Route

APPENDIX G – RWDI PEDESTRIAN WIND ASSESSMENT

REPORT

150 KNEELAND STREET

BOSTON, MA

PEDESTRIAN WIND ASSESSMENT

PROJECT #1803303

MAY 3, 2018

SUBMITTED TO

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Boston, MA 02111
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1. INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by Hudson Group to assess the pedestrian wind conditions for the proposed 150 Kneeland Street development in Boston, MA (see Image 1). This assessment is based on the following:

- a review of regional long-term meteorological data from Boston Logan International Airport;
- design drawings received from Hudson Group on April 11 and 27, 2018;
- wind-tunnel studies undertaken by RWDI for similar projects in the Boston Area;
- our engineering judgement and knowledge of wind flows around buildings[1-3]; and,
- use of software developed by RWDI (Windestimator[2]) for estimating the potential wind conditions around generalized building forms.

This qualitative approach provides a screening-level estimation of potential wind conditions. In order to quantify these conditions or refine any conceptual mitigation measures, physical scale-model tests in a boundary-layer wind tunnel would be required.

Note that other wind issues, such as those related to cladding and structural wind loads, air quality, etc., are not considered in the scope of this assessment.

Image 1: Rendering of the Proposed Project – View from Southeast

1. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", *Journal of Wind Engineering and Industrial Aerodynamics*, vol.104-106, pp.397-407.
2. H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter (2004), "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions", *ASCE Structure Congress 2004,* Nashville, Tennessee.
3. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", *10th International Conference on Wind Engineering*, Copenhagen, Denmark.

2. BUILDING AND SITE INFORMATION

The proposed development is located at the northeast corner of the intersection of Kneeland St. and Utica St. in Boston, MA (Image 2 and 3). The site is immediately surrounded by a basketball court to the southwest and by mid-rise buildings in all other directions. Tall buildings are located a few blocks away to the west through northeast of the site. Downtown Boston and Fort Point Channel are approximately 0.2 miles to the north and east, respectively. The site is currently occupied by 1 and 4-story buildings.

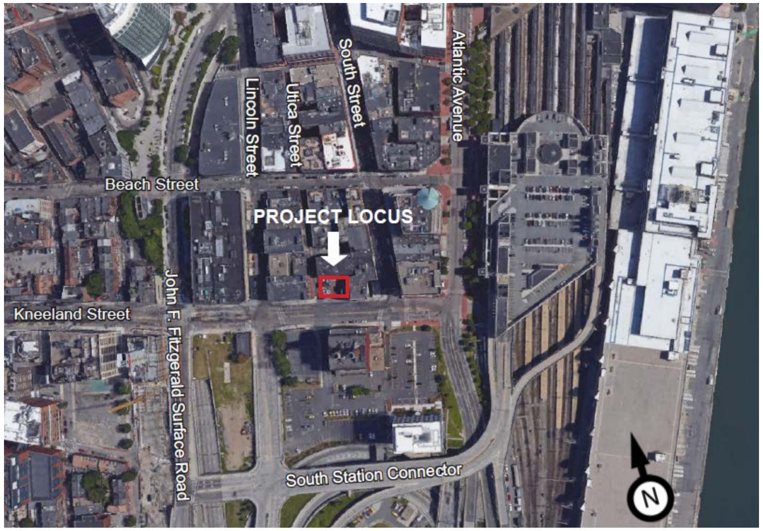


Image 2: Rending of the Existing Site and Surrounding (Courtesy of GoogleEarth™)

The proposed development consists of a 21-story tower (see Images 1 and 3). The pedestrian areas of interest include the main entrance and public sidewalks.

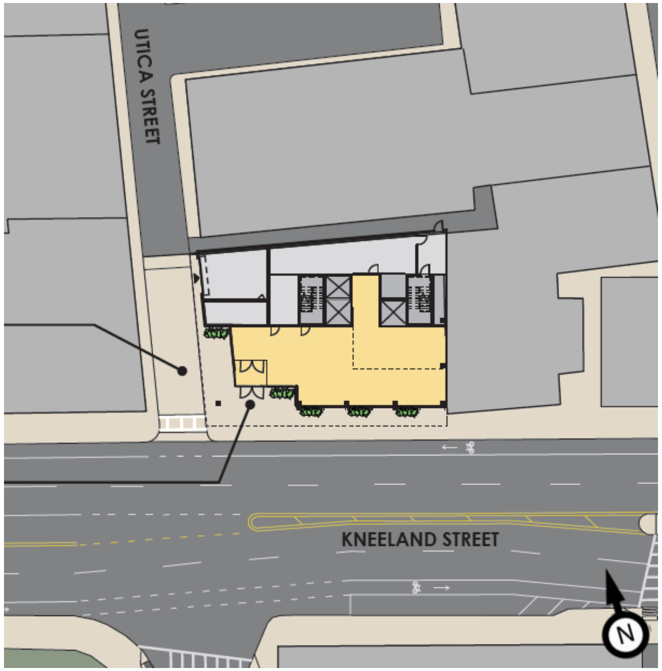


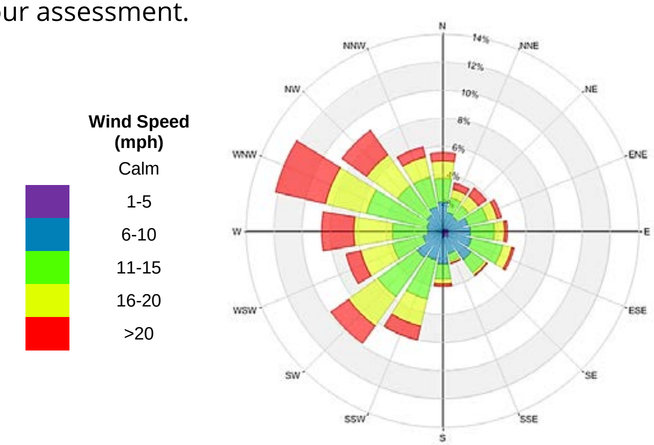
Image 3: Site Plan

3. METEOROLOGICAL DATA

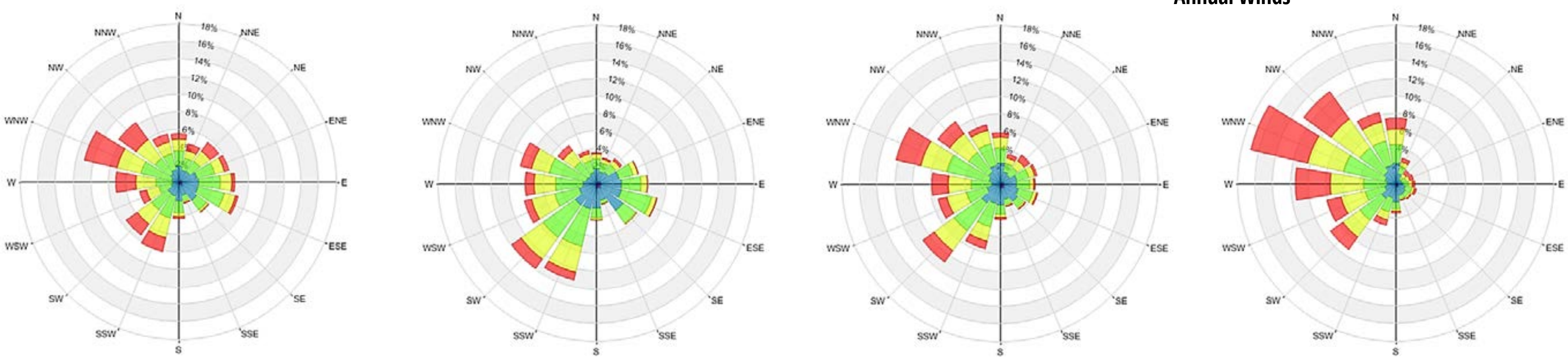
Wind statistics at Boston Logan International Airport between 1990 and 2015, inclusive, were analyzed for the spring (March to May), summer (June to August), fall (September to November) and winter (December to February) seasons. Image 4 graphically depicts the distributions of wind frequency and directionality for the four seasons and for the annual period. When all winds are considered (regardless of speed), winds from the northwest and southwest quadrants are predominant. Northeasterly winds are also frequent, especially in the spring.

Strong winds with mean speeds greater than 20 mph (red bands in the images) are predominantly from the northwesterly directions throughout the year, but are also frequent from the southwesterly and northeasterly directions.

Winds from the northwest, west, southwest and northeast directions are considered most relevant to the current study, although winds from other directions were also considered in our assessment.



Annual Winds



Spring (March-May) **Summer (June-Aug)** **Fall (Sep-Nov)** **Winter (Dec-Feb)**

Image 4: Directional Distribution of Winds Approaching Boston Logan International Airport (1990 – 2015)

4. BPDA WIND CRITERIA

The Boston Planning and Development Agency (BPDA) has adopted two standards for assessing the relative wind comfort and safety of pedestrians.

First, the BPDA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of the time.

The second set of criteria used by the BPDA to determine the acceptability of specific locations is based on the work of Melbourne . This set of criteria is used to determine the relative level of pedestrian wind comfort for activities such as sitting, standing, or walking. The criteria are expressed in terms of benchmarks for the 1-hour mean wind speed exceeded 1% of the time (i.e., the 99-percentile mean wind speed). They are as follows:

BPDA Mean Wind Criteria*

Dangerous	> 27 mph
Uncomfortable for Walking	> 19 and ≤ 27 mph
Comfortable for Walking	> 15 and ≤ 19 mph
Comfortable for Standing	> 12 and ≤ 15 mph
Comfortable for Sitting	≤ 12 mph

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

Pedestrians on sidewalks and parking lots will be active and wind speeds comfortable for walking are appropriate. Lower wind speeds comfortable for standing are desired for building entrances where people are apt to linger. For any outdoor amenity at and above grade, low wind speeds comfortable for sitting are desired in the summer, when it is typically in use.

The wind climate found in a typical location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BPDA effective gust velocity criterion of 31 mph at most areas, while windier conditions may be expected near the corners of tall buildings exposed to the prevailing winds. However, without any mitigation measures, this wind climate is likely to be frequently unsuitable for more passive activities such as sitting.

Discussions related to pedestrian wind comfort and safety will be based on the annual wind climate. Typically, the summer and fall winds tend to be more comfortable than annual winds, while the winter and spring winds are less comfortable than annual winds.

5. PEDESTRIAN WIND CONDITIONS

Background

Predicting wind speeds and occurrence frequencies is complicated. It involves building geometry, orientation, position and height of surrounding buildings, upstream terrain and the local wind climate. Over the years, RWDI has conducted thousands of wind-tunnel model studies regarding pedestrian wind conditions around buildings, yielding a broad knowledge base. This knowledge has been incorporated into RWDI's proprietary software that allows, in many situations, for a qualitative, screening-level numerical estimation of pedestrian wind conditions without wind tunnel testing.

Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. Such a downwashing flow (see Image 5) is the main cause for increased wind activity around tall buildings at the grade level. If this building/wind combination occurs for prevailing winds, there is a greater potential for increased wind activity.

Given the tall buildings upwind of the strong prevailing northwesterly and northeasterly winds and the positive design features of the development which will be discussed later in this report, winds at all pedestrian areas on and around the development are expected to meet the effective gust criterion, for both the No-Build and Build configurations. Detailed discussions on the potential wind comfort conditions at key pedestrian areas are provided in the next sections.

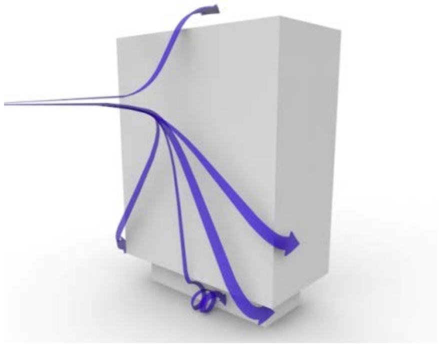


Image 5: Downwashing Flow

Sidewalks

The tall buildings to the west through northeast of the site will provide blockage from the strong winds from those directions, while the building itself will provide additional blockage to the sidewalks from the strong northeasterly winds. The south façade of the proposed development is exposed to the southwesterly winds which could accelerate down the façade and reach the ground. A similar phenomenon, could occur for the northwesterly winds along the west façade. The large canopy along the west façade is a positive feature which will help to redirect these winds downwashing off the west façade away from the ground (see Image 6). Generally wind speeds along the sidewalks of Kneeland St. and Utica St. might be slightly higher than what is currently experienced; however, conditions are expected to be comfortable for walking or better throughout the year which is appropriate for the intended use. Calmer conditions along the sidewalks of Kneeland St. can be achieved by increasing the depth of the canopy along the south façade to allow redirection of winds away from the ground.

Wind conditions at the sidewalks of Lincoln St and South St. are not expected to be impacted by the addition of the proposed development due to the distance of the building from those sidewalks.

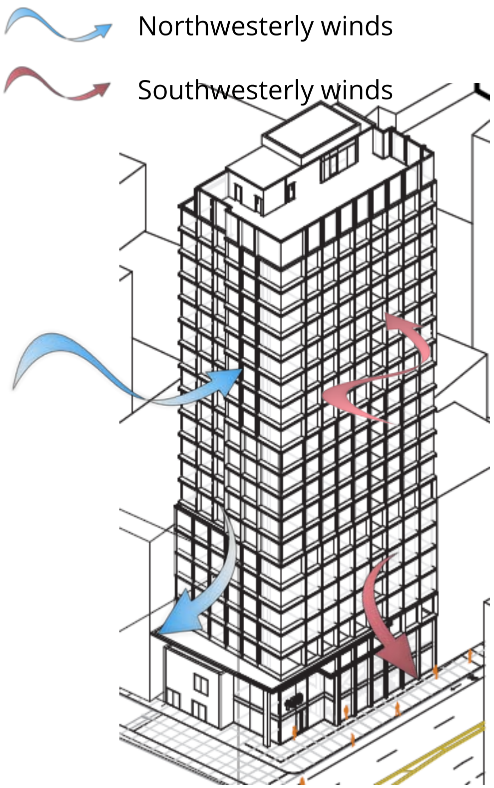


Image 6: 3D Rendering of the Proposed Development – View from Southwest

Main Entrance

The main entrance to the development is at its southwest corner, marked by a red triangle in Image 7. The canopy along the west facade of the building is a positive feature which will help to deflect winds away from the entrance. Additionally the entrance is recessed from the main façade which will provide an area with low wind speeds in front of it. The vestibule at this entrance will also allow for patrons to seek shelter inside on windy days. Appropriate wind conditions are expected at this entrance throughout the year.

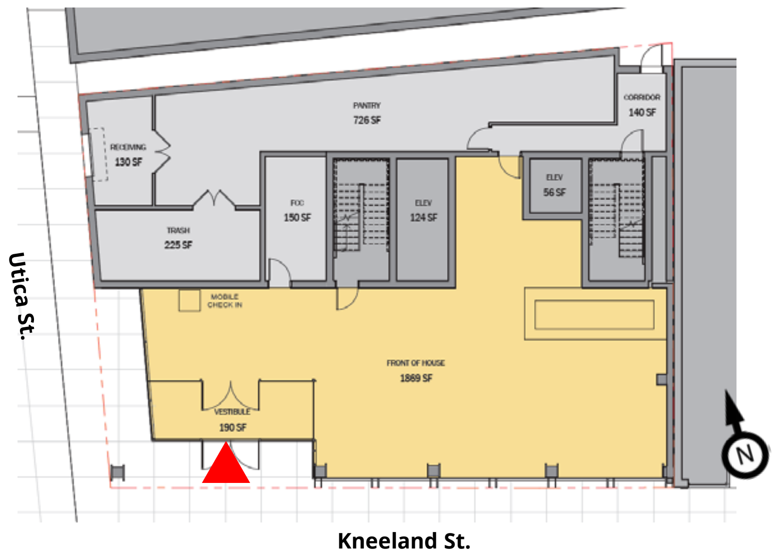


Image 7: Ground Floor Plan

6. SUMMARY

Wind conditions on and around the proposed 150 Kneeland Street development are discussed in this report, based on the local wind climate, surrounding buildings and our past experience with wind tunnel testing of similar buildings.

The proposed project has several positive design features such as a recessed entrance, the large canopy along the west facade and the vestibule at the main entrance. These positive design features together with the tall buildings to the northwest through northeast of the site will result in appropriate wind conditions throughout the year at the sidewalks a of Kneeland St., Utica St., Lincoln St. and South St., and at the main entrance. Further, winds at all above mentioned areas are expected to meet the effective gust criterion.

7. APPLICABILITY OF RESULTS

The assessment presented in this report are for the 150 Kneeland Street development based on the design drawings and documents received from Hudson Group on April 11 and 27, 2018. In the event of any significant changes to the design, construction or operation of the building or addition of surroundings in the future, RWDI could provide an assessment of their impact on the pedestrian wind conditions discussed in this report. It is the responsibility of others to contact RWDI to initiate this process.

APPENDIX H – RESPONSE TO BPDA BROADBAND QUESTIONNAIRE

Broadband Ready Buildings Questionnaire for Inclusion in BPDA Article 80 Development Review

The City of Boston is working to cultivate a broadband ecosystem that serves the current and future connectivity needs of residents, businesses, and institutions. The real estate development process offers a unique opportunity to create a building stock in Boston that enables this vision. In partnership with the development community, the Boston Planning and Development Authority and the City of Boston will begin to leverage this opportunity by adding a broadband readiness component to the Article 80 Design Review. This component will take the form of a set of questions to be completed as part of the Project Notification Form. Thoughtful integration of future-looking broadband practices into this process will contribute to progress towards the following goals:

1. Enable an environment of competition and choice that results in all residents and businesses having a choice of 2 or more wireline or fixed wireless high-speed Internet providers
2. Create a built environment that is responsive to new and emerging connectivity technologies
3. Minimize disruption to the public right of way during and after construction of the building

The information that is shared through the Project Notification Form will help BPDA and the City understand how developers currently integrate telecommunications planning in their work and how this integration can be most responsive to a changing technological landscape.

Upon submission of this online form, a PDF of the responses provided will be sent to the email address of the individual entered as Project Contact. Please include this PDF in the Project Notification Form packet submitted to BPDA.

Section 1: General Questions

For consistency, general intake questions below are modeled after Boston Planning and Development Agency Climate Change Resiliency and Preparedness Checklist.

Project Information:

- Project Name: **150 Kneeland Street**
- Project Address Primary: **150 Kneeland Street, Boston, MA 02111**
- Project Address Additional:
- Project Contact: **Noam Ron/ Hudson Group/noam@hudsongroupna.com/781-632-7645**
- Expected completion date: **3rd Quarter, 2020**

Team Description:

- Owner / Developer: **Hudson Group**
- Architect: **RODE ARCHITECTS Inc.**
- Engineer (building systems): **Howard Stein Hudson**
- Permitting: **MLF Consulting LLC**
- Construction Management: **TBD**

Section 2: Right of Way to Building

Point of Entry Planning

Point of entry planning has important implications for the ease with which your building's telecommunications services can be installed, maintained, and expanded over time.

#1: Please provide the following information for your building's point of entry planning (conduits from building to street for telecommunications). Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Number of Points of Entry: **1**
- Locations of Points of Entry: **Kneeland Street**
- Quantity and size of conduits: **TBD-Unknown**
- Location where conduits connect (e.g. building-owned manhole, carrier-specific manhole or stubbed at property line): **TBD- Unknown**
- Other information/comments:

#2: Do you plan to conduct a utility site assessment to identify where cabling is located within the street? This information can be helpful in determining the locations of POEs and telco rooms. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Yes
- No
- **Unknown**

Section 3: Inside of the Building

Riser Planning

Riser capacity can enable multiple telecom providers to serve tenants in your building.

#3: Please provide the following information about the riser plans throughout the building. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Number of risers **TBD- Unknown**
- Distance between risers (if more than one): **TBD- Unknown**
- Dimensions of riser closets: **TBD- Unknown**
- Riser or conduit will reach to top floor: **TBD- Unknown**
- Number and size of conduits or sleeves within each riser: **TBD- Unknown**
- Proximity to other utilities (e.g. electrical, heating): **TBD- Unknown**
- Other information/comments

Telecom Room

A well designed telecom room with appropriate security and resiliency measures can be an enabler of tenant choice and reduce the risk of service disruption and costly damage to telecom equipment.

#4: Please provide the following information about the telecom room plans. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- What is the size of the telecom room? **TBD- Unknown**

- Describe the electrical capacity of the telecom room (i.e. # and size of electrical circuits) **TBD- Unknown**

- Will the telecom room be located in an area of the building containing one or more load bearing walls? **TBD- Unknown**

- Will the telecom room be climate controlled?
  - Yes
  - No
  - **Unknown**

- If the building is within a flood-prone geographic area, will the telecom equipment will be located above the floodplain?
  - Yes
  - No
  - **Unknown**

- Will the telecom room be located on a floor where water or other liquid storage is present?
    - Yes
    - No
    - **Unknown**

- Will the telecom room contain a flood drain?
    - Yes
    - No
    - **Unknown**

- Will the telecom room be single use (telecom only) or shared with other utilities?
    - Telecom only
    - Shared with other utilities
    - **Unknown**
- Other information/comments

Delivery of Service Within Building (Residential Only)
Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure. Questions 5 through 8 are for residential development only.

#5: Will building/developer supply common inside wiring to all floors of the building?
- Yes
- No
- **Unknown**

#6: If so, what transmission medium (e.g. coax, fiber)? Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure.

#7: Is the building/developer providing wiring within each unit?
- Yes
- No
- **Unknown**

#8: If so, what transmission medium (e.g. coax, fiber)? Please enter ‘unknown’ if these decisions have not yet been made or you are presently unsure. **TBD- Unknown**

Section 4: Accommodation of New and Emerging Technologies

Cellular Reception

The quality of cellular reception in your building can have major impacts on quality of life and business operations.

Please provide the following information on your plans to facilitate high quality cellular coverage in your building. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

#9: Will the building conduct any RF benchmark testing to assess cellular coverage?

- Yes
- No
- **Unknown**

#10: Will the building allocate any floor space for future in-building wireless solutions (DAS/small cell/booster equipment)?

- Yes
- No
- **Unknown**

#11: Will the building be providing an in-building solution (DAS/ Small cell/ booster)?

- Yes
- No
- **Unknown**

#12: If so, are you partnering with a carrier, neutral host provider, or self-installing?

- Carrier
- Neutral host provider
- Self-installing

Rooftop Access

Building rooftops are frequently used by telecommunications providers to install equipment critical to the provision of service to tenants.

Please provide the following information regarding your plans for roof access and usage. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

#13: Will you allow cellular providers to place equipment on the roof?

- Yes
- No
- **Unknown**

#14: Will you allow broadband providers (fixed wireless) to install equipment on the roof?

- Yes
- No
- **Unknown**

Section 5: Telecom Provider Outreach

Supporting Competition and Choice

Having a choice of broadband providers is a value add for property owners looking to attract tenants and for tenants in Boston seeking fast, affordable, and reliable broadband service. In addition to enabling tenant choice in your building, early outreach to telecom providers can also reduce cost and disruption to the public right of way. The following questions focus on steps that property owners can take to ensure that multiple wireline or fixed wireless broadband providers can access your building and provide service to your tenants.

#15: (Residential Only) Please provide the date upon which each of the below providers were successfully contacted, whether or not they will serve the building, what transmission medium they will use (e.g. coax, fiber) and the reason they provided if the answer was 'no'.

- Comcast - enter contact info
- RCN - enter contact info
- Verizon - enter contact info
- Wicked Broadband - enter contact info
- WebPass
- Starry
- Level 3
- Cogent
- Lightower
- XO Communications
- AT&T
- Zayo
- Other(s) - please specify - enter contact info: **TBD- Unknown**

#16: Do you plan to abstain from exclusivity agreements with broadband and cable providers?

- Yes
- No
- **Unknown**

#17: Do you plan to make public to tenants and prospective tenants the list of broadband/cable providers who serve the building?

- Yes
- No
- **Unknown**

Section 6: Feedback for Boston Planning and Development Agency

The Boston Planning and Development Agency looks forward to supporting the developer community in enabling broadband choice for resident and businesses. Please provide feedback on your experience completing these questions.

APPENDIX I – PROJECT SUPPORT LETTER

The Project received approximately 30 support letters as part of a robust pre-filing community outreach effort in the Leather District and Chinatown neighborhoods. The following is a June 20, 2018 letter from the Leather District Neighborhood Association ("LDNA").

LEATHER DISTRICT NEIGHBORHOOD ASSOC.
c/o Chris Betke, Chair
116 Lincoln Street, Unit #5A
Boston, MA 02111
cbetke@coughlinbetke.com
617-988-8047 (office)
617-835-2836 (cell)

June 20, 2018

Michael Sinatra, MPA , Project Manager
Boston Planning & Development Agency
One City Hall Square
9th Floor
Boston, MA 02201

Re: Hudson Group Project
Boutique Hotel – 150 Kneeland Street

Dear Mr. Sinatra:

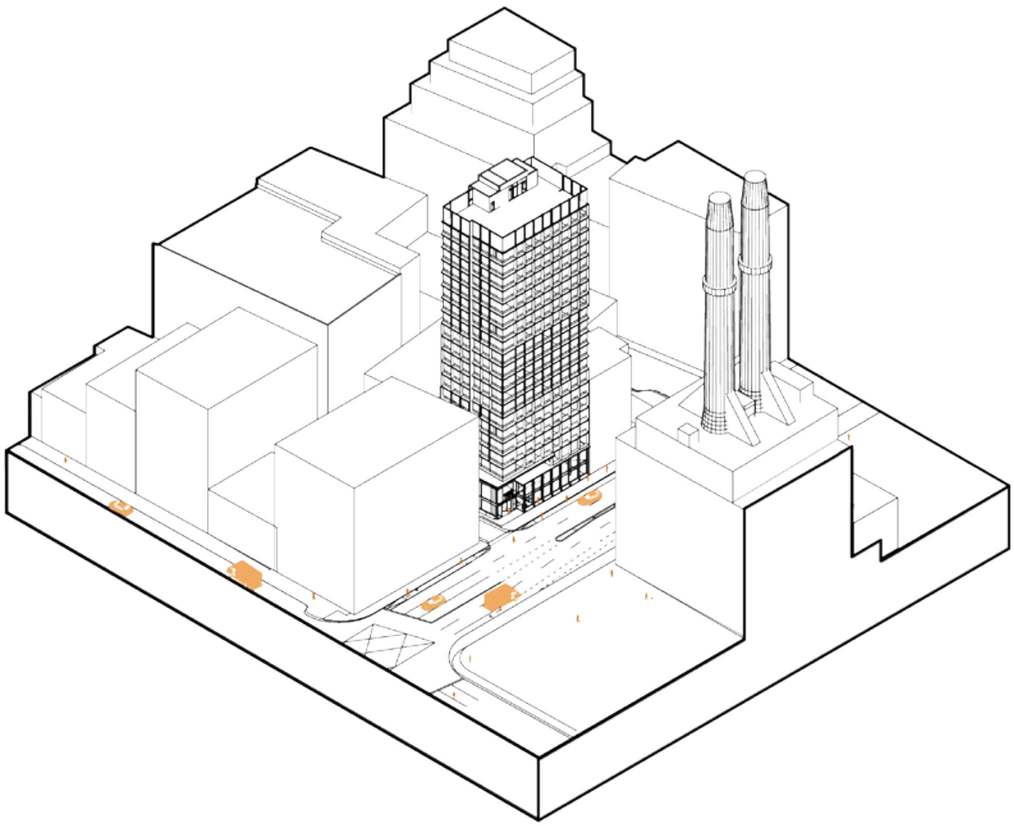
I am writing to formally advise you that the Leather District Neighborhood Association ("LDNA") voted overwhelmingly (46 yes/4 no) to support the Hudson Group's Proposal for a boutique hotel at 150 Kneeland Street with a proposed height of 218'. The LDNA's support is based in no small part on the participation of the Hudson Group in this project. Ori Ron and his son, Noam Ron, have a known track record of developing in a thoughtful and respectful manner in and around the Leather District. Indeed, I am not sure that this project would have been approved for any other developer. The LDNA's support for some relief from height limitations at this location is also based on the unique, small footprint of the location.

With the guidance of the Hudson Group, the LDNA believes that this project will be a net gain for the neighborhood. Our support is premised on the belief that the vast majority of neighborhood benefits from the project will be used for improvements in the Leather District. The LDNA looks forward to working collaboratively with the City and the Hudson Group to see that this project is built in a positive manner that will better the neighborhood and the City as a whole.

Please let me know if you have any questions or comments.

Very truly yours,

Christopher G. Betke, Chair, LDNA



150 Kneeland Street, Leather District

MLF CONSULTING LLC

HUDSON GROUP

RODE ARCHITECTS INC