Notice of Project Change

HOOD PARK MASTER PLAN

Submitted to:
Boston Planning & Development Agency
One City Hall, 9th Floor
Boston, Massachusetts 02201

Submitted by:
Hood Park LLC
6 Kimball Lane
Lynnfield, Massachusetts 01940

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

In Association with:
Trademark Partners LLC
SMMA
Elkus Manfredi Architects
Howard Stein Hudson
Haley & Aldrich, Inc.

September 14, 2018

Epsilon
ASSOCIATES INC.

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Chapter 1.0

Project Description

1.0 PROJECT DESCRIPTION

This chapter provides information on the proposed project's site and surroundings, buildings and uses, impacts and benefits, and proposed mitigation. It also includes information on the zoning history of the site, legal information, permitting, public participation in the review process, and the project's schedule.

1.1 Introduction

Hood Park is an approximately 20-acre site owned by Hood Park LLC (the "Proponent"), located on Rutherford Avenue in Charlestown (the "Project Site"). The Project Site was formerly used as the Hood Dairy plant until it ceased operations in the late 1990s. Hood Park currently houses approximately 443,000 square feet of commercial space and a 177-unit residential building that is currently under construction.

Since taking ownership of the Site, the Proponent has strived to replace the lost industrial jobs by creating a campus-style office park. In October 2000, the Boston Redevelopment Authority (now the Boston Planning and Development Agency or "BPDA") approved a masterplan for the Site's development, allowing for approximately 1.2 million square feet of leasable square footage. Hood Business Park, as it was originally named, has been successful in attracting office and lab tenants to occupy the available space. However, the park remains isolated from the rest of Charlestown by Rutherford Avenue which is acts as a barrier preventing the Park from being truly integrated with the surrounding urban fabric. With the planned reconstruction of Rutherford Avenue and the re-imagination of Sullivan Square, the Proponent believes that the time is right to modify the Park's Master Plan and redesign Hood Park in a manner that reflects a vision for mixed-use neighborhoods proximate to transit and amenities, while providing new residences, retail, entertainment, office and lab space to accommodate Boston's growing economy.

The Proponent is filing this Expanded Notice of Project Change (NPC) pursuant to Article 80B of the Boston Zoning Code, Large Project Review, for an amended Master Plan development that will include approximately 1,735,800 square feet of development and have a floor area ratio (FAR) of 2.0, matching the Project Site's underlying zoning pursuant to Article 62 of the Zoning Code. The Proponent intends to file an Amended and Restated Master Plan pursuant to Article 80C, Planned Development Area Review, to allow for the revised densities, dimensions, and uses presented in this NPC.

1.2 Development Team

Proponent	Hood Park LLC Six Kimball Lane Lynnfield, MA 01940 Christopher P. Kaneb, Manager
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Mechanical/Electrical/Plumbing Consultant	SMMA | Symmes Maini & McKee Associates 1000 Massachusetts Avenue Cambridge, MA 02138 Telephone: (617) 547-5400

Geotechnical Consultant/Licensed Site Professional	Haley & Aldrich 465 Medford Street, Suite 2200 Boston, MA 02129 Telephone: (617) 886-7400 Kelvin Wong, P.E. Damian Siebert, P.E.
Sustainability Consultant	New Ecology, Inc. 15 Court Square, Suite 420 Boston, MA 02108 Telephone: (617) 557-1700 Lauren Bauman, Vice President
Pre-Construction Advisor	Lee Kennedy Co, Inc. 122 Quincy Shore Drive Quincy, MA 02171 Telephone: (617) 825-6930 Chris Pennie, Senior Vice President Christine Walsh,

1.3 Hood Park Area Context

Hood Park is a 19.92-acre site located on the west side of Rutherford Avenue between D Street and Bunker Hill Industrial Park in Charlestown. The Site was formerly the headquarters for H.P. Hood Dairy operations, which sold the property and ceased usage for dairy production in the late 1990s. Currently, Hood Park is approved for approximately 1.169 million square feet of predominantly commercial development and structured parking. Uses allowed in the existing Master Plan include residential, office, research and development, light industrial, restaurant, scientific laboratory, service uses, vehicular uses, warehousing, and all conditional and allowed uses in the underlying zoning.

See Figure 1-1 for a locus map and Figure 1-2 for an aerial view of the existing Site. Figures 1-3 through 1-7 present views of the Site from various locations. A site survey is included in Appendix A.

The Project Site is situated within an emerging growth and development corridor stretching from Kendall Square and downtown Boston to Assembly Square in Somerville and the Encore Casino in Everett. This corridor, and Sullivan Square specifically, was designated in the City of Boston's Imaging Boston 2030 under the "Expanded Neighborhoods" section as a targeted area for "mixed-use job and housing development" focused on "creation of a job center that can become an anchor in the area's innovation and research economy." The area will benefit from over $325 million in roadway improvements over the next several years including reconstruction of the North Washington Street bridge and reconfiguration of Rutherford Avenue and Sullivan Square. Rutherford Avenue will be redesigned to be less of a regional highway and more of a neighborhood-friendly urban boulevard with fewer lanes

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

Hood Park Master Plan **Boston, Massachusetts**

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Figure 1-1

USGS Locus Map

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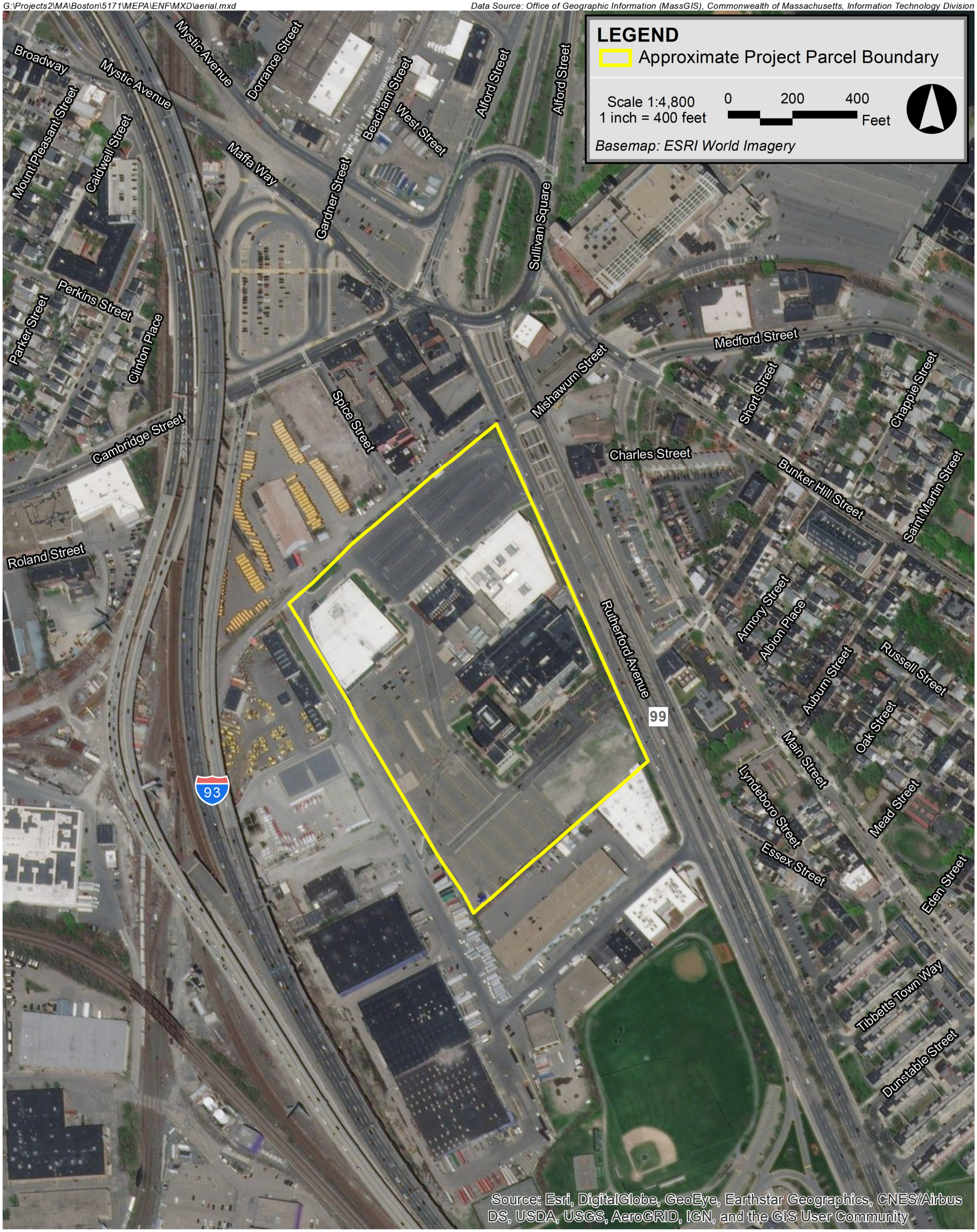
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division



Hood Park Master Plan Boston, Massachusetts

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Figure 1-2
Aerial Locus Map

EDWARDS PLAYGROUND

BALDWIN STREET

Figure 1-3

Peripheral Views – Edwards Playground and Baldwin Street

COMMUNITY COLLEGE MBTA

W. SCHOOL STREET

Figure 1-4

Peripheral Views – Community College MBTA and West School Street

RUTHERFORD AT BRIDGEVIEW APARTMENTS

ESSEX STREET

Figure 1-5

Peripheral Views – Rutherford Avenue at Bridgeview Apartments and Essex Street

ALFORD STREET

MISHAWUM STREET / MASSPORT TRACKS

Figure 1-6

Peripheral Views – Alford Street and Mishawum Street / Massport Tracks

SPICE STREET

SULLIVAN SQUARE

Figure 1-7

Peripheral Views – Spice Street and Sullivan Square and improved pedestrian, bicycle, and automobile connections to the amenities in the residential neighborhoods of Charlestown. The Rutherford Avenue project will also provide an improved streetscape including shared use paths, open spaces, and amenities such as pocket parks, street furniture, improved lighting and connections to a new North Washington Street Bridge. Likewise, Sullivan Square will be transformed by replacing the traffic rotary and tunnel with an urban street grid and providing future opportunities for open space, development, community amenities, and improved access to Sullivan Square station, the Mystic River, and Ryan Playground.

The construction of the Encore Casino in Everett (including the Encore Casino-funded roadway improvements) and other nearby projects such as 32 Cambridge Street, Bridgeview, Cambridge Crossing (formerly Northpoint) and Assembly Square are bringing new private investment to the area and changing the nature of development in the corridor.

The western side of Rutherford Avenue, including Hood Park, continues to evolve. Formerly an industrial and operations district, the corridor is currently transitioning to office and residential uses, though still separated from the balance of the residential neighborhood portions of Charlestown by the existing heavily-travelled Rutherford Avenue. The long-established Charlestown residential community immediately east of Hood Park and Rutherford Avenue has a wide variety of housing stock, neighborhood amenities, and businesses.

To the north of Hood Park, directly across D Street is 32 Cambridge Street (now known as The Graphic), a 171-unit conversion of an existing three-story industrial building. Across Sullivan Square to the east is the Shrafft's Center and to the north is the Assembly Square project in Somerville. The Sullivan Square MBTA station is a major transfer station to the Orange Line from numerous bus lines servicing the northern suburban market. The nearby development of the Encore Casino project in Everett is underway and is expected to open in 2019. As part of that development, Encore Casino is making several improvements to the area, including:

- Reconstructing Spice Street and D Street directly adjacent to the Project Site;
- Reconfiguring the streets and busways at Sullivan Square to allow northbound traffic from Hood Park to avoid the Sullivan Square rotary;
- Improving signal timing on Cambridge Street; and
- Adding an additional right turn lane off the I-93 northbound ramp onto Cambridge Street.

To the south and southwest of Hood Park are low-intensity industrial uses including a self-storage facility, wholesalers, shipping and receiving services, Boston Sand and Gravel, Casella Waste transfer station, and other industrial uses. Further south, Bridgeview opened in 2016 as a 61-unit residential project with a 5-unit adult supportive service program.

Further south is the Bunker Hill Community College with educational and community facilities, ball fields, walking trails, and the Community College MBTA stop on the Orange Line.

The Project Site is well served by public transportation, with access to two Orange Line MBTA stations, (Sullivan Square and Community College) and numerous nearby bus routes. Sullivan Square station is located approximately 0.2 miles north of the Project Site and provides access to the Orange Line and 12 MBTA bus routes. Spice Street, which is currently being improved as part of the Encore Casino mitigation, provides a direct connection between the Project Site and the Sullivan Square station.

Community College station is approximately 0.6 miles from the Project Site and is accessible via pedestrian paths on the Bunker Hill Community College campus or via Rutherford Avenue.

The Orange Line provides connections to Somerville and Malden to the north, and downtown Boston, North Station, Back Bay, Roxbury, and Jamaica Plain to the south. Commuters can transfer to MBTA commuter rail trains at North Station for points north of Boston, and Back Bay for points south of Boston. The 12 MBTA bus routes connect the Project Site to locations such as Harvard Square, Cleveland Circle, Davis Square, Clarendon Hill, Malden Center, Linden Square, and Ruggles Station, among others.

To the west of the Project Site are the elevated north and southbound lanes of the I-93 highway and Leverett connector which create a visual and physical barrier to east Cambridge and Somerville and the Cambridge Crossing development.

1.4 Existing Master Plan and Site Conditions

1.4.1 Current Master Plan

The Project Site is covered in its entirety by the Master Plan for Planned Development Area No. 51 approved on October 20, 2000 (the "Existing PDA Master Plan"). This PDA Master Plan has been amended four times, most recently on December 16, 2016 to allow residential uses within the Existing PDA Master Plan. Planned Development Areas are allowed in the LI subdistrict.

Under the Existing PDA Master Plan, up to 1,168,820 square feet of development is approved in six buildings, plus 1,765 parking spaces in three structured parking garages. Individual projects under the PDA Master Plan must file individual PDA Development Plans and go through the BPDA's design review process. Section 62-21 of the Code limits the

Floor Area Ratio ("FAR") to 2.0 and building heights to 75 feet along Rutherford Avenue and 115 feet west of a line drawn parallel to and 300 feet west of the westerly sideline of Rutherford Avenue and to the south of a line drawn parallel to and 400 feet south of the southerly sideline of Cambridge Street. Figure 1-8 depicts the current PDA Master Plan.

1.4.2 Existing Site Conditions

There are currently three buildings on-site. The first is 500 Rutherford Avenue, an approximately 368,750 square-foot (sf) office building. It is fully tenanted by 13 tenants, including Indigo Ag. Inc., Cambridge College, and the MA Teachers' Retirement System. The second is 510 Hood Park Drive, aka the Power House, an approximately 34,812 square-foot, fully occupied office building. Lastly, 570 D Street, aka the Cooler Building, is a 52,500 square-foot building located in the northwest corner of the Park. It currently houses some functions of Bunker Hill Community College.

The remainder of the Site comprises surface parking lots and internal roadways. The site is nearly 100 percent impermeable. As can be seen in Figure 1-9, green space is currently limited to just small areas of lawn and plantings, immediately adjacent to the office buildings.

Two buildings are currently under construction on the southern edge of the Project Site. The first is 50 Hood Park Drive (aka 480 Rutherford Avenue). Being marketed as "The Harvey," in honor of Harvey Pearly Hood, it is a 177-unit residential building with 154-market rate units and 23 affordable units, including approximately 10,000 square feet of retail space and 90 parking spaces within the building footprint. The second is a 67,500-square foot building in the southwest corner of the Site at 100 Hood Park Drive. It is a 912-space above-grade parking structure with approximately 20,000 square feet of retail uses on the first floor, 50,000 square feet of office / lab lease space on the second floor, and five levels of flat plate parking above. These floors have been designed for conversion to future office use in the event parking demand no longer justifies a parking garage.

The current building program on-site is summarized in Table 1-1.

Hood Park Master Plan **Boston, Massachusetts**

Figure 1-8

Existing Master Plan

Figure 1-9
Existing Site

Table 1-1 Current On-site Buildings

Building	Approximate Size (sf)	Primary Use
500 Rutherford Avenue	368,750 sf	Office, including Indigo Ag. Inc.
510 Rutherford Avenue (aka the Power House)	34,812 sf	Office
50 Hood Park Drive, The Harvey (aka 480 Rutherford Avenue)	167,000 sf	Residential **Under Construction**
100 Hood Park Drive	95,192 sf	Parking, Office, Lab **Under Construction**
Total Existing	665,754 sf	Existing and currently under construction
Parking Spaces	A total of **1,671**, including 669 surface lot spaces; and 912 spaces in 100 Hood Park Drive, and 90 spaces in 50 Hood Park Drive under construction.	

1.5 Proposed Project

Pending changes to the Project Site's zoning by the Boston Zoning Commission, the Proponent plans to submit an Amended and Restated PDA Master Plan for Planned Development Area No. 51, Hood Park which will seek to revise the Park's existing approvals by creating a mixed-use development to further the goals of Imagine Boston 2030 and the Rutherford Avenue/Sullivan Square reconstruction.

The owners of Hood Park have delayed redevelopment until the City of Boston and community of Charlestown could be confident that the growth of Hood Park could be accommodated by the infrastructure supporting it, including Rutherford Avenue and Sullivan Square. With over $325 million in infrastructure improvements to the vehicular systems in this corridor now planned, the time has arrived for Hood Park to evolve and become an integral part of the Charlestown neighborhood. By bringing this historic resource into the 21st Century through the creation of a true mixed-use live, work, play environment, the Proponent expects to enhance the neighborhood and to create jobs and the opportunities for new employment in emerging technology companies that will grow and enliven the Park. The Proposed Project will help to integrate the eastern and western sides of Rutherford into a single Charlestown community and add the kind of active business and residential uses that other neighborhoods in the City enjoy and that Charlestown residents also deserve.

1.5.1 Proposed Program

The Proponent has developed a new Master Plan for Hood Park that envisions a total of 1,785,804 gross square feet spread among a total of eleven buildings having commercial, residential, hotel, and retail uses. A total of 1,765 parking spaces are proposed, the great majority of which (1,687) will be within structured garages integrated into the proposed buildings. The remaining 78 spaces will be along the interior streets. The Proposed Project

Site Plan is shown on Figures 1-10 and 1-11, and its elements diagrammed on Figure 1-12. Table 1-2 summarizes the proposed building program, and each building is described in more detail below.

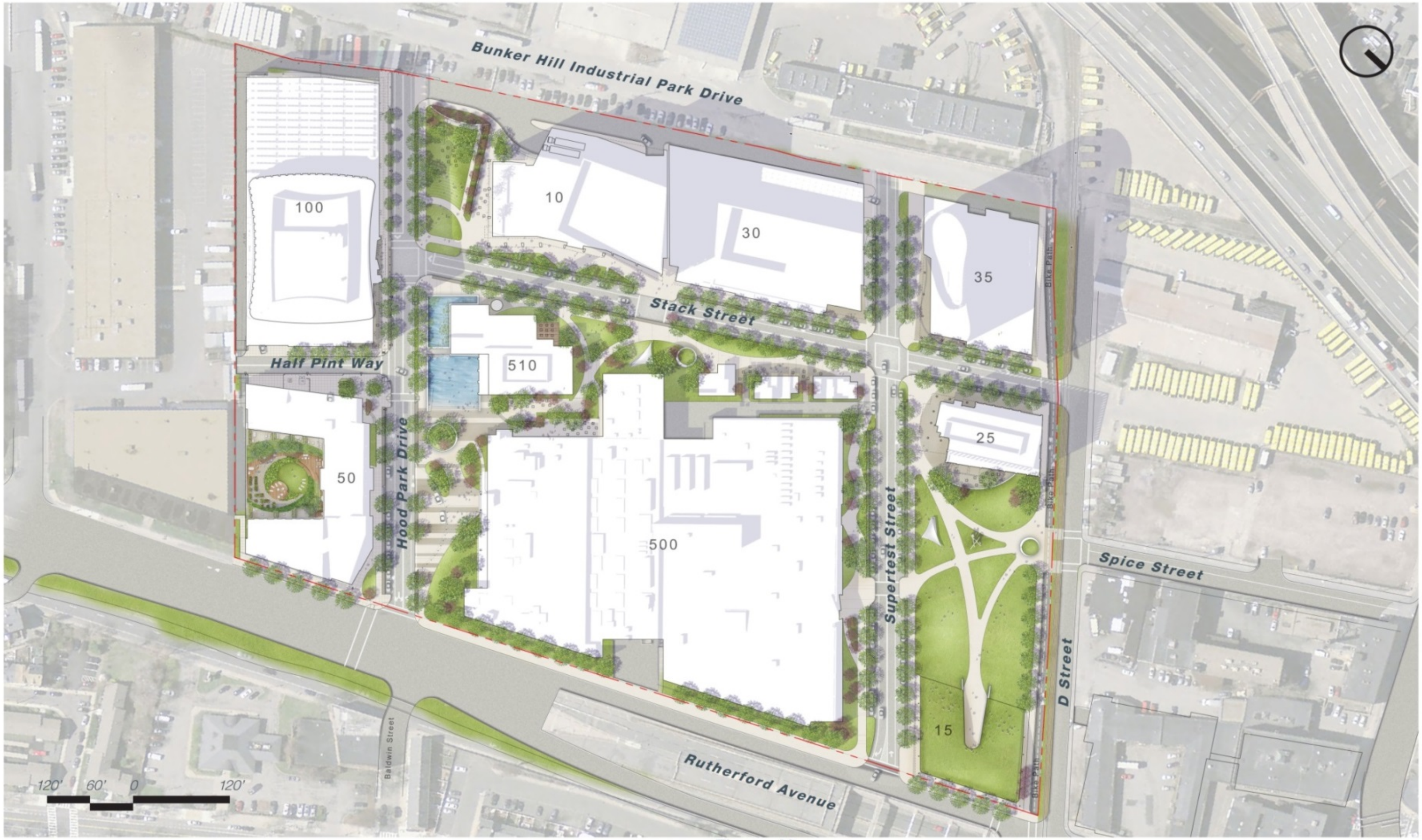
Table 1-2 Proposed Building Program

Building	Size (sf)	Height(feet)	Primary Use	Parking Spaces
Existing Buildings				
500 Rutherford Avenue	368,750	50	Office	
510 Rutherford Avenue (aka the Power House)	34,812	50	Office	
50 Hood Park Drive (Under Construction)	167,000	83	Residential	90
100 Hood Park Drive (Under Construction)	95,192	83	Office/Lab	912
Proposed Buildings				
10 Stack Street	365,000	235		150
100 Hood Park Drive (addition)	150,000	190	Office/Lab	
30 Stack Street	110,000	130	Office/Lab	285
45 Stack Street	6,050	20	Pop-up Retail	
35 Supertest Street	304,700	290	Office/Lab/Residential	200
25 Supertest Street	122,300	100	Hotel (130 rooms)	50
Hood Green	50,000	N/A	Open Space	
15 Supertest Street	12,000	20	Retail	
Street Parking Spaces				78
Totals	**1,785,804**			**1,765**
Total Lot Area	**897,802**			
Maximum FAR	**2.0**			

1.5.2 Proposed Building Descriptions

10 Stack Street

Ten Stack Street will the first new building constructed within the proposed new Masterplan. It is an office / laboratory building with active retail ground floor. An anchor tenant is intended to occupy the majority of the building and take advantage of visibility from the I-93 corridor for corporate identity. It includes important frontages toward a modestly-sized park on Hood Park Drive and toward Stack Street opposite the historic Powerhouse. The position of the building is intentionally placed north to create a significant open sky view on the axis of Hood Park Drive looking west into the development. This view corridor enhances the view from Baldwin Street within Charlestown neighborhood.



Hood Park Master Plan **Boston, Massachusetts**

ELKUS | MANFREDI HOOD PARK SMMA

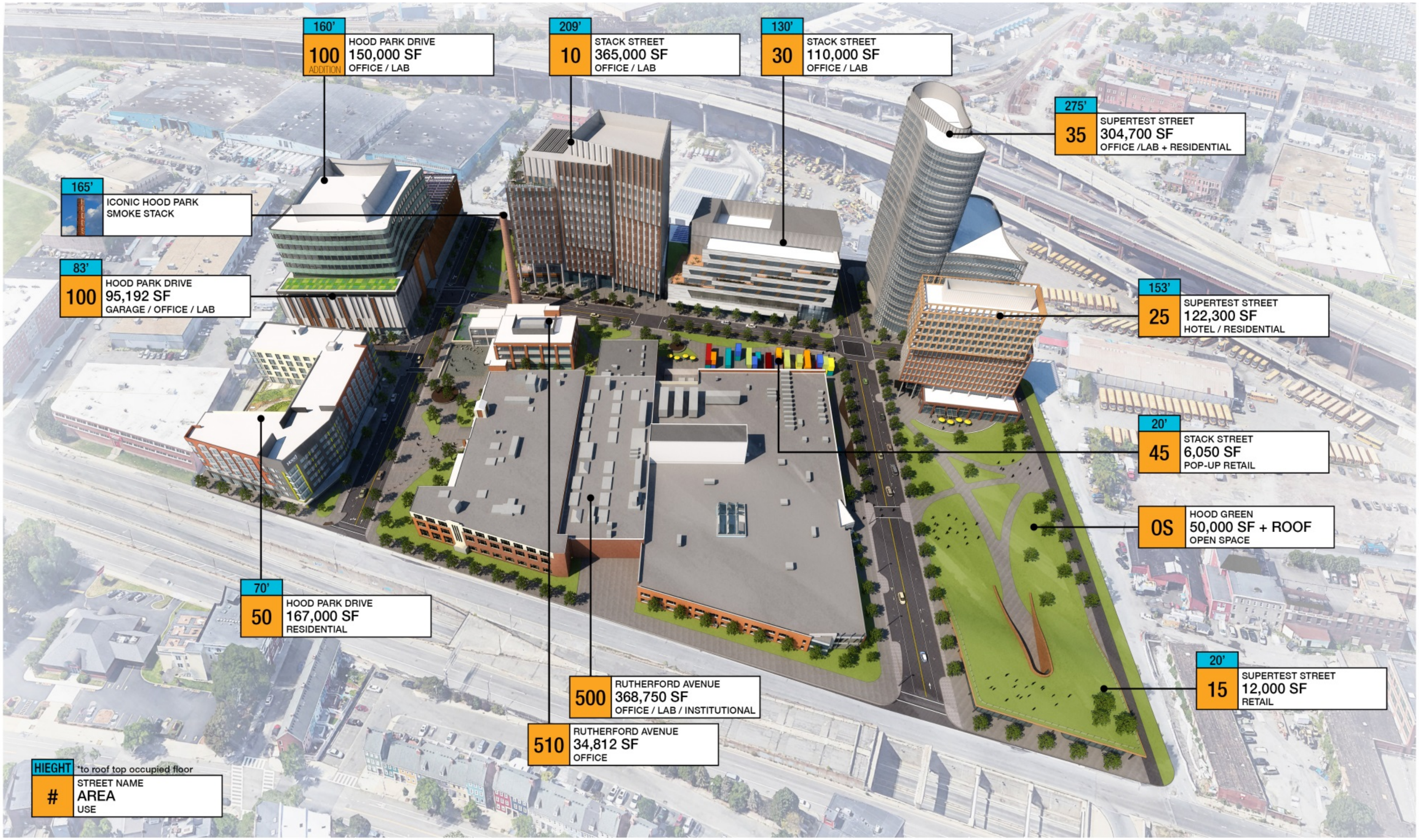
Figure 1-10

Proposed Master Plan – Aerial View

Hood Park Master Plan Boston, Massachusetts

ELKUS | MANFREDI HOOD PARK SMMA

Figure 1-11
Proposed Master Plan



Hood Park Master Plan **Boston, Massachusetts**

ELKUS | MANFREDI HOOD PARK SMMA

Figure 1-12

Proposed Areas, Uses and Zoning Heights

Because 10 Stack will be built in the near future, the design for the building has been advanced further than have those of the other proposed buildings. Figures 1-13 through 1-23 depict the proposed building's rendering views, elevation views, and building sections. Refer to Appendix B for floor plans and additional renderings of 10 Stack Street.

100 Hood Park Drive (addition)

Intended as a vertical expansion of 100 Hood Park Drive, this building (addition) is intended as laboratory and office use. The 100 Hood Park Drive entrance lobby, service entrance and vertical transportation, which are currently under construction, will also serve the proposed addition.

The building massing takes advantage of the broad dimension of parking structure it will be constructed above. This will provide relatively large floor plates, creating loft-like flexible plan layout for lab and office tenants. The overall building form is defined by symmetrical convex and concave walls responsive to the 100 Hood Park Drive architecture below it.

30 Stack Street

Completing an important west edge of the street, 30 Stack Street is anticipated to be a laboratory / office building incorporating above-grade parking and a continuous active ground floor retail along the street. The tall 30 Stack Street entrance lobby anchors the corner of Stack Street and Supertest Street, participates with other building entrances at this intersection. Parking access is from the northwest corner along Supertest St. and service is intended to be from a service alley along west property line.

45 Stack Street

Envisioned as a low height market to activate the corner of Stack Street and Supertest Street, the Masterplan intends the character of 45 Stack Street to be more like pop-up retail than a singular building. This proposed structure may be a series of smaller retail structures that redefine the western face of 500 Rutherford Avenue. These structure(s) will serve as both destination and open space interventions to visually activate the important corner of development site circulation.

35 Supertest Street

Located in the northwest corner of the Park, 35 Supertest Street will be the tallest building on the Site. The intent is to incorporate a signature, taller building having prominent visibility from I-93 and Route 99. The building is sited so as to be furthest from the neighborhood and nearby taller development anticipated to be built around the Sullivan Square MBTA Station. The building is envisioned to be mixed-use, with residential use on upper floors placed above full-block commercial office lower floors. A large green roof terrace level tops the large office floor plates. Ground floor retail is intended and the primary building entrance will anchor the street intersection corner, visible from both

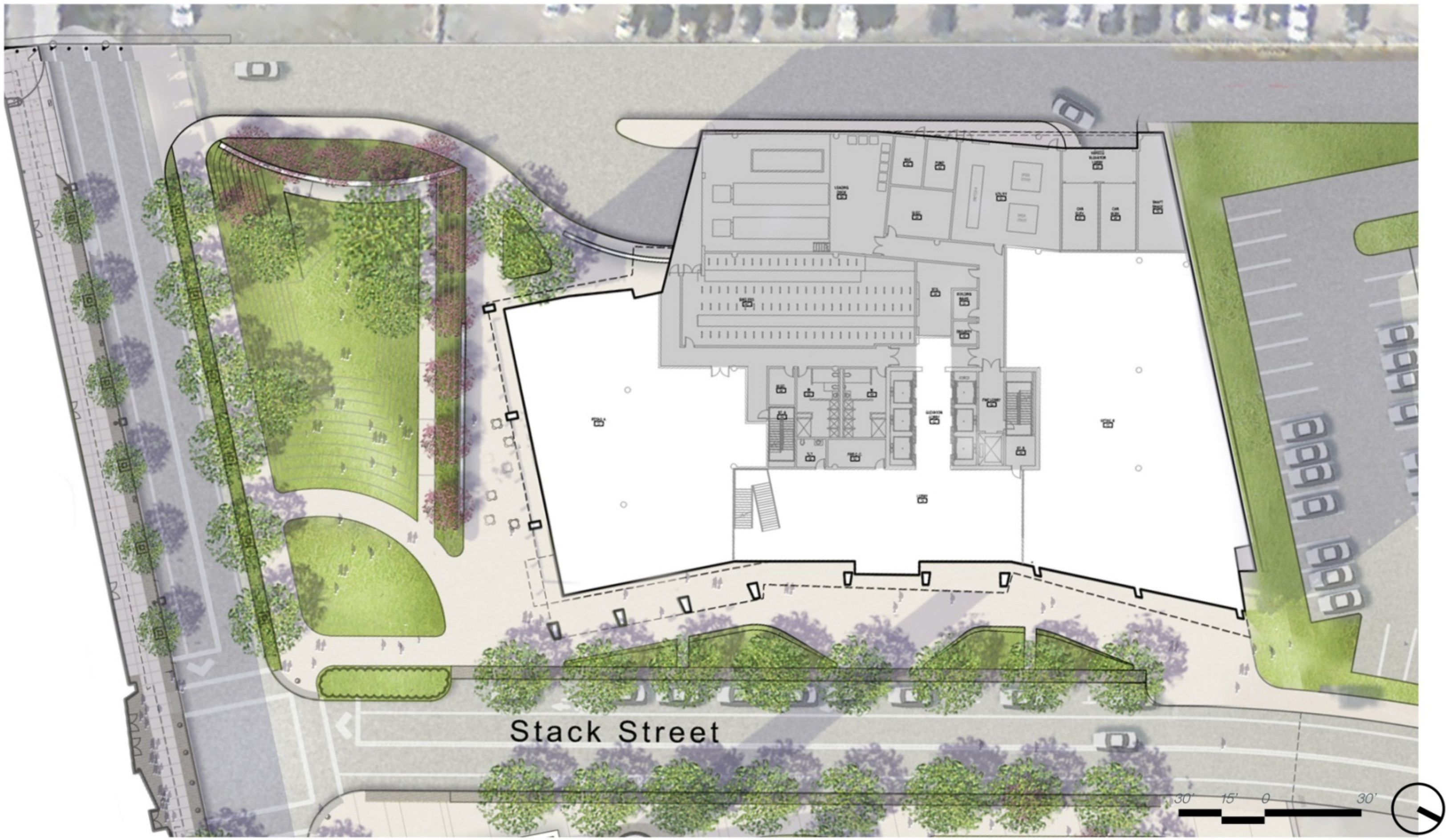


Figure 1-13

10 Stack Street – Site Plan

Figure 1-14
10 Stack Street

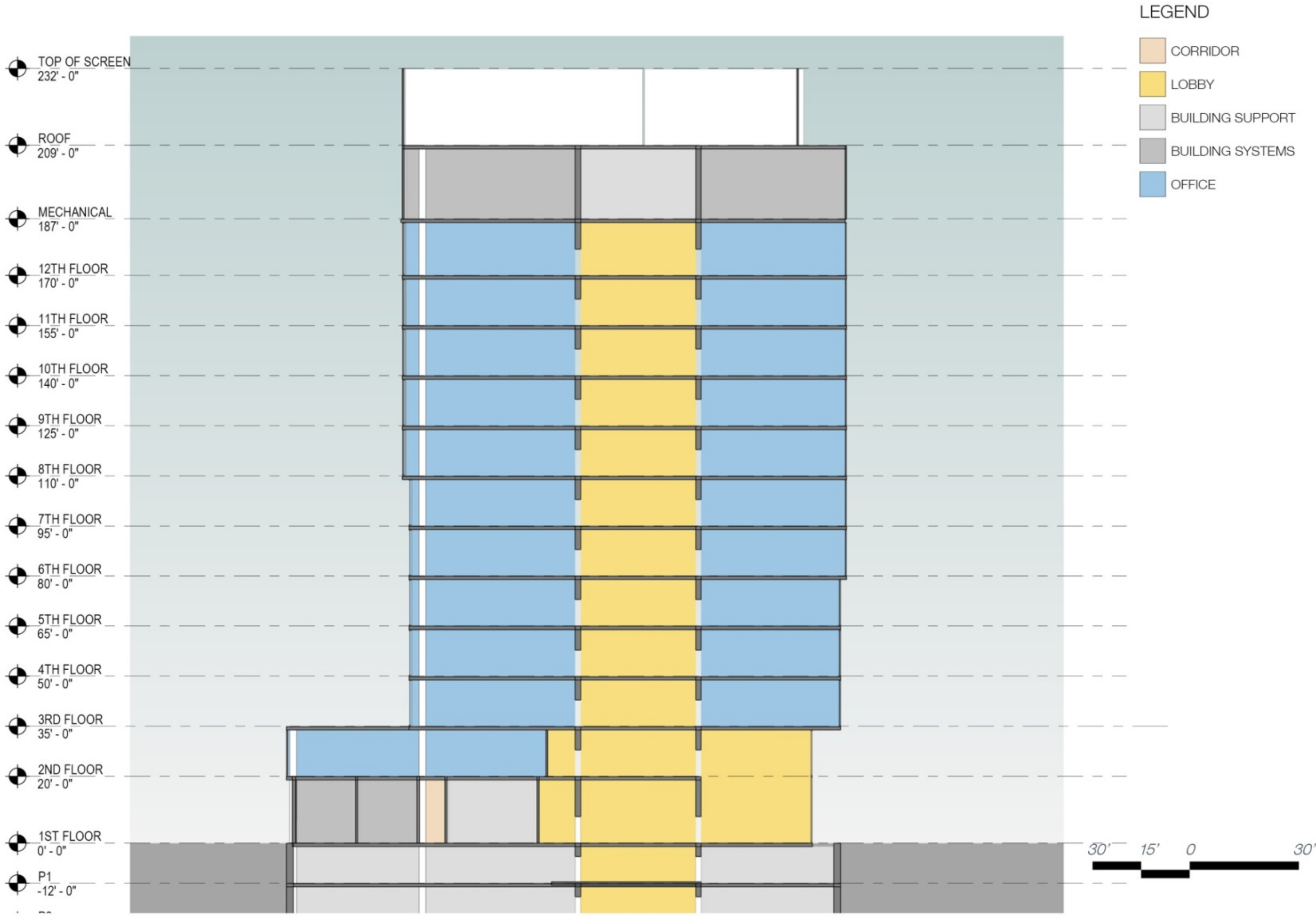
Figure 1-15

10 Stack Street – View Across Stack Street

Figure 1-16

10 Stack Street – Overview of Plaza

Figure 1-17
10 Stack Street – Lobby and Plaza



Hood Park Master Plan Boston, Massachusetts

Figure 1-18

10 Stack Street – North to South Section

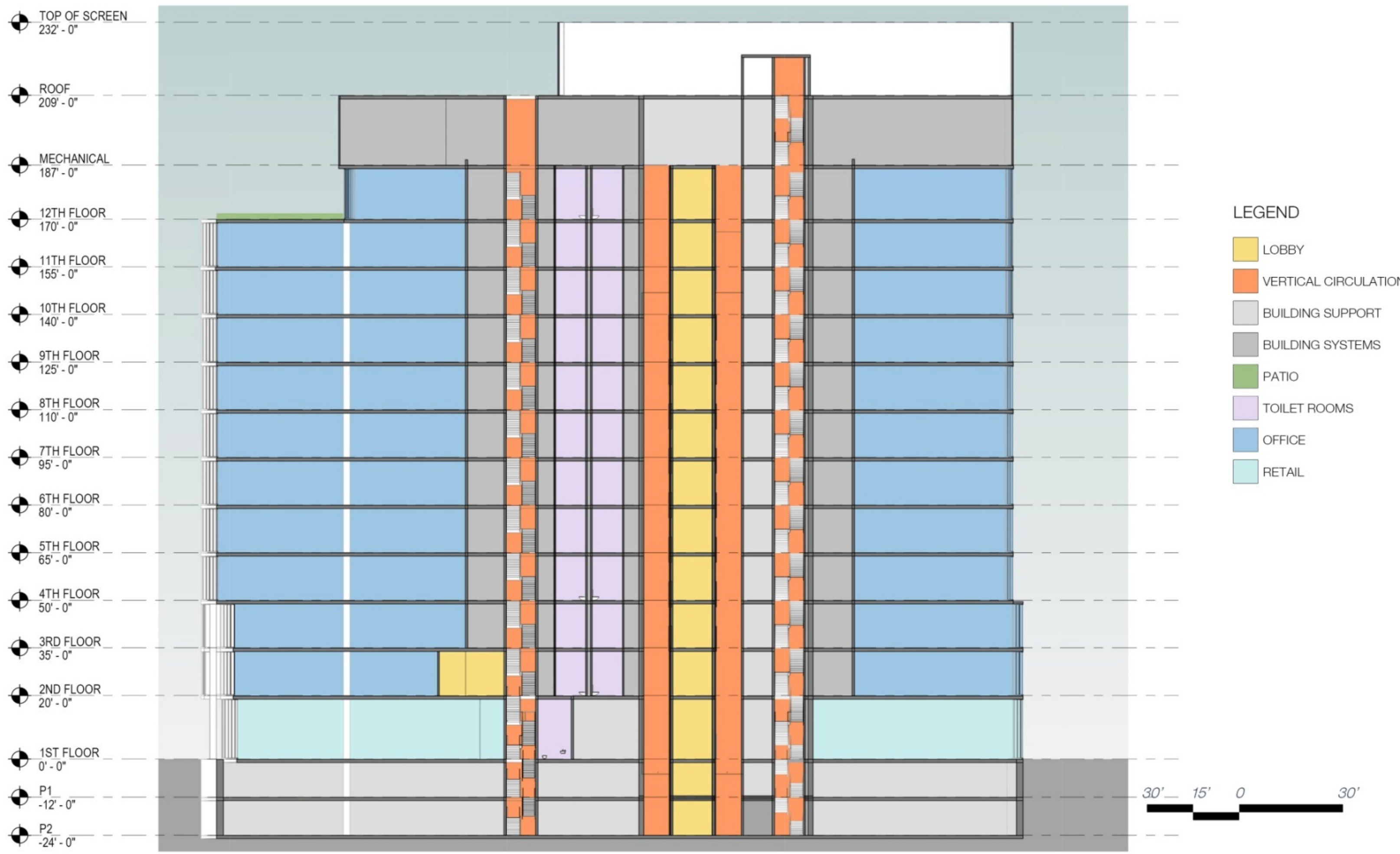


Figure 1-19

10 Stack Street – East to West Section

Hood Park Master Plan   Boston, Massachusetts

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Figure 1-20

10 Stack Street – East Elevation

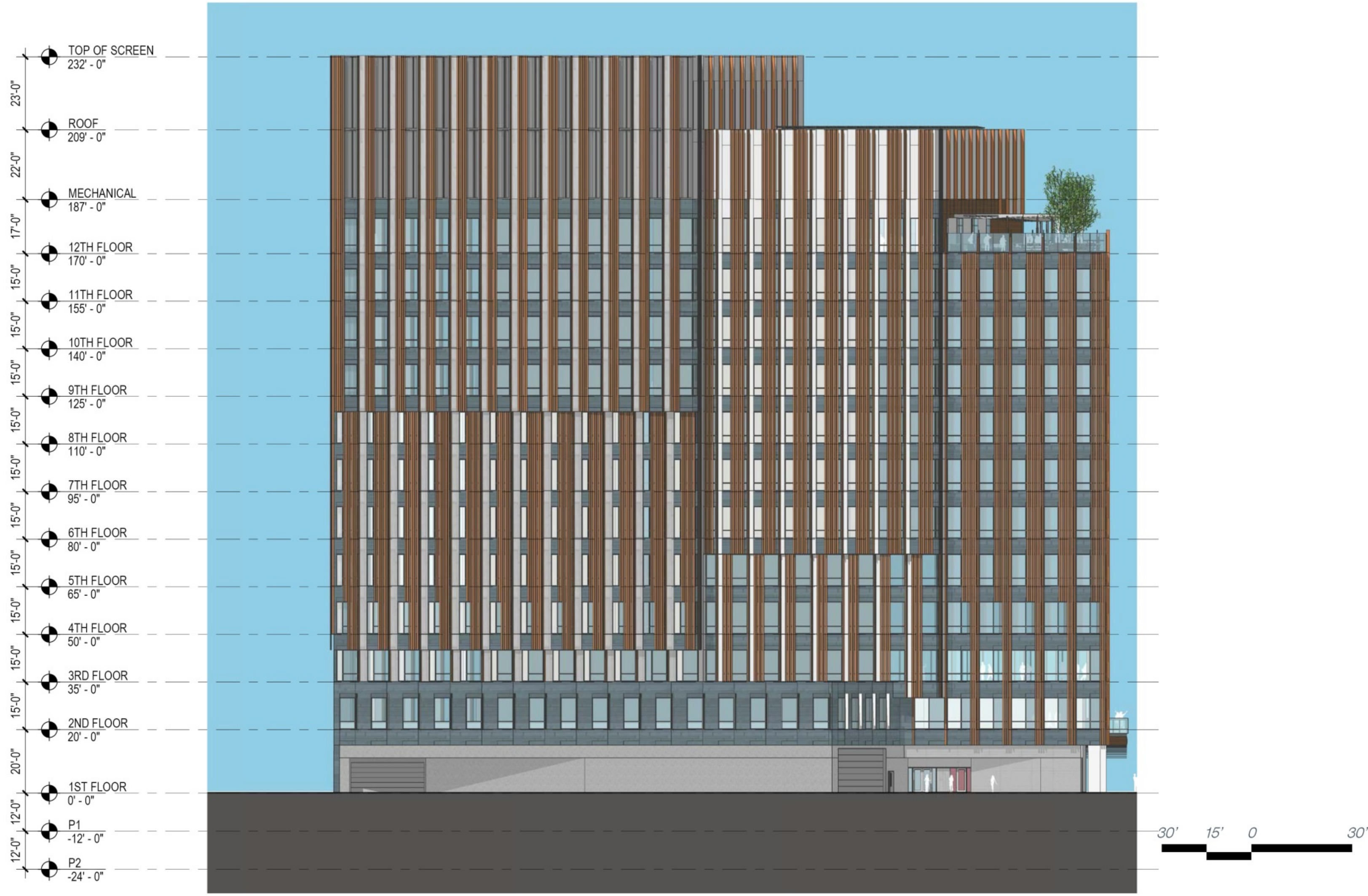


Figure 1-21

10 Stack Street – West Elevation

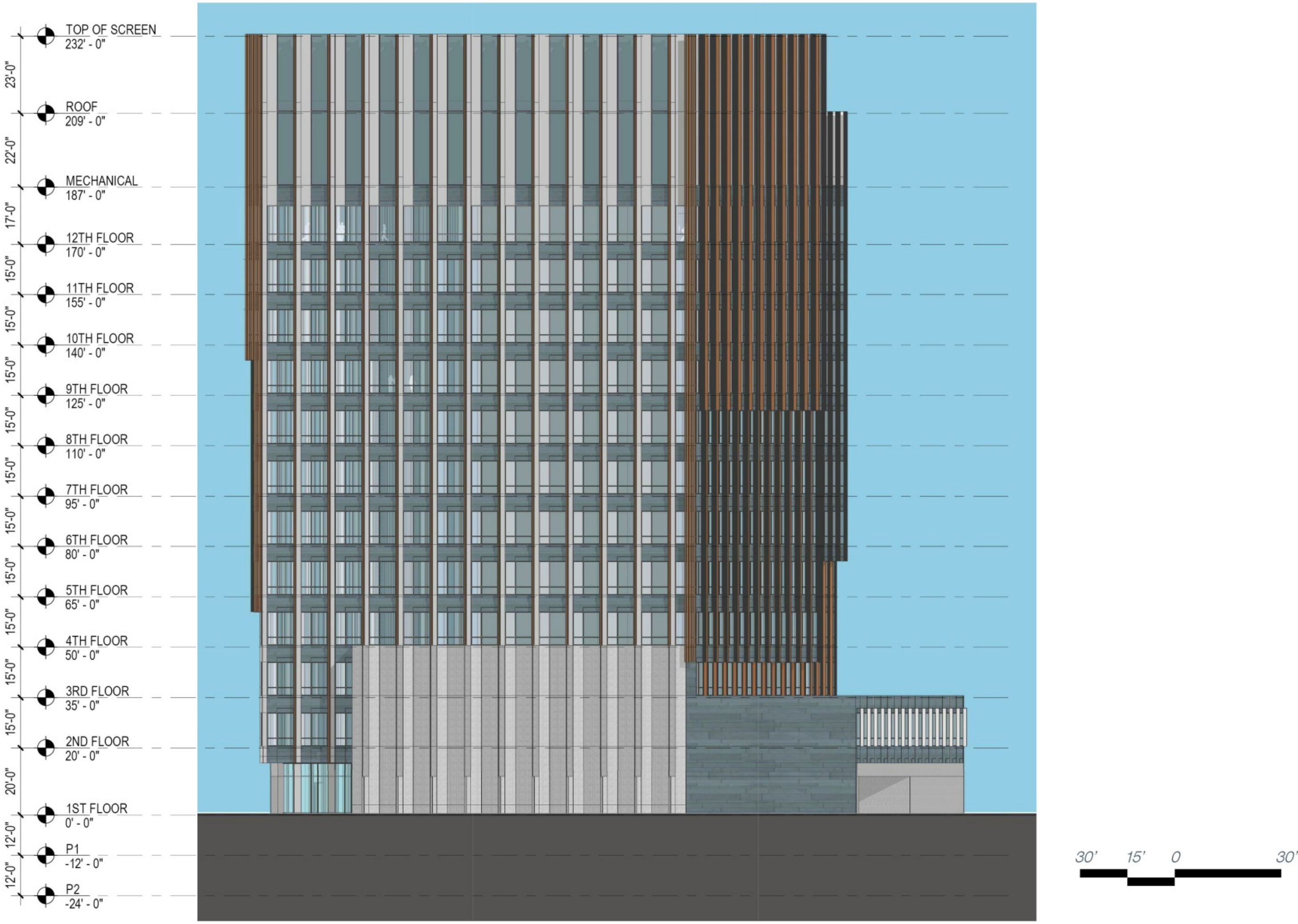


Figure 1-22

10 Stack Street – North Elevation

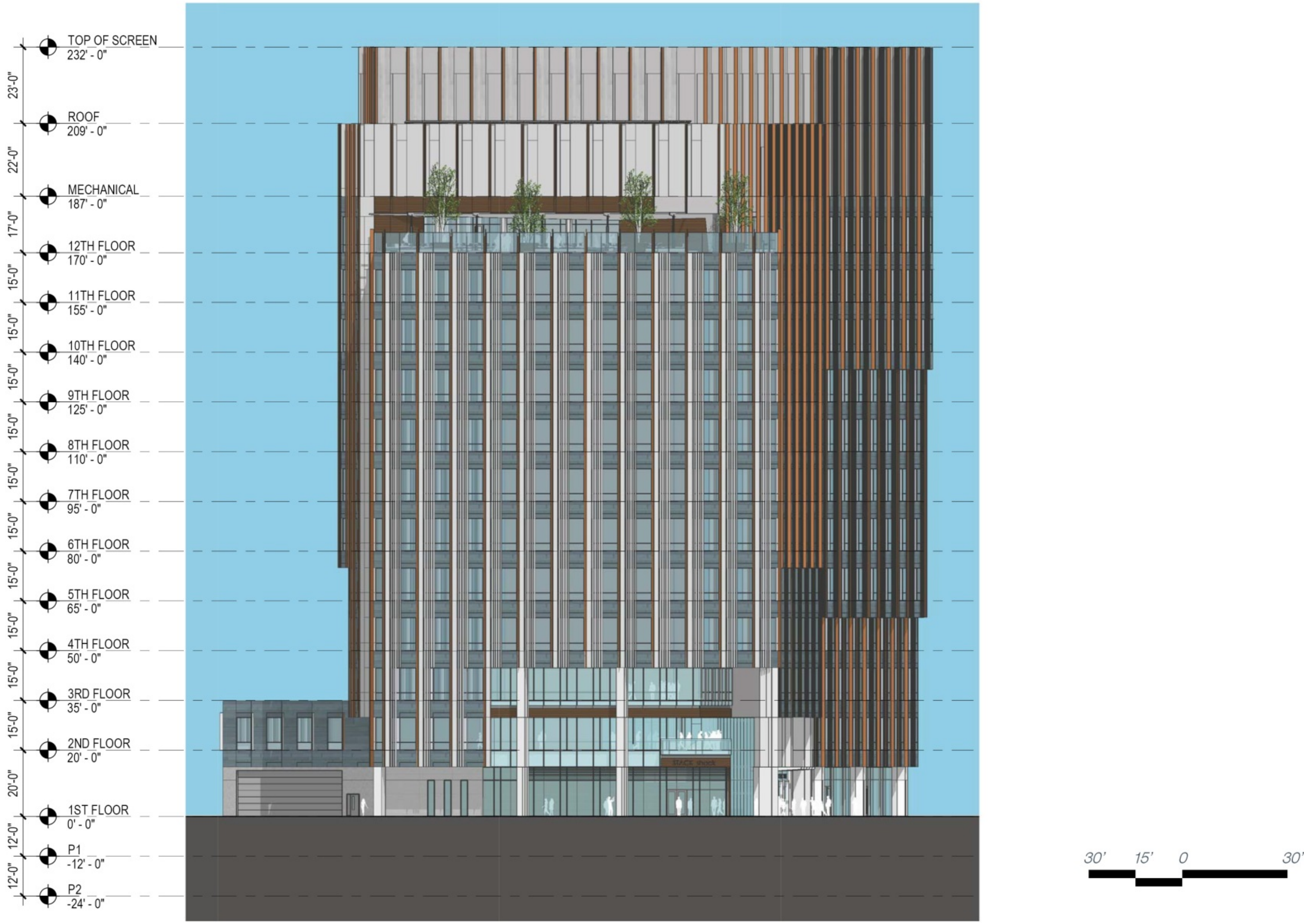


Figure 1-23

10 Stack Street – South Elevation

approaches. The lower floors include above grade parking levels intended to be integrated into facades of office floors above. Service and Parking entrances will be placed along west property line service alley so that most of street face along both Stack and Supertest Streets can be activated.

25 Supertest Street

This building is positioned to hold the street edge at extension of Stack Street to D Street as well as frame the west edge of the proposed Hood Green open space. This building is proposed as a hotel use and includes restaurant or other gathering space taking advantage of the open and accessible position within Hood Park where pedestrian and bicycle access

from Spice Street and D Street are anticipated. The building will also have frontages on both Supertest Street as well as Stack Street and its hospitality functions and primary lobby entrance will participate with other building entrances fronting this street intersection.

15 Supertest Street

The proposed 15 Supertest Street building is a single-story structure facing Rutherford Avenue also accessible from a portal to the Hood Green on the opposite side. This building is intended to create an active retail edge that has presence toward the Charlestown neighborhood, also serving as gateway building inviting patrons and residents to the open space within Hood Park. As such, the retail tenants of the building may participate with customers accessing their business(es) from both Rutherford Avenue and Hood Green.

Hood Green

Hood Green is an approximately 1-acre proposed new open space located at the intersection of Spice and D Streets. Located along the most direct line between Hood Park and Sullivan Square station, this space will naturally be an active zone at various points throughout the day. However, it is planned to be much more than a pleasant gateway to Hood Park. The Proponent envisions Hood Green as an active park that welcomes the community. The Proponent has been gathering input from the community about what types of programming elements they would like to see. The ideas are both exciting and varied, and it has become clear that community input into the specifics of this space will be vital to its success. For the purposes of this master plan amendment, Hood Green is shown in a general manner to allow this space to truly be shaped by community input. [

1.5.3 Access Circulation and Parking

Roadway Network

A privately-owned but open to public use internal roadway network will be developed as part of the Proposed Project. These new private roadways are proposed to be built to City of Boston standards and will comply with the Boston Complete Streets guidelines. This new roadway system is designed to give priority to pedestrians and bicyclists while providing an internal circulation loop for vehicles within Hood Park. The layout of the proposed roadways are depicted on Figures 1-24 (Primary Streets, e.g., Hood Park Drive) and 1-25 (Secondary Streets, e.g., Half Pint Way) Plazas and roadways are designed to make connections to the emerging neighborhood to the north and the plan anticipates future connections to potential developments to the west and south. Where possible, service and parking entrances are located away from the primary streets which are Hood Park Drive, Stack Street, and Supertest Street, as shown on Figure 1-25.

Access

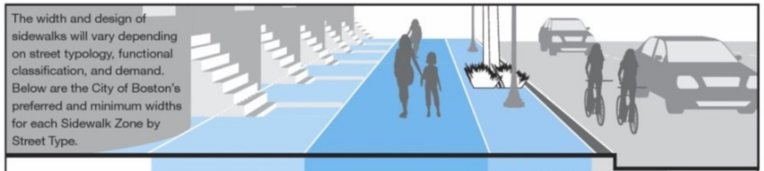
The Proponent will fund a new intersection at the intersection of Hood Park Drive, Rutherford Avenue, and Baldwin Street as part of the Proposed Project which will be constructed concurrently with the Rutherford Avenue improvements being constructed by the City of Boston. This new intersection will allow northbound Rutherford Avenue traffic to turn left to enter Hood Park and allow vehicles exiting Hood Park to turn left onto Rutherford Avenue northbound. Vehicles will also be able to cross from Baldwin Street to Hood Park Drive, but given Baldwin Street's one-way configuration, vehicles will not be permitted utilize Baldwin Street as a shortcut into the residential neighborhood streets. This restriction of flow into the residential neighborhood is an important priority of the community.

The existing curb cut to the north of the existing 500 Rutherford Avenue building will remain and will provide access to the northern portion of the site. This access point will only allow right turns onto Rutherford Avenue southbound and right turns from Rutherford Avenue onto the new Supertest Street.

A third vehicular access point will be located at the intersection of Stack and D Street on the northern boundary of the Project Site. This intersection and vehicular access will be subject to review and coordination with Massport, MassDOT and the Federal Rail Administration as it requires crossing the currently unutilized rail corridor serving the Charlestown waterfront to the east of Main Street.

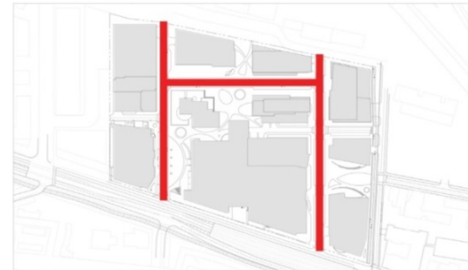
Pedestrians will be able to access Hood Park at each of the above intersections and at a the proposed Hood Green open space located at the southern terminus of Spice Street (described in the preceding section). This plaza will be designed to provide active landscaped space, outdoor dining, and a pedestrian connection between Hood Park and Sullivan Square station via the newly reconstructed Spice Street.

All internal roadways in Hood Park will have dedicated bicycle lanes and the Rutherford Avenue intersections will connect to the proposed future bike and pedestrian linear park along the east side of Rutherford Avenue. A dedicated pedestrian and bicycle corridor is proposed to run along the entire length of the northern property line to provide safe bicycle and pedestrian passage along D Street, while maintaining a workable right of way for the

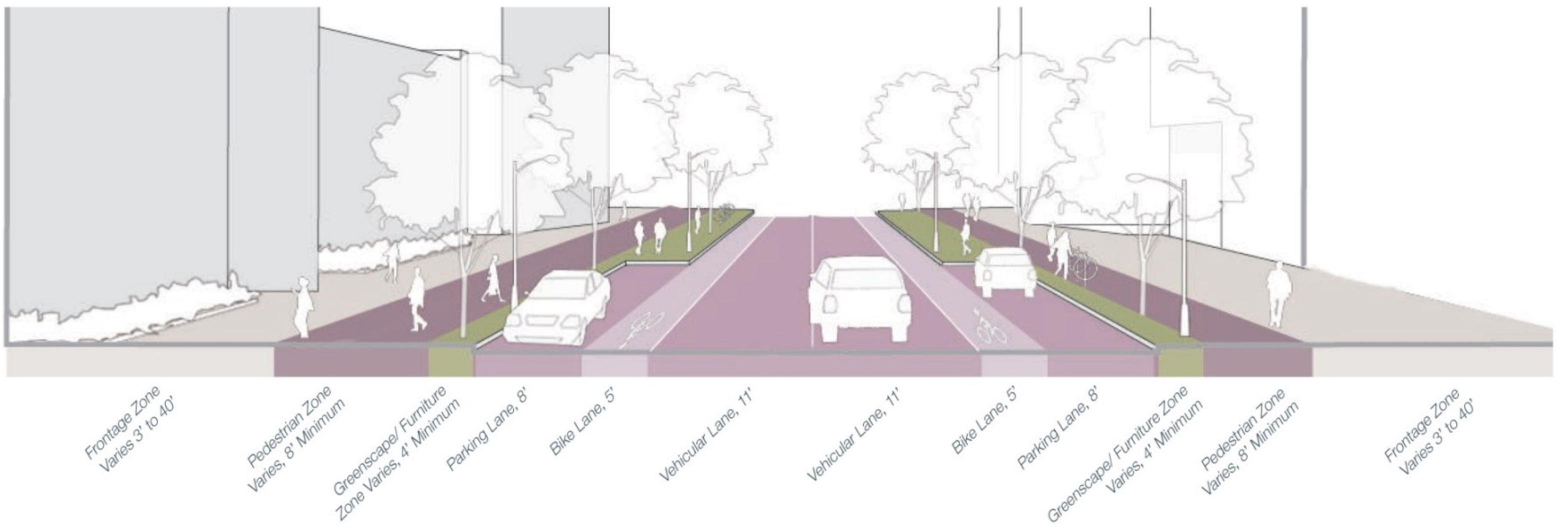


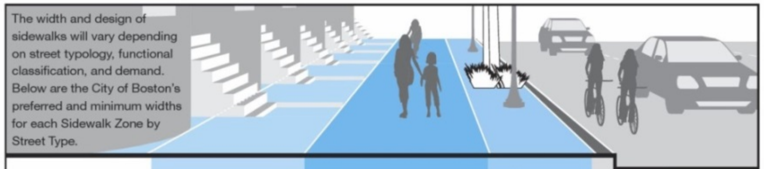
Street Type	Frontage Zone		Pedestrian Zone*		Greenscape/ Furnishing Zone		Curb Zone	Total Width	
	Preferred	Minimum	Preferred	Minimum	Preferred	Minimum		Preferred	Minimum
Downtown Commercial	2'	0'	12'	8'	6'	1'-6"	6"	20'-6"	10'
Downtown Mixed-Use	2'	0'	10'	8'	6'	1'-6"	6"	18'-6"	10'
Neighborhood Main	2'	0'	8'	5'	6'	1'-6"	6"	16'-6"	7'
Neighborhood Connector	2'	0'	8'	5' (4')*	5'	1'-6"	6"	15'-6"	7'
Neighborhood Residential	2'	0'	5'	5' (4')*	4'	1'-6"	6"	11'-6"	7'

Excerpt from Boston Complete Streets Guidelines



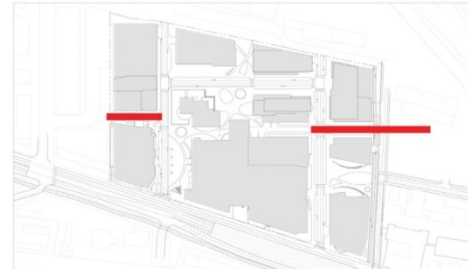
Primary Streets Plan





Street Type	Frontage Zone		Pedestrian Zone*		Greenscape/ Furnishing Zone		Curb Zone	Total Width	
	Preferred	Minimum	Preferred	Minimum	Preferred	Minimum		Preferred	Minimum
Downtown Commercial	2'	0'	12'	8'	6'	1'-6"	6"	20'-6"	10'
Downtown Mixed-Use	2'	0'	10'	8'	6'	1'-6"	6"	18'-6"	10'
Neighborhood Main	2'	0'	8'	5'	6'	1'-6"	6"	16'-6"	7'
Neighborhood Connector	2'	0'	8'	5' (4')*	5'	1'-6"	6"	15'-6"	7'
Neighborhood Residential	2'	0'	5'	5' (4')*	4'	1'-6"	6"	11'-6"	7'

Excerpt from Boston Complete Streets Guidelines



Secondary Streets Plan

Figure 1-25

Typical Street Sections – Secondary Streets

Massport rail line. This path will have the ability to form a connection to pathways that are planned as part of the Inner Belt Master Plan to the west and the shared-use path on Rutherford Avenue. The details of these components will be further developed in conjunction with BTD, the BPDA and Massport to ensure consistency with good urban design and transportation standards.

Parking

The Proposed Project will replace the currently-existing surface parking lots with structured parking facilities integrated into the proposed buildings, as summarized in Table 1-2. Access to parking garages will generally be from the smaller streets within the Park as shown on Figure 1-26. With a proposed 912 parking spaces, 100 Hood Park Drive will be the primary parking garage for the public, visitors to Hood Park, and patrons of the retail establishments and restaurants. Parking and Revenue Control ("PARC") systems will be utilized to manage the various users of the garage and accommodate validations, Hood Park tenants and residents, and cash transactions. The garage will be able to accommodate both pay-on-exit or pay-on-entry to reduce exit durations during times of high throughput. Parking access to the building will be from Half Pint Way and Hood Park Drive.

The Proponent will open the garage to residents, at no cost, during snow emergencies and offer limited below-market rate overnight parking to residents of Charlestown on a first-come first-served basis as capacity and demand warrant, after accommodating all Hood Park users and uses.

The remainder of the spaces will be included in the separate projects in structured above or below grade garages to be used only by building tenants and guests. Approximately 125 on-street parking spaces will be available for public use. Table 1-2 shows the location of parking within Hood Park. Hood Park is not in the City of Boston's Parking Freeze zone.

1.5.4 Open Space

As can be seen on the Open Space Plan (Figure 1-27), the Proposed Project includes several notable new publicly accessible open and green spaces. These spaces are vital resources for the users and guests of Hood Park. They will bolster retail establishments, serve as a back yard to residents, and provide a place for employees of businesses within Hood Park to take a break for an outdoor lunch or after-work enjoyment. These spaces are a tremendous opportunity for active programming such as exercise classes, food festivals, farmers' markets, concerts, beer gardens, splash pads, or a skating rink. Each of these spaces will be privately funded, maintained, and operated. The open spaces are described in detail in Section 5.4.

Hood Park Master Plan **Boston, Massachusetts**

ELKUS | MANFREDI HOOD PARK SMMA

Figure 1-26

Parking and Service Access

Hood Park Master Plan **Boston, Massachusetts**

ELKUS | MANFREDI HOOD PARK SMMA

Figure 1-27
Open Space Plan

1.6 Public Benefits

The reimagining of Hood Park will generate myriad public benefits for Charlestown and the City of Boston as a whole, both during construction and continuing on into the future once completed and occupied. These public benefits include both the financial benefits that will accrue to the city as well urban design/public realm improvements that will benefit the Charlestown neighborhood.

1.6.1 Financial Benefits

The development of Hood Park will help to create an economic engine comprising office/laboratory space, a hotel, residential, and retail amenities will result in significant financial benefits to the City of Boston and its residents, including:

- Significant additional real estate tax revenues to the City's General Fund;
- Approximately $10.5 million in housing linkage funds and approximately $2.1 million in jobs linkage funds to the City of Boston.
- The creation of over 3,000 construction jobs over the next 15 years.
- The area of office / lab space created represents approximately 2,500 to 3,500 employees with an additional 250 permanent jobs in retail, hospitality and residential projects.
- Up to 130 new hotel rooms in the city that will generate additional sales tax for the City of Boston.

1.6.2 Urban Design Benefits

- Implementation of a truly mixed-use development that includes retail, hotel, lab, and more residential uses to the Park.
- Creation of a new integrated street, bike and pedestrian plan designed to knit the Park into the surrounding neighborhoods.

1.6.3 Transportation and Other Infrastructure Benefits

- Reconstruction of the Hood Park Drive/Rutherford Avenue to create an at-grade pedestrian crossing and both left- and right-turn exits from Hood Park. This location currently lacks these connections due to the current configuration of the Rutherford Avenue underpass.
- Construction of internal roadways will comply with BTD standards and the Boston Complete Streets guidelines. Internal streets will include bicycle lanes in each direction.

- Construction of a dedicated pedestrian and bicycle corridor along the entire length of the northern property line. This pathway will provide safe bicycle and pedestrian passage along D Street, while maintaining a workable right of way for the Massport rail line should rail service ever be reintroduced. This path will be able to connect to pathways that are planned as part of the Inner Belt Master Plan to the west and the shared-use linear park along the east side of Rutherford Avenue.

- Installation and maintenance of a Bluebike Station bicycle sharing system on Hood Park campus. The Bluebike Station or other bicycle sharing system shall be operational or fully funded prior to or upon issuance of a Certificate of Occupancy for the next project within Hood Park, tentatively known as 10 Stack Street Office Building.

- Making improvements to both on-site and off-site infrastructure systems, contributing to the sustainability of the Rutherford Avenue corridor and reducing the environmental impact of Hood Park on the City's water, sewer, stormwater, and energy delivery systems. This includes relocating current electric and tele/data service lines mounted on poles into concrete duct-banks to reduce potential storm interruptions due to downed wires and new water service mains, meters and loops through campus to provide redundancy in water and fire protection services.

1.6.4 Sustainability Benefits

- Regrading and raising of the entire 20-acre Park by approximately three feet from base elevation 17 to base elevation 20, representing a significant improvement in the resiliency of the campus during storm and flood events as it elevates the park to the newer high storm surge elevation level recommended by the City of Boston.

- Construction of climate resilient, energy-efficient "green" buildings. All new buildings will be built so as to be LEED Silver certifiable or better. The Harvey residential building is being built as LEED Platinum and anticipates receiving certification, and the 100 Hood Park Drive Garage building is being constructed as LEED Silver Certifiable and in accordance with ParkSMART standards.

1.6.5 Other Community Benefits

- Creation of new housing to meet the City of Boston's goal to create 53,000 new housing units in the city by 2030 through the addition of approximately 200 residential units, including on-site affordable units complying with the City of Boston's Inclusionary Development Policy.

- Providing free vehicle parking in the garage to Charlestown residents during local snow emergencies.

- Contributing $48,000 to support public realm improvements in Charlestown or other neighborhood based initiatives (payable to the Boston Planning & Development Agency upon the execution of a lease(s) for at least fifty (50%) of the retail space within the Proposed Project).

- Allocation of 4,000 square-feet of ground floor space within the Harvey, currently under construction, at no cost to the City of Boston or the non-profit community in Charlestown, for a term of ten years, for community programming in conjunction with Bunker Hill Community College, Cambridge College and the business employers on the Hood Park campus. The specific dollar values and level of required commitment for meaningful programming and engagement will be determined through the permitting and community engagement process.

1.7 Zoning Information

The Project Site is located within the Charlestown Neighborhood District in the Local Industrial (LI) Subdistrict, which is governed by Article 62 of the Boston Zoning Code. Planned Development Areas are allowed within the LI Subdistrict, provided that the total FAR at the Site does not exceed 2.0 and that the heights of the structures are no higher than 75′ along Rutherford Ave. and no higher than 115′ west of a line 300′ parallel to the westerly sideline of Rutherford Ave. and 400′ south of the southerly sideline of Cambridge Street. As set forth above, in 2001 the Site was designated as Planned Development Area No. 51 pursuant to the PDA Master Plan in accordance with the provisions of Article 3, Article 62, and Article 80C of the Code. The Site satisfies the five-acre requirement for a Master Plan PDA contained in Section 3-1A(a) of the Code.

An Amended and Restated Master Plan will be submitted to be reviewed and approved by the BPDA, the Boston Zoning Commission, and the Mayor pursuant the provisions of Article 62 and Article 80C of the Code. The revised densities, dimensions, uses, appearance, landscaping and other matters for the structures included in the Amended and Restated Master Plan are set forth and further described in this Notice of Project Change. It is contemplated that an amendment to Article 62 will be approved that would allow the height limit 300′ west of Rutherford Ave. to be increased from 115 feet to approximately 275 feet to allow for the revised locations of the proposed structures and the significant open space, landscaping and street layout improvements as further described in this Notice of Project Change.

A PDA Development Plan will also be submitted to allow for the construction of the new building at 10 Stack Street. This building will total approximately 365,000 sf and will be used for office, laboratory, and research and development uses (± 360,000 sf), with approximately 15,000 sf of ground floor retail use. The dimensions and design features of 10 Stack Street are further described above in Section 1.5.2.

1.8 Legal Information

1.8.1 Legal Judgements Adverse to the Propose Project

There are no legal judgments affecting the Project Site.

1.8.2 History of Tax Arrears on the Project Site

Property taxes are paid when due, and the Proponent owes no outstanding unpaid taxes or other fees.

1.8.3 Site Control and Public Easements

The Site is owned by Hood Park LLC pursuant to the Quitclaim Deed dated December 17, 1997 recorded with the Suffolk Registry of Deeds in Book 22016, Page 128 and noted on Certificate of Title No. 112697 in Book 559, Page 97 on file with the Suffolk Registry District of the Land Court. There are easements for utilities serving the buildings on the Site that affect portions of the Site. A survey for the Project Site is included in Appendix A.

1.9 Anticipated Permits

Table 1.9-1 presents a preliminary list of local, state, and federal permits and approvals that may be required for the Proposed Project. The list is based on current information about the Proposed Project and is subject to change as the design of the Project advances. Some of the permits listed may not be required, while there may be others not listed that will be needed.

Table 1-3 Preliminary List of Permits and Approvals

Agency	Approval
Boston	
Boston Planning and Development Agency	Article 80B-Large Project Review Certification of Compliance Certification of Consistency Development Impact Project Agreement(s) Cooperation Agreement(s) Affordable Housing Agreement(s)
Interagency Green Building Committee	Article 37 Green Building Compliance Review
Boston Zoning Commission	Amended and Restated PDA Master Plan Approval PDA Development Plan Approvals
Boston Civic Design Commission	Design Review
Boston Landmarks Commission	Article 85 Demolition Delay Review

Table 1-3 Preliminary List of Permits and Approvals (Continued)

Agency	Approval
Boston Water and Sewer Commission	Site Plan Review Water and Sewer Connection permits Construction Dewatering Permits Cross Connection Backflow Prevention
Public Improvement Commission	Specific Repairs/Discontinuance (if required) Layout of Private Ways
Boston Transportation Department	Transportation Access Plan Agreement Construction Management Plan
Boston Public Works Department	Curb Cut Permit(s)
Boston Public Safety Commission	Permit to Erect and Maintain a Parking Structure
Joint Committee on Licenses	Flammable Storage License
Boston Inspectional Services Department	Demolition/Building Permits/Occupancy Permit
State	
Executive Office of Energy and Environmental Affairs	Massachusetts Environmental Policy Act Review Public Benefits Determination
Department of Transportation	Consent for issuance of a building permit to the Commissioner of the City of Boston's Inspectional Services Department under Chapter 40, Section 54A
Massachusetts Historical Commission	State Register Review (via the MEPA process)
Department of Environmental Protection	Notice of Demolition/Construction/Fossil Fuel
Massachusetts Port Authority	Railroad Crossing Approvals
Federal	
Federal Aviation Administration	Determination of No Hazard to Air Navigation
Environmental Protection Agency	NPDES Notice of Intent for Construction - Stormwater

1.10 Public Participation

The Proponent has already initiated a comprehensive community outreach process and looks forward to working with neighbors and other stakeholders to develop a project that will strengthen Charlestown through significant urban design and public infrastructure improvements; the creation of new public open space, new retail amenities, considerable financial benefits, and jobs.

The Proposed Project is in the early stages of the Article 80B public review process. The Proponent has met periodically with BPDA staff and the staff of other City Departments to review specific aspects of the development proposal in advance of this filing, which begins the Proposed Project's formal Article 80 public review process.

The Proponent looks forward to working with the Impact Advisory Group to review and provide input on the Proposed Project, and expects that the IAG will be an important forum for community review and comment. Table 1.10-1 lists the meetings that the Proponent has already had with various community groups in 2018.

Table 1-4 Hood Park Community Meetings

Meeting Date	Forum
February 13	Hood Park Future Planning Community Presentation
March 8	Community Meeting
March 12	BPDA Community Meeting (Zoning & Height)
April 3	Charlestown Neighborhood Council Presentation
April 11	Massport Meeting / Presentation
April 11	Boston Zoning Commission
May 10	Councilor At Large Pressley Site Visit
May 16	Community Meeting
May 21	Charlestown Preservation Society Design Review Meeting
May 30	Community Design Charrette 1
June 5	Charlestown Neighborhood Council Presentation
June 6	Charlestown Mothers Association Presentation / Tour
June 16	City Councilor Edwards Presentation / Tour
June 18	Congressman Capuano Presentation / Tour
June 23	Community Design Charrette 2
June 27	Community Event / Presentation
July 18	ULI Presentation / Tour
August 15	Massport Working Session / Meeting
September 12	Community Meeting / Presentation
September 15	Community Meeting / Event on Campus

The Proponent has commenced a series of design charrettes in the Charlestown neighborhood to determine the types, location, and configuration of open space and programming most needed in the community. Assuming the Charlestown community is supportive of substantial open space at Hood Park, the Proponent anticipates a coordinated effort with the Boston Planning and Development Agency, City of Boston Parks Department, and related City and State Agencies to coordinate the open space planning for Hood with Ryan Playground and proposed Sullivan Square Redevelopment Parcel A, currently proposed for open space uses.

1.11 Project Schedule

The Proposed Project is generally expected to proceed clockwise from the southeast corner. This phased redevelopment plan starts with the current construction efforts at 480 Rutherford, slated for occupancy in May 2019 and 100 Hood Park Drive slated for vehicle parking usage in August of 2019. Subsequent development will proceed with the office / lab uses at 10 Stack Street, and include the open green space surrounding the Power House building and the new entry drop-off at 500 Rutherford Avenue. Along with the utility, private street, intersection work at Rutherford Avenue (as part of the Rutherford Avenue corridor redesign) and pedestrian connections, these first phases will complete all construction work at the southern third of Hood Park. Subsequent phases will include additional passive and active landscaped spaces and the multi-modal transportation link at the northern boundary of the park, connecting to Spice and D Streets. Specific phasing of the remaining built components will be determined, on an ongoing basis in accordance with market demand and the evolution of traffic and access at the northern portions of the park. Full build out is expected to take approximately 15 years. See Figure 1-28 for the Phasing Diagrams for the Proposed Project.

1.12 Summary of Impacts

Hood Park, as an overall phased development project and on a building by building basis, is committed to achieving the highest levels of sustainability and resiliency practicable. This is reflected in the design for the Harvey residential building currently in construction which will be a LEED Platinum project and the 100 Hood Park parking garage project is being designed as LEED Silver and compliant with ParkSMART standards for garage construction and operations. The Project team is committed to a minimum of LEED Silver for all new construction office, retail and lab projects with a goal of LEED Gold for at least half of the commercial buildings proposed. Further, the developer is committed to achieving LEED Platinum for all residential buildings on campus and LEED Gold for all retail buildings.

Hood Park is also committed to developing a resilient project that anticipates some of the possible effects of climate change. As such, the Project includes elevating the campus above the BPDA Sea Level Rise Floor Hazard elevation of 20 feet (current campus elevation average is 16.5 feet). This elevation increase will result in the campus being above the sea level rise floor elevation in a critically low area of the Charlestown neighborhood and will further assist in prevention of flooding upstream at those areas south and west of the campus which remain below flood elevation levels. As part of the overall sustainability and resiliency approach Hood Park has sought to meet or exceed the requirements in a broad array of sustainability categories from transportation access to water reduction, energy efficiency and similar sustainable categories identified in the LEED checklist.

This section summarizes the key findings with regard to the Project's expected impacts.

1.12.1 Transportation

Being proximate to both the Sullivan Square and Community College Stations on the MBTA Orange Line, as well as numerous bus routes, the Proposed Project is very well situated to take advantage of public transportation.

The Project is expected to generate approximately 6,490 vehicle trips per day, including 539 in the morning peak hour and 613 during the evening peak hour.

Based on the transportation analysis, the Project will have relatively modest traffic impacts to the study area intersections. Nearby planned developments, other than the Project, will increase future background traffic volumes but will also institute infrastructure elements that will improve area transit and roadway conditions.

Hood Park Master Plan **Boston, Massachusetts**

Figure 1-28

Phasing Diagrams

The additional traffic from the Project will not cause a significant change in level of service. Project impacts will vary depending on the scope and timing of future improvements to be implemented by Encore Casino and/or Boston Transportation Department (BTD). The Proponent is committed to implementing Transportation Demand Management (TDM) measures to further reduce single occupancy vehicles (SOV) and encourage the use of other modes of transportation such as public transit.

The Proponent will also fund a new intersection at the intersection of Hood Park Drive, Rutherford Avenue, and Baldwin Street as part of the Proposed Project which will be constructed concurrently with the Rutherford Avenue improvements being constructed by the City of Boston. This new intersection will allow northbound Rutherford Avenue traffic to turn left to enter Hood Park and allow vehicles exiting Hood Park to turn left onto Rutherford Avenue northbound.

All new roadways within the Park will be built to City of Boston standards and will comply with the Boston Complete Streets guidelines. The new roadways are designed to give priority to pedestrians and bicyclists to promote those modes. The Project also includes a a dedicated 20' wide pedestrian and bicycle corridor along the entire length of the northern property line. This pathway is intended to provide safe bicycle and pedestrian passage along D Street, while maintaining a workable right of way for the MassPort rail line.

1.12.2 Architectural Impacts – Wind, Shadow, Daylight

The Proponent has studied the potential wind, shadow, and daylight impacts of the Proposed Project.

With the addition of the proposed development, conditions are expected to remain generally unchanged around the outskirts of the site. However, the preliminary wind tunnel testing does currently predict some "dangerous" level wind locations being created within confined the northwest corner of the Park. The Proponent fully expects that as more specific designs for the buildings are advanced and mitigation measures incorporated into the testing (e.g., refinements to the building massing, use of canopies, landscaping, etc.) that these impacts will be mitigated such that the dangerous conditions are eliminated. The Proponent will continue to test and is committed to addressing wind issues during future design phases.

Shadow impacts are expected to be minor. The shadow study shows that new shadow will mainly be cast across portions of the Project site and nearby streets and sidewalks. Among the times studies, the Project's proposed open space will be free of shadow, with the exception of December 21. No new shadow will fall on an existing open space.

Daylight impacts were studied using the BPDA's BRADA program. The study indicates that expected daylight obstruction values are consistent with the surrounding area and similarly developed areas around Boston, as shown by the area context viewpoints.

1.12.3 Infrastructure

The Project Site is well served by existing infrastructure within Rutherford Avenue and the Proponent does not anticipate any unusual challenges related to water and sewer. New utility infrastructure is currently under construction as part of the Harvey (480 Rutherford Avenue, aka 50 Hood Park Drive) and 100 Hood Park Drive garage projects.

The Project will fully comply with the Boston Water and Sewer Commission's (BSWC) requirements for the management of stormwater and will infiltrate an amount equal to one inch of rainfall over the entire site. As stated above, the Project includes raising the base elevation of the campus above the BPDA Sea Level Rise Floor Hazard elevation of 20 feet.

As part of the ongoing commitment to sustainable and resilient development Hood Park is committed to meeting many of the BPDA's recommended Smart Utility Technology goals for projects at or above 1.5 million square feet of floor area.

1.12.4 Geotechnical

Testing conducted to date at a portion of the Project Site indicates that historic releases of oil and hazardous material have occurred. Materials excavated during construction of the Project will be managed in accordance with all applicable regulatory requirements including Release Abatement Measure (RAM) Plans prepared for construction of the proposed buildings under the MCP. The RAM Plan for 100 Hood Park Drive and the RAM Plan for 480 Rutherford Avenue are designed to be coordinated with each other to allow for the on-site reuse of suitable existing materials between the projects. Remedial activities conducted under the RAM Plans in conjunction with project construction are expected to result in achievement of a Permanent Solution under the MCP.

The designs for proposed building foundations have not been finalized, but based on preliminary/available subsurface information, the various structures will require support beneath the fill and organic deposits, and into suitable bearing soils. The Proponent is currently evaluating the potential for below-grade levels that would allow certain buildings to "float" and bear on the intermediate Marine or Glaciomarine Deposits. Other buildings may utilize ground improvement bearing in the same intermediate stratigraphy to enable shallow foundation construction (without below-grade space). Taller buildings with greater structure demands may require deep foundations (e.g. end-bearing piles, drilled shafts) terminating in the underlying glacial till and/or bedrock.

1.12.5 Solid and Hazardous Wastes

The Project will generate solid waste typical of residential, office and hotel uses. Solid waste is expected to include wastepaper, cardboard, glass bottles and food. Based on commonly used formulas for estimating solid waste generation, the Project is expected to generate approximately 2,615 tons of solid waste per year. The Project will include a recycling program in accordance with LEED standards.

With the exception of household hazardous wastes typical of hotel and residential developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials. Tenants generating laboratory wastes will be responsible for establishing programs for their safe handling and disposal in accordance with applicable regulations.

1.12.6 Air and Noise

A mesoscale air quality analysis has been done to assess the potential for pollution resulting from the increase in traffic resulting from the Project. The study indicates increases of five percent in VOC and NOx emissions for the 2026 Build condition relative to the 2026 No-Build condition; however, the actual increase in emissions is well less than one ton per year of each pollutant.

1.12.8 Historic Resources

The Project Site is located in the Charlestown B&M Railroad Industrial Survey Area (BOS.RL) and adjacent to several properties listed in the State and National Registers of Historic Places and included in the Inventory, including the Middlesex Canal Historic and Archaeological National Register District which includes several non-contributing buildings at 480 Rutherford Avenue (BOS.13986 & BOS.13987), the former H.P. Hood and Son Milk Company at 500 Rutherford Avenue (BOS.12853), the Rosev Dairy at 420-438 Rutherford Avenue (BOS.12852) and the Middlesex Canal (BOS.9729, demolished).

The Project is not expected to have any significant impact on historic resources located near Hood Park.

Chapter 2.0

Transportation

2.0 TRANSPORTATION

The Proponent engaged Howard Stein Hudson (HSH) to conduct an evaluation of the transportation impacts of the Project in the Charlestown neighborhood of Boston, Massachusetts. This Notice of Project Change (NPC) transportation study focuses on the traffic impacts associated with the net change in the proposed Project program, and includes an assessment of existing conditions and future conditions.

2.1 Project Description

The site has been approved for redevelopment since 2001. The most recent PDA calls for 1,001,515 square feet of office space (including 443,750 square feet of existing occupied office space and 557,765 square feet of new office space), 177 residential apartments, and approximately 10,000 square feet of retail space.

The Proposed Project includes redefining the remaining buildings of the previously approved PDA in 2016. Table 2-1 shows the breakdown of land uses and square footage by building.

Table 2-1 Development Program by Building

Location	Land Use (sf)				Total
	Office	Retail	Residential	Hotel	
100 Hood Park Drive	221,200	24,000	-	-	245,200
10 Stack Street	350,000	15,000	-	-	365,000
15 Stack Street	-	12,000	-	-	12,000
30 Stack Street	105,000	5,000	-	-	110,000
35 Supertest Street	331,000	7,500	-	-	338,500
50 Hood Park Drive	-	10,000	157,000	-	167,000
500 Rutherford Avenue	368,750	-	-	-	368,750
45 Stack Street	-	6,050	-	-	6,050
25 Supertest Street	-	2,500	-	86,000	88,500
510 Rutherford Avenue	24,800	10,000	-	-	34,800
	1,400,750	**92,050**	**157,000**	**86,000**	**1,735,800**

The entire NPC Project contains approximately 1.74 million square feet of development. Some of this square footage consists of existing office space, previously permitted but not constructed office space, and under construction residential and retail space. The NPC transportation study assesses the impacts of the increased square footage compared to the current PDA building program. Table 2-2 summarizes the NPC Project development by use.

Table 2-2 NPC Project Building Program for Transportation Analysis

Land Use	Existing	Permitted (No-Build)	NPC Project Increase	NPC Project (Build)
Retail	0	34,000	58,050	92,050
Office	368,750	221,200	810,800	1,400,750
Residential	0	157,000		157,000
Hotel	0	0	86,000	86,000
Total (sf)	**368,750**	**412,200**	**954,850**	**1,735,800**

2.1.1 Study Area

The transportation study area runs along the Rutherford Street corridor, bounded by Bunker Hill Street at Medford Street and Main Street to the east, Cambridge Street at the I-93 NB off-ramp to the west, Beacham Street at Main Street to the north, and Rutherford Avenue at Austin Street to the south. The study area consists of the following 15 intersections in the vicinity of the Project Site, also shown on Figure 2-1:

- Rutherford Avenue/Austin Street (signalized);
- Cambridge Street/I-93 NB off-ramp (signalized);
- Sullivan Square Rotary (unsignalized);
- Maffa Way/Cambridge Street/Alford Street (signalized);
- Cambridge Street/Spice Street/MBTA Driveway (unsignalized);
- Main Street/Beacham Street (unsignalized);
- Maffa Way/Beacham Street/MBTA Driveway (unsignalized);
- Main Street/Bunker Hill Street/Medford Street (unsignalized);
- Mishawum Street/Main Street (unsignalized);
- Rutherford Avenue/Mishawum Street (unsignalized);
- Rutherford Avenue/Baldwin Street (unsignalized);
- Rutherford Avenue/Essex Street (unsignalized)
- Rutherford Avenue/Bunker Hill Industrial Park Drive (unsignalized);
- Rutherford Avenue/Hood Park Drive (unsignalized);
- Rutherford Avenue/D Street (unsignalized).

2.1.2 Study Methodology

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

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

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. The long-term transportation impacts are evaluated for the year 2026, based on an eight-year horizon from the year of the filing of this traffic study.

The No-Build (2026) Condition analysis includes general background traffic growth, traffic growth associated with specific developments and transportation improvements that are planned in the vicinity of the Project Site. This condition also incorporates the previously approved program as reflected in the 2016 NPC.

The Build (2026) Condition analysis includes a net increase in traffic volume due to the addition of Project-generated trip estimates to the traffic volume developed as part of the No-Build (2026) Condition analysis. The transportation study identified expected roadway, parking, transit, pedestrian, and bicycle accommodations, as well as loading capabilities and deficiencies. This condition will study two different roadway geometries.

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

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

2.2 Existing Condition

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

2.2.1 Existing Roadway Conditions

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

Hood Park Master Plan **Boston, Massachusetts**

HOWARD STEIN HUDSON
Engineers + Planners

Figure 2-1
Study Area

Rutherford Avenue is a pair of 1-way, predominantly 2-lane roadways, the southbound direction of which is adjacent to the east side of the Project site. Rutherford Avenue runs in a predominately north-south direction, beginning at the Sullivan Square rotary and runs parallel to Route 99 for approximately one half mile until it merges with Route 99. Rutherford Avenue is classified as an urban principal arterial under the jurisdiction of The City of Boston. On-street parking is not permitted anywhere along Rutherford Avenue.

Austin Street is a 2-way, primarily 2-lane roadway located south of the Project site that runs in a predominately east-west direction between Main Street to the east and the west end of the Gilmore Bridge where Austin Street becomes Charlestown Avenue. Approximately 950 feet of Austin Street from Main Street to Rutherford Avenue is classified as an urban minor arterial under BTD jurisdiction. The remaining 1,200 feet is classified as an urban principal arterial under the jurisdiction of The City of Boston. On-street parking exists along both sides of the roadway between Rutherford Avenue and Main Street. Sidewalks are provided on both sides of Austin Street from Main Street to Rutherford Avenue and along the north side of Austin Street from Rutherford Avenue through its merge with Charlestown Avenue.

Bunker Hill Industrial Park Drive is a 2-way, 2-lane roadway adjacent to the west side of the Project site as well as south of the Project site. Bunker Hill Industrial Park Drive runs in a north-south direction from D Street to the north for approximately 1,400 feet until it turns east and runs approximately 820 feet to its intersection with Rutherford Avenue. Bunker Hill Industrial Park Drive is a local/commercial roadway that is not under any official jurisdiction. There is no on-street parking permitted anywhere along Bunker Hill Industrial Park Drive.

Essex Street is a 1-way, 1-lane roadway located east of the Project site that runs in an westbound direction between Main Street to the east and Rutherford Avenue to the west. Essex Street is a local road under the jurisdiction of the City of Boston. On-street parking and sidewalks exist along both sides of the roadway.

D Street (north side) is a 2-way, 2-lane roadway adjacent to the north side of the Project site that travels in an east-west direction for approximately 800 feet from Rutherford Avenue. D Street is part of a Massport-owned right-of-way adjacent to a rail line and dead ends at private driveways serving MassDOT and Boston Sand and Gravel service roads near the Project Site northwest corner. D Street is a local/commercial roadway that is under BTD jurisdiction. There is no on-street parking permitted anywhere along D Street, though unregulated parking occurs along both sides of D Street and on top of the unused adjacent rail line

Hood Business Park Driveway (D Street) is a 2-way, 2-lane roadway adjacent to the south side of the Project Site that travels in an east-west direction through the old gate for approximately 480 feet from Rutherford Avenue, before turning north and exiting at the north edge of the Project Site. There is no on-street parking permitted anywhere along the roadway. Sidewalks are provided only along the north side of the roadway.

Baldwin Street is a 1-way, 1-lane roadway located east of the Project site that runs in a westbound direction between Bunker Hill Street to the northeast and Rutherford Avenue to the southwest and a westbound direction between Bunker Hill Street to the southwest and Medford Street to the northeast. Baldwin Street is a local roadway that is under the jurisdiction of the City of Boston. On-street parking and sidewalks are provided along both sides of Baldwin Street.

Mishawum Street is a 2-way, 2-lane roadway to the northeast of the Project site that runs in an east-west direction between Main Street to the east and Rutherford Avenue to the west. Mishawum Street is a local roadway under the jurisdiction of the City of Boston. Parking is restricted and sidewalks are provided along both sides of the roadway.

Bunker Hill Street is a 2-way, 2-lane roadway located northeast of the Project site that runs in a predominately east-west direction between its connection with Lowney Way to the east and its intersection with Main Street and Medford Street to the west. Bunker Hill Street is classified as an urban minor arterial under the jurisdiction of the City of Boston. On-street parking exists along the majority of both sides of the roadway, with a five minute idling limit along the south side of the roadway after its intersection with Tufts Street and Vine Street. Sidewalks are provided on both sides of Bunker Hill Street.

Main Street is primarily a 2-way, 2-lane roadway located northeast of the Project site that runs in a predominately north-south direction between its connection with Mystic Avenue in the north and its intersection with Austin Street and Green Street in the south. Main Street continues as a 1-way2-lane roadway on the west side of Sullivan Square and as a one-way single-lane roadway after its intersection with Austin Street and Green Street until its intersection with City Square to the south. Main Street is classified as an urban minor arterial under the jurisdiction of the City of Boston. There is a dedicated bike lane in each direction as well as on-street parking and sidewalks along both sides of the roadway.

Medford Street is a 2-way, 2-lane roadway located to the northeast of the Project site that runs in a predominately north-south direction between Chelsea Street in the south and its intersection with Bunker Hill Street and Main Street in the north. Medford Street is classified as an urban minor arterial under the jurisdiction of the City of Boston. On-street parking and sidewalks exists along both sides of the roadway.

Sullivan Square is a 2-lane rotary, located to the northeast of the Project site that connects Main Street, Alford Street, West Street, Maffa Way, Cambridge Street and Rutherford Avenue. Sullivan Square is classified as an urban principle arterial under the jurisdiction of the City of Boston. A dedicated bike lane exists around the portions of the rotary and on-street parking is restricted along both sides of the roadway. Sidewalks are provided intermittently along the outside edge of the rotary.

Alford Street is a 2-way, 4- lane roadway located to the northeast of the Project site that runs in a predominantly north-south direction between Dexter Street in the east and Sullivan Square in the west. Alford Street is classified as a urban principal arterial under the jurisdiction of the City of Boston. A dedicated bike lane and sidewalks are provided along both sides of the roadway. There is no on-street parking provided along Alford Street.

Maffa Way is a one-way, primarily three lane roadway located to the north of the Project site that runs in the eastbound direction between Sullivan Square to the southeast and its connection with Broadway to the northwest. In addition to the three lanes, there is an approximately 200 foot storage lane for right turns onto Cambridge Street. Maffa Way is classified as an urban principal arterial under the jurisdiction of the City of Boston. 50 feet of on-street parking exists along the south side of the roadway adjacent to the building at 16 Server Street. Sidewalks are provided on both sides of Maffa Way.

Cambridge Street is a 2-way, primarily 2-lane roadway located north of the Project site that runs in a north-south direction between Sullivan Square to the northeast and its intersection with Crescent Street to the southwest. Cambridge Street opens into a 2-way 4-lane roadway southwest of its intersection with the I-93 NB off-ramp. It is classified as an urban principal arterial under the jurisdiction of the City of Boston. A dedicated bike lane and on-street parking exist along both sides of the roadway until the intersection with the I-93 NB off-ramp. Sidewalks are provided on both sides of the street.

Spice Street is a 2-way, 2-lane roadway located north of the Project site that runs in a north-south direction between Cambridge Street to the north and D Street to the south. Spice Street is a local roadway under the jurisdiction of the City of Boston. On-street parking exists on the east side of the roadway and sidewalks are provided along both sides.

2.2.2 Existing Intersection Conditions

Existing conditions at the study area intersections are described below.

Rutherford Avenue/Austin Street is a 4-leg, signalized intersection with four approaches. Both the Austin Street eastbound and westbound approaches consist of three lanes, an exclusive left-turn lane, a shared left-turn/through and a channelized right-turn lane. The Rutherford Avenue northbound approach consists of three lanes, a channelized U-turn lane, an exclusive left-turn lane and a shared through/right-turn lane. The Rutherford Avenue SB approach consists of three lanes, a channelized U-turn lane, a shared left-turn/through lane and a channelized right-turn lane.

Sidewalks are provided along the south side of the eastern leg of Austin Street, both sides of the western leg of Austin Street, the east side of Rutherford Avenue NB, and the west side of Rutherford Avenue SB. Crosswalks and curb-ramps are provided across each leg of the intersection, however the raised medians that intersect the crosswalks of both Austin Street legs do not have curb ramps.

I-93 NB off-ramp/Cambridge Street is a 3-leg, signalized intersection with two approaches. The Cambridge Street eastbound and westbound approaches both consist of two exclusive through lanes. I-93 northbound off-ramp approach is one-way and consists of an exclusive right-turn lane and an exclusive left-turn lane.

There is a dedicated bike lane on the Cambridge Street eastbound approach and sharrows on the westbound approach. There are sidewalks on both sides of all legs of the intersection. Crosswalks and curb-ramps are provided across each leg of the intersection and on-street parking is restricted along both sides of each leg of the intersection.

Sullivan Square Rotary is an 11-leg traffic circle that has six approaches. The Maffa Way eastbound approach is signalized and consists of three lanes, two exclusive through lanes and one exclusive right-turn lane. The Cambridge Street eastbound approach is signalized and consists of two lanes, one exclusive through lane and one shared through and right-turn lane. The Rutherford Avenue northbound approach is stop controlled and consists of two through lanes. The Main Street westbound approach is stop controlled and consists of a single through lane and a dedicated bike lane. The Alford Street southbound approach is stopped controlled and consists of three lanes, two through lanes, an exclusive right-turn lane and a dedicated bike lane. The West Street eastbound approach is uncontrolled and consists of an exclusive right-turn lane.

There are sidewalks provided along all legs of the intersection as well as around the outside edge of the rotary. Crosswalks are provided across each leg of the intersection except the Main Street departure on the west side of the rotary and the West Street approach.

Cambridge Street/Spice Street/MBTA Driveway is a 4-leg, unsignalized intersection with three approaches. Both the Cambridge Street eastbound and westbound approaches consist of a shared left-turn/through lane and a through/right-turn lane. The Spice Street northbound approach is stop controlled and consists of a shared left-turn/through/right-turn lane.

There is a dedicated bike lane on the Cambridge Street eastbound approach and sharrows on the Cambridge Street westbound approach. There are sidewalks along each leg of the intersection. There are crosswalks with curb-ramps across the Spice Street and MBTA Driveway legs and across the western leg of Cambridge Street. On-street parking is restricted along all legs of the intersection except the east side of Spice Street.

Main Street/Beacham Street is a 4-leg, unsignalized intersection with two approaches. The Beacham Street northbound approach is one-way and consists of a shared left-turn/through lane. The Main Street westbound approach is one-way and consists of two lanes, an exclusive through lane and a shared through/right-turn lane.

There are sidewalks along both sides of Main Street and Beacham Street. There are no sidewalks provided along Beacham Street between Maffa Way and Main Street. There are no crosswalks across any leg of the intersection; however there are curb-ramps provided on each side of Beacham Street near the intersection. On-street parking is restricted along all approaches to the intersection.

Maffa Way/Beacham Street/MBTA Driveway is a 4-leg, unsignalized intersection with two approaches. The MBTA Driveway northbound approach is one-way and consists of two lanes, an exclusive through lane and a channelized right-turn only lane. The Maffa Way eastbound approach is one-way and consists of three lanes, two exclusive through lanes and a shared left-turn/through lane.

There are sidewalks along both sides of Maffa Way as well as along the east side of the MBTA Driveway between Cambridge Street and Maffa Way. There are crosswalks with wheelchair ramps provided across the MBTA Driveway northbound approach and none across the Maffa Way southbound approach. On-street parking is restricted along all approaches to the intersection.

Main Street/Bunker Hill Street/Medford Street is a 4-leg, unsignalized intersection with four approaches. All approaches of the intersection consist of a shared left-turn/through/right-turn lane. Both the Main Street eastbound and northbound approaches consist of a dedicated bike lane on each side of the roadway.

There are sidewalks along both sides of each leg of the intersection and crosswalks and curb-ramps across each leg of the intersection as well. On-street parking is permitted along both sides of the Main Street northbound and Medford Street southbound legs of the intersection and there is an MBTA bus stop on both sides of the Bunker Hill Street approach. On-street parking is also permitted along both sides of the Bunker Hill Street approach after the MBTA bus stops.

Main Street/Mishawum Street is a 3-leg, unsignalized intersection with three approaches. Each approach of the intersection consists of a shared left-turn/through/right-turn lane. The Main Street northbound and southbound approaches have a dedicated bike lane on both sides of the roadways.

There are sidewalks provided along both sides of Mishawum Street and Main Street. Crosswalks are not provided across any leg of the intersection; however there are curb-ramps on each side of Mishawum Street. On-street parking is restricted along all legs of the intersection; however there is access to an off-street parking lot on the north side of Mishawum Street.

Rutherford Avenue NB/Mishawum Street is a 3-leg, unsignalized intersection with two approaches. The Mishawum Street westbound approach consists of a shared through/right-turn lane. The Rutherford Avenue northbound approach consists of two lanes, a shared left-turn/through lane and a shared through/right-turn lane.

There are sidewalks along both sides of Mishawum Street and along the east side of Rutherford Avenue northbound. There are no crosswalks across any leg of the intersection; however there are curb-ramps provided across Mishawum Street. On-street parking is restricted along all legs of the intersection; however there is access to off street parking along the north side of Mishawum Street.

Rutherford Avenue NB/Baldwin Street is a 3-leg, unsignalized intersection with two approaches. The Baldwin Street one-way westbound approach consists of an exclusive right-turn lane and the Rutherford Avenue northbound approach consists of two through lanes.

There are sidewalks along both sides of the Baldwin Street leg and along the east side of Rutherford Avenue northbound. There are no crosswalks across any leg of the intersection; however there are curb-ramps on both sides of Baldwin Street. On-street parking is permitted along the east side of Rutherford Avenue northbound as well as on both sides of the Baldwin Street southbound approach.

Rutherford Avenue NB/Essex Street is a 3-leg, unsignalized intersection with two approaches. The Essex Street one-way westbound approach consists of an exclusive right-turn lane and the Rutherford Avenue northbound approach consists of two through lanes.

There are sidewalks along both sides of the Essex Street leg and along the east side of Rutherford Avenue northbound. There is a crosswalk with curb ramps across the Essex Street leg of the intersection. On-street parking is permitted along both sides of Essex Street and restricted along both sides of Rutherford Avenue northbound.

Rutherford Avenue SB/Bunker Hill Industrial Park Drive is a 3-leg, unsignalized intersection with two approaches. The Bunker Hill Industrial Park Drive eastbound approach consists of an exclusive right-turn lane. The Rutherford Street southbound approach consists of two lanes, an exclusive through lane and a shared through/right-turn lane.

There is a sidewalk along the west side of Rutherford Avenue southbound as well as along the south side of the Bunker Hill Industrial Park Drive; however there are no crosswalks or curb-ramps across any leg of the intersection. On-street parking is restricted along both sides of Rutherford Avenue southbound as well as Bunker Hill Industrial Parking Drive; however there is access to off street parking adjacent to every building along Bunker Hill Industrial Park Drive.

Rutherford Avenue SB/Hood Park Drive (D Street) is a 3-leg, unsignalized intersection with two approaches. The Hood Park Drive (D Street South) eastbound approach consists of a shared through/right-turn lane. The Rutherford Street southbound approach consists of two lanes, an exclusive through lane and a shared through/right-turn lane.

There is a sidewalk along the west side of Rutherford Avenue southbound; however there are no crosswalks or curb-ramps across any leg of the intersection.

Rutherford Avenue SB/D Street is a 3-leg, unsignalized intersection with two approaches. The D Street eastbound approach consists of an exclusive right-turn lane. The Rutherford Avenue southbound approach consists of two lanes, an exclusive through lane and a shared through/right-turn lane.

There is a sidewalk along the west side of Rutherford Avenue southbound. There are no crosswalks provided across any leg of the intersection. On-street parking is permitted along both sides of D Street and restricted along both sides of Rutherford Avenue southbound.

2.2.3 Existing Parking

An inventory of the existing on-street and off-street parking in the vicinity of the Project Area was collected. A description of each follows.

2.2.3.1 Existing On-Street Parking Regulations

On-street parking surrounding the Project Site consists of predominately residential parking, commercial parking, and no parking. The on-street parking regulations within the study area are shown in Figure 2-2.

2.2.3.2 Existing Off-Street Parking

The Hood Park site currently has approximately 750 spaces in a surface parking lot. These spaces will be replaced by structured parking garages as per the NPC.

2.2.3.3 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.

Zipcar is the primary company in the Boston car sharing market. There are currently three Zipcar locations within a half-mile walk of the Project Site. The nearby car sharing locations are shown in Figure 2-3.

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Figure 2-2
On-street Parking

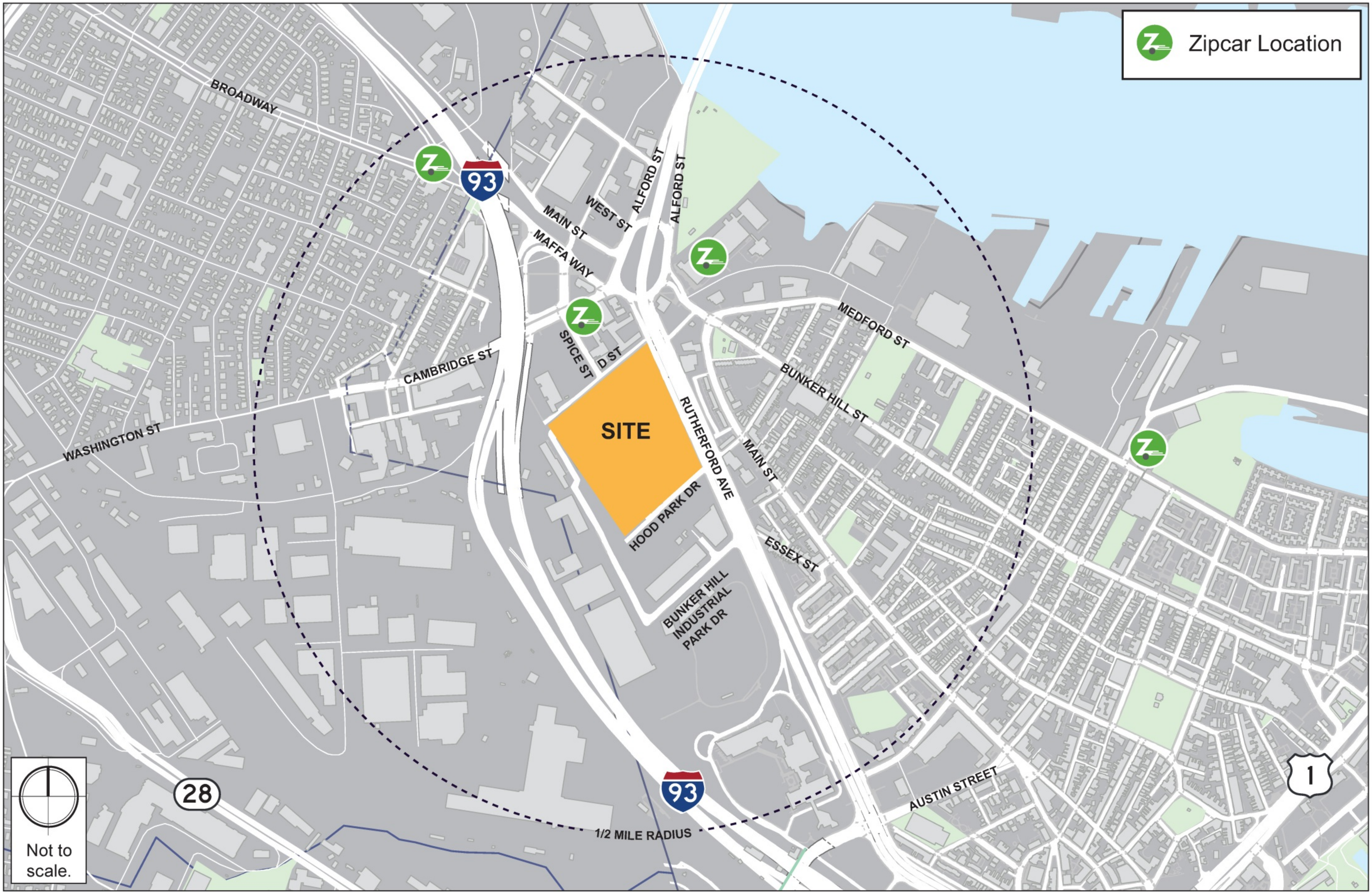

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Figure 2-3
Car Sharing Locations

2.2.4 Existing Traffic Data

Traffic volume data was collected at eight of the fourteen study area intersections on September 16, 2015, September 27, 2017, and October 12, 2017. Turning Movement Counts (TMCs) and vehicle classification counts were conducted during the weekday a.m. and weekday p.m. peak periods (7:00 – 9:00 a.m. and 4:00 – 6:00 p.m., respectively). The traffic classification counts included car, heavy vehicle, pedestrian, and bicycle movements. The detailed traffic counts are provided in **Appendix B**.

2.2.4.1 Seasonal Adjustment

To account for seasonal variation in traffic volumes throughout the year, data provided by MassDOT was reviewed. The most recent (2011) MassDOT Weekday Seasonal Factors were used to determine the need for seasonal adjustments to the September or October traffic volumes. The seasonal adjustment factor for roadways similar to the study area (Group 6) during these months is below 1.0. This indicates that average month traffic volumes are less than the traffic volumes that were collected for the Project. The collected traffic counts were not adjusted downward to reflect average month conditions; therefore they provide a conservatively high analysis of existing conditions. The MassDOT 2011 Weekday Seasonal Factors table is provided in **Appendix B**.

2.2.5 Existing Vehicular Traffic Volumes

The existing traffic volumes that were collected in September 2015, September, and October 2017, were used to develop the Existing (2018) Condition traffic volumes. The 2015 volumes were balanced upwards to the 2018 volumes to represent three years of growth as well as the 2017 volumes to reflect one-year growth. These traffic volumes include traffic associated with the existing 443,750 square feet of office currently occupied at Hood Park. The Existing (2018) weekday a.m. Peak Hour and weekday p.m. Peak Hour traffic volumes are shown in Figures 2-4 and Figure 2-5, respectively.

2.2.6 Existing Bicycle Volumes and Accommodations

In recent years, bicycle use has increased dramatically throughout the City of Boston. The Project site is conveniently located in close proximity to several bicycle facilities. The City of Boston's "Bike Routes of Boston" map designates Medford Street as a beginner route, Main Street south of Sullivan Square as an intermediate route, and Alford Street, Cambridge Street, Maffa Way and Main Street north of Sullivan Square as advanced routes. Beginner routes are suitable for all type of bicyclists, intermediate routes are suitable for riders with some on-road experience and advanced routes are suitable for experienced and traffic-confident cyclists.

Bicycle counts were conducted concurrent with the vehicular TMCs and are presented in Figure 2-6. As shown in the figure, bicycle volumes are heaviest along Rutherford Avenue during the a.m. Peak Hour and Main Street during both peak periods.

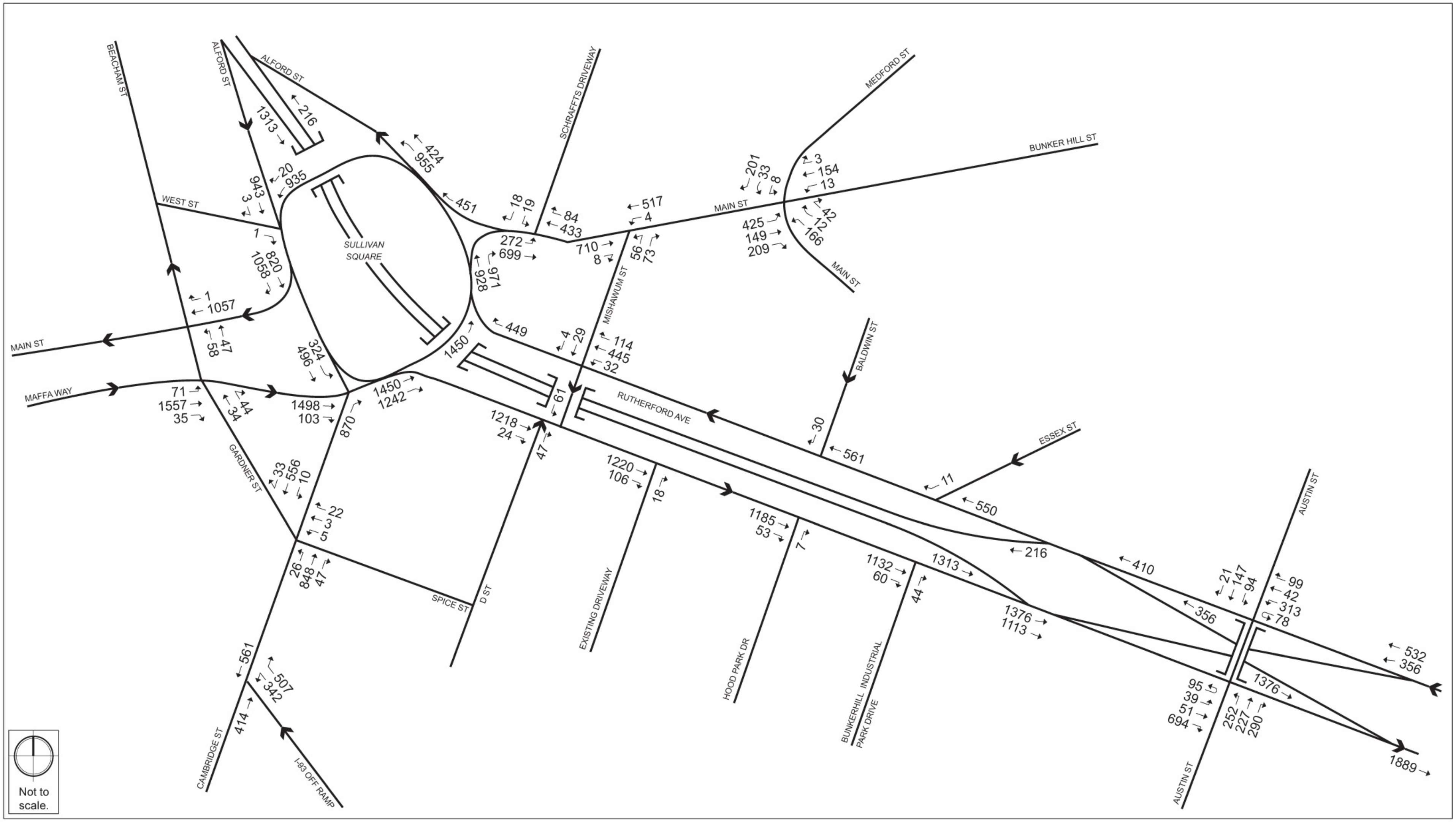

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Figure 2-4

Existing (2018) Condition Traffic Volumes, Weekday a.m. Peak Hour

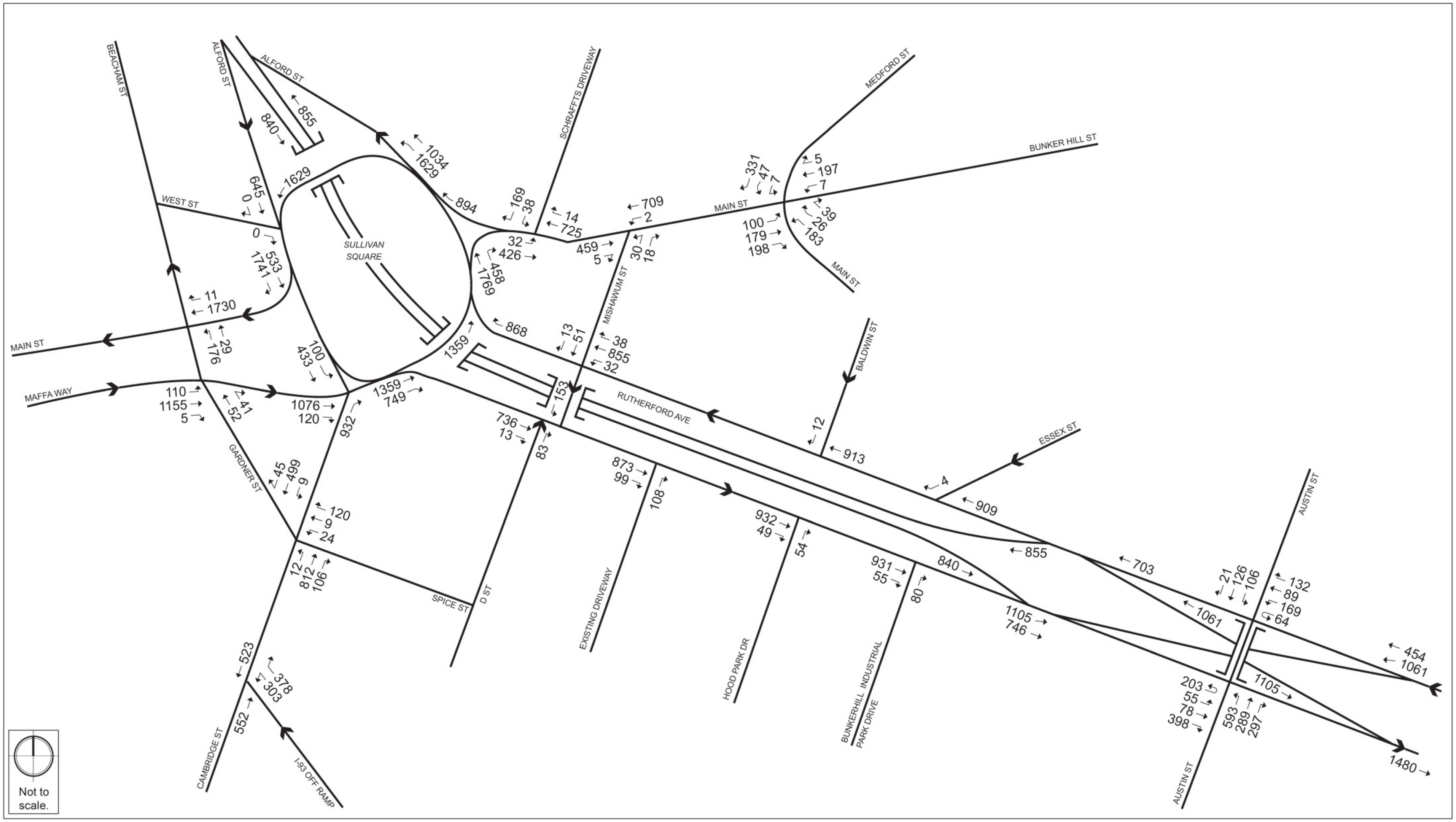

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Figure 2-5

Existing (2018)Condition Traffic Volumes, Weekday p.m. Peak Hour

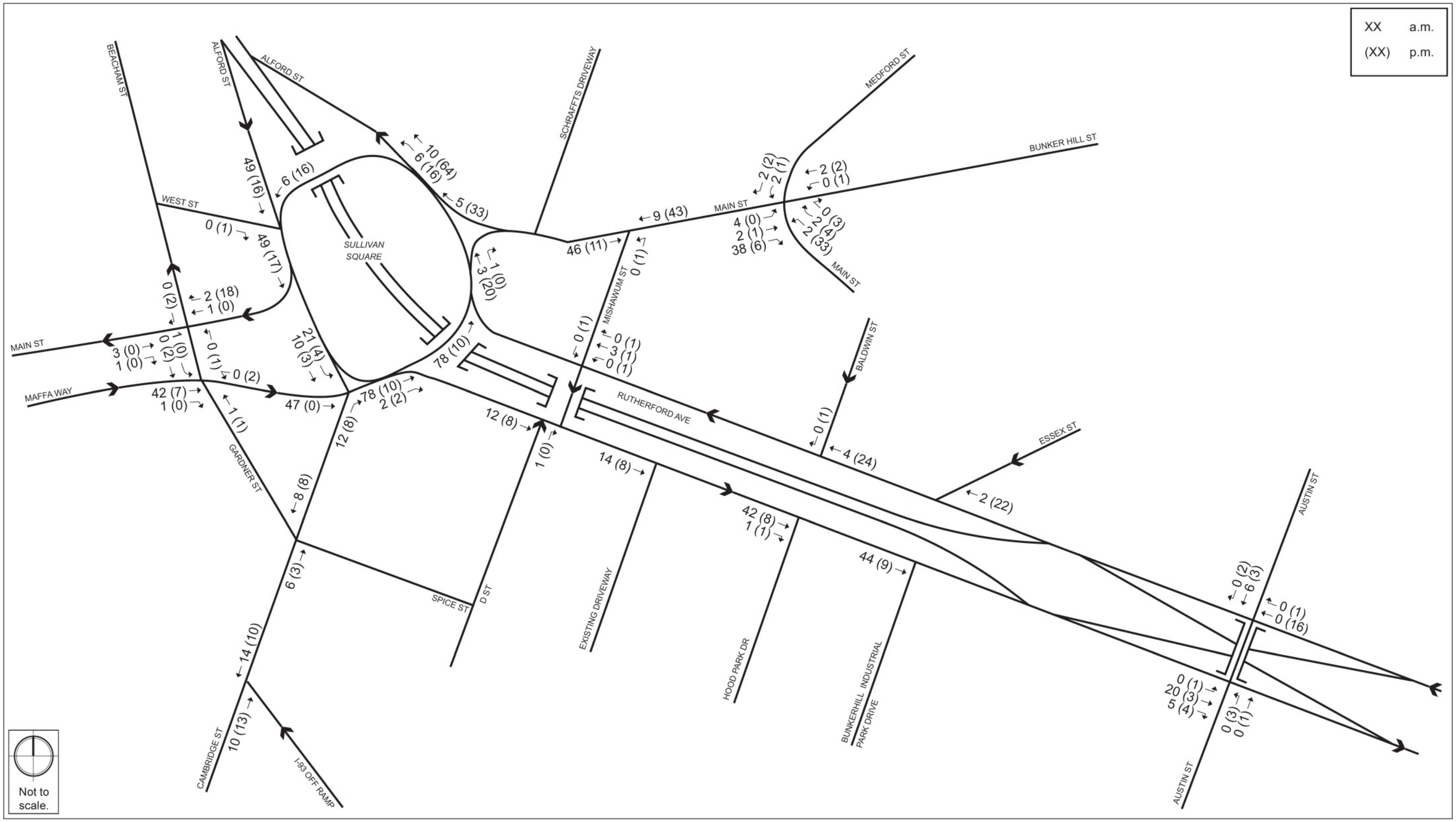

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Figure 2-6

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

2.2.6.1 Bicycle Sharing Services

The Project site is also located in proximity to three bicycle sharing stations provided by BLUEbikes (formerly Hubway). BLUEbikes 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. There are two BLUEbike stations within a half mile of the site and three additional BLUEbike stations within three-quarters of a mile of the Project site. Figure 2-7 shows the BLUEbike stations near the project site. Hood Park has committed to fund a new bicycle sharing station on campus as part of the development of the 10 Stack Street building.

2.2.7 Existing Pedestrian Volumes and Accommodations

In general, sidewalks are provided along all roadways and are in good condition Crosswalks are provided at all study area intersections. Pedestrian signal equipment is provided at all three of the signalized study area intersections.

To determine the amount of pedestrian activity within the study area, pedestrian counts were conducted concurrent with the TMCs at the study area intersections and are presented in Figure 2-8. As shown in the figure, pedestrian activity is heavy throughout the study area near the southeast side of the Sullivan Square Rotary.

2.2.8 Existing Public Transportation Services

The Project Site is located in Boston's Charlestown neighborhood with reliable public transportation opportunities. The Commuter Rail, Orange Line and numerous bus lines provide access throughout the city. The closest Orange Line station is less than one-quarter mile away at the Sullivan Square Station. The Community College Station is approximately one-half mile away from the Project site.

The MBTA operates eleven bus routes within a quarter mile of the Project. A twelfth MBTA bus route is located approximately 0.75-mile from the Project site. Figure 2-9 maps all of the public transportation service located in close proximity of the Project site, and Table 2-3 provides a brief summary of all routes.

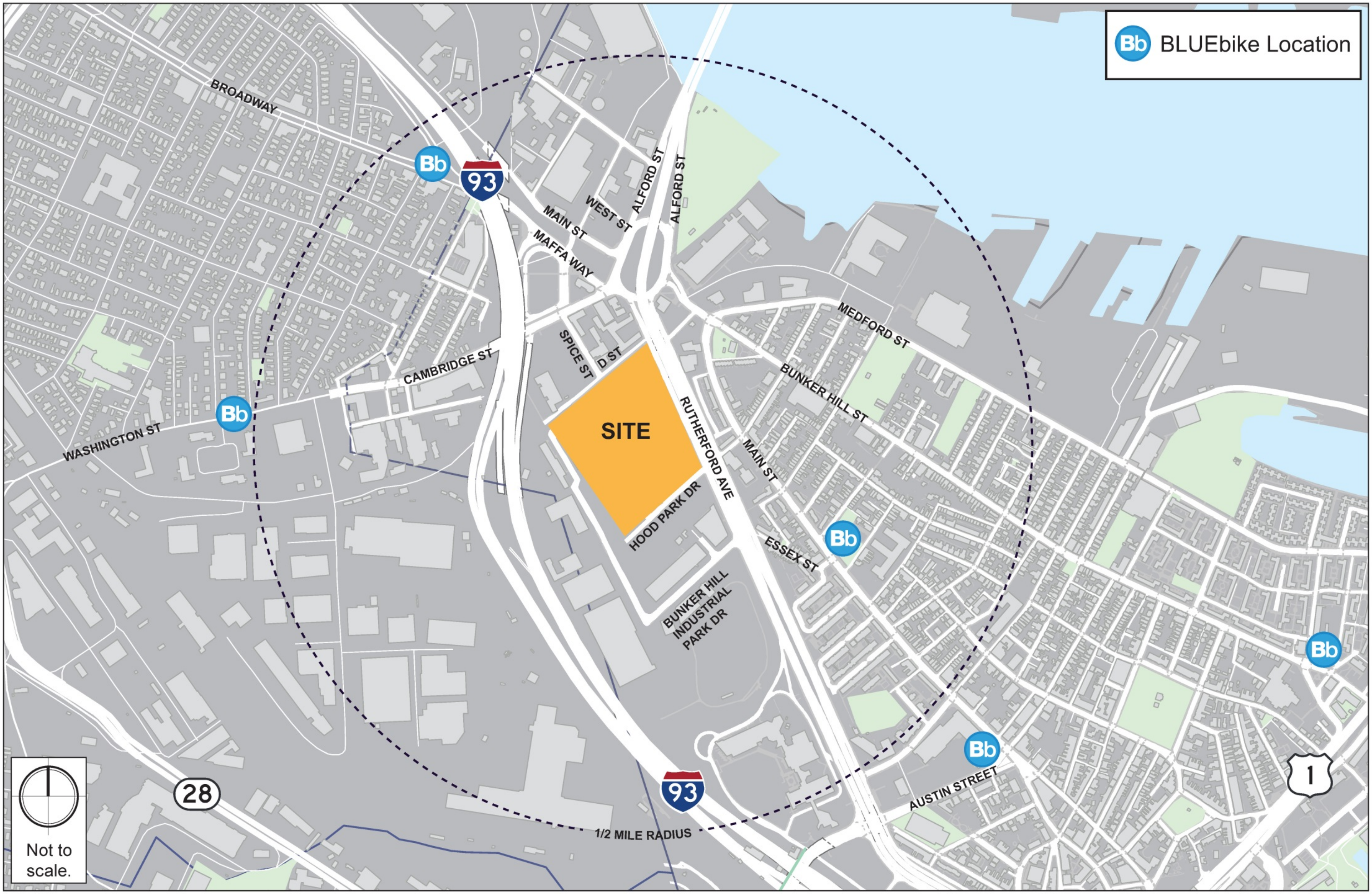

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Figure 2-7
Bike Sharing Locations

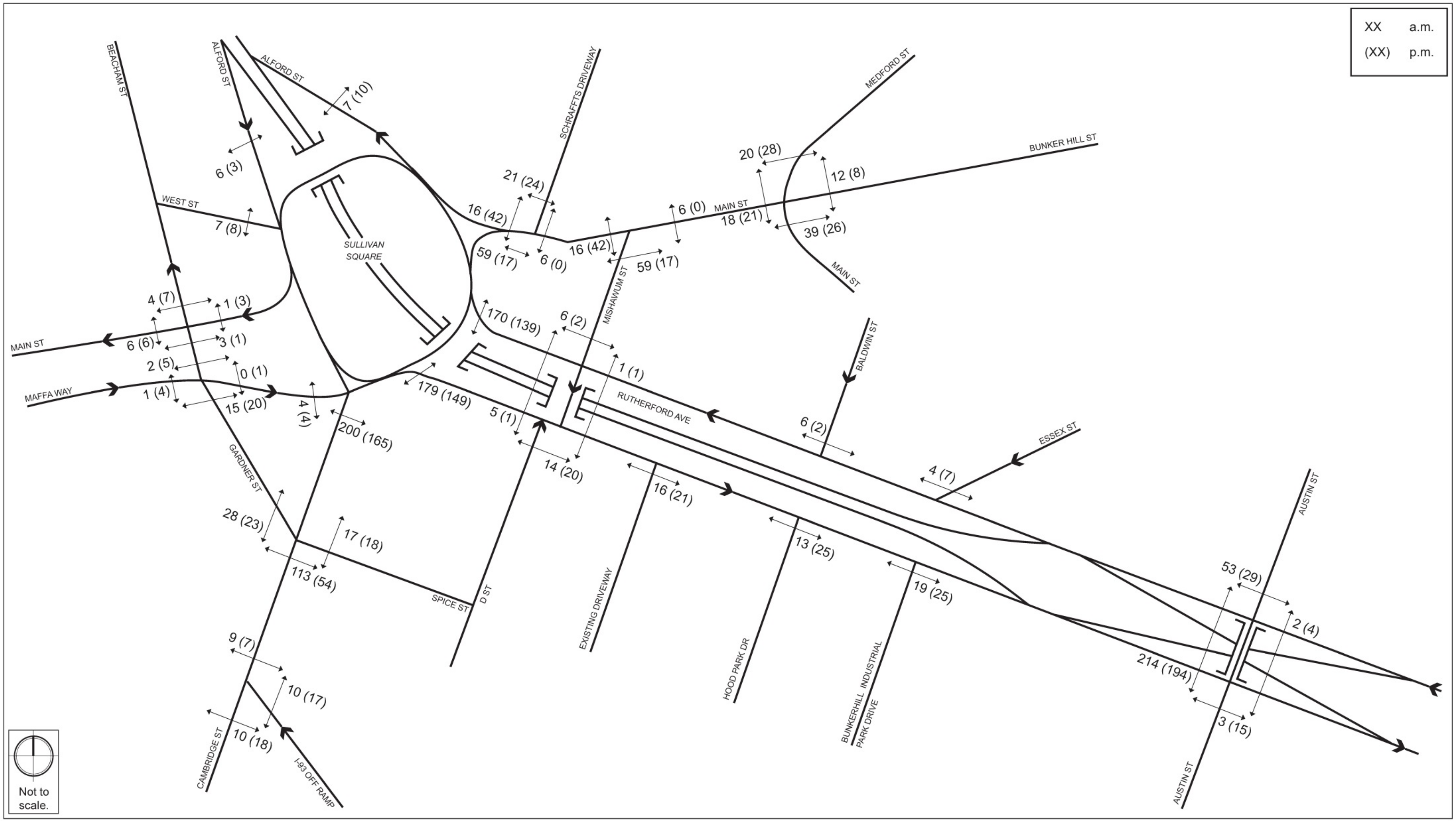

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Figure 2-8

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

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Figure 2-9
Public Transportation

Table 2-3 Existing Public Transportation Service Summary

Transit Service	*Description*	*Rush-hour Headway (in minutes)**
Subway Routes		
Orange	Oak Grove – Forest Hills	6
Bus Routes		
86	Sullivan Square Station – Reservoir Station (Cleveland Circle)	10-20
89	Sullivan Square Station– Davis Square/Clarendon Hill	20
90	Sullivan Square Station – Davis Square/Wellington Station	40
91	Sullivan Square Station – Union Square/Central Square	30
92	Assembly Square Mall – Devonshire Street & Milk Street	15
93	Sullivan Square Station – Haymarket Square Station/Devonshire & Milk Street	8
95	West Medford – Medford Square/Sullivan Square Station	25
101	Malden Center Station – Sullivan Square Station	10
104	Malden Center Station – Sullivan Square Station	15
105	Malden Center Station – Sullivan Square Station	40
109	Linden Square – Sullivan Square Station	16
CT2	Sullivan Square Station – Ruggles Station	25
111	Broadway & Park Avenue – Haymarket Square Station	8

* Headway is the time between buses.

2.2.9 Crash Data

HSH compiled motor vehicle crash data from the MassDOT Crash Records System for the most recent 5-year period for which they are available (2012–2016). Crash rates are determined based on the number of crashes per million vehicles entering an intersection. The detailed crash data summary and intersection crash rate worksheets are included in the Appendix. There were 89 crashes at the 15 study area intersections over the 5-year period, with one fatality. Table 2-4 displays the crash rates for the study area intersections

Table 2-4 Study Area Intersections Crash Rates

Control Type	Intersection	Crash Rate
Signalized	Rutherford Avenue/Austin Street	0.38
Signalized	Cambridge Street/I-93 NB off-ramp	0.25
Unsignalized	Sullivan Square Rotary	0.30
Signalized	Maffa Way/Cambridge Street/Alford Street	0.12
Unsignalized	Cambridge Street/Spice Street/MBTA Driveway	0.22
Unsignalized	Main Street/Beacham Street	0.10

Table 2-4 Study Area Intersections Crash Rates (Continued)

Control Type	Intersection	Crash Rate
Unsignalized	Maffa Way/Beacham Street/MBTA Driveway	0.06
Unsignalized	Main Street/Bunker Hill Street/Medford Street	0.04
Unsignalized	Mishawum Street/Main Street	0.08
Unsignalized	Rutherford Avenue/Mishawum Street	0.12
Unsignalized	Rutherford Avenue/Baldwin Street	0.00
Unsignalized	Rutherford Avenue/Essex Street	0.00
Unsignalized	Rutherford Avenue/Bunker Hill Industrial Park Drive	0.09
Unsignalized	Rutherford Avenue/Hood Park Drive	0.13
Unsignalized	Rutherford Avenue/D Street	0.00

As shown in Table 2-4, the crash rates at the study area intersections are below the MassDOT District 6 average crash rates for signalized intersections (0.71) and unsignalized intersections (0.52). The intersections with the two highest crash totals are Rutherford Avenue/Austin Street with 25 crashes over the 5-year period and Sullivan Square Rotary with 26 crashes over the 3-year period. These two intersections have crash rates of 0.38 and 0.30 crashes per million entering vehicles, respectively. Both intersections are high-volume (over 20,000 entering vehicles daily) and have multiple lanes on each approach. Actual lane utilization may differ from intended lane utilization, leading to increased driver confusion.

2.3 No-Build (2026) Condition

The No-Build (2026) Condition reflects a future scenario that incorporates anticipated traffic volume changes associated with background traffic growth independent of any specific project, traffic associated with planned specific developments, and planned infrastructure improvements that will affect travel patterns throughout the study area. These infrastructure improvements include roadway, public transportation, pedestrian and bicycle improvements.

2.3.1 Background Traffic Growth

The methodology to account for generic future background traffic growth, independent of this Project, 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 to account for any additional unforeseen traffic growth, a traffic growth rate of one-half (0.5%) percent per year, compounded annually, was used.

2.3.2 Specific Development Traffic Growth

Traffic volumes associated with known development projects can affect traffic patterns throughout the study area within the future analysis time horizon. Six such projects were specifically accounted for in the traffic volumes for future scenarios, while others were included in the general background traffic growth (the background projects are mapped on Figure 2-10):

Current Hood Park PDA – As stated previously, the current Hood Park PDA calls for the addition of 725,070 square feet of office, residential, and retail space. The residential and retail portion is currently under construction. Since none of this space was occupied during the data collection, it is included in the No-Build Condition as additional permitting related to transportation is not necessary to develop this portion of the Hood Park.

32 Cambridge Street – This project consists of two parcels. The parcel located on the northeast portion consists of preserving and refurbishing the existing three-story building, with approximately 52 new residential units and 2,500 square feet (sf) of ground-floor retail or restaurant space. The southern structure will be demolished and replaced with a four-story structure consisting of approximately 119 residential units. This project is under construction.

Cambridge Crossing (Formerly NorthPoint) – This project consists of the redevelopment of the existing Cambridge Crossing Property to include approximately 3,000,000 square feet of residential space and 2,100,000 square feet of commercial space. The project will include between 2,300-2,700 residential units, approximately 2,025,000 square feet of office/lab space, and approximately 75,000 square feet of retail space. These uses will be split between 20 buildings of varying heights from 60 feet to 250 feet. The project will include approximately 5,460 parking spaces, 2,700 residential, 2,100 non-residential, and 480 for the redevelopment of the existing Lechmere station. This project has been approved by the BPDA. Traffic volumes were obtained from the traffic study conducted for this project and included in the future conditions traffic volumes.

One Charlestown – This project consists of the redevelopment of the existing Charlestown Public Housing Development to include approximately 3,200 new residential units and approximately 100,000 square feet of civic/retail space split between 14 buildings of varying heights from 6 to 21 stories. The project will include an approximate total of 2,080 off-street parking spaces and 320 on-street parking spaces as well as 3,200 covered bicycle and 640 outdoor bicycle spaces. This project is under review by the BRA. Traffic volumes were obtained from the traffic study conducted for this project and included in the future conditions traffic volumes.

Assembly Row – This project consists of the development of the Block 11 of Assembly Row and will involve the construction of two mixed-use buildings with approximately 1,106,578 square feet of office space, 12,500 square feet of daycare space, and 105,922 square feet of retail/restaurant space. The project will also replace the existing 907 surface parking spaces with 2,904 structured spaces. Traffic volumes associated with the unoccupied portions of this development were obtained from the traffic study conducted for this project and included in the future conditions traffic volumes. This project is under construction.

Encore Resort & Casino – This project will consist of 4,142 gaming positions, 629 hotel rooms, and about 67,000 sf of retail space. The Encore project will generate significantly more trips during the p.m. peak hour than the a.m. peak hour, though the peak hour of the resort will take place much later than the p.m. peak hour of the roadways near Sullivan Square. This project is under construction and scheduled to be completed in 2019. The trips expected to be generated by this project were distributed to the study area intersections.

2.3.3 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 near the study area.

The area is currently undergoing major redesign efforts including eliminating the rotary/traffic circle in Sullivan Square and modifications to the Rutherford Avenue corridor from Sullivan Square, past the site, to points south.

The latest BTD design was obtained and is assumed to be in place before the completion of the development of the Hood Park NPC. The major impacts of this design include

- Full vehicular access from the site to Rutherford Avenue including northbound left-turns in and eastbound left-turns out) via signalization at the intersection of Rutherford Avenue/Hood Park Drive (vehicular access between Hood Park Drive and Baldwin Street will not be permitted);

- Pedestrian access between Hood Park and the rest of Charlestown via signalized Rutherford Avenue pedestrian crossings at Essex Street and Baldwin Street

- Access from Cambridge Street to Maffa Way and Main Street and points north through the existing MBTA only bus way (this improvement is being constructed as part of the mitigation for the Encore Casino and will be in place with or without the further redesign being conducted by BTD/MassDOT.)

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Figure 2-10

Area Developments in the Area

2.3.4 No-Build Traffic Volumes

The one-half percent per year annual growth rate, compounded annually, was applied to the Existing (2018) Condition traffic volumes, the traffic volumes associated with the background development projects listed above were added, and the geometric modifications due to the roadway redesign were accounted for to develop the No-Build (2026) Condition traffic volumes. The No-Build (2026) weekday morning and evening peak hour traffic volumes are shown on Figures 2-11 and Figure 2-12, respectively.

2.4 Build (2026) Condition

As previously mentioned, the proposed Project will consist of the redevelopment of the Hood Business Park. The Project will consist of 954,850 square feet of development in addition to the currently approved 780,950 square feet (which includes 368,750 square feet of currently occupied office space).

2.4.1 Site Access and Vehicle Circulation

The site access plan is shown in Figure 2-13.

2.4.2 Project Parking

Parking goals have been developed by BTD for this section of Charlestown and include maximum parking ratios by land use. Office space and retail space call for a maximum of 0.75 to 1.00 parking spaces per 1,000 square feet and hotel and residential allow for a maximum 0.75 to 1.0 units. The Project is planning for 1,765 spaces throughout to be constructed in a combination of above- and below-grade structured parking garage levels, incorporated into mixed-use buildings, along with limited on-street parking spaces, which will ultimately replace the existing surface parking on site.

2.4.3 Loading and Service Accommodations

There will be separate loading areas located throughout the Project Site. Each building will be serviced by its own loading dock that will be accessed from internal roadways within Hood Park.

2.4.4 Bicycle Accommodations

BTD has established guidelines requiring projects subject to Transportation Access Plan Agreements (TAPA) to provide secure bicycle parking for residents and employees, short-term bicycle racks for visitors, as well as BLUEbikes stations. The proposed Project intends to meet the intent of the BTD guidelines. The details of the bicycle facilities will be finalized in the individual TAPAs that will be required for each building.

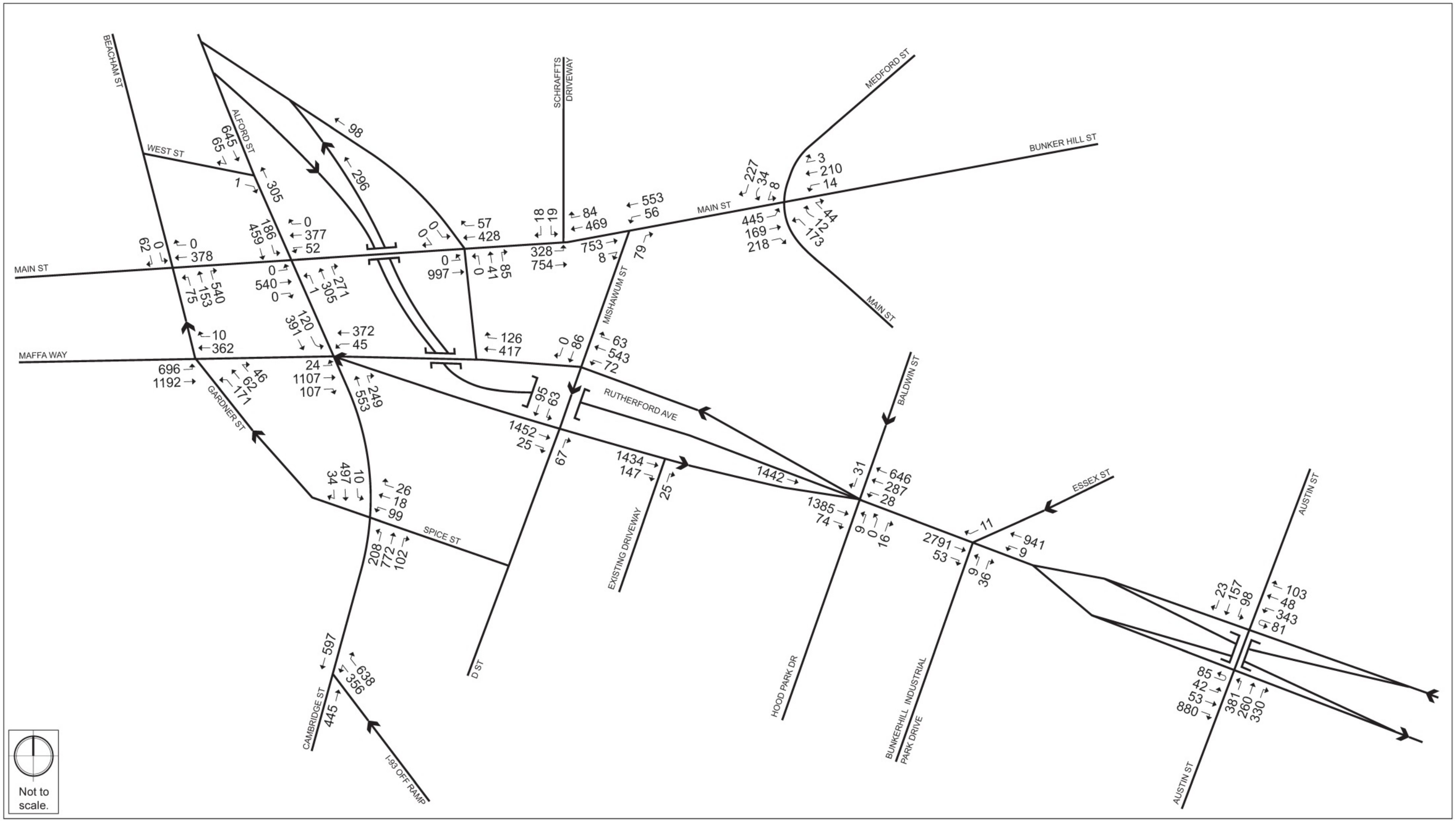

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Figure 2-11

No-Build (2026) Condition Traffic Volumes with BTD Improvements, Weekday a.m. Peak Hour

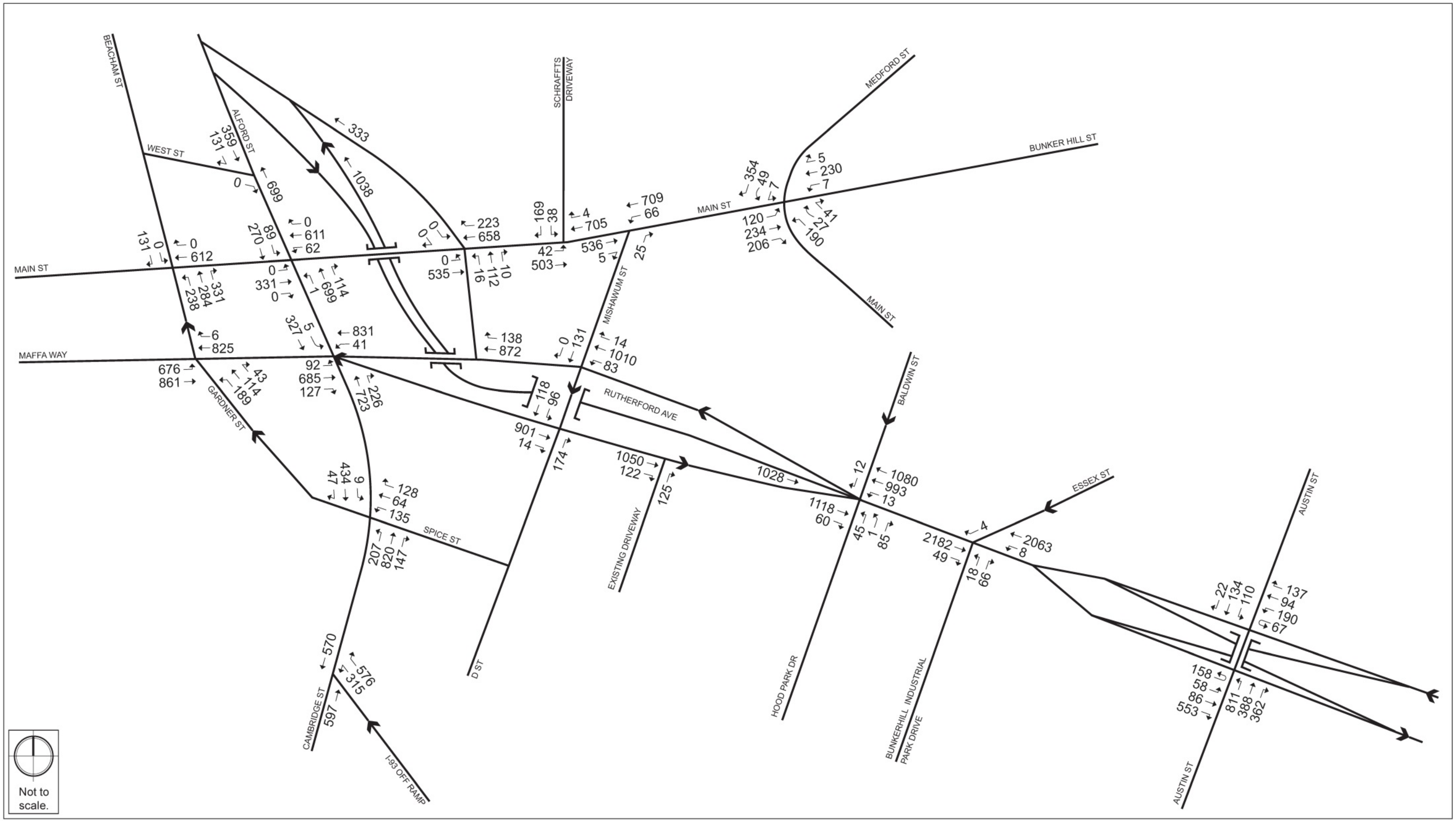

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Figure 2-12

No-Build (2026) Condition Traffic Volumes with BTD Improvements, Weekday, p.m. Peak Hour

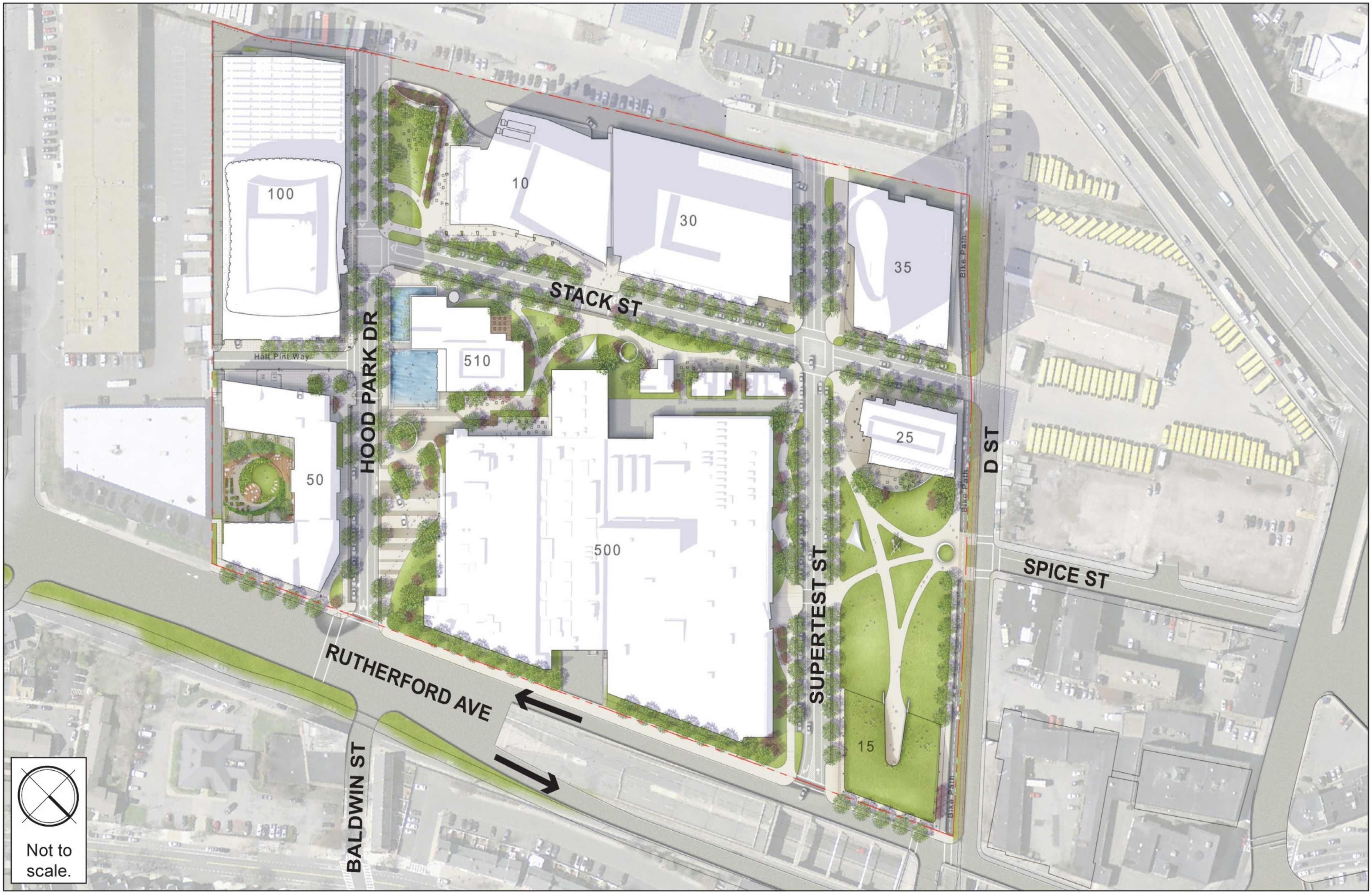

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Figure 2-13
Site Plan

2.4.5 Trip Generation Methodology

Determining the future trip generation of a project is a complex, multi-step process that produces an estimate of vehicle trips, transit trips, and walk/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 site.

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

Land Use Code 221 – Multifamily Housing Mid-Rise. A Mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three and 10 levels (floors). Calculations of the number of trips use ITE's average rate per dwelling units.

Land Use Code 310 – Hotel. A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. Calculations of the number of trips use ITE's average rate per rooms

Land Use Code 710 – General Office Building. A general office building houses multiple tenants and is a location where affairs of businesses, commercial, or industrial organizations are conducted. Calculations of the number of trips use ITE's average rate per 1,000 square feet.

Land Use Code 820 – Shopping Center. The shopping center land use code is defined as an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. A shopping center's composition is related to its market area in terms of size, location, and type of store and also provides on-site parking facilities sufficient to serve its own parking demands. Shopping center trip generation estimates are based on the gross leasable area (GLA) of the center. Calculations of the number of trips use ITE's average rate per 1,000 square feet.

---

1 Trip Generation Manual, 10th Edition; Institute of Transportation Engineers; Washington, D.C.; 2017.

2.4.6 Mode Share

BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. The Project is located in the westerly portion of designated Area 11 – Charlestown. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)[2]. The person trips were then distributed to different modes according to the mode shares shown in Table 2-4.

Table 2-4 Travel Mode Share

Land Use		Walk/Bicycle Share	Transit Share	Auto Share	Vehicle Occupancy Rate
Daily					
Multifamily Housing (Mid Rise)	In	35%	19%	46%	1.13
	Out	35%	19%	46%	1.13
Hotel	In	35%	15%	50%	1.84
	Out	35%	15%	50%	1.84
Office Building	In	10%	33%	57%	1.13
	Out	10%	33%	57%	1.13
Shopping Center	In	35%	15%	50%	1.78
	Out	35%	15%	50%	1.78
a.m. Peak Hour					
Multifamily Housing (Mid Rise)	In	42%	23%	35%	1.13
	Out	32%	32%	36%	1.13
Hotel	In	43%	19%	38%	1.84
	Out	34%	26%	40%	1.84
Office Building	In	10%	35%	55%	1.13
	Out	10%	35%	55%	1.13
Shopping Center	In	43%	19%	38%	1.78
	Out	34%	26%	40%	1.78

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

Table 2-4 Travel Mode Share (Continued)

Land Use		Walk/Bicycle Share	Transit Share	Auto Share	Vehicle Occupancy Rate
p.m. Peak Hour					
Multifamily Housing (Mid Rise)	In	32%	32%	36%	1.13
	Out	42%	23%	35%	1.13
Hotel	In	34%	26%	40%	1.84
	Out	43%	19%	38%	1.84
Office Building	In	10%	35%	55%	1.13
	Out	10%	35%	55%	1.13
Shopping Center	In	34%	26%	40%	1.78
	Out	43%	19%	38%	1.78

2.4.7 Project Trip Generation

The mode share percentages shown in Table 2-4 were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates for the Project. The trip generation for the Project by mode is shown in Table 2-5. The detailed trip generation information is provided in **Appendix C**.

Table 2-5 Project Trip Generation

Land Use		Walk/Bicycle Trips	Transit Trips	Vehicle Trips
Daily				
Residential – 140 units LUC 221 (Multi Housing Mid-Rise)	In	151	82	175
	Out	151	82	175
Hotel – 130 rooms LUC 310 (Hotel)	In	350	150	271
	Out	350	150	271
Office – 810,800 sf LUC 710 (Office)	In	446	1,472	2,251
	Out	446	1,472	2,251
Retail – 58,050 sf LUC 820 (Shopping Center)	In	683	293	548
	Out	683	293	548
Total Project Generated	**In**	**1,630**	**1,997**	**3,245**
	Out	**1,630**	**1,997**	**3,245**
a.m. Peak Hour				
Residential – 140 units LUC 221 (Multi Housing Mid-Rise)	In	6	3	5
	Out	13	13	13
Hotel – 130 rooms LUC 310 (Hotel)	In	28	13	14
	Out	6	4	4

Table 2-5 Project Trip Generation (Continued)

Land Use		Walk/Bicycle Trips	Transit Trips	Vehicle Trips
a.m. Peak Hour				
Office – 810,800 sf LUC 710 (Office)	In	88	306	426
	Out	13	45	63
Retail – 58,050 sf LUC 820 (Shopping Center)	In	17	7	8
	Out	9	7	6
Total Project Generated	**In**	**139**	**329**	**453**
	Out	**41**	**69**	**86**
p.m. Peak Hour				
Residential – 140 units LUC 221 (Multi Housing Mid-Rise)	In	7	7	6
	Out	6	3	4
Hotel – 130 rooms LUC 310 (Hotel)	In	21	16	14
	Out	28	13	14
Office – 810,800 sf LUC 710 (Office)	In	16	57	80
	Out	87	304	422
Retail – 58,050 sf LUC 820 (Shopping Center)	In	54	41	36
	Out	74	32	37
Total Project Generated	**In**	**98**	**121**	**136**
	Out	**195**	**352**	**477**

As shown in Table 2-5, there is expected to be 3,260 new pedestrian/bicycle trips, 3,994 new transit trips, and 6,490 new vehicle trips throughout the day. During the a.m. peak hour, there is expected to be 180 pedestrian/bicycle trips (139 in and 41 out), 398 transit trips (329 in and 69 out), and 539 vehicle trips (453 in and 86 out). During the p.m. peak hour, there is expected to be 293 pedestrian trips (98 in and 195 out), 473 transit trips (121 in and 352 out), and 613 vehicle trips (136 in and 477 out).

2.4.8 Trip Distribution

The trip distribution identifies the various travel paths for vehicles associated with the Project. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 11. The trip distribution percentages for the Project are illustrated in Figure 2-14 and Figure 2-15.

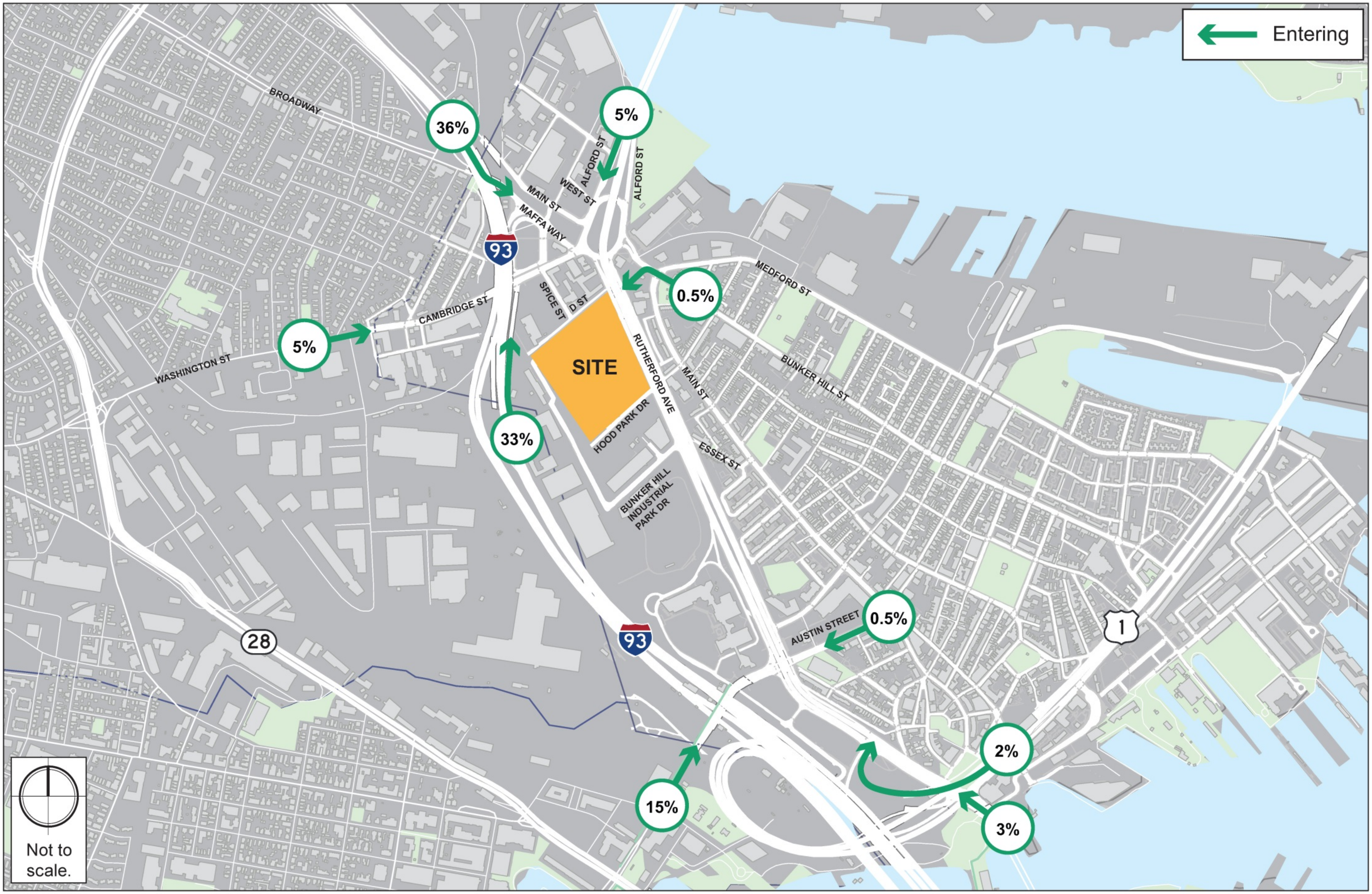

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Figure 2-14
Trip Distribution - Entering

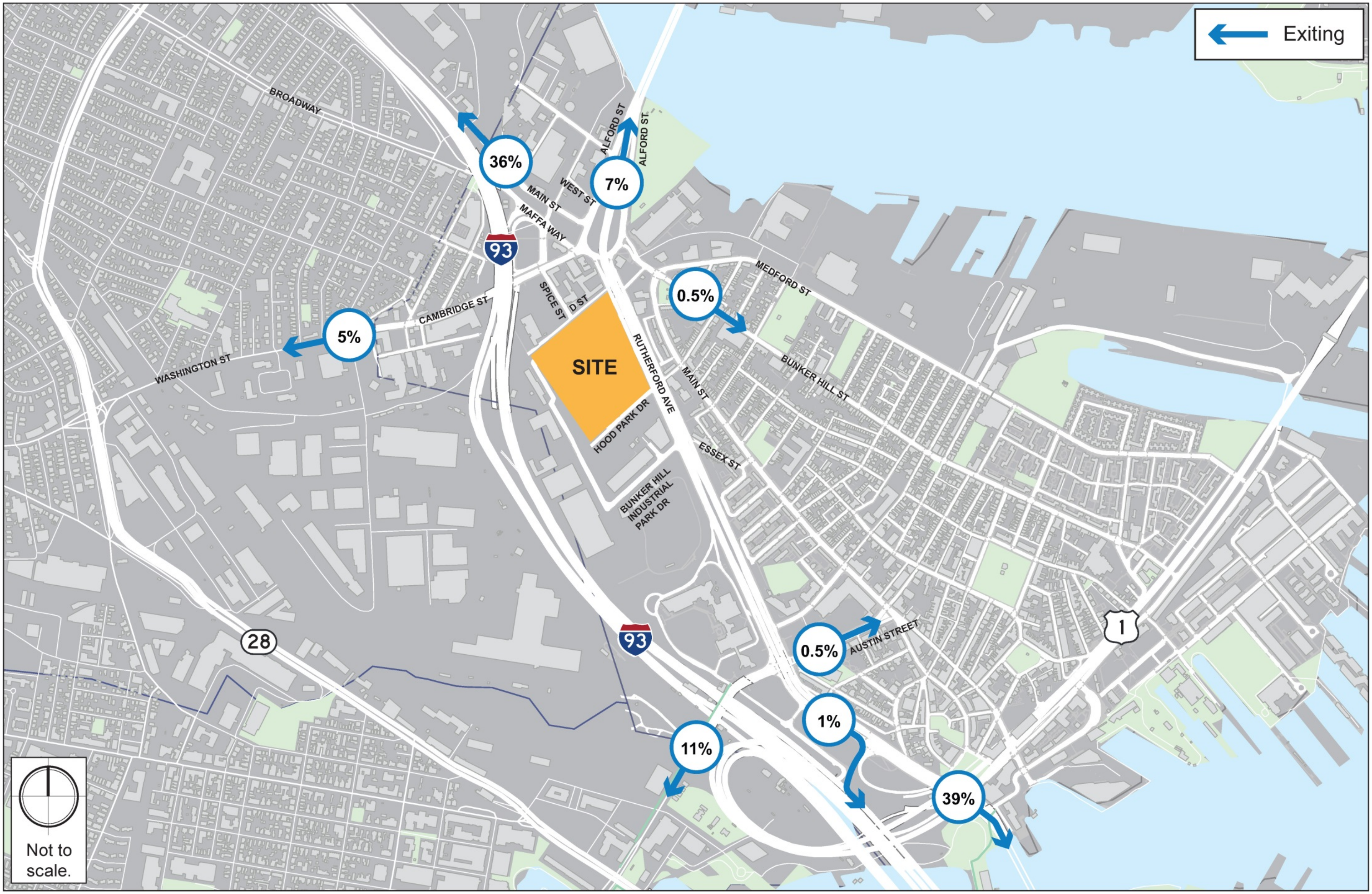

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Figure 2-15
Trip Distribution - Exiting

2.4.9 Build (2026) Condition Traffic Volumes

The vehicle trips were distributed through the study area. The Project-generated trips for the a.m. and p.m. peak hours are shown in Figure 2-16 and Figure 2-17, respectively. The trip assignments were added to the No-Build (2026) Condition vehicular traffic volumes to develop the Build (2026) Condition vehicular traffic volumes. The Build (2026) Condition a.m. and p.m. peak hour traffic volumes are shown on Figure 2-18 and Figure 2-19, respectively.

2.5 Build (2026) without BTD Improvements Condition

The transportation impacts of the proposed Project have been determined should the BTD/MassDOT redesign of Sullivan Square and Rutherford Avenue not proceed on the schedule currently expected. The Build (2026) traffic volumes were routed through the Sullivan Square area (which would include the to be constructed Encore Casino mitigation improvements) to determine the traffic operations in the area.

2.5.1 Build (2026) without BTD Improvements Condition Traffic Volumes

The vehicle trips were distributed through the study area. The Build (2026) without BTD Improvements Condition a.m. and p.m. peak hour traffic volumes are shown on Figure 2-20 and Figure 2-21, respectively.

2.6 Traffic Capacity Analysis

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay experienced by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 9) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. Table 2-6 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 desirable during the peak hours of traffic in urban and suburban settings.

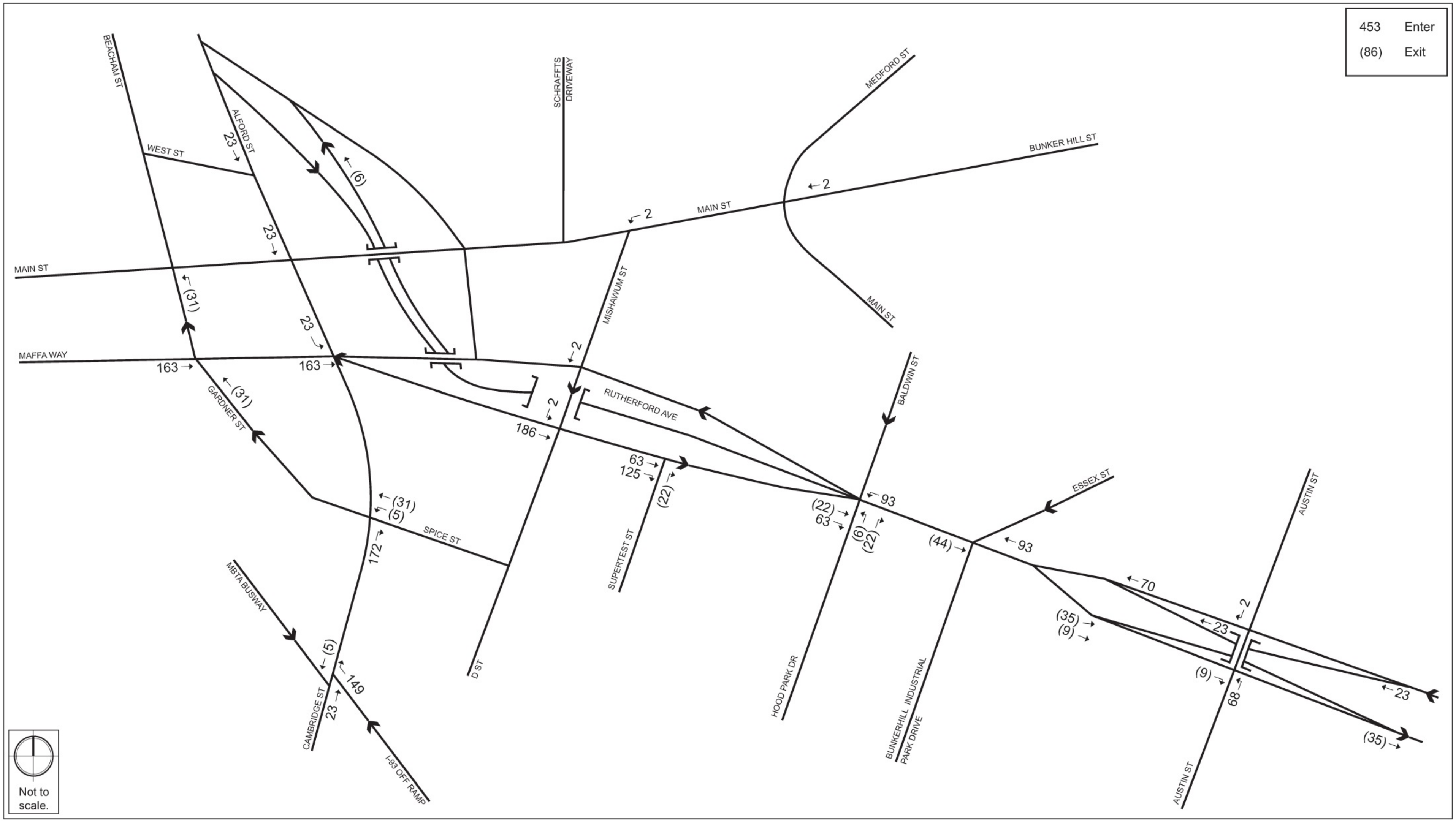

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Figure 2-16

Project-Generated Trips with BTD Improvements, a.m. Peak Hour

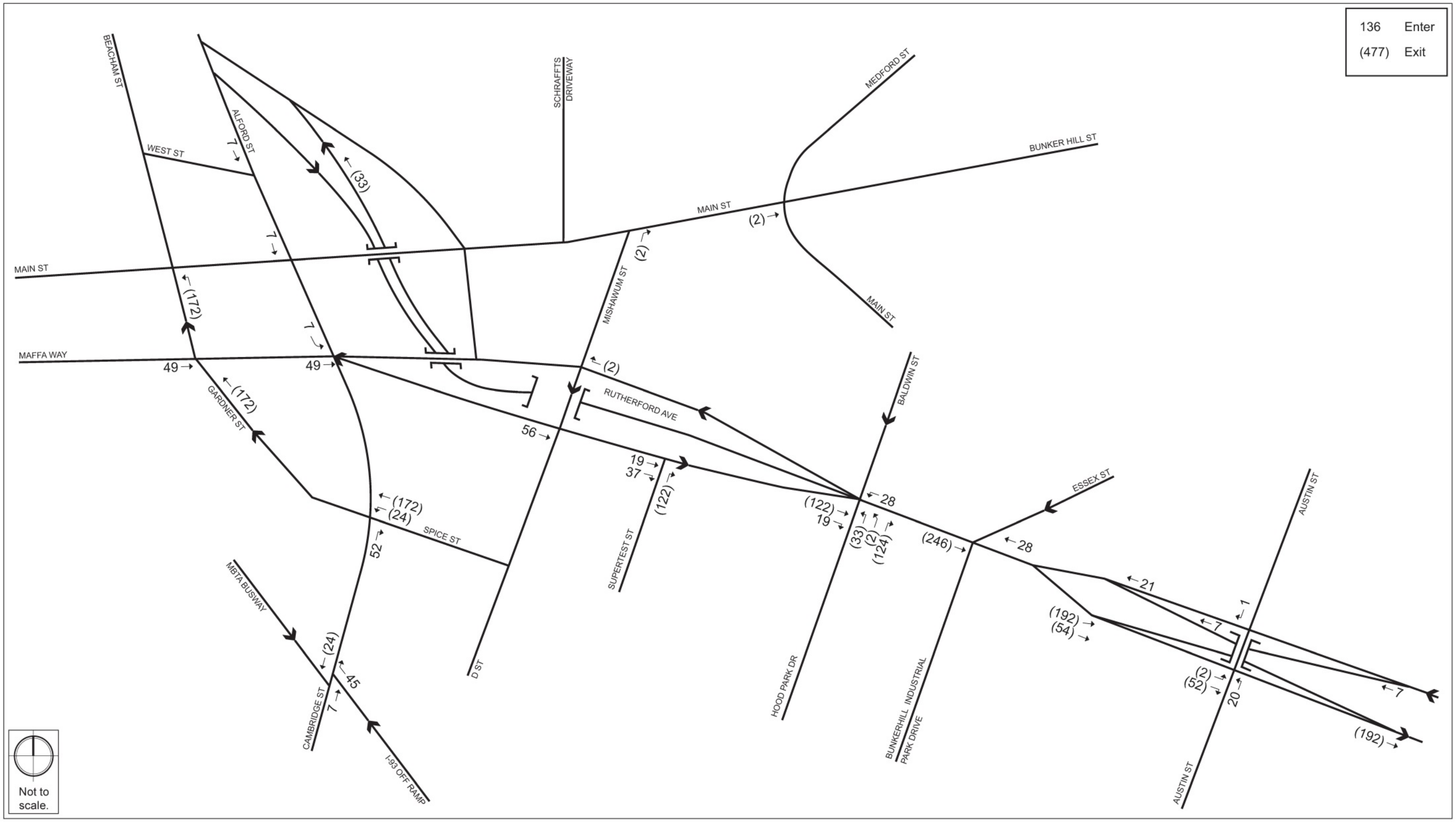

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Figure 2-17

Project-Generated Trips with BTD Improvements, p.m. Peak Hour

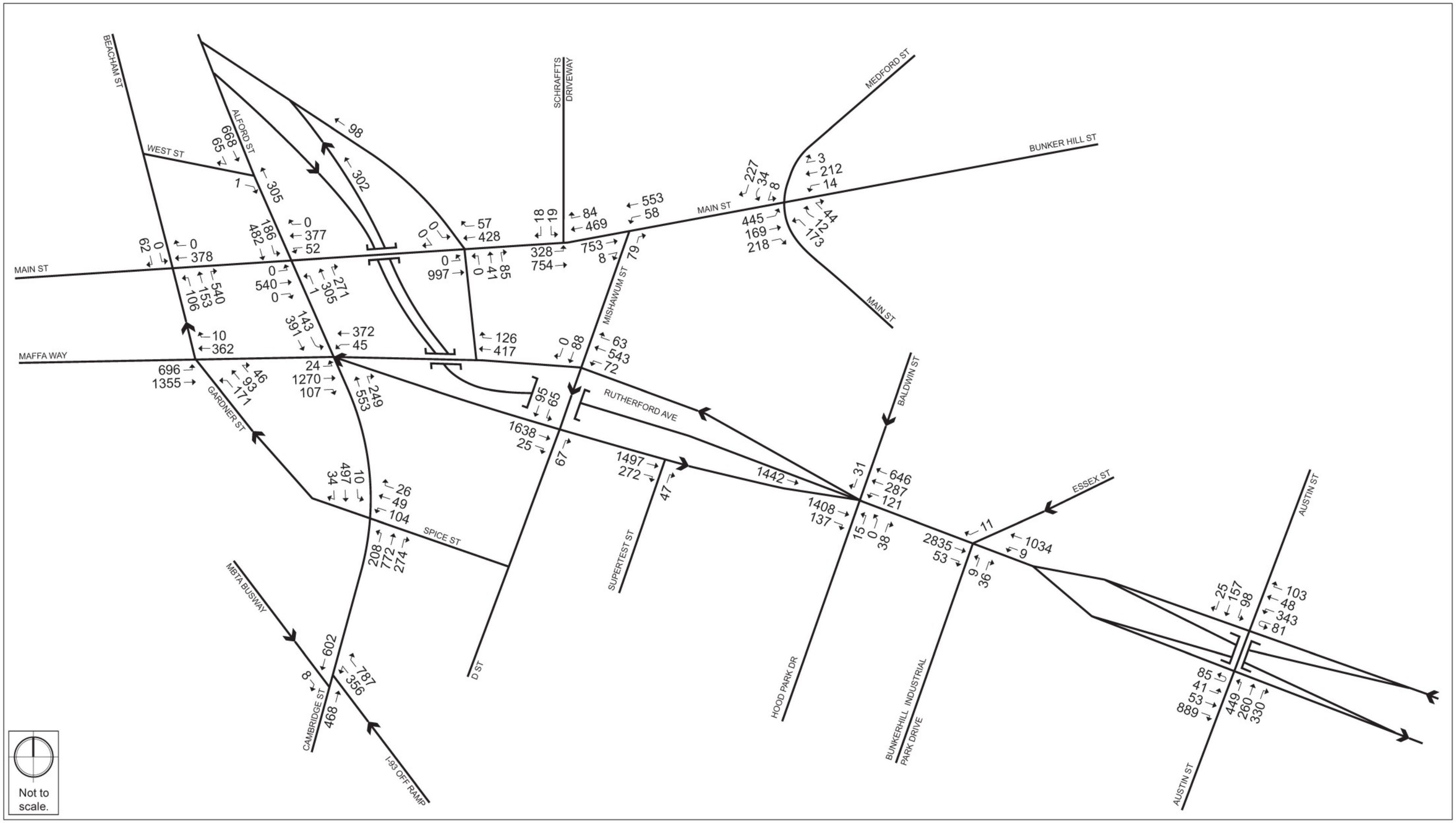

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Figure 2-18

Build (2026) Condition Traffic Volumes with BTD Improvements, Weekday a.m. Peak Hour

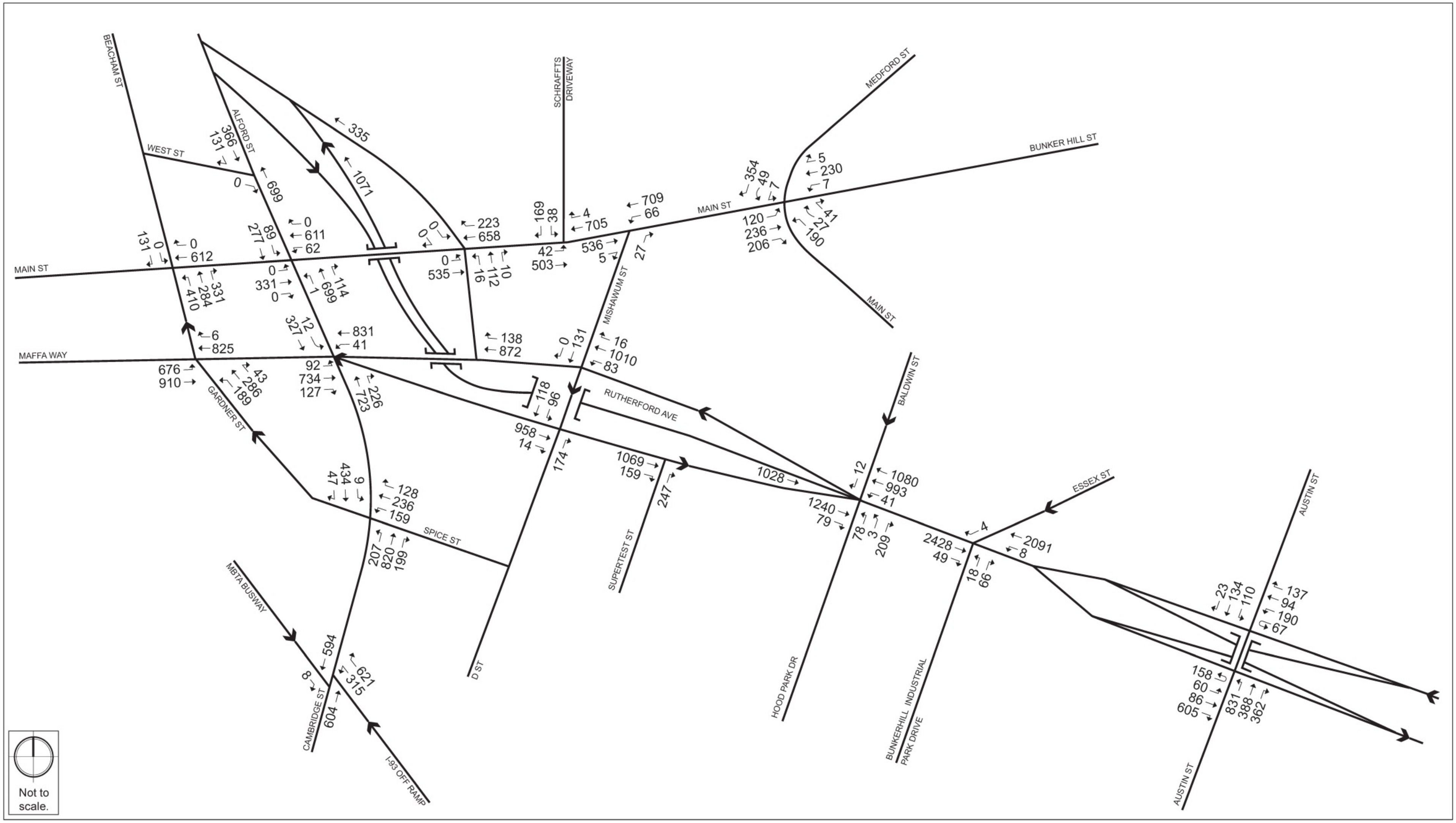

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Figure 2-19

Build (2026) Condition Traffic Volumes with BTD Improvements, Weekday p.m. Peak Hour

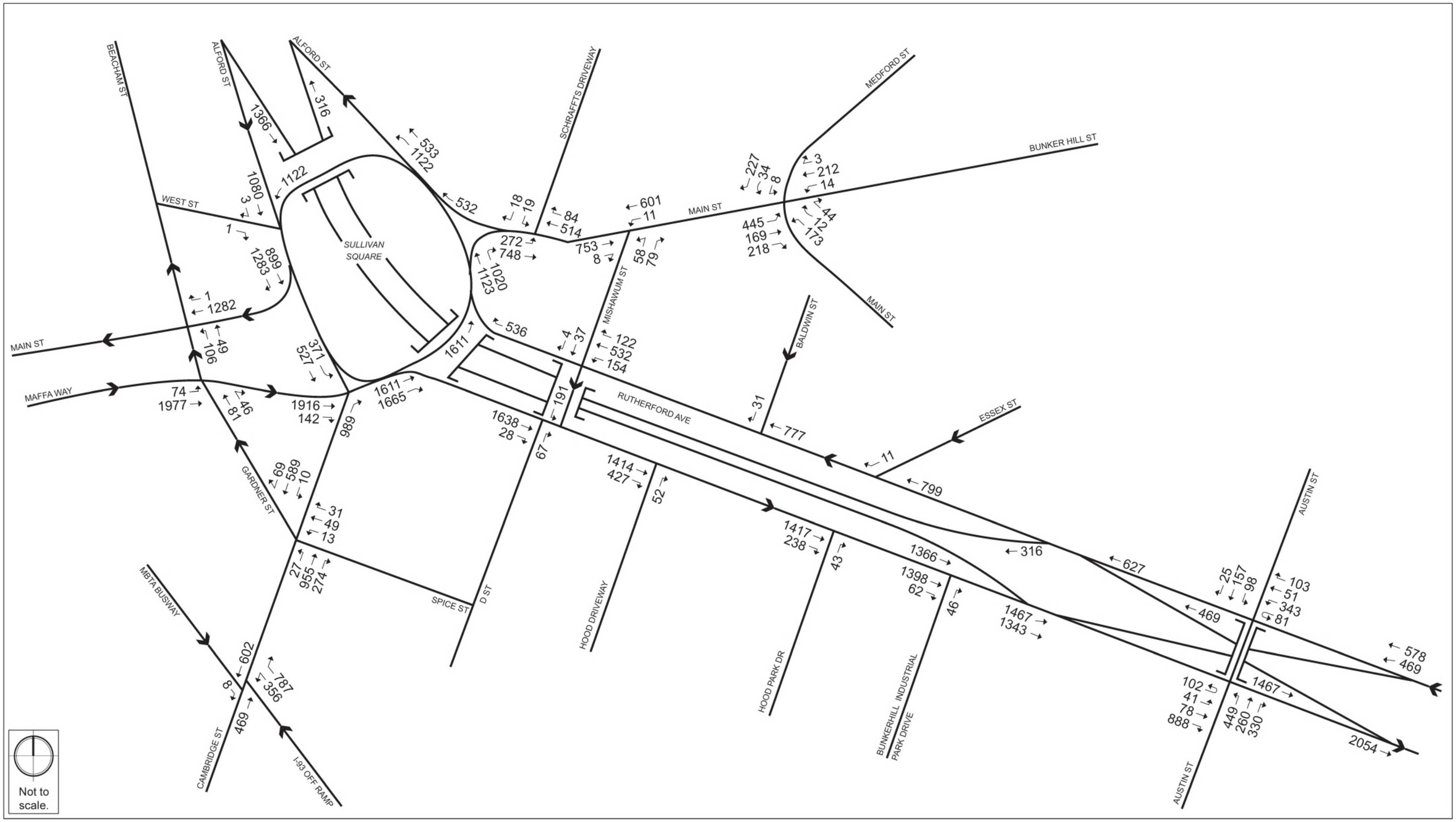

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Figure 2-20

Build (2026) Condition Traffic Volumes without BTD Improvements, Weekday a.m. Peak Hour

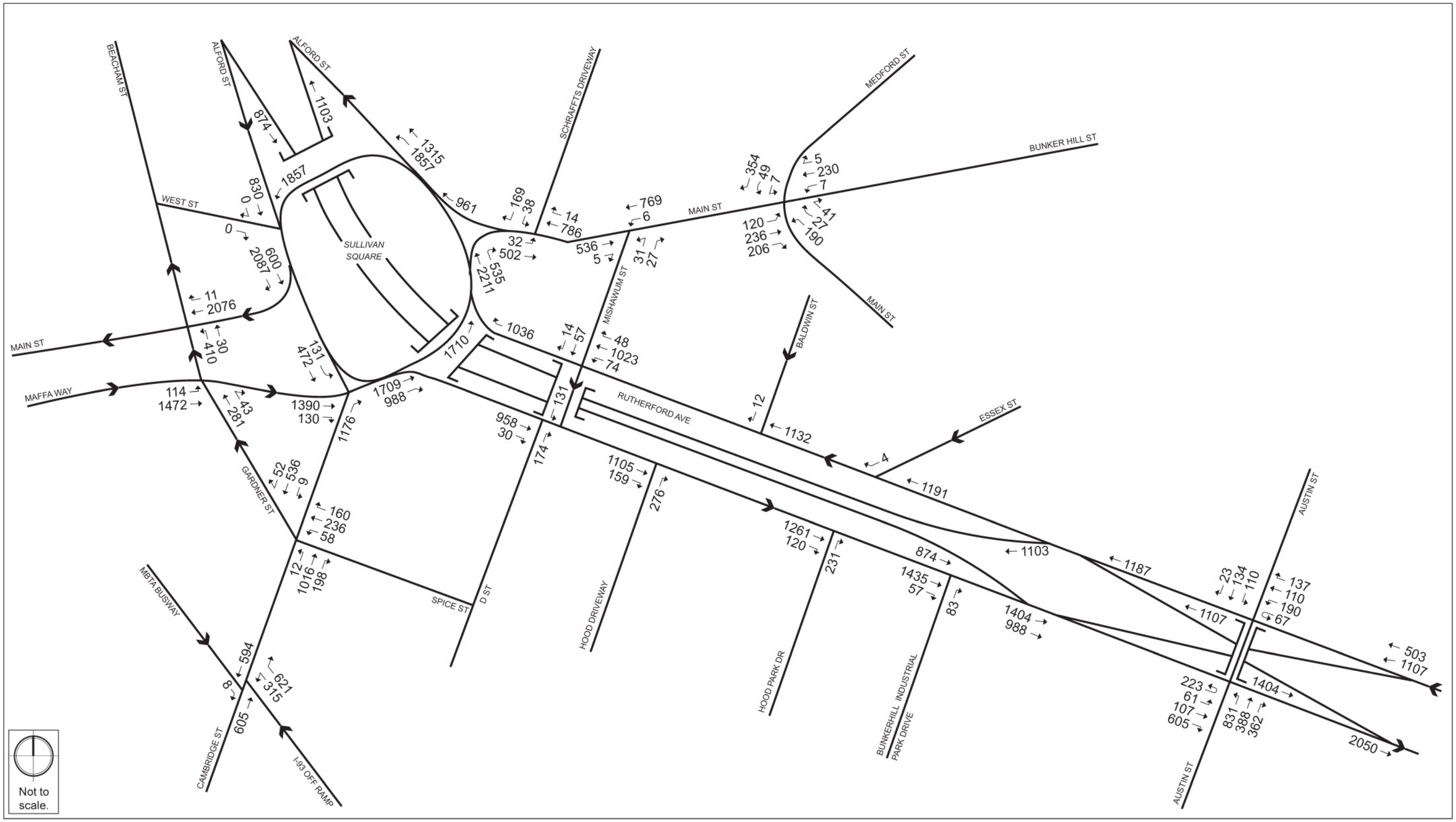

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Figure 2-21

Build (2026) Condition Traffic Volumes without BTD Improvements, Weekday p.m. Peak Hour

Table 2-6 Vehicle Level of Service Criteria

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

Source: 2000 Highway Capacity Manual, Transportation Research Board.

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

The volume-to-capacity ratio (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 95th percentile queue, measured in feet, denotes the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line. This maximum queue occurs five percent, or less, of the time during the peak hour, and typically does not develop during off-peak hours. Since volumes fluctuate throughout the hour, the 95th percentile queue represents what can be considered a "worst case" condition. Queues at an intersection are generally below the 95th percentile length throughout most of the peak hour. It is also unlikely that 95th percentile queues for each approach to an intersection occur simultaneously.

Table 2-7 summarize the Existing (2018) Condition capacity analysis for the study area intersections during both the weekday a.m. and p.m. peak hours. Table 2-8 and Table 2-9 summarize the No-Build with BTD Improvements (2026) Condition and the Build with BTD Improvements (2026) Condition capacity analysis for the study area intersection during the weekday a.m. and p.m. Peak hours, respectively. Table 2-10 present the Build (2026) without BTD Improvements Condition capacity analysis for both the a.m. and p.m. peak hours. The detailed analysis of the Synchro results is provided in **Appendix**.

2.6.1 Existing (2018) Condition Traffic Capacity Analysis

As shown in Table 2-7, the study area intersections and approaches generally operate below capacity (v/c ratio below 1.00) and at acceptable levels of service (LOS D or better) under the Existing (2018) Condition. The following locations were shown to have movements at capacity (v/c ratio of 1.00 or higher) or operating at high delays (LOS E or LOS F):

The signalized intersection of **Rutherford Avenue/Austin Street** operates at LOS C during both the a.m. and the p.m. peak hours. The Austin Street westbound approach operates at LOS E during both the a.m. and the p.m. peak hours. The Rutherford Avenue northbound left-turn lane operates at LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. The Rutherford Avenue northbound through/right approach and the Rutherford Avenue southbound left/through approach operates at LOS E during the p.m. peak hour. The longest queue occurs at the Rutherford Avenue northbound left approach during the a.m. peak hour and the Austin Street eastbound left | left/through approach during the p.m. peak hour.

The signalized intersection of **Cambridge Street/ I-93 northbound off-ramp** operates at LOS F during the a.m. peak hour and at LOS E during the p.m. peak hour. Both the I-93 northbound off-ramp left and right approaches operate at LOS F during both the peak hours. The longest queue occurs at the I-93 northbound off-ramp right approach during both the a.m. and p.m. peak hours.

The signalized intersection of **Maffa Way/Cambridge Street/Alford Street** operates at LOS D during the a.m. peak hour and LOS E during the p.m. peak hour. The Maffa Way eastbound through approach operates at LOS E during the p.m. peak hour. The Cambridge Street northbound approach operates at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour. The Alford Street southbound left approach operates at LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. The longest queue occurs at the Cambridge Street northbound right approach during both the a.m. and p.m. peak hours.

At the unsignalized intersection of **Main Street/Beacham Street**, the Beacham Street northbound approach operates at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour.

At the unsignalized intersection of **Maffa Way/Beacham Street/MBTA Driveway**, the MBTA driveway northbound approach operates at LOS F during both the a.m. and p.m. peak hours.

At the unsignalized intersection of **Main Street/Bunker Hill Street/Medford Street**, the Main Street northbound through approach operates at LOS F during both the a.m. and p.m. peak hours. The Medford Street southbound approach operates at LOS F during the a.m. peak hour.

At the unsignalized intersection of **Mishawum Street/Main Street**, the Mishawum Street northbound approach operates at LOS E during the a.m. peak hour.

At the **Sullivan Square Rotary**, the Rutherford Avenue northbound approach, the Main Street northbound approach and the Alford Street southbound approach operate at LOS F during both the a.m. and p.m. peak hours. The Maffa Way eastbound/Cambridge Street northbound approach operates at LOS F during the a.m. peak hour.

Table 2-7 Existing (2018) Condition Capacity Analysis Summary

Intersection/Movement	Existing (2018), a.m. Peak Hour					Existing (2018), p.m. Peak Hour				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th
Signalized Intersections										
Rutherford Avenue/Austin Street	**C**	**20.2**	-	-	-	**C**	**26.2**	-	-	-
Austin St EB left | left/thru	D	41.3	0.55	195	255	D	40.7	0.69	393	475
Austin St EB right	A	6.6	0.49	0	74	B	10.5	0.43	49	130
Austin St WB left/thru | thru/right	E	55.2	0.61	131	161	E	73.5	0.75	158	184
Rutherford Ave NB left	F	86.7	0.95	288	#478	E	69.5	0.66	177	255
Rutherford Ave NB thru/right	C	25.1	0.43	51	120	E	75.0	0.85	202	#318
Rutherford Ave SB left/thru	D	50.2	0.35	75	130	E	66.4	0.54	128	203
Rutherford Ave SB right | right	B	13.8	0.53	152	210	A	1.5	0.25	0	24
Cambridge Street/I-93 NB Off-Ramp	**F**	**131.0**	-	-	-	**E**	**64.1**	-	-	-
Cambridge St EB thru | thru	C	20.4	0.25	101	136	C	22.2	0.38	153	198
Cambridge St WB thru | thru	C	22.5	0.39	153	200	C	22.0	0.37	147	192
I-93 NB Off-ramp NB left	F	>80.0	>1.00	~370	#560	F	>80.0	>1.00	~293	#473
I-93 NB Off-ramp NB right	F	>80.0	>1.00	~575	#791	F	>80.0	>1.00	~352	#549
Maffa Way/Cambridge Street/ Alford Street	**D**	**50.6**	-	-	-	**E**	**67.1**	-	-	-
Maffa Way EB thru | thru | thru	D	48.7	0.86	551	606	E	61.2	0.83	436	493
Maffa Way EB right	B	13.8	0.32	22	73	B	18.6	0.26	38	96
Cambridge St NB right | right	E	59.0	0.92	480	#625	F	>80.	>1.0	~684	#916
Alford St SB left | left	F	96.2	0.93	175	#271	E	74.2	0.09	57	96
Alford St SB thru | thru	C	20.3	0.28	148	187	C	27.7	0.28	160	226
Unsignalized Intersections										
Cambridge Street/Spice Street/ MBTA Driveway	-	-	-	-	-	-	-	-	-	-
Cambridge St EB left/thru | thru/right	A	0.7	0.02	-	2	A	0.3	0.01	-	1
Cambridge St WB left/thru | thru/right	A	0.5	0.01	-	1	A	0.4	0.01	-	1
Spice St NB left/thru/right	B	14.1	0.07	-	6	B	14.2	0.29	-	31
Main Street/Beacham Street	-	-	-	-	-	-	-	-	-	-
Main St WB thru | thru/right	A	0.0	0.45	-	0	A	0.0	0.73	-	0
Beacham St NB thru/right	E	35.8	0.56	-	77	F	>50.	>1.0	-	438
Maffa Way/Beacham Street/MBTA Driveway	-	-	-	-	-	-	-	-	-	-
Maffa Way EB left/thru | thru | thru/right	A	1.5	0.05	-	4	A	2.5	0.07	-	6

Table 2-7 Existing (2018) Condition Capacity Analysis Summary (Continued)

Intersection/Movement	Existing (2018), a.m. Peak Hour					Existing (2018), p.m. Peak Hour				
	LOS	Delay (s)	V/C Ratio	Queues (ft)		LOS	Delay (s)	V/C Ratio	Queues (ft)	
				50th	95th				50th	95th
MBTA Driveway NB thru	F	>50.	>1.0	-	116	F	>50.	0.68	-	80
MBTA Driveway NB left	C	19.7	0.19	-	17	B	14.6	0.10	-	8
Main Street/Bunker Hill Street/ Medford Street	-	-	-	-	-	-	-	-	-	-
Main St EB left/thru | thru/right	A	6.8	0.35	-	40	A	2.4	0.08	-	7
Bunker Hill St WB left/thru/right	A	0.8	0.01	-	1	A	0.4	0.01	-	1
Main St NB left/thru/right	F	>50.	>1.0	-	-	F	>50.	>1.0	-	-
Medford St SB left/thru/right	F	>50.	0.95	-	227	C	23.4	0.71	-	144
Mishawum Street/Main Street	-	-	-	-	-	-	-	-	-	-
Main St EB thru | thru/right	A	0.0	0.44	-	0	A	0.0	0.30	-	0
Main St WB left/thru | thru	A	0.1	0.01	-	0	A	0.1	0.00	-	0
Mishawum St NB right	E	39.6	0.62	-	94	C	22.5	0.20	-	19
Rutherford Avenue NB/Mishawum Street	-	-	-	-	-	-	-	-	-	-
Mishawum St WB thru/right	B	14.2	0.09	-	8	C	24.1	0.30	-	30
Rutherford Ave NB thru | thru/right	A	1.1	0.02	-	2	A	0.7	0.02	-	2
Rutherford Avenue NB/Baldwin Street	-	-	-	-	-	-	-	-	-	-
Baldwin St WB right	B	10.5	0.06	-	5	B	12.4	0.03	-	2
Rutherford Ave NB thru | thru	A	0.0	0.17	-	0	A	0.0	0.29	-	0
Rutherford Avenue NB/Essex Street	-	-	-	-	-	-	-	-	-	-
Essex St WB right	B	10.2	0.03	-	2	B	14.0	0.03	-	2
Rutherford Ave NB thru | thru	A	0.0	0.17	-	0	A	0.0	0.29	-	0
Rutherford Avenue SB/	-	-	-	-	-	-	-	-	-	-
Bunker Hill Industrial Park Dr EB right	C	17.5	0.16	-	14	C	17.6	0.32	-	34
Rutherford Ave SB thru | thru/right	A	0.0	0.46	-	0	A	0.0	0.41	-	0
Rutherford Avenue SB/Hood Park Drive	-	-	-	-	-	-	-	-	-	-
Hood Park Drive EB right	B	14.0	0.02	-	2	B	13.3	0.12	-	10
Rutherford Ave SB thru | thru/right	A	0.0	0.49	-	0	A	0.0	0.40	-	0
Rutherford Avenue SB/D Street	-	-	-	-	-	-	-	-	-	-
D St EB right	B	14.7	0.13	-	11	B	12.9	0.27	-	27
Rutherford Ave SB thru | thru/right	A	0.0	0.49	-	0	A	0.0	0.29	-	0
Rutherford Avenue SB/Mishaum Street	-	-	-	-	-	-	-	-	-	-
Mishaum St WB left	C	16.4	0.17	-	15	B	13.5	0.18	-	16
Rutherford Ave SB thru | thru	A	0.0	0.40	-	0	A	0.0	0.28	-	0
Sullivan Square Rotary	-	-	-	-	-	-	-	-	-	-
Rutherford Ave NB bear right/right	F	>80.	>1.0	-	755	F	>80.	>1.0	-	4309
Main St NB thru/right	F	62.8	0.98	-	274	F	>80.	>1.0	-	5561
Alford St SB thru/bear-right/right	F	>80.	>1.0	-	1471	F	>80.	>1.0	-	548
West St SB	B	14.4	0.07	-	4	B	10.6	0.02	-	1
Maffa Way EB/Cambridge NB	F	>80.	>1.2	-	2192	C	18.8	0.78	-	179

Grey Shading indicates LOS E or F.

~ 50th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.

\# 95th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.

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

2.6.2 No-Build (2026) Condition with BTD Improvements Traffic Capacity Analysis

As shown in Table 2-8 and Table 2-9, the study area intersections and approaches generally continue to operate at the same levels of service as under the Existing (2018) Condition, with the exception of the following intersections and movements:

The signalized intersection of **Rutherford Avenue/Austin Street** improves from LOS C to LOS B during the a.m. peak hour and remains LOS C during the p.m. peak hour. The Rutherford Avenue southbound left/through approach improves from LOS D to LOS C in the a.m. peak hour and decreases from LOS E to LOS F during the p.m. peak hour. The longest queues at the intersection occur at the Austin Street eastbound right approach during the a.m. peak hour and at the Austin Street eastbound left, left and through approaches during the p.m. peak hour.

The signalized intersection of **Cambridge Street/I-93 NB Off-Ramp** improves from LOS F to LOS C during the a.m. peak hour and from LOS E to LOS C during the p.m. peak hour. The Cambridge Street eastbound approach decreases from LOS C to LOS D during both the a.m. and p.m. peak hours. The I-93 NB Off-ramp northbound left approach improves from LOS F to LOS B during both the a.m. and p.m. peak hours. The I-93 NB Off-ramp northbound right movement improves from LOS F to LOS A during both the a.m. and p.m. peak hours. The longest queues at the intersection occur at the Cambridge Street eastbound approach during both the a.m. and p.m. peak hours.

The signalized intersection of **Cambridge Street/Spice Street/MBTA Driveway** operates at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The Cambridge Street eastbound approach operates at LOS E during the p.m. peak hour. The Spice Street northbound through/right approach operates at LOS F during the p.m. peak hour. The longest queues at the intersection occur at the Cambridge Street eastbound approach during both the a.m. and p.m. peak hours.

The signalized intersection of **Rutherford Avenue/Cambridge Street/Alford Street/Maffa Way** operates at LOS E during both the a.m. and p.m. peak hours. The Cambridge Street eastbound through and through/hard right approach operates at LOS F during both the a.m. and p.m. peak hours. The Alford Street westbound left approach operates at LOS F during the a.m. peak hour. The Maffa Way southbound through approaches operate at LOS F during the a.m. peak hour. The Rutherford Avenue north-westbound left-turn approaches operate at LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Maffa Way south-eastbound through approaches during the a.m. peak hour and at the Cambridge Street eastbound through and through hard right approach during the p.m. peak hour.

The signalized intersection of **Main Street/Beacham Street** operates at LOS D during the a.m. peak hour and LOS E during the p.m. peak hour. The Beacham Street northbound left approach operates at LOS F during both the a.m. and p.m. peak hours. The Beacham Street northbound through and right approach operates at LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Beacham Street northbound left approach during both the a.m. and the p.m. peak hours.

The signalized intersection of **Maffa Way/Beacham Street/MBTA Driveway** operates at LOS D during the a.m. peak hour and at LOS E during the p.m. peak hour. The Maffa Way eastbound left approach operates at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour. The Maffa Way eastbound through approaches operate at LOS E during the p.m. peak hour. The longest queues occur at the Maffa Way eastbound through approaches during the a.m. peak hour and at the Maffa Way eastbound left approach during the p.m. peak hour.

The signalized intersection of **Main Street/Bunker Hill Street/Medford Street** operates at LOS D during both the a.m. and the p.m. peak hour. The Main Street northbound approach operates at LOS F during both the a.m. and the p.m. peak hours. The Medford Street southbound approach operates at LOS E during both the a.m. and the p.m. peak hours. The longest queues at the intersection occur at the Main Street northbound approach during both the a.m. and the p.m. peak hours.

The signalized intersection of **Alford Street/Main Street** operates at LOS D during the a.m. peak hour and LOS E during the p.m. peak hour. The Main Street eastbound approach operates at LOS E during the a.m. peak hour. The Main Street eastbound approach operates at LOS E during the a.m. peak hour. The Main Street westbound approach operates at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour. The longest queues at the intersection occur at the Main Street eastbound approach during the a.m. peak hour and at the Main Street westbound approach during the p.m. peak hour.

At the unsignalized intersection of **Rutherford Avenue northbound/Mishawum Street,** the Mishawum Street westbound through approach operates at LOS F during the p.m. peak hour.

2.6.3 Build (2026) Condition with BTD Improvements Traffic Capacity Analysis

As shown in the Build (2026) Condition with BTD Improvements, all of the study area intersections and approaches continue to operate at the same levels of service as the No-Build (2026) during the weekday a.m. and p.m. peak hours, with the exception of the following movements:

The signalized intersection of **Rutherford Avenue/Austin Street** decreases from LOS B to LOS C during the a.m. peak hour and continues to operate at LOS C during the p.m. peak hour. The Austin Street westbound left, through and through approaches decrease from LOS C to LOS E during the p.m. peak hour. The Rutherford Avenue southbound left/through approach continues to operate at LOS F during the p.m. peak hour. The longest queues at the intersection occur at the Austin Street eastbound right approach during the a.m. peak hour and at the Austin Street eastbound left, left and through approaches during the p.m. peak hour.

The signalized intersection of **Cambridge Street/Spice Street/MBTA Driveway** continues to operate at LOS C during the a.m. peak hour and decreases from LOS D to LOS E during the p.m. peak hour. The Spice Street northbound through/right approach decreases from LOS C to LOS E during the a.m. peak hour and continues to operate at LOS F during the p.m. peak hour. The longest queues at the intersection occur at the Cambridge Street eastbound approach during both the a.m. and the p.m. peak hour.

The signalized intersection of **Rutherford Avenue/Cambridge Street/Alford Street/Maffa Way** continues to operate at LOS E during both the a.m. and the p.m. peak hours. The Cambridge Street eastbound through and through/hard right approach continues to operate at LOS F during both the a.m. and p.m. peak hours. The Alford Street westbound left approach continues to operate at LOS F during the a.m. peak hour and decreases from LOS D to LOS E during the p.m. peak hour. The Maffa Way southbound through approaches continue to operate at LOS F during the a.m. peak hour. The Rutherford Avenue north-westbound left-turn approaches continue to operate at LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Maffa Way southbound through approaches during the a.m. peak hour and at the Cambridge Street eastbound through and through hard right approach during the p.m. peak hour.

The signalized intersection of **Main Street/Beacham Street** continues to operate at LOS D during the a.m. peak hour and decreases from LOS E to LOS F during the p.m. peak hour. The Beacham Street northbound left approach continues to operate at LOS F during both the a.m. and the p.m. peak hour. The Beacham Street northbound through and right approach improves from LOS E to LOS D during the p.m. peak hour. The longest queues at the intersection occur at the Beacham Street northbound left/through approach during both the a.m. and the p.m. peak hours.

The signalized intersection of **Maffa Way/Beacham Street/MBTA Driveway** decreases from LOS D to LOS E during the a.m. peak hour and continues to operate at LOS E during the p.m. peak hour. The Maffa Way eastbound left approach continues to operate at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour. The Maffa Way eastbound through approaches decrease from LOS D to LOS F during the a.m. peak hour and continues to operate at LOS E during the p.m. peak hour. The longest queues occur at the Maffa Way eastbound through approaches during the a.m. peak hour and at the Maffa Way eastbound left approach during the p.m. peak hour.

The signalized intersection of **Main Street/Bunker Hill Street/Medford Street** continues to operate at LOS D during both the a.m. and the p.m. peak hour. The Main Street northbound approach continues to operate at LOS F during both the a.m. and the p.m. peak hours. The

Medford Street southbound approach continues to operate at LOS E during both the a.m. and the p.m. peak hours. The longest queues at the intersection occur at the Main Street northbound approach during both the a.m. and the p.m. peak hours.

The signalized intersection of **Hood Park Drive/Rutherford Avenue/Baldwin Street** decreases from LOS C to LOS E during the a.m. peak hour. The Rutherford Avenue southbound approach decreases from LOS D to LOS F during the a.m. peak hour. The longest queues at the intersection occur at the Rutherford Avenue southbound approach during both the a.m. and the p.m. peak hours.

The signalized intersection of **Alford Street/Main Street** continues to operate at LOS D during the a.m. peak hour and at LOS E during the p.m. peak hour. The Main Street eastbound approach continues to operate at LOS E during the a.m. peak hour. The Main Street westbound approach continues to operate at LOS E during both the a.m. and the p.m. peak hours. The longest queues at the intersection occur at the Main Street eastbound approach during the a.m. peak hour and at the Main Street westbound approach during the p.m. peak hour.

At the unsignalized intersection of **Rutherford Avenue northbound/Mishawum Street,** the Mishawum Street westbound through approach continues to operate at LOS F during the p.m. peak hour.

At the unsignalized intersection of **Rutherford Avenue southbound/D Street/Mishawum Street,** the Mishawum Street westbound through approach decreases from LOS D to LOS F during the a.m. peak hour.

Table 2-8 Capacity Analysis Summary with BTD Improvements, Weekday a.m. Peak Hour

Intersection/Movement	No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th
Signalized Intersections										
Rutherford Avenue/Austin Street	**B**	**19.7**	-	-	-	**C**	**20.3**	-	-	-
Austin St EB left | left | thru	B	11.1	0.56	31	55	C	28.5	0.41	161	199
Austin St EB right	D	35.6	0.61	223	327	D	35.6	0.61	223	327
Austin St WB left | thru | thru	C	26.2	0.13	46	67	D	47.3	0.5	80	144
Rutherford Ave NB left/thru | thru/right	C	21.7	0.35	133	178	C	26.2	0.13	46	67
Rutherford Ave SB left/thru	C	23.6	0.11	64	m69	C	23.7	0.11	64	m70
Rutherford Ave SB right	A	3.5	0.60	0	m251	A	3.6	0.61	1	m4
Cambridge Street/I-93 NB Off-Ramp	**C**	**21.1**	-	-	-	**C**	**20.6**	-	-	-
Cambridge St EB thru | thru	D	40.1	0.54	166	199	D	40.0	0.56	175	207
Cambridge St WB thru | thru	C	23.0	0.73	95	87	C	20.5	0.71	90	86
I-93 NB Off-ramp NB left | left/right	B	14.2	0.44	118	193	B	14.4	0.49	131	214
I-93 NB Off-ramp NB right	A	5.9	0.51	23	103	A	9.7	0.53	61	187

Table 2-8 Capacity Analysis Summary with BTD Improvements, Weekday a.m. Peak Hour (Continued)

Intersection/Movement	No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50^{th}	Queues (ft) 95^{th}
Signalized Intersections										
Cambridge Street/Spice Street/ MBTA Driveway	**C**	**20.4**	-	-	-	**C**	**28.3**	-	-	-
Cambridge St EB left/thru | thru/right	B	17.2	0.74	319	352	C	26.6	0.80	346	383
Cambridge St WB left/thru | thru/right	C	21.8	0.27	187	246	C	21.7	0.26	187	251
Spice St NB left	D	45.4	0.30	73	128	D	47.6	0.36	77	135
Spice St NB thru/right	C	25.5	0.13	13	48	E	77.6	0.25	41	89
Rutherford Avenue/Cambridge Street/Alford Street/Maffa Way	**E**	**71.7**	-	-	-	**E**	**76.5**	-	-	-
Cambridge St EB thru | thru/hard right	F	>80.	>1.0	~347	#480	F	>80.	1.02	~346	#478
Alford St WB left	F	>80.	>1.0	~111	m208	F	>80.	1.29	~152	m#25
Alford St WB thru | thru	B	16.2	0.36	135	m50	B	16.0	0.36	135	m48
Maffa Way SB left	B	11.2	0.04	12	m15	B	10.2	0.04	11	m11
Maffa Way SB thru | thru	F	>80.	0.98	~523	#665	F	92.7	1.13	~676	#820
Maffa Way SB hard right	A	8.2	0.19	39	m49	A	6.9	0.19	32	m35
Rutherford Ave NWB left | left	F	>80.	0.42	20	42	F	>80.	0.42	20	39
Rutherford Ave NWB thru | thru	A	9.1	0.36	40	59	A	9.1	0.36	40	75
Main Street / Beacham Street	**D**	**44.7**	-	-	-	**D**	**46.9**	-	-	-
Main St WB thru | thru/right	D	41.0	0.23	176	m188	D	41.6	0.24	176	m188
Beacham St NB left	F	>80.	0.79	194	m241	F	>80.	0.88	219	m#29
Beacham St NB thru/right	B	12.1	0.45	118	m186	B	11.8	0.45	107	m163
Beacham St SB left/thru/right	A	0.3	0.10	0	0	A	0.3	0.10	0	0
Maffa Way/Beacham Street/MBTA Driveway	**D**	**53.6**	-	-	-	**E**	**68.6**	-	-	-
Maffa Way EB left	E	69.4	0.86	212	#335	E	70.1	0.86	212	#341
Maffa Way EB thru | thru	D	54.2	0.74	433	526	F	>80.	0.85	533	#653
Maffa Way WB thru | thru/right	C	34.1	0.23	123	168	C	33.4	0.24	124	155
MBTA Driveway NB left/thru |	D	38.2	0.63	100	149	D	46.8	0.72	118	m166
Main Street/Bunker Hill Street/ Medford Street	**D**	**39.3**	-	-	-	**D**	**39.2**	-	-	-
Main St EB left/thru | thru/right	A	4.6	0.60	35	71	A	4.6	0.60	35	72
Bunker Hill St WB left/thru/right	A	9.7	0.23	53	109	A	9.7	0.23	54	111
Main St NB left/thru/right	F	>80.	0.94	109	#213	F	>80.	0.94	109	#213
Medford St SB left/thru/right	E	69.3	0.44	16	63	E	69.3	0.44	16	63
Mishawum Street/Main Street	**B**	**13.2**	-	-	-	**B**	**13.2**	-	-	-
Main St EB thru | thru/right	A	8.4	0.38	53	134	A	8.4	0.38	53	134
Main St WB left/thru | thru	C	20.7	0.38	96	191	C	20.6	0.38	95	192
Mishawum St NB right	A	1.6	0.15	0	10	A	1.6	0.15	0	10
Hood Park Drive/Rutherford Avenue/ Baldwin Street	**C**	**29.6**	-	-	-	**E**	**65.5**	-	-	-
Hood Park Dr EB left/right	A	2.8	0.18	0	0	B	14.9	0.37	0	30
Baldwin St WB right	A	0.2	0.06	0	0	A	0.2	0.06	0	0
Rutherford Ave NB left	B	18.4	0.20	4	m29	D	52.9	0.61	76	144

Table 2-8 Capacity Analysis Summary with BTD Improvements, Weekday a.m. Peak Hour (Continued)

Intersection/Movement	No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th
Hood Park Dr EB left/right	A	2.8	0.18	0	0	B	14.9	0.37	0	30
Baldwin St WB right	A	0.2	0.06	0	0	A	0.2	0.06	0	0
Rutherford Ave NB left	B	18.4	0.20	4	m29	D	52.9	0.61	76	144
Rutherford Ave NB thru | thru | thru	A	4.8	0.31	47	54	A	6.1	0.35	46	53
Rutherford Ave SB thru | thru |	D	38.2	0.96	~971	#103	F	>80.	1.12	~108	m#113
Bunker Hill Industrial Park/Rutherford Avenue/Essex Street	**A**	**9.4**	**-**	**-**	**-**	**B**	**12.7**	**-**	**-**	**-**
Bunker Hill Industrial Park Dr EB	B	11.2	0.33	0	21	B	11.2	0.33	0	21
Essex St WB right	A	0.1	0.02	0	0	A	0.1	0.02	0	0
Rutherford Ave NB left	A	6.7	0.07	2	m5	A	7.1	0.07	2	m5
Rutherford Ave NB thru | thru	B	19.4	0.44	317	384	C	20.2	0.49	361	437
Rutherford Ave SB thru | thru |	A	6.2	0.94	~10	#101	B	10.1	0.95	~101	m81
Alford Street/Main Street	**D**	**36.2**	**-**	**-**	**-**	**D**	**35.5**	**-**	**-**	**-**
Main St EB left/thru | thru/right	E	62.1	0.75	245	305	E	60.1	0.75	238	296
Main St WB left/thru | thru/right	E	73.9	0.93	183	#287	E	73.9	0.93	183	#287
Alford St NB left	A	3.0	0.00	0	m0	A	3.0	0.00	0	m0
Alford St NB thru | thru/right	A	1.0	0.40	0	m0	A	0.9	0.40	0	m0
Alford St SB left	C	25.2	0.57	82	129	C	25.2	0.57	82	129
Alford St SB thru | thru/right	B	19.0	0.28	110	171	B	19.2	0.29	116	181
Alford St Extension/Main Street	**A**	**4.5**	**-**	**-**	**-**	**A**	**4.4**	**-**	**-**	**-**
Main St EB left/thru | thru	A	4.0	0.38	58	114	A	4.0	0.38	58	114
Main St WB thru | thru/right	A	0.9	0.19	0	0	A	0.9	0.19	0	0
Alford St Ext. NB left/thru/right	C	21.0	0.54	21	69	C	21.0	0.54	21	69
Alford St Ext. SB left/right	-	-	-	-	-	-	-	-	-	-
Unsignalized Intersections										
Rutherford Avenue NB/Mishawum Street	-	-	-	-	-	-	-	-	-	-
Mishawum St WB thru	C	20.9	0.29	-	29	C	21.2	0.30	-	30
Mishawum St WB right	A	0.0	0.00	-	0	A	0.0	0.00	-	0
Rutherford Ave NB thru | thru/right	A	1.9	0.05	-	4	A	1.9	0.05	-	4
Rutherford Avenue SB/D Street/	-	-	-	-	-	-	-	-	-	-
D St EB right	A	9.9	0.09	-	7	A	9.9	0.09	-	7
Mishawum St WB left	B	10.4	0.09	-	7	B	10.4	0.09	-	8
Mishawum St WB thru	D	32.3	0.44	-	52	F	>50.0	0.66	-	94
Rutherford Ave SB thru | thru/right	A	0.0	0.61	-	0	A	0.0	0.68	-	0
Alford Street/West Street	-	-	-	-	-	-	-	-	-	-
West St EB right	B	10.8	0.00	-	0	B	10.9	0.0	-	0
Alford St NB thru | thru/right	A	0.0	0.10	-	0	A	0.0	0.10	-	0
Alford St SB thru | thru/right	A	0.0	0.10	-	0	A	0.0	0.28	-	0

Grey Shading indicates LOS E or F.
~ 50th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
\# 95th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
m Volumes for 95th percentile queue is metered by upstream signal

Table 2-9 Capacity Analysis Summary with BTD Improvements, Weekday p.m. Peak Hour

Intersection/Movement	No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th
Signalized Intersections										
Rutherford Avenue/Austin Street	**C**	**20.6**	-	-	-	**C**	**20.5**	-	-	-
Austin St EB left | left | thru	D	48.3	0.82	200	243	B	15.5	0.3	235	304
Austin St EB right	A	0.4	0.25	0	0	A	0.4	0.25	0	0
Austin St WB left | thru | thru	C	29.8	0.24	80	128	E	61.5	2.1	100	164
Rutherford Ave NB left/thru | thru/right	D	42.6	0.54	159	213	C	33.4	0.15	31	47
Rutherford Ave SB left/thru	F	>80.	0.36	102	m107	F	>80.	0.37	100	m96
Rutherford Ave SB right	A	0.5	0.38	0	0	A	0.5	0.42	0	m0
Cambridge Street/I-93 NB Off-Ramp	**C**	**23.0**	-	-	-	**C**	**22.8**	-	-	-
Cambridge St EB thru | thru	D	44.3	0.71	234	270	D	43.8	0.70	235	272
Cambridge St WB thru | thru	B	20.0	0.67	116	126	C	20.1	0.69	126	135
I-93 NB Off-ramp NB left | left/right	B	13.4	0.40	97	164	B	10.9	0.42	102	170
I-93 NB Off-ramp NB right	A	4.7	0.39	8	74	A	5.8	0.42	19	97
Cambridge Street/Spice Street/ MBTA Driveway	**D**	**53.2**	-	-	-	**E**	**66.7**	-	-	-
Cambridge St EB left/thru | thru/right	E	64.5	0.75	394	430	E	64.2	0.77	403	438
Cambridge St WB left/thru | thru/right	B	17.0	0.25	150	189	B	16.9	0.25	150	188
Spice St NB left	D	48.9	0.43	102	170	D	51.8	0.53	122	196
Spice St NB thru/right	F	>80.	0.55	96	180	F	>80.	1.15	~364	#562
Rutherford Avenue/Cambridge Street/Alford Street/Maffa Way	**E**	**56.9**	-	-	-	**E**	**56.1**	-	-	-
Cambridge St EB thru | thru/hard right	F	>80.	0.82	422	#561	F	>80.	0.86	396	m#52
Alford St WB left	D	53.0	0.08	4	m11	E	56.3	0.21	10	m21
Alford St WB thru | thru	B	14.7	0.26	110	m43	B	14.6	0.26	109	m42
Maffa Way SB left	D	39.0	0.19	41	m45	D	38.9	0.19	42	m41
Maffa Way SB thru | thru	D	42.1	0.71	162	m174	D	42.1	0.76	180	m175
Maffa Way SB hard right	B	17.6	0.25	38	m40	B	17.6	0.25	36	m36
Rutherford Ave NWB left | left	E	67.6	0.39	17	m22	E	67.9	0.39	17	m21
Rutherford Ave NWB thru | thru	D	38.8	0.92	315	#489	D	37.8	0.92	328	m#48
Main Street / Beacham Street	**E**	**58.2**	-	-	-	**F**	**91.2**	-	-	-
Main St WB thru | thru/right	C	33.8	0.69	105	m87	C	33.8	0.69	105	m87
Beacham St NB left	F	>80.	0.99	455	m421	F	>80.	1.32	~758	m#70
Beacham St NB thru/right	E	60.7	0.32	130	m116	D	35.4	0.32	89	m88
Beacham St SB left/thru/right	A	0.8	0.21	0	1	A	9.9	0.24	16	64
Maffa Way/Beacham Street/MBTA Driveway	**E**	**66.5**	-	-	-	**E**	**68.6**	-	-	-
Maffa Way EB left	F	>80.	>1.0	~617	#856	F	>80.	1.18	~617	#856
Maffa Way EB thru | thru	E	66.8	0.97	369	#506	E	79.7	1.03	~421	#552
Maffa Way WB thru | thru/right	C	21.7	0.94	139	m205	C	22.0	0.94	135	m#21
MBTA Driveway NB left/thru |	D	35.9	0.46	109	155	C	34.2	0.79	196	m221
Main Street/Bunker Hill Street/ Medford Street	**D**	**54.7**	-	-	-	**D**	**54.6**	-	-	-
Main St EB left/thru | thru/right	A	1.9	0.42	11	18	A	1.9	0.42	11	18
Bunker Hill St WB left/thru/right	B	13.8	0.29	79	117	B	13.8	0.29	79	117
Main St NB left/thru/right	F	>80.	0.87	107	#270	F	>80.	0.87	107	#270
Medford St SB left/thru/right	E	68.4	0.50	16	80	E	68.4	0.50	16	80

Table 2-9 Capacity Analysis Summary with BTD Improvements, Weekday p.m. Peak Hour (Continued)

Intersection/Movement	No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th
Signalized Intersections										
Mishawum Street/Main Street	**C**	**24.8**	**-**	**-**	**-**	**C**	**24.8**	**-**	**-**	**-**
Main St EB thru | thru/right	B	10.7	0.33	49	38	B	10.7	0.33	49	38
Main St WB left/thru | thru	D	35.5	0.56	190	m245	D	35.5	0.56	190	m245
Mishawum St NB right	A	0.1	0.03	0	0	A	0.1	0.04	0	0
Hood Park Drive/Rutherford Avenue/ Baldwin Street	**B**	**15.6**	**-**	**-**	**-**	**D**	**39.4**	**-**	**-**	**-**
Hood Park Dr EB left/right	D	40.4	0.66	52	114	E	78.5	0.97	180	#365
Baldwin St WB right	A	0.1	0.03	0	0	A	0.2	0.03	0	0
Rutherford Ave NB left	A	2.6	0.10	0	m1	A	3.0	0.01	0	m0
Rutherford Ave NB thru | thru | thru	A	5.9	0.75	89	m93	D	42.6	0.81	127	m23
Rutherford Ave SB thru | thru |	C	23.4	0.80	617	732	C	31.8	0.92	608	699
Bunker Hill Industrial Park/Rutherford Avenue/Essex Street	**C**	**26.0**	**-**	**-**	**-**	**C**	**28.7**	**-**	**-**	**-**
Bunker Hill Industrial Park Dr EB	C	28.2	0.53	14	65	C	28.2	0.53	14	65
Essex St WB right	A	0.0	0.01	0	0	A	0.0	0.01	0	0
Rutherford Ave NB left	A	4.5	0.06	1	m2	A	4.4	0.06	1	m2
Rutherford Ave NB thru | thru	D	41.3	1.00	903	#123	D	45.5	0.81	127	m23
Rutherford Ave SB thru | thru |	B	11.8	0.75	144	282	C	31.7	0.92	608	699
Alford Street/Main Street	**E**	**59.3**	**-**	**-**	**-**	**E**	**59.6**	**-**	**-**	**-**
Main St EB left/thru | thru/right	D	48.2	0.46	144	194	D	47.1	0.46	146	196
Main St WB left/thru | thru/right	F	>80.	>1.0	~354	#476	F	>80.	1.20	~354	#476
Alford St NB left	A	9.0	0.00	0	m0	B	12.0	0.00	0	m0
Alford St NB thru | thru/right	B	10.1	0.58	41	112	B	11.8	0.58	41	m110
Alford St SB left	C	20.1	0.39	37	67	C	20.1	0.39	37	67
Alford St SB thru | thru/right	B	17.8	0.16	60	102	B	17.8	0.17	62	104
Alford St Extension/Main Street	**A**	**5.5**	**-**	**-**	**-**	**A**	**5.5**	**-**	**-**	**-**
Main St EB left/thru | thru	A	3.8	0.22	36	67	A	3.8	0.22	36	67
Main St WB thru | thru/right	A	1.3	0.37	4	9	A	1.3	0.37	4	9
Alford St Ext. NB left/thru/right	D	38.1	0.56	68	117	D	38.1	0.56	68	117
Alford St Ext. SB left/right	-	-	-	-	-	-	-	-	-	-
Unsignalized Intersections										
Rutherford Avenue NB/Mishawum Street	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Mishawum St WB thru	F	>50.	0.87	-	150	F	>50.0	0.87	-	150
Mishawum St WB right	A	0.0	0.00	-	0	A	0.0	0.00	-	0
Rutherford Ave NB thru | thru/right	A	1.5	0.05	-	4	A	1.5	0.05	-	4
Rutherford Avenue SB/D Street/ Mishawum Street	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
D St EB right	A	9.5	0.19	-	17	A	9.6	0.19	-	18
Mishawum St WB left	B	11.7	0.16	-	14	B	11.6	0.16	-	14
Mishawum St WB thru	C	15.5	0.27	-	27	C	16.2	0.28	-	29
Rutherford Ave SB thru | thru/right	A	0.0	0.38	-	0	A	0.0	0.40	-	0

Table 2-9 Capacity Analysis Summary with BTD Improvements, Weekday p.m. Peak Hour (Continued)

Intersection/Movement	No-Build (2026) Condition					Build (2026) Condition				
	LOS	Delay (s)	V/C Ratio	Queues (ft)		LOS	Delay (s)	V/C Ratio	Queues (ft)	
				50th	95th				50th	95th
Unsignalized Intersections										
Alford Street/West Street	-	-	-	-	-	-	-	-	-	-
West St EB right	A	0.0	0.00	-	0	A	0.0	0.00	-	0
Alford St NB thru | thru/right	A	0.0	0.22	-	0	A	0.0	0.00	-	0
Alford St SB thru | thru/right	A	0.00	0.15	-	0	A	0.0	0.00	-	0

Grey Shading indicates LOS E or F.
~ 50th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
\# 95th percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
m Volumes for 95th percentile queue is metered by upstream signal

2.6.4 Build (2026) Condition with-out BTD Improvements Traffic Capacity Analysis

As shown in Table 2-10, the study area intersections and approaches generally operate below capacity (v/c ratio below 1.00) and at acceptable levels of delay (LOS D or better) under the Build (2026) Condition without BTD improvements. The following locations were shown to have movements at capacity (v/c ratio of 1.00 or higher) or operating at high delays (LOS E or LOS F):

The signalized intersection of **Rutherford Avenue/Austin Street** continues to operate at LOS C during both the a.m. and the p.m. peak hours. The Alford Street westbound through, through/right approach continues to operate at LOS E during the a.m. peak hour and decreases from LOS E to LOS F during the p.m. peak hour. The Rutherford Avenue northbound left approach continues to operate at LOS F during the a.m. peak hour and decreases from LOS E to LOS F during the p.m. peak hour. The Rutherford Avenue northbound through/right approach decreases from LOS E to LOS F during the p.m. peak hour. The Rutherford Avenue southbound left/through approach continues to operate at LOS E during the p.m. peak hour. The longest queues at the intersection occur at the Rutherford Avenue northbound left approach during the a.m. peak hour and at the Austin Street eastbound left, left/through approach during the p.m. peak hour.

The signalized intersection of the **I-93 northbound off-ramp/Cambridge Street** improves from LOS F to LOS E during the a.m. peak hour and from LOS E to LOS C during the p.m. peak hour. The I-93 northbound off-ramp right approach continues to operate at LOS F during the p.m. peak hour. The longest queues at the intersection occur at the I-93 northbound off-ramp right approach during both the a.m. and the p.m. peak hours.

The signalized intersection of **Rutherford Avenue/Cambridge Street/Alford Street/Maffa Way** decreases from LOS D to LOS F during the a.m. peak hour and from LOS E to LOS F during the p.m. peak hour. The Maffa Way EB through lanes approach decrease from LOS D to F during the a.m. peak hour and from LOS E to F during the p.m. peak hour. The Cambridge

Street northbound right approaches decrease from LOS E to LOS F during the a.m. peak hour and continues to operate at LOS F during the p.m. peak hour. The Alford Street southbound left-turn approaches continue to operate at LOS F during the a.m. peak hour. The longest queues at the intersection occur at the Maffa Way eastbound through approaches during the a.m. peak hour and at the Cambridge Street northbound right approaches during the p.m. peak hour.

At the unsignalized intersection of **Main Street/Bunker Hill Street/Medford Street,** The Main Street northbound approach continues to operate at LOS F during both the a.m. and the p.m. peak hours. The Medford Street southbound approach continues to operate at LOS F during the a.m. peak hour and decreases from LOS C to LOS E during the p.m. peak hour.

At the unsignalized intersection of **Mishawum Street/Main Street,** the Mishawum Street northbound approach decreases from LOS E to LOS F during the a.m. peak hour.

At the unsignalized intersection of **Rutherford Avenue NB/Mishawum Street**, the Mishawum Street westbound approach decreases from LOS B to LOS E during the p.m. peak hour.

At the unsignalized intersection of **Rutherford Avenue SB/Hood Park Drive**, the Hood Park Drive eastbound approach decreases from LOS B to LOS E during the p.m. peak hour.

At the unsignalized intersection of Rutherford Avenue SB/Mishawum Street, the Mishawum Street westbound approach decreases from LOS C to LOS F during the a.m. peak hour.

At the **Sullivan Square Rotary**, the Rutherford Avenue northbound approach, the Main Street northbound approach and the Alford Street southbound approach continue to operate at LOS F during both the a.m. and p.m. peak hours. The Maffa Way eastbound approach continues to operate at LOS F during the a.m. peak hours and decreases from LOS C to LOS F during the p.m. peak hour.

Table 2-10 Build (2026) Condition without BTD Improvements Capacity Analysis Summary

Intersection/Movement	Build (2026), a.m. Peak Hour					Build (2026), p.m. Peak Hour				
	LOS	Delay (s)	V/C Ratio	Queues (ft)		LOS	Delay (s)	V/C Ratio	Queues (ft)	
				50th	95th				50th	95th
Signalized Intersections										
Rutherford Avenue/Austin Street	**C**	**25.3**	-	-	-	**C**	**28.2**	-	-	-
Austin St EB left | left/thru	D	46.7	0.74	309	385	D	42.3	0.81	560	656
Austin St EB right	A	9.6	0.53	29	118	B	13.9	0.46	102	192
Austin St WB thru | thru/right	E	55.7	0.64	140	171	F	>80.	0.96	173	#219
Rutherford Ave NB left	F	>80.	>1.0	~342	#541	E	73.8	0.73	204	289
Rutherford Ave NB thru/right	C	30.7	0.47	71	146	F	>80.	0.94	245	#406
Rutherford Ave SB left/thru	D	51.5	0.42	101	164	E	71.4	0.64	165	250
Rutherford Ave SB right | right	B	17.4	0.63	244	314	A	1.2	0.33	0	24

Table 2-10 Build (2026) Condition without BTD Improvements Capacity Analysis Summary (Continued)

Intersection/Movement	Build (2026), a.m. Peak Hour					Build (2026), p.m. Peak Hour				
	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th	LOS	Delay (s)	V/C Ratio	Queues (ft) 50th	Queues (ft) 95th
Signalized Intersections										
Cambridge Street/I-93 NB Off-Ramp/MBTA Busway	E	**56.5**	-	-	-	**C**	**34.3**	-	-	-
Cambridge St EB thru | thru	D	38.3	0.56	164	220	D	47.3	0.83	206	#292
Cambridge St WB thru | thru	D	35.1	0.79	227	300	C	26.6	0.83	208	#294
I-93 NB Off-ramp NB left/thru/right	B	14.5	0.64	253	380	A	9.5	0.48	141	213
I-93 NB Off-ramp NB right	F	>80.0	>1.00	~549	#414	D	54.3	0.96	255	#518
MBTA Busway SB right	A	0.0	0.01	0	0	A	0.0	0.01	0	0
Cambridge Street/Spice Street/ MBTA Driveway	**A**	**9.1**	-	-	-	**C**	**21.9**	-	-	-
Cambridge St EB left	A	3.3	0.04	3	m5	A	7.4	0.03	3	m3
Cambridge St EB thru | thru	A	4.7	0.46	120	m137	B	13.0	0.65	172	m166
Cambridge St WB left/thru | thru/right	B	11.3	0.37	90	127	C	22.5	0.54	97	300
Spice St NB left/thru/right	D	50.1	0.57	54	106	D	44.1	0.82	262	#488
Maffa Way/Cambridge Street/ Alford Street	**F**	**185.7**	-	-	-	**F**	**118.6**	-	-	-
Maffa Way EB thru | thru | thru	F	>80.	>1.0	~795	#879	F	>80.	>1.0	~412	#510
Maffa Way EB right	B	14.2	0.28	15	81	B	10.4	0.26	13	m57
Cambridge St NB right | right	F	>80.	>1.0	~528	#680	F	>80.	>1.0	~607	#760
Alford St SB left | left	F	>80.	>1.0	~170	#268	D	51.4	0.52	45	77
Alford St SB thru | thru	B	10.3	0.26	91	120	A	9.2	0.24	72	98
Main Street/Beacham Street	**A**	**6.2**	-	-	-	**B**	**17.5**	-	-	-
Main St WB thru | thru/right	A	4.7	0.52	131	228	B	14.2	0.87	458	592
Beacham St NB left | left	A	5.5	0.36	1	4	C	32.0	0.78	40	m70
Beacham St NB thru	D	40.6	0.36	31	50	C	30.4	0.16	11	m21
Maffa Way/Beacham Street/MBTA Driveway	**D**	**51.7**	-	-	-	**B**	**13.1**	-	-	-
Maffa Way EB left/thru | thru | thru	D	52.4	0.57	157	254	A	5.3	0.45	124	147
MBTA Driveways NB thru | thru/right	D	41.7	0.62	30	48	D	52.6	0.87	71	m#14
Unsignalized Intersections										
Main Street/Bunker Hill Street/ Medford Street	-	-	-	-	-	-	-	-	-	-
Main St EB left/thru | thru/right	A	7.4	0.39	-	47	A	2.7	0.10	-	9
Bunker Hill St WB left/thru/right	A	0.7	0.02	-	1	A	0.3	0.01	-	1
Main St NB left/thru/right	F	>50.	>1.0	-	-	F	>50.	>1.0	-	-
Medford St SB left/thru/right	F	>50.	>1.0	-	375	E	36.3	0.84	-	220
Mishawum Street/Main Street	-	-	-	-	-	-	-	-	-	-
Main St EB thru | thru/right	A	0.0	0.47	-	0	A	0.0	0.35	-	0
Main St WB left/thru | thru	A	0.4	0.02	-	1	A	0.2	0.01	-	0
Mishawum St NB right	F	>50.	0.78	-	137	D	26.5	0.27	-	27
Rutherford Avenue NB/Mishawum Street	-	-	-	-	-	-	-	-	-	-
Mishawum St WB thru/right	C	22.7	0.19	-	17	E	42.4	0.49	-	59
Rutherford Ave NB thru | thru/right	A	3.3	0.10	-	9	A	1.4	0.05	-	4

Table 2-10 Build (2026) Condition without BTD Improvements Capacity Analysis Summary (Continued)

Intersection/Movement	Build (2026), a.m. Peak Hour					Build (2026), p.m. Peak Hour				
	LOS	Delay (s)	V/C Ratio	Queues (ft)		LOS	Delay (s)	V/C Ratio	Queues (ft)	
				50^{th}	95^{th}				50th	95th
Unsignalized Intersections										
Rutherford Avenue NB/Baldwin Street	-	-	-	-	-	-	-	-	-	-
Baldwin St WB right	B	11.6	0.08	-	6	B	13.9	0.04	-	3
Rutherford Ave NB thru | thru	A	0.0	0.24	-	0	A	0.0	0.36	-	0
Rutherford Avenue NB/Essex Street	-	-	-	-	-	-	-	-	-	-
Essex St WB right	B	11.3	0.03	-	3	C	16.8	0.04	-	3
Rutherford Ave NB thru | thru	A	0.0	0.24	-	0	A	0.0	0.38	-	0
Rutherford Avenue SB/ Bunker Hill Industrial Park Drive	-	-	-	-	-	-	-	-	-	-
Bunker Hill Industrial Park Dr EB right	C	21.9	0.21	-	20	D	32.8	0.53	-	71
Rutherford Ave SB thru | thru/right	A	0.0	0.57	-	0	A	0.0	0.63	-	0
Rutherford Avenue SB/Hood Park Drive	-	-	-	-	-	-	-	-	-	-
Hood Park Drive EB right	C	20.9	0.22	-	20	E	36.6	0.71	-	130
Rutherford Ave SB thru | thru/right	A	0.0	0.59	-	0	A	0.0	0.54	-	0
Rutherford Avenue SB/D Street	-	-	-	-	-	-	-	-	-	-
D St EB right	C	22.1	0.28	-	28	C	15.9	0.37	-	42
Rutherford Ave SB thru | thru/right	A	0.0	0.68	-	0	A	0.0	0.38	-	0
Rutherford Avenue SB/Mishawum Street	-	-	-	-	-	-	-	-	-	-
Mishawum St WB left	F	>50.	0.78	-	147	C	17.8	0.34	-	36
Rutherford Ave SB thru | thru	A	0.0	0.55	-	0	A	0.0	0.36	-	0
Sullivan Square Rotary	-	-	-	-	-	-	-	-	-	-
Rutherford Ave NB bear right/right	F	>50.	>1.0	-	726	F	>50.	>1.0	-	4030
Main St NB thru/right	F	50.4	>1.0	-	1279	F	>50.	>1.0	-	5950
Alford St SB thru/bear-right/right	F	>50.	>1.0	-	2422	E	49.6	>1.0	-	488
West St SB	C	15.9	0.07	-	5	B	12.7	0.02	-	1
Maffa Way EB/Cambridge NB	F	>50.	>1.0	-	1185	F	>50.	>1.0	-	5950

Grey Shading indicates LOS E or F.
~ 50^{th} percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
\# 95^{th} percentile volume exceeds capacity. Queue shown is the maximum after two cycles.
m Volumes for 95^{th} percentile queue is metered by upstream signal

2.7 Transportation Demand Management

The Proponent is committed to implementing Transportation Demand Management (TDM) measures to minimize automobile usage and Project related traffic impacts.

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

The Proponent is prepared to take advantage of good transit access in marketing the Project Site to future tenants 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:

- The Proponent will designate a transportation coordinator to oversee transportation issues, including parking, service and loading, and deliveries, and will work with tenants as they move in to office space to raise awareness of public transportation, bicycling, and walking opportunities;
- Provide an annual (or more frequent) newsletter or bulletin summarizing transit, ridesharing, bicycling, alternative work schedules, and other travel options;
- Promote to commercial tenants that, as employers, they can save on payroll-related taxes and provide employee benefits when they offer transportation benefits such as subsidized public transportation;
- Encourage employers to subsidize on-site full-time employees' purchase of monthly transit passes;
- Encourage employers to arrange to provide Guaranteed Ride Home during hours in which public transit service is no longer available to employee's home;
- Provide on-line registration for the RideSource ride-matching program through the local TMA membership;
- Provide access to information on area carpool and vanpool participants through the local TMA membership;
- Provide electric vehicle charging stations for five percent of the parking spaces in the garage;
- Provide information on travel alternatives for employees and visitors via the Internet and in the building lobby;
- Vehicle Sharing Program: The Proponent will explore the feasibility of providing spaces in the garage for a car sharing service.

2.8 Transportation Mitigation Measures

The Proponent is committed to working with the City of Boston so that the Project efficiently serves vehicle trips, improves the pedestrian environment, and encourages transit and bicycle use.

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 Project expects to contribute to mitigation measures to improve the existing transportation conditions in the area. Potential additional mitigation measures that could be appropriate for a Project with this level of impact include:

- Pedestrian improvements in the area; and/or
- Traffic signal infrastructure improvements in the area.

Further mitigation measures will be discussed with BTD as the Project moves through the permitting process. All mitigation measures will be detailed in the TAPA which is a legal binding document.

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

2.9 Evaluation of Short-term Construction Impacts

Most construction activities will be accommodated within the current Project 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 CMP 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 CMP:

- Limited construction worker parking on-site;
- Encouragement of worker carpooling;
- Consideration of a subsidy for MBTA passes for full-time employees; and
- Providing secure spaces on-site for workers' supplies and tools so they do not have to be brought to the site each day.

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

Chapter 3.0

Environmental Review Component

3.0 ENVIRONMENTAL REVIEW

3.1 Wind

3.1.1 Introduction

A pedestrian wind study was conducted by RWDI for the proposed Project. The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas around the study site and provide recommendations for minimizing adverse effects.

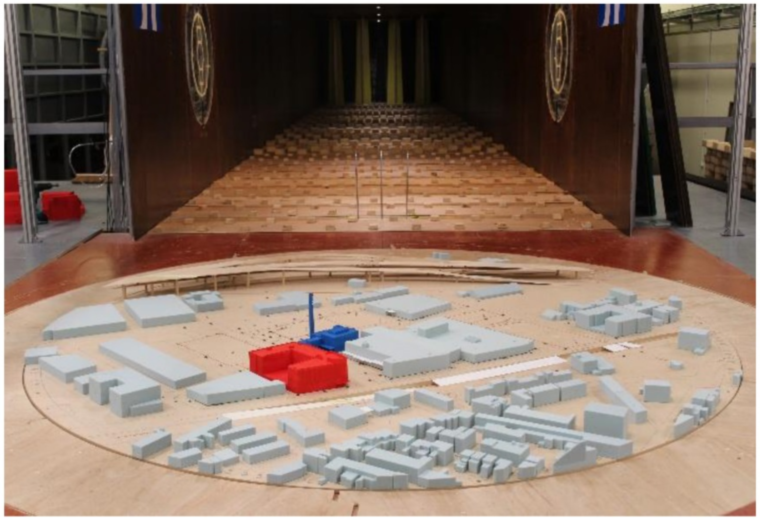
The study involved wind simulations on a 1:400 scale model of the proposed building and surroundings. These simulations were conducted in one of RWDI's boundary-layer wind tunnels in Milton Keynes, UK, for the purpose of quantifying local wind speed conditions and comparing to appropriate criteria for gauging wind comfort in pedestrian areas. The criteria recommended by the BPDA were used in the study. This section describes the methods and presents the results of the wind tunnel simulations.

3.1.2 Methodology

Information concerning the site and surroundings was derived from site plans and elevations of the proposed development provided by the design team. The following configurations were simulated:

- **No Build**: includes all existing site and surrounding buildings; and
- **Build**: includes the proposed Hood Park development and all existing surrounding buildings.

As shown in Figure 3.1-1, the wind tunnel model included the proposed development and all relevant surrounding buildings and topography within a 1,600–foot radius of the study site. The mean speed profile and turbulence of the natural wind approaching the modeled area were also simulated in RWDI's boundary layer wind tunnel. The scale model was equipped with 159 specially designed wind speed sensors that were connected to the wind tunnel's data acquisition system to record the mean and fluctuating components of wind speed at a full-scale height of five feet above grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 wind directions, in 10-degree increments, starting from true north. The measurements at each sensor location were recorded in the form of ratios of local mean and rms speeds to the reference wind speed in the free stream above the model. The results were then combined with long-term meteorological data, recorded during the years 1993 - 2018 at Logan Airport, to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year.



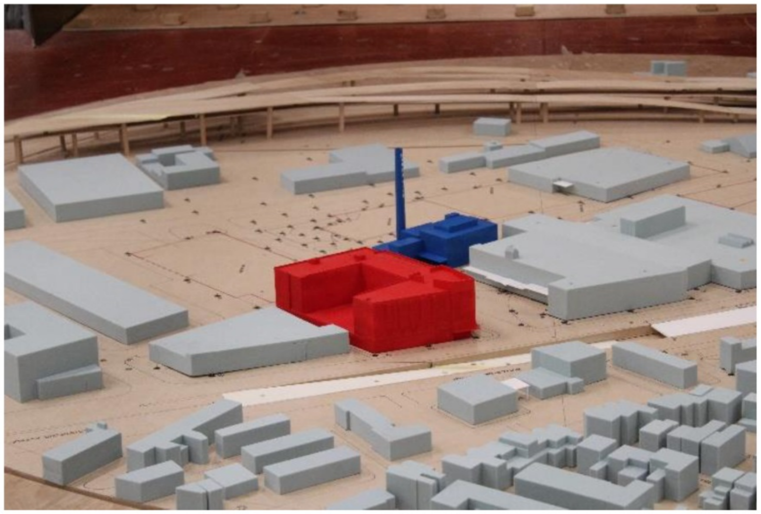
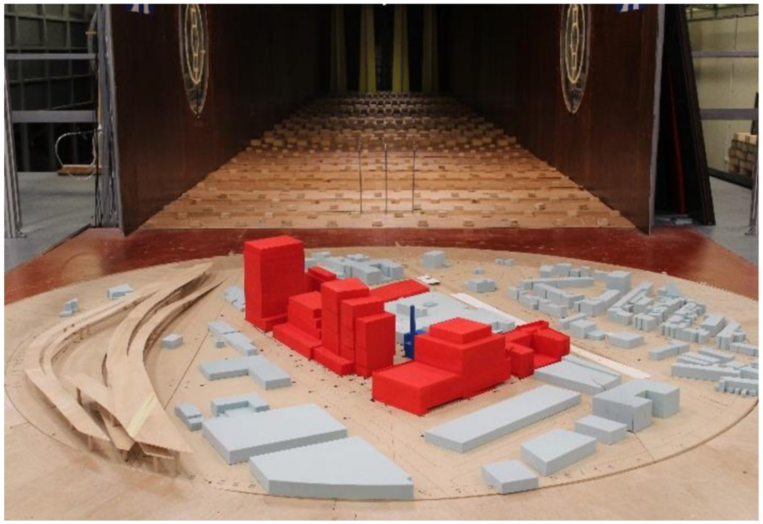


Image 1a: Wind Tunnel Study Model – No Build



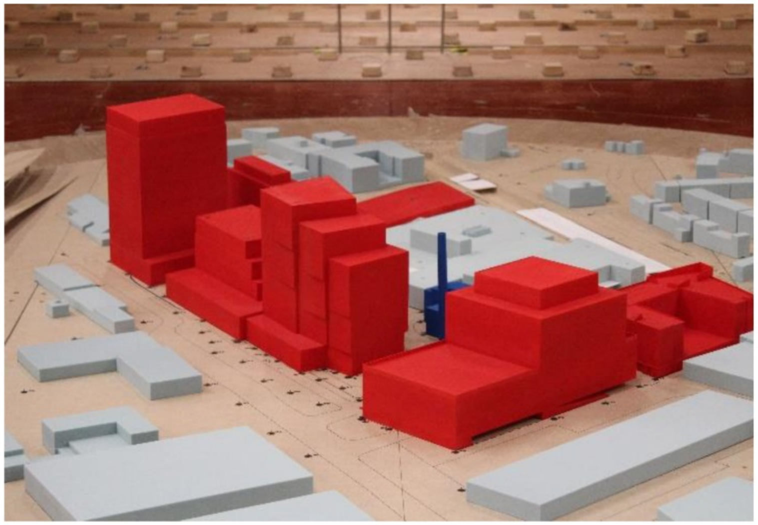


Image 1b: Wind Tunnel Study Model – Build

Figure 3.1-1
Wind Tunnel Study – No Build and Build

3.1.3 Meteorological Data

Figures 3.1-2and 3.1-3 present "wind roses", summarizing the seasonal and annual wind climates in the Boston area, based on the data from Logan Airport. Figure 3.1-2, for example, summarizes the spring (March, April, and May) wind data. In general, the prevailing winds at this time of year are from the west-northwest, northwest, east, southwest and south-southwest. In the case of strong winds (speeds greater than 20 mph, red bands), however, the most common wind directions are northeast, west-northwest and southwest.

On an annual basis (Figure 3.1-3) the most common wind directions are those between south-southwest and northwest. Winds from the east and east-southeast are also relatively common. In the case of strong winds, northeast, west-northwest and southwest are the dominant wind directions.

3.1.4 Wind Criteria

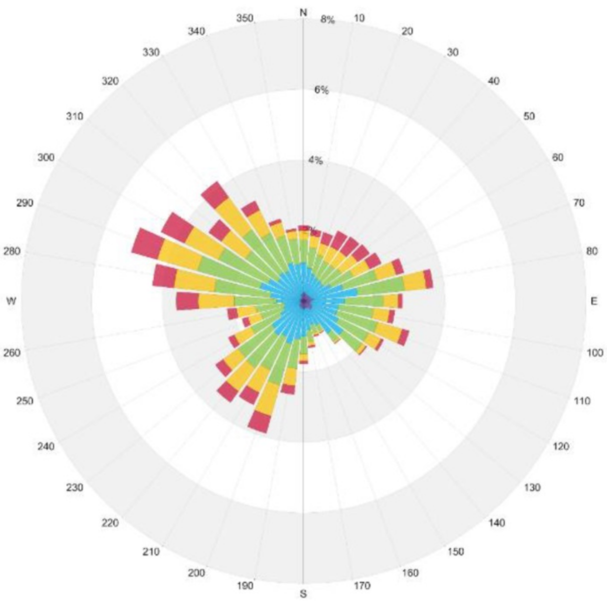
The BPDA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BPDA wind design guidance criterion states that an effective gust velocity (hourly mean wind speed +1.5 times the root-mean-square wind speed) of 31 mph should not be exceeded more than one percent of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

Table 3.1-1 BPDA Mean Wind Criteria*

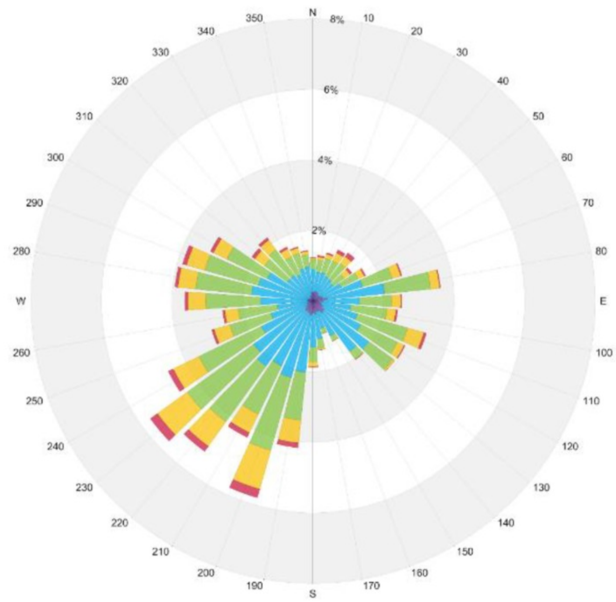
Comfort Category	Mean Wind Speed (mph)
Dangerous	>27 mph
Uncomfortable for Walking	>19 and ≤27 mph
Comfortable for Walking	>15 and ≤19 mph
Comfortable for Standing	>12 and ≤15 mph
Comfortable for Sitting	<12 mph

*Applicable to the hourly mean wind speed exceeded 1% of the time

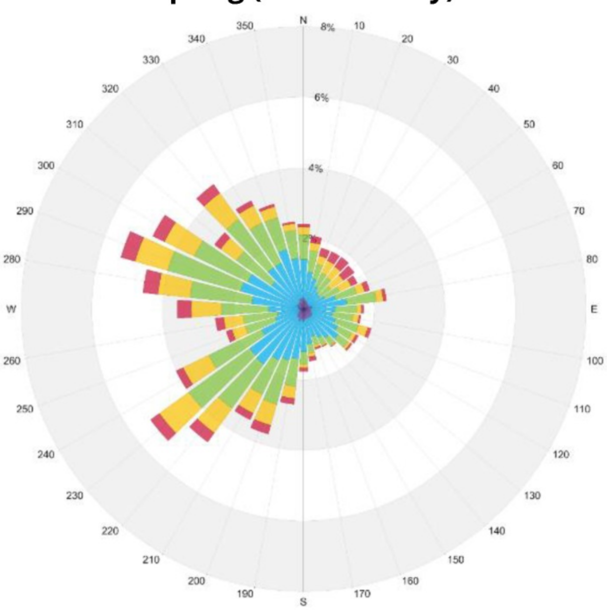
1 Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions", Journal of Industrial Aerodynamics, 3 (1978) 241 - 249.



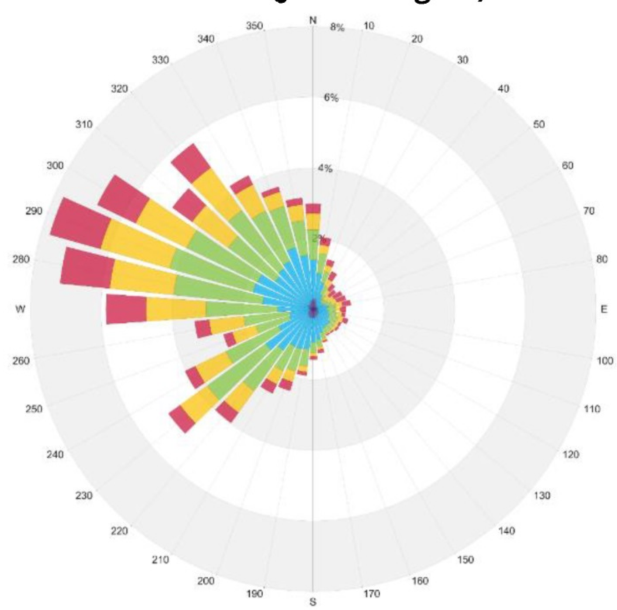
Spring (March – May)



Summer (June – August)



Fall (September – November)

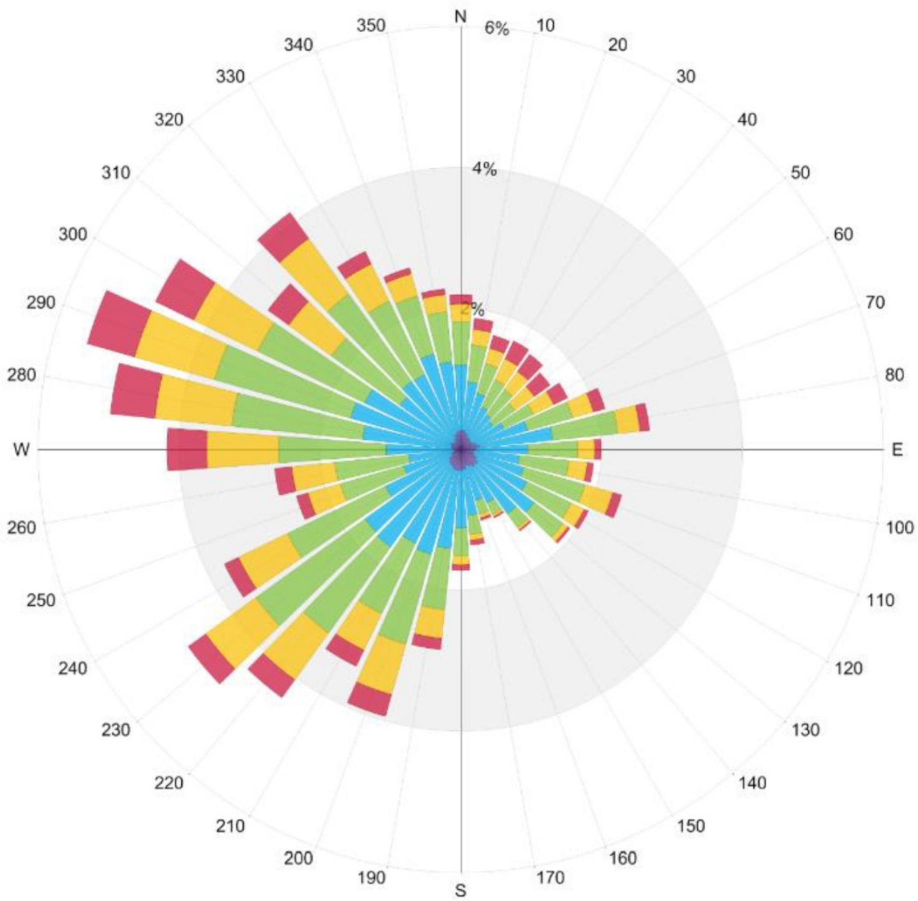


Winter (December – February)

Wind Speed (mph)	Probability (%) Spring	Summer	Fall	Winter
Calm	2.6	2.8	3.2	2.4
1-5	6.7	9.2	8.3	6.3
6-10	28.7	38.7	34.3	27.8
11-15	32.5	34.5	32.2	31.0
16-20	19.3	12.1	15.1	19.8
>20	10.2	2.6	6.9	12.7

Figure 3.1-2

Seasonal Directional Distribution of Winds Approaching Boston Logan International Airport from 1993 through 2018



Wind Speed (mph)	Probability (%) Annual
Calm	2.7
1-5	7.6
6-10	32.3
11-15	32.6
16-20	16.6
>20	8.1

Figure 3.1-3

Annual Directional Distribution of Winds Approaching Boston Logan International Airport from 1993 through 2018

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

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

3.1.5 Predicted Wind Conditions

The predicted wind flows include the following generalized types of wind flows.

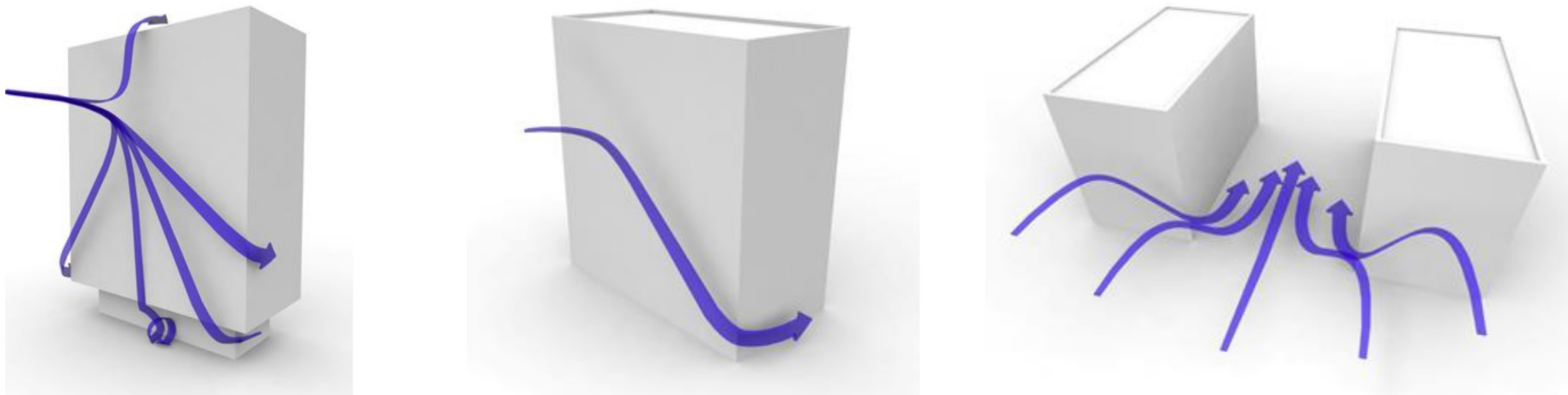
Downwashing Flow. Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level (Image 1, Figure 3.1-4). Such a Downwashing Flow is often the main cause for wind accelerations around large buildings at the pedestrian level.

Corner Acceleration. When winds approach at an oblique angle to a tall façade and are deflected down, a localized increase in the wind activity or Corner Acceleration can be expected around the downwind building corner at pedestrian level (Image 2, Figure 3.1-4).

Channeling Effect. When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to Channeling Effect caused by the narrow gap (Image 3, Figure 3.1-4).

If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity. Design details like setting back a tall tower from the edges of a podium, deep canopies close to ground level, chamfering of corners, wind screens, tall trees with dense landscaping, etc. can help reduce wind speeds to a large extent (Images 4 and 5, Figure 3.1-4). The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

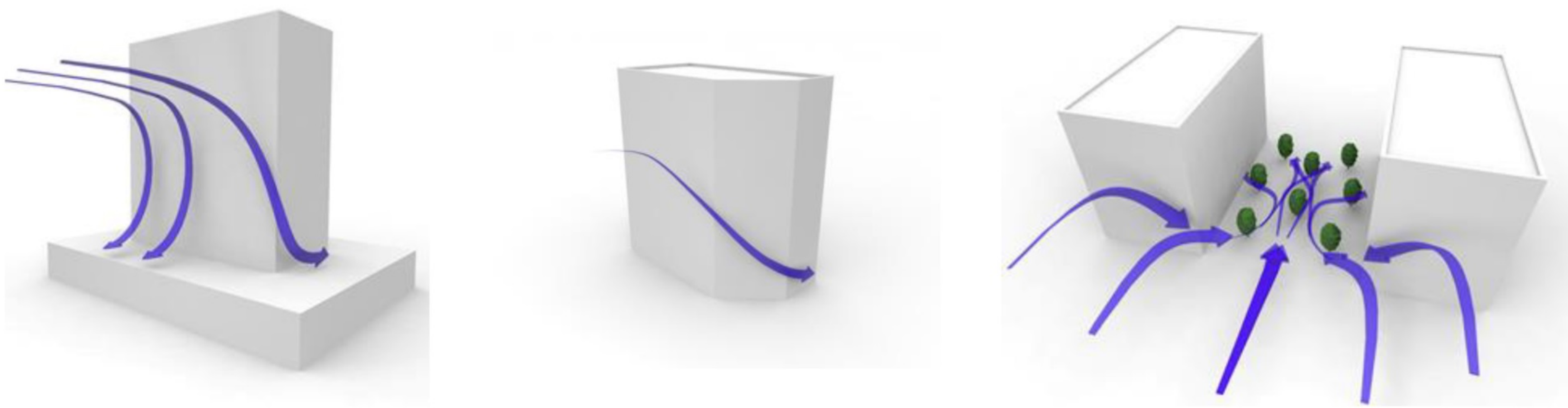
Figures 3.1-5 through 3.1-9 graphically depict the wind conditions at each wind measurement location based on the annual winds. Table 1 in Appendix D presents the mean and effective gust wind speeds annually and Table 2 presents the same information for each season. In both tables the colors represent the comfort category that this location falls within and these colors are defined in the footer of said tables. Typically, the summer



1) Downwashing flow

2) Corner acceleration

3) Channelling effect



4) Podium/tower setbacks and canopies reduce impact of downwashing at ground level

5) Landscaping reduces vertical and horizontal wind accelerations

Image 4: General wind patterns and wind control measures

Figure 3.1-4

Predicted Wind Conditions

Figure 3.1-5

Pedestrian Wind Conditions – Mean Speed – No Build, Annual

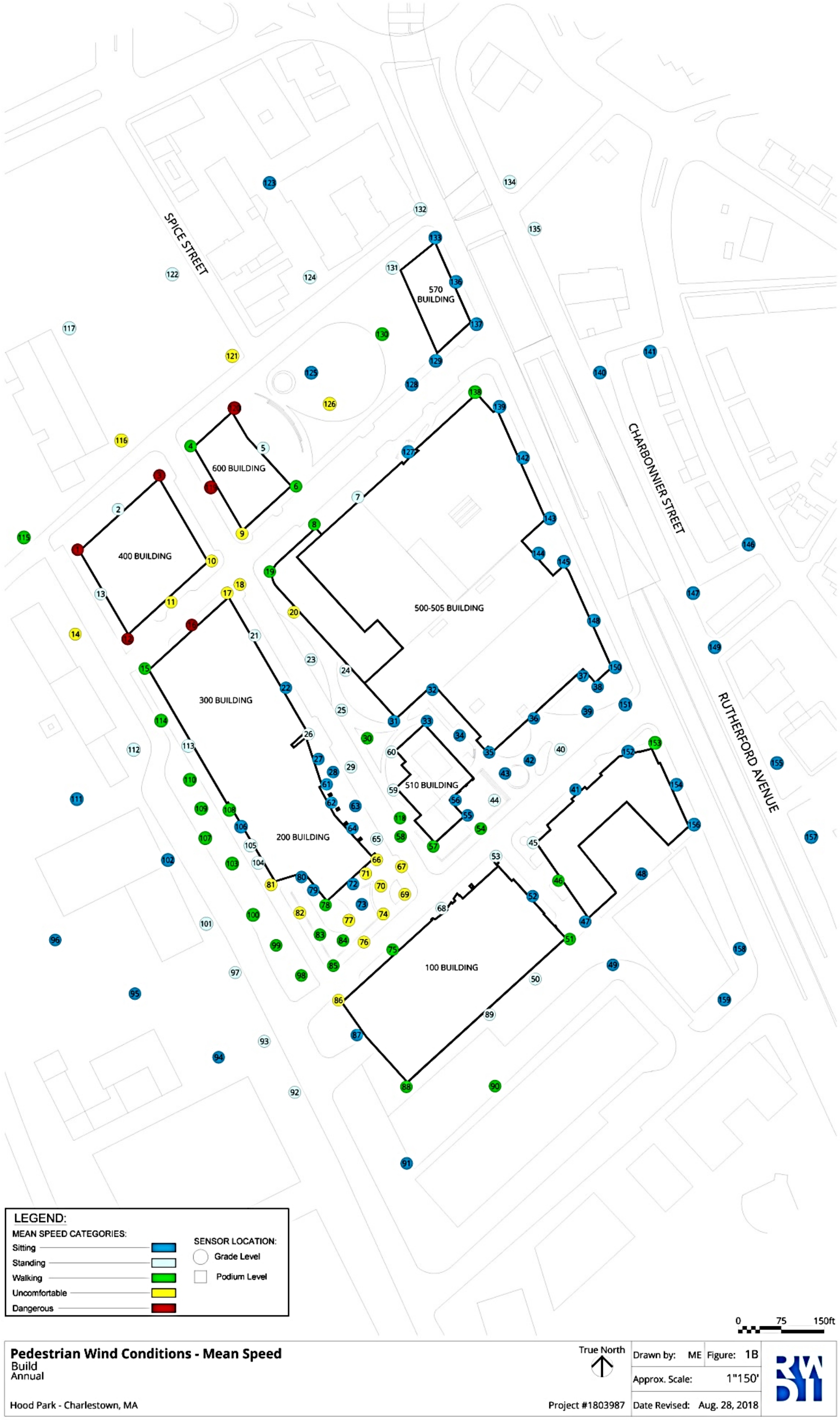


Figure 3.1-6

Pedestrian Wind Conditions – Mean Speed – Build, Annual

Figure 3.1-7
Pedestrian Wind Conditions – Effective Gust Speed – No Build, Annual

Figure 3.1-8

Pedestrian Wind Conditions – Effective Gust Speed – Build, Annual

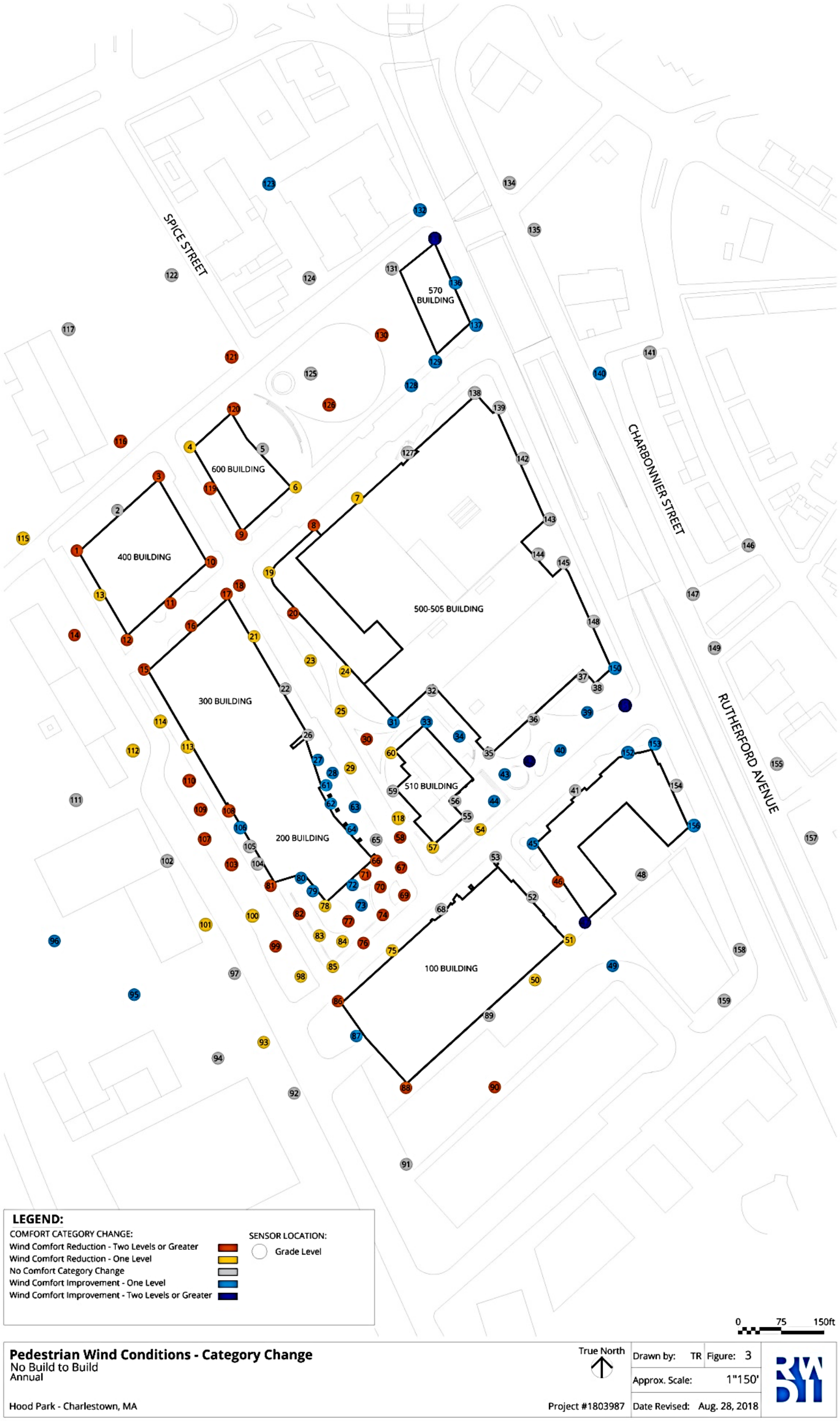


Figure 3.1-9

Pedestrian Wind Conditions – Category Change – No Build to Build, Annual and fall winds tend to be more comfortable than the annual winds, while the winter and spring winds are less comfortable than the annual winds. The following summary of pedestrian wind comfort is based on the annual winds for each configuration tested, except where noted below in the text.

3.1.6 No Build

As shown in on Figure 3.1-5, the No Build configuration was tested with the existing site conditions with existing surroundings. Note that the Existing Condition was assumed to include 50 Hood Park Drive, but not 100 Hood Park Drive. This figure shows the mean wind speeds are comfortable for walking or better around the majority of the site annually with one location which had uncomfortable wind speeds (Location 153).

The effective gust criterion is met annually at all locations around the site (Figure 3.1-7 and Tables 1 and 2 in Appendix D).

3.1.7 Build

With the addition of the proposed development, conditions are expected to remain unchanged in general around the outskirts of the site, specifically to the west.

Immediately surrounding the proposed developments conditions are expected to be less comfortable than the No Build configuration, with the overall number of uncomfortable locations increasing from one in the No Build configuration to 20 in the Build configuration on an annual basis.

Six locations, all in the northwest portion of the Project Site are predicted to have dangerous wind conditions annually. While this preliminary wind tunnel test predicts these high winds, these types of results are not uncommon for initial testing at the masterplan level of design. The Proponent will continue to refine the design of the buildings and will introduce further mitigation measures to address undesirable wind conditions. These measures could include possibly chamfering of building corners at ground level and/or planting around building corners to reduce corner acceleration or the use of windscreens at grade level where landscaping is not possible.

The effective gust criterion is met annually at most locations except Locations 1, 3, 10, 12, 16, 17, 20, 69-71, 74, 119 and 120 (Figure 3.1-8 and Table 1 in Appendix D).

3.2 Shadow

3.2.1 Introduction and Methodology

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

The shadow analysis presents the existing shadow and new shadow that would be created by the proposed Project, illustrating the incremental impact of the Project. The analysis focuses on nearby open spaces, sidewalks and bus stops adjacent to and in the vicinity of the Project site. Shadows have been determined using the applicable Altitude and Azimuth data for Boston. Figures showing the net new shadow from the Project are provided in Figures 3.2-1 to 3.2-14 at the end of this section.

The analysis shows that new shadow cast from the Project will generally be limited to the streets and sidewalks in the surrounding area. No new shadow will be cast onto existing open spaces. In addition, the proposed open space on the Project site will be mostly free of shadow throughout most of the day, and particularly during the middle of the day.

3.2.2 Vernal Equinox (March 21)

At 9:00 a.m. during the vernal equinox, new shadow will be cast to the west across portions of the Project site, D Street, Bunker Hill Industrial Park and Interstate 93 that is not already under existing shadow.

At 12:00 p.m., new shadow will be minimal and cast to the north, with new shadow onto small portions of the Project site and across D Street.

At 3:00 p.m., new shadow will be cast to the northeast, with new shadow cast onto portions of the Project site.

No new shadow will be cast onto existing open spaces or bus stops during the time periods studied.

3.2.3 Summer Solstice (June 21)

At 9:00 a.m. during the summer solstice, new shadow will be cast to the west across portions of the Project site, D Street and Bunker Hill Industrial Park.

At 12:00 p.m., new shadow will be minimal and cast to the north, with new shadow cast onto small portions of the Project site and D Street.

At 3:00 p.m., new shadow will be minimal and cast to the northeast, with new shadow cast onto portions of the Project site.

At 6:00 p.m., new shadow will be cast to the east across portions of the Project site.

No new shadow will be cast onto nearby existing open spaces or bus stops during the time periods studied.

3.2.4 Autumnal Equinox (September 21)

At 9:00 a.m. during the vernal equinox, new shadow will be cast to the northwest across portions of the Project site, Bunker Hill Industrial Park and D Street.

At 12:00 p.m., new shadow will be cast to the north, with new shadow on portions of the Project site and D Street.

At 3:00 p.m., new shadow will be cast to the northeast, with new shadow cast onto portions of the Project site.

At 6:00 p.m., new shadow will be cast to the east across portions of the Project site, a sliver of a bus stop on Bunker Hill Street, and small portions of Rutherford Avenue and Main Street that are not already under existing shadow.

No new shadow will be cast onto existing open spaces during the time periods studied.

3.2.5 Winter Solstice (December 21)

The winter solstice creates the least favorable conditions for sunlight in New England. Because the sun angle during the winter is lower than in other seasons, shadows are longer and reach further into the surrounding area.

At 9:00 a.m. during the winter solstice, new shadow will be cast to the northwest across portions of the Project site, D Street, and a portion of Interstate 93 that is not already under existing shadow.

At 12:00 p.m., new shadow will be cast to the north, with new shadow on portions of the Project site, D Street and Spice Street and its sidewalks.

At 3:00 p.m., new shadow will be cast to the northeast, with new shadow cast onto portions of the Project site, D Street, Rutherford Avenue and its sidewalks and Mishawum Street and its sidewalks.

No new shadow will be cast onto nearby open spaces or bus stops during the time periods studied.

3.2.6 Conclusions

Fourteen time periods were studied to determine the extent of new shadow to be cast by the Project. The shadow study shows that new shadow will mainly be cast across portions of the Project site and nearby streets and sidewalks. The Project's proposed open space will be free of shadow, with the exception of December 21. No new shadow will fall on an existing open space.

Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-1

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

Figure 3.2-2

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

Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-3

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

Figure 3.2-4

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

Figure 3.2-5

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

Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-6

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

Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-7

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

Hood Park Master Plan Boston, Massachusetts

SMMA

Figure 3.2-8

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

Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-9

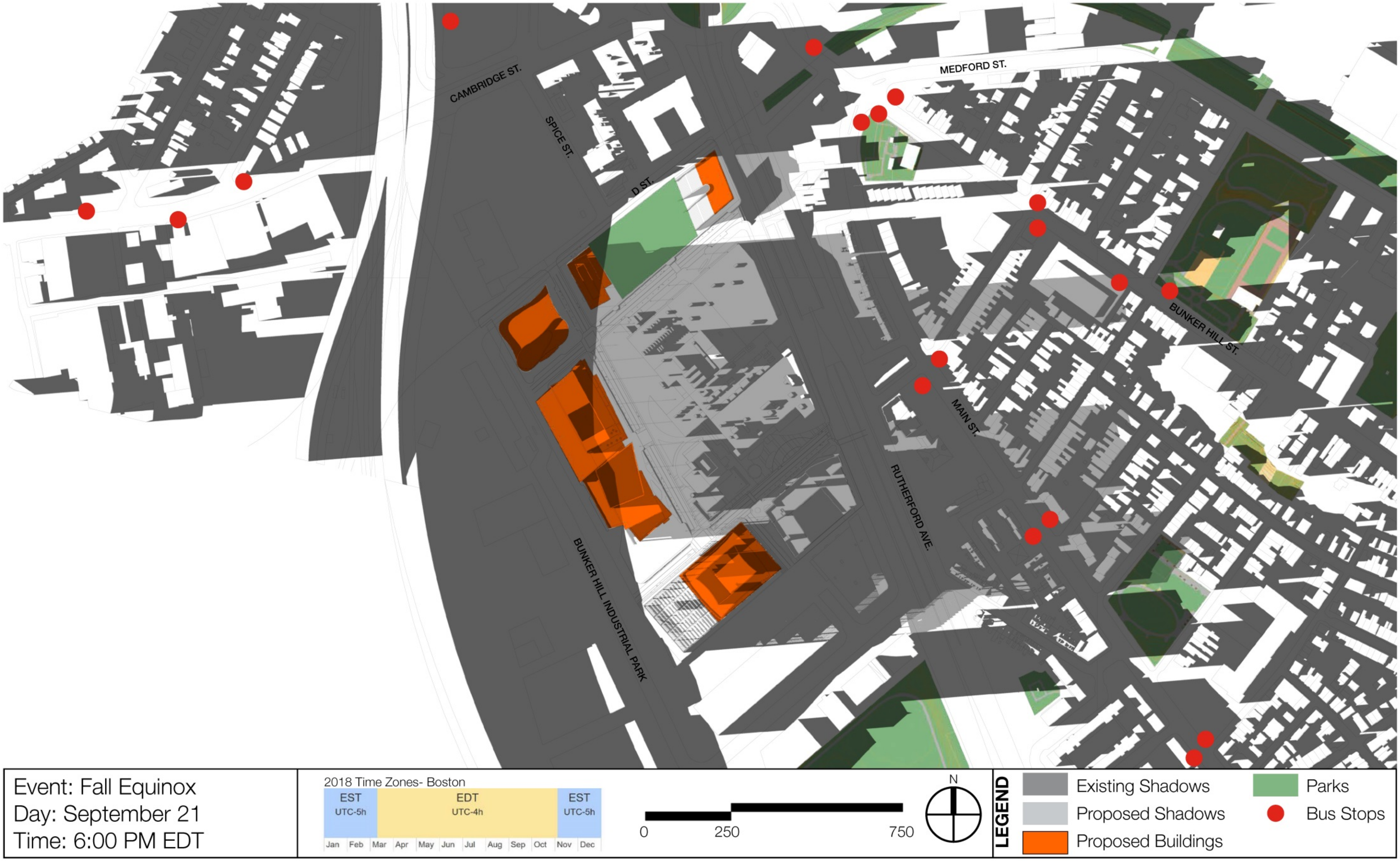
Shadow Study: September 21, 12:00 p.m.

Hood Park Master Plan   Boston, Massachusetts

SMMA

Figure 3.2-10

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



Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-11

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

Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-12

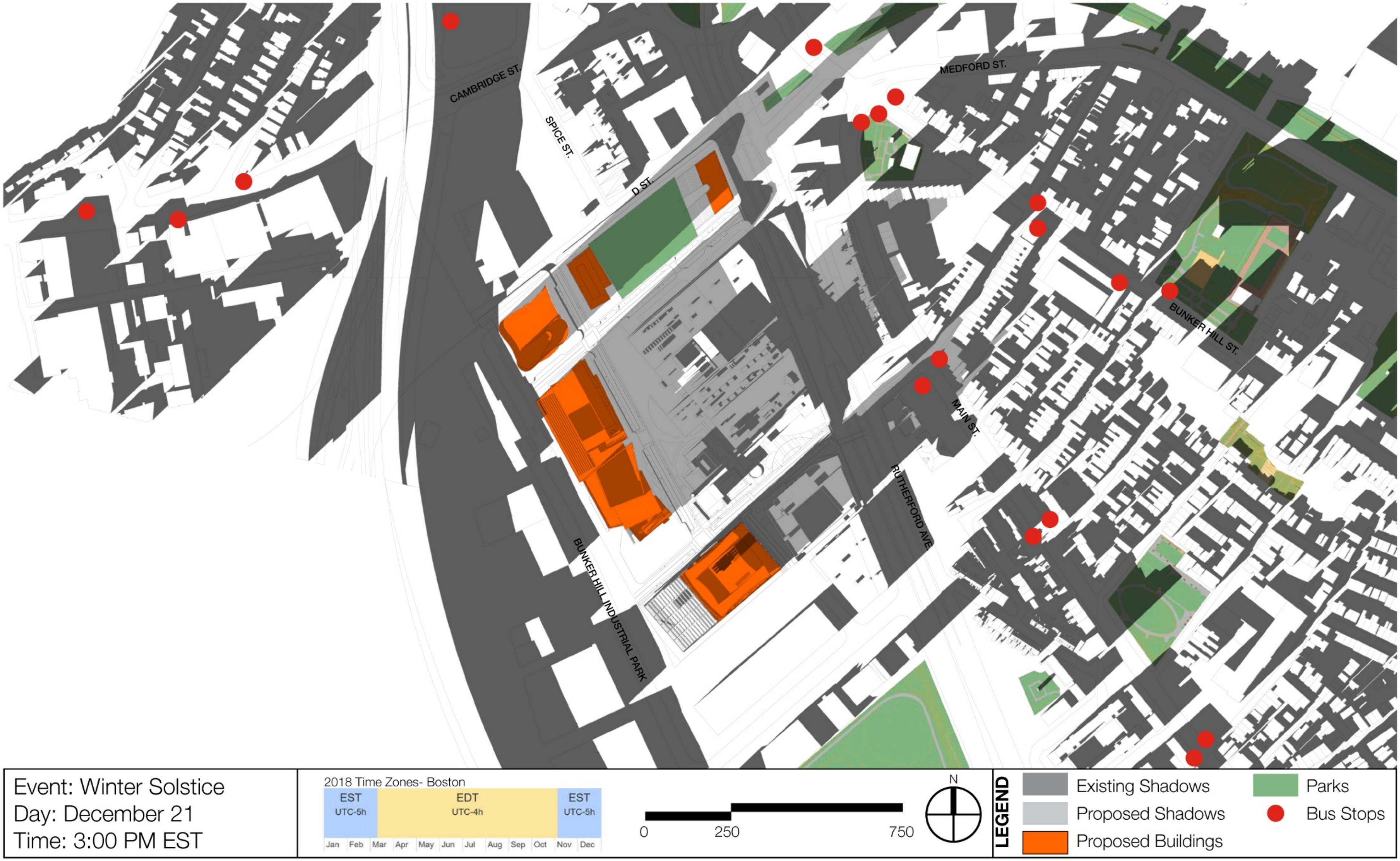
Shadow Study: December 21, 9:00 a.m.

Hood Park Master Plan Boston, Massachusetts

SMMA

Figure 3.2-13

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



Hood Park Master Plan **Boston, Massachusetts**

SMMA

Figure 3.2-14

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

3.3 Daylight

3.3.1 Introduction

The purpose of the daylight analysis is to estimate the extent to which a proposed project will affect the amount of daylight reaching the streets and the sidewalks in the immediate vicinity of a project site.

3.3.2 Methodology

The daylight analysis was performed using the BPDA's Daylight Analysis (BRADA) computer program[2]. This program measures the percentage of sky-dome that is obstructed by a project and is a useful tool in evaluating the net change in obstruction from existing to build conditions at a specific site.

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

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

Five viewpoints were chosen to evaluate the daylight obstruction for the Existing and Proposed Conditions. Two area context points were considered to provide a basis of comparison to existing conditions in the surrounding area. The viewpoint and area context viewpoints were taken in the following locations and are shown on Figures 3.3-1 to 3.3-8.

- **Viewpoint 1:** View from Rutherford Avenue facing southwest toward the northern portion of the site
- **Viewpoint 2:** View from Rutherford Avenue facing southwest toward the southern portion of the site
- **Viewpoint 3:** View from D Street facing south toward the site

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

- **Viewpoint 4:** View from Bunker Hill Industrial Park facing northeast toward the northern portion of the site

- **Viewpoint 5:** View from Bunker Hill Industrial Park facing northeast toward the southern portion of the site

- **Area Context Viewpoint AC1:** View from Rutherford Avenue facing west toward 420 Rutherford Avenue

- **Area Context Viewpoint AC2:** View from Bunker Hill Industrial Park facing west toward 40 Park Street

3.3.3 Results

The results for each viewpoint are presented in Table 3.3-1. Figures 3.3-2 through 3.3-8 illustrate the BRADA results for each analysis.

Table 3.3-1 Results of Each Viewpoint

Viewpoint Locations		Existing Conditions	Proposed Conditions
Viewpoint 1	View from Rutherford Avenue facing southwest toward the northern portion of the site	31.5%	31.5%
Viewpoint 2	View from Rutherford Avenue facing southwest toward the southern portion of the site	9.3%	10.7%
Viewpoint 3	View from D Street facing south toward the site	2.0%	6.0%
Viewpoint 4	View from Bunker Hill Industrial Park facing northeast toward the northern portion of the site	3.5%	37.5%
Viewpoint 5	View from Bunker Hill Industrial Park facing northeast toward the southern portion of the site	6.9%	14.9%
Area Context Points			
AC1	View from Rutherford Avenue facing west toward 420 Rutherford Avenue	51.6%	N/A
AC2	View from Bunker Hill Industrial Park facing west toward 40 Park Street	15.5%	N/A

Rutherford Avenue

Viewpoints 1 and 2 were taken from Rutherford Avenue facing southwest towards the site. Viewpoint 1 faces 50 Hood Park Drive and 100 Hood Park Drive, which are currently under construction, on the southern edge of the site. Since the two buildings are included in the existing and proposed conditions, the daylight obstruction value will remain 31.5% for Viewpoint 1. Viewpoint 2 faces 500 Rutherford Avenue, which is a low-rise industrial building, and a surface parking lot on the northern portion of the site, which results in a lower daylight obstruction value of 9.3%. The daylight obstruction value for the proposed condition of 10.7% for Viewpoint 2 is moderate because there are spaces between building areas, low building heights and the proposed open space.

D Street

Viewpoint 3 was taken from D Street looking at the northern portion of the site. In the existing condition, the site is mostly covered by surface parking, leading to a low daylight obstruction value of 2.0%. The development of the Project will result in an increased daylight obstruction value of 6.0% due to the moderate buildings heights, spaces between buildings and the proposed open space.

Bunker Hill Industrial Park

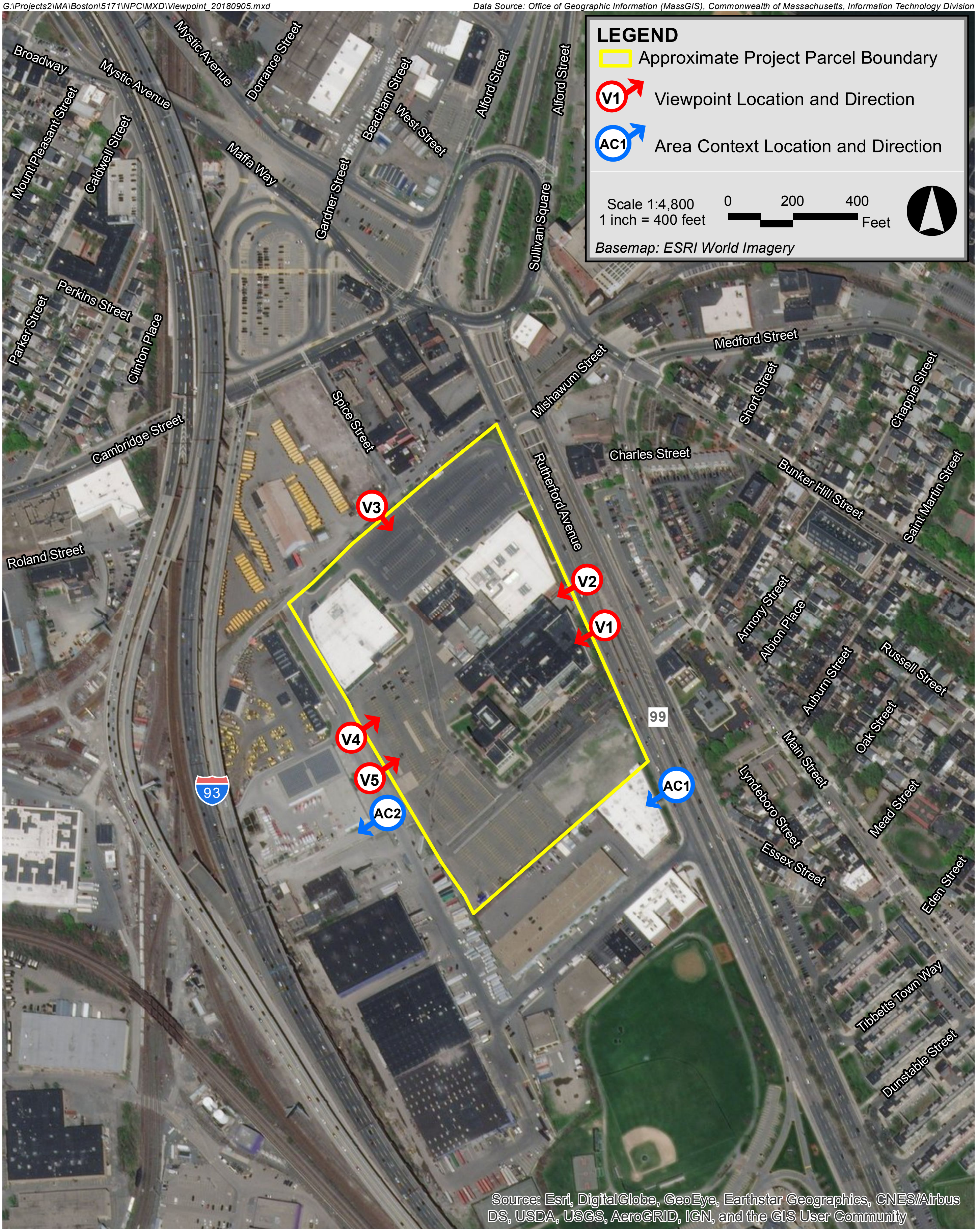
Viewpoints 4 and 5 were taken from Bunker Hill Industrial Park facing northeast toward the Project site. In the existing condition, both Viewpoints 4 and 5 look at portions of the site with undeveloped space, resulting in low daylight obstruction values ranging from 3.5% to 6.9%. The proposed condition for Viewpoint 4 includes buildings with taller portions built towards the edge of the property line and will result in a daylight obstruction value of 37.5%. The proposed condition for Viewpoint 5 includes more space between buildings, setbacks of the taller portions from the edge of the property line and a new plaza between buildings and will therefore result in a daylight obstruction value of 14.9%.

Area Context

The two area context points selected in the area are shown on Figure 3.3-1. They are from Rutherford Avenue looking southwest at 420 Rutherford Avenue (self-storage facility) and looking west from Bunker Hill Industrial Avenue towards I-93. These viewpoints are generally representative of the area, and have daylight obstruction values ranging from 15.5% to 51.6%.

3.3.4 Conclusion

The Project will further develop the site which currently consists of large, low-rise, industrial buildings surrounded by surface parking lots with five new taller structures, surrounded by new streets and open spaces. The development will introduce new open space and space between buildings, creating views of the sky, but also includes structures taller than the existing buildings. The existing daylight obstruction values range from 2.0% to 31.5%. The proposed development will result in daylight obstruction values ranging from 6.0% to 37.5%. The daylight obstruction values are consistent with the surrounding area and similarly developed area around Boston, as shown by the area context viewpoints which have daylight obstruction values ranging from 15.5% to 51.6%.



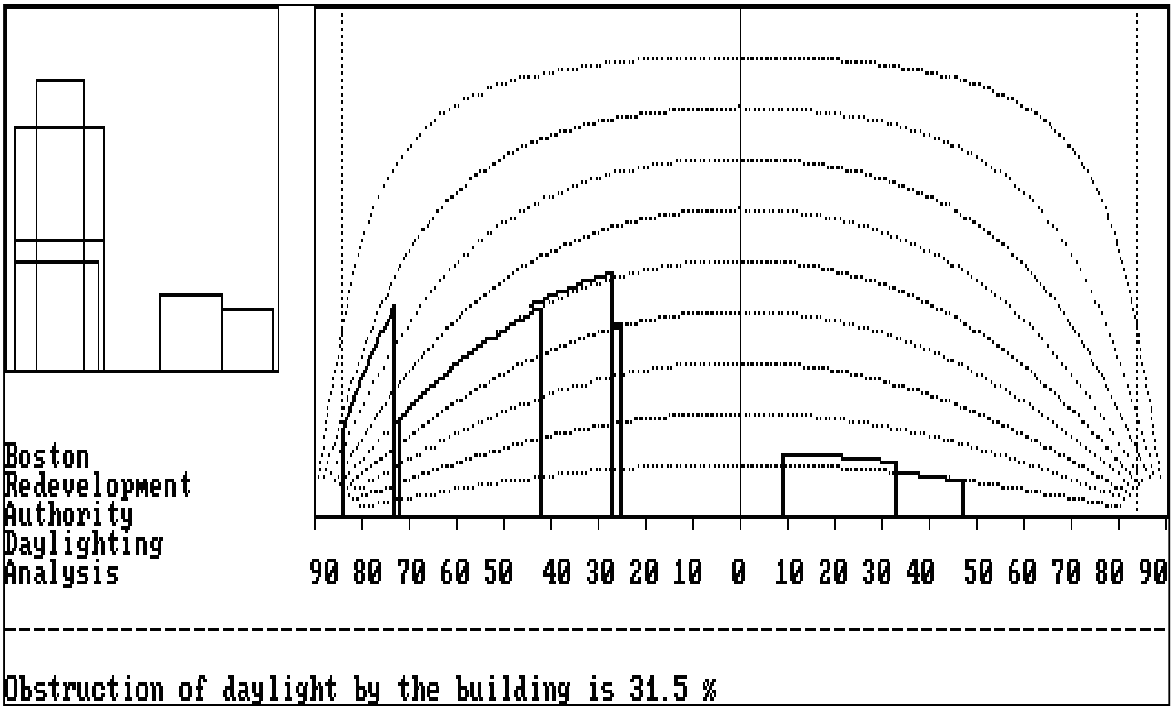
Hood Park Master Plan **Boston, Massachusetts**

Epsilon ASSOCIATES INC.

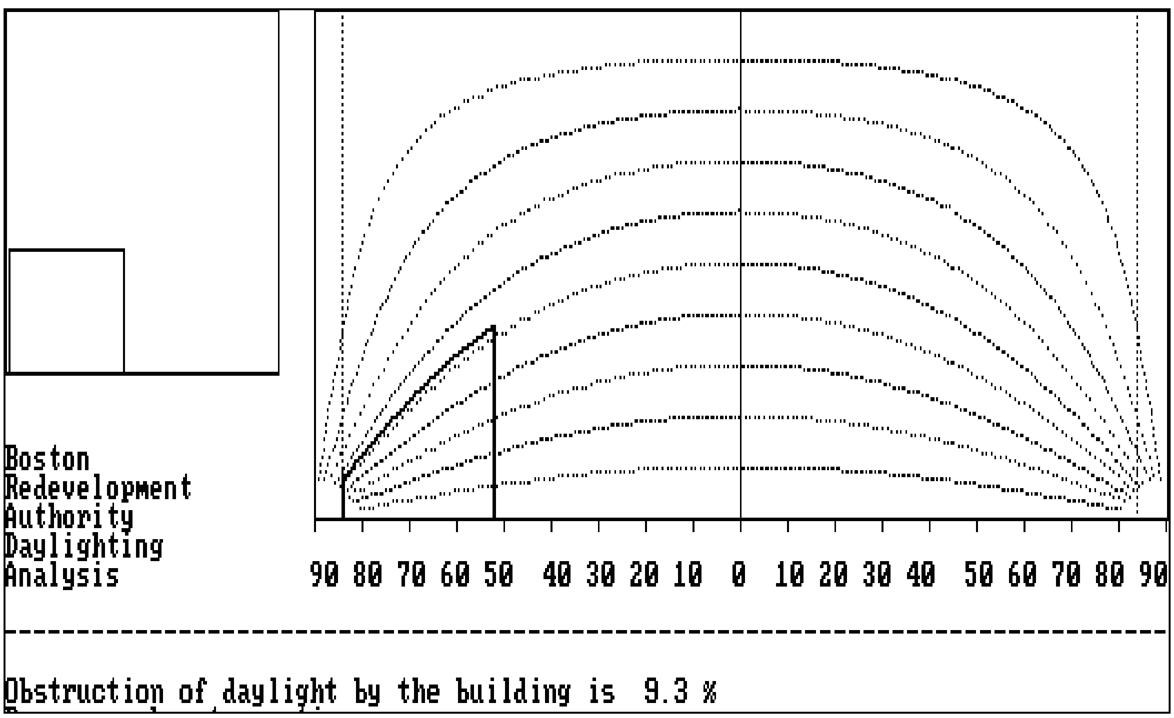
Figure 3.3-1

Viewpoint and Area Context Locations

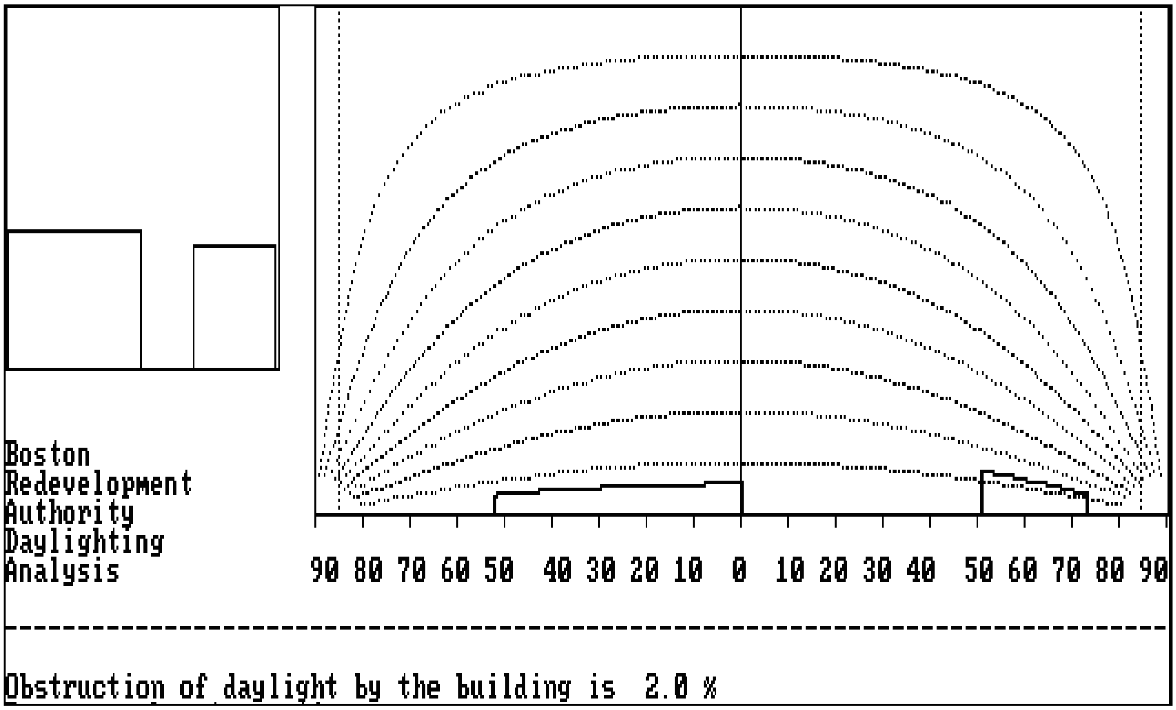
Viewpoint 1: View from Rutherford Avenue facing west toward the western portion of the Project site



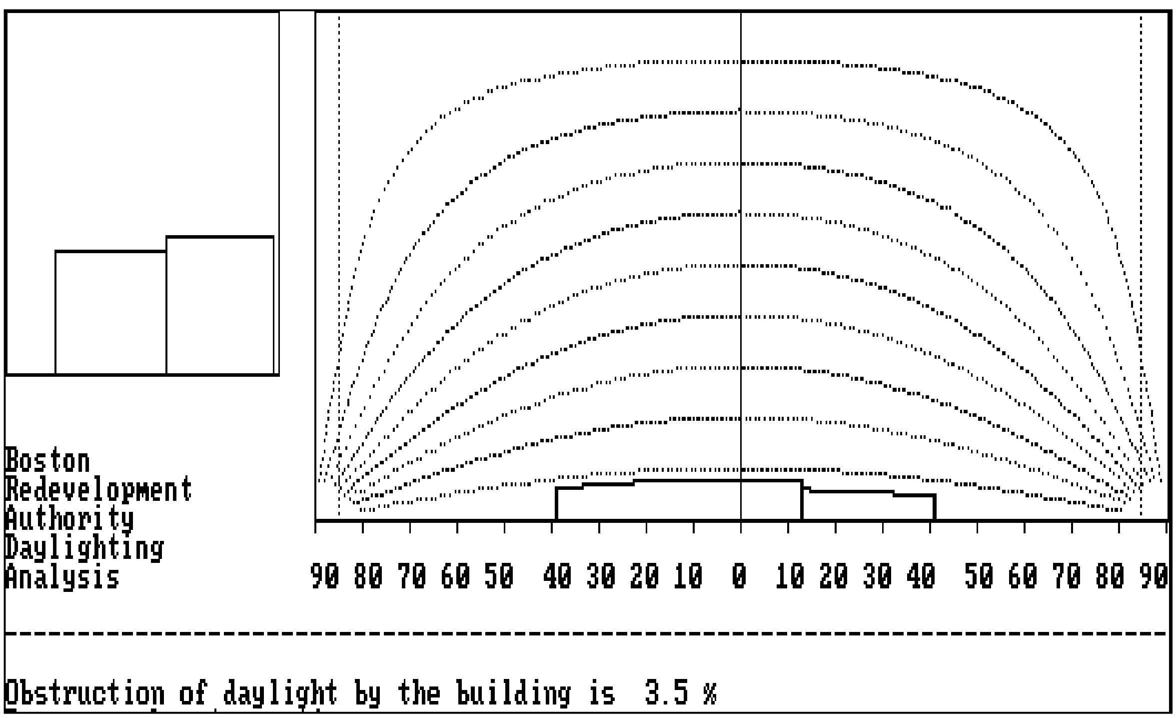
Viewpoint 2:View from Rutherford Avenue facing west toward the eastern portion of the Project site



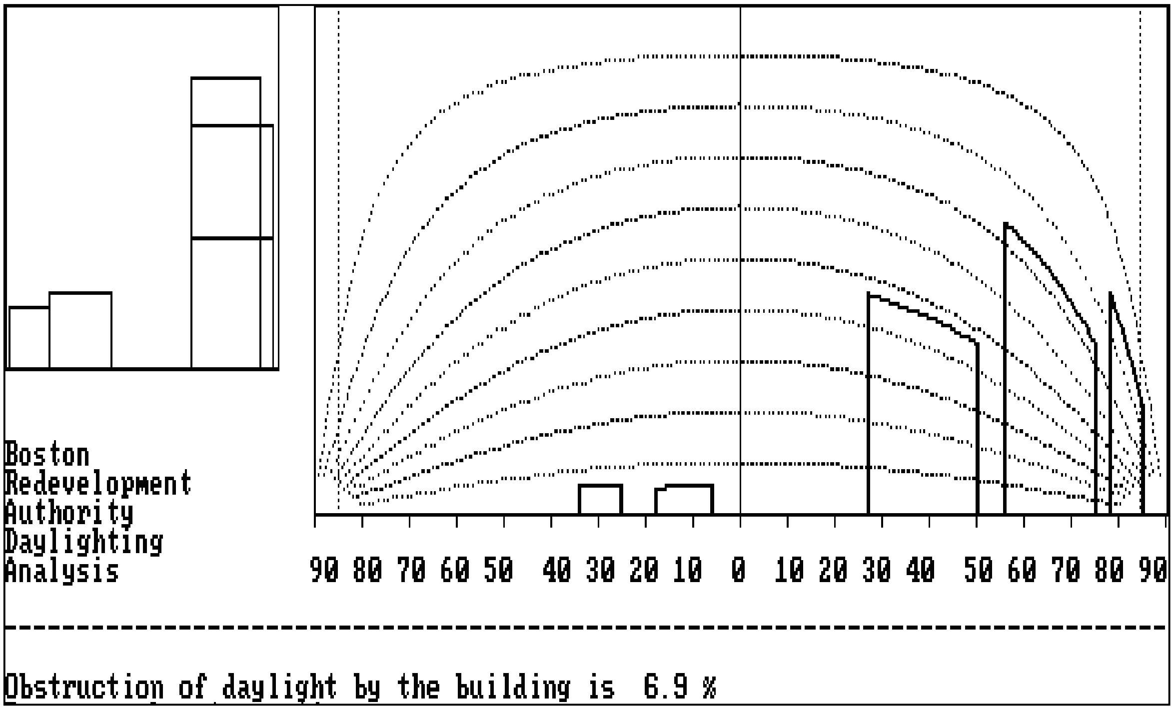
Viewpoint 3: View from D Street facing southeast toward the Project site



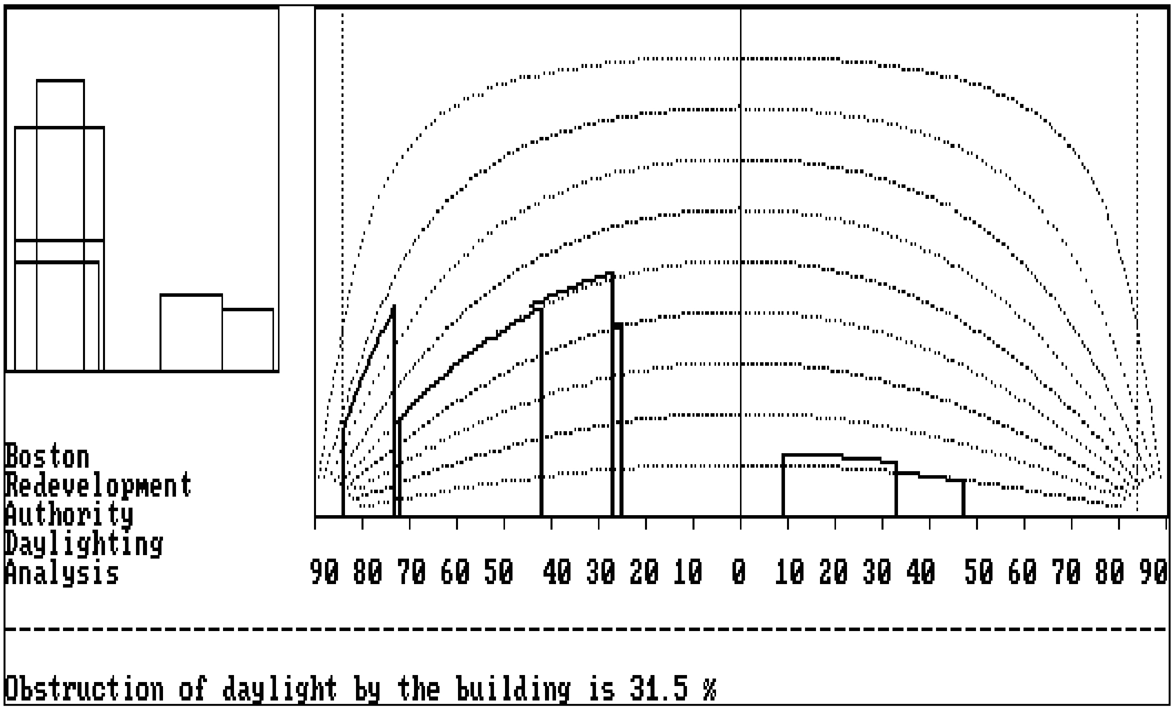
Viewpoint 4:View from Bunker Hill Industrial Park Road facing northeast toward the northwestern portion of the Project site



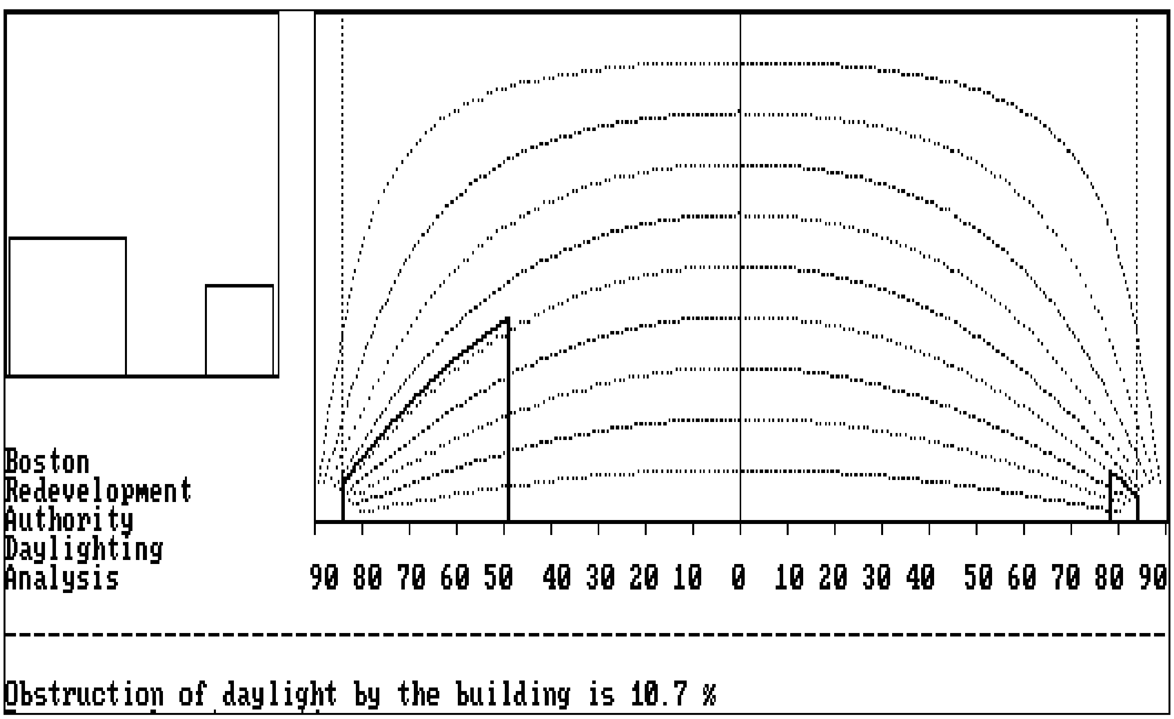
Viewpoint 5: View from Bunker Hill Industrial Park Road facing northeast toward the northeastern portion of the Project site



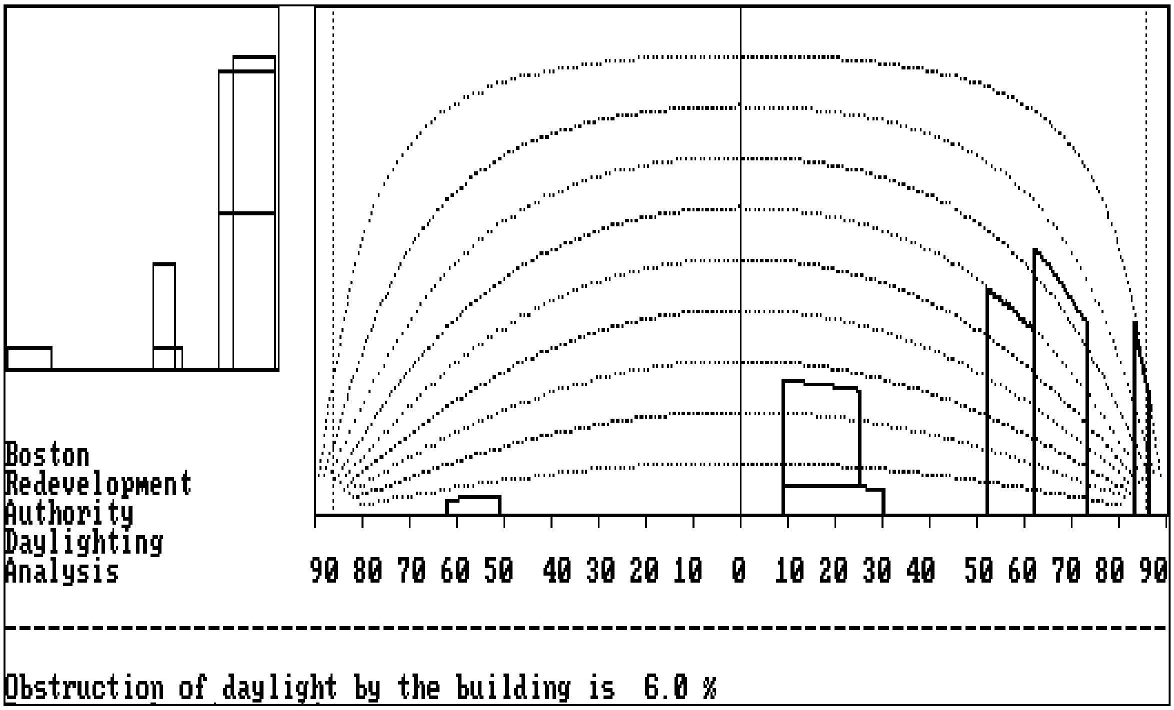
Viewpoint 1: View from Rutherford Avenue facing west toward the western portion of the Project site



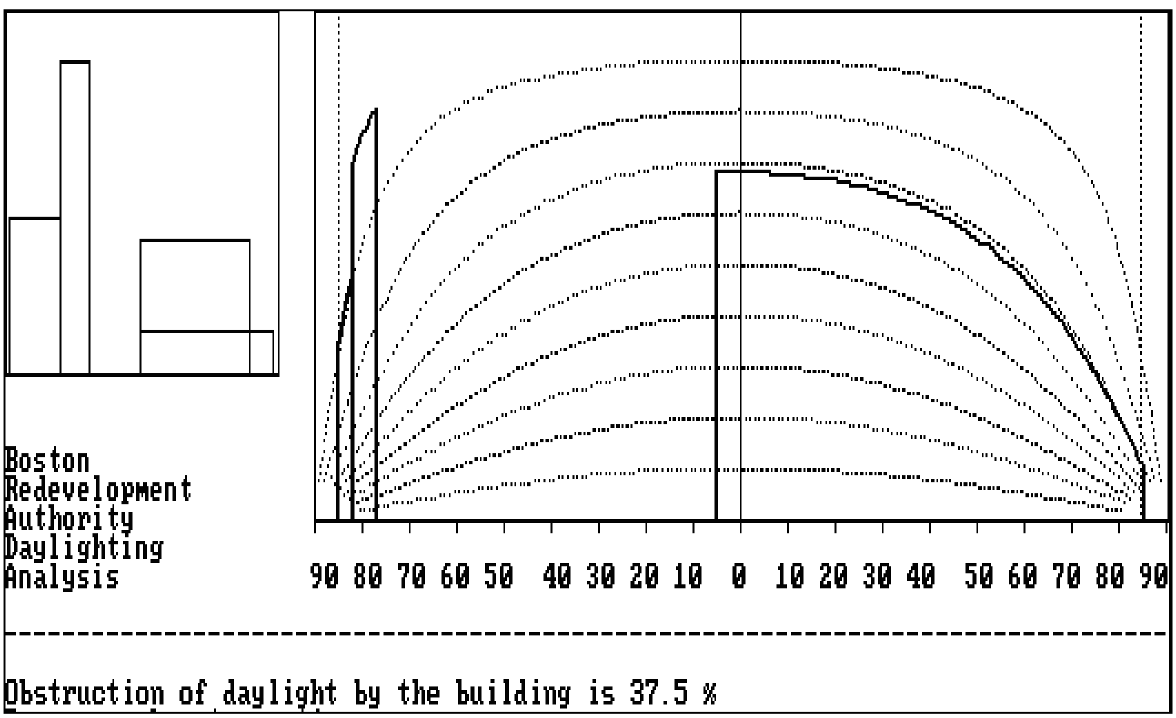
Viewpoint 2:View from Rutherford Avenue facing west toward the eastern portion of the Project site



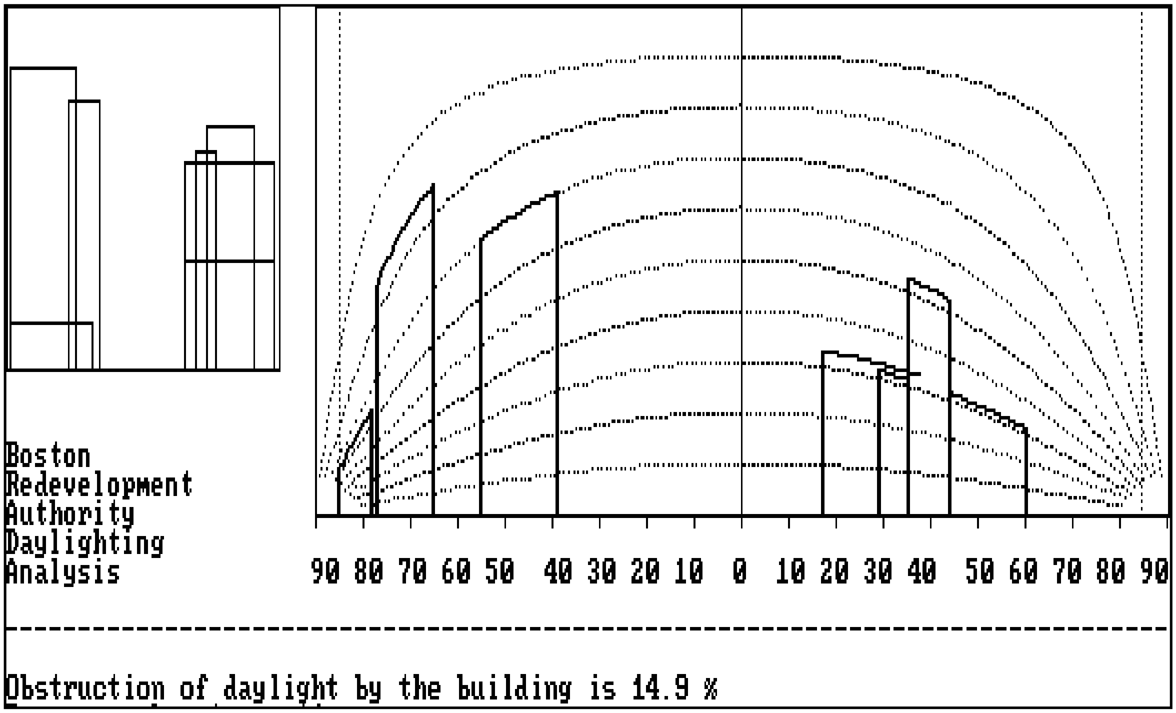
Viewpoint 3: View from D Street facing southeast toward the Project site



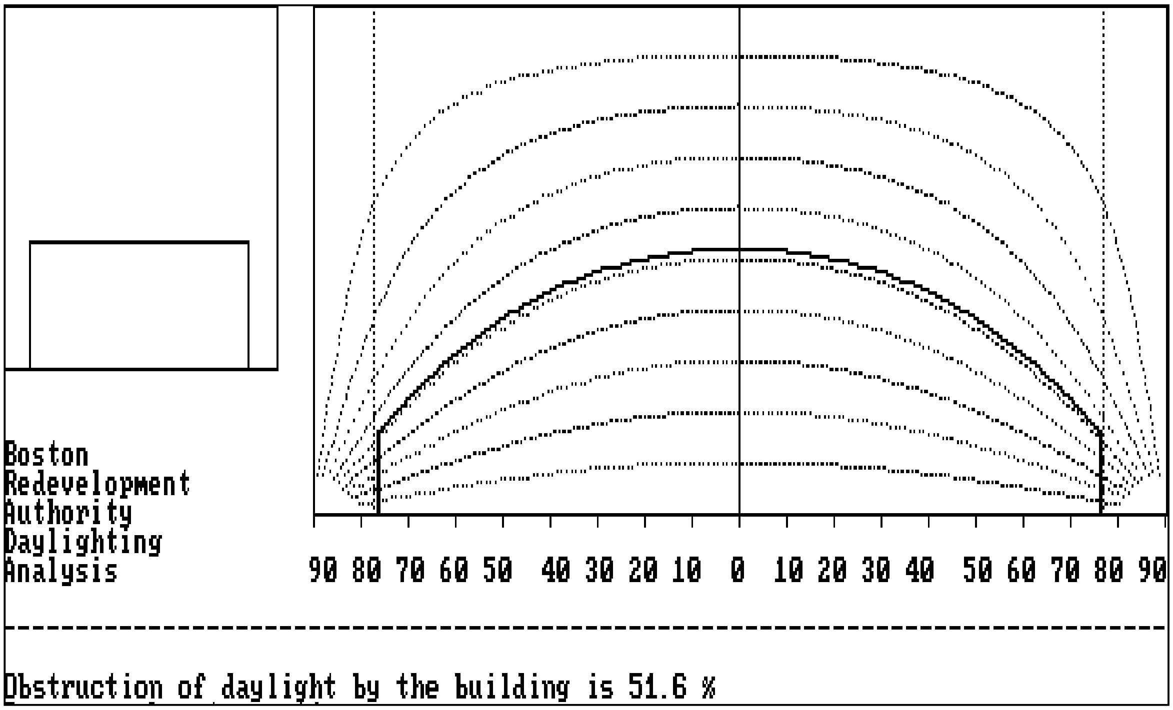
Viewpoint 4:View from Bunker Hill Industrial Park Road facing northeast toward the western portion of the Project site



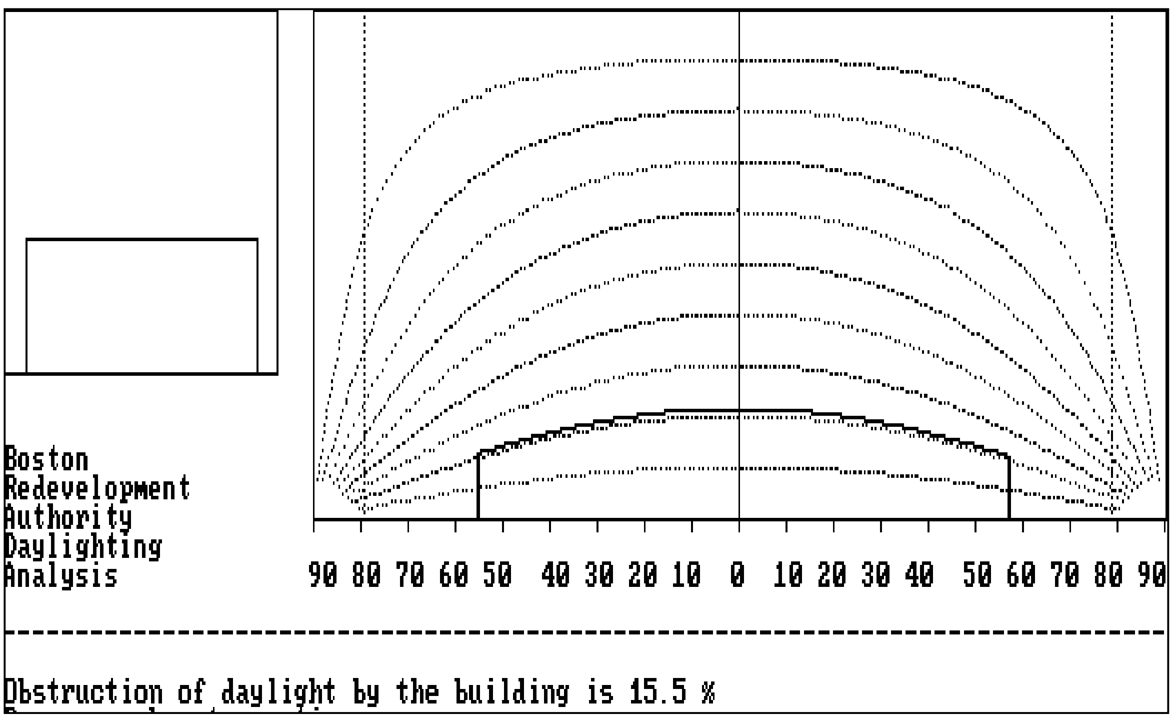
Viewpoint 5: View from Bunker Hill Industrial Park Road facing northeast toward the eastern portion of the Project site



Area Context 1: View from Rutherford Avenue facing west toward 420 Rutherford Avenue



Area Context 2: View from Bunker Hill Industrial Park facing west toward 40 Park Street



3.4 Solar Glare

The Proponent does not plan to include the use of highly reflective glass or other reflective materials on the building facades that would result in adverse impacts from reflected solar glare from the Project.

3.5 Air Quality

An air quality analysis has been conducted to determine the impact of pollutant emissions from mobile sources generated by the Project. Any new stationary sources will be reviewed by the Massachusetts Department of Environmental Protection (MassDEP) and permitted, likely under the Environmental Results Program (ERP), if required.

3.5.1 National Ambient Air Quality Standards

The 1970 Clean Air Act was enacted by the U.S. Congress to protect the health and welfare of the public from the adverse effects of air pollution. As required by the Clean Air Act, EPA promulgated NAAQS for the following criteria pollutants: nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter (PM) (PM10 and PM2.5), carbon monoxide (CO), ozone (O3), and lead (Pb). Additional standards have been added as recently as 2012. The NAAQS are listed in Table 5-1.

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

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

Massachusetts Ambient Air Quality Standards (MAAQS) are codified in 310 CMR 6.04, and generally follow the NAAQS but are not identical (highlighted in bold in Table 3.5-1).

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

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

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

3.5.2 Background Concentrations

To estimate background pollutant levels representative of the area, the most recent air quality monitor data reported by the MassDEP in their Annual Air Quality Reports was obtained for 2014 to 2016. The three-hour and 24-hour SO2 values are no longer reported in the annual reports. Data for these pollutant and averaging time combinations were obtained from the EPA's AirData website.

The Clean Air Act allows for one exceedance per year of the CO and SO2 short-term NAAQS per year. The highest second-high accounts for the one exceedance. Annual NAAQS are never to be exceeded. The 24-hour PM-10 standard is not to be exceeded more than once per year on average over three years. To attain the 24-hour PM-2.5 standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 μg/m3. For annual PM-2.5 averages, the average of the highest yearly observations was used as the background concentration. To attain the one-hour NO2 standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 μg/m3.

Background concentrations were determined from the closest available monitoring stations to the proposed development. All pollutants are not monitored at every station, so data from multiple locations are necessary. The closest monitor is at 174 North Street (1.1 miles west-southwest), but this site only samples PM-2.5. The next closest site is at Kenmore Square, roughly 3.5 miles west-southwest of the Project location. However, this site only samples for SO2 and NO2. A site on Harrison Avenue is roughly 3.7 miles southwest of the Project. This site samples for the remaining pollutants. A summary of the background air quality concentrations are presented in Table 3.5-2.

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

Pollutant	Averaging Time	2014	2015	2016	Background Concentration ($\mu g/m^3$)	NAAQS	Percent of NAAQS
SO_2 (1)(6)	1-Hour (5)	25.4	14.4	10.7	16.9	196.0	9%
	3-Hour	24.6	11.5	10.0	24.6	1300.0	2%
	24-Hour	13.1	7.6	5.2	13.1	365.0	4%
	Annual	2.5	1.3	1.1	2.5	80.0	3%
PM-10	24-Hour	53.0	30.0	30.0	53.0	150.0	35%
	Annual	14.9	14.2	14.1	14.9	50.0	30%
PM-2.5	24-Hour (5)	14.4	16.7	14.7	15.2	35.0	44%
	Annual (5)	6.9	7.3	7.7	7.3	12.0	61%
NO_2 (3)	1-Hour (5)	92.1	105.3	88.4	95.3	188.0	51%
	Annual	32.3	32.5	28.3	32.5	100.0	33%
CO (2)	1-Hour	1963.1	1560.9	2750.4	2750.4	40000.0	7%
	8-Hour	1489.8	1031.4	2062.8	2062.8	10000.0	21%
Ozone (4)	8-Hour	106.0	109.9	113.9	113.9	147.0	77%
Lead	Rolling 3-Month	0.014	0.016	0.017	0.017	0.15	12%

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

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

3.5.3 Regional (Mesoscale) Impacts

A mesoscale analysis is used to ensure that a proposed project will not negatively impact the existing State Implementation Plan (SIP). The SIP is created to track how the state intends to maintain compliance with NAAQS or to plan for future emissions reductions to attain compliance.

Methodology

A mesoscale analysis predicts the change in regional ozone precursor emissions (oxides of nitrogen [NOx] and volatile organic compounds [VOCs]) due to the Project.

The analysis includes a comparison of the future Build condition to the Base condition. If emissions are greater for the Build condition, reasonable and feasible mitigation measures will be evaluated. The methodology and parameters for the mesoscale analysis follow methodology approved by MassDEP.

The total vehicle pollutant burden was estimated for the 2018 Existing condition and the No-Build and Build condition for year 2026. Traffic conditions are described in more detail in Section 4.

The EPA has developed an emissions factor model (called MOVES) and MassDEP provides state-specific inputs required for this model. Therefore, the MOVES computer program was used to estimate motor vehicle emissions of VOC and NOx (and greenhouse gases) on the roadway network in the Project area. Average hourly emission estimates were calculated using the vehicle count data provided in the transportation study, mileage between intersections, and county-specific model inputs provided by MassDEP.

Traffic volumes provided in Section 4 form the basis of the mesoscale study. Approximately 70 roadway links were included in the mesoscale analysis. Peak hour traffic volumes were provided by Stantec. Estimates of average daily traffic (ADT) were made from the peak hour volumes assuming a 10% K-Factor. This ADT was then converted into average hourly volumes by simply dividing by 24. Average speed was assumed based on roadway type (typically 10-40 mph for arterial roads) for all links. Distances for the links were estimated with mapping software.

MOVES output emissions are in tons per hour. Since average hourly traffic data were input, emissions in tons per year were calculated assuming a seven day week for 52 weeks per year.

For intersection emissions, idle vehicle emission rates were obtained in MOVES by using a fictitious roadway link with 100 vehicles and a zero miles per hour vehicle speed. The total emissions on this link can be divided by the number of vehicles to get a mass per hour emission rate for idling vehicles. This method is recommended by EPA to get emission factors for air quality concentration analyses of idling vehicles at intersections (microscale analyses). These emission factors were then used with vehicle counts and delay information from the traffic analysis to estimate vehicle emissions at intersections.

Attachment E presents the intersection emissions calculations, and the Project-specific link data input into the MOVES program.

Results

Results of the mesoscale analysis are presented in Tables 3.5-3 and 3.5-4.

As shown in Table 3.5-3, the analysis indicates the change in total emissions from the 2018 Existing conditions to the 2026 No-Build conditions. Typically, a decrease in total emissions, even with the modest increases (or in this case no differences) in traffic vehicle miles traveled (VMT), is attributable to anticipated improvements in vehicle engine and emissions technologies, which are expected to reduce the per-vehicle emission rates. Even with minimal increase in VMT, large reductions are realized due to improved fleet vehicle emissions.

Table 3.5-3 Regional Mesoscale (Indirect) Emissions Analysis Summary (No Build)

Pollutant	VOC (lbs/day)	VOC (tons/yr)	NOx (lbs/day)	NOx (tons/yr)
2018 Existing	54.7	10.0	49.1	9.0
2026 No-Build	38.8	7.1	22.4	4.1
Difference	-15.9	-2.9	-26.7	-4.9
Difference (%)	-29%	-29%	-54%	-54%

As shown in Table 3.5-4, the 2026 Build condition exhibits an increase of NOx and VOC emissions compared to 2026 No-Build condition due to a direct increase in vehicular traffic and increased delay times at area intersections attributable to the Project. This results in increases of approximately five percent of VOC and NOx emissions.

Table 3.5-4 Regional Mesoscale (Indirect) Emissions Analysis Summary (Build)

Pollutant	VOC (lbs/day)	VOC (tons/yr)	NOx (lbs/day)	NOx (tons/yr)
2026 Base	38.8	7.1	22.4	4.1
2026 Build	40.9	7.5	23.4	4.3
Difference	2.1	0.4	1.0	0.2
Difference (%)	5%	5%	5%	5%

Conclusions

Mesoscale analysis results show increases of five percent in VOC and NOx emissions for the 2026 Build condition relative to the 2026 No-Build condition due to traffic increases. However, the actual increase in emissions is well less than one ton per year of each pollutant.

Signal timing adjustments reduce idle times at area intersections, directly reducing both VOC and NOx emissions. The primary focus of signal timing adjustments is to alleviate traffic and keep intersections operating smoothly. Any benefits to air quality are secondary to the traffic benefits.

Reduced intersection delay times would also result in a general increase in traffic speed along roadway links. In general, NOx emission rates decrease from idle to 30 mph. Therefore, any reduction in idling time and corresponding increase in speed up to the 25 mph local speed limit would decrease NOx emissions.

Implementation of any future improvements not yet determined or discussed in Chapter 2 may further reduce emissions.

3.5.4 Localized (Microscale) Impacts

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

Starting with the phase out of leaded gasoline between 1973 and 1996, to the most recent Tier 3 vehicle emission standards, light duty passenger cars and small trucks have been emitting fewer air pollutants. The new Tier 3 standards include requirements which will result in lower tailpipe and evaporative fuel system emissions, as well as reduced sulfur content of on-road gasoline fuels.

Diesel fuel used for on-road vehicles consists of far less sulfur than ever, significantly reducing emissions of soot and sulfur dioxide. Diesel engines are also becoming equipped with control devices to reduce emissions. Many newer heavy duty trucks are being sold, and many older trucks are being retrofitted with diesel particulate filters (DPF) or diesel oxidation catalysts (DOC), which reduce particulate emissions. DPFs have verified control efficiencies of 85 to 90 percent for particulate matter and 70 to 90 percent for CO. DOCs are capable of reducing emissions of particulate matter by 20 to 40 percent, hydrocarbons by 40 to 75 percent, and carbon monoxide by 10 to 60 percent.

The “microscale” analysis involves modeling of CO (and for federal projects, PM10 and PM2.5) emissions from vehicles idling at and traveling through signalized intersections. Predicted ambient concentrations are compared with federal (and state) ambient air quality standards.

The microscale analysis typically examines ground-level CO impacts due to traffic queues in the immediate vicinity of a project. CO is used in microscale studies to indicate roadway pollutant levels since it is the most abundant pollutant emitted by motor vehicles and can result in so-called "hot spot" (high concentration) locations around congested intersections. The NAAQS standards do not allow ambient CO concentrations to exceed 35 parts per million (ppm) for a one-hour averaging period, and 9 ppm for an eight-hour averaging period, more than once per year at any location. The widespread use of CO catalysts on current vehicles has reduced the occurrences of CO hotspots.

With these engine improvements, localized CO impacts on air quality have also been dramatically reduced. Typical modeled concentrations in the vicinity of even the worst intersections in the Greater Boston area rarely exceed 1.0 ppm for both the one-hour and eight-hour averaging periods. When combined with ambient background concentrations that are generally less than 5 ppm for either averaging period, resulting concentrations are practically always less than the NAAQS for CO.

3.5.5 Stationary Sources

Stationary sources of air pollution are typically units that combust fuel. In this case, these sources consist of heating and hot water units and emergency electrical generators. Cooling towers, although not a combustion source, are a source of particulate emissions.

It is expected that the majority of stationary sources (boilers, engines, etc.) may be subject to MassDEP's Environmental Results Program (ERP). The Proponent will complete the required applications and submittals for the equipment, as necessary. No sources are expected to meet or exceed the thresholds for a Limited or Non-Major Comprehensive Plan Approval.

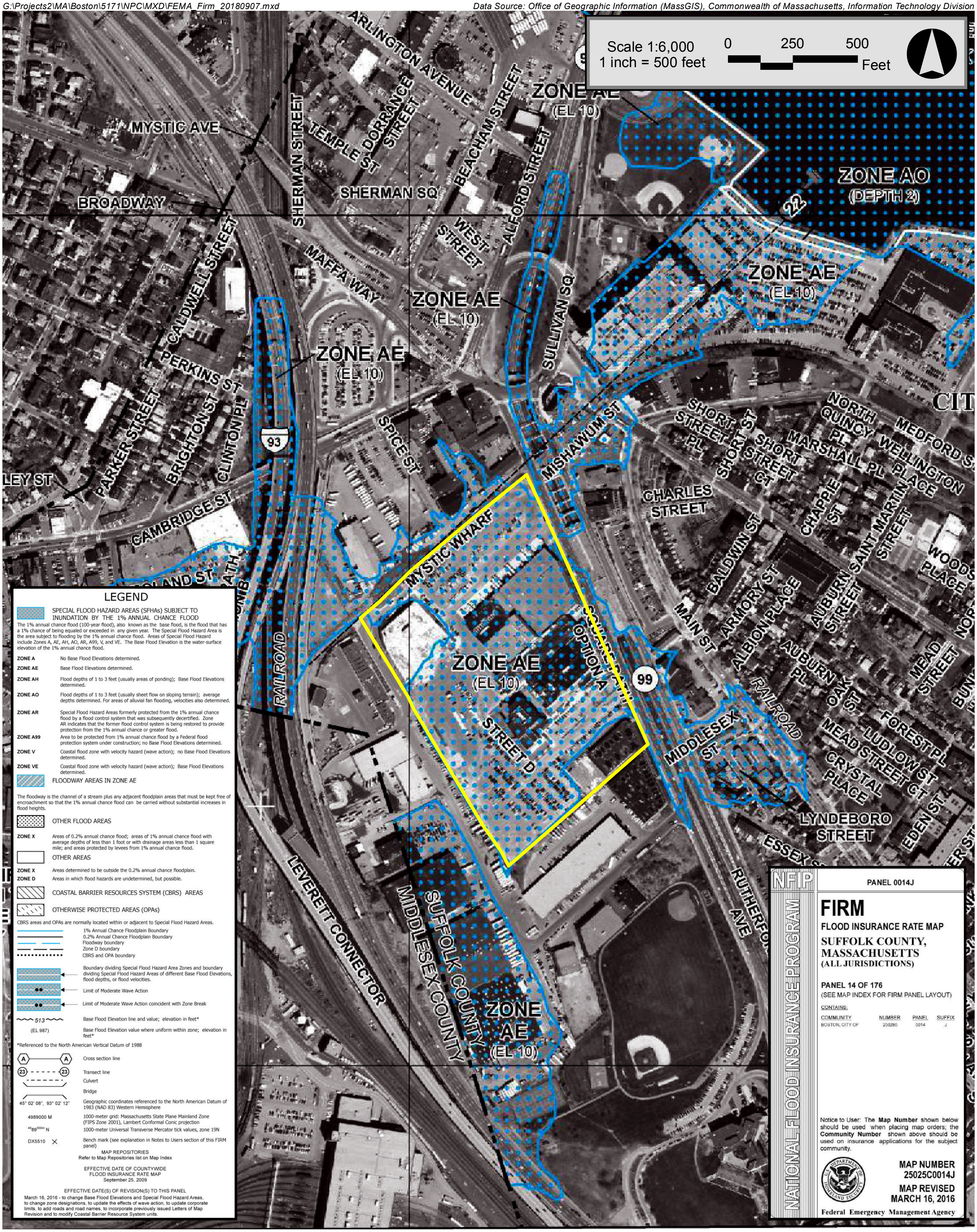
3.6 Stormwater/Water Quality

Please refer to Chapter 7 which includes information about stormwater and water quality.

3.7 Flood Hazard Zones/Wetlands

3.7.1 FEMA 100-Year Flood Elevation

The Flood Insurance Rate Maps (FIRMs) for the Project site indicate that the site lies within the 100-year flood zone (Community Panel Numbered 25025C0014J, effective March 16, 2016), which is designated as Zone AE. The current 100-year (1 percent annual probability) flood elevation is 10 feet NAVD88, which equates to approximately 16.5 feet BCB (Boston City Base). This flood elevation extends across most of the site (see Figure 3.7-1). All existing building first floor elevations are above this elevation.



Hood Park Master Plan   Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 3.7-1

Flood Map (FIRM Panel Map 25025C0014J)

3.7.2 Proposed Master Plan Grading

The grading design for the Master Plan is shown on Figure 3.7-1.

The grading supports the design goals of the streetscape and public open spaces, and meets design criteria for resilience and flood protection.

The grading creates a street network that is generally two to three feet above the existing elevation of the site. This enables the first floor elevations of proposed buildings to be set at approximately elevation 20 feet BCB, consistent with the City's goals for climate change preparedness. The existing first floor elevations at 500 and 510 Rutherford Avenue, which remain as part of the master plan, are also at an approximate elevation of 20 feet BCB. The master plan meets the existing grade at the boundaries of the property along Rutherford Avenue and D Street (Massport Right of Way), but is designed to connect with higher offsite grades in the future as adjacent street networks are developed.

The design team is studying the incorporation of a number of measures to mitigate against flood impacts, including

- Placing essential mechanical equipment above the future flood level;
- Water-tight utility conduits;
- Wastewater backflow prevention; and
- Resilient materials on the first floors of the buildings that can either withstand flooding or easily be replaced.

3.8 Geotechnical Impacts

3.8.1 Site History

Historic maps indicate that the Project Site was formerly a tidal mill pond prior to filling in the late 1800s and was undeveloped prior to 1892. Beginning in the late 1880s structures and railroad spurs, associated with the Boston and Maine Railroad, traversed the northern corner of the site, adjacent to Rutherford Avenue. By 1901, the majority of the site was developed with railroad spurs and freight houses running east to west, H. P. Hood & Sons Milk Depot, and storage for hay and lumber. The site continued to be developed and by 1917, the site was occupied by freight houses Nos. 32 to 37, the H. P. Hood & Sons machine/carpenter shop and storage building, milk depot and creamery and railroad spurs. According to the 1950 Sanborn Map, Freight Houses Nos. 32 to 35, in the southern half of the site, were removed and the area was noted as government property; Freight Houses Nos. 36 and 37 remained north of the Hood Milk Plant. Aerial images indicate that between 1969 and 1978 the H.P. Hood & Sons shop building had been re-constructed and remained in place through the early 1980s.

A former building at 480 Rutherford Avenue and current existing buildings at 500, 510 and 570 Rutherford Avenue within Hood Park were constructed in phases from 1947 to 1983 and the remainder of the Master Plan Site was used as parking lots since that time. The former building at 480 Rutherford Avenue was demolished in 2008 to make way for an approved but never-built office building. This portion of the Master Plan Site remained vacant until construction of the current residential/retail building began in August 2017 and currently ongoing. Construction of the 100 Hood Park Drive multi-use building began in May 2018 and is also currently ongoing.

3.8.2 Environmental Soil and Groundwater Conditions

Urban fill materials at the site contain compounds that exceed applicable Massachusetts Contingency Plan (MCP) reportable concentrations. The contaminants are likely the result of historical site use, fills brought to the site, the presence of coal, coal ash, wood ash in the fill, and use of the property as a railyard. The known compounds are commonly present on similar sites throughout Boston and are not expected to represent any unusual concern or requirements in connection with the proposed development.

In accordance with normal practices, the Proponent conducted initial phases of soil and groundwater sampling within the Site to collect information on soil and groundwater quality for project planning purposes. Initial phases of soil and groundwater sampling and testing will continue to be conducted on the remainder of the Site as building plans progress. Additional soil testing to characterize and classify the soil within the proposed excavation limits for off-site removal to appropriate facilities and/or to characterize soil for risk assessment purposes has also been conducted as plans for building design of the Master Plan has progressed. To date soil testing programs have been conducted within the 480 Rutherford Avenue, 100 Hood Park Drive, 10 Stack Street, and a part of the 30 Stack Street portions of the Master Plan Site.

Testing of groundwater has also been conducted to determine if groundwater has been impacted and to determine if treatment of construction dewatering effluent will be necessary in support of the appropriate permits for discharge to nearby storm drains or sewers.

Testing conducted to date at a portion of the Site indicates that historic releases of oil and hazardous material have occurred. The historic releases described below were reported to MassDEP in April 2017 for conditions at 480 Rutherford Avenue and February 2018 for conditions at 100 Hood Park Drive, 10 Stack Street, and part of 30 Stack Street.

- RTN 3-31484 – Reportable Concentrations of arsenic, lead, mercury, total petroleum hydrocarbons (TPH), and polycyclic aromatic hydrocarbon (PAH) compounds were identified comingled in urban fill soil and reported to MassDEP for 480 Rutherford Avenue in April 2017. MassDEP subsequently assigned RTN 3-31484 to the release. Development at the 480 Rutherford Avenue Site, including management of impacted urban fill is being conducted under a Release Abatement Measure (RAM) Plan. Upon completion of RAM activities regulatory closure will be obtained.

- RTN 3-34756 – Reportable Concentrations of PAHs, petroleum and metals, including antimony, arsenic, and lead were identified comingled in urban fill soil and elevated concentrations of dissolved lead were identified in groundwater during a subsurface exploration and chemical testing program conducted at the 100 Hood Park Drive, 10 Stack Street, and a part of the 30 Stack Street portions of the Master Plan Site. MassDEP was notified of the release on 9 February 2018 and subsequently assigned RTN 3-34756 to the release. Development at the 100 Hood Park Drive Site is being conducted under a RAM Plan. Following completion of RAM activities at 100 Hood Park Drive, a partial Permanent Solution will be achieved for the 100 Hood Park Drive portion of RTN 3-34756. RAM activities do not include construction of future buildings at 10 or 30 Stack Street. A separate RAM Plan will be prepared for construction of these buildings designed to achieve a Permanent Solution upon project completion of each building.

Materials excavated during construction of the project will be managed in accordance with all applicable regulatory requirements including Release Abatement Measure (RAM) Plans prepared for construction of the proposed buildings under the MCP. The RAM Plan for 100 Hood Park Drive and the RAM Plan for 480 Rutherford Avenue are designed to be coordinated with each other to allow for the on-site reuse of suitable existing materials between the projects. Remedial activities conducted under the RAM Plans in conjunction with project construction are expected to result in achievement of a Permanent Solution under the MCP.

Other Documented releases within the Master Plan Site include:

- RTN 3-00815 – historic release of No. 6 heating oil from the piping associated with two fuel oil underground storage tanks (USTs) near the Power House was reported to MassDEP in April 1986. The UST was installed in 1987 and removed in 1998. Approximately 41 cubic yards of contaminated soil were excavated during repair to the leaking feed line. A Phase II Comprehensive site assessment associated with the RTN was completed in 2006. Soil and groundwater were impacted by petroleum, but analytical testing indicates that concentration were below applicable standards. The site was closed in 2006 with a Class A-2 Response Action Outcome (RAO) indicating that levels have been not reduced to background, but no significant risk exists.

- RTN 3-18142 – historic release of petroleum in the vicinity of 3 former USTs used to fuel the delivery fleet vehicles near the present-day 570 Rutherford Avenue building was reported to MassDEP in March 1999. The 3 tanks were removed in 1986. In 1998, soil and groundwater samples were collected during a subsurface investigation program and analyzed for VPH/EPH petroleum fractions and target analytes. One groundwater sample exceeded applicable RCGW-2 criteria. The site was closed with a Class A-2 RAO indicating that levels have not been reduced to background, but a condition of no significant risk exists.

- RTN 3-28573 - petroleum contamination identified in soil surrounding an abandoned No. 2 fuel oil UST within a portion of 480 Rutherford Avenue. The release was reported to MassDEP in 2009. The Site achieved regulatory closure with the submittal of a Class B-1 Response Action Outcome (RAO) in February 2013 indicating that remedial actions were not conducted because a condition of no significant risk exists.

- RTN 3-29114 – assigned to a portion of 480 Rutherford Avenue in 2010 associated with LNAPL identified in onsite monitoring wells. RTN 3-29114 was linked to RTN 3-28573, and the Site achieved regulatory closure with the submittal of a Class B-1 RAO in February 2013 indicating that remedial actions were not conducted because a condition of no significant risk exists.

- RTN 3-12219 – historic release of diesel fuel in March 1995 during a vehicle fueling operation resulted in a 2-hour reporting notification to MassDEP nearby the present day 570 Rutherford Avenue building. MassDEP was notified and assigned RTN 3-12219 to the release. The Site subsequently achieved regulatory closure in March 1995 with the submittal of a Class A-1 RAO indicating that levels have been reduced to background and a condition of no significant risk exists.

3.8.3 Existing and Proposed Site and Subsurface Conditions

This section describes site conditions, subsurface soil and bedrock, groundwater conditions, planned construction, potential impacts of the construction, and planned mitigation measures.

3.8.3.1 Site Conditions

The Project Site currently consists primarily of paved parking lots, commercial office buildings at 500, 510 and 570 Rutherford Avenue, and buildings currently under construction at 480 Rutherford Avenue and 100 Hood Park Drive. Hood Business Park is bounded by Rutherford Avenue to the east. The western corner of the Master Plan Site is occupied by a one story commercial building known as 570 Rutherford Avenue. The Master Plan Site is bounded by D Street, beyond which are a school bus storage yard and a series of commercial buildings to the north; Boston Sand and Gravel, a recycling facility, and a storage rental building to the west; and a paved lot for the recycling facility to the south. Current site grade is approximately El. 15-17. Elevations refer to Boston City Base (BCB) and are given in feet (ft).

There are no surface water bodies located on the site. According to a MassDEP site Scoring Map, the site is not located within 500 feet (ft) of any surface water bodies, drinking water supplies (such as Zone II areas, Interim Wellhead Protection Areas, Zone A areas, Potentially Productive Aquifers or private wells), Areas of Critical Environmental Concern, Sole Source Aquifers, protected open space, fish habitats, and habitats of Species of Special Concern or Threatened or Endangered Species. The closest surface water body is the Mystic River located approximately 1,400 ft to the northeast.

3.8.3.2 Subsurface Soil and Bedrock Conditions

Generalized subsurface conditions observed in test borings conducted at the site, listed in increasing depth below ground surface, are summarized as follows:

Generalized Stratum Description	Thickness (ft)	Elevation of Stratum (ft, BCB)
Fill	8 to 15.5	17 to 15
Organic Deposits	0 to 9	8 to 0.5
Marine Deposits	7 to 15	4 to -5.5
Glacial Deposits	25.5 to 53	-6.5 to -16.5
Bedrock	--	-39 to -73

Note that one or more of the soil units may be absent at any specific location, and may vary in thickness across the subject site. Soil units were not fully penetrated in all explorations.

3.8.3.3 Groundwater

Groundwater was typically observed at approximately El. 8 to El. 11.5 BCB in existing and recently-installed observation wells. Test pits excavated through the shallow fills sometimes indicated localized perched water in the fill as high as El. 14.

Groundwater levels in the Site vicinity are anticipated to fluctuate and could be influenced by nearby construction activities, leakage into and out of sewers, storm drains and other below grade structures, as well as environmental factors such as precipitation, snowmelt, seasonal fluctuation, and temperature.

3.8.3.4 Foundation Support and Below-Grade Construction

The proposed mixed-use development within the Hood Park campus consists of several building sites, much of which includes ground floor retail. A network of roadways, greenscapes, and new infrastructure will surround the existing Hood Business Park main building. Finished grades are planned to be raised up to on the order of 4 to 5 ft, sloping down to resolve grading with the existing Rutherford Avenue roadway. The overall campus development will contain buildings with varying heights, configurations, and footprints. Accordingly, foundation options, potential below-grade space, and other geotechnical criteria will vary significantly depending on structure demand and program objectives. At each development site, at a minimum, excavation for foundations, below-grade work, on-grade building slabs, and utility and roadway construction will occur within the fill and organic deposits.

The building foundations have not been finalized, but based on preliminary/available subsurface information, the various structures will require support beneath the fill and organic deposits, and into suitable bearing soils. The project is currently evaluating the potential for below-grade levels that would allow certain buildings to "float" and bear on the intermediate Marine or Glaciomarine Deposits. Other buildings may utilize ground improvement bearing in the same intermediate stratigraphy to enable shallow foundation construction (without below-grade space). Taller buildings with greater structure demands may require deep foundations (e.g. end-bearing piles, drilled shafts) terminating in the underlying glacial till and/or bedrock.

Depending on the final configuration and foundation depths of each building development within the master plan, excavations for the buildings may be performed as local open cut excavations, or if basement space is planned, construction within a lateral support of excavation (SOE) system. A SOE system would involve using interlocking steel sheetpiles or other similar system extending into the Marine or Glaciomarine Clay, for temporary stability as well as to achieve groundwater cutoff. The temporary SOE would be designed by a licensed professional engineer. A permanent underdrain collection system would be constructed to collect future leakage past the groundwater cutoff (e.g. at sheetpile joints or through low permeability soils beneath the cutoff elevation).

Foundation construction and the excavation of soil materials from other earthwork-related activities will be accomplished using conventional earthwork equipment. An engineer's representative will be on site during foundation-related work to observe suitable subgrade and/or foundation element installation criteria are achieved, in accordance with Building Code requirements. Soil and groundwater management by the Contractor will require compliance with MCP requirements, and work will be observed and documented by the project LSP.

3.8.3.5 Potential Construction Impacts

Potential impacts during excavation and foundation construction include temporary, ground vibrations and noise; however no future buildings to-be constructed are located directly adjacent to the proposed work (other than those within the Hood Park campus, which will either be demolished or partially-demolished and renovated).

Incidental construction dewatering may be required within locally deeper excavations, for elevator pits, sumps, etc. to remove standing water from soil subgrades, whether from groundwater or from precipitation, during foundation construction. It is the intent of the project to recharge pumped water to other acceptable locations on the site to the extent possible; applicable dewatering discharge permits will be applied for if significant dewatering is anticipated (i.e. deeper excavations for below-grade space).

3.8.3.6 Mitigation Measures

Select instrumentation such as settlement monitoring points on adjacent buildings and vibration monitors may be installed before start of construction to establish baseline conditions, monitored during construction and, in the case of settlement monitoring points, for a period after construction to confirm stable conditions. However, given the distance of adjacent buildings to the planned construction, we do not anticipate structure monitoring generally being necessary. Adjacent utilities, as judged to be within the influence of mass excavations [if any], may also be monitored for settlement.

Dust generated during construction may be monitored in combination with various suppression techniques (wetting of construction access/travel roads, covering of stockpiles, etc.) to mitigate excessive fugitive dust concentration levels as defined in the RAM plan.

3.8.3.7 Boston Water and Sewer Commission Stormwater Recharge

The design will comply with the Boston Water and Sewer Commission (BWSC) requirement to store and recharge stormwater into the ground or reuse/recycle. The Project will capture the required rainfall from all building roof area(s) and roadways (as applicable) and recharge it into the ground through various on-site stormwater recharge systems.

3.8.3.8 Groundwater Conservation Overlay District

The Site is not located within the Groundwater Conservation Overlay District (GCOD) as established by Article 32 of the City of Boston Zoning Code. Although, the provisions of Article 32 do not apply to the Site, the BWSC-mandated stormwater recharge would meet the Article 32 requirements.

3.9 Solid and Hazardous Wastes

The Project will generate solid waste typical of residential, office and hotel uses. Solid waste is expected to include wastepaper, cardboard, glass bottles and food. Based on commonly used formulas for estimating solid waste generation, the Project is expected to generate approximately 2,615 tons of solid waste per year.

With the exception of household hazardous wastes typical of hotel and residential developments (e.g., cleaning fluids and paint), the Project will not involve the generation, use, transportation, storage, release, or disposal of potentially hazardous materials. Tenants generating laboratory wastes will be responsible for establishing programs for their safe handling and disposal in accordance with applicable regulations.

3.9.1 Recycling

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

3.10 Noise Impacts

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

Table 3.10-1 below presents the "Zoning District Noise Standards" contained in Regulation 2.5 of the APCC "Regulations for the Control of Noise in the City of Boston," adopted December 17, 1976. These maximum allowable sound pressure levels apply at the line of the receiving property. Zoning District Standards are presented below in Table 3.10-1.

Table 3.10-1 City of Boston Zoning District Noise Standards, Maximum Allowable Sound Pressure Levels

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

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

Additionally, the MassDEP has the authority to regulate noise under 310 CMR 7.10, which is part of the Commonwealth's air pollution control regulations. According to MassDEP, "unnecessary" noise is considered an air contaminant and thus prohibited by 310 CMR 7.10. The MassDEP administers this regulation through Noise Policy DAQC 90-001 which limits a source to a 10-dBA increase above the L90 ambient sound level measured at the Project property line and at the nearest residences. The MassDEP policy further prohibits "pure tone" conditions where the sound pressure level in one octave-band is 3 dB or more than the sound levels in each of two adjacent bands.

While the details of the mechanical equipment associated with the Project have not yet been precisely determined, steady operational noise from stationary sources will primarily involve heating, cooling, and ventilation equipment. During the final design phase of the Project, mechanical equipment will be specified to meet the applicable City of Boston and MassDEP noise limits. Reasonable efforts will be made, if necessary, to minimize noise impacts from the Project using routinely employed methods of noise control.

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

3.11 Construction

3.11.1 Introduction

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

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

During the construction phase of the Project, the Proponent will provide the name, telephone number and address of a contact person to communicate with on issues related to the construction. The construction contact will be responsible for responding to the questions/comments/complaints of the residents of the neighborhood.

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

3.11.2 Construction Methodology/Public Safety

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

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

3.11.3 Construction Schedule

The Proposed Project is generally expected to proceed clockwise from the southeast corner. This phased redevelopment plan starts with the current construction efforts at 50 Hood Park Drive, slated for occupancy in May 2019 and 100 Hood Park Drive slated for vehicle parking usage in August of 2019. Subsequent development will proceed with the office / lab uses at 10 Stack Street, and include the open green space surrounding the Power House building and the new entry drop-off at 500 Rutherford Avenue. Along with the utility, private street, intersection work at Rutherford Avenue (as part of the Rutherford Avenue corridor redesign) and pedestrian connections, these first phases will complete all construction work at the southern third of Hood Park. Subsequent phases will include additional passive and active landscaped spaces and the multi-modal transportation link at the northern boundary of the park, connecting to Spice and D Streets. Specific phasing of the remaining built components will be determined, on an ongoing basis in accordance with market demand and the evolution of traffic and access at the northern portions of the park. Full build out is expected to take approximately 15 years.

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

3.11.4 Construction Staging/Access

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

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

3.11.5 Construction Mitigation

The Proponent will follow City and MassDEP guidelines which will direct the evaluation and mitigation of construction impacts. As part of this process, the Proponent and construction team will evaluate the Commonwealth's Clean Air Construction Initiative.

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

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

3.11.6 Construction Employment and Worker Transportation

The number of workers required during the construction period will vary. It is anticipated that approximately 3,000 construction jobs will be created over the length of construction. The Proponent will make reasonable good-faith efforts to have at least 51% of the total employee work hours be for Boston residents, at least 40% of total employee work hours be for minorities and at least 12% of the total employee work hours be for women.

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

3.11.7 Construction Truck Routes and Deliveries

Truck traffic will vary throughout the construction period depending on the activity. The construction team will manage deliveries to the site during morning and afternoon peak hours in a manner that minimizes disruption to traffic flow on adjacent streets. Construction truck routes to and from the site for contractor personnel, supplies, materials, and removal of excavations required for the development will be coordinated with the BTD. Traffic logistics and routing will be planned to minimize community impacts. Truck access during construction will be determined by the BTD as part of the CMP. These routes will be mandated as a part of all subcontractors' contracts for the development. The construction team will provide subcontractors and vendors with Construction Vehicle & Delivery Truck Route Brochures in advance of construction activity.

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

3.11.8 Construction Air Quality

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

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

3.11.9 Construction Noise

The Proponent is committed to mitigating noise impacts from the construction of the Project. Increased community sound levels, however, are an inherent consequence of construction activities. Every reasonable effort will be made to minimize the noise impact of construction activities.

Mitigation measures are expected to include:

- Instituting a proactive program to ensure compliance with the City of Boston noise limitation policy;
- Using appropriate mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously running equipment, such as air compressors and welding generators;
- Replacing specific construction operations and techniques by less noisy ones where feasible;
- Selecting the quietest of alternative items of equipment where feasible;
- Scheduling equipment operations to keep average noise levels low, to synchronize the noisiest operations with times of highest ambient levels, and to maintain relatively uniform noise levels;
- Turning off idling equipment; and
- Locating noisy equipment at locations that protect sensitive locations by shielding or distance.

3.11.10 Construction Waste

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

3.11.11 Protection of Utilities

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

3.11.12 Rodent Control

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

3.12 Wildlife Habitat

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

4.0 SUSTAINABLE DESIGN AND CLIMATE CHANGE PREPAREDNESS

Hood Park, as a phased development project in total and on a building by building basis, is committed to achieving the highest levels of sustainability and resiliency practicable. While not part of this Notice of Project Change, it is worth noting that the residential building currently in construction on campus is designed as a LEED Platinum project and the parking garage project is designed as LEED Silver and compliant with ParkSMART standards for garage construction and operations. The development team is committed to a minimum of LEED Silver for all new construction office, retail and lab projects with a goal of LEED Gold for at least half of the commercial buildings proposed. Further, the developer is committed to achieving LEED Platinum for all residential buildings on campus and LEED Gold for all retail buildings.

Finally, as one of numerous sustainability and resiliency efforts, identified further in the attached LEED checklists, Hood Park is committed to elevating the campus above the BPDA Sea Level Rise Floor Hazard elevation of 20 feet (current campus elevation average is 16.5 feet). This elevation increase will result in the campus being above the sea level rise floor elevation in a critically low area of the Charlestown neighborhood and will further assist in prevention of flooding upstream at those areas south and west of the campus which remain below flood elevation levels. As part of the overall sustainability and resiliency approach Hood Park has sought to meet or exceed the requirements in a broad array of sustainability categories from transportation access to water reduction, energy efficiency and similar sustainable categories identified in the LEED checklist.

4.1 Sustainable Design

To comply with Article 37 of the Code, the Proposed Project will be designed and constructed under the guidelines of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Building Design and Construction (BD+C) Version 4 (v4) rating systems, including Core and Shell (CS), New Construction (NC), and Hospitality (H), as applicable. The buildings will meet or exceed the Article 37 requirement of "LEED certifiability." The following is an outline of the preliminary LEED compliance strategy for this project.

4.1.1 LEED BD+C Core and Shell v4 Scorecard – 100 Hood Park Drive, 10 Stack Street, 30 Stack Street

New Ecology, Inc. (NEI) has reviewed the preliminary project scope for the 100 Hood Park Drive addition, 10 Stack Street, and 30 Stack Street and understands the credit summary presented in Table 1 to be reasonable and achievable – the subsequent narrative identifies the project's current approach to compliance with all checklist prerequisites and applicable, optional credits.

Chapter 4.0

Sustainable Design and Climate Change Preparedness

Table 4-1 LEED BD+C Core and Shell v4 Summary Scorecard
100 Hood Park Drive, 10 Stack Street, 30 Stack Street

Category	Yes Points	Maybe Points
Integrative Process	1	0
Location and Transportation	11	1
Sustainable Sites	8	0
Water Efficiency	4	4
Energy and Atmosphere	12	6
Materials and Resources	5	2
Indoor Environmental Quality	4	1
Innovation	5	0
Regional Priority	2	0
Total Points	**52**	**14**

4.1.2 Narrative for LEED Credits – 100 Hood Park Drive, 10 Stack Street, 30 Stack Street

The Projects will fulfill all the prerequisites for all categories.

Only credits that will be pursued by the Project are discussed below; credits that will not be pursued are not included.

Integrative Process

IP Integrative Process 1 point

In compliance with credit requirements, the project will complete the following tasks:

- A preliminary "Box" Energy Model: during the schematic design phase, the team will model the project's design and assess potential strategies associated with the limited site conditions, the extensive massing and required building orientation, the basic envelope design, lighting levels within the regularly occupied spaces, the thermal comfort ranges of the occupants, the plug and process load needs, and the programmatic and operational parameters of the building. All iterations and results will be documented and shared with the design team prior to final design decisions.

- A preliminary Water-Use systems Analysis: also during the schematic design phase, the team will explore methods of reducing potable water loads within the building as well as any potable water required for irrigation of the building site and process water necessary for equipment within the building.

Location and Transportation

LT Sensitive Land Protection 2 yes points

The project is located on a previously developed lot, located in downtown Boston, satisfying the credit conditions.

LT High Priority Site 3 yes points

The project is located on a brownfield where prior soil contamination has been identified and will be remediated per Massachusetts Environmental Policy Act requirements. Brownfield-designated site locations are awarded 3 points per LEED credit requirements.

LT Surrounding Density and Diverse Uses 2 yes points

Option 2, Diverse Uses. The project is located in the Sullivan Square area of Boston, and has significant access to community resources. The project will likely meet the credit requirement of eight (8) uses within a ½-mile walking distance of the main entrance, thereby earning 2 points for this credit under Option 2.

LT Access to Quality Transit 3 yes points

The project site is located within a short walk of the Sullivan Square MBTA subway and bus station. This station provides at least 147 weekday trips and 225 weekend trips (an average of 112.5 on each weekend day) on the Orange Line in each direction, qualifying for three points via the applicable LEED thresholds. The project team will evaluate additional transportation access options to determine if additional LEED points are available for this credit.

LT Bicycle Facilities 1 maybe point

The project team will investigate options to provide protected and covered bike storage within the buildings in addition to shower facilities.

LT Green Vehicles 1 yes point

The project will designate five percent of all parking spaces as preferred parking for green vehicles.

Sustainable Sites

SS Construction Activity Pollution Prevention Required

The project's construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA Construction General Permit of the NPDES. A Stormwater Pollution Prevention Plan (SWPPP) will also be developed for the site in accordance with the requirements for the US EPA's National Pollutant Discharge Elimination System Construction General Permit. These documents will be used to document compliance with this prerequisite.

SS Site Assessment 1 yes point

The project will complete and document an assessment of the site including the following information:

- Topography – contours and sloping,
- Hydrology – flood hazards and existing water bodies,
- Climate – solar exposure and sun angles,
- Vegetation – vegetation types and greenfield spaces,
- Soils – soils delineation, prime farmland, and disturbed soils,
- Human Use – enhanced views, availability of transportation, and future building potential, and
- Human Health Effects – population assessment, physical fitness, and existing air pollution sources.

SS Rainwater Management 3 yes points

100 Hood Park Drive, 10 Stack Street, 30 Stack Street are zero lot line projects in an urban area with a density exceeding 1.5 FAR, meeting the LEED requirements for SS Rainwater Management Path 3, requiring management of the 85th percentile rainfall event. The 85th percentile rainfall event for this location is 0.83-inch, one inch will be stored and infiltrated on site, earning three LEED points for this credit.

SS Heat Island Reduction 2 yes points

The project will utilize high albedo materials for all hardscapes onsite, including both non-roof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values.

SS Light Pollution Reduction 1 yes point

The project will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up lighting will be utilized the project team will evaluate nighttime dimming options to keep the site safe while minimizing light pollution.

SS Tenant Design and Construction Guidelines 1 yes point

The project will educate commercial tenants in implementing sustainable design and construction features in their build-outs by providing documentation of the sustainable design and construction features incorporated in the building and recommendations for additional sustainable strategies, products, materials, and services to include in their use of the space.

Water Efficiency

WE Outdoor Water Use Reduction Required

The project will reduce the landscape water requirement by at least 30% below the EPA WaterSense Water Budget Tool calculated amount, satisfying this prerequisite, for any landscaping within the LEED project boundary.

WE Indoor Water Use Reduction Required

The project will reduce demand for potable water at least 20% below the aggregate water consumption baseline through high efficiency fixtures within the commercial restrooms and service areas – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Building-Level Water Metering Required

The project will comply with the requirements of this credit by installing a water meter for the building.

WE Outdoor Water Use Reduction 2 maybe points

Through reducing irrigation below the EPA Water Sense Water Budget Tool baseline, including through landscaping choices and irrigation system efficiency, the project team will endeavor to achieve 1-2 LEED points for a 50-100% reduction below baseline.

WE Indoor Water Use Reduction 3 yes points

The project will reduce demand for potable water through high efficiency fixtures within the commercial restrooms and service areas, as stipulated in the Tenant Design and Construction Guidelines – this design will have a goal of 35% reduction and will seek additional efficiencies to improve that percentage. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Cooling Tower Water Use 2 maybe points

The project team in coordination facilities staff will seek to optimize the any cooling tower's function to minimize the number of cycles required for intended cooling capacity and to reduce the concentrations of parameters to be treated by the cooling tower water treatment system, thereby reducing the total potable water used in the cooling tower.

WE Water Metering 1 yes point

The project will include water sub-metering for at least two end uses to potentially include irrigation, dishwashing, domestic hot water, or indoor plumbing fixtures.

Energy and Atmosphere

EA Fundamental Commissioning and Verification Required

The project team will include an experienced Commissioning (Cx) Agent - this person will be hired before the end of the design development phase and will provide review services for the project Basis of Design and Owner's Project Requirements as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters.

EA Minimum Energy Performance Required

The project will meet this prerequisite, as well as the Massachusetts Stretch Energy Code through the following design resulting in an ASHRAE 90.1- 2010 Appendix G model demonstrating a minimum energy use reduction of 20%, and the team will explore additional strategies to reduce energy use further to 26%:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,

- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Building-Level Energy Metering Required

The project will include a building-level energy meter for all energy consumption including electricity and natural gas.

EA Fundamental Refrigerant Management Required

The project's HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.

EA Enhanced Commissioning 3 yes points; 2 maybe points

The project team will include an experienced Commissioning (Cx) Agent. In addition to fundamental commissioning, the Cx Agent will review contractor submittals, verify system manual requirements in construction documents, verify operator and occupant training, verify seasonal testing, perform a 10-month seasonal review of building operations after substantial completion, and develop an ongoing commissioning plan. The project team will also investigate options for envelope commissioning for an additional 2 points.

EA Optimize Energy Use 9 yes points, 3 maybe points

The project will be designed to achieve a minimum energy use reduction of 20%, as demonstrated through ASHRAE 90.1- 2010 Appendix G modeling, and the team will explore additional strategies to reduce energy use further to 26%:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Enhanced Refrigerant Management 1 maybe point

The project will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.

Materials and Resources

MR Storage and Collection of Recyclables Required

The project will provide a designated storage point for recyclable materials; management will then move all refuse to the street for city collection. Collected materials will include the following:

- Mixed paper,
- Corrugated cardboard,
- Glass,
- Plastics,
- Metals,
- Batteries, and
- Mercury Containing Lamps.

MR Construction and Demolition Waste Management Planning Required

The project will implement a Construction and Demolition Waste Management Plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.

MR Building Life-Cycle Impact Reduction 3 yes points

The project will utilize the Tally plugin to Revitt to estimate the lifecycle carbon emissions and environmental impacts to produce a complete lifecycle analysis, thereby earning three LEED points.

MR Building Product Disclosure and Optimization – Environmental Product Declarations 1 maybe point

The project will seek to document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers that include confirmed environmental product declaration documents. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Building Product Disclose and Optimization – Material Ingredients 1 maybe point

The project will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Construction and Demolition Waste Management 2 yes points

The team is committed to reducing construction waste through at least 75% diversion including four material streams. The project team will document the means of meeting this diversion target and the details of the end use of recycled materials through the Construction and Demolition Waste Management Plan.

Indoor Air Quality

IEQ Minimum Indoor Air Quality Performance Required

The project will ensure that all ventilation systems meet the minimum requirements of Sections 4 through 7 of the ASHRAE 62.1-2010 standard for Acceptable Indoor Air Quality in all indoor spaces.

IEQ Environmental Tobacco Smoke Control Required

The project will prohibit smoking inside the building and within 25-feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be indicated in all leasing agreements and will be displayed via onsite signage.

IEQ Enhanced Indoor Air Quality Strategies 2 yes points

The project will be designed to include the following enhanced indoor air quality strategies:

- Permanent entryway systems (walk-off mats) at least 10-feet long in the primary direction of travel,
- Direct exhaust of all housekeeping and hazardous gas and chemical storage and use areas to prevent cross-contamination,
- MERV 13 filtration on all ventilation systems,
- CO2 monitoring and ventilation controls within all densely occupied spaces.

IEQ Low Emitting Materials 1 yes point, 1 maybe point

The project team will specify paints, coatings, flooring, adhesives, sealants, and composite wood that comply with California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, Office Scenario and meet all applicable VOC content requirements. The team will target at least 1 LEED point and seek an additional LEED point by meeting the requirements for all four product categories listed above.

IEQ Construction Indoor Air Quality Management Plan 1 yes point

The general contractor will develop an Indoor Air Quality Management Plan meeting the SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition, 2007, ANSI/SMACNA 008-2008, Chapter 2. The contractor will protect absorptive materials stored and installed on site from moisture damage, ensure that all installed ductwork is adequately protected throughout the construction phase, not operate permanent air handling equipment during construction unless with MERV 8 filtration, replace filter media before occupancy, and prohibit smoking anywhere on site. This protection will be verified through site inspections by NEI.

Innovation in Design

ID Innovation in Design 4 yes points

The project will seek to achieve at least 4 out of 5 applicable Innovation points; potential credits include: Purchasing – Low Mercury Lamps, Walkable Project Site, LEED O&M Starter Kit, and Occupant Comfort Survey.

ID LEED Accredited Professional 1 yes point

Thomas Chase, LEED AP, is coordinating the Article 37 Compliance process and LEED certification for this project.

Regional Priority

RP Regional Priority 2 yes credits

The project will meet the threshold for at least two Regional Priority credit points, including:

- LT High Priority Site; and
- SS Rainwater Management.

4.1.3 LEED BD+C Core and Shell v4 Scorecard Scorecard – 15 Supertest Street

New Ecology, Inc. (NEI) has reviewed the preliminary project scope for 15 Supertest Street and understands the credit summary presented in Table 3 to be reasonable and achievable – the subsequent narrative identifies the project's current approach to compliance with all checklist prerequisites and applicable, optional credits. Due to the size of the building, presumed mechanical systems, and green roof proposed for 15 Supertest Street, this building has a slightly different LEED approach than the other LEED BD+C v4 C&S buildings in this submission. Attached in Appendix A, please find the official preliminary checklists for the Proposed Project.

Table 4-2 LEED BD+C New Construction v4 Summary Scorecard
15 Supertest Street

Category	Yes Points	Maybe Points
Integrative Process	1	0
Location and Transportation	11	1
Sustainable Sites	8	2
Water Efficiency	4	2
Energy and Atmosphere	12	6
Materials and Resources	5	2
Indoor Environmental Quality	4	1
Innovation	5	0
Regional Priority	2	0
Total Points	**52**	**14**

4.1.4 Narrative for LEED Credits – 15 Supertest Street

The Project will fulfill all the prerequisites for all categories.

Only credits that will be pursued by the Project are discussed below; credits that will not be pursued are not included.

Integrative Process

IP Integrative Process 1 point

In compliance with credit requirements, the project will complete the following tasks:

- A preliminary "Box" Energy Model: during the schematic design phase, the team will model the project's design and assess potential strategies associated with the limited site conditions, the extensive massing and required building orientation, the basic envelope design, lighting levels within the regularly occupied spaces, the thermal comfort ranges of the occupants, the plug and process load needs, and the programmatic and operational parameters of the building. All iterations and results will be documented and shared with the design team prior to final design decisions.

- A preliminary Water-Use systems Analysis: also during the schematic design phase, the team will explore methods of reducing potable water loads within the building as well as any potable water required for irrigation of the building site and process water necessary for equipment within the building.

Location and Transportation

LT Sensitive Land Protection 2 yes points

The project is located on a previously developed lot, located in downtown Boston, satisfying the credit conditions.

LT High Priority Site 3 yes points

The project is located on a brownfield where prior soil contamination has been identified and will be remediated per Massachusetts Environmental Policy Act requirements. Brownfield-designated site locations are awarded 3 points per LEED credit requirements.

LT Surrounding Density and Diverse Uses 2 yes points

Option 2. Diverse Uses. The project is located in the Sullivan Square area of Boston, and has significant access to community resources. The project will likely meet the credit requirement of eight (8) uses within a ½-mile walking distance of the main entrance, thereby earning 2 points for this credit under Option 2.

LT Access to Quality Transit 3 yes points

The project site is located within a short walk of the Sullivan Square MBTA subway and bus station. This station provides at least 147 weekday trips and 225 weekend trips (an average of 112.5 on each weekend day) on the Orange Line in each direction, qualifying for 3 points via the applicable LEED thresholds. The project team will evaluate additional transportation access options to determine if additional LEED points are available for this credit.

LT Bicycle Facilities 1 maybe point

The project team will investigate options to provide protected and covered bike storage within the buildings in addition to shower facilities.

LT Green Vehicles 1 yes point

The project will designate five percent of all parking spaces as preferred parking for green vehicles.

Sustainable Sites

SS Construction Activity Pollution Prevention Required

The project's construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA Construction General Permit of the NPDES. A Stormwater Pollution Prevention Plan (SWPPP) will also be developed for the site in accordance with the requirements for the US EPA's National Pollutant Discharge Elimination System Construction General Permit. These documents will be used to document compliance with this prerequisite.

SS Site Assessment 1 yes point

The project will complete and document an assessment of the site including the following information:

- Topography – contours and sloping,
- Hydrology – flood hazards and existing water bodies,
- Climate – solar exposure and sun angles,
- Vegetation – vegetation types and greenfield spaces,
- Soils – soils delineation, prime farmland, and disturbed soils,
- Human Use – enhanced views, availability of transportation, and future building potential, and
- Human Health Effects – population assessment, physical fitness, and existing air pollution sources.

SS Site Development – Protect or Restore Habitat 2 maybe points

The project team will investigate the potential to integrate native or adapted plants that provide habitat and promote biodiversity for the proposed green roof plantings. If feasible, the area of restored habitat will include at least 30% of the site area including the building footprint.

SS Rainwater Management 3 yes points

15 Supertest Street is a zero lot line project in an urban area with a density exceeding 1.5 FAR, meeting the LEED requirements for SS Rainwater Management Path 3, requiring management of the 85th percentile rainfall event. The 85th percentile rainfall event for this location is 0.83 inch, one inch will be stored and infiltrated on site, earning three LEED points for this credit.

SS Heat Island Reduction 2 yes points

The project will utilize high albedo or green roof materials for all hardscapes onsite, including both non-roof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values or vegetation requirements.

SS Light Pollution Reduction 1 yes point

The project will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up lighting will be utilized and the project team will evaluate nighttime dimming options to keep the site safe while minimizing light pollution.

SS Tenant Design and Construction Guidelines 1 yes point

The project will educate commercial tenants in implementing sustainable design and construction features in their build-outs by providing documentation of the sustainable design and construction features incorporated in the building and recommendations for additional sustainable strategies, products, materials, and services to include in their use of the space.

Water Efficiency

WE Outdoor Water Use Reduction Required

The project will reduce the landscape water requirement by at least 30% below the EPA WaterSense Water Budget Tool calculated amount, satisfying this prerequisite, for any landscaping within the LEED project boundary.

WE Indoor Water Use Reduction Required

The project will reduce demand for potable water at least 20% below the aggregate water consumption baseline through high efficiency fixtures within the commercial restrooms and service areas – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Building-Level Water Metering Required

The project will comply with the requirements of this credit by installing a water meter for the building.

WE Outdoor Water Use Reduction 2 maybe points

Through reducing irrigation below the EPA Water Sense Water Budget Tool baseline, including through landscaping choices and irrigation system efficiency, the project team will endeavor to achieve 1-2 LEED points for a 50-100% reduction below baseline.

WE Indoor Water Use Reduction 3 yes points

The project will reduce demand for potable water through high efficiency fixtures within the commercial restrooms and service areas, as stipulated in the Tenant Design and Construction Guidelines – this design will have a goal of 35% reduction and will seek additional efficiencies to improve that percentage. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Water Metering 1 yes point

The project will include water sub-metering for at least two end uses to potentially include irrigation, dishwashing, domestic hot water, or indoor plumbing fixtures.

Energy and Atmosphere

EA Fundamental Commissioning and Verification Required

The project team will include an experienced Commissioning (Cx) Agent - this person will be hired before the end of the design development phase and will provide review services for the project Basis of Design and Owner's Project Requirements as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters.

EA Minimum Energy Performance Required

The project will meet this prerequisite, as well as the Massachusetts Stretch Energy Code through the following design resulting in an ASHRAE 90.1- 2010 Appendix G model demonstrating a minimum energy use reduction of 20%:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Building-Level Energy Metering Required

The project will include a building-level energy meter for all energy consumption including electricity and natural gas.

EA Fundamental Refrigerant Management Required

The project's HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.

EA Enhanced Commissioning 3 yes points; 2 maybe points

The project team will include an experienced Commissioning (Cx) Agent. In addition to fundamental commissioning, the Cx Agent will review contractor submittals, verify system manual requirements in construction documents, verify operator and occupant training, verify seasonal testing, perform a 10-month seasonal review of building operations after substantial completion, and develop an ongoing commissioning plan. The project team will also investigate options for envelope commissioning for an additional 2 points.

EA Optimize Energy Use 9 yes points, 3 maybe points

The project will be designed to achieve a minimum energy use reduction of 20%, as demonstrated through ASHRAE 90.1- 2010 Appendix G modeling:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,

- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Enhanced Refrigerant Management 1 maybe point

The project will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.

Materials and Resources

MR Storage and Collection of Recyclables Required

The project will provide a designated storage point for recyclable materials; management will then move all refuse to the street for city collection. Collected materials will include the following:

- Mixed paper,
- Corrugated cardboard,
- Glass,
- Plastics,
- Metals,
- Batteries, and
- Mercury Containing Lamps.

MR Construction and Demolition Waste Management Planning Required

The project will implement a Construction and Demolition Waste Management Plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.

MR Building Life-Cycle Impact Reduction 3 yes points

The project will utilize the Tally plugin to Revitt to estimate the lifecycle carbon emissions and environmental impacts to produce a complete lifecycle analysis, thereby earning three LEED points.

MR Building Product Disclosure and Optimization – Environmental Product Declarations 1 maybe point

The project will seek to document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include confirmed environmental product declaration documents. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Building Product Disclose and Optimization – Material Ingredients 1 maybe point

The project will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Construction and Demolition Waste Management 2 yes points

The team is committed to reducing construction waste through at least 75 percent diversion including four material streams. The project team will document the means of meeting this diversion target and the details of the end use of recycled materials through the Construction and Demolition Waste Management Plan.

Indoor Environmental Quality

IEQ Minimum Indoor Air Quality Performance Required

The project will ensure that all ventilation systems meet the minimum requirements of Sections 4 through 7 of the ASHRAE 62.1-2010 standard for Acceptable Indoor Air Quality in all indoor spaces.

IEQ Environmental Tobacco Smoke Control Required

The project will prohibit smoking inside the building and within 25-feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be indicated in all leasing agreements and will be displayed via onsite signage.

IEQ Enhanced Indoor Air Quality Strategies 2 yes points

The project will be designed to include the following enhanced indoor air quality strategies:

- Permanent entryway systems (walk-off mats) at least 10-feet long in the primary direction of travel,
- Direct exhaust of all housekeeping and hazardous gas and chemical storage and use areas to prevent cross-contamination,

- MERV 13 filtration on all ventilation systems,
- CO2 monitoring and ventilation controls within all densely occupied spaces.

IEQ Low Emitting Materials 1 yes point, 1 maybe point

The project team will specify paints, coatings, flooring, adhesives, sealants, and composite wood that comply with California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, Office Scenario and meet all applicable VOC content requirements. The team will target at least 1 LEED point and seek an additional LEED point by meeting the requirements for all four product categories listed above.

IEQ Construction Indoor Air Quality Management Plan 1 yes point

The general contractor will develop an Indoor Air Quality Management Plan meeting the SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition, 2007, ANSI/SMACNA 008-2008, Chapter 2. The contractor will protect absorptive materials stored and installed on site from moisture damage, ensure that all installed ductwork is adequately protected throughout the construction phase, not operate permanent air handling equipment during construction unless with MERV 8 filtration, replace filter media before occupancy, and prohibit smoking anywhere on site. This protection will be verified through site inspections by NEI.

Innovation in Design

ID Innovation in Design 4 yes points

The project will seek to achieve at least 4 out of 5 applicable Innovation points; potential credits include: Purchasing – Low Mercury Lamps, Walkable Project Site, LEED O&M Starter Kit, and Occupant Comfort Survey.

ID LEED Accredited Professional 1 yes point

Thomas Chase, LEED AP, is coordinating the Article 37 Compliance process and LEED certification for this project.

Regional Priority

RP Regional Priority 2 yes credits

The project will meet the threshold for at least 2 Regional Priority credit points, including:

- LT High Priority Site; and
- SS Rainwater Management.

4.1.5 LEED BD+C: Hospitality Scorecard – 25 Supertest Street

NEI has reviewed the preliminary project scope for 25 Supertest Street and understands the credit summary presented in Table 3 to be reasonable and achievable – the subsequent narrative identifies the project's current approach to compliance with all checklist prerequisites and applicable, optional credits. Due to this building being a hotel, it has a slightly different LEED approach than the other LEED BD+C v4 buildings in this submission.

Table 4-3 LEED BD+C Hospitality v4 Scorecard - 25 Supertest Street

Category	Yes Points	Maybe Points
Integrative Process	1	0
Location and Transportation	9	1
Sustainable Sites	8	0
Water Efficiency	4	4
Energy and Atmosphere	11	7
Materials and Resources	5	2
Indoor Environmental Quality	7	1
Innovation	5	0
Regional Priority	2	0
Total Points	**52**	**15**

4.1.6 Narrative for LEED Credits – 25 Supertest Street

Integrative Process

IP Integrative Process 1 point

In compliance with credit requirements, the project will complete the following tasks:

- A preliminary "Box" Energy Model: during the schematic design phase, the team will model the project's design and assess potential strategies associated with the limited site conditions, the extensive massing and required building orientation, the basic envelope design, lighting levels within the regularly occupied spaces, the thermal comfort ranges of the occupants, the plug and process load needs, and the programmatic and operational parameters of the building. All iterations and results will be documented and shared with the design team prior to final design decisions.

- A preliminary Water-Use systems Analysis: also during the schematic design phase, the team will explore methods of reducing potable water loads within the building as well as any potable water required for irrigation of the building site and process water necessary for equipment within the building.

Location and Transportation

<u>LT Sensitive Land Protection   1 yes points</u>

The project is located on a previously developed lot, located in downtown Boston, satisfying the credit conditions.

<u>LT High Priority Site   2 yes points</u>

The project is located on a brownfield where prior soil contamination has been identified and will be remediated per Massachusetts Environmental Policy Act requirements. Brownfield-designated site locations are awarded 3 points per LEED credit requirements.

<u>LT Surrounding Density and Diverse Uses   2 yes points</u>

Option 2, Diverse Uses. The project is located in the Sullivan Square area of Boston, and has significant access to community resources. The project will likely meet the credit requirement of eight (8) uses within a ½-mile walking distance of the main entrance, thereby earning 2 points for this credit under Option 2.

<u>LT Access to Quality Transit   3 yes points</u>

The project site is located within a short walk of the Sullivan Square MBTA subway and bus station. This station provides at least 147 weekday trips and 225 weekend trips (an average of 112.5 on each weekend day) on the Orange Line in each direction, qualifying for three points via the applicable LEED thresholds. The project team will evaluate additional transportation access options to determine if additional LEED points are available for this credit.

<u>LT Bicycle Facilities   1 maybe point</u>

The project team will investigate options to provide protected and covered bike storage within the buildings in addition to shower facilities.

<u>LT Green Vehicles   1 yes point</u>

The project will designate five percent of all parking spaces as preferred parking for green vehicles.

Sustainable Sites

<u>SS Construction Activity Pollution Prevention   Required</u>

The project's construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA Construction General Permit of the NPDES. A Stormwater Pollution Prevention Plan (SWPPP) will also be developed for the site in accordance with the requirements for the US EPA's National Pollutant Discharge Elimination System Construction General Permit. These documents will be used to document compliance with this prerequisite.

SS Site Assessment 1 yes point

The project will complete and document an assessment of the site including the following information:

- Topography – contours and sloping,
- Hydrology – flood hazards and existing water bodies,
- Climate – solar exposure and sun angles,
- Vegetation – vegetation types and greenfield spaces,
- Soils – soils delineation, prime farmland, and disturbed soils,
- Human Use – enhanced views, availability of transportation, and future building potential, and
- Human Health Effects – population assessment, physical fitness, and existing air pollution sources.

SS Open Space 1 yes point

25 Supertest Street will be adjacent to the planned Hood Green, a 50,000 square foot open space exceeding 30% of the total site area for this building and thereby earning 1 LEED point.

SS Rainwater Management 3 yes points

25 Supertest Street will include on-site rainwater management of the 95th percentile local rainfall event. The 95th percentile rainfall event for this location will be stored and infiltrated on site, earning three LEED points for this credit.

SS Heat Island Reduction 2 yes points

The project will utilize high albedo or green roof materials for all hardscapes onsite, including both non-roof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values or vegetation requirements.

SS Light Pollution Reduction 1 yes point

The project will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up lighting will be utilized and the project team will evaluate nighttime dimming options to keep the site safe while minimizing light pollution.

Water Efficiency

WE Outdoor Water Use Reduction Required

The project will reduce the landscape water requirement by at least 30% below the EPA WaterSense Water Budget Tool calculated amount, satisfying this prerequisite, for any landscaping within the LEED project boundary.

WE Indoor Water Use Reduction Required

The project will reduce demand for potable water at least 20% below the aggregate water consumption baseline through high efficiency fixtures within the commercial restrooms and service areas – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Building-Level Water Metering Required

The project will comply with the requirements of this credit by installing a water meter for the building.

WE Outdoor Water Use Reduction 2 maybe points

Through reducing irrigation below the EPA Water Sense Water Budget Tool baseline, including through landscaping choices and irrigation system efficiency, the project team will endeavor to achieve 1-2 LEED points for a 50-100% reduction below baseline.

WE Indoor Water Use Reduction 3 yes points

The project will reduce demand for potable water through high efficiency fixtures within the commercial restrooms and service areas, as stipulated in the Tenant Design and Construction Guidelines – this design will have a goal of 35% reduction and will seek additional efficiencies to improve that percentage. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Cooling Tower Water Use 2 maybe points

The project team in coordination facilities staff will seek to optimize the any cooling towers function to minimize the number of cycles required for intended cooling capacity and to reduce the concentrations of parameters to be treated by the cooling tower water treatment system, thereby reducing the total potable water used in the cooling tower.

WE Water Metering 1 yes point

The project will include water sub-metering for at least two end uses to potentially include irrigation, dishwashing, domestic hot water, or indoor plumbing fixtures.

Energy and Atmosphere

EA Fundamental Commissioning and Verification Required

The project team will include an experienced Commissioning (Cx) Agent - this person will be hired before the end of the design development phase and will provide review services for the project Basis of Design and Owner's Project Requirements as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters.

EA Minimum Energy Performance Required

The project will meet this prerequisite, as well as the Massachusetts Stretch Energy Code through the following design resulting in an ASHRAE 90.1- 2010 Appendix G model demonstrating a minimum energy use reduction of 20%:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Building-Level Energy Metering   Required

The project will include a building-level energy meter for all energy consumption including electricity and natural gas.

EA Fundamental Refrigerant Management   Required

The project's HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.

EA Enhanced Commissioning   3 yes points; 2 maybe points

The project team will include an experienced Commissioning (Cx) Agent. In addition to fundamental commissioning, the Cx Agent will review contractor submittals, verify system manual requirements in construction documents, verify operator and occupant training, verify seasonal testing, perform a 10-month seasonal review of building operations after substantial completion, and develop an ongoing commissioning plan. The project team will also investigate options for envelope commissioning for an additional 2 points.

EA Optimize Energy Use   8 yes points, 4 maybe points

The project will be designed to achieve a minimum energy use reduction of 20%, as demonstrated through ASHRAE 90.1- 2010 Appendix G modeling:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Enhanced Refrigerant Management   1 maybe point

The project will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.

Materials and Resources

MR Storage and Collection of Recyclables   Required

The project will provide a designated storage point for recyclable materials; management will then move all refuse to the street for city collection. Collected materials will include the following:

- Mixed paper,
- Corrugated cardboard,
- Glass,
- Plastics,
- Metals,
- Batteries, and
- Mercury Containing Lamps.

MR Construction and Demolition Waste Management Planning   Required

The project will implement a Construction and Demolition Waste Management Plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.

MR Building Life-Cycle Impact Reduction   3 yes points

The project will utilize the Tally plugin to Revitt to estimate the lifecycle carbon emissions and environmental impacts to produce a complete lifecycle analysis, thereby earning three LEED points.

MR Building Product Disclosure and Optimization – Environmental Product Declarations   1 maybe point

The project will seek to document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include confirmed environmental product declaration documents. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Building Product Disclose and Optimization – Material Ingredients 1 maybe point

The project will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Construction and Demolition Waste Management 2 yes points

The team is committed to reducing construction waste through at least 75 percent diversion including four material streams. The project team will document the means of meeting this diversion target and the details of the end use of recycled materials through the Construction and Demolition Waste Management Plan.

Indoor Environmental Quality

IEQ Minimum Indoor Air Quality Performance Required

The project will ensure that all ventilation systems meet the minimum requirements of Sections 4 through 7 of the ASHRAE 62.1-2010 standard for Acceptable Indoor Air Quality in all indoor spaces.

IEQ Environmental Tobacco Smoke Control Required

The project will prohibit smoking inside the building and within 25-feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be indicated in all leasing agreements and will be displayed via onsite signage.

IEQ Enhanced Indoor Air Quality Strategies 2 yes points

The project will be designed to include the following enhanced indoor air quality strategies:

- Permanent entryway systems (walk-off mats) at least ten feet long in the primary direction of travel,
- Direct exhaust of all housekeeping and hazardous gas and chemical storage and use areas to prevent cross-contamination,
- MERV 13 filtration on all ventilation systems,
- CO2 monitoring and ventilation controls within all densely occupied spaces.

IEQ Low Emitting Materials 1 yes point, 1 maybe point

The project team will specify paints, coatings, flooring, adhesives, sealants, and composite wood that comply with California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, Office Scenario and meet all applicable VOC content requirements. The team will target at least 1 LEED point and seek an additional LEED point by meeting the requirements for all four product categories listed above.

IEQ Construction Indoor Air Quality Management Plan 1 yes point

The general contractor will develop an Indoor Air Quality Management Plan meeting the SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition, 2007, ANSI/SMACNA 008-2008, Chapter 2. The contractor will protect absorptive materials stored and installed on site from moisture damage, ensure that all installed ductwork is adequately protected throughout the construction phase, not operate permanent air handling equipment during construction unless with MERV 8 filtration, replace filter media before occupancy, and prohibit smoking anywhere on site. This protection will be verified through site inspections by NEI.

IEQ Thermal Comfort 1 yes point

The mechanical engineer will design the HVAC systems to meet the requirements of ASHRAE Standard 55-2010, all apartments will be provided with individual thermostats, and all common and commercial office space areas will be provided with shared thermal comfort controls.

IEQ Interior Lighting 2 yes points

All individually occupied spaces will be equipped with individual lighting controls and group occupied spaces will be equipped with group lighting controls. In addition, the project team will utilize improved lighting quality strategies to reduce glare and provide more comfortably lit interior spaces.

Innovation in Design

ID Innovation in Design 4 yes points

The project will seek to achieve at least 4 out of 5 applicable Innovation points; potential credits include: Purchasing – Low Mercury Lamps, Walkable Project Site, LEED O&M Starter Kit, and Occupant Comfort Survey.

ID LEED Accredited Professional 1 yes point

Thomas Chase, LEED AP, is coordinating the Article 37 Compliance process and LEED certification for this project.

Regional Priority

RP Regional Priority 2 yes credits

The project will meet the threshold for at least 2 Regional Priority credit points, including:

- LT High Priority Site; and
- SS Rainwater Management.

4.1.7 LEED BD+C: New Construction Scorecard – 35 Supertest Street

NEI has reviewed the preliminary project scope for 35 Supertest Street and understands the credit summary presented in Table 4-2 to be reasonable and achievable – the subsequent narrative identifies the project's current approach to compliance with all checklist prerequisites and applicable, optional credits. Due to the residential component, this building has a slightly different LEED approach than the other LEED BD+C v4 buildings in this submission. Attached in Appendix A, please find the official preliminary checklists for the Proposed Project.

Table 4-4 LEED BD+C New Construction v4 Summary Scorecard 35 Supertest Street

Category	Yes Points	Maybe Points
Integrative Process	1	0
Location and Transportation	9	1
Sustainable Sites	7	0
Water Efficiency	4	4
Energy and Atmosphere	11	7
Materials and Resources	5	2
Indoor Environmental Quality	7	1
Innovation	5	0
Regional Priority	2	0
Total Points	**51**	**15**

4.1.8 Narrative for LEED Credits –35 Supertest Street

The Project will fulfill all the prerequisites for all categories.

Only credits that will be pursued by the Project are discussed below; credits that will not be pursued are not included.

Integrative Process

<u>IP Integrative Process 1 point</u>

In compliance with credit requirements, the project will complete the following tasks:

- A preliminary "Box" Energy Model: during the schematic design phase, the team will model the project's design and assess potential strategies associated with the limited site conditions, the extensive massing and required building orientation, the basic envelope design, lighting levels within the regularly occupied spaces, the thermal comfort ranges of the occupants, the plug and process load needs, and the programmatic and operational parameters of the building. All iterations and results will be documented and shared with the design team prior to final design decisions.

- A preliminary Water-Use systems Analysis: also during the schematic design phase, the team will explore methods of reducing potable water loads within the building as well as any potable water required for irrigation of the building site and process water necessary for equipment within the building.

Location and Transportation

<u>LT Sensitive Land Protection 1 yes points</u>

The project is located on a previously developed lot, located in downtown Boston, satisfying the credit conditions.

<u>LT High Priority Site 2 yes points</u>

The project is located on a brownfield where prior soil contamination has been identified and will be remediated per Massachusetts Environmental Policy Act requirements. Brownfield-designated site locations are awarded 2 points per LEED credit requirements.

<u>LT Surrounding Density and Diverse Uses 2 yes points</u>

Option 2, Diverse Uses. The project is located in the Sullivan Square area of Boston, and has significant access to community resources. The project will likely meet the credit requirement of eight (8) uses within a ½-mile walking distance of the main entrance, thereby earning 2 points for this credit under Option 2.

<u>LT Access to Quality Transit 3 yes points</u>

The project site is located within a short walk of the Sullivan Square MBTA subway and bus station. This station provides at least 147 weekday trips and 225 weekend trips (an average of 112.5 on each weekend day) on the Orange Line in each direction, qualifying for 3 points via the applicable LEED thresholds. The project team will evaluate additional transportation access options to determine if additional LEED points are available for this credit.

<u>LT Bicycle Facilities 1 maybe point</u>

The project team will investigate options to provide protected and covered bike storage within the buildings in addition to shower facilities.

<u>LT Green Vehicles 1 yes point</u>

The project will designate five percent of all parking spaces as preferred parking for green vehicles.

Sustainable Sites

<u>SS Construction Activity Pollution Prevention Required</u>

The project's construction documents will include a Soil Erosion and Sedimentation Control Plan to be developed in accordance with the EPA Construction General Permit of the NPDES. A Stormwater Pollution Prevention Plan (SWPPP) will also be developed for the site in accordance with the requirements for the US EPA's National Pollutant Discharge Elimination System Construction General Permit. These documents will be used to document compliance with this prerequisite.

<u>SS Site Assessment 1 yes point</u>

The project will complete and document an assessment of the site including the following information:

- Topography – contours and sloping,
- Hydrology – flood hazards and existing water bodies,
- Climate – solar exposure and sun angles,
- Vegetation – vegetation types and greenfield spaces,
- Soils – soils delineation, prime farmland, and disturbed soils,
- Human Use – enhanced views, availability of transportation, and future building potential, and
- Human Health Effects – population assessment, physical fitness, and existing air pollution sources.

SS Rainwater Management 3 yes points

35 Supertest Street is a zero lot line project in an urban area with a density exceeding 1.5 FAR, meeting the LEED requirements for SS Rainwater Management Path 3, requiring management of the 85th percentile rainfall event. The 85th percentile rainfall event for this location is 0.83 inch, one inch will be stored and infiltrated on site, earning three LEED points for this credit.

SS Heat Island Reduction 2 yes points

The project will utilize high albedo or green roof materials for all hardscapes onsite, including both non-roof and roof installations. All installed materials will meet LEED requirements for either initial or three-year Solar Reflectance Index values or vegetation requirements.

SS Light Pollution Reduction 1 yes point

The project will ensure that all exterior lighting fixtures are full cutoff and meet the LEED dark sky requirements. No up lighting will be utilized and the project team will evaluate nighttime dimming options to keep the site safe while minimizing light pollution.

Water Efficiency

WE Outdoor Water Use Reduction Required

The project will reduce the landscape water requirement by at least 30% below the EPA WaterSense Water Budget Tool calculated amount, satisfying this prerequisite, for any landscaping within the LEED project boundary.

WE Indoor Water Use Reduction Required

The project will reduce demand for potable water at least 20% below the aggregate water consumption baseline through high efficiency fixtures within the commercial restrooms and service areas – this design will surpass the prerequisite requirement for 20% reduction with a goal of 35% reduction. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Building-Level Water Metering Required

The project will comply with the requirements of this credit by installing a water meter for the building.

WE Outdoor Water Use Reduction 2 maybe points

Through reducing irrigation below the EPA Water Sense Water Budget Tool baseline, including through landscaping choices and irrigation system efficiency, the project team will endeavor to achieve 1-2 LEED points for a 50-100% reduction below baseline.

WE Indoor Water Use Reduction 3 yes points

The project will reduce demand for potable water through high efficiency fixtures within the commercial restrooms and service areas, as stipulated in the Tenant Design and Construction Guidelines – this design will have a goal of 35% reduction and will seek additional efficiencies to improve that percentage. The design will specify WaterSense labeled fixtures and the following flow rates:

- Shower: 1.5 GPM,
- Bath Lavatory: 0.5 GPM, and
- Toilet: 1.1 GPF

WE Cooling Tower Water Use 2 maybe points

The project team in coordination facilities staff will seek to optimize the any cooling towers function to minimize the number of cycles required for intended cooling capacity and to reduce the concentrations of parameters to be treated by the cooling tower water treatment system, thereby reducing the total potable water used in the cooling tower.

WE Water Metering 1 yes point

The project will include water sub-metering for at least two end uses to potentially include irrigation, dishwashing, domestic hot water, or indoor plumbing fixtures.

Energy and Atmosphere

EA Fundamental Commissioning and Verification Required

The project team will include an experienced Commissioning (Cx) Agent - this person will be hired before the end of the design development phase and will provide review services for the project Basis of Design and Owner's Project Requirements as well as a thorough review of both the Design Development and Construction Documents plan and specification set, observation of all start-up testing and balancing procedures, and confirmation of installation and operation according to the design parameters.

EA Minimum Energy Performance Required

The project will meet this prerequisite, as well as the Massachusetts Stretch Energy Code through the following design resulting in an ASHRAE 90.1- 2010 Appendix G model demonstrating a minimum energy use reduction of 20%:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Building-Level Energy Metering Required

The project will include a building-level energy meter for all energy consumption including electricity and natural gas.

EA Fundamental Refrigerant Management Required

The project's HVAC systems will not include any chlorofluorocarbon (CFC)-based refrigerants.

EA Enhanced Commissioning 3 yes points; 2 maybe points

The project team will include an experienced Commissioning (Cx) Agent. In addition to fundamental commissioning, the Cx Agent will review contractor submittals, verify system manual requirements in construction documents, verify operator and occupant training, verify seasonal testing, perform a 10-month seasonal review of building operations after substantial completion, and develop an ongoing commissioning plan. The project team will also investigate options for envelope commissioning for an additional 2 points.

EA Optimize Energy Use 8 yes points, 4 maybe points

The project will be designed to achieve a minimum energy use reduction of 20%, as demonstrated through ASHRAE 90.1- 2010 Appendix G modeling:

- Above code levels of insulation within the cavity as well as continuous exterior insulated sheathing,
- Very high efficiency equipment mechanical systems,
- LED lighting and sophisticated, automated controls,
- ENERGY STAR appliances, and
- Energy Recovery for all ventilation.

EA Enhanced Refrigerant Management 1 maybe point

The project will calculate the total impact of all refrigerant-using equipment and ensure that it does not exceed the LEED limits for Global Warming Impact and Ozone Depletion.

Materials and Resources

MR Storage and Collection of Recyclables Required

The project will provide a designated storage point for recyclable materials; management will then move all refuse to the street for city collection. Collected materials will include the following:

- Mixed paper,
- Corrugated cardboard,
- Glass,
- Plastics,
- Metals,
- Batteries, and
- Mercury Containing Lamps.

MR Construction and Demolition Waste Management Planning Required

The project will implement a Construction and Demolition Waste Management Plan with a diversion goal of 75% of the site-generated waste from the landfill. The construction team will provide monthly reports of waste diversion.

MR Building Life-Cycle Impact Reduction 3 yes points

The project will utilize the Tally plugin to Revitt to estimate the lifecycle carbon emissions and environmental impacts to produce a complete lifecycle analysis, thereby earning three LEED points.

MR Building Product Disclosure and Optimization – Environmental Product Declarations 1 maybe point

The project will seek to document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include confirmed environmental product declaration documents. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Building Product Disclose and Optimization – Material Ingredients 1 maybe point

The project will document the use of at least 20 different permanently installed products, sourced from at least five different manufacturers, that include manufacturer's inventory of all contents, Health Product Declarations, and/or Cradle-to-Cradle certification. The project team will explore the most cost-effective products to be specified to meet the credit requirements.

MR Construction and Demolition Waste Management 2 yes points

The team is committed to reducing construction waste through at least 75% diversion including four material streams. The project team will document the means of meeting this diversion target and the details of the end use of recycled materials through the Construction and Demolition Waste Management Plan.

Indoor Environmental Quality

IEQ Minimum Indoor Air Quality Performance Required

The project will ensure that all ventilation systems meet the minimum requirements of Sections 4 through 7 of the ASHRAE 62.1-2010 standard for Acceptable Indoor Air Quality in all indoor spaces.

IEQ Environmental Tobacco Smoke Control Required

The project will prohibit smoking inside the building and within 25-feet of all entries, outdoor air intakes, and operable windows; these prohibitions will be indicated in all leasing agreements and will be displayed via onsite signage.

IEQ Enhanced Indoor Air Quality Strategies 2 yes points

The project will be designed to include the following enhanced indoor air quality strategies:

- Permanent entryway systems (walk-off mats) at least 10-feet long in the primary direction of travel,
- Direct exhaust of all housekeeping and hazardous gas and chemical storage and use areas to prevent cross-contamination,
- MERV 13 filtration on all ventilation systems,
- CO2 monitoring and ventilation controls within all densely occupied spaces.

IEQ Low Emitting Materials 1 yes point, 1 maybe point

The project team will specify paints, coatings, flooring, adhesives, sealants, and composite wood that comply with California Department of Public Health Standard Method V1.1–2010, using CA Section 01350, Appendix B, Office Scenario and meet all applicable VOC content requirements. The team will target at least 1 LEED point and seek an additional LEED point by meeting the requirements for all four product categories listed above.

IEQ Construction Indoor Air Quality Management Plan 1 yes point

The general contractor will develop an Indoor Air Quality Management Plan meeting the SMACNA IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition, 2007, ANSI/SMACNA 008-2008, Chapter 2. The contractor will protect absorptive materials stored and installed on site from moisture damage, ensure that all installed ductwork is adequately protected throughout the construction phase, not operate permanent air handling equipment during construction unless with MERV 8 filtration, replace filter media before occupancy, and prohibit smoking anywhere on site. This protection will be verified through site inspections by NEI.

IEQ Thermal Comfort 1 yes point

The mechanical engineer will design the HVAC systems to meet the requirements of ASHRAE Standard 55-2010, all apartments will be provided with individual thermostats, and all common and commercial office space areas will be provided with shared thermal comfort controls.

IEQ Interior Lighting 2 yes points

All individually occupied spaces will be equipped with individual lighting controls and group occupied spaces will be equipped with group lighting controls. In addition, the project team will utilize improved lighting quality strategies to reduce glare and provide more comfortably lit interior spaces.

Innovation in Design

ID Innovation in Design 4 yes points

The project will seek to achieve at least 4 out of 5 applicable Innovation points; potential credits include: Purchasing – Low Mercury Lamps, Walkable Project Site, LEED O&M Starter Kit, and Occupant Comfort Survey.

ID LEED Accredited Professional 1 yes point

Thomas Chase, LEED AP, is coordinating the Article 37 Compliance process and LEED certification for this project.

Regional Priority

RP Regional Priority 2 yes credits

The project will meet the threshold for at least 2 Regional Priority credit points, including:

- LT High Priority Site; and
- SS Rainwater Management.

4.2 Climate Preparedness

4.2.1 Climate Change Resilience

Climate Ready Boston details the vulnerability of the City and its neighborhoods to the anticipated impacts of climate change. This area of Charlestown is particularly vulnerable to Sea Level Rise (SLR) and increased precipitation, and increased temperatures and extreme heat events. The Master Plan design has incorporated many strategies to prepare Hood Park to be resilient to these future changes in climate. The Climate Resiliency Report Summary is included in Appendix E.

4.2.2 *Sea Level Rise*

In the Draft Boston Climate Change Checklist Guidance dated August 1, 2017, the City recommends that projects consider the potential for up to 40-inches of sea level rise in new projects. Based on the map included in the Guidance, this results in one-percent annual (100-year) flood elevation of 19' BCB at the Hood Park site.

In part to address this potential future flooding, most of the Park will be raised 2-3 feet to this elevation, while maintaining existing elevations at the property line. Proposed buildings will have first floor elevation at 20' BCB, providing 12 inches of freeboard above the anticipated one-percent annual flood elevation. The first floor of the existing Buildings 500 and 510 are also approximately 20’ BCB. In addition, the failure point of critical infrastructure (transformers, meters, emergency generators, demarcation points, etc.) will be located at an elevation of at least 21' BCB to protect against flooding damage. (The first-floor elevations of 480 Rutherford Avenue and 15 Supertest Street are set by the elevation of Rutherford Avenue and therefore lower than 20.0).

New utility services will be underground. Subsurface utility infrastructure will be waterproofed and designed to operate during a flooded condition. Any vaulted electrical or communication equipment for example will be specified as waterproof. Drainage and sewer systems will include back-water valves at connections to the municipal system to minimize back-water flooding and system contamination. Building sewer systems may include separated first floor connections (or alternative design) to avoid upper floor sewers surcharging first floor plumbing if the street main is flooded.

4.2.3 *Increased Precipitation Events*

The Draft Boston Climate Change Checklist Guidance notes that climate change may result in fewer, larger storms. The storm depth increases for the 10-year, 24-hour design storm may increase by 15 percent or more.

The stormwater management system utilizes multiple design features to minimize site runoff. These features include:

- Increased landscape areas and green roofs to reduce initial runoff volumes,
- Permeable pavement contributing to structured planting soils that increase infiltration, plant vitality and evapotranspiration,
- Subsurface groundwater recharge systems, and
- The pond adjacent to Building 510, that stores, infiltrates and evaporates runoff.

The drainage system is designed to accommodate the current 10-year, 24-hour design storm without surcharging the pipe network, which provides a 27-inch minimum freeboard between water surface and street surface. The drainage system will accommodate a storm increase of 15 percent with modest pipe surcharge, which results in approximately 18 inches of minimum freeboard.

4.2.4 Increased Temperatures and Extreme Heat Events

The site design incorporates several strategies to mitigate the impact of more extreme temperatures in the urban environment. The proposed Master Plan will significantly increase the amount of landscaping and tree cover on the site relative to the existing condition. High reflectance paving materials will be used for the pedestrian areas, and high reflectance roofing materials will be used on the buildings. Several of the lower building roofs will also incorporate green roofs to mitigate temperatures and reduce stormwater runoff. The ponds will provide further relief from extreme heat by lowering local temperatures through evaporative cooling.

Many of the strategies that will make the buildings more energy efficient will also make them more resilient to extreme temperatures. Highly insulated and air tight buildings minimize the amount of heat transfer through the enclosure, helping to maintain comfortable indoor conditions. Indoor air temperatures can also be reduced by designing for natural daylighting. By using natural daylight, electric lighting can be turned off during the day, reducing internal heat gains and demands for cooling.

Where appropriate, buildings will be designed with operable windows, particularly the residential and hotel components of the project. Operable windows can provide for ventilation during times of both extreme temperatures and power service interruptions.

Figure 4-1 shows the location of green roofs and those that will be constructed PV-ready.

4.2.5 Utility Service Interruption

The Proposed Master Plan has incorporated several strategies to make the facilities resilient to utility service interruptions. The design of the site and building enclosures discussed above will help to reduce demand for cooling, lighting, and ventilation. The electric grid will also be supported by on-site PV generation. In addition, buildings will be designed with backup emergency generators.

The commercial building spaces will be designed with life safety systems to allow people time to evacuate the building in times of emergency. The residential buildings, including the hotel, will be designed to maintain safe living conditions during emergency events.

Hood Park Master Plan **Boston, Massachusetts**

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Figure 4-1

Green Infrastructure

4.2.6 Transportation System Disruption

The Proposed Master Plan provides enhanced connectivity for access to public transit including trains and buses, as well as pedestrian, and bicycle infrastructure. By integrating infrastructure for multiple modes of travel, the Project will be resilient to transportation system disruptions.

Hood Park has also committed to providing available structured parking to city residents during emergency weather events. This will provide safe storage for vehicles above flood conditions and will remove cars from neighborhood streets contributing to public safety and improved mobility.

Chapter 5.0

Urban Design

5.0 URBAN DESIGN

5.1 Existing Urban Fabric

Hood Park is located on the northwest edge of Charlestown, an area with a rich history influenced by industry and transportation. The site is within the "LI" industrial zone, west of Rutherford Avenue is currently defined by the elevated portion of Interstate 93 (I-93) highway constructed above a major railroad corridor. The highway is constructed on multiple levels including a northbound off ramp. Although adjacency with Sullivan Square is good, Hood Park is currently separated from the Charlestown neighborhood to the east by the Rutherford Avenue corridor. This is a multi-lane surface highway with physical barriers and cut of below grade midsection. This area could be considered a West Rutherford district within Charlestown.

5.1.1 Site History

The Hood Park site was used as a mill pond in the 17th and 18th centuries and became the southern terminus of the Middlesex Canal by the early 1800s. During the 1870s, the Eastern Railroad and the Boston and Maine Railroad were running along what is now the western boundary of the site. By the end of the 1880s the site became a freight depot crisscrossed with rail spurs and sidings. H.P. Hood & Sons had a freight terminal on the site by 1892. The first half of the 20th century saw the site being used for freight and warehousing purposes. Many of New England's dairy companies, including H.P. Hood & Sons took advantage of the site's proximity to rails and brought milk from the countryside to the high concentration of customers in the Boston region. The Hood dairy acquired the site in 1910 and used it as its headquarters, processing and distribution operations until moving out in 1996.

5.1.2 Stewardship: The Hood Plant and Powerhouse

The site is now known for its iconic powerhouse chimney and its many years as a significant landmark and Hood Plant employer along Rutherford Avenue. Currently isolated from the Charlestown neighborhood to the east by Rutherford Avenue, Hood Park is bordered primarily by various industrial uses to the south, west and north.

The Hood Park owners, Hood Park LLC, have enhanced and expanded the existing 500 Rutherford Avenue and 510 Rutherford Avenue buildings. The owners have been stewards of these buildings and extended their useful life for many years to come. The transformation from milk processing facility to 'business park' came through the approval of the Existing Master Plan in October 2000 and subsequent projects under that approval. The existing buildings are now home to a variety of office and educational uses and will become central elements of the new Hood Park.

The Harvey (currently 480 Rutherford Avenue, to become 50 Hood Park Drive) building, currently under construction, expands functional uses at Hood Park to include residential and retail, providing vitality on Rutherford Avenue and continuing the pattern of mid-rise residential buildings along the street.

5.1.3 Transformation: Rutherford Avenue and Sullivan Square

The Hood Park Masterplan Amendment envisions opportunistic enhancements such as complementary uses and improved connectivity. Although Hood Park has been physically defined by the functional hardscape of surrounding industry and highways, this context is evolving. New residential and retail uses and connections across Rutherford Avenue will stitch together active participation with the neighborhood beyond. The existing buildings on Rutherford Avenue define a familiar street edge as Hood Park meets the existing residential neighborhood to the east. This essential stepping of overall site massing is an important guiding principal which is proposed to continue through the amended masterplan. The reconfiguration of Sullivan Square will evolve as the dominant context for Hood Park and will provide ample opportunity to create a vibrant new neighborhood. See Figures 5-1 through 5-4 for a comparison of existing and proposed peripheral views of the Project Site from various viewpoints in the surrounding area.

5.2 Urban Design Principles

The following urban design principles have informed the proposed Hood Park Masterplan Amendment: connecting to the urban grid, creating diversity of uses, creating active uses on site to complement the neighborhood and creating diversity in building massing and architectural expression.

5.2.1 Connect the Urban Grid

A primary goal of the proposed Masterplan Amendment is to reconfigure the development in a manner which extends the neighborhood street grid. To accomplish this goal, the Hood Park team has worked with planners at the BPDA and the BTD to reorganize the street pattern of the existing masterplan so that circulation onsite facilitates logical connections to both existing and potential streets. The goal is to enable Hood Park to be an integral part of Sullivan Square and the Rutherford Avenue corridor as surrounding streets are reconfigured, reconstructed and further development occurs.

Proposed Hood Park streets create a grid of predictable, “complete” streets connecting future redevelopment of adjacent properties to the north, south and west of Hood Park. These streets will also enhance vehicular, bicycle and pedestrian connection to Charlestown neighborhood east of Rutherford Avenue once the corridor is reconstructed. Improving bicycle and pedestrian connection with Spice Street and the Sullivan Square transit station is an integral goal of the proposed Masterplan.



Edwards Playground



View from Bunker Hill Street, between Charles St & Baldwin St.

Figure 5-1

View from Edwards Playground and View Bunker Hill Street, between Charles Street & Baldwin Street

View from pedestrian bridge at Rutherford Ave. / Gilmore Bridge

View from Rutherford Ave. near Essex Street

Figure 5-2

View from Pedestrian Bridge at Rutherford Avenue / Gilmore Bridge and View from Rutherford Avenue near Essex Street

View from Spice Street near Cambridge St.

View from Massport RR Crossing and Mishawum St.

Figure 5-3

View from Spice Street near Cambridge Street and View from Massport Railroad Crossing and Mishawum Street

View from Baldwin Street

Figure 5-4

View towards Hood Park and View from Baldwin Street

Though the streets will continue to be held and maintained privately (permitted through PIC as private, open to public use), they will seamlessly meet the surrounding city streets in character and dimension by adhering to the Boston Complete Streets Guidelines and lighting standards. Hood Park Drive, Stack Street, and Supertest Street are proposed to be converted from private drives to private streets with public access. Refer to Figures 1-24 and 1-25 in Chapter 1 for typical sections through the various types of streets in the development.

5.2.2 Create Diversity in Use

The proposed Hood Park Masterplan Amendment seeks to further expand the range of building uses on site. The original Masterplan focused on commercial office development as well as structured parking and surface parking within a 'business park'. Recent Masterplan Amendments have expanded on allowed uses to include residential, retail, restaurant, hotel, laboratory, entertainment and other uses. The first residential building, 50 Hood Park Drive or 480 Rutherford), is currently under construction. 100 Hood Park Drive, also under construction, includes lab and street retail space and supplements surface parking enabling further development of Hood Park.

This updated Masterplan Amendment strives to create a truly mixed-use development with buildings of varying uses distributed in a meaningful way throughout the remaining site. The office and laboratory uses accessed by commuters are placed deeper within the site along the west property edge. Residential, hotel and market uses are placed in visual relationship to surrounding complementary uses. The goal is for Hood Park to become an extension of the neighborhood and complement the existing urban fabric and building uses surrounding it.

5.2.3 Create Activity as Catalyst for Improvement

The Masterplan Amendment intends to increase the 24/7 activity within Hood Park enabling the development to be a catalyst for improving the surrounding context. The goal is to strengthen Hood Park's relationship with existing neighborhood fabric while providing opportunity for development surrounding the site. This is consistent with the City's "Imagine Boston 2030" plan including expanding transit-oriented neighborhoods such as Sullivan Square. The Hood Park Masterplan Amendment seeks to increase activity by two means: increasing the variety of building uses (described above) and creating a variety of publicly accessible open spaces.

- **Variety of building uses**: Hood Park intends to include residential, hotel, entertainment and restaurant uses which will attract evening activity to the site and the access routes surrounding it. The addition of office, laboratory, educational and other uses will activate the site all day as well as provide more customers businesses surrounding Hood Park. The mix of proposed uses will generate more pedestrian and bicycle traffic along this portion of Rutherford Avenue making this edge a safer, more inviting route. Likewise, the access routes from transit stops of Sullivan Square and Community College will continue to benefit from increased commuter pedestrian travel to Hood Park.

- **Variety of programmed open space**: In addition to building uses, Hood Park seeks to create and activate large and varied publicly accessible open spaces. The goal is to provide amenity to Hood Park users and residents as well as the Charlestown neighborhood and others. Coffee shops, restaurants and markets will be constructed with orientation to utilize these new open spaces. It is intended that office, hotel and residential users on site will benefit from a variety of spaces to get outside and mix with others coming into Hood Park. In addition, the open spaces will be available to public uses by the neighborhood and others. Activities such as a children's splashpool and open lawns invite additional users to Hood Park. Throughout the week and on weekends these open spaces will allow for a variety of programming such as concerts, farmers markets, art exhibits, festivals and exercise classes.

5.2.4 Create Diversity in Building Massing and Architectural Expression

A goal of the Hood Park Masterplan Amendment is to ensure the collection of buildings creates an inviting and active urban setting within the development while also being sensitive to impacts when viewed from the surrounding urban context. Buildings will be designed to establish meaningful relationships with the new streets and open spaces created within Hood Park. The plan seeks to ensure beneficial access to daylight and views within the development both at street level as well as within the buildings themselves. Attention has been made to enhance the environment surrounding existing buildings, particularly the historic Powerhouse and its iconic chimney stack. See Figures 5-5 through 5-7 for site plans and renderings of the proposed spaces around the Powerhouse.

The height of proposed buildings will step down as development approaches Rutherford Avenue and the existing Charlestown residential neighborhood. The heights of buildings along Rutherford Avenue will not exceed the current regulated height limitation. Proposed buildings are taller along west property edge toward the I-93 elevated highway. These buildings are varied in height so that natural light and views are preserved. Intentional open space has been created along both Hood Park Drive and Supertest Street to maintain Charlestown neighborhood view corridors between buildings of the western skyline.

In addition to massing variation, the Hood Park Masterplan Amendment seeks to create variation in architectural expression. Some of this is accomplished through building use where variation of building dimensions and fenestration are representative of their function.

Figure 5-5

Stack Street Open Spaces and Streetscape

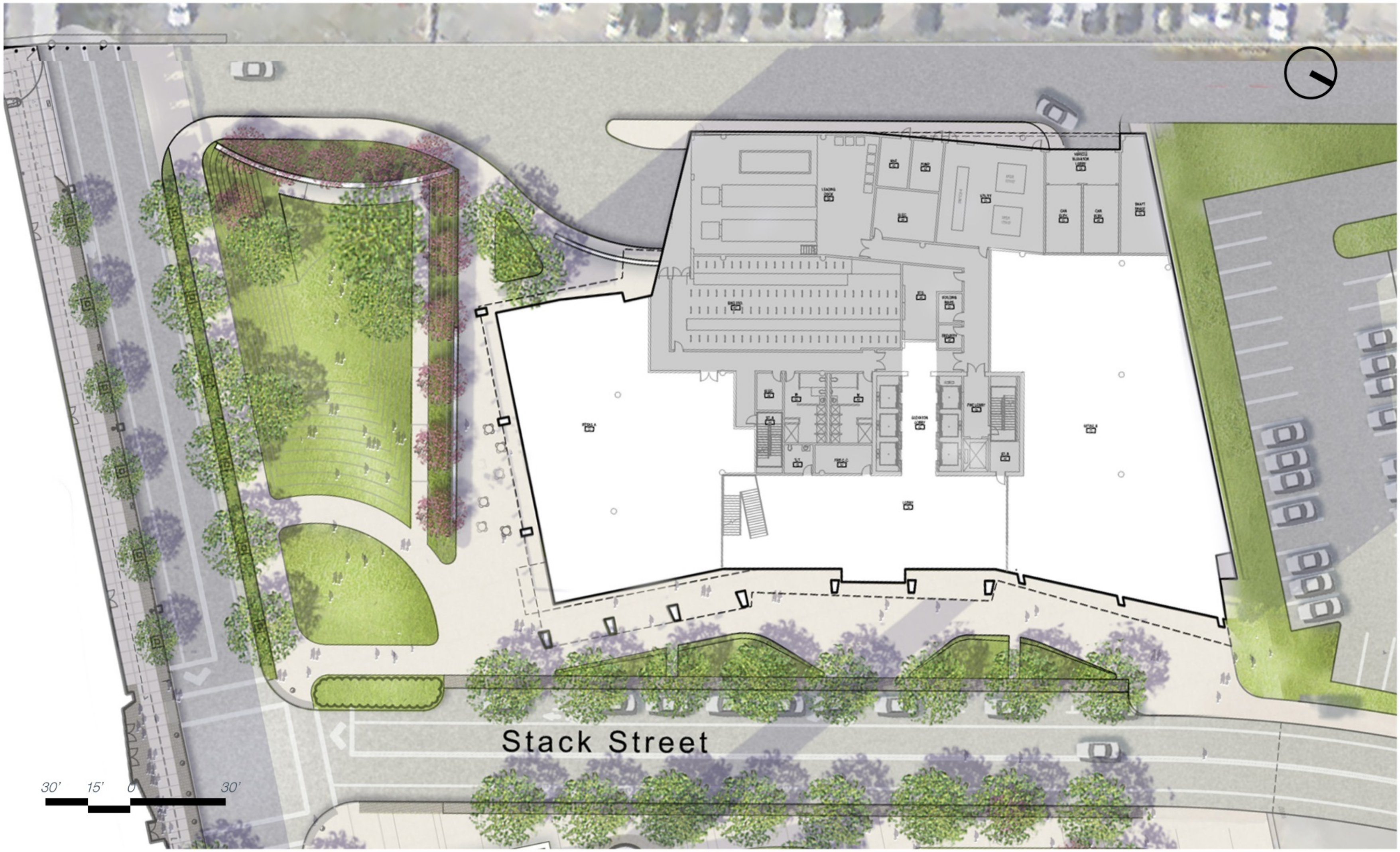

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Figure 5-6

10 Stack Street and Plaza

Hood Park Master Plan   Boston, Massachusetts

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Figure 5-7
The Hill at 10 Stack Street

It is also intentional to design buildings to provide an image of urban development which evolved over time as well as design variation in architectural language through façade articulation and materiality.

The conceptual design of individual buildings within the Hood Park Masterplan Amendment is further described in the section below.

5.3 Circulation

5.3.1 Access to Hood Park

Hood Park has incredible adjacency to public transportation. It is an approximate five to seven minute walk from the MBTA subway and busses at Sullivan Square station to the north and a similar distance to the Community College subway stop to the south. From Sullivan Square transit, pedestrian access to Hood Park is via Spice Street. The proposed Masterplan intends a generously scaled open space at the terminus of Spice Street providing a major portal for both pedestrian and bicycle access connecting to the rest of the site. From the south, pedestrians and cyclists can access the site through either Hood Park Drive or Supertest Street where sidewalks and bicycle lanes will connect with the Rutherford Avenue sidewalk.

Hood Park is within close proximity to many major vehicular routes, including Route 99 (Rutherford Avenue), I-93, and Route 1. Within the proposed Masterplan, vehicles will have three choices for accessing the site under current circulation patterns: Stack Street via Spice and D Streets, Supertest Street via Rutherford Avenue, and Hood Park Drive via Rutherford Avenue. The Masterplan Amendment also provides for future vehicular connections to the west via Hood Park Drive and Supertest Street, potentially linking to a reconfigured Bunker Hill Industrial Park Drive and beyond.

Currently, access via Rutherford Avenue is most easily available to southbound traffic, as there are no signalized intersections where a left turn to reach Hood Park can be made for those traveling northbound on Rutherford Avenue. There are currently no connections across Rutherford Avenue for pedestrian and bicycle access. Boston Transportation Department's Rutherford Avenue redevelopment plan, however, calls for new signalized intersections along the route at Baldwin Street across from Hood Park Drive in addition to signalized crossing at Mishawum Street. The reconstructed Rutherford Avenue will create more of an urban boulevard that gives higher priority to non-vehicular modes of travel as well as better vehicular access for northbound traffic. Invaluable linkages for bicyclists and pedestrians will eventually connect Hood Park to the balance of the Charlestown neighborhood.

5.3.2 Parking, Drop-off and Service

Hood Park is currently dominated by surface parking. In the Existing Master Plan, stand-alone structured parking garages and surface parking areas define much of the streetscape. The Proposed Masterplan Amendment addresses this by concentrating a significant portion of the parking in a single garage with active ground floor retail space (100 Hood Park Drive, currently under construction). Remaining parking requirements are intended to be distributed within the buildings of the Project. This will allow nearly all of the streetscape to be activated with retail, restaurants and building entrances instead of parking garages.

Street parking is proposed in several areas providing shorter term parking for retail and drop-off needs. This parking is important to drop-in businesses such as coffee shops or dry cleaners and a major convenience for residents and commercial use visitors. At various locations throughout the Project site, drop-off zones are designated to help facilitate deliveries and taxi service. Despite elimination of two additional dedicated parking structures as well as surface parking lots, the Proposed Masterplan Project will maintain the previous parking count of 1,765 spaces approved in the Existing Master Plan.

To the extent possible, the Masterplan Amendment intends to keep building service entrances and structured parking portals to a minimum on the primary streets of Hood Park Drive, Supertest Street, and Stack Street. Although some buildings will require access from these streets, the plan prefers to provide parking and service entry points from the service drive along the western property line and the more minor street, Half Pint Way. The existing building, 500 Rutherford, will require service entry points from Supertest Street, and minor access from Stack Street.

Refer to Figures 1-26 in Chapter 1 for the locations where street vehicle drop-off, parking garage entrances and building service entrances might be placed within the amended Master Plan.

5.3.3 D Street / Massport Right of Way

D Street is currently slated for upgrades as part of the traffic mitigation projects from the nearby casino. It will remain largely in its existing layout but with new curbing, pavement, and a sidewalk along the north side. However, the future of D Street and the adjacent Massport railroad right of way is currently unknown. BPDA, BTD, and Massport will be working together on further improvements to this street.

As this is an unresolved issue, the proposed Hood Park Masterplan has assumed that D Street will remain where it exists today. It calls for the relocating the existing crossing over the Massport rail right of way, allowing for the extension of Stack Street to D Street. The plan also proposes upgrading the existing pedestrian and bicycle crossing over the rail tracks into Hood Park at the terminus of Spice Street.

5.4 Public Realm

5.4.1 Streetscape Design Objectives

Several new private streets are created within the proposed Masterplan. The primary streets are Hood Park Drive, Stack Street, and Supertest Street, all of which meet existing public ways. A smaller street, Half Pint Way, provides service and parking access to The Harvey (50 Hood Park Drive aka 480 Rutherford) and 100 Hood Park Drive. All proposed streets on campus have the potential to be continued on to adjacent parcels if and when development of those properties comes to fruition. BTD's design for proposed Rutherford Avenue/ Sullivan Square Design Project includes a signalized intersection where Hood Park Drive intersects Rutherford Avenue, providing safe passage for pedestrians to cross back and forth, and for vehicle travel both north and south from Hood Park.

In addition to Hood Park's proposed streets, the Proposed Plan envisions an access drive along the western edge of the site. This alley will provide service and parking access to the buildings abutting it. It will also provide for fire department access.

An important urban design objective within the amended Master Plan is to distribute the opportunity for open space activation along the direct access lines for pedestrians, bicycles and vehicular travel. In this manner, the streetscape is both a consistent edge to unify various onsite uses as well as programmatic amenities for those uses. While the streetscape will have some variation depending on direct adjacent use, there are several elements and dimensions that will be present throughout:

- Sidewalks will include a ten foot wide pedestrian zone at a minimum, with many sidewalks exceeding this dimension.
- Greenscape/ Furnishing zones will be four feet wide at a minimum.
- Many sidewalks include a frontage zone of five to fifteen feet.
- All hard surfaces will be composed of permeable pavement or standard pavement whose grading directs surface runoff to permeable pavement or softscape.
- Paving materials will be an ADA-compliant combination of permeable pavers and cast in place concrete
- Granite curbing will line each sidewalk at the street edge.
- Street trees will be provided at an interval of approximately 1 per 40 linear feet. Trees will be planted in zones of structural soil to provide optimum growing conditions for longevity and vigor, and to aid in stormwater management.

♦ Consistent street lighting will provide adequate light for safety. Street lighting will meet City of Boston lighting standards in model, spacing, and light level provided. Pedestrian-scaled ornamental lighting will be included at key building entrances and in open spaces. Roadway lighting is envisioned on the outer edges of Hood Park Drive, Stack Street, and Supertest Street, with pedestrian scale lighting on the interior edges of those streets.

♦ Regularly spaced street furniture will be provided, including benches, trash receptacles and additional seating types, where appropriate. Seatwalls are planned in several open space areas.

♦ All walking surfaces are planned to be ADA accessible, with a minimum of ramps required for accessibility. The use of stairs throughout the site is purposely minimized to facilitate ease of access for all people.

The Proposed Project has been designed to comply with the Boston Complete Streets guidelines. Recognizing that these streets are privately owned and not intended to be major thoroughfares for cars, the vehicular portions of the streets are modestly, but appropriately scaled: two eleven foot travel lanes, one in each direction. The streets also contain five foot minimum bike lanes traveling in both directions.

The pedestrian realm is the primary focus of the amended Master Plan's circulation strategy. When comparing standards to the Boston Complete Streets guidelines, Hood Park's roads are designed to comply with three street types: "Downtown Mixed-Use," "Neighborhood Connector," and Neighborhood Residential."

The primary streets of Hood Park Drive, Stack Street, and Supertest Street adhere to the street type called "Downtown Mixed-Use." Per the guidelines, "these streets support a lively mix of retail, residential, office, and entertainment uses; this wide-range creates many of the city's most dynamic public spaces. While usually smaller in scale than Downtown Commercial Streets, they similarly serve residents, visitors, and workers. They should support high levels of walking, bicycling, and transit, as well as support frequent parking turnover, including loading zones to foster economic vitality."

The Greenscape/Furnishing Zone can accommodate street trees, utilities, and sign posts, and a clear and unobstructed Pedestrian Zone should be provided. Stormwater practices can be small, such as green gutters, or more extensive depending on the nature of the street. Visual interest is provided by architectural detail and greenscape elements on adjacent private property."

5.4.2 Open Space Design Objectives

The Proposed Project includes several notable new publicly accessible open and green spaces. These spaces are vital resources for the users and guests of Hood Park. They will bolster retail establishments, serve as a back yard to residents, and provide a place for employees of businesses within Hood Park to take a break for an outdoor lunch or afterwork enjoyment. These spaces are a tremendous opportunity for active programming such as exercise classes, food festivals, farmers' markets, concerts, beer gardens, splash pads, or a skating rink. Each of these spaces will be privately funded, maintained, and operated. See Figure 1-27 for the Open Space Plan, and Figures 5-8 to 5-9 for renderings of these spaces.

5.4.3 Hood Park Drive Public Realm

Powerhouse Square is a major open space proposed as part of the amended Master Plan. This space is at the heart of Hood Park, and serves as a generous foreground for the existing structures to remain: 500 Rutherford Avenue, the original Powerhouse (510 Rutherford Avenue), and the iconic "Hoods Milk" chimney stack. This space is intended to serve as both a passive space at times as well as an actively programmed space. Though the Square is envisioned as one large entity, it has been designed with two subsections: The Pond and The Garden Passage.

- **The Pond** is proposed at the base of existing stack attached to Power House. In addition to being a storm water management and sustainable site design feature (shown in Figures 5-10 and 5-11), the pond is an important functional and visual centering amenity for Hood Park, providing an interesting visual street edge condition and organizing device for the overall Powerhouse Square. This water feature is discovered as users move through central circulation pathways and serves to celebrate the unique historical powerhouse, its brick stack, and a nod to the mill pond that once occupied the Hood Park site. The Pond is a two-level water body. The separation is meant to both add interest and separate functions. The upper pool is at the intersection of Hood Park Drive and Stack Street. This pool serves as the stormwater management component of the overall water feature, containing aquatic plants and a subsurface gravel wetland below. The lower pool is closer to 500 Rutherford and is intended to be an interactive water feature. The lower pool is characterized by a recirculating water fall, playful jets, and a very shallow bottom. It is accessible by several steps and a sloped walk. Seat walls surround both pools along the sidewalk edges. A major paved area adjacent to the pond and to the south of 500 Rutherford will serve multiple purposes. This space will be at sidewalk level to prioritize the pedestrian. It will provide a clean, level area where a variety of activities could occur, such as exercise classes, food festivals, farmers markets, concerts, beer gardens, and a skating rink. A pragmatic function that a portion of this space will serve is a drop-off area to 500 Rutherford, and a turn-around for the park users.

Figure 5-8
Hood Park

Figure 5-9

Site Entry at Hood Green and Spice Street

Hood Park Master Plan Boston, Massachusetts

ELKUS | MANFREDI HOOD PARK SMMA

Figure 5-10
Splash Pond

Figure 5-11

The Ponds

- **The Garden Passage** is located in the space between 500 and 510 Rutherford Avenue. It is planned to be an intensely planted area, mixing existing mature vegetation with new lush plantings of perennials, shrubs, and ornamentals. The planting palate will be chosen to create an ever-changing display throughout each season. This space will provide a pedestrian connection between the southeast portions of Hood Park and the rest of the development. It also serves as a necessary egress point for the Power House and Building 500. An existing dining terrace off of building 500 will be connected with the passage.

Stack Street Park is located at the intersection of Stack Street and Hood Park Drive and is a moderately sized green space that is intended to be constructed in conjunction with the 10 Stack Street building. This space will compliment other planned green spaces on campus by providing a smaller-scaled, more intimate atmosphere. It is designed as a sloped lawn leading up to a 10’ high promontory. The slope can serve multiple purposes. It can provide space with lawn seating for small outdoor concerts or performances. It may also be used as a small sledding hill for children. It will be made accessible by a gently sloping walk to the top. The sides of the hill will be planted with waves of perennials, shrubs and ornamental trees. The back of the hill will be supported by a retaining wall allowing for greater hill height. In addition to providing an interesting landscape element, the hill will also serve a practical purpose. It will provide a pleasant visual terminus looking west down Hood Park Drive and help mitigate the sights and sounds of the adjacent active waste and recycling center as well as traffic from Boston Sand and Gravel, and I-93.

Paved areas between the plantings and the proposed 10 Stack Street building will provide access and potential seating for retail users. A seat wall is also planned at the base of the hill adjacent to 10 Stack Street. At the Stack Street façade, the sidewalk is planned to open up wider to create a small plaza-like environment. Within the plaza, permeable pavements, street trees, and ornamental lighting will help provide a welcoming feel. A series of small rain gardens are planned in the sidewalk between the curb and the plaza for stormwater management and visual interest.

5.4.4 Stack Street Public Realm

The Lawns are proposed as a collection of open lawns and paved areas at the eastern edge of Stack Street from the Power House along the west façade of the existing 500 Rutherford Avenue. The openness of this area will allow flexibility of uses and create an opportunity for adjacent retail to spill outside. While primarily open, the space is flanked with trees and more intensely vegetated areas to provide shade and softness to the edges. The pavement in this area is intended to be mostly composed of permeable and porous materials to help mitigate the intensity of storm water runoff and reduce the chances of standing water and puddles in this minimally sloped zone. A variety of moveable and fixed furnishings is planned, allowing users to help craft the space to their own needs and to allow events to have flexible layout options. Lawn games, swings, and outdoor working spaces will accommodate a variety of users and interests. Low level pedestrian scaled lighting, along with building and accent lighting on features such as the pond will provide security and create a warm, festive mood. Lighting will also reinforce the geometry of this space, and help reveal views in the evenings to the space from the adjacent buildings.

The Market anchors Stack Street at the intersection of Supertest Street and will create a new street frontage for the west corner of the existing 500 Rutherford Avenue (see Figure 5-12). The intent is to activate this key point linking Stack Street with the portal to Hood Park to the north. Contained within this space are a series of pop-up retail buildings that enliven the space functionally and visually to participate with and help frame the Stack Street open space.

5.4.5 Supertest Street Public Realm

Hood Green is a major proposed open space located at the terminus of Spice Street at D Street. Located along the most direct line between Hood Park and Sullivan Square station, this space will naturally be an active zone at various points throughout the day. However, it is planned to be much more than a pleasant gateway to Hood Park (see Figure 5-13). The Proposed Plan envisions Hood Green as an active one-acre park that welcomes the community. The Hood Park team has been gathering input from the community about what types of programming elements they would like to see. The ideas are both exciting and varied, and it has become clear that community input into the specifics of this space will be vital to its success. For the purposes of this Master Plan amendment, Hood Green is shown in a general manner to allow this space to truly be shaped by community input.

- Two buildings flank Hood Green: 15 Supertest Street to the east and 25 Stack Street to the west. 15 Supertest Street is envisioned as an extension to Hood Green with a gently sloping turf roof that meets grade. Visitors will be invited to use the roof of the building and enjoy the sloping lawn. 15 Supertest Street performs two vital functions. Firstly, it creates an edge to the park, giving a sense of separation and safety from the large volume of traffic on Rutherford Avenue. Secondly, it continues and strengthens the emerging urban street edge condition along Rutherford Avenue, thus helping to transform the image from a highway into a local street boulevard.

Bikeway/ Path is a dedicated 20' wide pedestrian and bicycle corridor along the entire length of the northern property line. This pathway is intended to provide safe bicycle and pedestrian passage along D Street, while maintaining a workable right of way for the MassPort rail line. This path will have the ability to form a connection to pathways that are planned as part of the Inner Belt Master Plan to the west and the future bike and pedestrian linear park along the east side of Rutherford Avenue.

Figure 5-12
The Market

Figure 5-13
Supertest Streetscape

5.4.6 Ground Floor Uses

Every new building, regardless of the use above the street level, will be programmed and designed with street-facing retail components. Figure 5-12 illustrates the opportunity for retail activation of public realm streetscapes within Hood Park. Various retail, restaurant, service, or other uses which invite functional or visual connections between the street and building interior will be considered. Publicly accessed retail uses are prioritized in locations such as the Hood Green and the many open spaces surrounding the Power House on Stack Street.

Building entrance lobbies are also proposed in locations which further reinforce active participation of internal streets. These lobby locations are distributed to spread their influence and favor placement at key open spaces and/or view corridors within Hood Park. Building service entrances and back of house functions serving buildings generally occupy outer property edges without excluding possible further activation of street connections as future extension of off-site street grid is realized.

5.5 Building Design

Although design of individual buildings will occur as market demand for tenancy at Hood Park evolves, the proposed Masterplan Amendment includes specific building designs to envision the architectural character and overall design objectives of a fully constructed Hood Park. The proposed building at 10 Stack Street is intended for approval as the next building constructed integral to the Hood Park Masterplan Amendment and its architecture is further described with others below. Specific proposed building square footages and heights can be found on Table 1-2, the overall plan, Figure 1-11 and Figure 1-12.

5.5.1 Building Design Objectives

The following building design principles have informed the proposed Hood Park Masterplan Amendment:

- ♦ Create architectural diversity through distribution of various building uses. This intends to enhance the 24X7 activation of Hood Park and further seek diversity in building character through proportional and façade variations inherent to the building function.

- ♦ Create architectural diversity in building massing and height, even between buildings of the same use. This intends to reinforce a sense of Hood Park's evolution over time, provide visual interest and enhance daylight and views within Hood Park as well as viewing of Hood Park from surrounding context. Incorporate massing setbacks where appropriate to enhance access to natural light and views.

- Create architectural diversity through varying façade expression, articulation and materiality. In addition to providing as sense of Hood Park evolving over time, the objective is to allow buildings to simultaneously express their own language and narrative while being responsive to each other as a collective whole.

- Incorporate active retail space at the ground floor of every building. Design buildings so that lobby entrances and retail frontages create a strong functional relationship and visual transparency to new streetscapes and active open spaces on site.

- Design buildings so that above grade parking and service entrances are visually obstructed or away from view corridors, new streetscapes and open spaces.

5.5.2 Existing 500 and 510 Rutherford Avenue

The design character and geometry of the proposed Masterplan is informed by physical presence of the existing buildings, 500 and 510 Rutherford Avenue. The historic Hood Milk processing plant buildings are fully integrated into the Proposed Project, preserving and emphasizing the important character of these buildings. The iconic Powerhouse (510) chimney / smoke stack is framed and respected by site organization, distribution of uses, as well as building placement and massing. It is anticipated that 510 Rutherford Avenue will functionally change over time to benefit from the open space activity and new building entrances surrounding it. The existing buildings on Rutherford Avenue define a height and presence which is both familiar and low as Hood Park meets the existing residential neighborhood to the east. This essential stepping of overall site massing is an important guiding principal which is proposed to continue through the Masterplan Amendment. The existing 500 Rutherford Avenue building has a large footprint which greatly impacts the overall future plan. This building will also adapt somewhat, particularly at northwest corner to the intended build out of the Masterplan. These buildings do not include parking and will depend upon relationship with new surrounding buildings to serve parking needs.

5.5.3 50 and 100 Hood Park Drive (buildings currently under construction)

The Harvey (aka 50 Hood Park Drive or 480 Rutherford) is under construction as a residential building. 50 HPD establishes an active edge on both Rutherford Avenue and Hood Park Drive. It is scaled to complement the existing 500 Rutherford Ave building and lower height of residential buildings on opposite, neighborhood, side of Rutherford Avenue. The Harvey will also incorporate a 'Kids Lab' community-use space along Rutherford Ave as well as retail space on Hood Park Drive.

Also currently under construction is 100 Hood Park Drive, a parking garage above active retail ground floor and office/lab use second floor. 100 HPD will create an active urban southern edge to Hood Park Drive and visual southern terminus for Stack Street. This building anchors the intended open spaces adjacent to The Powerhouse and 10 Stack Street. The parking it provides are intended to serve existing buildings including 500 Rutherford Ave as well as future needs of the masterplan development.

Together these two buildings currently under construction establish a framework for the southern edge of the Hood Park Masterplan. See Figure 5-14 for a rendering of the Hood Park Drive Streetscape.

5.5.4 100 Hood Park Drive Addition

Intended as a vertical expansion of 100 Hood Park Drive, this building (addition) is intended as laboratory and office use. The 100 Hood Park Drive entrance lobby, service entrance and vertical transportation currently under construction will serve the proposed addition.

The building massing takes advantage of the broad dimension of parking structure it will be constructed above. This will provide relatively large floor plates, creating loft-like flexible plan layout for lab and office tenants. The overall building form is defined by symmetrical convex and concave walls responsive to the 100 Hood Park Drive architecture below it. These curved wall planes optimize the floor area, provide connection to outdoor terracing at lowest level of the addition and minimize wall surface area. Curved outside corners create fluidity in the overall form. The goal is also to allow this building to sit quietly atop this block stepped away from the Rutherford Avenue side.

Given the architectural screening materials and sizable 'aperture' entrance portal of the garage structure, the addition is proposed as a quieter, uniform expression. The building design provides a visual separation from the architecture below through expression of continuous table elevated above top parking deck. The intent is to minimize the architectural gestures in favor of a refined expression of copper cladding as a next generation of materials below it. See Figure 5-15 for the 100 Hood Park Addition.

5.5.5 10 Stack Street

As the first new building to be constructed within the proposed Masterplan Amendment, 10 Stack Street is an office / laboratory building with active retail ground floor. An anchor tenant is intended to occupy the majority of the building and take advantage of visibility from the I-93 corridor for corporate identity. 10 Stack Street includes important frontages toward a small proposed park on Hood Park Drive and toward Stack Street opposite the historic Powerhouse. The position of the building is intentionally placed north to create a significant open sky view on the axis of Hood Park Drive looking west into the development. This view corridor enhances the view from Baldwin Street within Charlestown neighborhood. Locating the building in this manner also maintains some

Figure 5-14

Hood Park Drive Streetscape

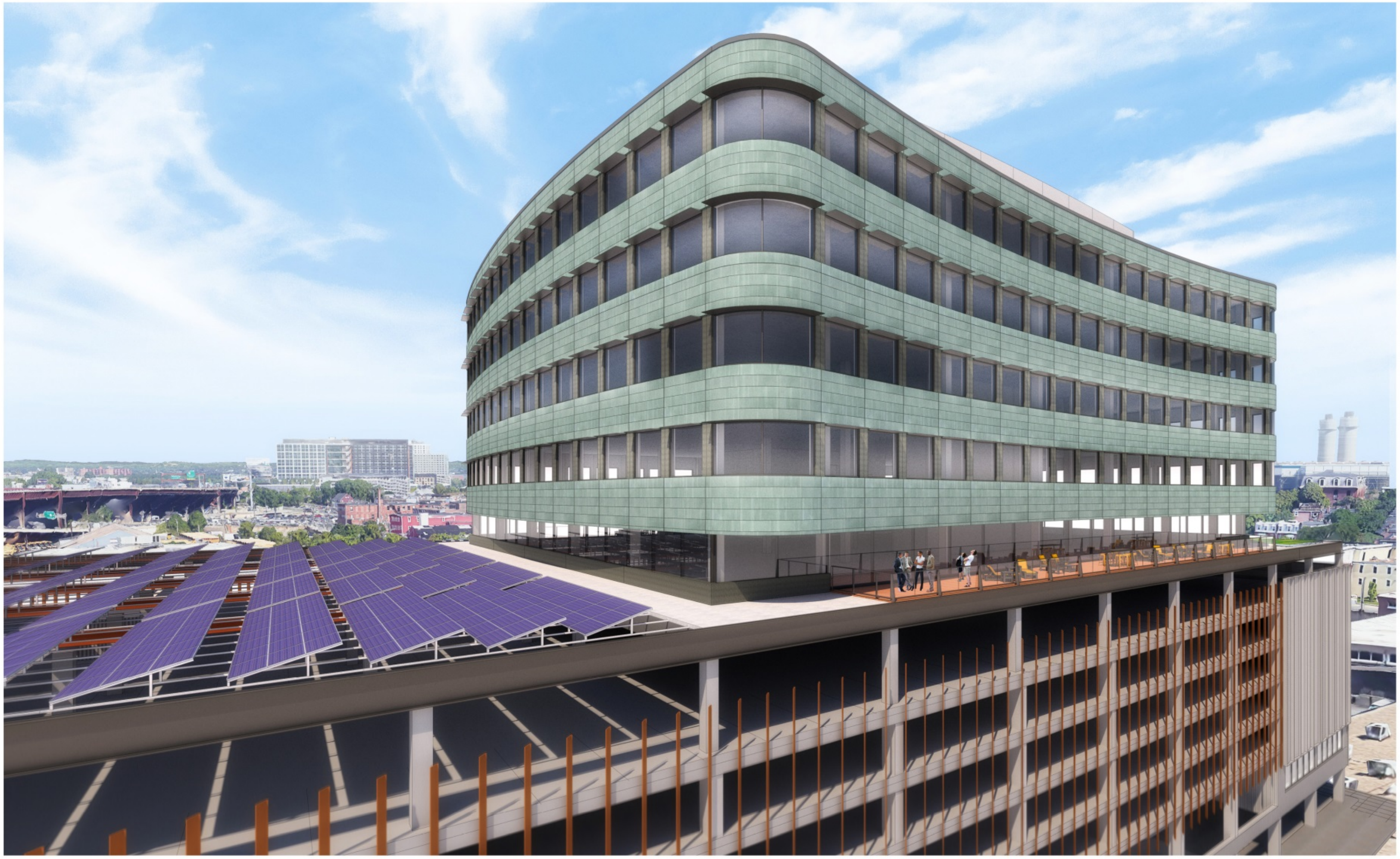


Figure 5-15

100 Hood Park Drive Addition

visibility of the iconic Powerhouse Stack from I-93 highway deck. The open space created at the intersection of Hood Park Drive and Stack Street is described above and will be activated by ground floor retail space on that end of 10 Stack Street. All of the parking associated with the project is below grade and accessed from a service drive on west property line along with service loading dock.

One of several goals in design of 10 Stack Street was to fold the overall mass vertically in a manner which would break the building into three vertical sections. This massing gesture establishes a rotation of the building in response to the Powerhouse Chimney/Stack and helps diminish the longer axis of the building visually. The broken massing form also helps articulate the building on the west side toward I-93. Additional pleats in the façade further express this folding dynamic and both folds and subset pleats will benefit from sun shadows on east and west faces. The plan rotation helps align the building at the south end to the street grid alignment of Hood Park Drive while creating an embracing entrance location as the street grid rotates to the Stack Street axis.

Associated with each portion of the folded plan is a stepped massing which creates the lowest volume at the southern end of 10 Stack Street where the project meets lower Hood Park Drive buildings. This lowest portion is also in closest visual proximity to the iconic Hood stack when entering the site from Rutherford Avenue. Successively the building steps up to middle section and again to northern section. The lowest portion is proposed to include a large roof terrace for use by tenant accessed from the top floor. The mechanical penthouse is fully integrated into the overall form and façade treatment of northern portion of the building.

The design of 10 Stack Street also incorporates a mirrored stepping of glazed portions of lower floors of the building as it engages the street and open space park at Hood Park Drive. These façade steps reveal larger portions of glass at street level as well as a second-floor balcony which is accessed from the lobby and projects out over the open space as viewing location for activities with the park. The intent is to allow building activities to be visible from public streets and also respond to the Powerhouse (510) stepped massing across the Stack Street. The glazed lobby is shallow and stretched along center section of the building and flanked by retail on each side.

The design proposes an architectural narrative for 10 Stack Street facades which incorporates a vertical graining of varying intensities of screen material intended to make loose reference to crop-rows as an aspect of the prime tenant's business. The color patterning of screen material is deployed in a manner to accentuate folds and pleats of the building face. The glazed window portions, which are mostly punched openings, are worked into this vertically oriented screen pattern. The intent is to tune the solar shading capability through a combination of building fenestration size and the overlay of solar screening.

5.5.6 30 Stack Street

Completing an important west edge of the street, 30 Stack Street is anticipated to be a laboratory / office building incorporating above-grade parking and a continuous active ground floor retail along the street (see Figure 5-16).

The tall 30 Stack Street entrance lobby anchors the corner of Stack Street and Supertest Street, participates with other building entrances at this intersection. Parking access is from the northwest corner along Supertest St. and service is intended to be from a service alley along west property line.

The massing expresses the plates of occupied floors above and steps back as it rises from its connection with 10 Stack as well as the lawns and active open space along Stack Street. This composition seeks to provide small outdoor terrace opportunities to activate building outside of upper floor locations along the street. It also serves to enhance daylighting and views between 30 Stack and 10 Stack buildings. The overall stacking and stepped expression intended as loose drydock reference also seeks to contrast the more vertical cadence of flanking 10 Stack Street and 35 Supertest Street. The lower overall height of 30 Stack Street also provides another open sky break along the west edge of development when viewed from the neighborhood or from I-93 deck. Since the lab / office space above parking is held to Stack Street side there is a lower volume toward the west where a photovoltaic panel array can be placed. The patterned ribbon façade is broken is held above a continuous glass retail frontage on the street.

5.5.7 45 Stack Street

Envisioned as a low-scaled market to activate the corner of Stack Street and Supertest Street, the Masterplan intends the character of 45 Stack Street to be more like pop-up retail than a singular building. This proposed structure may be a series of smaller retail structures that redefine the western face of 500 Rutherford Avenue. These structure(s) will serve as both destination and open space interventions to visually activate the important corner of development site circulation.

5.5.8 15 Supertest Street

The proposed 15 Supertest Street building is a single-story structure facing Rutherford Avenue also accessible from a portal to the Hood Green on the opposite side. This building is intended to create an active retail edge that has presence toward the Charlestown neighborhood, also serving as gateway building inviting patrons and residents to the open space within Hood Park. As such, the retail tenants of the building may participate with customers accessing their business(es) from both Rutherford Avenue and Hood Green.

Figure 5-16

30 Stack Street

The design intent is to create an urban edge to the evolving Rutherford Avenue urban boulevard while maintaining a low profile for views into Hood Park from neighborhood locations. A unique aspect of the proposed 15 Supertest Street is its composition as both building and site feature. The roof is intended as sloping green extension of publicly accessible open space as it rises from the Hood greenspace on its west side to meet Rutherford Ave. parapet. This sloped green is proposed to be accessible with further potential to activate the street edge visually. Tall glass retail frontages define the Rutherford Avenue façade and service is tucked into a portion of Supertest St. edge.

5.5.9 25 Supertest Street

25 Supertest is positioned to hold the street edge at extension of Stack Street to D Street as well as frame the west edge of the proposed Hood Green open space. This building is proposed as a hotel use and includes restaurant or other gathering space taking advantage of the open and accessible position within Hood Park where pedestrian and bicycle access from Spice Street and D Street are anticipated. 25 Supertest will also have frontages on both Supertest Street as well as Stack Street and its hospitality functions and primary lobby entrance will participate with other building entrances fronting this street intersection. The plan geometry and small setback of 25 Supertest helps ensure visibility of entrance to 35 Supertest at street level.

25 Supertest is proposed with a rectilinear massing with regular punched window fenestration within an open grid pattern. The overall massing establishes an important step down from the taller 35 Supertest as the development reaches toward the proposed Hood Green and neighborhood. The simple massing is lifted somewhat from ground plane where larger-glazed portions, containing function and retail spaces are inserted into the lower portions of the building. Parking and service are placed at the northwest corner on Stack Street extension.

5.5.10 35 Supertest Street

Located in the northwest corner of Hood Park, 35 Supertest Street is proposed as the tallest building within the Masterplan development. The intent is to incorporate a signature, taller building in this location that has very prominent visibility from I-93 and 99 inbound corridors. This places the greatest height within Hood Park furthest from the neighborhood and nearby taller development anticipated surrounding Sullivan Square MBTA station. At the intersection of Stack Street and Supertest Street, the building is envisioned as a mixed-use project. The proposal contains residential use on upper floors placed above full-block commercial office lower floors. A large green roof terrace level tops the large office floor plates. Ground floor retail is intended and the primary building entrance will anchor the street intersection corner, visible from both approaches. The lower floors include above grade parking levels intended to be integrated into facades of office floors above. Service and Parking entrances will be placed along west property line service alley so that most of street face along both Stack and Supertest Streets can be activated.

35 Supertest massing incorporates thinner residential upper floor plate turned parallel with Supertest Street allowing the upper massing to be more elegant and create thinner dimensions and provide a wider break to open sky when viewing the development from the Charlestown neighborhood. This design aspect is further emphasized by an intersecting curved form (kidney plan shape) that creates rounded ends where balconies further articulate the edges of the building and join it with the larger office building base. A strong sense of the shallow floor height dimensions is articulated by horizontal banding of floor lines within glass façades.

Chapter 6.0

Historic and Archaeological Resources

6.0 HISTORIC AND ARCHAEOLOGICAL RESOURCES

This section identifies the historic and archaeological resources within and in the vicinity of the Project site and discusses potential Project-related impacts.

6.1 Project Site

Hood Park is 19.92-acre site located on the west side of Rutherford Avenue between D Street and Bunker Hill Industrial Park in Charlestown. The Site was formerly the headquarters for H.P. Hood Dairy operations, which sold the property and ceased usage for dairy production in the late 1990s. There are currently three buildings on-site; the first is 500 Rutherford Avenue, an approximately 368,750 square-foot (sf) office building, the second is 510 Hood Park Drive, aka the Power House, an approximately 34,812 square-foot, office building and the third is 570 D Street, aka the Cooler Building, a 52,500 square-foot building located in the northwest corner of the Park. The Cooler Building currently houses some functions of Bunker Hill Community College. The remainder of the Site comprises surface parking lots and internal roadways.

6.2 Historic Resources within the Project Area

The Project will involve the redevelopment of the former headquarters for H.P. Hood Dairy Company, which sold the property and ceased usage for dairy production purposes in the late 1990s. The Project Site is located in the Charlestown B&M Railroad Industrial Survey Area (BOS.RL) and adjacent to several properties listed in the State and National Registers of Historic Places and included in the Inventory, including the Middlesex Canal Historic and Archaeological National Register District which includes several non-contributing buildings at 480 Rutherford Avenue (BOS.13986 & BOS.13987), the former H.P. Hood and Son Milk Company at 500 Rutherford Avenue (BOS.12853), the Rosev Dairy at 420-438 Rutherford Avenue (BOS.12852) and the Middlesex Canal (BOS.9729, demolished).

6.3 Historic Resources in the Vicinity

The Project Site is in the vicinity of numerous properties and districts included on the State and National Registers of Historic Places, as well as properties included in the Inventory. In the immediate vicinity, is the H.P. Hood and Sons Distribution Center (BOS.12855) located to the north of the Project Site and the Middlesex Canal Historic and Archaeological National Register District extends to the north and to the south along the eastern boundary of the Project Site. The Charlestown Heights National Register Historic District, also known as the Ensign John J. Doherty Playground is located to the east of the Project Site along Bunker Hill, St. Martin and Medford Streets. One individual National Register-listed property, the Bunker Hill School at 68 Baldwin Avenue and is also located within a one-quarter mile of the Project Site and one property, the Boston Engine Company No. 32 at

442 Bunker Hill St has been determined eligible for listing on the National Register. Table 6-1 lists historic resources within a quarter mile radius of the Project Site; the locations of these resources are depicted on Figure 6-1.

Table 6-1 Historic Resources Within and in the Vicinity of the Project

Existing Map Key	Historic Resource	Address	Designation*
A	Middlesex Canal Historic and Archaeological	Charlestown	NRDIS
B	Charlestown Heights/ Doherty, Ensign John J. Playground	Bunker Hill, St. Martin, and Medford Streets	NRDIS
1		32 Alford Street	NRDIS
2		27 West Street	NRDIS
3	Sullivan Square T-Station	Alford Street	NRDIS
4	Henry Sawyer Printers/ H. P. Hood and Sons Distribution Center	583 Rutherford Ave	NRDIS
5	Boston Engine Company No. 32	442 Bunker Hill St	NRDOE
6	Bunker Hill School	68 Baldwin Street	NRIND
7		480 Rutherford Ave	NRDIS
8		480 Rutherford Ave	NRDIS
9	H. P. Hood and Sons Milk Company	500 Rutherford Ave	NRDIS
10	Rosev Dairy	420-438 Rutherford Ave	NRDIS

*Designation Legend

NRIND	Individually listed in the National Register of Historic Places
NRDIS	National Register of Historic Places historic district
NRDOE	Determined eligible for inclusion in the National Register of Historic Places

6.3 Archaeological Resources

A review of Massachusetts Historical Commission's (MHC) online archaeological base maps was conducted on September 5, 2018 indicating that there are no archaeological sites listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth on the Project Site; however, the eastern boundary of the Project Site is within the boundary of the Middlesex Canal Historic and Archaeological National Register District. Listed in 2009, the nomination states that "though the route of the canal can still be traced from old maps of the area, the forces of urbanization have removed most vestiges of the original canal structure. Additionally, the nomination form indicates that in the 19th century, the project area was filled in for railroad yards and

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

Hood Park Master Plan **Boston, Massachusetts**

Epsilon ASSOCIATES INC.

Figure 6-1

Historic Resources

subsequently redeveloped by Bunker Hill Community College and the Former Hood and Rosev Dairy Manufacturing facilities, therefore, no archaeological resources are expected to be impacted by the Project.

6.4 Potential Impacts to Historic Resources

6.4.1 Urban Design

The buildings will be designed to establish meaningful relationship with the new streets and open spaces created within Hood Park. The plan seeks to ensure beneficial access to daylight and views within the development both at street level as well as within the buildings themselves. Attention has been made to enhance the environment surrounding existing buildings, particularly the historic Powerhouse and its iconic chimney stack.

The height of proposed buildings will step down as development approaches Rutherford Avenue and the existing Charlestown residential neighborhood. Proposed buildings are taller along west property edge toward the I-93 elevated highway. These buildings are varied in height so that natural light and views are preserved. Intentional open space has been created along both Hood Park Drive and Supertest Street so that view corridors between buildings will be maintained for Charlestown neighborhood western skyline.

In addition to massing variation, the Hood Park Masterplan Amendment seeks to create variation in architectural expression. Some of this is accomplished through building use where variation of building dimensions and fenestration are representative of their function. It is also intentional to design buildings to provide an image of urban development which evolved over time as well as design variation in architectural language through façade articulation and materiality. Additionally, the buildings have been designed so that lobby entrances and retail frontages create a strong functional relationship and visual transparency to new streetscapes and active open spaces on-site to improve the pedestrian experience.

6.4.2 Shadow Impacts

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

As illustrated in the shadow study diagrams (Figures 3.2-1 to 3.2-14), during isolated time periods the Project will cast minimal net new shadow primarily on areas north, west and east of the Project Site, including limited areas of Middlesex Canal Historic and Archaeological National Register District to the east. However, none of the shadow impacts resulting from the Project will adversely impact the character-defining features of the Middlesex Canal Historic and Archaeological National Register District that make it eligible for inclusion in the National Register.

6.4.3 Wind Impacts to Historic Resources

Wind conditions around the existing site are comfortable for the current use of the areas with one location at the corner of D Street and Rutherford Avenue which had uncomfortable wind speeds.

With the addition of the proposed development, preliminary wind tunnel testing indicates that conditions will remain unchanged in general around the outskirts of the Site, specifically to the west, however, immediately surrounding the proposed buildings, wind conditions are expected to be less comfortable. Based on the preliminary design concepts and an initial wind analysis, a number of uncomfortable and dangerous wind conditions are predicted to occur including at the base of Buildings 400, Building 600 and to the north of Building 300 along Hood Park Drive and to the south of Building 200 along Supertest Street if no mitigation measures are incorporated into the landscaping or building design. These wind tunnel testing results are not uncommon for a high-level masterplan in the Boston area. The Proponent will continue wind tunnel testing as the specific design of the buildings and proposed landscaping is advanced and fully expects that wind conditions will improve as refinements are made. The Project is not expected to have wind impacts that would affect the setting of nearby historic properties.

6.5 Status of Project Reviews with Historical Agencies

6.5.1 Boston Landmarks Commission

The Proponent is committed to working closely with BLC staff as the design for the Project advances.

6.5.2 Massachusetts Historical Commission

The MHC has review authority over projects requiring state or federal licensing, permitting and/or approvals, or utilize state or federal funding. The Proponent has initiated review of the Proposed Project by MHC via the filing of an Environmental Notification Form (ENF) pursuant to the Massachusetts Environmental Policy Act (MEPA). (See Section 8.2) MHC did not comment on the ENF.

Chapter 7.0

Infrastructure

7.0 INFRASTRUCTURE

7.1 Introduction

New utility infrastructure in Hood Park Drive is currently under construction as part of the Harvey (480 Rutherford Avenue, aka 50 Hood Park Drive) and 100 Hood Park Drive garage projects.

This utility infrastructure is designed to service 480, 100 HPD, the existing 510 Rutherford Avenue building, and then extended to serve 10 Stack Street and the full buildout of the Master Plan.

7.2 Wastewater

Under predevelopment and full buildout, the sewer system has two points of connection to the 42-inch combined sewer main in Rutherford Avenue. A new 12-inch connection to the 42-inch main at Hood Park Drive is currently under construction. The second point of connection, at Supertest Street will utilize the existing 12-inch sewer adjacent to the north side of 500 Rutherford Avenue.

The proposed routing for Hood Park is shown on Figure 7-1.

7.3 Water System

The proposed water system for the Master Plan will maintain the same basic alignment and points of connection as the pre-development network but will upgrade the mains and meters. The system will continue to connect the 16″ BWSC main in Rutherford Avenue at the south entrance near 480 Rutherford Avenue, with the 12″ BWSC main in the Massport right of way at Spice Street. This new main will provide service for domestic and fire protection flows.

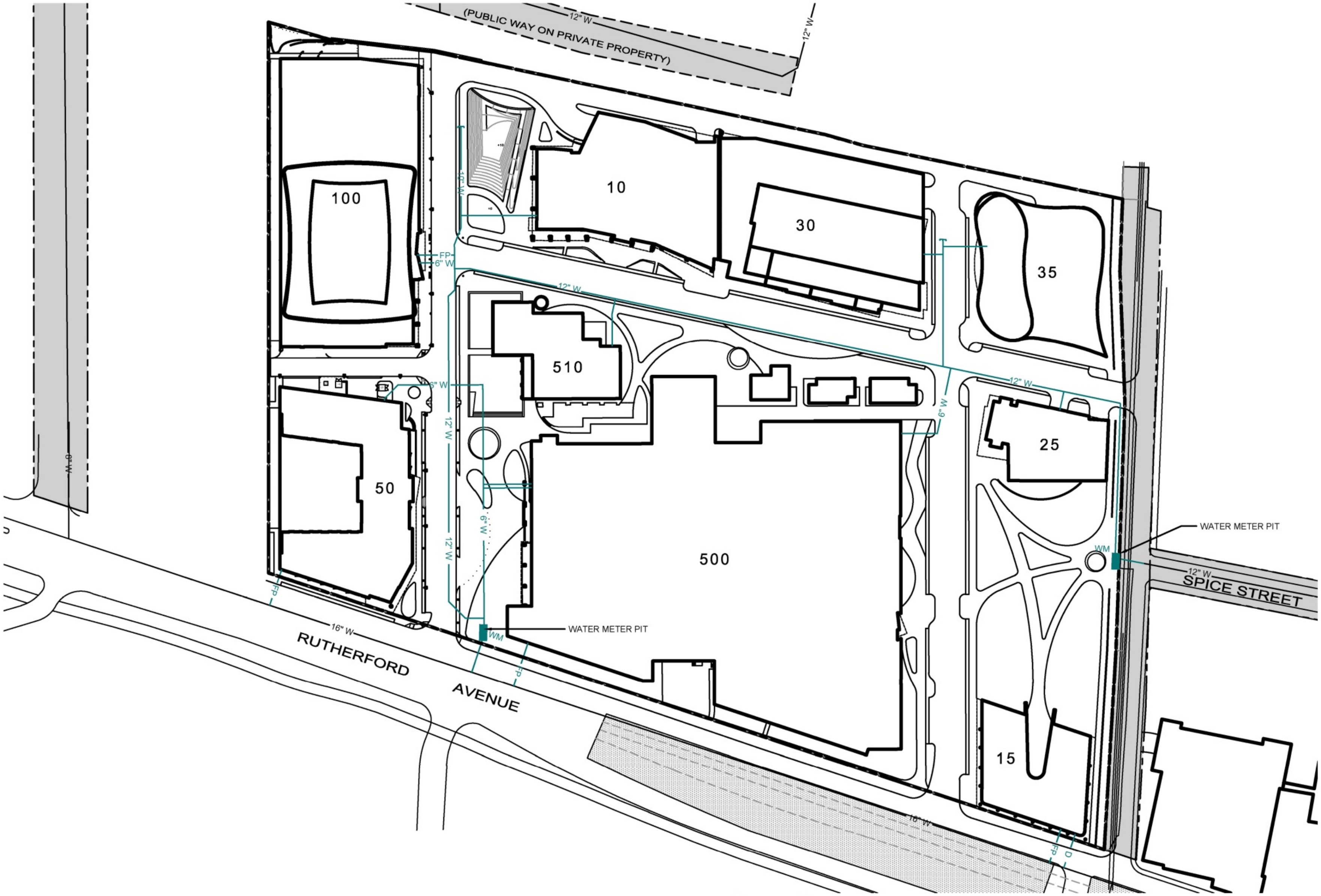
SMMA prepared a WaterCAD analysis to model the existing and proposed pipe network. Based upon the proposed building areas and demand characteristics a 12″ water main is required. BWSC requires that meters are within one “size” of the main, so therefore new 10-inch meters are proposed at the points of connection. Figure 7-2 describes the water main loop with sizes, connection points and suggested service connections for each building. Under existing conditions pits for domestic and fire service meters are located at the Rutherford Avenue and D Street (Massport right of way) connection points. The meter pit at Rutherford Avenue is currently being replaced to BWSC standards as part of the 100 HPD garage project. Replacement of the meter pit in the Massport right of Way (D Street at Spice Street) requires an easement agreement with Massport. Discussions regarding the easement between the parties are ongoing.

The initial 700 foot section of 12-inch main is currently being installed in Hood Park Drive as part of the 480 Rutherford Ave and 100 Hood Park Drive projects.

Hood Park Master Plan   Boston, Massachusetts

Figure 7-1

Sewer Utility Concept Plan



Hood Park Master Plan Boston, Massachusetts

ELKUS | MANFREDI HOOD PARK SMMA

Figure 7-2

Water Utility Concept Plan

7.4 Water Quality and Stormwater Management

7.4.1 Existing Storm Drainage System

The on-site drainage system in the pre-development conditions was composed of multiple parallel piped systems discharging to the City's 42-inch combined sewer in Rutherford Avenue. The combined sewer is approximately 8 feet below grade, at an elevation between 7.5′ and 9.5′ Boston City Base (BCB).

To the west of Hood Park there is a 15-inch diameter dedicated storm drain in Bunker Hill Industrial Park. This drain also discharges to the combined sewer in Rutherford Avenue. There is a 12-inch diameter storm drain in Spice Street which discharges to a combined sewer in Cambridge Street.

As part of the ongoing construction of The Harvey and 100 Hood Park Drive a new dedicated storm drain system has been constructed to BWSC standards in Hood Park Drive. It is constructed to a higher elevation (11′ BCB) in anticipation of connection to a future dedicated storm drain system planned in Rutherford Avenue.

7.4.2 Proposed Storm Drainage System

Under proposed conditions the Site is raised approximately 2-3 feet above existing grade to accommodate first floor elevations at 20' BCB. This will provide approximately 12-inches of freeboard above the anticipated one-percent annual flood elevation. The proposed storm water management system is designed to discharge to the planned dedicated storm drain system in Rutherford Ave. The storm water management system complies with BWSC and DEP standards.

7.4.3 Stormwater Management and Proposed Pond

The proposed pond adjacent to Building 510 will be designed to receive stormwater runoff from surrounding hardscape, landscape, walkways and buildings. The pond has multiple goals:

- Provides storage volume for stormwater management purposes.
- Provides filtration of surface runoff to meet water quality requirements.
- Supports the landscape design of the Master Plan.

7.4.4 Infiltration Systems

The recent storm water improvement projects at 500 North, 480 Rutherford Avenue and 100 Hood Park Drive (under construction) incorporate infiltration systems in compliance with the BWSC requirement for one-inch of infiltration for all new impervious area.

The planned drainage system for the Master Plan provides one-inch of infiltration for all new impervious areas. The Storm Water Master Plan being developed identifies sub-surface infiltration areas required for the roadway, sidewalk and plaza surface areas. As noted above, the pond adjacent to Building 510 will also provide storage volume to contribute to the required volume.

Infiltration systems are proposed for each building, to be integrated into the building design, landscape areas and adjacent sidewalks and roadways consistent with the designs for 500 North, 480 Rutherford Avenue and 100 Hood Park Drive.

The Site will incorporate pervious paving where possible, including pervious asphalt and porous pavers.

7.4.5 Compliance with MassDEP Stormwater Management Policy

The Project is designed to meet DEP Stormwater Management Policy. The following outlines how the Project will comply with each standard of the policy.

Standard 1 – Untreated Stormwater

The Project will only discharge to existing municipal drainage systems. All stormwater will be treated and discharge without eroding wetlands or waters of the Commonwealth.

Standard 2 – Post-Development Peak Discharge Rates

The existing site is almost 100% impervious. The Project includes large landscaped areas and porous pavement zones, and provides infiltration systems storing one-inch for new all impervious areas. Peak storm water discharges will be reduced.

Standard 3 – Recharge to Groundwater

The existing soils are a combination of C & D Hydrologic Soil Group (HSG) Soils. This requires the recharge of 0.25-inch and 0.1-inch infiltration, respectively. The proposed infiltration systems will recharge one-inch, exceeding this requirement.

Standard 4 – Removal of Total Suspended Solids

All impervious areas will be routed through water quality systems, infiltration areas and/or pond (including its filtration & infiltration component). Combined, these water quality systems will provide Total Suspended Solids (TSS) removal of at least 80%.

Standard 5 – Land Uses with Higher Potential Pollutant Loads

The stormwater management system is designed to comply with the performance standards for Land Uses of Higher Potential Pollutant Load (LUHPPL).

Standard 6 – Critical Areas

No portion of the Project Site is located within a critical area therefore this standard does not apply.

Standard 7 – Redevelopment Projects

The Project is a redevelopment with reduced impervious areas. The Project will comply with all applicable standards.

Standard 8 – Erosion and Sedimentation Controls

The Project will comply with the erosion and sedimentation guidelines developed by the DEP and the United States Environmental Protection Agency (US EPA) and complies with the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities.

Standard 9 – Operation and Maintenance Plan

A long-term, post-construction operation and maintenance plan will be developed as part of the Construction Documentation process.

Standard 10 – Illicit Discharges to Drainage System

There are no known or suspected illicit discharges to the stormwater management system at the Project Site.

7.5 Energy Systems

7.5.1 Electrical

Hood Park has coordinated with Eversource to confirm that power is available for the Master Plan loads and to develop the on-site distribution network. The duct bank will loop through the Site and connect at Rutherford Avenue at Hood Park Drive and Supertest Street. The duct bank loop will be constructed as two dead-end systems, and then interconnected once the roadway network is completed.

Approximately 400 feet of (9) conduit duct bank (3x3 concrete encased) is installed in Hood Park Drive as the first section of the Master Plan infrastructure. The next section, serving 100 Hood Park Drive and relocation of power to properties to the west, is currently under construction.

The electrical network for the Park is being designed to best practices for resilient design. Pad mounted equipment will be located above design flood elevation with secondary terminals about 24″ above pad elevations. Emergency generators will be located above flood elevation.

7.5.2 Natural Gas

Hood Park has coordinated with National Grid on the availability of service and design of the gas mains for the projected Master Plan loads. The new gas mains in Hood Park will be serviced by the existing 36-inch main in Rutherford Avenue. Approximately 400-feet of new 8-inch main is installed in Hood Park Drive as part of the 480 Rutherford Avenue Project. The next section, serving the 100 Hood Park Drive garage is currently under construction.

7.5.3 Telecommunications/Data

The first section of telecommunications conduit duct bank (2x2 concrete encased) and associated infrastructure is currently under construction in Hood Park Drive. Hood Park has coordinated with Comcast, RCN and Verizon to determine the details for this initial section of infrastructure, and the Master Plan extension within the Park.

The telecommunications system is being designed to best practices for reliability, redundancy and resilience. This includes the design of duct banks, the arrangement of equipment within telecom manholes and the location of equipment within demarcation rooms. Demarcation equipment is planned approximately three feet above planned first floors, which equates to approximately elevation 23 (Boston City Base), or six feet above the current 100-year flood elevation.

7.6 Compliance with Smart Utilities Policy

Earlier this year, the BPDA Board approved a new Smart Utilities Policy that incorporates five Smart Utility Technologies into the Article 80 Development Review Guidelines. The technologies are aimed at preparing Boston's utility infrastructure for the impacts of climate change, including increased flood risks, heat waves and stronger storms, reducing costs for end users, and reducing traffic congestion and roadway construction.

The Proponent is committed to the highest level of resiliency and sustainability, as demonstrated both by past development efforts including certification level of LEED Platinum for The Harvey residential building, and future commitments including elevating the entire 19+ acre campus above the BPDA Sea Level Rise Flood Hazard level. As part of the ongoing commitment to sustainable and resilient development Hood Park is committed to meeting many of the recommended Smart Utility Technology goals for projects at or above 1.5 million square feet of floor area.

7.6.1 District Energy Microgrid

A Microgrid is an electricity generation and distribution system generally serving multiple buildings that can be operated in a controlled, coordinated way with the main power grid or, as needed, independently when disconnected from the main power grid (in "island mode"). Microgrids are composed of: a) a power source; b) a power management system; c) electricity consuming devices; and d) a utility connection. They may also include an energy storage system.

The policy for District Energy Microgrids is crafted with an eye toward being reasonable and flexible. The Proponent is currently studying the practicability of creating a district Energy Microgrid to determine its economic feasibility and return on investment.

7.6.2 Green Infrastructure

Green Infrastructure is an approach to water management that includes policies, planning activities, and infrastructure implementation that assist in absorbing, delaying, detaining, and treating stormwater in order to reduce flood risk and pollution downstream.

As discussed above in Section 7.4, the Proponent is taking extraordinary steps to raise the base elevation of the Site to prevent flooding and provide for a resilient development. Furthermore, the Project will comply with BWSC standards to infiltrate an inch of rain over the entire Site and will fully comply with the MassDEP's Stormwater Management Regulations. As the design for the Site progresses, the Proponent will continue to look for innovative means to increase stormwater retention on the Site.

7.6.3 Adaptive Signal Technology

Adaptive Signal Technology ("AST") utilizes intelligent signals, traffic cameras, pavement sensors, and visual monitoring equipment to manage traffic flow in real-time of all transportation modes, including buses, pedestrians, and bicycles. These technologies are used to reduce wait time and facilitate throughput and safety at intersections.

The Proponent is committed to installing adaptive signal technology at the new traffic signals at Rutherford Avenue and Hood Park Drive.

7.6.4 Smart Street Lights

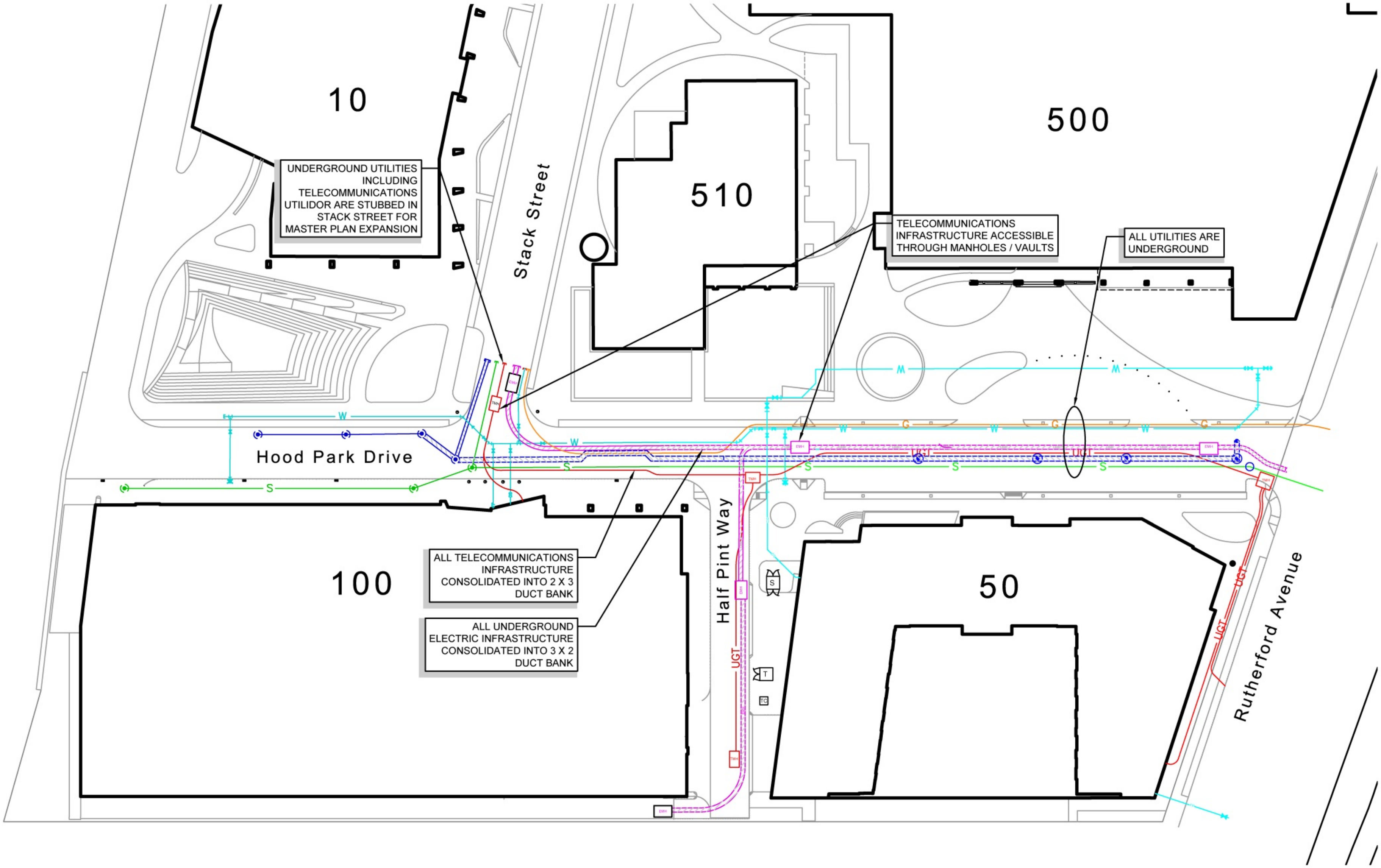
Smart Street Lights are traditional light poles that are equipped with smart sensors, wifi, cameras, etc. for health, equity, safety, traffic management, and other benefits.

The Proponent is committed to installing smart street lights having fiber optic and electrical connections throughout the Hood Park campus.

7.6.5 Telecom Utilidor

The Telecommunications Utilidor ("Telecom Utilidor") is an underground conduit duct bank that will house all telecommunication assets.

The Proponent will install a telecommunication utilidor in all new Hood Park streets (see Figure 7-3).



Hood Park Master Plan **Boston, Massachusetts**

ELKUS | MANFREDI HOOD PARK SMMA

Figure 7-3

Hood Park Drive Utility / Telecom Utilidor

Chapter 8.0

Coordination

8.0 COORDINATION WITH OTHER GOVERNMENTAL AGENCIES

8.1 Architectural Access Board Requirements

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

8.2 Massachusetts Environmental Policy Act

The Project is subject to review under the Massachusetts Environmental Policy Act (MEPA) because it requires consent for issuance of a building permit to the Commissioner of the City of Boston's Inspectional Services Department under Chapter 40, Section 54A from the Secretary of Transportation, which is considered a state action for MEPA purposes, and the Project exceeds a review threshold related to Transportation. An Environmental Notification Form (ENF) was filed to initiate MEPA review on July 2, 2018. On August 10, 2018, the Secretary of Energy and Environmental Affairs issued a Certificate requiring the preparation of a Draft Environmental Impact Report (DEIR). The Proponent intends to file the DEIR in the near future.

8.3 Massachusetts Historical Commission

The Project will require state actions that will trigger review by MHC under State Register review regulations (950 CMR 71.00). The ENF filed with the MEPA office served as MHC's notification of the Project and initiated MHC's review of the Project. MHC did not comment on the ENF.

8.4 Massachusetts Port Authority

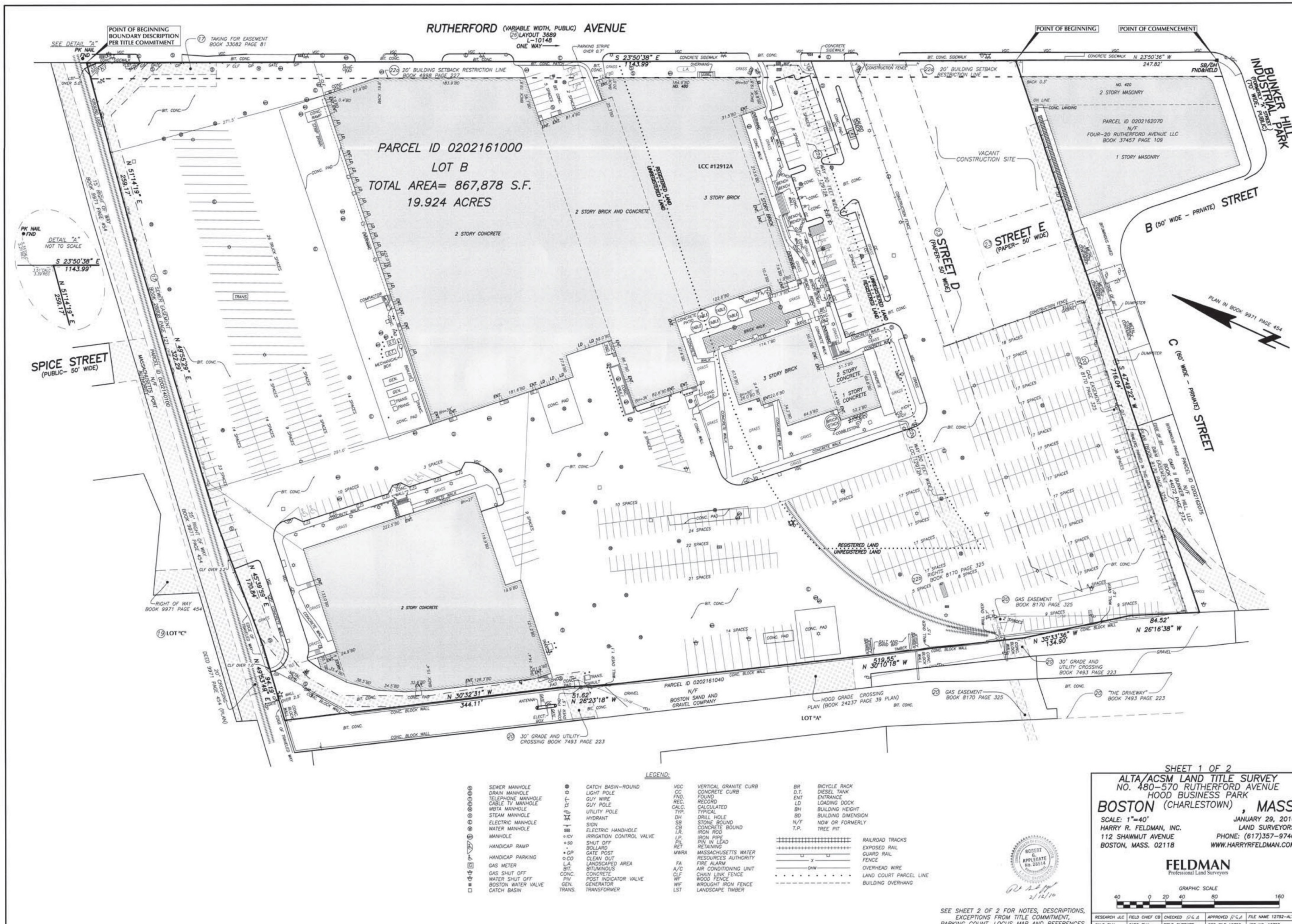
Massport owns the unused railroad right-of-way (the Mystic Wharf Branch Rail) that borders the northern edge of the Project Site. The Proponent is working collaboratively with Massport to ensure that the Proposed Project does not adversely affect the ability of the railroad should Massport seek to reestablish rail operations along the right-of-way in the future.

8.5 Boston Civic Design Commission

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

Appendix A

Site Survey

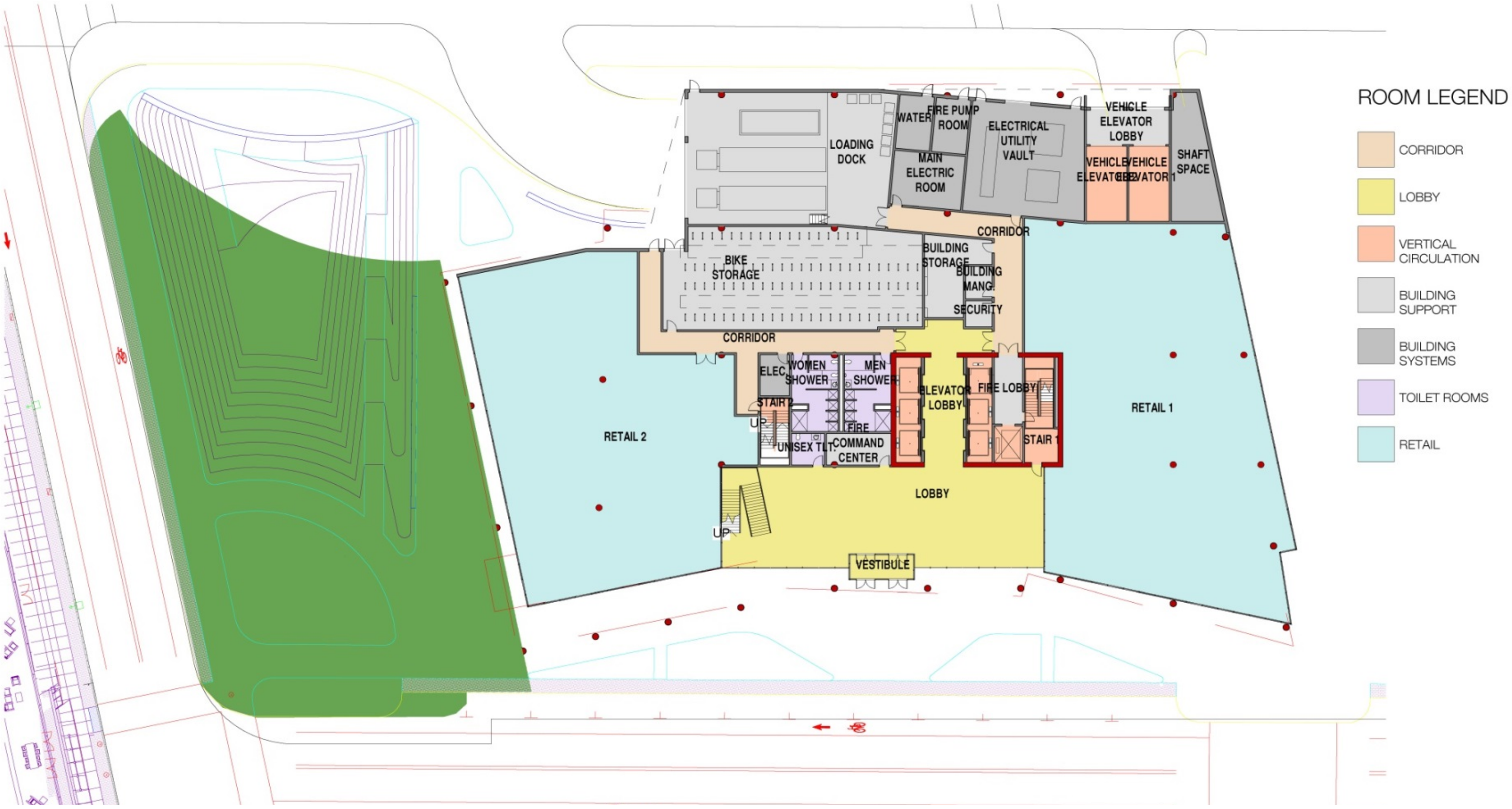


RUTHERFORD (VARIABLE WIDTH, PUBLIC) AVENUE
PARCEL ID 0202161000
LOT B
TOTAL AREA= 867,878 S.F.
19.924 ACRES
2 STORY CONCRETE
2 STORY BRICK AND CONCRETE
3 STORY BRICK
SPICE STREET
(PUBLIC- 50' WIDE)
STREET D
STREET E
VACANT CONSTRUCTION SITE
B (50' WIDE - PRIVATE) STREET
C (60' WIDE - PRIVATE) STREET
BUNKER HILL INDUSTRIAL PARK
LEGEND:
SHEET 1 OF 2
ALTA/ACSM LAND TITLE SURVEY
NO. 480-570 RUTHERFORD AVENUE
HOOD BUSINESS PARK
BOSTON (CHARLESTOWN), MASS.
SCALE: 1"=40'
JANUARY 29, 2010
HARRY R. FELDMAN, INC.
LAND SURVEYORS
112 SHAWMUT AVENUE
PHONE: (617)357-9740
BOSTON, MASS. 02118
WWW.HARRYRFELDMAN.COM
FELDMAN
Professional Land Surveyors
GRAPHIC SCALE
SEE SHEET 2 OF 2 FOR NOTES, DESCRIPTIONS, EXCEPTIONS FROM TITLE COMMITMENT, PARKING COUNT, LOCUS MAP AND REFERENCES

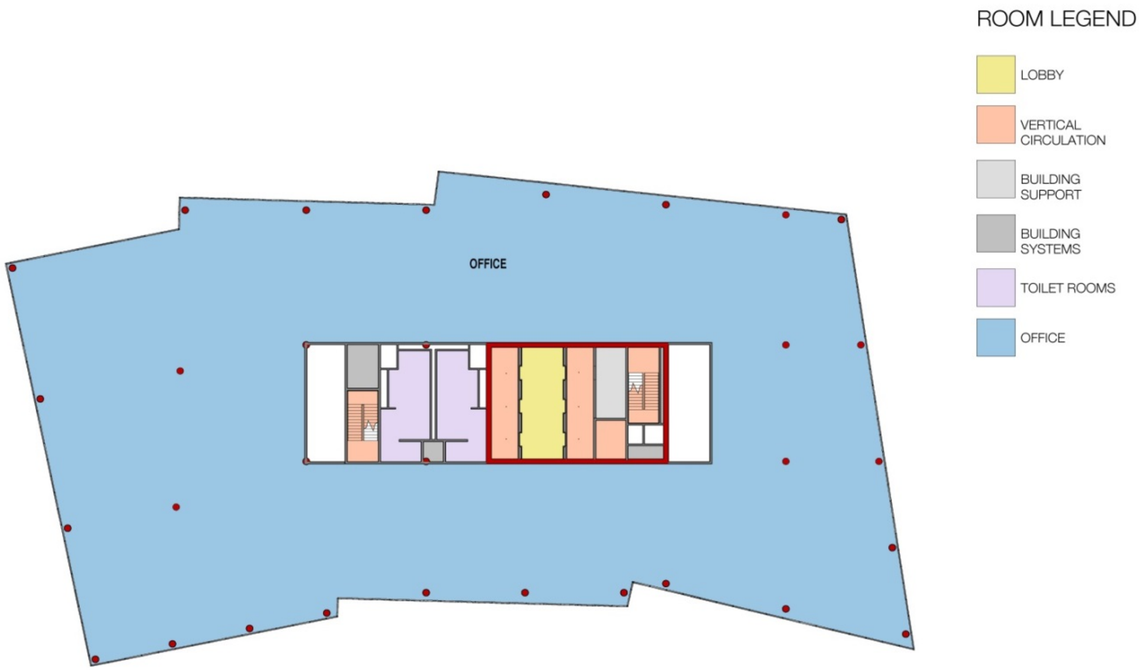
Appendix B

10 Stack Street Floor Plans


PARKING
AREA
Room
EXHAUST
ELEVATOR
LOBBY
FIRE LOBBY
STAIR 1
UP
STAIR 2
ROOM LEGEND
LOBBY
VERTICAL
CIRCULATION
BUILDING
SUPPORT
BUILDING
SYSTEMS

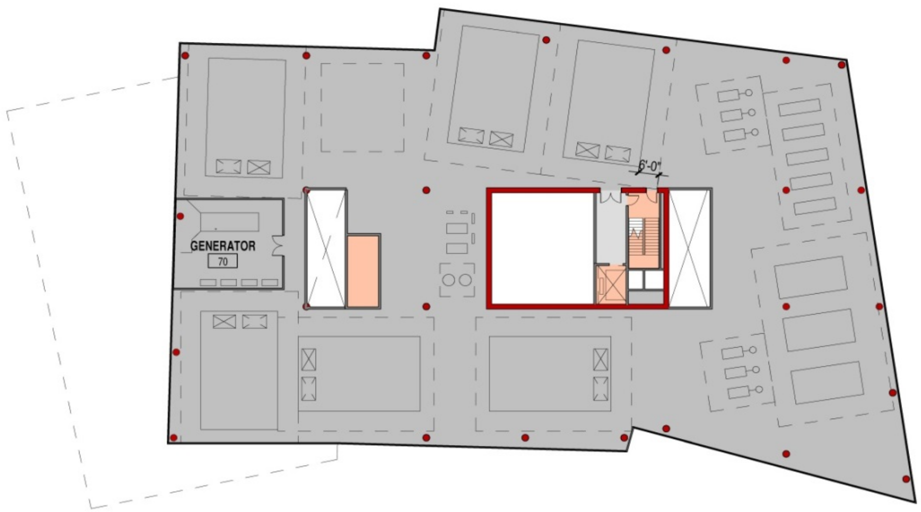

ROOM LEGEND
CORRIDOR
LOBBY
VERTICAL CIRCULATION
BUILDING SUPPORT
BUILDING SYSTEMS
TOILET ROOMS
RETAIL
LOADING DOCK
WATER
FIRE PUMP ROOM
MAIN ELECTRIC ROOM
ELECTRICAL UTILITY VAULT
VEHICLE ELEVATOR LOBBY
VEHICLE ELEVATOR 2
VEHICLE ELEVATOR 1
SHAFT SPACE
BIKE STORAGE
BUILDING STORAGE
BUILDING MANG.
SECURITY
CORRIDOR
ELEC.
WOMEN SHOWER
MEN SHOWER
STAIR 2
UNISEX TLT
FIRE COMMAND CENTER
ELEVATOR LOBBY
FIRE LOBBY
STAIR 1
RETAIL 1
RETAIL 2
LOBBY
VESTIBULE
UP

LEASABLE SPACE
ELEC.
MENS TOILET
WOMENS TOILET
ELEVATOR LOBBY
FIRE LOBBY
STAIR 1
STAIR 2
J.
TEL/DATA
BUILDING AMENITY
PATIO
ROOM LEGEND
LOBBY
VERTICAL CIRCULATION
BUILDING SUPPORT
BUILDING SYSTEMS
TOILET ROOMS
PATIO / BUILDING AMENITY
OFFICE



10 Stack Street – Typical Upper Floor Plan


INDIGO
OFFICE
PATIO
ELEC.
STAIR 1
MENS TOILET
WOMENS
TOILET
ELEVATOR
LOBBY
FIRE LOBBY
STAIR 2
TEL/DATA
ROOM LEGEND
LOBBY
VERTICAL
CIRCULATION
BUILDING
SUPPORT
BUILDING
SYSTEMS
TOILET ROOMS
PATIO /
BUILDING
AMENITY
OFFICE



ROOM LEGEND

VERTICAL CIRCULATION

BUILDING SUPPORT

BUILDING SYSTEMS

Appendix C

Transportation

Provided on CD ROM

Appendix D

Wind

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
1	A	Annual	13		Standing	19		Acceptable
	B	Annual	28	115%	Dangerous	37	95%	Unacceptable
2	A	Annual	14		Standing	19		Acceptable
	B	Annual	14		Standing	21	11%	Acceptable
3	A	Annual	14		Standing	19		Acceptable
	B	Annual	32	129%	Dangerous	42	121%	Unacceptable
4	A	Annual	14		Standing	21		Acceptable
	B	Annual	19	36%	Walking	29	38%	Acceptable
5	A	Annual	14		Standing	20		Acceptable
	B	Annual	13		Standing	20		Acceptable
6	A	Annual	13		Standing	18		Acceptable
	B	Annual	17	31%	Walking	25	39%	Acceptable
7	A	Annual	11		Sitting	17		Acceptable
	B	Annual	15	36%	Standing	23	35%	Acceptable
8	A	Annual	10		Sitting	16		Acceptable
	B	Annual	16	60%	Walking	26	62%	Acceptable
9	A	Annual	12		Sitting	18		Acceptable
	B	Annual	23	92%	Uncomfortable	31	72%	Acceptable
10	A	Annual	4		Sitting	6		Acceptable
	B	Annual	24	500%	Uncomfortable	33	450%	Unacceptable
11	A	Annual	5		Sitting	8		Acceptable
	B	Annual	22	340%	Uncomfortable	31	288%	Acceptable
12	A	Annual	5		Sitting	8		Acceptable
	B	Annual	30	500%	Dangerous	39	388%	Unacceptable
13	A	Annual	12		Sitting	17		Acceptable
	B	Annual	15	25%	Standing	22	29%	Acceptable
14	A	Annual	13		Standing	19		Acceptable
	B	Annual	22	69%	Uncomfortable	30	58%	Acceptable
15	A	Annual	5		Sitting	8		Acceptable
	B	Annual	19	280%	Walking	29	262%	Acceptable
16	A	Annual	5		Sitting	8		Acceptable
	B	Annual	31	520%	Dangerous	40	400%	Unacceptable
17	A	Annual	4		Sitting	5		Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed: Speed (mph)	Mean Wind Speed: % Change	Mean Wind Speed: Rating	Effective Gust Wind Speed: Speed (mph)	Effective Gust Wind Speed: % Change	Effective Gust Wind Speed: Rating
	B	Annual	24	500%	Uncomfortable	33	560%	Unacceptable
18	A	Annual	11		Sitting	17		Acceptable
	B	Annual	22	100%	Uncomfortable	31	82%	Acceptable
19	A	Annual	15		Standing	21		Acceptable
	B	Annual	16		Walking	25	19%	Acceptable
20	A	Annual	13		Standing	19		Acceptable
	B	Annual	24	85%	Uncomfortable	33	74%	Unacceptable
21	A	Annual	10		Sitting	15		Acceptable
	B	Annual	14	40%	Standing	22	47%	Acceptable
22	A	Annual	12		Sitting	17		Acceptable
	B	Annual	10	-17%	Sitting	19	12%	Acceptable
23	A	Annual	12		Sitting	17		Acceptable
	B	Annual	14	17%	Standing	23	35%	Acceptable
24	A	Annual	12		Sitting	18		Acceptable
	B	Annual	13		Standing	20	11%	Acceptable
25	A	Annual	12		Sitting	18		Acceptable
	B	Annual	15	25%	Standing	22	22%	Acceptable
26	A	Annual	13		Standing	18		Acceptable
	B	Annual	15	15%	Standing	21	17%	Acceptable
27	A	Annual	13		Standing	18		Acceptable
	B	Annual	12		Sitting	19		Acceptable
28	A	Annual	13		Standing	18		Acceptable
	B	Annual	11	-15%	Sitting	19		Acceptable
29	A	Annual	12		Sitting	17		Acceptable
	B	Annual	14	17%	Standing	22	29%	Acceptable
30	A	Annual	11		Sitting	16		Acceptable
	B	Annual	16	45%	Walking	23	44%	Acceptable
31	A	Annual	13		Standing	20		Acceptable
	B	Annual	11	-15%	Sitting	18		Acceptable
32	A	Annual	7		Sitting	11		Acceptable
	B	Annual	6	-14%	Sitting	9	-18%	Acceptable
33	A	Annual	15		Standing	22		Acceptable
	B	Annual	9	-40%	Sitting	15	-32%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
34	A	Annual	13		Standing	20		Acceptable
	B	Annual	11	-15%	Sitting	17	-15%	Acceptable
35	A	Annual	10		Sitting	16		Acceptable
	B	Annual	10		Sitting	16		Acceptable
36	A	Annual	11		Sitting	17		Acceptable
	B	Annual	10		Sitting	15	-12%	Acceptable
37	A	Annual	6		Sitting	9		Acceptable
	B	Annual	6		Sitting	10	11%	Acceptable
38	A	Annual	12		Sitting	17		Acceptable
	B	Annual	11		Sitting	16		Acceptable
39	A	Annual	15		Standing	23		Acceptable
	B	Annual	12	-20%	Sitting	19	-17%	Acceptable
40	A	Annual	16		Walking	25		Acceptable
	B	Annual	14	-12%	Standing	21	-16%	Acceptable
41	A	Annual	11		Sitting	19		Acceptable
	B	Annual	9	-18%	Sitting	16	-16%	Acceptable
42	A	Annual	16		Walking	23		Acceptable
	B	Annual	12	-25%	Sitting	19	-17%	Acceptable
43	A	Annual	14		Standing	20		Acceptable
	B	Annual	10	-29%	Sitting	17	-15%	Acceptable
44	A	Annual	16		Walking	22		Acceptable
	B	Annual	14	-12%	Standing	22		Acceptable
45	A	Annual	18		Walking	26		Acceptable
	B	Annual	13	-28%	Standing	21	-19%	Acceptable
46	A	Annual	8		Sitting	15		Acceptable
	B	Annual	16	100%	Walking	22	47%	Acceptable
47	A	Annual	16		Walking	24		Acceptable
	B	Annual	12	-25%	Sitting	18	-25%	Acceptable
48	A	Annual	12		Sitting	18		Acceptable
	B	Annual	11		Sitting	17		Acceptable
49	A	Annual	14		Standing	20		Acceptable
	B	Annual	12	-14%	Sitting	19		Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
50	A	Annual	12		Sitting	18		Acceptable
	B	Annual	14	17%	Standing	20	11%	Acceptable
51	A	Annual	14		Standing	21		Acceptable
	B	Annual	19	36%	Walking	26	24%	Acceptable
52	A	Annual	11		Sitting	18		Acceptable
	B	Annual	11		Sitting	16	-11%	Acceptable
53	A	Annual	15		Standing	21		Acceptable
	B	Annual	14		Standing	22		Acceptable
54	A	Annual	15		Standing	22		Acceptable
	B	Annual	16		Walking	25	14%	Acceptable
55	A	Annual	4		Sitting	6		Acceptable
	B	Annual	4		Sitting	6		Acceptable
56	A	Annual	10		Sitting	16		Acceptable
	B	Annual	8	-20%	Sitting	13	-19%	Acceptable
57	A	Annual	13		Standing	19		Acceptable
	B	Annual	16	23%	Walking	23	21%	Acceptable
58	A	Annual	12		Sitting	18		Acceptable
	B	Annual	18	50%	Walking	25	39%	Acceptable
59	A	Annual	13		Standing	20		Acceptable
	B	Annual	14		Standing	20		Acceptable
60	A	Annual	10		Sitting	16		Acceptable
	B	Annual	13	30%	Standing	21	31%	Acceptable
61	A	Annual	13		Standing	18		Acceptable
	B	Annual	8	-38%	Sitting	13	-28%	Acceptable
62	A	Annual	14		Standing	19		Acceptable
	B	Annual	9	-36%	Sitting	14	-26%	Acceptable
63	A	Annual	13		Standing	18		Acceptable
	B	Annual	11	-15%	Sitting	16	-11%	Acceptable
64	A	Annual	13		Standing	18		Acceptable
	B	Annual	10	-23%	Sitting	15	-17%	Acceptable
65	A	Annual	14		Standing	19		Acceptable
	B	Annual	14		Standing	20		Acceptable
66	A	Annual	13		Standing	19		Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
	B	Annual	20	54%	Uncomfortable	27	42%	Acceptable
67	A	Annual	13		Standing	19		Acceptable
	B	Annual	20	54%	Uncomfortable	29	53%	Acceptable
68	A	Annual	14		Standing	20		Acceptable
	B	Annual	14		Standing	21		Acceptable
69	A	Annual	14		Standing	19		Acceptable
	B	Annual	26	86%	Uncomfortable	35	84%	Unacceptable
70	A	Annual	14		Standing	19		Acceptable
	B	Annual	26	86%	Uncomfortable	35	84%	Unacceptable
71	A	Annual	13		Standing	18		Acceptable
	B	Annual	22	69%	Uncomfortable	32	78%	Unacceptable
72	A	Annual	14		Standing	19		Acceptable
	B	Annual	12	-14%	Sitting	18		Acceptable
73	A	Annual	14		Standing	20		Acceptable
	B	Annual	10	-29%	Sitting	18		Acceptable
74	A	Annual	13		Standing	19		Acceptable
	B	Annual	25	92%	Uncomfortable	34	79%	Unacceptable
75	A	Annual	14		Standing	20		Acceptable
	B	Annual	19	36%	Walking	28	40%	Acceptable
76	A	Annual	14		Standing	20		Acceptable
	B	Annual	21	50%	Uncomfortable	29	45%	Acceptable
77	A	Annual	13		Standing	19		Acceptable
	B	Annual	24	85%	Uncomfortable	31	63%	Acceptable
78	A	Annual	14		Standing	20		Acceptable
	B	Annual	19	36%	Walking	25	25%	Acceptable
79	A	Annual	14		Standing	20		Acceptable
	B	Annual	11	-21%	Sitting	15	-25%	Acceptable
80	A	Annual	14		Standing	20		Acceptable
	B	Annual	10	-29%	Sitting	14	-30%	Acceptable
81	A	Annual	14		Standing	20		Acceptable
	B	Annual	22	57%	Uncomfortable	28	40%	Acceptable
82	A	Annual	14		Standing	20		Acceptable
	B	Annual	20	43%	Uncomfortable	28	40%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
83	A	Annual	14		Standing	20		Acceptable
	B	Annual	18	29%	Walking	25	25%	Acceptable
84	A	Annual	13		Standing	19		Acceptable
	B	Annual	18	38%	Walking	25	32%	Acceptable
85	A	Annual	14		Standing	20		Acceptable
	B	Annual	17	21%	Walking	25	25%	Acceptable
86	A	Annual	14		Standing	20		Acceptable
	B	Annual	22	57%	Uncomfortable	31	55%	Acceptable
87	A	Annual	14		Standing	20		Acceptable
	B	Annual	11	-21%	Sitting	17	-15%	Acceptable
88	A	Annual	12		Sitting	18		Acceptable
	B	Annual	19	58%	Walking	26	44%	Acceptable
89	A	Annual	13		Standing	19		Acceptable
	B	Annual	13		Standing	19		Acceptable
90	A	Annual	11		Sitting	17		Acceptable
	B	Annual	17	55%	Walking	25	47%	Acceptable
91	A	Annual	12		Sitting	17		Acceptable
	B	Annual	12		Sitting	18		Acceptable
92	A	Annual	13		Standing	18		Acceptable
	B	Annual	14		Standing	20	11%	Acceptable
93	A	Annual	12		Sitting	17		Acceptable
	B	Annual	13		Standing	19	12%	Acceptable
94	A	Annual	11		Sitting	16		Acceptable
	B	Annual	10		Sitting	16		Acceptable
95	A	Annual	13		Standing	18		Acceptable
	B	Annual	11	-15%	Sitting	17		Acceptable
96	A	Annual	13		Standing	17		Acceptable
	B	Annual	12		Sitting	17		Acceptable
97	A	Annual	13		Standing	19		Acceptable
	B	Annual	14		Standing	20		Acceptable
98	A	Annual	14		Standing	20		Acceptable
	B	Annual	17	21%	Walking	25	25%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
99	A	Annual	12		Sitting	18		Acceptable
	B	Annual	16	33%	Walking	24	33%	Acceptable
100	A	Annual	13		Standing	19		Acceptable
	B	Annual	19	46%	Walking	27	42%	Acceptable
101	A	Annual	11		Sitting	16		Acceptable
	B	Annual	13	18%	Standing	19	19%	Acceptable
102	A	Annual	10		Sitting	16		Acceptable
	B	Annual	10		Sitting	16		Acceptable
103	A	Annual	12		Sitting	18		Acceptable
	B	Annual	17	42%	Walking	24	33%	Acceptable
104	A	Annual	13		Standing	18		Acceptable
	B	Annual	14		Standing	20	11%	Acceptable
105	A	Annual	13		Standing	19		Acceptable
	B	Annual	15	15%	Standing	21	11%	Acceptable
106	A	Annual	13		Standing	18		Acceptable
	B	Annual	12		Sitting	18		Acceptable
107	A	Annual	12		Sitting	17		Acceptable
	B	Annual	16	33%	Walking	24	41%	Acceptable
108	A	Annual	12		Sitting	18		Acceptable
	B	Annual	16	33%	Walking	24	33%	Acceptable
109	A	Annual	12		Sitting	18		Acceptable
	B	Annual	18	50%	Walking	26	44%	Acceptable
110	A	Annual	12		Sitting	18		Acceptable
	B	Annual	17	42%	Walking	25	39%	Acceptable
111	A	Annual	11		Sitting	16		Acceptable
	B	Annual	10		Sitting	16		Acceptable
112	A	Annual	11		Sitting	16		Acceptable
	B	Annual	14	27%	Standing	21	31%	Acceptable
113	A	Annual	12		Sitting	18		Acceptable
	B	Annual	14	17%	Standing	21	17%	Acceptable
114	A	Annual	14		Standing	21		Acceptable
	B	Annual	18	29%	Walking	26	24%	Acceptable
115	A	Annual	14		Standing	19		Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
	B	Annual	19	36%	Walking	28	47%	Acceptable
116	A	Annual	14		Standing	20		Acceptable
	B	Annual	21	50%	Uncomfortable	30	50%	Acceptable
117	A	Annual	13		Standing	19		Acceptable
	B	Annual	13		Standing	20		Acceptable
118	A	Annual	13		Standing	19		Acceptable
	B	Annual	17	31%	Walking	25	32%	Acceptable
119	A	Annual	14		Standing	19		Acceptable
	B	Annual	33	136%	Dangerous	41	116%	Unacceptable
120	A	Annual	14		Standing	20		Acceptable
	B	Annual	28	100%	Dangerous	35	75%	Unacceptable
121	A	Annual	15		Standing	20		Acceptable
	B	Annual	20	33%	Uncomfortable	27	35%	Acceptable
122	A	Annual	15		Standing	20		Acceptable
	B	Annual	13	-13%	Standing	18		Acceptable
123	A	Annual	14		Standing	21		Acceptable
	B	Annual	12	-14%	Sitting	19		Acceptable
124	A	Annual	14		Standing	21		Acceptable
	B	Annual	14		Standing	20		Acceptable
125	A	Annual	5		Sitting	8		Acceptable
	B	Annual	12	140%	Sitting	17	112%	Acceptable
126	A	Annual	4		Sitting	7		Acceptable
	B	Annual	20	400%	Uncomfortable	29	314%	Acceptable
127	A	Annual	12		Sitting	18		Acceptable
	B	Annual	9	-25%	Sitting	16	-11%	Acceptable
128	A	Annual	13		Standing	18		Acceptable
	B	Annual	8	-38%	Sitting	14	-22%	Acceptable
129	A	Annual	13		Standing	18		Acceptable
	B	Annual	7	-46%	Sitting	12	-33%	Acceptable
130	A	Annual	4		Sitting	7		Acceptable
	B	Annual	18	350%	Walking	27	286%	Acceptable
131	A	Annual	13		Standing	19		Acceptable
	B	Annual	13		Standing	21	11%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
132	A	Annual	18		Walking	25		Acceptable
	B	Annual	15	-17%	Standing	22	-12%	Acceptable
133	A	Annual	16		Walking	22		Acceptable
	B	Annual	12	-25%	Sitting	19	-14%	Acceptable
134	A	Annual	14		Standing	20		Acceptable
	B	Annual	13		Standing	21		Acceptable
135	A	Annual	14		Standing	20		Acceptable
	B	Annual	13		Standing	20		Acceptable
136	A	Annual	14		Standing	20		Acceptable
	B	Annual	9	-36%	Sitting	15	-25%	Acceptable
137	A	Annual	13		Standing	19		Acceptable
	B	Annual	12		Sitting	18		Acceptable
138	A	Annual	18		Walking	25		Acceptable
	B	Annual	16	-11%	Walking	27		Acceptable
139	A	Annual	12		Sitting	18		Acceptable
	B	Annual	11		Sitting	17		Acceptable
140	A	Annual	13		Standing	20		Acceptable
	B	Annual	12		Sitting	20		Acceptable
141	A	Annual	10		Sitting	17		Acceptable
	B	Annual	9		Sitting	15	-12%	Acceptable
142	A	Annual	9		Sitting	15		Acceptable
	B	Annual	9		Sitting	14		Acceptable
143	A	Annual	9		Sitting	15		Acceptable
	B	Annual	9		Sitting	15		Acceptable
144	A	Annual	9		Sitting	14		Acceptable
	B	Annual	8	-11%	Sitting	13		Acceptable
145	A	Annual	10		Sitting	15		Acceptable
	B	Annual	10		Sitting	15		Acceptable
146	A	Annual	10		Sitting	16		Acceptable
	B	Annual	9		Sitting	15		Acceptable
147	A	Annual	11		Sitting	18		Acceptable
	B	Annual	9	-18%	Sitting	16	-11%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
148	A	Annual	9		Sitting	15		Acceptable
	B	Annual	8	-11%	Sitting	14		Acceptable
149	A	Annual	10		Sitting	15		Acceptable
	B	Annual	9		Sitting	15		Acceptable
150	A	Annual	15		Standing	22		Acceptable
	B	Annual	12	-20%	Sitting	18	-18%	Acceptable
151	A	Annual	16		Walking	24		Acceptable
	B	Annual	11	-31%	Sitting	18	-25%	Acceptable
152	A	Annual	15		Standing	23		Acceptable
	B	Annual	11	-27%	Sitting	17	-26%	Acceptable
153	A	Annual	21		Uncomfortable	30		Acceptable
	B	Annual	18	-14%	Walking	27		Acceptable
154	A	Annual	8		Sitting	14		Acceptable
	B	Annual	8		Sitting	13		Acceptable
155	A	Annual	12		Sitting	19		Acceptable
	B	Annual	11		Sitting	18		Acceptable
156	A	Annual	13		Standing	20		Acceptable
	B	Annual	11	-15%	Sitting	18		Acceptable
157	A	Annual	12		Sitting	18		Acceptable
	B	Annual	12		Sitting	19		Acceptable
158	A	Annual	9		Sitting	15		Acceptable
	B	Annual	10	11%	Sitting	16		Acceptable
159	A	Annual	12		Sitting	18		Acceptable
	B	Annual	10	-17%	Sitting	15	-17%	Acceptable

Configurations	Mean Wind Criteria Speed (mph)		Effective Gust Criteria (mph)	
No Build	≤ 12	Comfortable for Sitting	≤ 31	Acceptable
	13 - 15	Comfortable for Standing	> 31	Unacceptable
Build	16 - 19	Comfortable for Walking		
	20 - 27	Uncomfortable for Walking		
	> 27	Dangerous Conditions		

Notes

1) Wind Speeds are for a 1% probability of exceedance

2) % Change is based on comparison with Configuration A

3) % changes less than 10% are excluded

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
1	A	15	10	13	14	21	14	19	20
	B	29	23	27	30	38	30	35	40
2	A	15	11	14	15	20	15	19	20
	B	14	11	14	15	22	17	21	23
3	A	15	11	13	15	20	15	19	21
	B	33	24	30	36	42	31	39	46
4	A	15	11	14	16	21	16	20	22
	B	20	15	19	21	31	23	29	32
5	A	14	11	13	15	21	16	19	21
	B	13	10	12	14	21	16	19	22
6	A	13	11	12	13	20	15	18	20
	B	18	14	17	18	27	21	25	27
7	A	11	9	10	12	17	13	16	19
	B	15	11	14	16	24	18	22	26
8	A	11	8	10	11	17	12	15	17
	B	16	12	15	17	26	20	24	28
9	A	13	10	12	13	19	15	17	19
	B	23	17	22	26	32	24	29	35
10	A	4	3	4	4	6	5	6	6
	B	26	19	24	26	36	26	33	35
11	A	5	4	5	5	8	6	7	8
	B	23	18	22	24	32	24	30	34
12	A	5	4	5	6	9	7	8	9
	B	30	23	28	34	39	30	36	43
13	A	12	10	11	13	17	14	16	18
	B	15	11	14	17	23	17	21	25
14	A	13	10	13	15	20	15	19	21
	B	23	18	21	24	31	24	29	32
15	A	5	4	5	6	9	6	8	9
	B	20	15	18	21	29	23	27	31
16	A	5	4	5	5	8	7	8	9
	B	31	23	29	34	41	30	37	45
17	A	4	3	4	4	5	4	5	6

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
	B	24	18	23	26	34	25	31	37
18	A	11	9	11	12	17	13	16	18
	B	22	16	20	24	31	23	29	34
19	A	16	12	15	17	21	16	20	22
	B	17	13	16	18	26	20	24	27
20	A	14	10	12	14	20	15	18	20
	B	24	18	22	27	33	25	31	38
21	A	11	9	10	11	16	13	15	16
	B	15	11	13	15	24	17	22	24
22	A	13	10	12	12	18	14	17	18
	B	11	8	10	11	20	14	18	20
23	A	12	10	11	12	18	14	17	18
	B	14	10	13	15	23	17	21	25
24	A	13	12	12	12	20	17	18	19
	B	13	9	12	14	20	15	19	23
25	A	13	10	12	13	19	14	17	19
	B	15	12	14	16	24	18	21	24
26	A	13	11	12	13	19	15	18	19
	B	15	11	14	16	22	16	20	23
27	A	14	11	13	14	19	15	18	20
	B	12	9	11	13	19	14	18	21
28	A	13	11	12	13	19	15	18	19
	B	11	8	10	12	19	14	17	21
29	A	13	10	12	13	18	15	17	18
	B	15	11	14	16	23	17	21	24
30	A	12	9	11	11	17	14	16	17
	B	16	12	15	18	25	18	22	26
31	A	13	11	13	14	20	17	19	21
	B	11	8	10	12	18	14	17	20
32	A	7	6	7	8	12	9	11	12
	B	6	5	6	7	10	7	9	10
33	A	15	11	14	17	23	17	21	25
	B	9	8	9	10	16	13	15	17

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
34	A	14	11	13	14	20	15	19	21
	B	11	10	10	11	18	15	16	18
35	A	11	8	10	11	17	12	15	18
	B	10	8	9	10	16	13	15	18
36	A	12	10	11	11	18	15	16	17
	B	11	9	10	10	17	14	15	16
37	A	6	5	5	6	10	8	9	10
	B	7	6	6	7	11	9	10	11
38	A	12	10	12	12	18	15	17	18
	B	12	10	11	12	17	14	16	17
39	A	15	12	14	16	23	18	22	25
	B	12	10	11	12	19	16	18	20
40	A	17	13	16	18	25	20	23	27
	B	14	11	13	15	21	17	20	23
41	A	12	9	11	13	19	14	18	21
	B	10	7	9	10	16	12	15	17
42	A	17	14	16	17	24	20	23	25
	B	13	10	12	13	20	16	19	21
43	A	15	13	14	15	21	18	20	22
	B	10	8	10	11	17	14	17	19
44	A	17	15	16	17	23	19	22	24
	B	14	12	14	15	23	19	22	24
45	A	19	17	18	19	27	24	26	28
	B	13	10	13	14	22	16	20	23
46	A	9	7	8	9	15	12	14	16
	B	17	15	16	16	24	21	22	22
47	A	16	13	16	18	24	20	23	26
	B	13	10	12	13	19	14	18	19
48	A	12	9	11	13	18	14	17	19
	B	12	10	11	11	18	15	17	18
49	A	14	11	13	15	20	16	19	23
	B	13	10	12	13	19	15	18	20

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
50	A B	12 15	10 13	12 14	13 14	18 21	14 18	17 20	19 21
51	A B	14 20	11 16	13 19	15 20	21 28	16 21	19 26	23 27
52	A B	11 11	8 8	10 10	12 11	18 17	14 13	17 16	19 18
53	A B	15 15	11 13	14 14	16 15	22 22	17 18	20 21	23 23
54	A B	16 16	12 13	15 16	17 18	23 25	17 20	21 24	23 27
55	A B	4 4	3 3	4 4	5 5	7 7	5 5	6 6	7 7
56	A B	11 8	9 7	10 7	10 8	17 13	14 11	16 12	16 14
57	A B	13 17	11 14	12 16	13 16	19 24	16 21	18 23	20 24
58	A B	12 19	9 14	11 18	13 19	18 27	14 20	17 25	19 27
59	A B	14 15	11 13	12 14	14 13	21 22	16 19	19 20	22 20
60	A B	11 13	9 10	10 12	11 15	17 21	14 15	16 19	17 23
61	A B	13 8	10 6	12 8	14 8	19 14	15 11	18 13	19 14
62	A B	14 10	10 8	13 9	15 10	20 15	15 11	18 14	21 15
63	A B	13 13	11 9	12 11	13 12	18 18	15 12	17 16	19 17
64	A B	14 11	11 8	13 10	14 11	19 17	15 12	18 15	19 16
65	A B	14 16	10 11	13 14	15 15	20 22	15 15	18 20	21 21
66	A	14	10	13	14	19	15	18	21

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
	B	22	15	20	21	29	21	27	29
67	A	14	10	13	15	19	15	18	21
	B	22	16	20	21	30	24	28	30
68	A	14	11	13	15	21	16	19	22
	B	14	11	13	15	21	16	20	23
69	A	14	11	13	15	20	15	19	21
	B	26	21	25	28	35	28	33	37
70	A	14	11	13	15	20	16	19	21
	B	27	21	25	28	36	28	33	37
71	A	13	11	13	14	19	15	18	20
	B	23	19	21	23	33	28	31	34
72	A	14	11	13	15	20	15	19	21
	B	12	11	12	12	19	17	18	19
73	A	14	11	13	15	20	16	19	21
	B	11	9	10	11	18	16	18	18
74	A	14	11	13	14	20	16	19	21
	B	25	22	25	27	34	30	33	36
75	A	15	11	14	15	21	16	19	22
	B	20	15	18	22	29	21	26	30
76	A	15	11	14	15	21	16	19	22
	B	22	18	20	22	31	24	29	31
77	A	14	11	13	14	19	16	18	20
	B	24	20	23	26	32	26	30	34
78	A	14	11	13	15	20	16	19	21
	B	19	16	18	21	26	22	25	27
79	A	14	11	14	15	20	16	19	21
	B	11	8	10	12	15	12	15	17
80	A	14	11	13	15	20	16	19	21
	B	10	7	9	11	14	11	13	15
81	A	14	11	13	15	20	16	19	21
	B	22	16	20	24	28	21	26	31
82	A	14	11	14	15	21	16	19	22
	B	20	15	19	23	28	21	26	31

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
83	A	14	11	13	15	21	16	19	22
	B	18	15	17	19	26	22	24	28
84	A	14	11	13	14	20	16	19	21
	B	18	16	17	19	26	22	25	27
85	A	15	11	14	15	21	16	19	22
	B	18	14	17	18	26	21	24	26
86	A	14	11	13	15	20	16	19	22
	B	22	16	20	25	31	24	29	35
87	A	14	11	13	15	21	16	19	22
	B	11	8	10	12	17	13	16	19
88	A	13	10	12	13	19	14	17	19
	B	19	17	19	21	26	23	26	28
89	A	13	11	12	14	19	15	18	20
	B	13	12	13	14	20	17	19	20
90	A	12	10	11	12	18	14	17	18
	B	18	14	17	19	25	19	23	27
91	A	13	10	12	13	18	15	17	18
	B	13	10	12	13	19	16	18	19
92	A	13	11	12	14	19	16	18	19
	B	14	11	13	15	20	15	19	22
93	A	13	10	12	13	18	14	17	19
	B	13	10	12	14	20	14	18	20
94	A	11	8	10	12	17	13	15	18
	B	10	8	9	11	16	13	15	17
95	A	14	11	13	14	19	15	18	20
	B	12	9	11	12	17	13	16	18
96	A	13	10	12	14	18	14	17	19
	B	12	9	12	14	17	13	16	19
97	A	14	10	13	14	20	15	18	20
	B	14	10	13	15	20	15	19	22
98	A	15	11	14	16	21	16	20	22
	B	17	13	16	19	26	20	24	27

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
99	A B	13 16	10 13	12 15	13 18	19 24	15 19	18 23	19 26
100	A B	13 19	10 15	13 18	14 21	19 27	15 21	18 26	20 30
101	A B	11 13	8 10	10 12	12 15	17 19	13 15	16 19	17 22
102	A B	10 11	8 8	10 10	11 11	16 16	13 13	15 15	17 17
103	A B	13 17	10 13	12 16	13 19	19 25	14 19	18 23	19 27
104	A B	13 14	10 11	13 13	13 16	19 20	15 15	18 19	20 22
105	A B	14 15	10 11	13 13	14 16	20 21	15 16	18 20	20 23
106	A B	13 12	10 9	13 11	14 13	19 18	14 14	18 17	19 19
107	A B	12 17	9 13	12 15	13 18	18 24	14 20	17 23	19 26
108	A B	13 17	10 13	12 16	13 18	18 25	14 19	17 23	19 27
109	A B	13 18	10 14	12 17	13 20	19 26	14 21	17 25	19 29
110	A B	13 17	9 13	12 16	13 18	19 25	14 20	17 24	19 27
111	A B	11 10	9 7	11 9	12 10	16 16	12 12	15 15	17 17
112	A B	12 14	8 11	11 13	12 15	18 22	13 17	16 20	18 23
113	A B	12 14	9 11	12 13	13 16	18 22	14 17	17 20	20 24
114	A B	14 18	11 13	14 16	16 20	21 26	16 20	20 24	23 29
115	A	14	11	13	15	20	15	19	21

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
	B	20	16	18	20	28	23	27	30
116	A	15	12	14	15	21	16	20	21
	B	22	18	20	23	31	25	29	32
117	A	13	10	13	14	20	15	18	21
	B	14	11	12	14	21	17	19	21
118	A	13	10	12	14	20	16	19	21
	B	18	15	17	18	26	22	25	26
119	A	14	10	13	15	20	15	18	21
	B	33	25	31	37	41	31	39	46
120	A	15	11	13	15	21	15	19	22
	B	28	21	26	31	35	27	33	38
121	A	15	11	14	16	21	16	19	22
	B	20	15	18	22	27	21	26	31
122	A	15	11	14	16	20	15	19	22
	B	13	10	12	14	19	15	17	20
123	A	15	12	14	15	22	17	20	22
	B	12	9	12	14	19	15	18	21
124	A	14	11	13	16	21	16	20	23
	B	14	11	13	15	20	16	19	22
125	A	5	4	5	5	8	6	8	8
	B	14	9	12	13	18	13	17	18
126	A	4	3	4	5	7	5	7	7
	B	20	15	18	22	29	22	26	32
127	A	12	10	11	12	18	15	18	20
	B	9	7	9	10	16	12	15	17
128	A	14	11	12	14	19	15	18	19
	B	8	6	8	9	14	10	13	15
129	A	14	10	13	14	20	14	18	19
	B	8	6	7	8	13	10	12	13
130	A	4	3	4	5	7	5	6	7
	B	18	14	17	20	27	21	25	30
131	A	14	11	13	14	20	16	19	21
	B	14	11	13	14	22	16	20	23

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
132	A	19	15	18	19	27	20	25	26
	B	17	12	15	16	24	17	22	23
133	A	18	13	16	17	25	18	22	24
	B	13	10	12	13	20	15	19	21
134	A	14	11	13	14	21	16	19	22
	B	14	10	13	15	21	16	19	23
135	A	14	12	13	15	21	17	20	22
	B	13	10	12	14	21	16	19	22
136	A	15	12	14	15	22	16	20	22
	B	10	7	9	10	16	11	15	16
137	A	14	11	13	14	20	15	18	20
	B	13	9	12	12	19	14	18	19
138	A	18	14	17	20	25	19	23	28
	B	17	12	15	18	27	20	24	30
139	A	13	10	12	13	20	15	18	20
	B	11	9	10	12	18	14	16	18
140	A	13	10	12	15	20	15	19	22
	B	12	9	11	14	20	15	18	22
141	A	10	8	9	11	17	13	16	19
	B	9	7	8	9	16	12	14	17
142	A	10	7	9	10	16	11	14	16
	B	9	7	9	10	15	11	14	15
143	A	10	8	9	10	16	12	15	16
	B	10	8	9	10	16	12	14	16
144	A	9	8	8	9	14	12	13	14
	B	9	7	8	8	14	11	12	13
145	A	10	8	9	10	16	12	15	16
	B	10	8	9	10	16	12	15	16
146	A	10	8	10	10	17	14	16	17
	B	10	7	9	10	15	12	15	16
147	A	11	10	11	12	18	15	17	19
	B	9	7	9	10	16	13	15	17

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
148	A	10	7	9	10	16	12	15	16
	B	9	7	8	9	15	11	14	15
149	A	10	8	10	11	16	13	15	17
	B	9	7	9	10	15	12	14	16
150	A	17	11	15	16	24	16	22	23
	B	13	9	12	13	20	14	18	19
151	A	16	12	15	17	25	19	23	27
	B	12	10	11	12	19	15	18	19
152	A	15	11	14	16	23	17	21	25
	B	11	8	10	12	18	13	16	19
153	A	21	16	19	22	31	23	28	32
	B	19	14	17	20	28	21	25	29
154	A	9	7	8	9	15	11	14	15
	B	8	6	8	8	14	10	13	13
155	A	12	9	11	13	19	14	18	20
	B	12	9	11	12	18	14	17	20
156	A	14	10	13	14	21	15	20	21
	B	12	9	12	12	19	14	18	19
157	A	13	10	12	13	19	15	18	20
	B	13	10	12	13	19	16	18	20
158	A	10	7	9	10	17	12	15	16
	B	10	7	9	10	18	12	16	17
159	A	12	10	11	13	18	14	17	20
	B	10	9	10	11	16	13	15	17

Seasons	Months	Mean Wind Criteria Speed (mph)		Effective Gust Criteria (mph)
Spring	March - May	≤ 12	Comfortable for Sitting	≤ 31 Acceptable
Summer	June - August	13 - 15	Comfortable for Standing	> 31 Unacceptable
Fall	September - November	16 - 19	Comfortable for Walking	
Winter	December - February	20 - 27	Uncomfortable for Walking	
Annual	January - December	> 27	Dangerous Conditions	

Configurations

No Build

Build

Notes

1) Wind Speeds are for a 1% probability of exceedance

Appendix E

Climate Change Checklist

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

Submitted: 09/14/2018 08:58:01

A.1 - Project Information

Project Name:	Hood Park - Master Plan			
Project Address:	10 Stack Street, Boston, MA			
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)			
Filing Contact:	Thomas Chase	New Ecology, Inc.	chase@newecology.org	6175571700
Is MEPA approval required?	Yes	MEPA date:	07/02/2018	

A.2 - Project Team

Owner / Developer:	Hood Park, LLC
Architect:	SMMA
Engineer:	SMMA
Sustainability / LEED:	New Ecology, Inc.
Permitting:	Epsilon Associates, Inc.
Construction Management:	Lee Kennedy Co., Inc.

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Commercial (office, lab, retail, hotel, high rise residential)
List the First Floor Uses:	Commercial
List any Critical Site Infrastructure and or Building Uses:	None

Site and Building:

Site Area (SF):	882000	Building Area (SF):	965000
Building Height (Ft):	290	Building Height (Stories):	25
Existing Site Elevation – Low (Ft BCB):	17.5	Existing Site Elevation – High (Ft BCB):	17.5
Proposed Site Elevation – Low (Ft BCB):	20	Proposed Site Elevation – High (Ft BCB):	20
Proposed First Floor Elevation (Ft BCB):	20	Below grade spaces/levels (#):	0

Article 37 Green Building:

LEED Version - Rating System:	LEED BD+C v4 Core and Shell,	LEED Certification:	Yes

Boston Planning & Development Agency
Climate Resiliency Report Summary

	New Construction, Hospitality		
Proposed LEED rating:	Silver	Proposed LEED point score (Pts.):	Preliminary: 51-52 points

Building Envelope:

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

Roof:	30	Exposed Floor :	30
Foundation Wall:	10	Slab Edge (at or below grade):	10

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

Area of Opaque Curtain Wall & Spandrel Assembly:	10	Wall & Spandrel Assembly Value:	0.05
Area of Framed & Insulated / Standard Wall:	20	Wall Value:	24
Area of Vision Window:	69	Window Glazing Assembly Value:	0.40
		Window Glazing SHGC:	0.40
Area of Doors:	1	Door Assembly Value :	0.40

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Building will be designed to be at least 20% more efficient than ASHRAE 90.1-2010 baseline and 15% more efficient than ASHRAE 90.1-2013 baseline, by a team experienced in meeting and exceeding these standards. Design is in preliminary stages and mechanical, lighting, and other critical systems have not yet been developed. Specific energy loads and performance are yet to be determined.

Annual Electric (kWh):		Peak Electric (kW):	
Annual Heating (MMbtu/hr):		Peak Heating (MMbtu):	
Annual Cooling (Tons/hr):		Peak Cooling (Tons):	
Energy Use - Below ASHRAE 90.1 - 2013 (%):	15	Have the local utilities reviewed the building energy performance?:	No
Energy Use - Below Mass. Code (%):	15	Energy Use Intensity (kBtu/SF):	70

Back-up / Emergency Power System

Electrical Generation Output (kW):		Number of Power Units:	5
System Type (kW):	Combustion engine	Fuel Source:	Natural gas or diesel

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

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

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

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

B.1 – GHG Emissions - Design Conditions

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

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

Energy efficiency will be a driving factor in building design. The building will be modeled as soon as possible in design to allow the energy model to inform architects' and engineers' decisions. High performance envelope details and systems are planned.

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

Building envelope will be prioritized and glazing design will be informed by solar orientation.

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

All equipment will be high performance, utilize building energy controls including lighting controls, and all plumbing fixtures will be low-flow or low-flush.

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

Buildings will be designed to be solar PV ready, and solar PV will be installed if construction and operating economics permits.

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

Buildings will be designed to be solar PV ready, and solar PV will be installed if construction and operating economics permits.

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

The building will be modeled by experience energy modelers and design guidance will be provide by experts well-versed in high-performance building design.

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):

Throughout design and selection of mechanical systems, future options for converting to net zero emissions systems will be considered, as will future options for net zero carbon emissions inform envelope and renewable energy system design.

C - Extreme Heat Events

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

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low (Deg.):	7	Temperature Range - High (Deg.):	91
Annual Heating Degree Days:	5659	Annual Cooling Degree Days	899

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

Days - Above 90° (#):	10	Days - Above 100° (#):	5
Number of Heatwaves / Year (#):	2	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:

High reflectance paving and roofing materials and landscaped areas will be used to help mitigate heat-island effect.

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 building system cooling capacity will be designed with expected higher temperatures and longer heat waves in mind.

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:

Building will employ an above average envelope to extend passive occupancy time during extended utility service interruptions.

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

What is the project design precipitation level? (In. / 24 Hours)	1

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

Building will direct storm water runoff to storage and infiltration system as well as Hood Park site stormwater retention pond. Permeable pavers and landscaping at grade will also help reduce run-off.

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):

On-site storm water retention capacity increases and green roofs will be explored for future accommodation of more significant rain events.

E – Sea Level Rise and Storms

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

Is any portion of the site in a FEMA Special Flood Hazard Area?	Yes	What Zone:	AE
What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)?			10

Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see SLR-FHA online map)?	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 by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)?	19		
What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)?	19	First Floor Elevation (Ft BCB):	20
What are the Site Elevations at Building (Ft BCB)?	20	What is the Accessible Route Elevation (Ft BCB)?	20

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 entire site, including vehicle and pedestrian access, will be elevated above the base flood and sea level rise design flood elevations.

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.:

Building first floor will be elevated above the design flood elevation and all critical systems will be located above the first floor.

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:

Buildings are not intended to provide shelter-in-place capacity. Emergency power will be provided for egress and emergency lighting.

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

Building will be constructed of materials with low susceptibility to flood damage, with equipment located well above the expected flood level, allowing rapid cleanup and recovery.

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.:

Site will be elevated at this time to raise all of the building and vehicle and pedestrian access routes above the expected sea level rise flood level.

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

Future building adaptation strategies could include additional relocation of electrical equipment to higher elevation, redesigning building elevators, and dry- or wet-floodproofing all areas on the first floor.

Thank you for completing the Boston Climate Change Checklist!

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

Appendix F

Accessibility Checklist

Article 80 – Accessibility Checklist

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

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

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

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

Accessibility Analysis Information Sources:

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

Glossary of Terms:

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

1. Project Information: *If this is a multi-phased or multi-building project, fill out a separate Checklist for each phase/building.*			
Project Name:	Hood Masterplan		
Primary Project Address:	Hood Park, Charlestown, MA		
Total Number of Phases/Buildings:	Three Phases / Six Buildings		
Primary Contact (Name / Title / Company / Email / Phone):	Mark Rosenshein, Trademark Partners LLC Mark Rosenshein (mark@trademark.boston); 617-331-4281		
Owner / Developer:	Hood Park LLC		
Architect:	By Block		
Civil Engineer:	SMMA		
Landscape Architect:	SMMA		
Permitting:	Trademark Partners, LLC		
Construction Management:	Lee Kennedy, Co.		
At what stage is the project at time of this questionnaire? Select below: Submitting with ENPC and DEIR.			
	PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BPDA Board Approved
	BPDA Design Approved	Under Construction	Construction Completed:
Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	Not this time.		

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:	*Portion of 20 acre site*	Building Area:	*By Block GSF*
Building Height:	*By Block ft.*	Number of Stories:	*By Block*
First Floor Elevation:	*By Block ft.*	Is there below grade space:	*By Block Flrs.*

What is the Construction Type? (Select most appropriate type) *By Block*				
	Wood Frame	Masonry	Steel Frame	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply) *By Block per PDA.*				
	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:	*Retail, restaurant, main lobbies, office or lab support space, storage/mech., service.*			

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:	This project is located on the west side of Rutherford Ave within the larger Hood Park in Charlestown. The topography of Hood Park and this area of Charlestown is generally quite level.
List the surrounding accessible MBTA transit lines and their proximity to development site: commuter rail / subway stations, bus stops:	The project is located between two accessible MBTA stations: Sullivan Square (0.5 mi away, Orange Line and major Bus hub), and Community College (0.5 mi. away, Orange Line).
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	The project is near the Bridgeview Center (an adult supportive services facility); Bunker Hill Community College; Mishawum Park Apartments;
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	The project is near the Bunker Hill Community College ballfields; the Edwards playground; the Golden Age Community Center; the Charlestown Community Gardens
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	Currently, the site is being used by existing buildings, tenant parking, and construction

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:	staging and material storage for the 50 Hood Park Drive and 100 Hood Park Drive Projects. Therefore, there are no sidewalk or pedestrian ramps currently along Stack Street, Hood Park Drive, or anywhere on the 10 Stack Street project site. Existing sidewalks and pedestrian ramps elsewhere on site are in good condition and accessible.
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:	There are no sidewalks or pedestrian ramps currently along Stack Street, Hood Park Drive, or anywhere on the 10 Stack Street project site. Existing sidewalks and pedestrian ramps elsewhere on site are in good condition and accessible.
5. Surrounding Site Conditions – Proposed *This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.*	
Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	The proposed design is envisioned as a highly accessible pedestrian-oriented area with all building uses and exterior spaces meeting ADA and MAAB guidelines as required by the Commonwealth of Massachusetts, as well the City's Boston Complete Streets Guidelines. Proposed sidewalks are consistent with the Boston Complete Street Guidelines, with the most prominent Street Types being Downtown Mixed-Use (Hood Park Drive, Stack Street, and Supertest Street).
What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	Hood Park Drive: 4.5' (min.) Furnishing Zone (incl. curb) 10' Pedestrian Zone 3' – 50' Frontage Zone Steepest slope is no more than 2% near Rutherford Ave. Stack Street: 4.5' (min.) Furnishing Zone (incl. curb) 10' Pedestrian Zone 0' – 60' Frontage Zone No slope, relatively flat. Stack Street (north portion to D Street): 4.5' (min.) Furnishing Zone (incl. curb) 8' – 10' Pedestrian Zone 0' – 10' Frontage Zone

	Steepest slope is no more than 2% when it meets D Street on the north side. Supertest Street: 4.5' (min.) Furnishing Zone (incl. curb) 10' Pedestrian Zone 0' – 60' Frontage Zone Steepest slope is no more than 2% near Rutherford Ave. Half Pint Way: 1.5' – 4.5' (min.) Furnishing Zone (incl. curb) 4.5' – 8' Pedestrian Zone 0' – 60' Frontage Zone Steepest slope is no more than 2% heading to south side of site.
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?	Proposed materials will be in accordance to the standards set forth within the Boston Complete Streets Design Guidelines. Accessible surfaces will be smooth, slip-resistant, and comfortable for people of all ages and abilities. Materials will generally consist of stone, precast concrete or cast-in-place concrete and will comply with City of Boston and ADA guidelines. All new streets utilize the same materials for each zone. All future sidewalks are on private property but publicly accessible. Furnishing Zone: Permeable pavers or open planting bed, street trees and granite curb. Pedestrian Zone: Concrete and precast pavers. Frontage Zone: Concrete and precast pavers.
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?	Sidewalk cafes will be programmed and designed for specific buildings in the future. Although there is no public right-of-way since the streets are private, they will be designed to comply with City of Boston regulations on accessible paths of travel. Sidewalk café locations and dimensions will be determined as tenants are secured.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	No.
Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	None.
1. 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?	There is a total of 1,765 parking spaces planned for the development site. Most spaces will be in above and below grade garages. Approximately 178 spaces will be on the various streets. The plan includes 150 spaces in a structured below-grade parking garage at 10 Stack Street.
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle?	Existing developed buildings currently have the proper number of accessible and van accessible spaces. The quantities of parking spaces in most future buildings have not been determined at this time. When determined, MAAB and ADA guidelines will be followed for accessible and van accessible spaces. The below-grade parking at 10 Stack Street is not a public parking garage yet it will have the minimum number of required accessible and van accessible spaces.
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	To be determined as each building design progresses and space counts are finalized.
Where is the accessible visitor parking located?	There will be visitor parking will be in 100 Hood Park Drive parking garage. Additional visitor parking will be determined as each building design progresses.
Has a drop-off area been identified? ***If yes,*** will it be accessible?	Drop-off areas have been established in front of 500 Rutherford South and 500 Rutherford North. There is a drop-off area under construction at 50 Hood Park Drive. Drop-off areas are planned in front of 10 Stack Street, 35 Supertest, and 25 Supertest.
2. 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 (max. 1/2 inch thresholds at entrances and floor transitions.
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no***, what is the reason?	Yes. Same doors for both. Equipped with automatic openers.

If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	The project will be fully served by accessible routes for all users. The structured parking below grade is served by elevators to both levels discharging at the entry lobbies. All way-finding signage is ADA and MAAB compliant including contrasting color letters and braille text. Way-finding signage is provided throughout the parking garage, retail areas, and lobbies.
3. 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?	50 Hood Park Drive: 177 rental apartment units (under construct.) 35 Supertest Street: This will be developed as the building is designed. 25 Supertest Street: This will be developed as the building is designed.
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 (Inclusionary Development Policy) units?	No units are for sale. All are planned to be rental apartments. 50 Hood Park Drive: 23 units (13%) will be IDP rental units. 35 Supertest Street: Breakdown of units will be developed when the project enters the construction and leasing phases.
If a residential development, how many accessible Group 2 units are being proposed?	50 Hood Park Drive: 9 units (5%) are Group 2 accessible. 35 Supertest Street: This will be developed as the building is designed. The number of Group 2 units will follow MAAB Regulations, ADA Guidelines, and FHA Accessibility Guidelines.
If a residential development, how many accessible Group 2 units will also be IDP units? *If none*, describe reason.	50 Hood Park Drive: Of the 23 IDP units, 3 (13%) are Group 2 accessible. 35 Supertest Street: This will be developed as the building is designed. The number of Group 2 units will follow MAAB Regulations, ADA Guidelines, and FHA Accessibility Guidelines.
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.	25 Supertest Street: The number of accessible units with a wheel-in shower will be developed as the building is designed and follow MAAB Regulations and ADA Guidelines.
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.	50 Hood Park Drive: The project follows MAAB Regulations, ADA Guidelines, and FHA Accessibility Guidelines. 35 Supertest Street: This will be developed as the building is designed. 25 Supertest Street: This will be developed as the building is designed.
Are there interior elevators, ramps or lifts located in the	50 Hood Park Drive: Elevators and ramps serve all levels. The project follows MAAB Regulations, ADA Guidelines, and FHA Accessibility Guidelines.

development for access around architectural barriers and/or to separate floors? *If yes*, describe:	35 Supertest Street: This will be developed as the building is designed. 25 Supertest Street: This will be developed as the building is designed.

4. 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, the project is creating sidewalks along private ways within Hood Park including landscaping and street trees. The project will also enter into a Transportation Access Plan Agreement and will make required any required contributions and improvements as a part of that agreement; The development of 480 Rutherford, under the same PDA Master Plan included a contribution of $162,000 towards the construction of future Rutherford Avenue improvements, plus sidewalk improvements to Rutherford Avenue including street trees and other landscaping.
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?	At 50 and 100 Hood Park Drive, all access points, lobbies, circulation paths and public areas have been designed to provide full accessibility. 10 Stack Street will have all access points, lobbies, circulation paths and public areas designed to provide full accessibility. Inclusion of accessible elements will be developed as the remaining buildings are designed.
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.	50 Hood Park Drive: Common restrooms on first and second floors for residents/guests. 100 Hood Park Drive: No common restrooms. 10 Stack Street: Common restrooms on each floor for tenants. 500 Rutherford South: Common restrooms on each floor for tenants. 500 Rutherford North: Common restrooms on each floor for tenants. Tenant fit-outs are not part of this project. Tenants will design their own restrooms.
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?	No.
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	No.

project more accessible?	

5. Attachments

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

Provide a diagram of the accessible routes to and from the accessible parking lot/garage and drop-off areas to the development entry locations, including route distances. *See attached plan.*
Provide a diagram of the accessible route connections through the site, including distances. *See attached plan.*
Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) *See attached plan.*
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry. *New residential units will be developed as the building is designed. Group 2 units in 50 Hood Park Drive (480 Rutherford) have been approved and are under construction.*
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

Hood Park Master Plan **Boston, Massachusetts**

ELKUS | MANFREDI HOOD PARK SMMA

Figure F-1

Accessible Routes